

City of Leavenworth, Kansas



January 1, 2019 - December 31, 2019

Kansas Permit No: M-MO12-SN01

Federal Permit No: KSR044011

February 28, 2020

RESOLUTION NO. B-2245

A RESOLUTION APPROVING THE 2019 KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT (KDHE) ANNUAL REPORT FOR STORMWATER AND AUTHORIZING THE CITY OF LEAVENWORTH, KANSAS, TO SUBMIT THE REPORT TO KDHE.

WHEREAS, the City of Leavenworth, Kansas is regulated by the Kansas Department of Health and Environment (KDHE) and the US Environmental Protection Agency (EPA) as a Phase II City for stormwater purposes; and

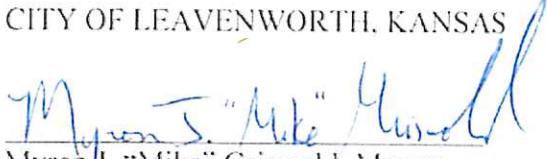
WHEREAS, the City of Leavenworth, Kansas has prepared the Annual Report for Stormwater as required and reviewed such report at the February 11, 2020 City Commission meeting allow time for public review and input prior to approval by the Governing Body.

NOW, THEREFORE, BE IT RESOLVED BY THE GOVERNING BODY OF THE CITY OF LEAVENWORTH, KANSAS:

Section 1. That the 2019 Annual Report for Stormwater reflects the direction, efforts and accomplishments by City of Leavenworth for calendar year 2019. It shall be an official record of these actions to meet the requirements of Kansas Department of Health and Environment (KDHE) for an Annual Report until or unless changed by official action.

PASSED AND APPROVED this 25th day of February 2020.

CITY OF LEAVENWORTH, KANSAS


Myron J. "Mike" Griswold, Mayor

ATTEST:


Carla K. Williamson, CMC, City Clerk





February 27, 2020

Mr. Rance Walker
KDHE Bureau of Water
1000 SW Jackson, Suite 420
Topeka, KS 66612-1367

RE: **2019 KDHE Report on Stormwater
City of Leavenworth**

Please find the following submitted for compliance with 2019 Annual Report for Stormwater.

CD/DVD containing:

- Final report with signed certification
- 2016 SMP
- PDF file of Leavenworth stormwater system and outfalls, and other structures

Please do not hesitate to call me at (913) 684-0375 if you have any questions.

Sincerely,

Michael G. McDonald, P.E.
Director of Public Works

LEAVENWORTH
330 SHAWNEE ST
LEAVENWORTH, KS 66048-9998
195038-0593
(800)275-8777
02/28/2020 08:49 AM

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USPS Tracking or call 1-800-222-1811.

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First-Class Package Service 2 Days (Domestic) (TOPEKA, KS 66612) (Weight:0 Lb 2.10 Oz) (Estimated Delivery Date) (Monday 03/02/2020) (USPS Tracking #) (9502 1154 1993 0059 5366 50)	1	\$3.80	\$3.80
Sign Conf			\$3.15
Total:			\$6.95

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YOUR OPINION COUNTS

Credit Card Remitd \$6.95
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(Account #:XXXXXXXXXX7201)
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(AID:A0000000031010 Chip)
(AL:VISA CREDIT)
(PIN:Not Required)

Receipt #: 840-56400683-3-3576756-2
Clerk: 4

CITY OF LEAVENWORTH

Kansas Stormwater Annual Report Form for Municipal Separate Storm Sewer Systems

January 1, 2019 - December 31, 2019

Kansas Permit No: M-MO12-SN01

CITY OF LEAVENWORTH

Kansas Stormwater Annual Report Form for

Municipal Separate Storm Sewer Systems (MS4)

January 1, 2019 - December 31, 2019

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Section A

Local Government Information

- Basic Information
- DVD Submitted to KDHE
 - Copy of this Report
 - Copy of 2016 Stormwater Management Program
 - PDF of Stormwater System Showing Inlets, Outfalls and other Information

**KANSAS STORMWATER 2019 ANNUAL REPORT FORM
FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4)**

Please place an "X" in the left box if any information has changed from previous years

<input type="checkbox"/>	Permittee [Agency Name] Mailing Address 1:	City of Leavenworth
<input type="checkbox"/>	Mailing Address 2:	100 N. 5th Street
<input type="checkbox"/>	Municipality:	Leavenworth
	State:	Kansas
<input type="checkbox"/>	Zip Code:	66048
<input type="checkbox"/>	MS4 Program Contact - Person:	Michael G. McDonald
<input type="checkbox"/>	Contact E-Mail Address:	mmcdonald@firstcity.org
<input type="checkbox"/>	Contact Phone Number:	913-684-0375
<input type="checkbox"/>	MS4 Program Construction Contact - Person	Mike Hooper
<input type="checkbox"/>	Construction E-Mail Address:	mhooper@firstcity.org
<input type="checkbox"/>	Contact Phone Number:	913-684-0375
<input type="checkbox"/>	Kansas Permit Number: — Ex. M-MC21-SU01	M-MO12-SN01

Reporting period covers activities from January 1, 2019 through December 31, 2019.

This annual report must be submitted to the Kansas Department of Health and Environment (KDHE) by February 28th, 2020. The annual report is to be submitted as PDF files to KDHE preferably on a standard compact disk (CD) or digital versatile disk (DVD). If the permittee does not have the ability to provide the files in a CD or DVD, a flash drive can be submitted. Some permittees provide additional hard copy submissions of the annual report or supplemental documents along with the electronic files. There is no requirement to provide hard copies of any documents other than a simple transmittal letter.

CITY OF LEAVENWORTH

Kansas Stormwater Annual Report Form for Municipal Separate Storm Sewer Systems

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Item 2

- Executive Summary

CITY OF LEAVENWORTH

Kansas Stormwater Annual Report Form for Municipal Separate Storm Sewer Systems

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SECTION 1: EXECUTIVE SUMMARY

To satisfy the requirements of the NPDES permit, this annual report summarizes the City of Leavenworth's plans and actions to reduce the discharge of pollutants from the municipal separate storm sewer system (MS4) to the maximum extent practicable, to protect water quality, and to meet the appropriate water quality requirements of the Clean Water Act. The information contained within this report was obtained through interviews with City staff, review of permits and projects from 2019, and examining communications and publications made available to the citizens of Leavenworth.

City staff pursue activities in all of the Six Minimum Control Measures throughout the year. Key observations for the purposes of this report are shown below.

- **Were there any aspects of the program that appeared especially effective at reducing pollutants in your stormwater discharge?**

- Contractor and public compliance with implementation of the Land Disturbance Permit requirements is improved over the initial years and is generally satisfactory
- Street sweeping is an effective tool for removing pollutants
- Use of "Stormwater Utility" funds to address long-standing small to medium sized issues has reduced erosion in several locations through the "Orange Fence Repair Projects".

- **Were there any aspects of the program that provided unsatisfactory results?**

While most items identified as BMPs are believed to be effective at some level, the passive education and information sharing such as leaving material at the library and having informational brochures available were probably the least effective tools identified.

- **What was the most successful part of the program?**

The visibly effective measures of correctly installed construction site runoff control and post construction activities were the most successful parts of the program

- **What was the most challenging aspect of the program?**

The Grease Trap Program is easily the most challenging activity. Owners of Grease Traps and Interceptors are often working hard to grow their business and see city efforts to ensure compliance with regulations as a hindrance. Staff has improved compliance in this area over the last few years.

- **Describe any City/County area MS4 clean-ups and the participation.**

- City of Leavenworth sponsors a "City Wide Clean-up" effort each year. This was on April 6, 2019 with over 920 participants. This also includes coordination with Leavenworth County for a HHW (Household Hazardous Waste) Collection Site within the City.
- The City has created a "Three-Mile Creek" monthly clean-up program for citizen groups. Seven groups received \$500 donation per group from transient guest tax dollars in 2019.

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Kansas Stormwater Annual Report Form for Municipal Separate Storm Sewer Systems

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- **Describe the elected officials' participation in the stormwater pollution elimination.**

The City Commission has supported stormwater pollution elimination by creating a "Stormwater Utility" that is funded by a fee on all properties that began in January 2019. This fee is used to address longstanding stormwater problems in the community, typically including reduction or elimination of erosion that has been causing failed roadways, culverts and streambanks. The Commission has also supported staff goal to have all public and private projects have some level of permanent water quality improvement included.

- **Describe the collaboration with other organizations to eliminate stormwater pollution.**

The City coordinates with 34 groups during Citywide clean-up day. Leavenworth County provides HHW services throughout the year.

- **If an audit/inspection of your MS4 program was conducted by EPA or KDHE during the year, list the items the audit/inspection report identified as required changes and provide a narrative explanation of how the changes were implemented or explain the plan to implement the changes and identify a target date for final implementation.**

There were no known inspections of the MS4 program by KDHE or EPA in 2019. EPA has sent a letter releasing the City from the Consent Decree issued on July 18, 2019. This letter is included in the appendix.

CITY OF LEAVENWORTH

Kansas Stormwater Annual Report Form for Municipal Separate Storm Sewer Systems

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Item 3

- New Stormwater Ordinances/Resolutions - N/A

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Kansas Stormwater Annual Report Form for Municipal Separate Storm Sewer Systems

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Item 4

- July 18, 2019 EPA Letter Releasing City from Consent Decree - (December 16, 2015)

COPY



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 7

11201 Renner Boulevard
Lenexa, Kansas 66219

JUL 18 2019

CERTIFIED MAIL

RETURN RECEIPT REQUESTED

Article No.: 7014 1200 0000 6119 0112

Honorable Jermaine Wilson, Mayor
City of Leavenworth
100 N. 5th Street
Leavenworth, Kansas 66048

Dear Mayor Wilson:

On December 16, 2015, the referenced Administrative Order for Compliance on Consent was issued by the U.S. Environmental Protection Agency to the City of Leavenworth under the authority of Section 309(a) of the Clean Water Act, 33 USC § 1319(a). The EPA has reviewed the information submitted by you in response to the required compliance activities outlined in paragraphs 38 and 39 of the Order and has determined that those requirements have been adequately met. This letter serves as a notification to you that the EPA is terminating the Order. The EPA's decision to terminate the Order is conditioned upon the accuracy of your representations to the EPA in response to the requirements of the Order.

Termination of this Order in no way relieves you of the obligation to comply with your National Pollutant Discharge Elimination System permit and all applicable statutes and regulations. The effect of this termination is limited to the requirements imposed under the Order. The EPA reserves all its authorities, both legal and equitable, under the CWA and any other statutory, regulatory, or common law authorities of the United States.

If you have any questions relating to this termination letter or the above referenced enforcement action, please contact Cynthia Sans of my staff, at (913) 551-7492 or Melissa Bagley in the Office of Regional Counsel at (913) 551-7522.

Sincerely,

A handwritten signature in black ink, appearing to read "Wendy" followed by a stylized signature.

DeAndré Singletary
Acting Director
Enforcement and Compliance Assurance Division

cc: Tom Stiles, KDHE

CITY OF LEAVENWORTH

Kansas Stormwater Annual Report Form for Municipal Separate Storm Sewer Systems
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Item 5

- Topics Required to be Addressed in this Report as Identified in Part V of the Permit

CITY OF LEAVENWORTH

Kansas Stormwater Annual Report Form for Municipal Separate Storm Sewer Systems

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The permittee is well advised to accurately report the conditions and status of their stormwater program and give due consideration to improving or enhancing their program where it is weak, or deficient in any of the core aspects (stormwater management program, six minimum control measures and TMDL best management practices - if applicable - also for Phase I permittees monitoring industrial facilities).

TOPICS REQUIRED TO BE ADDRESSED IN THIS REPORT AS IDENTIFIED IN PART V OF THE PERMIT

Within the next one or two pages, or perhaps more if so desired, provide comments addressing the following items:

- 1. Provide the status of compliance with permit conditions, an assessment of the appropriateness of the implemented Best Management Practices, progress towards achieving the statutory goal of reducing the discharge of pollutants to the maximum extent practicable (MEP), and the measurable goals with an indication of the progress toward meeting the goals for each of the six minimum control measures.***

City of Leavenworth opinion is that the information shown in each of the "Six Minimum Control Measures" tables support the conclusion that meaningful reduction in discharge of pollutants has occurred over the last five years of the permit, especially during the last two years.

- 2. Provide results of information collected and analyzed, (for example test results, surveys, or public comments/input) during the annual reporting period. This may include monitoring data used to assess the success of best management practices with respect to reduction in pollutant discharge. Include an interpretation of the information which addresses success or failure of the portion of the program for which the information applies.***

The City has collected information on a wide variety of municipal activities associated with various BMPs. This includes data on leaf collection, street sweeping, deicing use (salt), grease trap program, land disturbance permit issuance, SSO reporting, creek crossing inspections, BMP operation (particularly detention basins) annual meeting and others. There has been no overall "trend" noticed in this data, but it is indicative of the effort of our community to be aware of important issues related to water quality. Specific data for many of these reporting items is in the assessment of the various BMP activities for the last year. It is clear that staff, public, contractors and businesses are aware of the various permitting programs associated with the SMP, and water quality is improved and/or maintained as a result.

- 3. Provide results of information collected and analyzed, if any, during the annual reporting period, including monitoring data used to assess the success of the program at reducing the TMDL regulated pollutants.***

KDHE removed the requirement that the City sample stormwater entering and leaving the city during the 2019 Calendar Year. The City does continue to sample rivers and creeks (especially for e. coli) when evaluating action for SSO events. Sampling is also done as part of the NPDES Permit for the Wastewater Plant as well as within the Sanitary Sewer System for industrial chemicals that are not easily removed with the systems in place at the WWTP.

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4. Provide a summary of the stormwater activities that were scheduled to be undertaken during the previous calendar year and the status of these activities.

Key programs associated with stormwater activities, all of these programs were conducted in 2019 as noted. There are many other smaller programs as well.

- ✓ Building Permits, Fills, Excavations are evaluated for needing an NOI, Land Disturbance Permit, Basic Erosion Control, SWPP and other clean water related elements
- ✓ Projects under construction are inspected and deficiencies brought to the attention of the contractor, owner or other appropriate person
- ✓ Citywide civic effort for "Spring Clean-up"
- ✓ Grease Trap Program inspections and reports
- ✓ BMP annual meeting
- ✓ Street Sweeping Program – sweeping was curtailed in summer months beginning in 2018 to allow additional resources to be used on other work assignments. Goal of once per month on Arterials and three times per year on residential streets was met.
- ✓ Leaf Collection Program – program eliminated curbside pick-up in 2019, but retains free drop off site and collection by Refuse Service
- ✓ Free Drop-Off Recycling Program
- ✓ Household Hazardous Waste Program (Coordinated with Leavenworth County)
- ✓ Free drop-off refuse disposal once per month
- ✓ Maintain "Clean-up your Dog Poop" effort at selected City parks
- ✓ Aggressive response to SSO calls 24/7
- ✓ Creek Crossing (Sanitary Sewer) Inspections at least four times each year
- ✓ Sewer line cleaning and TV program
- ✓ Stormwater articles in City newsletters

5. Provide a summary of the stormwater activities which are scheduled to be undertaken during the next calendar year (including an implementation schedule).

All activities as noted in #4 are expected to be continued in 2020. City Staff and Commission will be evaluating the new permit and associated BMPs in 2020 for implementation in 2021.

6. Provide a map showing changes in the permittee's Permit Area if the permit area has changed within the year.

There were no changes to the City Limits in 2019

7. Provide a description of significant changes in any of the BMPs.

The City has made the following changes to BMPs in 2019

- Street Sweeping Program – sweeping curtailed in summer months beginning in 2018 to allow additional resources to be used on other work assignments. Goal of once per month on Arterials and three times per year on residential streets was met.
- Leaf Collection Program – program eliminated curbside pick-up in 2019, but retains free drop off site and collection by Refuse Service.

CITY OF LEAVENWORTH

Kansas Stormwater Annual Report Form for Municipal Separate Storm Sewer Systems

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- 8. Provide a list of any ordinances or resolutions which were updated in the last year and are associated with the SMP. Please note, page on of this report requires submission of any new stormwater related ordinances or resolutions or any such updated ordinances or resolution be submitted with this annual report.**

There were no ordinances or resolutions associated with the SMP in 2019 except where the City Commission approved the 2018 KDHE Annual Report.

- 9. Provide a list of other parties (such as other municipalities or consultants), which are responsible for implementing any of the program areas of the Stormwater Management Program.**

There were no other municipalities or consultants involved with implementing the SMP.

- 10. For Phase I permittees only, provide a summary of the inspection results, including the wet weather surface water quality monitoring test results, and information obtained under PART III Monitoring Industrial Stormwater Discharges section of this permit.**

KDHE has released the City of Leavenworth from sampling stormwater entering and leaving the City limits in 2019.

CITY OF LEAVENWORTH

Kansas Stormwater Annual Report Form for Municipal Separate Storm Sewer Systems

January 1, 2019 - December 31, 2019

Kansas Permit No: M-MO12-SN01

Sections A, B, C & D

- KDHE Stormwater 2019 Annual Report

SIX MINIMUM CONTROL MEASURES FOR MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) WITH NPDES PERMITS

The following outlines the NPDES permit requirements for implementation of the Six Minimum Control Measures as required under Kansas MS4 permits issued by the KDHE. The NPDES permit provided to the MS4 authority should be reviewed for additional requirements associated with implementation of the Six Minimum Control Measures such as deadlines for the implementation of the requirements or supplemental requirements associated with the individual measures. The general requirements are as follows:

A. Six Minimum Controls — The permittee shall develop and implement Best Management Practices (BMPs) with measurable goals for each of the six minimum control measures. The six minimum control measures and the associated requirements are listed and explained as follows:

1. Public Education and Outreach

The permittee shall implement a public education program which includes distribution of educational materials to the community or conducting equivalent outreach activities which address the impacts of stormwater discharges on water bodies and the steps the public can take to reduce pollutants in stormwater runoff.

2. Public Involvement and Participation

The permittee shall implement a public involvement and participation program to solicit public comment and recommendations regarding the BMPs and measurable goals utilized by the permittee to comply with the permit. The permittee shall comply with state and local public notice requirements when implementing a public involvement and participation program.

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3. Illicit Discharge Detection and Elimination

The permittee shall:

- a. Develop, implement and enforce a program to detect and eliminate illicit discharges into the MS4.
- b. Develop a storm sewer system map of the permittee's MS4, showing the location of all outfalls, either pipes or open channel drainage, showing the names and location of all streams or lakes that receive discharges from those outfalls. A copy of the map shall be submitted to KDHE. This map may be submitted as a PDF file(s) on a CD or DVD.
- c. Enact ordinances or resolutions to prohibit non-stormwater discharges into the storm sewer system and implement appropriate enforcement procedures and actions if the permittee has such authority. A copy of the ordinances or resolutions shall be submitted to KDHE.
- d. Inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste; and
- e. Develop and implement a plan to detect and address prohibited non-stormwater discharges, including but not limited to illegal dumping, to the storm sewer system. Unless identified by either the permittee or KDHE as a significant source of pollutants to waters of the state, the following examples of non-stormwater discharges are not prohibited from entering the MS4:

1. Water line flushing
2. Diverted stream flow
3. Rising groundwaters
4. Uncontaminated groundwater infiltration as defined under 40 CFR 35.2005(20) to separate storm sewers
5. Uncontaminated pumped groundwater
6. Contaminated groundwater if authorized by KDHE and approved by the municipality
7. Discharges from potable water sources
8. Foundation drains
9. Air conditioning condensate
10. Irrigation waters
11. Springs
12. Water from crawl space pumps
13. Footing drains
14. Lawn watering
15. Individual residential car washing
16. Occasional not-for-profit car wash activities
17. Flows from riparian habits and wetlands
18. Dechlorinated swimming pool discharges excluding filter backwash
19. Street wash waters (excluding street sweepings which have been removed from the street)
20. Discharges of flows from firefighting activities
21. Heat pump discharge waters (residential only)
22. Treated wastewater meeting requirements of a NPDES permit
23. Sump pump drains
24. Other discharges determined not to be a significant source of pollutants to waters of the state, a public health hazard, or a nuisance

4. Construction Site Stormwater Runoff Control

The permittee shall develop, implement, and enforce a program to reduce pollutants in any stormwater runoff to the MS4 from construction activities that result in a land disturbance of greater than or equal to one acre. Reduction of stormwater discharges from construction activity disturbing less than one acre must be included in the program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more. The program must include the development and implementation, at a minimum, of the following:

- a. Permittees which have the authority to enact ordinances or resolutions shall enact such ordinances or resolutions to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under State and Local law;
- b. Requirements for construction site owners or operators to implement appropriate erosion and sediment control best management practices;
- c. Requirements for construction site owners or operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that are likely to cause adverse impacts to water quality;
- d. Procedures for site plan review which incorporate consideration of potential water quality impacts;
- e. Procedures for receipt and consideration of information submitted by the public;
- f. Procedures for site inspection and enforcement of control measures.

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

The permittee shall develop, implement, and enforce a program to address post-construction stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development and implementation, at a minimum of the following:

- a. BMPs to prevent or minimize adverse water quality impacts;
- b. Strategies which include a combination of structural and/or non-structural BMPs appropriate for the municipality;
- c. For permittees which have the authority, ordinances or resolutions to address post-construction runoff from new development and redevelopment projects to the extent allowable under State and local law;
- d. Ensure adequate long-term operation and maintenance of BMPs

6. Pollution Prevention/Good Housekeeping for Municipal Operations

The permittee shall develop and implement an operation and maintenance program that includes employee training to prevent and reduce stormwater pollution from municipal operations activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and stormwater system maintenance.

B. Stormwater Management Program

Please place an "X" in the left boxes to complete the table below.

YES	NO	N/A	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has the Stormwater Management Program (SMP) been developed and implemented?
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Has the SMP been modified or updated during this reporting period?
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	If the answer to question 2 above was "yes," has the modified SMP been submitted to KDHE for review?

If the answer to item 3 is a "NO," a copy of the updated SMP must be submitted with this annual report. If it is anticipated a measurable goal cannot be met in the next year the SMP should be modified and submitted to KDHE for review. The modifications may include different BMPs and/or revised goals to avoid being in a position of non-compliance. However; reasonable BMPs with reasonable goals must be implemented or KDHE may require the permittee to modify the SMP to include additional or better BMPs and/or more reasonable goals.

C. Total Maximum Daily Load (TMDL) Best Management Practices (BMPs)

Some permittees are required to implement BMPs to reduce the discharge of listed TMDL regulated pollutants (potentially any or all of the following pollutants – bacteria, nutrients, and sediment)

Please place an "X" in the left boxes to complete the table below.

YES	NO	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Were any BMPs intended to attenuate the discharge of TMDL regulated pollutants implemented? See your permit to determine if TMDL regulated pollutants are listed for the receiving stream affected by your stormwater system (TMDL Table).
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	List all of the BMPs intended to attenuate the discharge of TMDL regulated pollutants as identified in the SMP and provide the requested information in the following table.

List all the TMDL BMPs as identified in the SMP and provide the requested information in the following table.

D. TMDL BMP Table — Please fill out accordingly

BMP ID NUMBER	BRIEF BMP DESCRIPTION	REGULATED TMDL PARAMETERS	MEASURABLE GOAL(S)	PROGRESS ACHIEVING GOAL(S) (MEASURED RESULT)

City Not Required to Report

Section E

- Stormwater Management Program Requirements
(Sections E1 - E6)

E. Stormwater Management Program Requirements (Six Minimum Control Measures)

1. Public Education and Outreach (Table) - Please fill out accordingly

List all of the public education and outreach BMPs as identified in the SMP and provide the requested information in the following table. (List presentations and media)

BMP ID NUMBER	BRIEF BMP DESCRIPTION	MEASURABLE GOAL(S)	PROGRESS ACHIEVING GOAL(S) (MEASURED RESULT)
1.1	Webpage link to stormwater infrastructure information – City Stormwater Management Program, 2019 Stormwater Guidelines, 2019 Stormwater Permit.	# of visitors – in June 2019 the City switched to a new website that monitors views since the switch. The new site had 322,016 views, with 11,553 views on the Solid Waste Division page and 1,549 views on the Brush Site page.	All previous permits and annual reports are available online at the City's webpage. Newly posted is a brochure listing steps to slow down or stop soil erosion. Brochure can be found at: https://www.leavenworthks.org/publicworks
1.2	Place documents in public library.	# Check-out requests – Unknown	All items available in the reference section at the public library. No check out requests are known.
1.3	Include articles or stories related to stormwater in City newsletter in at least two issues per year.	# Articles/Stories – three articles from the three issues in 2019 can be found at: https://issuu.com/melissabower/docs/fall_2019_for_web_pg_7 https://issuu.com/melissabower/docs/summer_2019_final_corrected2_pg_4 https://issuu.com/melissabower/docs/winterspring_2019_final_pg_16	Coordination between Public Information Office and Public Works has stories on the City's Annual Spring Cleanup. From the Parks Division: Arbor Day, Legacy Tree, Adopt-a-Park - all can be found at this link: https://www.leavenworthks.org/parksrec/page/parks-programs
1.4	City-generated posts on social media related to stormwater issues at least ten occurrences per year.	# Issues – three issues of City Connection delivered in 2019, and the link is: https://www.leavenworthks.org/citymanager/page/public-information-office	Public Information Office interacts with the public on social media on a wide range of stormwater-related issues.
1.5	Provide Information to citizens regarding the City of Leavenworth Solid Waste Division.	Distribute trash bags to citizens with proper disposal handout.	The City continues to provide citizens with information via the City website, handouts, and a recycling coach app. A paper insert with solid waste and other City information is provided to the doorstep of nearly all residences twice per year in a roll of trash

			<p>bags. The City also utilizes free notification space on monthly residential water billing for trash bag delivery that falls one month prior to the event, twice per year, and a "Recycle Coach App" to assist residents with refuse issues.</p>
1.6	<p>Show stormwater information on local cable TV station.</p>	<p>Broadcast community forums, in which continued water quality discussions take place.</p> <p>There were 10 City Commission meetings (study sessions and regular meetings) during the course of the year that specifically discussed stormwater. These meetings can be viewed on the City's channel cable TV station and YouTube.</p>	<p>Public Information Office broadcasts City Commission Meetings, Planning Commission Meetings and others on City channel cable TV which began live broadcast online in 2017. The list of meetings can be found at Appendix D, BMP 1.6 & 2.1.</p>

E. Stormwater Management Program Requirements (Six Minimum Control Measures) (CONTINUED)

2. Public Involvement and Participation (Table) - Please fill out accordingly

List all of the public improvement and participation BMPs as identified in the SMP and provide the requested information in the following table.
(List all associations and partnerships)

BMP ID NUMBER	BRIEF BMP DESCRIPTION	MEASURABLE GOAL(S)	PROGRESS ACHIEVING GOAL(S) (MEASURED RESULT)
2.1	Hold public information meetings regarding stormwater issues.	Annual review by City Commission of Stormwater Annual Report – YES. Review of stormwater projects in annual Capital Improvement Plan - YES.	City Commission reviewed KDHE annual stormwater report February 26th, 2019. The meetings were also broadcast on the City's channel cable TV station and YouTube. City Commission reviewed stormwater projects for CIP in 2018 and approved design and construction of several projects. A lengthy and complex discussion of projects took place over several meetings during the approval process for the stormwater fee. See listing in appendix for 2.1 & 1.6. APPENDIX D
2.2	Create an "Adopt a Stream Program"	# Streams adopted - None # Streams cleaned – None	The City's "Three-Mile Creek" monthly clean-up program had seven citizen groups that received \$500 donations per group from transient guest tax dollars in 2019.
2.3	Improve lines of communication with the public through use of website and social media.	Integrate contemporary methods of providing and receiving information to the public. - Ongoing	Public Information Office continues a robust social media program for all City issues. Posted information on other efforts such as detention ponds, creek bank erosion, and water quality issues improves as staff skills increase. Additionally, the many ways to slow, hold, filter, and/or infiltrate stormwater are listed in the KSU ISC Rain-Garden Project Guidebook which can be found at: https://www.leavenworthks.org/cd/page/rain-garden-design-and-implementation-kansas-property-owners
2.4	Annual Citywide Clean-Up Program.	# Groups – 34 # Participants – 948	Citywide clean up continues to occur. The Annual Spring Clean-up Program on April 6, 2019 had a slightly higher turnout of 948 volunteers. This is an increase of number in 2018 where there were 920 volunteers. The Solid Waste Division conducted cleanup of random homeless sites within the City limits. In 2019 there were 5 locations that were cleaned up.
2.5	Customer surveys – conduct at least one survey each year on stormwater related issues in an on-line environment.	# of responses – N/A	No survey was conducted in 2019 as surveys in previous years have resulted in extremely limited responses.

2.6	Encourage groups to participate in activities such as inlet stencil program and similar.	# Groups – None # Programs – None	Group participation is encouraged for environmental issues. There were no participants in 2019. See also BMP 2.2.
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E. SMP Requirements (Six Minimum Control Measures) (Continued)

a. Illicit Discharge Detection and Elimination

Please place an "X" in the left boxes to complete the table below.

YES	NO	N/A	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has a program/plan been developed and is it presently implemented to detect and address illicit/prohibited discharges into the MS4?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has a map of the MS4 been developed, showing the location of all outfalls, either pipes or open channel drainage, showing names and location of all streams or lakes receiving discharges from the outfalls?
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	The permit may require the permittee enact ordinances, or resolutions. Have ordinances, or resolutions, or regulations to prohibit non-stormwater discharges into the storm sewer system been enacted? Effective date:
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Have the ordinances, resolutions, or regulations been modified? Effective date:

List all the Illicit Discharge Detection and Elimination BMPs as identified in the SMP and provide the requested information in the following table

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E. Stormwater Management Program Requirements (Six Minimum Control Measures)

3. Illicit Discharge Detection and Elimination (Table) - Please fill out accordingly

List all of the illicit discharge detection and elimination BMPs as identified in the SMP and provide the requested information in the following table.

BMP ID NUMBER	BRIEF BMP DESCRIPTION	MEASURABLE GOAL(S)	PROGRESS ACHIEVING GOAL(S) (MEASURED RESULT)
3.1	Inspect complaints of illicit discharge.	<p>Inform public of methods to communicate concerns regarding illicit discharges - YES</p> <p># Reports investigated – in 2019 there were 246 total incoming calls regarding sewer issues: WPC: 73, Public Works: 12, Street: 2, Citizens: 159. Of that total, 45 calls were sewer/storm sewer issues.</p>	<p>Public Information Officer has created social media space for complaints. Other calls are forwarded to WPC for evaluation and possible action.</p> <p>24/7 “real person” phone answering service can dispatch City forces for emergencies during off-duty hours.</p>
3.2	Update stormwater outfall maps.	Continue efforts to accurately locate and measure existing and new stormwater infrastructure.	City maps are updated constantly. The GIS staff and the stormwater crew assist in obtaining accurate measurements and locations. In 2016 the maps were made available online to the public. The GIS link is: https://map.firstcity.org/
3.3	Inspect outfalls	# Outfalls inspected – over 2,651 inlets and drains were inspected. No specific notation on “outfall”.	Continued effort by the stormwater crew has inspected infrastructure throughout the year as part of their routine work and for the GIS staff. Additionally, stormwater crew inspects for pollution evidence either entering or exiting the area. See also BMP 6.4.
3.4	Collect yard waste at City composting facility.	# Customers: for 2019, Grass – 61, Leaves - 472.	City provides free drop off of yard waste for composting. There may be slight overlap with #3.5. Note: the brush site was closed during the 2019 Missouri River flood from March - July.
3.5	Collect tree and brush debris at brush disposal site.	# Customers – 2,253 for 2019. (1,048 on free Saturdays, 1,205 on other days).	City provides a KDHE approved site for drop off of tree and brush debris for disposal through a combination of mulching, composting and burning. Note: the brush site was closed during the 2019 Missouri River flood from March - July.
3.6	Collect household hazardous waste (HHW) as part of Citywide clean-up event.	# Pounds of household hazardous waste recycled – approximately 2,260 lbs. (From the City Spring Cleanup Day)	City residents are directed to Leavenworth County facility during most of the year. Citywide clean up accepts HHW at MSC.
3.7	Conduct free disposal. Saturdays (first Saturday)	# Events - 12 # Tons collected – 226.08 (trash and recycling)	The free Saturdays are well attended; however, volume of recycling material is not weighed separately.

3.8	Staff training.	# of staff trained – 53 staff attended 56 training opportunities.	At least 46 days of training on stormwater-related issues; many on multiple issues. This is a possible overlap with 4.3.
3.9	Storm sewer maintenance and inspection.	Provide dry weather storm sewer inspection. - YES.	Two-person crew inspects stormwater structures and works with GIS staff. City began development of stormwater inspection “app” in 2019.
3.10	Inspection of sanitary sewer systems.	Inspect residential and commercial sanitary systems for improper discharge into storm drains. - YES Inspect sanitary sewer system to reduce number and volume associated with SSO - YES Coordinate SSO events between wastewater staff, building officials and engineering. - YES	City operates CCTV of sewer and storm sewer systems throughout the year. Approximately 43.63 total miles of sanitary sewer lines were cleaned in 2019. City inspected 9 miles of sanitary sewer and 0.77 miles of storm sewers with CCTV. City completed \$480,215 in work within the sanitary sewer system in 2019 to reduce Inflow and Infiltration to and from the storm sewer system. The WPC staff’s aggressive response to SSOs greatly improved coordination between wastewater staff and building inspection staff on review and resolution of SSO events.
3.11	Commercial Grease Trap Inspection Program	Review status of commercial grease traps through record review and physical inspection – YES.	An aggressive Grease Trap Inspection Program has improved participation and recordkeeping from the approximately 72 entities required to have a grease trap; including three new ones. At least 35 different installations were visited by City staff in 2019 as a result of this program, and five installations closed during the reporting period. A summary of this program for 2019 can be found at the appendix for BMP 3. APPENDIX D

E. SMP Requirements (Six Minimum Control Measures) (Continued)

b. Construction Site Stormwater Runoff Control

Please place an "X" in the left boxes to complete the table below.

YES	NO	N/A	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The permit requires the permittee, if they have such authority, to enact ordinances or resolutions. Have ordinances or resolutions to address construction site runoff from new development/redevelopment projects been enacted? Effective date: 12/23/2016
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has a copy of the ordinances or resolutions been submitted to KDHE as required by the permit?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has a procedure or program been developed requiring construction site owners and/or operators to implement appropriate erosion and sediment control best management practices?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has a procedure or program been developed requiring construction site owners and/or operators to control waste such as discarded building materials, concrete truck washout, chemicals, paint, litter, and sanitary waste at construction sites likely to cause adverse impacts to water quality?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has a procedure been developed and implemented requiring site plan review which includes consideration of potential water quality impacts?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has a procedure been developed for the receipt and consideration of information submitted by the public?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has a procedure been developed and implemented for construction site inspection and enforcement of the control measures?

List all the construction site stormwater runoff control BMPs as identified in the SMP and provide the requested information in the following table.

E. Stormwater Management Program Requirements (Six Minimum Control Measures)

4. Construction Site Stormwater Runoff Control (Table) - Please fill out accordingly

List all of the Site Stormwater Runoff Control BMPs as identified in the SMP and provide the requested information in the following table.

BMP ID NUMBER	BRIEF BMP DESCRIPTION	MEASURABLE GOAL(S)	PROGRESS ACHIEVING GOAL(S) (MEASURED RESULT)
4.1	Construction drawing plan review and site runoff control.	# Plans reviewed – 63 (53 were construction and 10 were development). # LDPs issued - 63 (51-residential, 2-commercial construction, 10-site development/utility work.)	All development projects were reviewed related to installation of appropriate BMPs. All construction projects were reviewed to ensure adequate BMPs were included in the work to prevent erosion runoff.
4.2	Publish updated standard details and design criteria for erosion control.	Make available on-line - YES Review annually with staff – no formal meeting; however, staff has met informally throughout the year.	Discussed with the Development Review Committee (DRC) and with the designers.
4.3	Staff training on runoff inspection.	# Inspectors trained – Staff; see section 3.8.	The Stormwater Crew of 2 attended an annual 8-hour training course on Competent Person Excavation/Trenching. Note: staff turnovers impacted the training opportunities.
4.4	Inform local contractors of LDP.	Annual notification of LDP requirements - YES LDP documents available online - YES	Contractor's LDPs are regularly inspected and contractors are informed of any deficiencies. LDPs were discussed when the permit was issued. A completed LDP example can be found at: https://www.leavenworthks.org/publicworks/page/building-inspections
4.5	Pre-construction meetings with owner and contractor - require meetings with owner and contractor prior to commencement of grading operations.	# Meetings – 10 (City projects)	LDP application and summary are available online. All City-funded projects have a pre-construction conference. Development projects typically meet at the Development Review Committee where BMP requirements are discussed and then incorporated into the plans. City has no requirement that private development have a pre-con with the City.

4.6	<p>Construction site inspection and enforcement - Increase the frequency of inspections and communications back to owner/contractor.</p>	<p>Documentation of inspections – YES 310 total inspections were conducted in 2019; including detention basin inspections.</p>	<p>Extensive documentation of site visits (both random and after rainfall) are included in each project file. This includes City and development projects, and individual LDP inspections (such as home construction). Examples of these documents can be found at the City's webpage: https://www.leavenworthks.org/publicworks/page/building-inspections</p>
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E. SMP Requirements (Six Minimum Control Measures) (Continued)

c. Post-Construction Site Stormwater Management in New Development and Redevelopment

Please place an "X" in the left boxes to complete the table below.

YES	NO	N/A	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The permit requires the permittee, if they have such authority, to enact ordinances or resolutions. Have ordinances or resolutions to address construction site runoff from new development and redevelopment projects been enacted? Effective date: 12/23/2016
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has a copy of the ordinances or resolutions been submitted to KDHE as required by the permit?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Has a post-construction stormwater runoff program been implemented?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Have post-construction sites been inspected?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Are BMPs specified to minimize adverse water quality impacts?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Have strategies been developed to include a combination of structural and/or non-structural BMP appropriate for the municipality?
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Have measures been implemented to ensure adequate long-term operation and maintenance of structural BMPs?

List all the post-construction site stormwater management in new development and redevelopment BMPs as identified in the SMP and provide the requested information in the following table.

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E. Stormwater Management Program Requirements (Six Minimum Control Measures)

5. Post - Construction Site Stormwater Runoff Control (Table) - Please fill out accordingly

List all of the post-construction site stormwater runoff BMPs as identified in the SMPs and provide the requested information in the following table.

BMP ID NUMBER	BRIEF BMP DESCRIPTION	MEASURABLE GOAL(S)	PROGRESS ACHIEVING GOAL(S) (MEASURED RESULT)
5.1	Construct sediment vane traps on new and reconstructed inlets.	# Inlets - 20	Sediment traps were installed on new and replacement inlets on various projects.
5.2	Protect sensitive areas, such as wetlands and riparian areas through plan review and selected land acquisition from developers and at tax sales.	# Tracts acquired from developers - 0 # Tracts from tax sale - 0 # Acres acquired/year – 0.93	Property on SE corner of 2nd and Thornton was part of the City's stormwater project.
5.3	Enforce post construction runoff control ordinance.	#LDP releases – 43 Documentation of inspection and communication – YES.	LDPs are closed out when the danger of off-site erosion has been eliminated through either vegetation or other means. This is documented in the various permits. Several LDPs from 2017 and 2018 are still open through 2019.
5.4	Conduct long-term BMP maintenance inspections.	Documentation of inspection and communication - YES. City spent 50 hours conducting inspections of selected sites on random, after rainfall, or with depth recording equipment.	City continues outreach to detention basin BMP owners. A meeting was held on March 14, 2019 with 11 attendees where they were given a packet with the meeting's agenda and a basic overview of detention basin maintenance. The packet also included examples of an emergency spill plan and an inspection form. This effort will continue and expand. Currently there are 62 BMP sites.
5.6	Analyze existing structural BMP performances at selected sites (particularly detention basins).	# Sites evaluated – 9	City installed depth recording devices in at least nine locations in 2019. This is to facilitate evaluation of performance. Selected graphs and charts are shared informally with interested parties via email. Examples can be found at Appendix D, 5.6.
5.7	Measure rain gauge and creek depth to evaluate flow quantity and duration from at least March – October.	# Rain gauges - 4 # Stream gauges - 2	City continues to maintain rain and creek monitors. The City also collaborates with other local governments on an extended rain gauge network. Selected graphs and charts are shared informally with interested parties via email.

E. SMP Requirements (Six Minimum Control Measures) (Continued)

d. Municipal Pollution Prevention/Housekeeping

Please place an "X" in the left boxes to complete the table below.

YES	NO	N/A	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The permit requires the permittee to enact a program to address pollution prevention/good housekeeping for Municipal Operations. Has such a program been enacted?

List all the municipal pollution prevention/housekeeping BMPs as identified in the SMP and provide the requested information in the following table.

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E. Stormwater Management Program Requirements (Six Minimum Control Measures) (CONTINUED)

6. Municipal Pollution Prevention / Housekeeping (Table) - Please fill out accordingly

List all of the municipal pollution prevention / housekeeping BMPs as identified in the SMPs and provide the requested information in the following table.

BMP ID NUMBER	BRIEF BMP DESCRIPTION	MEASURABLE GOAL(S)	PROGRESS ACHIEVING GOAL(S) (MEASURED RESULT)
6.1	Review City facilities for water quality concerns and develop plans to address them, goal is at least three facilities per year.	# Reports prepared: Two design reports were completed.	Two sites with enhanced water quality - City Hall lot & Thornton Street were constructed in 2019.
6.2	Street sweeping program – goal is residential areas three times per year and collector/arterial streets once per month (8 months).	# Times completed residential area sweeping – exceeded annual goals - met goal of 3 sweepings. # Times completed collector/arterial sweeping – exceeded annual goals - met goal of eight sweepings. # Hours sweeping – 714.50 # Miles of streets swept – 3,141 # Pounds of debris removed – 433.26 tons.	Street sweeping program operations continued throughout the year. There are two sweepers. Equipment repair and turnover reduced effectiveness also. City reduced sweeping for 6 weeks in the summer to provide workers for other projects.
6.3	Snow removal operations - use ground speed control and GPS equipment to keep salt use within guidelines.	# Pounds of salt used per year - 675. # Pounds per lane mile per storm – 288.72 lbs/lane-mile average for 2019.	Use of ground speed control resulted in application rates between 200 & 300 lbs/lane-mile.
6.4	Stormwater inlet cleaning.	# Inlets – 2,283.	Stormwater crew inspected and/or maintained approximately 2,283 inlets, and cleaned 1,858 area drains and other stormwater facilities. See also 3.3.
6.5	Continue Citywide Leaf Collection Program.	Program was modified in 2019.	Leaf Collection Program – modified by eliminating curbside leaf pick-up in 2019, but retained free drop off site and collection by Refuse Service.

Section F

No Surface Water Testing Required in 2019

- KDHE Email dated March 12, 2019, Releasing City from Surface Water Testing

Mike McDonald

From: Rance Walker [KDHE] <Rance.Walker@ks.gov>
Sent: Tuesday, March 12, 2019 8:23 AM
To: Mike McDonald
Cc: Deborah Mendenhall [KDHE]; Shelly Shores-Miller [KDHE]
Subject: RE: Leavenworth - RE: MS4 - Authority to Implement

Mr. McDonald,

This acknowledges the request to discontinue sampling and analysis of surface water associated with four storm events per year. Acknowledging the intent of this agency to discontinue this monitoring within the Leavenworth MS4 NPDES permit which will be issued this year, KDHE concurs with the request and approves discontinuing the storm event associated surface water monitoring.

The Draft NPDES permit for Leavenworth (as provided with the March 8, 2019 e-mail from this office) does not include any such monitoring, and this permit is scheduled to be placed on public notice March 21st with potential issuance at the end of April 2019, presuming no significant adverse comments during the 30 day public comment period. By copy of this communication to other KDHE staff I request the EDMR reporting system for the City of Leavenworth MS4 NPDES permit (M-MO12-SN01) be discontinued and future tracking of such annual reporting now end.

Thank you for the efforts the City of Leavenworth makes to properly manage stormwater.

Best Regards,

Rance Walker, P.E.
Kansas Department of Health and Environment
1000 SW Jackson Street, Suite 420
Topeka, Kansas 66612-1367

Phone: (785) 296-5537
E-Mail: rance.walker@ks.gov

From: Mike McDonald [mailto:MMcDonald@firstcity.org]
Sent: Monday, March 11, 2019 3:21 PM
To: Rance Walker [KDHE] <Rance.Walker@ks.gov>
Cc: Mike Hooper <mhooper@firstcity.org>; Chuck Staples <cstaples@firstcity.org>
Subject: Leavenworth - RE: MS4 - Authority to Implement

EXTERNAL: This email originated from outside of the organization. Do not click any links or open any attachments unless you trust the sender and know the content is safe.

Thanks –

A few things for you to consider:

CITY OF LEAVENWORTH

Kansas Stormwater Annual Report Form for Municipal Separate Storm Sewer Systems

January 1, 2019 - December 31, 2019

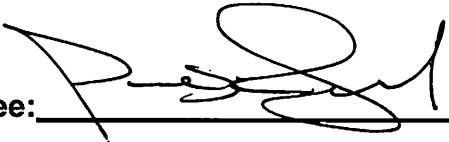
Kansas Permit No: M-MO12-SN01

Section G

Certification

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 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 fine and imprisonment for knowing violations."

Signature of Permittee:  Date Signed 2-27-20
(Legally responsible person)

Name Printed: PAUL KRAMER Title City Manager

40 CFR 122.22 Signatories to permit applications and reports.

(a) Application. All permit applications shall be signed by either a principal executive officer or ranking elected official.

All reports required by permits, and other information requested by the Director shall be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person.

Please note the submission requirements on page 1. Submit this report to:

KANSAS DEPARTMENT OF HEALTH & ENVIRONMENT

Municipal Programs Section

1000 SW Jackson Street, Suite 420

Topeka, Kansas 66612

Appendix A

Summary of Sampling Data

- City was released from sampling requirements for 2019. Only one event was sampled. (See Section F)
- Leavenworth Basin Map
- ● Leavenworth Gauge Locations:
 - 3-Mile Creek
 - 5-Mile Creek
- Weather Summary - 2019
- Photographs at Sample Site of March 13, 2019
- Summary of Sampling Data of March 13, 2019

E. SMP Requirements (Six Minimum Control Measures) (Continued)

e. PHASE ONE OPERATORS ONLY: Monitoring Industrial and High Risk Runoff

The permit requires the permittee to enact a program to address post-construction site stormwater runoff from new development and redevelopment.

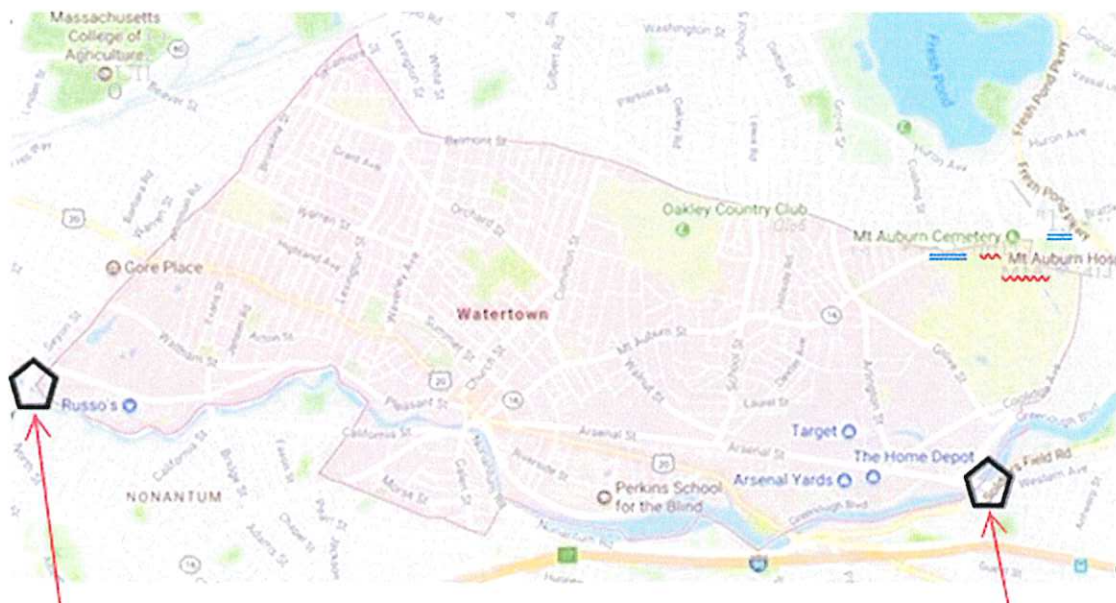
Please place an “X” in the left boxes to complete the table below.

YES	NO	N/A	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Has the permittee developed and maintained a list of the municipal industrial facilities contributing to the pollutant loading to the MS4?
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Have at least two municipal industrial facilities on the list had inspection and sampling conducted?
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	If the answer to items 1 and 2 is “No,” provide a statement.

F. Recordkeeping and Reporting

Some permittees are required to monitor surface waters if the permit includes TMDL monitoring requirements for Specific Impaired Streams to Target within Part II of the permit and surface water monitoring locations are identified in a subsequent table. Provide a current map of monitoring locations and site information data in the succeeding table (expand the table if necessary to address all sites).

Example map and table below—Please fill out map and table on page 26 and adjust as needed.



Upstream Site: Farwell Street Bridge over Charles River

Downstream Site: Arsenal Street Bridge over Charles River

City of Leavenworth, KS

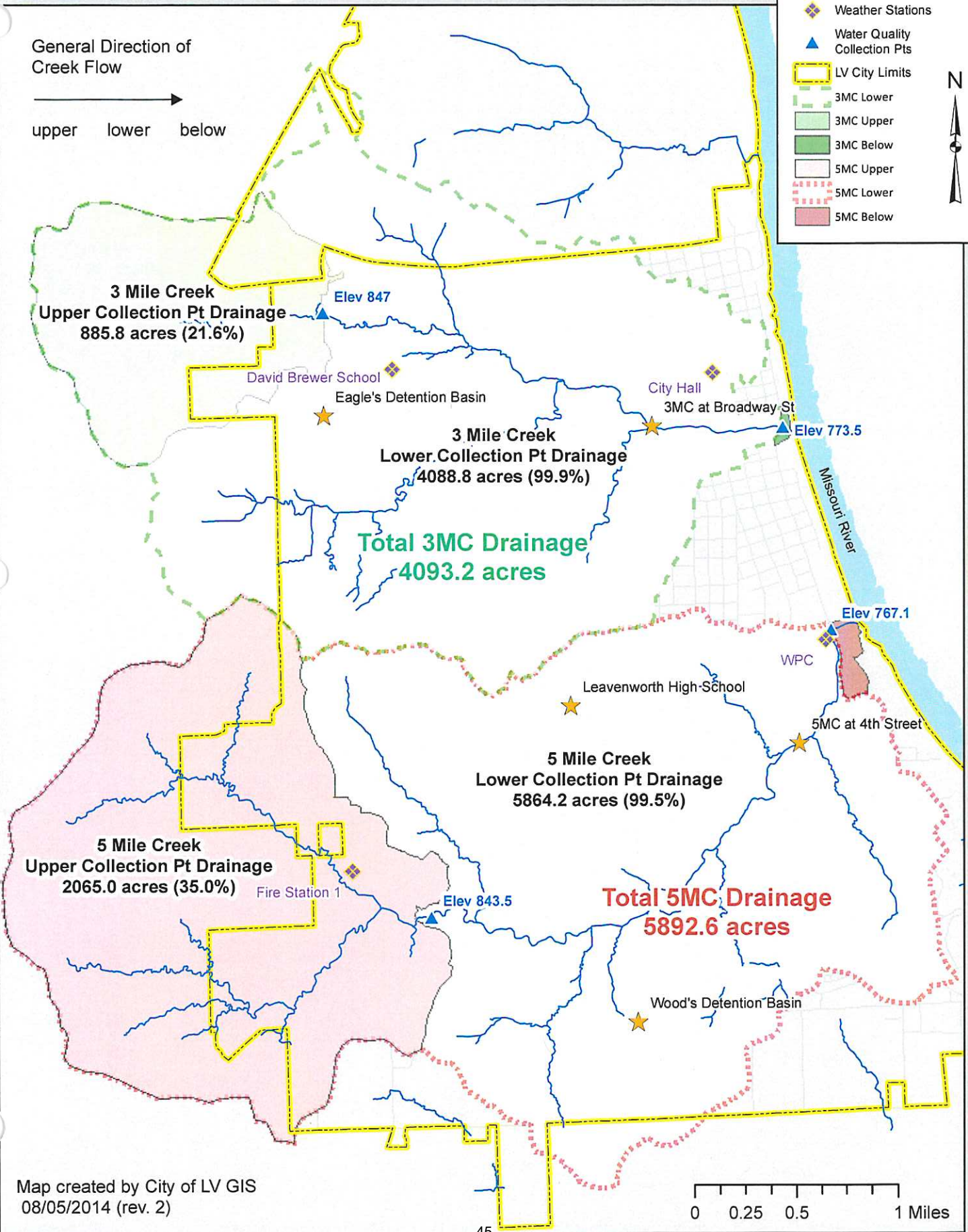
Stormwater Management Data Collection

Legend 3.2

- ★ Data Loggers
- ◆ Weather Stations
- ▲ Water Quality Collection Pts
- LV City Limits
- 3MC Lower
- 3MC Upper
- 3MC Below
- 5MC Upper
- 5MC Lower
- 5MC Below

General Direction of Creek Flow
 upper lower below

→













Map created by City of LV GIS
 08/05/2014 (rev. 2)

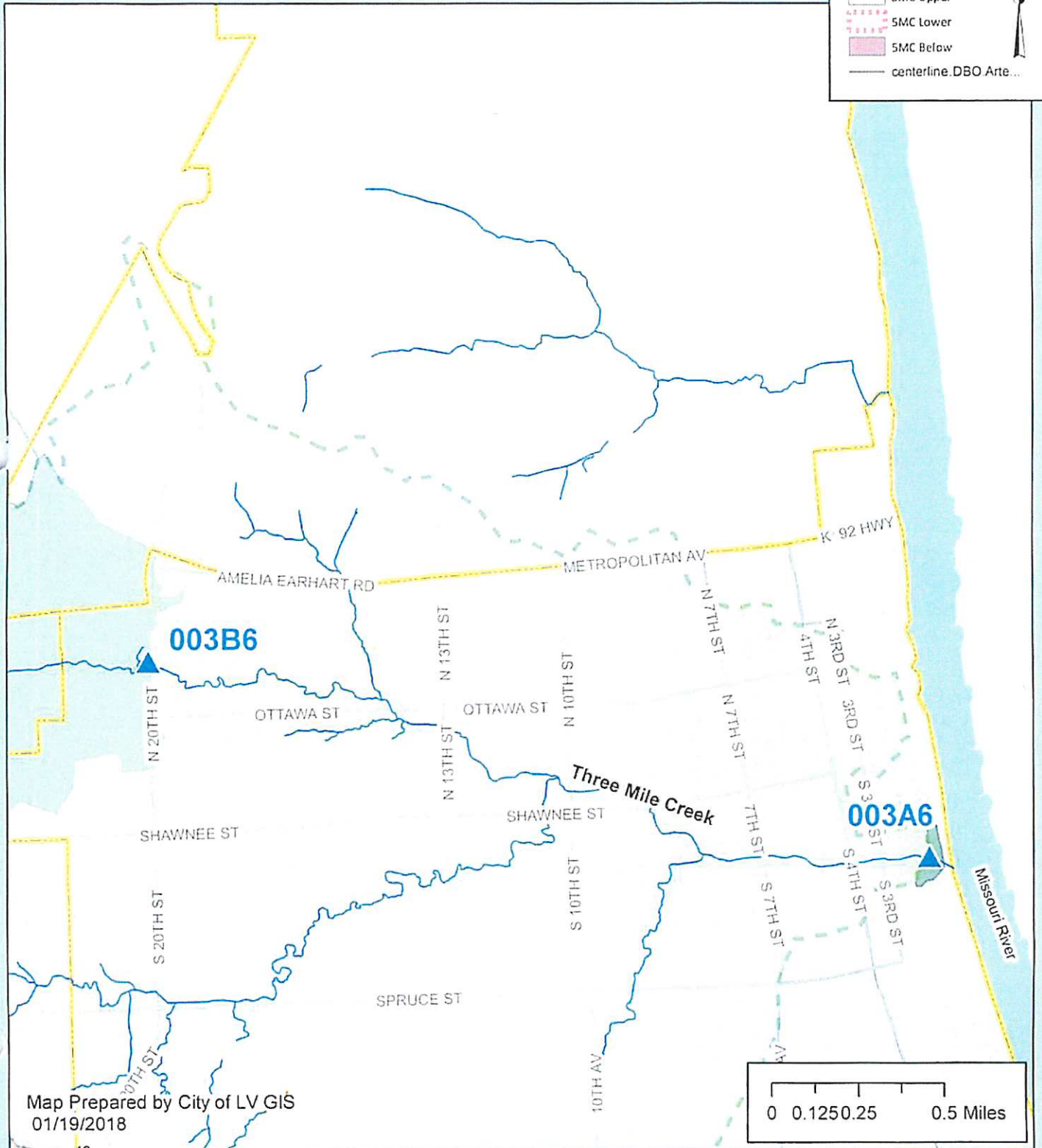
0 0.25 0.5 1 Miles

City of Leavenworth, KS Three Mile Creek Sampling Sites

Legend

-  Water Quality Collection Pts
-  LV City Limits
-  3MC Lower
-  3MC Upper
-  3MC Below
-  5MC Upper
-  5MC Lower
-  5MC Below
-  centerline.DBO Arte...

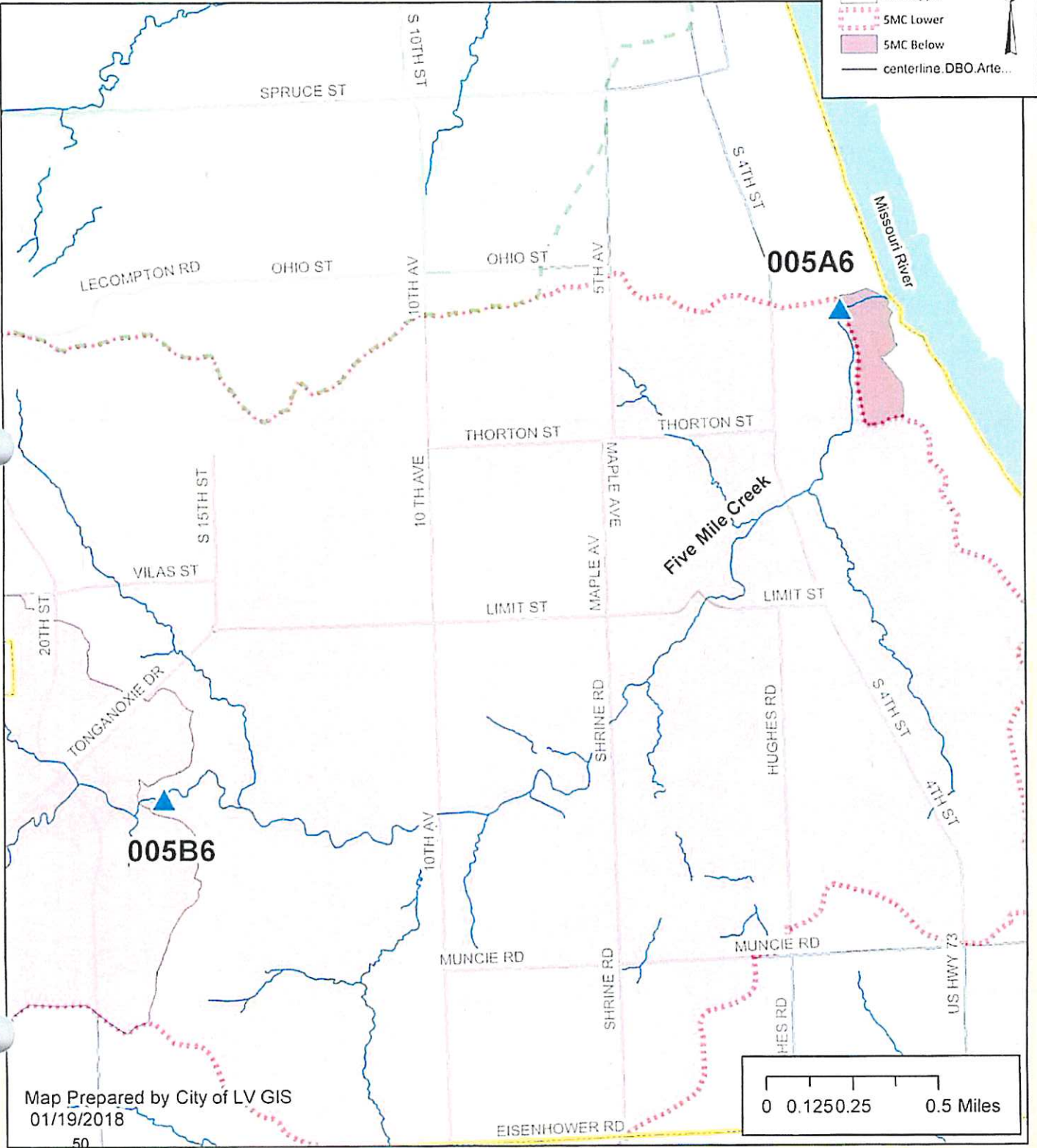
N




Map Prepared by City of LV GIS
01/19/2018

3.2

City of Leavenworth, KS Five Mile Creek Sampling Sites

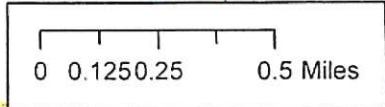


Legend

- ▲ Water Quality Collection Pts
- LV City Limits
- 3MC Lower
- 3MC Upper
- 3MC Below
- 5MC Upper
- 5MC Lower
- 5MC Below
- centerline.DBO.Arte...

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Map Prepared by City of LV GIS
01/19/2018



MONTHLY CLIMATOLOGICAL SUMMARY for JAN. 2019

5.7

NAME: City Hall CITY: STATE:
 ELEV: 0 ft LAT: LONG:

TEMPERATURE (°F), RAIN (in), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	17.3	20.9	12:30a	15.4	10:30a	47.7	0.0	0.00	3.4	15.0	5:15a	NNW
2	25.6	34.3	3:25p	17.4	12:45a	39.1	0.0	0.00	2.2	13.0	12:30p	SW
3	33.1	47.1	3:40p	22.6	6:30a	31.9	0.0	0.00	0.4	6.0	2:35p	S
4	38.1	55.1	2:30p	24.0	6:30a	26.9	0.0	0.00	0.7	12.0	3:05p	W
5	42.8	60.6	3:05p	29.6	8:00a	22.2	0.0	0.00	0.4	8.0	2:30p	S
6	48.2	59.6	6:05p	34.8	3:20a	16.8	0.0	0.00	4.1	34.0	11:35p	SSE
7	55.3	60.4	2:15p	43.2	11:20p	9.7	0.0	0.02	5.2	26.0	2:35a	W
8	44.9	51.0	3:05p	36.0	12:00m	20.1	0.0	0.00	6.0	31.0	3:35a	WNW
9	32.3	37.5	3:15p	25.8	12:00m	32.7	0.0	0.00	3.0	21.0	11:05a	NNW
10	30.8	39.6	3:55p	21.0	5:25a	34.2	0.0	0.00	2.4	12.0	2:55p	SE
11	35.6	39.5	9:10a	32.0	11:45p	29.4	0.0	0.53	1.8	10.0	10:35a	SE
12	30.6	32.1	12:05a	29.5	9:50a	34.4	0.0	0.22	0.1	4.0	12:05a	ENE
13	29.7	31.0	3:10p	27.8	11:40p	35.3	0.0	0.00	0.0	3.0	9:20a	N
14	28.1	31.3	12:00m	26.3	7:10a	36.9	0.0	0.00	1.7	9.0	3:45p	SW
15	32.4	33.8	4:10p	31.3	12:05a	32.6	0.0	0.00	3.7	13.0	8:45a	SSW
16	31.9	33.0	12:05p	30.8	2:25a	33.1	0.0	0.01	2.8	11.0	1:15a	ENE
17	32.2	33.2	10:30p	31.4	7:55a	32.8	0.0	0.01	2.9	12.0	1:10p	N
18	32.8	36.5	12:30p	23.5	12:00m	32.2	0.0	0.19	5.0	19.0	10:40a	ESE
19	15.7	23.6	12:05a	9.6	11:55p	49.3	0.0	0.00	5.5	30.0	3:55a	NNW
20	13.9	19.9	12:50p	8.0	4:50a	51.1	0.0	0.00	2.2	10.0	2:50p	ENE
21	24.0	34.3	11:55p	15.5	4:55a	41.0	0.0	0.00	5.0	22.0	2:35p	ESE
22	32.5	38.5	11:55a	21.3	11:35p	32.5	0.0	0.24	5.5	22.0	2:25p	NNW
23	20.6	27.9	4:15p	13.7	7:55a	44.4	0.0	0.01	2.2	19.0	12:30a	NNW
24	20.5	28.6	8:45a	6.7	12:00m	44.6	0.0	0.00	3.6	29.0	10:20a	NNW
25	21.2	36.1	4:20p	4.1	1:20a	43.8	0.0	0.00	3.2	30.0	10:05a	W
26	31.8	40.2	2:35p	22.3	5:15a	33.2	0.0	0.00	2.8	18.0	12:25p	W
27	34.1	44.8	12:00m	22.3	7:35a	30.9	0.0	0.00	6.2	30.0	10:10p	S
28	28.1	46.1	12:45a	16.5	12:00m	36.9	0.0	0.03	8.4	45.0	9:45a	NNW
29	16.2	26.3	9:40a	6.0	12:00m	48.8	0.0	0.00	3.3	22.0	9:50a	NNW
30	-0.4	6.0	12:05a	-6.3	7:55a	65.4	0.0	0.01	2.3	23.0	1:55a	NNW
31	16.3	35.7	4:05p	1.7	12:10a	48.7	0.0	0.00	3.4	13.0	9:30a	E
.	28.9	60.6	5	-6.3	30	1118.6	0.0	1.27	3.2	45.0	28	NNW

Max >= 90.0: 0
 Max <= 32.0: 9
 Min <= 32.0: 28
 Min <= 0.0: 1

Max Rain: 0.53 ON 01/11/19

Days of Rain: 6 (>.01 in) 4 (>.1 in) 0 (>1 in)

Heat Base: 65.0 Cool Base: 65.0 Method: Integration

5.7

MONTHLY CLIMATOLOGICAL SUMMARY for FEB. 2019

NAME: City Hall CITY: STATE:
 ELEV: 0 ft LAT: LONG:

TEMPERATURE (°F), RAIN (in), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	33.1	52.8	4:00p	16.6	7:45a	31.9	0.0	0.00	2.3	15.0	3:50p	NNE
2	49.2	55.9	5:40p	39.3	12:15a	15.8	0.0	0.00	6.5	25.0	8:50p	S
3	58.1	65.0	4:30p	52.6	12:15a	6.9	0.0	0.00	7.8	27.0	12:55p	S
4	32.0	59.9	12:05a	20.1	11:55p	33.0	0.0	0.00	5.9	33.0	8:00a	NNW
5	21.2	23.3	4:10p	18.8	3:45a	43.8	0.0	0.00	3.8	11.0	6:25a	NNE
6	22.2	23.9	2:45p	20.2	4:10a	42.8	0.0	0.00	4.3	15.0	11:55p	N
7	14.0	23.2	12:05a	9.2	8:55a	51.0	0.0	0.02	6.0	29.0	3:55a	NNW
8	12.8	20.8	4:20p	5.1	7:10a	52.2	0.0	0.00	2.7	13.0	12:10a	E
9	20.8	28.6	4:35p	12.6	4:35a	44.2	0.0	0.00	4.7	17.0	9:00a	ESE
10	32.5	36.7	4:35p	28.1	12:05a	32.5	0.0	0.04	2.8	12.0	1:10a	SE
11	32.7	33.7	1:45a	30.3	12:00m	32.3	0.0	0.31	4.2	17.0	12:00m	ENE
12	30.8	36.2	4:25p	28.1	4:45a	34.2	0.0	0.00	6.3	28.0	3:35p	WNW
13	38.3	52.2	2:25p	24.3	6:10a	26.7	0.0	0.00	3.7	25.0	2:25p	S
14	36.7	52.9	11:55a	17.6	12:00m	28.3	0.0	0.00	6.1	33.0	4:10p	NNW
15	13.8	17.7	12:05a	11.8	11:05a	51.2	0.0	0.10	4.3	14.0	12:05a	N
16	19.5	26.5	3:40p	14.1	12:05a	45.5	0.0	0.06	4.0	16.0	5:55p	ENE
17	23.5	26.7	3:40p	17.7	12:00m	41.5	0.0	0.00	4.5	21.0	10:55a	W
18	19.0	26.3	4:20p	11.7	7:35a	46.0	0.0	0.00	3.4	14.0	12:35p	NE
19	23.7	29.2	1:30p	16.3	7:35a	41.3	0.0	0.25	4.9	19.0	2:00p	E
20	31.7	37.2	4:50p	26.9	12:05a	33.3	0.0	0.07	4.6	26.0	12:05p	WSW
21	30.9	40.1	1:55p	20.4	8:20a	34.1	0.0	0.00	2.1	13.0	5:10p	E
22	33.2	37.0	4:00p	28.4	5:00a	31.8	0.0	0.31	4.0	17.0	9:00p	E
23	35.3	40.1	4:50p	28.6	11:45p	29.7	0.0	0.45	4.1	35.0	8:25p	E
24	24.4	29.0	12:25a	16.7	12:00m	40.6	0.0	0.00	6.7	39.0	12:45a	WNW
25	22.7	34.4	4:35p	12.4	7:10a	42.3	0.0	0.00	3.7	16.0	9:35p	NNE
26	24.9	32.1	2:20p	17.8	4:15a	40.1	0.0	0.00	3.8	14.0	1:05a	NNE
27	18.4	24.6	12:05a	13.6	11:45p	46.6	0.0	0.00	5.5	24.0	2:20a	NNW
28	19.2	27.9	3:30p	12.2	3:20a	45.8	0.0	0.00	3.1	11.0	10:00a	NE

	27.7	65.0	3	5.1	8	1045.4	0.0	1.61	4.5	39.0	24	NNW

Max >= 90.0: 0
 Max <= 32.0: 13
 Min <= 32.0: 26
 Min <= 0.0: 0
 Max Rain: 0.45 ON 02/23/19
 Days of Rain: 9 (>.01 in) 4 (>.1 in) 0 (>1 in)
 Heat Base: 65.0 Cool Base: 65.0 Method: Integration

5.7

MONTHLY CLIMATOLOGICAL SUMMARY for MAR. 2019

NAME: City Hall CITY: STATE:
 ELEV: 0 ft LAT: LONG:

TEMPERATURE (°F), RAIN (in), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	27.1	36.4	3:55p	17.6	4:00a	37.9	0.0	0.00	2.3	18.0	11:00p	W
2	23.6	29.8	12:05a	18.8	12:00m	41.4	0.0	0.00	5.9	23.0	11:15p	N
3	9.2	18.9	12:15a	2.1	11:05p	55.8	0.0	0.00	5.4	26.0	4:45a	N
4	7.8	16.8	4:40p	-0.3	6:55a	57.2	0.0	0.00	3.2	14.0	10:30a	W
5	16.5	23.4	3:50p	10.5	6:55a	48.5	0.0	0.00	3.9	21.0	9:10a	W
6	25.0	36.3	4:35p	10.9	3:20a	40.0	0.0	0.00	2.2	16.0	10:20a	SSE
7	34.2	36.8	5:35p	30.9	12:45a	30.8	0.0	0.00	3.9	18.0	11:40a	E
8	36.6	43.0	3:35p	32.6	6:30a	28.4	0.0	0.00	3.0	13.0	8:25p	E
9	41.1	58.5	1:10p	32.3	12:00m	23.9	0.0	0.52	6.9	37.0	2:15p	W
10	35.2	43.0	5:10p	29.6	8:10a	28.5	0.0	0.00	4.0	17.0	12:05a	NNW
11	38.8	52.7	4:45p	25.2	7:35a	26.2	0.0	0.00	1.3	10.0	1:45p	NNW
12	47.4	53.1	6:55p	39.8	1:05a	17.6	0.0	0.44	4.7	23.0	7:30p	SE
13	56.6	63.5	5:15p	51.8	3:00a	8.4	0.0	0.40	9.1	40.0	2:55p	SE
14	42.0	60.1	1:20a	35.9	11:00p	23.0	0.0	0.00	11.5	39.0	2:40a	W
15	39.9	49.1	4:40p	32.5	7:30a	25.1	0.0	0.00	7.4	30.0	1:30a	WNW
16	43.7	59.8	5:45p	27.2	6:40a	21.3	0.0	0.00	3.7	24.0	5:20p	W
17	41.8	51.3	3:35p	31.6	6:35a	23.2	0.0	0.00	3.4	14.0	5:15a	NNE
18	45.0	51.9	5:00p	37.3	8:00a	20.0	0.0	0.00	2.3	14.0	3:50p	NE
19	47.2	60.0	4:30p	39.3	7:25a	17.8	0.0	0.21	4.1	21.0	3:00p	SE
20	48.0	58.5	6:40p	41.4	7:10a	17.0	0.0	0.00	5.7	24.0	2:25p	W
21	46.0	57.5	5:35p	35.2	7:40a	19.0	0.0	0.00	3.5	16.0	12:35a	NNW
22	50.5	66.1	5:05p	33.8	6:55a	14.5	0.0	0.00	1.7	11.0	3:35p	E
23	52.6	57.9	5:25p	47.7	5:50a	12.4	0.0	0.00	3.8	22.0	8:35p	E
24	51.7	56.6	5:05p	48.4	5:05a	13.3	0.0	0.01	4.8	18.0	10:45a	NNW
25	49.3	54.8	4:55p	46.2	12:00m	15.7	0.0	0.00	4.4	17.0	11:30a	NNE
26	49.7	61.8	6:45p	36.3	6:20a	15.3	0.0	0.00	2.5	12.0	3:25p	SE
27	59.8	71.4	4:15p	47.8	5:30a	6.7	1.5	0.00	8.1	34.0	1:20p	S
28	55.8	62.0	12:05a	49.2	11:55p	9.2	0.0	0.66	3.3	20.0	12:35a	S
29	45.4	49.2	12:05a	41.8	12:00m	19.6	0.0	0.44	4.8	21.0	11:45p	NNE
30	37.9	41.9	12:05a	33.9	8:25a	27.1	0.0	0.07	7.3	29.0	10:35a	NNW
31	36.5	47.5	6:25p	28.5	6:45a	28.5	0.0	0.00	3.0	15.0	9:55a	N

	40.1	71.4	27	-0.3	4	773.3	1.5	2.75	4.6	40.0	13	NNW

Max >= 90.0: 0
 Max <= 32.0: 4
 Min <= 32.0: 12
 Min <= 0.0: 1
 Max Rain: 0.66 ON 03/28/19
 Days of Rain: 7 (>.01 in) 6 (>.1 in) 0 (>1 in)
 Heat Base: 65.0 Cool Base: 65.0 Method: Integration

5.7

MONTHLY CLIMATOLOGICAL SUMMARY for APR. 2019

NAME: City Hall CITY: STATE:
 ELEV: 0 ft LAT: LONG:

TEMPERATURE (°F), RAIN (in), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	44.4	56.1	5:30p	33.4	5:25a	20.6	0.0	0.00	4.9	20.0	11:00a	S
2	47.0	55.0	6:10p	40.5	7:20a	18.0	0.0	0.00	3.2	17.0	1:15a	NE
3	56.1	65.3	3:05p	48.9	3:15a	8.9	0.0	0.00	3.7	19.0	1:15p	SE
4	53.0	56.0	3:40a	50.3	12:00m	12.0	0.0	0.25	2.3	10.0	3:30a	ENE
5	54.2	65.6	5:35p	46.7	7:00a	10.8	0.0	0.00	2.4	14.0	4:40p	SE
6	62.3	76.0	4:45p	49.8	5:15a	5.7	3.0	0.69	4.1	23.0	10:05p	SE
7	63.9	74.8	5:20p	57.5	3:15a	3.1	2.0	0.00	3.7	23.0	5:30p	SW
8	66.1	81.2	5:50p	48.0	7:20a	4.1	5.2	0.00	2.5	18.0	6:05p	NNW
9	67.4	77.0	4:40p	55.5	7:20a	1.6	4.0	0.00	3.6	17.0	10:30a	SE
10	72.1	85.4	5:15p	56.6	7:15a	1.6	8.7	0.00	7.3	30.0	10:30p	E
11	53.3	77.9	12:05a	38.5	12:00m	13.7	2.0	0.00	8.8	34.0	4:05p	SW
12	42.5	54.6	5:40p	32.6	6:35a	22.5	0.0	0.00	7.8	33.0	11:05a	W
13	45.6	55.6	3:15p	32.4	7:15a	19.4	0.0	0.00	3.9	29.0	11:30p	NNE
14	47.7	57.1	5:50p	38.8	7:30a	17.3	0.0	0.00	4.9	20.0	12:20a	N
15	61.7	77.8	4:20p	45.5	5:20a	7.3	4.0	0.00	5.3	26.0	2:45p	S
16	70.7	83.4	4:25p	59.3	7:05a	0.7	6.3	0.00	5.7	22.0	1:55a	S
17	69.0	76.3	6:45p	54.8	12:00m	0.4	4.4	0.15	5.9	28.0	11:10a	S
18	54.1	61.7	4:15p	48.3	6:30a	10.9	0.0	0.04	6.3	26.0	2:05p	N
19	53.6	64.0	5:20p	44.2	6:10a	11.4	0.0	0.00	5.3	23.0	3:30p	N
20	46.9	63.3	10:40a	39.7	6:35a	8.1	0.0	0.00	0.6	13.0	10:40a	WNW
21												
22												
23	54.8	56.5	6:35p	50.9	11:45a	5.2	0.0	0.00	1.6	9.0	5:20p	E
24	58.7	67.5	5:55p	52.9	1:25a	6.5	0.2	0.00	1.4	10.0	9:10p	NNE
25	59.7	70.8	12:45p	47.8	6:55a	6.2	0.9	0.00	3.3	31.0	5:55p	N
26	60.8	71.2	4:20p	49.8	6:55a	5.4	1.1	0.00	2.6	14.0	11:55a	SE
27	58.9	73.6	12:35p	43.5	11:35p	7.0	0.9	0.00	8.3	35.0	12:45p	S
28	46.4	53.4	2:15p	39.4	7:00a	18.6	0.0	0.14	4.3	20.0	1:45p	E
29	56.8	63.0	6:10p	49.7	5:20a	8.2	0.0	0.46	3.3	17.0	5:15a	NNE
30	54.7	58.5	12:05a	51.5	7:05a	10.3	0.0	2.20	2.5	15.0	1:45a	ENE

	56.5	85.4	10	32.4	13	265.5	42.7	3.93	4.3	35.0	27	SE

Max >= 90.0: 0
 Max <= 32.0: 0
 Min <= 32.0: 0
 Min <= 0.0: 0
 Max Rain: 2.20 ON 04/30/19
 Days of Rain: 7 (>.01 in) 6 (>.1 in) 1 (>1 in)
 Heat Base: 65.0 Cool Base: 65.0 Method: Integration

5.7

MONTHLY CLIMATOLOGICAL SUMMARY for MAY. 2019

NAME: City Hall CITY: STATE:
 ELEV: 0 ft LAT: LONG:

TEMPERATURE (°F), RAIN (in), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	56.7	62.5	3:40p	53.0	7:10a	8.3	0.0	0.10	1.7	12.0	10:40p	WNW
2	54.5	60.6	4:40p	48.2	7:45a	10.5	0.0	0.16	2.9	18.0	3:25a	N
3	55.0	60.4	5:00p	48.2	12:00m	10.0	0.0	0.17	0.8	9.0	1:50p	ENE
4	57.8	72.4	5:40p	42.0	6:45a	8.6	1.5	0.01	0.4	9.0	3:35p	SE
5	64.7	77.3	4:10p	52.1	6:15a	4.4	4.0	0.03	3.2	24.0	9:50p	S
6	65.4	79.5	4:10p	56.4	6:35a	3.0	3.4	0.69	1.8	32.0	6:50p	NNE
7	60.1	64.2	5:25p	57.3	10:15a	4.9	0.0	0.65	2.7	15.0	10:30p	ENE
8	64.0	72.4	4:05p	53.2	11:55p	2.9	1.9	0.69	4.8	23.0	7:55a	SW
9	46.9	53.2	12:05a	42.2	9:10a	18.1	0.0	0.00	2.4	18.0	6:30a	NNW
10	52.3	60.4	3:40p	40.2	6:20a	12.7	0.0	0.00	0.8	10.0	10:00a	N
11	52.4	56.9	6:40p	49.4	11:55p	12.6	0.0	0.06	0.4	7.0	1:45p	SE
12	53.6	62.9	4:35p	48.5	4:00a	11.4	0.0	0.21	1.3	19.0	1:25p	NE
13	56.5	70.6	6:35p	42.3	4:55a	9.5	1.0	0.00	0.6	9.0	3:20p	SE
14	69.1	83.6	5:50p	52.1	6:35a	3.5	7.6	0.00	2.2	17.0	5:15p	SW
15	73.5	83.4	5:30p	61.1	6:05a	0.5	9.0	0.01	1.3	13.0	5:05p	SE
16	79.1	90.9	2:55p	67.1	6:15a	0.0	14.1	0.00	5.0	26.0	12:50p	SW
17	77.6	85.4	2:55p	69.5	6:45a	0.0	12.6	0.00	6.2	25.0	4:35p	S
18	66.8	75.5	12:05a	61.1	10:55p	0.8	2.6	0.58	2.6	22.0	1:05p	S
19	60.7	66.2	5:50p	54.9	12:00m	4.3	0.1	0.16	2.9	24.0	1:10p	W
20	50.9	55.8	10:30a	47.3	8:50p	14.1	0.0	1.48	3.2	26.0	11:30p	NE
21	55.2	68.6	6:35p	47.9	11:00a	9.9	0.2	1.16	4.6	34.0	1:30a	SE
22	64.7	73.3	5:45p	55.3	6:35a	2.7	2.4	0.00	3.9	21.0	1:55p	SW
23	65.1	75.3	3:30p	50.6	5:50a	4.0	4.1	0.00	1.8	16.0	10:25p	E
24	73.3	81.6	2:55p	66.4	10:25p	0.0	8.3	0.33	4.3	30.0	7:25p	SSE
25	72.8	80.1	6:10p	65.0	4:50a	0.0	7.8	0.67	4.6	33.0	11:25p	SW
26	72.4	82.3	4:35p	64.3	6:10a	0.1	7.5	0.01	2.1	25.0	12:05a	S
27	74.9	84.1	5:50p	64.9	6:20a	0.0	9.9	0.12	4.6	25.0	10:40a	S
28	74.1	78.0	4:40p	66.3	11:55p	0.0	9.1	0.38	2.9	23.0	4:15p	S
29	66.8	71.5	1:55p	60.9	11:45p	0.4	2.1	0.00	1.5	15.0	11:15a	W
30	65.7	76.8	3:40p	55.9	6:05a	2.4	3.1	0.01	2.6	19.0	3:15p	W
31	70.2	81.2	3:45p	59.4	4:10a	1.4	6.6	0.00	1.2	13.0	1:15p	W

	63.6	90.9	16	40.2	10	161.0	118.9	7.68	2.6	34.0	21	S

Max >= 90.0: 1
 Max <= 32.0: 0
 Min <= 32.0: 0
 Min <= 0.0: 0

Max Rain: 1.48 ON 05/20/19

Days of Rain: 17 (>.01 in) 14 (>.1 in) 2 (>1 in)

Heat Base: 65.0 Cool Base: 65.0 Method: Integration

MONTHLY CLIMATOLOGICAL SUMMARY for JUN. 2019

5.7

NAME: City Hall CITY: STATE:
 ELEV: 0 ft LAT: LONG:

TEMPERATURE (°F), RAIN (in), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	75.1	88.6	3:00p	62.1	2:10a	0.6	10.6	0.00	1.7	16.0	3:50p	N
2	71.1	79.2	4:10p	63.2	7:00a	0.2	6.3	0.00	1.7	11.0	11:20a	NNE
3	71.9	83.3	5:05p	59.0	4:25a	1.3	8.2	0.00	3.0	23.0	9:40p	SE
4	77.1	86.4	6:30p	68.6	3:05a	0.0	12.1	0.00	3.0	18.0	5:40p	S
5	81.4	91.3	2:30p	72.4	6:15a	0.0	16.4	0.00	2.4	17.0	8:45a	SW
6	75.0	82.0	5:00p	67.3	6:45a	0.0	10.0	0.80	1.6	23.0	3:05a	E
7	77.9	87.1	3:00p	67.2	4:35a	0.0	12.9	0.00	2.3	12.0	2:50p	E
8	77.1	86.7	2:25p	65.1	6:05a	0.0	12.1	0.00	1.4	10.0	1:05p	E
9	70.1	75.2	9:40a	65.1	5:10a	0.0	5.1	0.00	3.2	25.0	8:20p	NNW
10	68.1	78.0	4:20p	56.7	6:20a	1.9	5.0	0.00	2.0	18.0	12:10a	N
11	66.9	78.9	4:50p	58.8	6:20a	1.5	3.1	0.07	1.5	19.0	8:10p	SW
12	65.3	75.7	3:25p	58.7	7:05a	1.9	2.2	0.47	2.3	29.0	3:40p	NNW
13	67.2	79.6	5:15p	52.5	6:00a	3.4	5.6	0.00	1.8	14.0	3:35p	W
14	71.6	82.8	6:15p	61.0	8:50a	0.4	7.0	0.05	4.8	27.0	4:25p	S
15	77.8	87.0	6:55p	68.8	6:25a	0.0	12.8	0.84	4.2	23.0	2:50p	SW
16	77.6	86.3	2:45p	68.6	6:35a	0.0	12.6	0.00	1.5	11.0	2:15p	W
17	75.7	82.9	4:05p	68.7	6:05a	0.0	10.7	0.00	1.9	13.0	3:25p	ENE
18	72.8	80.7	2:05p	64.9	6:15a	0.0	7.8	0.23	0.8	10.0	2:55p	ESE
19	70.2	76.8	5:45p	66.0	7:05a	0.0	5.2	0.06	1.3	15.0	9:50a	NNW
20	75.8	88.8	5:35p	63.3	6:10a	0.2	11.0	0.00	1.6	15.0	11:55p	SE
21	73.8	80.2	6:35p	65.8	7:35a	0.0	8.8	1.01	3.0	35.0	6:30a	SE
22	75.6	89.5	3:55p	66.6	9:45p	0.0	10.6	1.33	3.0	33.0	6:05p	SE
23	68.2	75.6	5:55p	63.9	8:40a	0.1	3.3	0.81	1.7	16.0	2:50a	ESE
24	71.1	80.5	5:50p	61.9	6:35a	0.4	6.6	0.00	2.6	17.0	2:45p	W
25	77.7	89.4	5:05p	64.9	5:50a	0.0	12.7	0.00	3.2	17.0	2:35p	S
26	78.7	87.4	5:10p	69.4	6:15a	0.0	13.7	0.00	2.3	19.0	4:20p	S
27	83.1	91.1	3:00p	74.5	6:25a	0.0	18.1	0.00	3.8	23.0	2:40p	S
28	86.2	96.1	4:05p	76.9	6:20a	0.0	21.2	0.00	4.5	19.0	2:15p	S
29	87.6	96.2	3:35p	78.7	6:35a	0.0	22.6	0.00	2.6	15.0	11:50a	S
30	85.5	93.2	3:40p	76.7	6:20a	0.0	20.5	0.00	2.3	14.0	12:50p	S
	75.1	96.2	29	52.5	13	11.9	314.8	5.67	2.4	35.0	21	S

Max >= 90.0: 5
 Max <= 32.0: 0
 Min <= 32.0: 0
 Min <= 0.0: 0

Max Rain: 1.33 ON 06/22/19

Days of Rain: 10 (>.01 in) 7 (>.1 in) 2 (>1 in)

Heat Base: 65.0 Cool Base: 65.0 Method: Integration

5.7

MONTHLY CLIMATOLOGICAL SUMMARY for JUL. 2019

NAME: City Hall CITY: STATE:
 ELEV: 0 ft LAT: LONG:

TEMPERATURE (°F), RAIN (in), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	83.9	92.2	4:30p	73.5	6:25a	0.0	18.9	0.00	2.4	15.0	9:20a	SW
2	84.2	92.0	4:15p	75.2	6:25a	0.0	19.2	0.00	2.7	16.0	3:10p	S
3	80.8	88.8	1:45p	74.3	7:45a	0.0	15.8	0.00	2.8	18.0	4:25p	S
4	76.7	82.5	6:30p	73.3	6:35a	0.0	11.7	0.02	1.2	12.0	4:25p	S
5	78.2	85.1	3:05p	73.8	4:45a	0.0	13.2	0.02	1.7	18.0	11:40a	W
6	78.5	85.9	5:45p	71.2	4:55a	0.0	13.5	0.00	1.6	18.0	10:45a	N
7	80.3	87.5	3:15p	73.4	6:35a	0.0	15.3	0.00	1.4	9.0	1:35p	NE
8	81.1	90.2	4:05p	72.5	6:15a	0.0	16.1	0.00	1.8	13.0	1:45p	SE
9	83.8	94.2	4:35p	71.0	7:35a	0.0	18.8	0.19	2.8	20.0	7:05a	SW
10	80.6	87.6	5:30p	69.4	9:05a	0.0	15.6	0.52	1.8	39.0	8:40a	NNW
11	76.5	85.4	6:15p	67.8	5:45a	0.0	11.5	0.00	1.8	16.0	12:40p	N
12	78.3	88.3	6:25p	66.4	5:50a	0.0	13.3	0.00	1.0	10.0	3:15p	SE
13	81.0	92.3	5:45p	68.3	6:20a	0.0	16.0	0.00	1.0	12.0	2:45p	SE
14	82.3	91.8	4:45p	69.8	6:05a	0.0	17.3	0.00	1.4	15.0	6:55p	SE
15	78.4	85.1	3:15p	71.3	6:20a	0.0	13.4	0.00	2.1	15.0	2:50p	SE
16	80.7	91.1	4:45p	68.5	6:45a	0.0	15.7	0.00	1.2	11.0	4:20p	S
17	87.0	97.2	4:10p	77.8	4:05a	0.0	22.0	0.00	3.4	22.0	3:55p	S
18	88.5	97.3	5:55p	80.3	7:05a	0.0	23.5	0.00	6.2	25.0	5:10p	S
19	88.9	97.8	5:15p	81.0	7:25a	0.0	23.9	0.00	5.8	23.0	6:15p	S
20	89.1	98.4	6:05p	79.7	6:40a	0.0	24.1	0.00	5.0	23.0	9:20a	S
21	75.6	88.7	12:05a	70.2	7:35a	0.0	10.6	0.69	3.6	26.0	12:45a	N
22	74.0	81.4	3:35p	67.1	6:15a	0.0	9.0	0.00	3.1	20.0	2:45p	N
23	71.2	79.4	4:15p	61.8	7:00a	0.3	6.5	0.00	1.4	13.0	3:10p	N
24	73.4	83.9	4:45p	61.8	5:15a	0.5	8.9	0.00	0.8	10.0	6:10p	NNW
25	74.3	83.7	1:50p	61.8	5:20a	0.3	9.6	0.00	1.6	17.0	11:25a	S
26	78.2	87.8	3:15p	67.9	6:35a	0.0	13.2	0.00	3.4	21.0	12:15p	S
27	80.0	89.0	1:45p	69.0	6:25a	0.0	15.0	0.00	3.4	18.0	5:20p	S
28	81.7	91.5	4:20p	72.7	6:35a	0.0	16.7	0.03	4.8	26.0	12:15p	S
29	79.0	87.1	3:30p	71.7	12:00m	0.0	14.0	0.00	2.6	19.0	4:55p	N
30	76.0	86.0	3:30p	65.7	6:35a	0.0	11.0	0.00	1.4	10.0	5:55p	ENE
31	74.1	82.0	3:15p	67.4	8:35a	0.0	9.1	0.16	2.4	17.0	3:25p	SE

	79.9	98.4	20	61.8	23	1.1	462.4	1.63	2.5	39.0	10	S

Max >= 90.0: 12
 Max <= 32.0: 0
 Min <= 32.0: 0
 Min <= 0.0: 0
 Max Rain: 0.69 ON 07/21/19
 Days of Rain: 7 (>.01 in) 4 (>.1 in) 0 (>1 in)
 Heat Base: 65.0 Cool Base: 65.0 Method: Integration

5.7

MONTHLY CLIMATOLOGICAL SUMMARY for AUG. 2019

NAME: City Hall CITY: STATE:
 ELEV: 0 ft LAT: LONG:

TEMPERATURE (°F), RAIN (in), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	75.9	84.7	4:05p	67.9	4:45a	0.0	10.9	0.22	2.1	11.0	5:25a	E
2	75.3	80.4	3:45p	69.8	7:00a	0.0	10.3	0.00	2.0	11.0	11:10a	E
3	77.3	85.4	3:05p	70.2	7:10a	0.0	12.3	0.00	1.4	11.0	4:05p	E
4	78.2	89.6	3:20p	66.7	6:50a	0.0	13.2	0.00	0.7	8.0	3:40p	E
5	80.6	89.6	3:45p	69.9	7:00a	0.0	15.6	0.00	1.8	10.0	11:00a	SW
6	81.7	90.0	3:25p	75.1	4:00a	0.0	16.7	0.00	1.7	13.0	3:00p	N
7	75.8	84.5	3:35p	68.6	7:40a	0.0	10.8	0.80	1.4	25.0	7:00a	W
8	76.8	86.3	6:00p	69.8	7:00a	0.0	11.8	0.00	1.2	11.0	2:50p	SW
9	79.7	90.0	4:55p	70.2	6:25a	0.0	14.7	0.00	1.2	9.0	4:05p	SE
10	82.1	91.7	5:00p	73.1	6:50a	0.0	17.1	0.00	1.2	11.0	1:20p	SE
11	79.7	87.2	6:30p	73.9	9:15a	0.0	14.7	0.21	1.5	26.0	7:15a	ESE
12	82.4	93.8	4:50p	71.3	6:15a	0.0	17.4	0.02	2.0	30.0	4:40a	SE
13	81.4	89.6	3:05p	73.9	12:00m	0.0	16.4	0.00	1.5	21.0	3:05p	N
14	75.7	84.1	4:30p	69.9	12:00m	0.0	10.7	0.00	1.6	13.0	2:05p	N
15	72.6	81.8	6:05p	62.3	6:50a	0.3	7.8	0.06	1.4	41.0	9:15p	SE
16	75.1	83.3	6:30p	67.6	6:55a	0.0	10.1	1.03	2.2	24.0	3:15p	S
17	77.6	89.2	4:45p	67.0	3:05a	0.0	12.6	0.92	2.7	26.0	3:00a	SSE
18	80.0	89.0	4:45p	69.2	3:35a	0.0	15.0	0.82	2.3	38.0	2:40a	SE
19	83.0	96.4	5:25p	70.9	6:55a	0.0	18.0	0.00	1.1	12.0	2:20p	SE
20	86.2	96.0	5:05p	80.5	6:15a	0.0	21.2	0.00	3.6	18.0	5:05a	SW
21	76.3	82.7	12:05a	71.1	6:40a	0.0	11.3	0.11	1.3	17.0	12:20p	NNE
22	74.1	80.3	3:35p	70.3	7:15a	0.0	9.1	0.03	1.4	9.0	12:25a	ENE
23	74.7	81.4	4:40p	68.3	7:10a	0.0	9.7	0.00	2.4	14.0	2:55p	ENE
24	71.4	76.1	1:35p	66.2	7:00a	0.0	6.4	0.00	2.5	15.0	3:20p	E
25	68.3	70.4	1:55a	66.2	9:20a	0.0	3.3	0.92	1.7	13.0	4:50a	E
26	69.6	78.7	2:50p	65.8	11:00a	0.0	4.6	1.60	1.0	14.0	10:35a	N
27	71.7	81.9	3:45p	61.7	7:30a	0.3	6.9	0.01	1.2	18.0	3:10p	WNW
28	73.6	84.3	5:25p	62.0	6:55a	0.2	8.8	0.00	1.4	13.0	4:40p	W
29	78.1	91.7	5:00p	66.3	11:55p	0.0	13.1	1.14	3.5	29.0	10:05p	SW
30	70.1	77.2	5:00p	65.6	7:15a	0.0	5.1	1.01	2.4	18.0	1:35a	NE
31	67.5	74.0	12:45p	59.4	6:05a	1.2	3.7	0.01	0.9	7.0	12:30p	ENE

	76.5	96.4	19	59.4	31	2.0	359.3	8.91	1.8	41.0	15	E

Max >= 90.0: 7
 Max <= 32.0: 0
 Min <= 32.0: 0
 Min <= 0.0: 0

Max Rain: 1.60 ON 08/26/19

Days of Rain: 14 (>.01 in) 11 (>.1 in) 4 (>1 in)

Heat Base: 65.0 Cool Base: 65.0 Method: Integration

5.7

MONTHLY CLIMATOLOGICAL SUMMARY for SEP. 2019

NAME: City Hall CITY: STATE:
 ELEV: 0 ft LAT: LONG:

TEMPERATURE (°F), RAIN (in), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	71.4	79.9	5:30p	64.9	6:30a	0.0	6.4	0.00	0.6	7.0	3:20p	SE
2	76.7	88.6	4:35p	64.1	7:00a	0.0	11.8	0.00	1.5	15.0	5:40p	S
3	82.2	93.1	4:25p	73.5	7:50a	0.0	17.2	0.00	2.5	15.0	11:45a	SW
4	74.2	81.1	4:05p	67.1	8:20a	0.0	9.2	0.00	1.4	9.0	12:10a	N
5	79.0	92.8	4:15p	66.4	6:00a	0.0	14.0	0.00	2.4	18.0	2:45p	S
6	76.5	83.8	4:00p	68.8	12:00m	0.0	11.5	0.00	1.5	13.0	2:15p	N
7	74.3	85.2	5:05p	64.9	6:50a	0.0	9.3	0.02	1.6	13.0	3:15p	SE
8	74.3	84.1	5:20p	66.4	6:00a	0.0	9.3	0.06	1.7	22.0	1:00a	ESE
9	81.4	91.7	3:50p	71.1	7:10a	0.0	16.4	0.00	3.1	25.0	12:30p	S
10	81.6	87.5	5:10p	75.7	6:55a	0.0	16.6	0.00	3.7	21.0	11:25a	S
11	82.5	91.3	4:15p	75.2	6:25a	0.0	17.5	0.00	4.6	21.0	2:50p	S
12	76.2	82.3	10:10a	70.3	12:00m	0.0	11.2	0.53	2.9	21.0	9:35a	S
13	69.9	80.5	5:00p	59.9	6:50a	0.7	5.6	0.00	1.1	11.0	1:40a	W
14	75.5	88.0	5:45p	61.4	7:00a	0.4	10.9	0.00	2.7	18.0	1:30p	S
15	83.1	93.0	4:15p	74.6	7:55a	0.0	18.1	0.00	4.1	19.0	4:10a	SW
16	82.1	92.7	3:45p	71.6	7:05a	0.0	17.1	0.00	1.4	11.0	12:10a	S
17	81.3	91.3	4:15p	72.0	7:15a	0.0	16.3	0.00	1.4	16.0	1:55p	S
18	81.6	93.1	4:30p	71.4	4:20a	0.0	16.6	0.00	2.1	19.0	12:45p	S
19	80.5	91.9	3:20p	71.1	6:20a	0.0	15.5	0.01	0.8	8.0	2:40p	SSE
20	77.1	85.6	2:10p	69.9	6:45a	0.0	12.1	0.00	2.9	24.0	4:40p	SSE
21	75.2	77.1	4:55p	72.5	12:05a	0.0	10.2	0.14	4.5	26.0	3:20p	S
22	69.1	79.8	2:40p	61.6	12:00m	0.2	4.3	1.03	1.7	23.0	2:35a	NNW
23	68.1	81.5	4:20p	55.9	7:20a	2.6	5.7	0.01	0.7	11.0	4:10p	S
24	71.3	81.2	2:20p	60.6	5:40a	0.8	7.1	0.00	2.4	23.0	1:00p	S
25	74.6	82.5	2:30p	65.7	12:00m	0.0	9.6	0.00	1.7	11.0	12:30a	N
26	68.1	76.9	5:20p	57.4	7:50a	1.4	4.5	0.00	1.5	11.0	12:00p	SE
27	79.0	92.4	4:55p	70.4	12:05a	0.0	14.0	0.16	4.7	28.0	12:15p	S
28	62.8	71.3	12:05a	58.4	6:45a	2.5	0.3	1.24	1.9	15.0	1:25a	NE
29	76.7	87.2	3:25p	65.2	12:05a	0.0	11.7	0.00	2.7	19.0	11:10a	SSE
30	81.2	89.1	3:15p	75.4	7:05a	0.0	16.2	0.00	5.6	29.0	2:10p	S

	76.2	93.1	3	55.9	23	8.6	346.2	3.20	2.4	29.0	30	S

Max >= 90.0: 10
 Max <= 32.0: 0
 Min <= 32.0: 0
 Min <= 0.0: 0

Max Rain: 1.24 ON 09/28/19

Days of Rain: 7 (>.01 in) 5 (>.1 in) 2 (>1 in)

Heat Base: 65.0 Cool Base: 65.0 Method: Integration

5.7

MONTHLY CLIMATOLOGICAL SUMMARY for DEC, 2019

NAME: City Hall CITY: STATE:
ELEV: 0 ft LAT: LONG:

TEMPERATURE (°F), RAIN (in), WIND SPEED (mph)

DAY	MEAN TEMP	HIGH	TIME	LOW	TIME	HEAT DEG DAYS	COOL DEG DAYS	RAIN	AVG WIND SPEED	HIGH	TIME	DOM DIR
1	33.8	36.9	12:05a	29.8	10:45p	31.2	0.0	0.00	7.9	39.0	4:10a	NNW
2	32.9	44.7	3:25p	23.2	6:20a	32.1	0.0	0.00	0.9	14.0	12:50a	W
3	43.8	59.0	3:45p	31.7	7:25a	21.2	0.0	0.00	1.8	15.0	4:30p	WNW
4	45.3	59.7	3:25p	36.2	12:00m	19.7	0.0	0.00	1.4	11.0	12:35a	W
5	44.6	59.8	2:10p	31.4	8:05a	20.4	0.0	0.00	0.5	17.0	12:00m	N
6	35.4	47.4	12:05a	28.3	10:20p	29.6	0.0	0.00	3.4	24.0	1:10a	N
7	37.6	50.5	3:35p	26.3	1:50a	27.4	0.0	0.00	1.7	15.0	1:20p	SSE
8	45.9	50.5	2:15p	39.5	1:30a	19.1	0.0	0.00	2.1	18.0	3:45a	S
9	33.0	49.5	2:05a	20.0	12:00m	32.0	0.0	0.00	4.0	34.0	8:25a	NNW
10	25.2	32.1	3:25p	19.0	2:05a	39.8	0.0	0.00	1.3	17.0	12:10p	NNW
11	35.6	46.8	4:10p	21.6	12:45a	29.4	0.0	0.00	1.6	17.0	12:00m	ESE
12	45.2	50.5	3:20p	41.0	12:00m	19.8	0.0	0.00	5.9	33.0	5:05a	S
13	40.5	54.3	3:30p	29.2	7:05a	24.5	0.0	0.00	0.8	14.0	12:00m	NNW
14	27.5	36.9	12:05a	23.4	9:55p	37.5	0.0	0.00	3.6	24.0	4:00a	NNW
15	23.3	24.4	5:50a	21.7	6:30p	41.7	0.0	0.16	1.4	8.0	6:15p	ENE
16	22.4	26.0	2:00p	20.2	7:45a	42.6	0.0	0.00	1.7	10.0	1:05p	N
17	25.4	34.3	3:55p	17.8	7:35a	39.6	0.0	0.00	1.0	9.0	11:45a	W
18	28.5	38.1	2:40p	17.8	7:25a	36.5	0.0	0.00	1.1	13.0	4:30p	S
19	39.7	48.4	3:55p	30.4	6:55a	25.3	0.0	0.00	2.8	18.0	2:40p	S
20	39.6	47.0	3:20p	33.4	10:05p	25.4	0.0	0.00	3.2	22.0	11:00a	S
21	39.3	51.9	2:45p	32.0	4:10a	25.7	0.0	0.00	1.5	14.0	1:10p	S
22	39.0	50.7	4:20p	31.3	1:20a	26.0	0.0	0.00	2.5	15.0	3:30p	S
23	44.4	56.7	2:25p	31.4	7:30a	20.6	0.0	0.00	2.2	17.0	2:05p	S
24	51.8	63.4	2:25p	42.3	4:45a	13.2	0.0	0.00	4.2	24.0	1:10p	S
25	57.4	65.3	4:05p	51.0	7:55a	7.6	0.0	0.00	7.6	29.0	2:20a	S
26	37.4	57.3	12:05a	33.4	12:00m	27.6	0.0	0.00	2.9	20.0	12:15a	NNW
27	34.7	43.0	3:30p	26.8	6:40a	30.3	0.0	0.00	1.6	11.0	8:45p	E
28	49.2	57.5	4:10p	39.9	12:05a	15.8	0.0	1.25	2.3	19.0	4:15p	ESE
29	38.5	53.1	12:25a	30.0	9:50p	26.5	0.0	0.00	6.7	24.0	2:00a	SW
30	32.1	33.0	7:40p	31.1	1:35a	32.9	0.0	0.00	6.2	33.0	12:40a	W
31	34.9	43.4	3:45p	29.5	7:30a	30.1	0.0	0.00	3.4	17.0	9:40a	W

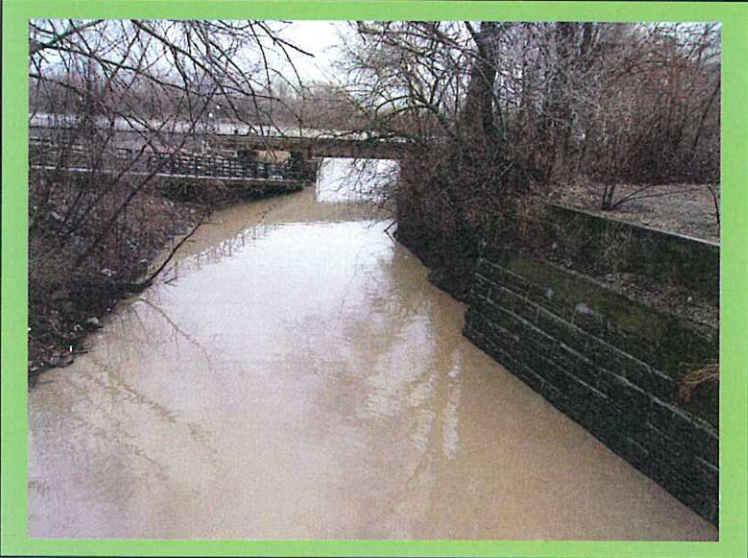
	37.5	65.3	25	17.8	17	851.1	0.0	1.41	2.9	39.0	1	S

Max >= 90.0: 0
 Max <= 32.0: 2
 Min <= 32.0: 23
 Min <= 0.0: 0
 Max Rain: 1.25 ON 12/28/19
 Days of Rain: 2 (>.01 in) 2 (>.1 in) 1 (>1 in)
 Heat Base: 65.0 Cool Base: 65.0 Method: Integration

2019 STORM EVENTS: THREE-MILE AND FIVE-MILE CREEKS, LEAVENWORTH, KS

MARCH 13, 2019

THREE-MILE CREEK EAST LOOKING EAST (DOWNSTREAM)



THREE-MILE CREEK EAST LOOKING WEST (UPSTREAM)



2019 STORM EVENTS: THREE-MILE AND FIVE-MILE CREEKS, LEAVENWORTH, KS

MARCH 13, 2019

THREE-MILE CREEK WEST LOOKING WEST (UPSTREAM)



THREE-MILE CREEK WEST LOOKING EAST (DOWNSTREAM)



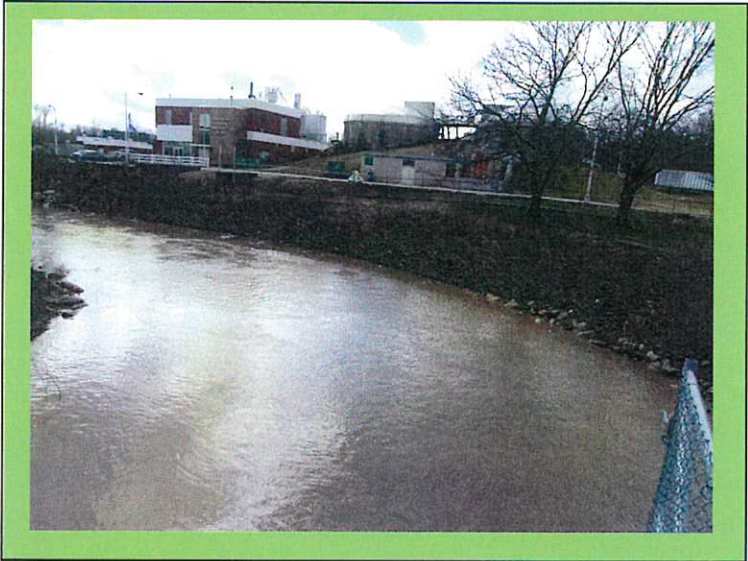
2019 STORM EVENTS: THREE-MILE AND FIVE-MILE CREEKS, LEAVENWORTH, KS

MARCH 13, 2019

FIVE-MILE CREEK EAST LOOKING EAST (DOWNSTREAM)



FIVE-MILE CREEK EAST LOOKING WEST (UPSTREAM)



2019 STORM EVENTS: THREE-MILE AND FIVE-MILE CREEKS, LEAVENWORTH, KS

MARCH 13, 2019

FIVE-MILE CREEK WEST LOOKING EAST (DOWNSTREAM)



FIVE-MILE CREEK WEST LOOKING WEST (UPSTREAM)



City of Leavenworth

2019 Stormwater Sampling Summary

		(West)	(East)
		March 13 2019	
		Upstream	Downstream
Three Mile Creek	CFS		
Total Phosphorus	mg/l	0.43	0.94
Ortho Phosphate	mg/l	0.19	0.39
Nitrate+Nitrite	mg/l	0.48	0.79
Total Kjeldahl Nitrogen	mg/l	2.8	2.8
Total Suspended Solids	mg/l	101	278
Turbidity	NTU	312	760
E.Coli	col/100ml	970	4100

		(West)	(East)
		March 13 2019	
		Upstream	Downstream
Five Mile Creek	CFS		
Total Phosphorus	mg/l	0.72	1.2
Ortho Phosphate	mg/l	0.27	0.35
Nitrate+Nitrite	mg/l	0.54	0.61
Total Kjeldahl Nitrogen	mg/l	1.9	2.9
Total Suspended Solids	mg/l	46.6	51.5
Turbidity	NTU	660	1100
E.Coli	col/100ml	630	1610

City of Leavenworth									
Surface Water Sampling information									
3/13/2019									
3 mile east	stream level	stream velocity	stream flow	distance to water surface	DO	Sample Time			
	up	steady	53.16 sec/50ft	20'2.25"	10.05 mg/L	1334			
3 mile west	up	steady	13.19 sec/50ft	19'3.5"	10.53 mg/L	1356			
5 mile west	up	steady	12.4 sec/50ft	21'5"	10.76 mg/L	1414			
5 mile east	up	steady	36.71 sec/50ft	10'1.5"	10.34 mg /L	1435			

Appendix B

TMDL

N/A

No TMDL monitoring required. Stream monitoring information not required in 2019. One storm sampled in 2019 is included in Report Section F and Appendix A.

Appendix D

Selected Supporting Documentation for Stormwater Management Program (Stormwater Annual Report - Section E) (BMP Numbers 1 & 2)

MP 1 - Public Education and Outreach & **BMP 2** - Public Involvement and Participation

- Public Information
 - City Newsletter Articles:
 - a. 2019 Spring Cleanup Flyer and Documents
 - b. Arbor Day Ceremony
 - c. Examples of Stormwater-Related Facebook Postings
 - Brochures and Information Can be Found at:
<https://www.leavenworthks.org/publicworks>
 - a. Solid Waste Services Brochure
 - b. KSU ISC (International Student Center) Rain-Garden Project Guidebook
 - c. Brochure Listing Steps to Slow Down or Stop Soil Erosion
 - City Commission Agenda
 - a. Table of City Commission Policy Reports and Minutes Related to Stormwater Management Program, KDHE Annual Stormwater Report, and City Stormwater Projects. (Individual documents can be found at:
www.leavenworthks.org/citycommission)

Colette Kiszka

From: Melissa Bower
Sent: Tuesday, January 22, 2019 9:24 AM
To: City Employees
Subject: This Week: Jan. 22, 2019



What Employees Should Know About the City of Leavenworth THIS WEEK

- Many of you have read that the federal government shutdown is affecting United States Penitentiary – Leavenworth employees, and likely a few others. The City has been sharing resources on social media with the hashtag #leavenworthstrong. Feel free to share. Our goal is to support our federal employees, not to take political sides. Resources include United Way’s “211” phone number and their website, <http://www.211.org/services/govshutdown> and the U.S. Government’s Office of Personnel Management, <https://www.opm.gov/policy-data-oversight/pay-leave/furlough-guidance/#url=Overview>
- The City of Leavenworth Community Development Block Grant program is taking applications for grants. Eligible entities must be social service nonprofits within the Leavenworth city limits. The funds can be applied to rent or utilities to groups that provide service to the community, as defined by the U.S. Department of Housing and Urban Development. Funding is still being determined by the federal government, however last year Leavenworth was able to provide \$50,210 to local agencies for service efforts. The 2019-20 application is available from the City’s Community Development Coordinator Mary Dwyer by emailing mdwyer@firstcity.org or calling 913-680-2628. Applications are due 4 p.m. February 22, 2019.
- The City will be hosting a safety meeting for the Leavenworth Citywide Spring Cleanup 4:30 p.m. Thursday, Jan. 24 in the City Commission chambers. We will have volunteer sign-up sheets available and a map so team leaders can pick their preferred areas. Sign-ups are due March 1. This is a great opportunity for children to help volunteer as well. Volunteers receive a free t-shirt and one-day pool pass for picking up trash. The event takes place Saturday, April 6.



1.3



Welcome to

Leavenworth

Kansas

Site Search



Home

Departments

Residents

Businesses

Visitors

Media Room

Services

Contact Us

100 N. 5th St.
Leavenworth, KS 66048
[Get Directions](#)

Phone:
(913) 682-9201

[Email Us](#)

[Staff Directory](#)

SAVE THE DATE: Citywide Spring Cleanup to take place April 6

Preliminary meeting Thursday, Jan. 24 at Leavenworth City Hall

City of Leavenworth Public Information Office - Jan. 17, 2019

Each year, thousands of volunteers make Leavenworth a cleaner place by picking up all trash in the City in one day. The Citywide Spring Cleanup will take place this year on Saturday, April 6.

Volunteers will receive a free t-shirt, a one-day pass to Wollman Aquatic Center. Trash bags and gloves will be provided. Volunteer sign-ups will be due March 1.

Volunteer packets for team leaders will be available at a Spring Cleanup Safety Meeting **4:30-5:30 p.m. Thursday, Jan. 24** at Leavenworth City Hall, 100 N. Fifth Street. Maps of grids will be at the meeting for team leaders to choose their preferred areas to pick up trash.

Residents, community organizations, social and civic service organizations, churches, scouting, school groups and businesses interested in volunteering should contact Public Information Officer [Melissa Bower](mailto:melissab@firstcity.org) at melissab@firstcity.org or 913-680-2610.



1-3

Colette Kiszka

From: Melissa Bower
Sent: Monday, April 01, 2019 10:08 AM
To: City Employees
Subject: THIS WEEK: April 1, 2019

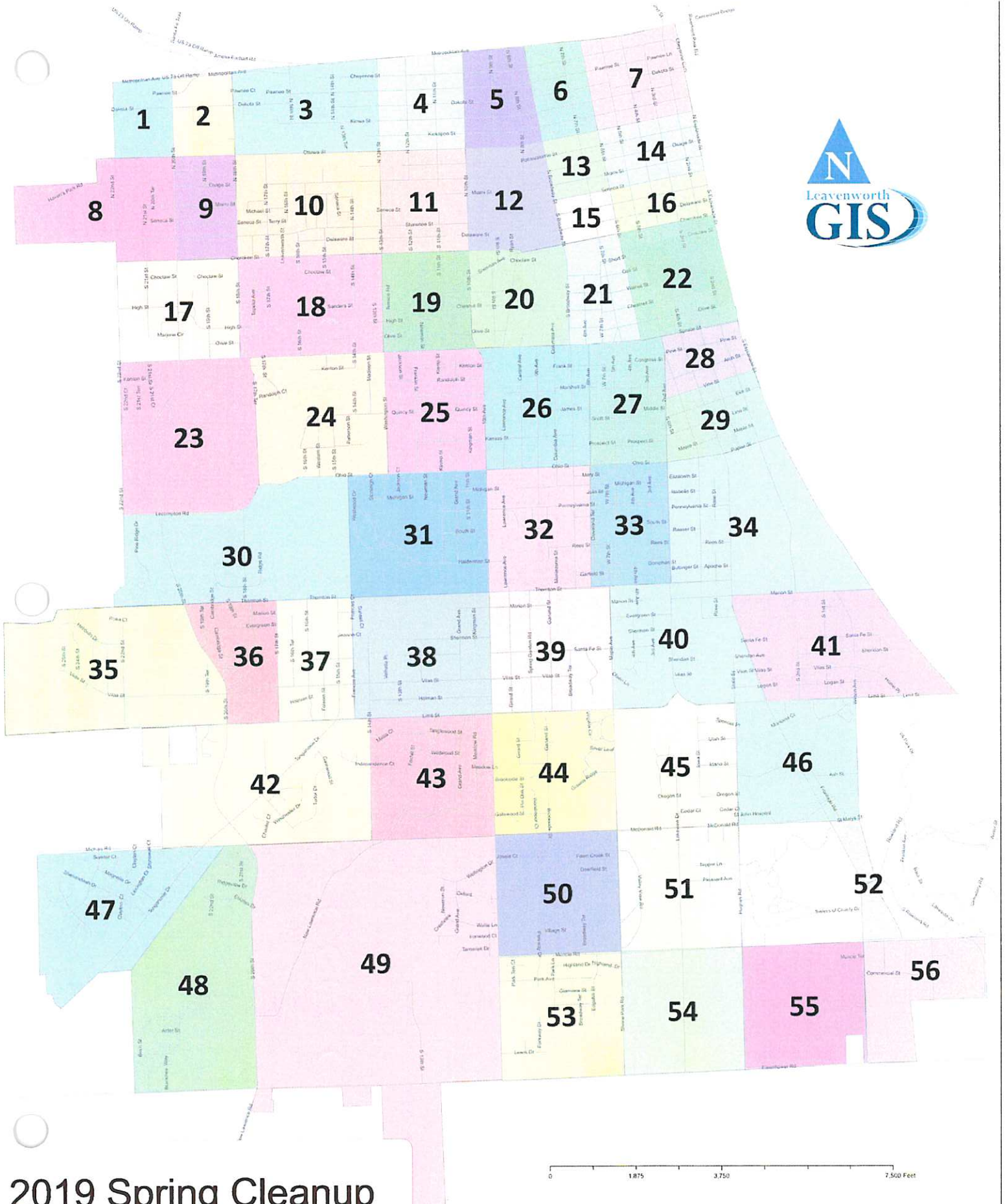


What Employees Should Know About the City of Leavenworth **THIS WEEK**

- **Our Citywide Spring Cleanup takes place Saturday, April 6.** A list of services available that day is on the City's website, including disposal of furniture, tires, household hazardous waste and free paper shredding sponsored by Citizens Savings and Loan. Unfortunately the Brush Site will be closed because of flooding. We have 925 signed up to pick up trash so far and expect a few more.
- Leavenworth Parks and Recreation Department and Sagasu Family Martial Arts are hosting the Easter Festivities and Egg Hunt 1-2:30 p.m. Saturday, April 13 at 10th Avenue Park. There will be lots of activities for children including a petting zoo and bounce house. The hunt begins at 2:30 sharp and usually only lasts a few minutes, so don't be late! This is a free event open to all children ages 12 and under.
- Lots of jobs are open now on the City's website, www.lvks.org/jobs, including park technician, traffic signal technician, zoning and code administrator and several summer job opportunities for the Parks and Recreation Department including concession stand manager, temporary parks workers, lifeguards and several others.

Melissa Bower, Public Information Officer
 City of Leavenworth, Kansas
 913-680-2610
melissab@firstcity.org
www.lvks.org
<https://www.facebook.com/CityofLeavenworthKS/>
<https://twitter.com/LeavenworthKS>

View videos of the Leavenworth City Commission at <https://www.youtube.com/user/leavenworthkansas>



2019 Spring Cleanup Zone Map of Sections

Colette Kiszka

From: Melissa Bower
Sent: Monday, April 22, 2019 11:02 AM
To: City Employees
Subject: THIS WEEK: April 22, 2019



**What Employees Should Know
About the City of Leavenworth
THIS WEEK**

- The City of Leavenworth will honor Arbor Day at a tree-planting ceremony 2 p.m. Friday April 26. We will meet at the soccer complex at 14th and New Lawrence Road, west of Warren Middle School. A redbud tree will be planted in memory of Dan Williamson, former finance director for the City for 23 years. This is a free event and all are welcome to attend.



- Leavenworth Parks and Recreation Department is hosting Touch a Truck is next week, Wednesday May 1. It will take place 10-11:30 a.m. at the south parking lot adjacent to the Riverfront Community Center. Children love seeing our fire trucks, police cruisers, Animal Control vans, SWAT vehicles, trash trucks, WPC video truck and many others. The event is free. There will be bounce houses, music and popcorn in the gym.
- A reminder that the City's brush site is open and back to its regular schedule. The next Free First Saturday will be May 4. Residents can find more information here - <https://www.lvks.org/topic/index.php?topicid=19>

Melissa Bower, Public Information Officer
City of Leavenworth, Kansas
913-680-2610

melissab@firstcity.org
www.lvks.org
<https://www.facebook.com/CityofLeavenworthKS/>
<https://twitter.com/LeavenworthKS>

1.4

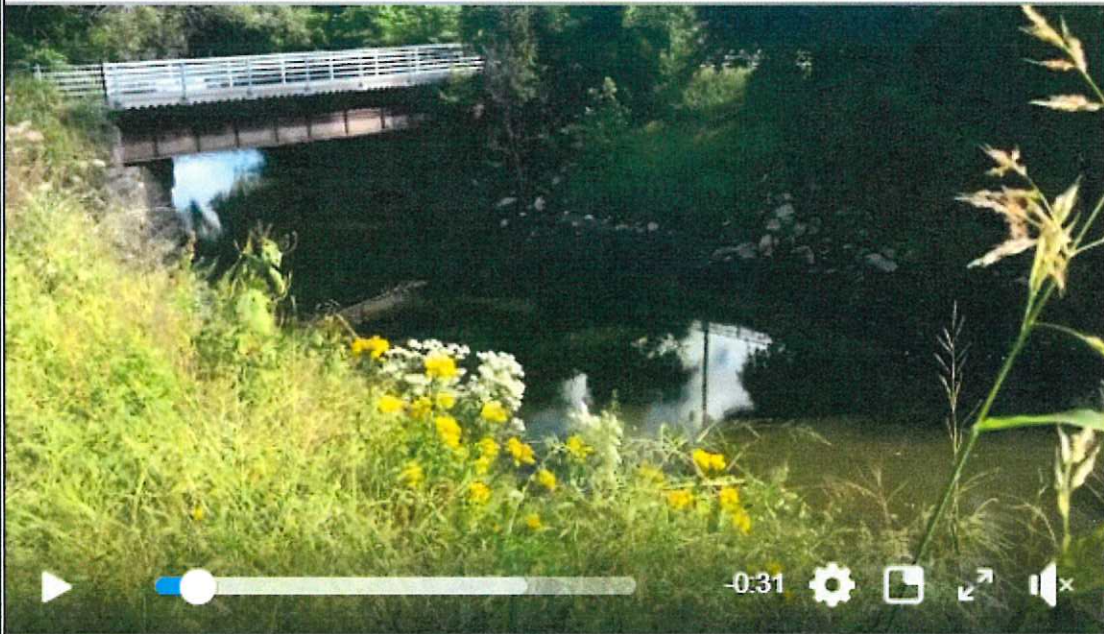


City of Leavenworth, Kansas Government



Published by Hootsuite [?] · September 23, 2019 · 🌐

The city's second eco-friendly drainage feature along Three Mile Creek, planted with native grasses, shrubs and flowers to improve the quality and quantity of stormwater and prevent soil erosion. The 2019 flood meant that much of this area was underwater earlier this summer, but many plants survived.



1,420

People Reached

151

Engagements

[Boost Post](#)

26

2 Comments 2 Shares 839 Views

Like

Comment

Share



Oldest ▾



Tom Beal Swell moving down the river from so Dakota
Minor flood coming

[Like](#) [Reply](#) [Message](#) · 22w



Jim Baskas I thought the City of Lv was getting rid of all that sand ?
they cant put it back in the river from what I hear !

[Like](#) [Reply](#) [Message](#) · 22w

1.4



City of Leavenworth, Kansas Government

Published by Melissa Bower (P) · July 12, 2019

Work is ongoing at 14th and Pawnee streets for a stormwater repair project. This project was funded through the Capital Improvements Project budget prior to our stormwater fee. Workers are replacing a wooden culvert that diverted stormwater away from the United States Penitentiary at Leavenworth. The City of Leavenworth-funded \$550,000 project is adding better drainage, then replacing a portion of Pawnee Street on top. Project is expected to last a few months.



1,520
People Reached

167
Engagements

[Boost Post](#)

BRUSH SITE 1803 S 2ND Street

The City of Leavenworth Solid Waste Division operates a Brush Site for residents to drop off organic materials, tree limbs, grass clippings, straw, hay, leaves and other organic materials from general yard waste. Trees must be free of dirt and less than 12-inches in diameter.

The Brush Site supplies free mulch, compost, wood chips & free firewood to residents. To pick up mulch, wood chips & compost, residents need to arrive at the Brush Site in a vehicle that can support the weight and the vehicle must have sides. The staff will use a bobcat to place the materials requested in your vehicle once a waiver is signed releasing the City of Leavenworth of any liability. Residents are welcome to load their vehicles by hand with their own tools. Leaves and grass clippings are always accepted free-of-charge. All other organic materials are accepted according to the fee schedule below:

BRUSH SITE FEES

Car or Van	\$2.00
Pickup Truck	\$5.00
Flatbed/Single Axle Dump Truck	\$15.00
Dual Axle Dump Truck/Chipper Box	\$25.00
Trailers:	
1' to 8'	\$5.00
8' to 16'	\$10.00
Over 16'	\$10.00
(plus \$1.00 for each foot over 16')	

On the 1st Saturday of each month, the Brush Site is free to City of Leavenworth residents. Commercial contractors will still need to pay. OPEN: March-November Tues, Wed, Fri & Sat. 8:00am-4:00pm

Last load accepted at 3:50pm
Closed Weekdays: December-February
But Open on Saturdays 8:00am-4:00pm
Open regular hours two weeks following Christmas for free Christmas tree recycling.

Hazardous Waste, Paint and Propane tanks are accepted at the County Transfer Station. For additional information about the County Transfer Station, please call 913/727-2858 or 913/727-3000. The County Transfer Station's operational hours are Tues. ~ Fri. 8am to 4pm and Sat. 8am to 2pm. (13523 Gilman Rd Lansing) www.leavenworthcounty.org



Hazardous Waste

Light bulbs and batteries can be dropped off at the Courthouse basement in kitchen (300 Walnut St. Leav.)

For Brush Site & 1st Saturdays

PROOF OF RESIDENCY:

1. VALID DRIVER'S LICENSE WITH LEAVENWORTH ADDRESS
 2. FOR OUT-OF-STATE LICENSE PLEASE BRING CURRENT UTILITY BILL
- Contractors working for City residents should have work order ready to show the location of job. County residents and Commercial Contractors working in the County, can dispose of brush at the Leavenworth County Transfer Station, 13523 Gilman Rd Lansing



The City of Leavenworth operates a Recycling Center one block west of the Municipal Service Center, 790 Thornton, at the intersection of Lawrence & Halderman Streets.

The Recycling Center is open Tuesday through Saturday 8:30 a.m. to 12:30 p.m.

The Recycling Center is always free.

The Recycle Center accepts the following items:

- Tin & aluminum cans
 - Car Batteries
 - Rechargeable Batteries (i.e. 9-volt batteries and batteries from hand tools)
 - **Battery sizes D, C, A, AA and AAA batteries are accepted at the Leavenworth County Transfer Station on Gilman Rd in Lansing.
 - E-Waste—electronic waste
 - Used Automotive Oil
 - Plastics—We cannot accept motor oil bottles, pesticide/herbicide bottles, automotive product bottles (brake fluid, windshield washer fluid, etc), plastic bags, plastic toys, expanded #6 polystyrene materials (packing sheets/blocks), PVC pipe or plastic sheet materials.
 - Glass—clear, brown or green
 - Paper products (cardboard, magazines, paper, etc.)
- We ask that you remove all lids and neck rings and clean and rinse any cans, plastic bottles and glass items.

CITY OF LEAVENWORTH



Solid Waste Services

Trash Services, Recycling Center, Brush Site, & Free Saturday Program



Pick up day is provided once each week (Mon-Fri)

Bags must be on curb by 7:00 A.M.

1.5

City of Leavenworth Solid Waste Services

WEEKLY REFUSE PICK UP

- Residential pick-up by City crews is provided once each week, Monday-Friday.
- Household trash cannot be left in the yard and must be disposed of properly, including auto parts, appliances, furniture, building materials, tires, cardboard, plastics, or any other items.
- Tree trimming and fallen limbs must be disposed of within a week.
- The charge for the trash service appears on the water bill each month. Please review your water bill to ensure you are paying for the appropriate number of units.

DO NOT SIT OUT TRASH PRIOR TO 24 HOURS IN ADVANCE OF YOUR REGULAR TRASH DAY

BAGS ONLY!

Please place refuse in disposable bags, securely tied and sit next to the curb line by 7:00am on your collection day to ensure pickup on that day.

Trash cans are not allowed on the curb. Trash bags will not be picked up out of trash cans. To throw away a container, boldly mark it "to be thrown away" and make sure it weighs less than 60 pounds.

Bags: A roll of 50 bags (30 gal) is furnished & delivered to your home twice a year (last Sat in March & Sept). Anytime in between bag delivery you may purchase the roll of bags at City Clerk's Office, City Hall, 100 N 5th St.

Got Critters? Dogs, cats & wild animals might tear up the bags. You may spray bleach or ammonia on the INSIDE of the trash bags to stop them from doing so!!!

OBSERVED HOLIDAYS

City offices are closed and trash is delayed on the following holidays:

New Year's Day, President's Day, Martin Luther King Jr. Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, and Christmas Day.
WE DO NOT OBSERVE COLUMBUS DAY!

If the holiday occurs Monday, Tuesday, Wednesday, Thursday, or Friday the normal trash collection day will move one day later. If on a Saturday or Sunday, there is no change.

BUNDLED ITEMS: Brush, tree limbs, wood and carpet will be collected with your refuse; however, these items must be cut into five foot lengths and either boxed, bagged or tied into bundles of less than 60 pounds.

TIRES: The City will collect up to five automobile tires per household (maximum ten tires per year) when left at the curb.

BOXES: If you have hired a moving, ask them if they will return to pick up the packing boxes. If not, you may put them out with your regular refuse— please, we ask that you break down as many as possible and tie them into bundles or take to the Recycling Center.

DISPOSAL OF SYRINGES, BROKEN GLASS OR OTHER SHARP OBJECTS:

Replace the protective cover on syringes after use and place them or other sharp items in a sealed container and/or box—mark "SHARP OBJECTS". Place beside the bags at the curb for collection. You may call the Service Center the day prior to your collection & we will post a notice for the crew.

BULK ITEM PICK UP on regular collection day —The City of Leavenworth will pick up most furniture items, TV's, mattresses and box springs with the regular trash.

SPECIAL PICKUP BY APPOINTMENT—FRIDAYS ONLY—Large metal items such as appliances, metal desks and miscellaneous heavy metal items will be picked up on Fridays. To schedule a pick up, please call the Service Center no later than 3:00 pm on

FREE SATURDAY

On the FIRST Saturday of each month, the City of Leavenworth offers "FREE Saturdays." This event is an excellent opportunity for residents to utilize the City's services at no charge. On FREE Saturdays the Brush Site is open from 8:00 am to 4:00 pm. At the Recycling Center, dumpsters are provided for residents at the north entrance (Pennsylvania and Lawrence) to drop off materials such as large appliances, furniture, trash and tires, between the hours of 8:30 am to 12:30 pm. The Recycling Center is always free and is open normal hours from 8:30 am to 12:30 pm for drop off of recyclable items. Any time the FREE First Saturday falls on a holiday it will be held on the 2nd Saturday of that month.

Never miss another waste collection day!



Download the FREE Recycle Coach™ app

Available on the App Store and Google Play

For questions regarding your weekly trash pick up, call the Municipal Service Center at 913/682-0650

Purchasing additional rolls of bags:

City Clerk's Office 100 N 5th St

\$7.00 per roll (50 - 30 gallon bags in a roll)

1.6
2.1

City of Leavenworth, Kansas		
2019 Stormwater-Related Policy Reports and Commission Minutes (which can be found at this link: https://www.leavenworthks.org/citycommission)		
Date	Type	Subject
2/19/2019	Agenda	Review Draft of KDHE Annual Stormwater Report
		Review Stormwater Management Program
	Policy Report	Review Draft 2018 KDHE Annual Report for Stormwater
		Review Stormwater Management Program
	Minutes	Review Draft 2018 KDHE Annual Report for Stormwater
		Review Stormwater Management Program
2/26/2019	Agenda	Resolution B-2215 Annual Report for Stormwater
		Resolution B-2216 Stormwater Management Program
	Minutes	Resolution B-2215 Annual Report for Stormwater
		Resolution B-2216 Stormwater Management Program
	Policy Report	Review Draft 2018 KDHE Annual Report for Stormwater
	Resolution	Resolution No. B-2215 - Annual Report for Stormwater
	Policy Report	Review Stormwater Management Program
Resolution	Resolution B-2216 Stormwater Management Program	
4/16/2019	Agenda	Stormwater Fee Discussion
5/14/2019	Policy Report	2019 Stormwater Project No.1 - North Improvements
	Minutes	
6/4/2019	Policy Report	Review Stormwater Issue - 2nd Street & Chestnut Drainage System
	Minutes	
6/11/2019	Policy Report	Emergency Repairs - Limit Street Storm Pipe Replacement Project
	Minutes	
	Policy Report	Engineering Services Contract for 2nd Street & Chestnut Drainage System
	Minutes	
6/25/2019	Policy Report	Design Contract for Independence Court Bank Stabilization Project
	Minutes	
12/10/2019	Policy Report	Construction of Stubby Park Storm Drain Replacement Project
	Minutes	
12/17/2019	Policy Report	2019 Stormwater Project No.2 - South Improvements
	Minutes	

Rain-Garden Design and Implementation for Kansas Property Owners

With a Discussion of Lessons Learned from Kansas State University's International Student Center Rain-Garden Design-Build Demonstration Project in Manhattan, Kansas

Introduction

- What a rain-garden looks like and how it functions
- Why rain-gardens are needed and valued
- Other stormwater management options

Steps to Create a Successful Rain-Garden

1. Understanding Your Property and Its Context
2. Locating and Sizing a Rain-Garden
3. Preparing a Place-Specific Rain-Garden Planting Design
4. Excavating and Preparing Soil for the Rain-Garden
5. Installing and Watering Plants
6. Monitoring and Caring for Your Rain-Garden

Common Rain-Garden Questions & Answers

Appendices (Case Studies, including designs and plant list for the KSU-ISC Rain-Garden)

The Kansas Department of Health and Environment (KDHE) provided financial assistance to the KSU-ISC Rain-Garden Project through EPA Section 319 Nonpoint Source Pollution Control Grant #C9007405-12. Three WaterLINK (Water Quality Restoration and Protection Service Learning Mini-Grants awarded to KSU by KDHE utilizing EPA funds) provided financial assistance for the Fall 2006 KSU Campus Creek Planning/Design Charrette, Spring & Summer 2007 KSU-ISC Rain-Garden Construction, and Fall 2007 rain-bowl designs for the KSU-ISC Rain-Garden. A Spring 2008 WaterLINK Grant, also awarded to KSU by KDHE using EPA funds, helped secure plants and pay for travel associated with the Rossville Rain-Garden project. Many KSU faculty, staff, and students assisted with design and implementation efforts. Professor Lee R. Skabelund served as Principal Investigator, Designer, and Projects Coordinator. Cary Thomsen was Lead Designer for the KSU-ISC Rain-Garden, with advice on plantings provided by Tor Jansen and Tim Keane, and the level-spreader designed by Dennis Day. Brett Tagtmeyer and Aarthi Padmanabhan were lead designers for the Rossville Rain-Garden.

Primary References:

Blue Thumb Guide to Raingardens: Design and Installation for Homeowners in the Upper Midwest.
 Authors: Rusty Schmidt, Dan Shaw, David Dods. 2007 Waterdrop Innovations, LLC.
Provides a very readable discussion of how to create rain-gardens in different contexts on residential properties and includes a guide for planting in USDA Zones 3, 4, and 5. Many excellent ideas are presented in this guide, and have been adapted in the following pages.

Rain Garden Handbook for Western Washington Homeowners
http://www.pierce.wsu.edu/Water_Quality/LID/Raingarden_handbook.pdf
Discusses a four-step process for creating rain-gardens, with excellent supporting graphics.

Introduction

What a Rain-Garden Looks Like and How It Functions

In the Flint Hills Eco-region and other parts of Kansas where prairie is the dominant historic vegetative community, rain-gardens can look and function much like a perennial garden.

The difference is that rain-gardens are intentionally designed to absorb the first inch or so of stormwater runoff from rooftops, pavement, and other impermeable surfaces of land. If a rain-garden holds more or less than the first inch of precipitation that is fine. What matters is that we try to reduce negative stormwater impacts on our aquatic resources, and rain-gardens can help!

Using native prairie species makes rain-gardens well adapted to our harsh Kansas climate, but other kinds of plants can also be used. However, please avoid invasive species!



Konza Prairie – October 25, 2005 photo by Lee Skabelund

Why are rain-gardens needed and valued?

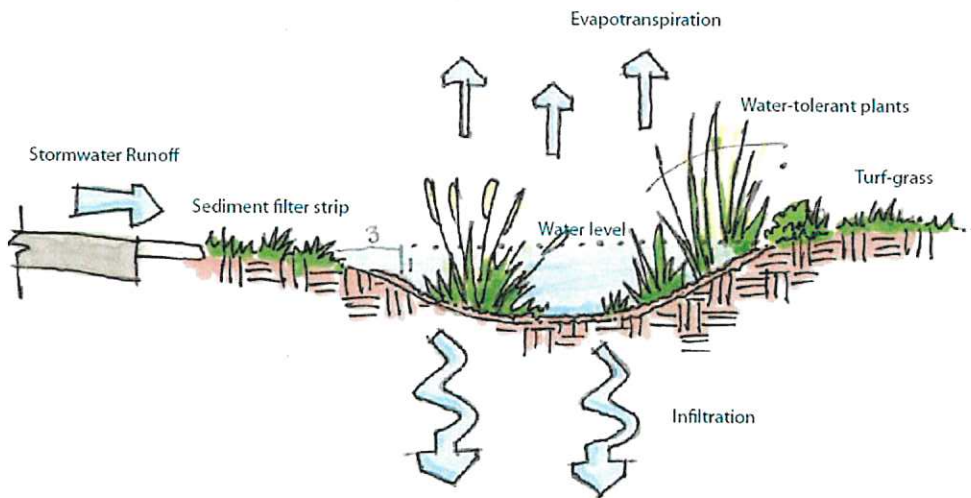
In most urban and suburban areas, and almost everywhere we have built homes, driveways, and streets, untreated stormwater flows directly across rooftops, pavements and lawns, into ditches or inlets and pipes, and is then quickly conveyed to local creeks, streams and rivers.

This process, called *stormwater runoff*, creates dispersed (or non-point-specific) water pollution, and is a leading cause of degraded streams, rivers, lakes, estuaries, and other aquatic ecosystems.

In fact, the US-EPA indicates that stormwater runoff is the most significant threat to water quality in lakes and streams – as well as to the Gulf of Mexico and other estuaries.

In recent years, rain-gardens and other “best management practices” (BMPs for short) have been designed and implemented in an attempt to slow, hold, filter and infiltrate stormwater as near as possible to the places where rain and other forms of precipitation fall to the earth.

Rain-gardens are a solution that can be readily adapted to capture and infiltrate stormwater on nearly every property, no matter the type of soils or slopes.



Rain-Garden sketch by Tim Merklein (KSU-LA/RCP 2008)

Residential Stormwater Retrofitting: An Educational Guidebook for Pottawatomie County, Kansas
Timothy Merklein, Dept. of Landscape Architecture / Kansas State University - Capstone 2008 (pg 32).

Why is effective stormwater management important?

If stormwater is allowed to move too far and too rapidly this flowing water will accumulate and create larger more concentrated flows, typically causing soil erosion in our upland landscapes, as well as excessive streambank erosion and sedimentation along our creeks, streams, and rivers.

How do we stop stormwater from concentrating?

There are many ways to slow, hold, filter and/or infiltrate stormwater. Options include, but are not limited to the following: temporarily storing water on rooftops (generally not favored due to concerns about preserving waterproofing membranes atop buildings), **creating green roofs** to capture and use a portion of the precipitation that lands on a roof during storm events for watering vegetation (an increasingly popular but more expensive way to treat stormwater given the need for adequate structural support, excellent rooftop waterproofing, and other technical requirements), **using cisterns and/or rain barrels** to store rooftop or other surface water runoff, **creating dry wells** (holes in the ground filled with gravel) to move stormwater into the earth, **creating bio-retention cells** (areas typically having a combination of engineered soils, plants and mulch), **installing porous pavement** atop a compacted washed gravel base; and **implementing rain-gardens** (shallow depressions that collect water from nearby impervious surfaces and then infiltrate the water into existing, plant-mediated soils).

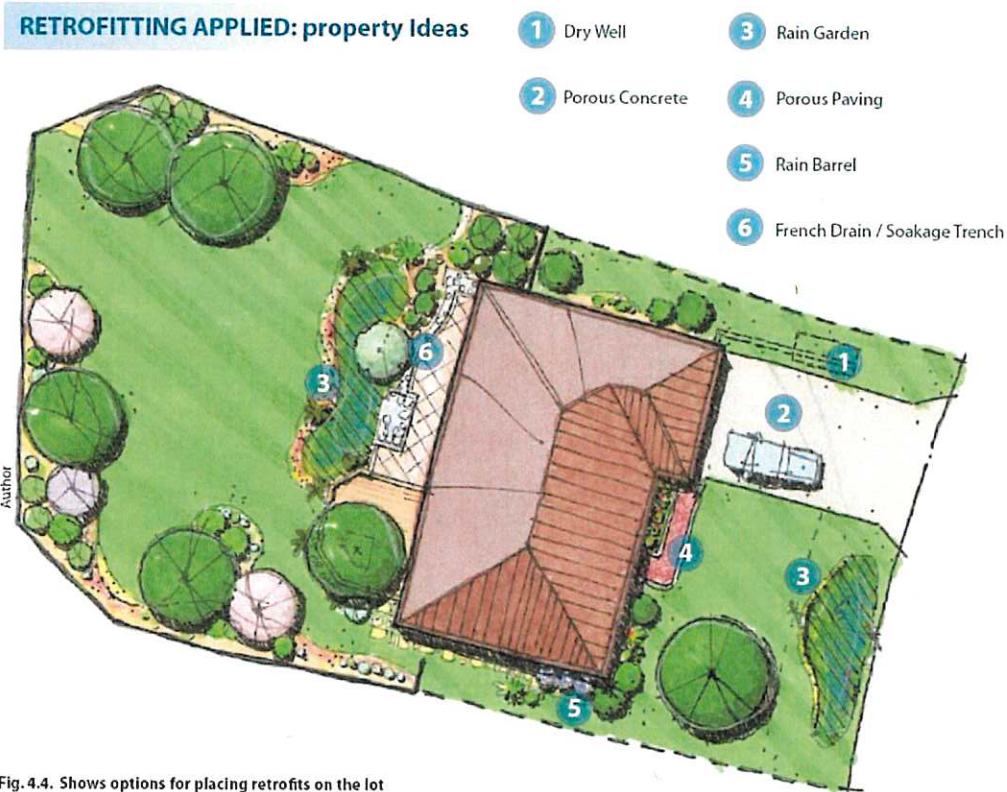


Fig. 4.4. Shows options for placing retrofits on the lot

recommendations / CAPSTONE 2008 43

Stormwater Retrofitting Ideas by Tim Merklein (KSU-LA/RCP 2008)

Residential Stormwater Retrofitting: An Educational Guidebook for Pottawatomie County, Kansas

Timothy Merklein, Dept. of Landscape Architecture / Kansas State University - Capstone 2008 (pg. 43).

Steps to Create a Successful Rain-Garden

In some ways creating a rain-garden can be as simple as A-B-C.

- A) Look for a good location;**
- B) Dig a shallow depression to collect water from part of a rooftop, patio or driveway; and**
- C) Plant vegetation that is well-adapted to the particular soils, climate/micro-climate, as well as the amount of water likely to be received by the garden.**

However, to make sure that you create a garden that relates well to its local and regional context and that will also last a good long time—we suggest that you thoughtfully consider the following six steps in your process of designing and then creating a rain-garden.

The first three steps relate to carefully planning your garden while the second three relate to successfully implementing your plans.

- 1. Understand Your Property and Its Context**
- 2. Locate and Size Your Rain-Garden**
- 3. Prepare a Place-Specific Rain-Garden Planting Design**
- 4. Excavate and Prepare Soil for the Rain-Garden**
- 5. Install and Water Plants**
- 6. Monitor and Care for Your Rain-Garden**

The following pages of this guidebook describe important ideas related to these six steps.

Adapting the ideas in this guidebook to your specific context will help you address the issues relevant to your property and thus create a rain-garden that responds to the unique soils, micro-climate, and other factors associated with your community and bio-region.

We wish you the very best in your effort to reduce negative stormwater impacts while also creating habitat for birds, butterflies, people, and other fascinating creatures!



Disappearing YARD by YARD?

How to slow or stop gradual loss of soil to stream erosion

Residential yard and other land loss to stream erosion has become a common problem in the city. Here are steps you can take to protect your property.

WHY?

Is my Creek Changing?

The problem of stream erosion is not unique to Leavenworth. Across Kansas and the nation, small streams and rivers evolved to gradually drain only the overflow that vast areas of porous wild grasslands and forests didn't absorb. Today, those streams are being asked to handle abnormal runoff from rooftops, parking lots, streets and other hard surfaces that come with increasing urbanization.



A 1-inch rain across Leavenworth's 2,000-plus acres of impervious surfaces creates more than 54 million gallons of rainwater with nowhere to go but into the small streams that drain the city. That increased volume means increased water speed within those streams. Increased water speed means more soil erosion, and more erosion means not just loss of property along the stream, but sediment and pollution downstream, as well.

Today, building designers and city planners take this runoff into account, but older homes and buildings may not be so carefully sited. If your property is losing yardage in large or small chunks during and immediately after storms, it's important to take action now, before the problem threatens structures and other valuable infrastructure.

Need more assistance?

Leavenworth Public Works
(913) 684-0375
63201 West Resources Building, 4th floor, Leavenworth, KS
For more information, www.kaworks.org



PUBLIC WORKS

What Steps CAN HELP?

GOOD

Rather than mowing to the water's edge, let the stream's natural vegetation grow wild. Thicker, taller vegetation can slow erosion by reducing both the amount and the speed of water running off into the stream. It helps protect bare soil from raindrop impact, slows the water flow, traps sediment, and even offers bird and wildlife habitat. On flat benches and gentle slopes, replacing sod with groundcovers like mulch and small stones can also help control erosion, conserve soil moisture and lower summer soil temperatures, and reduce mowing, edging and other lawn maintenance requirements.

BETTER

Selectively remove non-native and other invasive plant species. Replant native vegetation to replace them. Native species have evolved deeper root systems that help naturally hold the streambank in place. Consider thinning back treelines from the streambed to open up the canopy and encourage healthier growth of lower-growing bushes and grasses. Create a mix of overlapping and complementary plantings.

BEST

Although groundcover and plantings are generally the most cost-effective erosion control, for steep or severely undercut slopes, regrading, terracing, placing blocks or rock, or installing drain pipes may be necessary. Generally speaking, streambanks steep enough to require extra effort to climb (more than a 1-foot rise for every 3 feet of horizontal run) will likely require longterm engineering beyond plantings. Those solutions may require regrading to a gentler slope and protective plantings.

Do I Have a PROBLEM?

- Soil erosion is a natural process in which rainfall detaches soil particles and carries them away (along with your lawn's nutrients and organic material). But when does a little erosion become a big problem?
- Heavy rains exposing more tree roots or stones?
 - Small rills or gullies creeping up the banks?
 - Silt building up in low areas?
 - Rainfall splashing soil up on windows and walls?
 - Stream channel widening or deepening?
 - Holes appearing at the top of high stream banks?
 - Banks growing too steep to mow safely?
 - Whole sections of a bank sliding away or slumping?

What's the end goal of erosion control? Stream stability. Urban streams can be healthy and stable or unhealthy and unstable. How to tell the difference:

UNHEALTHY

- Steep bank slopes
- High banks
- Exposed bare dirt
- Exposed tree roots
- Straight channel
- Murky water



- Gentle bank slopes
- Little to no bare dirt
- Diverse native plants/trees
- Alternating pools and gentle rapids

HEALTHY

Do I Need a PERMIT?

In most cases, no. Unless you're damming, diverting, deepening, filling, adding large rock and other material that could be washed away, or otherwise changing the flow of the stream, simple plant-based erosion controls likely won't need regulatory oversight. Specific questions about the need for a regulatory permitting can be answered or referred by personnel in the Leavenworth Public Works Department.

What Should I REMOVE?

- Weak, thin, spindly trees
- Invasive plant species
- Non-native plant species
- Landscaping timbers below the high-water mark
- Grass and sod at the water line
- Trees/plants spaced too tightly to thrive

BUSH HONEYSUCKLES



WINTER CREEPER



TREE OF HEAVEN



BAMBOO



What Should I Keep and ENCOURAGE?

- Healthy native trees
- Native shrubs and grasses
- Groupings of plants and trees that complement and shelter one another
- Gradual and low-sloping banks

RED OSIER DOGWOOD



NINEBARK



BUR OR WHITE OAK



SOURGUM TREE



VIRGINIA CREEPER



VIRGINIA WILDRIPE



SANDBAR WILLOW



Sourgum Tree: Flickr/Emma Frisley. Some rights reserved.
 Sandbar Willow: Flickr/David Luchs. Some rights reserved.
 Used under CC BY-ND 2.0
 Virginia Wildripe: Flickr/Rick Lavin. Some rights reserved.
 Bur Oak: CC BY-ND 2.0
 Virginia Creeper: CC BY-ND 2.0
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Why Pick a Native SPECIES?

Successful plant-based erosion controls require plants that are not only attractive, but hardy, deep-rooted, deer-resistant and vigorous. Better-adapted to the particular regional climate of northeast Kansas than typical nursery plants, most native plants fill that bill. Once established, they generally need less water and less maintenance

For more information: GrowNative.org or PlantsOfMerit.org.

Why not Landscape TIMBERS?

Because they are prone to eventually washing away, landscape timbers are not recommended for retaining walls or bank protection. Washed away floating timbers can contribute to brush and log jams that may plug culverts and drains and could threaten bridge structures. Better are interlocking stacked stones or riprap boulders



Appendix D (Continued)

Selected Supporting Documentation for Stormwater Management Program (Stormwater Annual Report - Section E) (BMP Number 3)

BMP 3 - Illicit Discharge Detection and Elimination (IDDE)

- Municipal Service Center Household Hazardous Waste Cleanup Data
- Employee Training
- Grease Trap Prevention Program Summary

Leavenworth City Household Hazardous Waste Clean-up

Saturday April 6, 2019

Household Hazardous Waste Participation by Materials

Latex Paint – 1,980 lbs.

Oil Base paint – 40 lbs.

Flammable Liquids – 160 lbs.

Poisons – 24 lbs.

Corrosives – 16 lbs.

Aerosols – 40 lbs.

Antifreeze – 0

Car battery - 0

Customers Serviced

34

2019 City of Leavenworth Employee Training

No.	Training	Employee Name	Date Completed
City Hall			
1	Engineering a Permanent Road Foundation	Stewart	2/20/2019
2	Water Quality Seminar	McDonald	3/8/2019
3	National Stormwater Center Training Course	Smith	3/12/2019
4	New Tools for Comprehensive Erosion Control & Revegetation Specifications	Stewart	3/14/2019
5	Clean and Green Sustainability Conference & Expo	Stewart, Stephan, Hooper	3/28/2019
6	Stormwater Management Systems - Bio Clean	Stephan, Hooper, McDonald, Stewart, Marks, Staples, Guardado	4/2/2019
7	Practical Design Considerations that Can Extend the Service Life of Metal Buried - Bridge and Culvert Structures	Stewart	4/4/2019
8	Nutrient Smart Informational Webinar	McDonald, Hooper,	4/10/2019
9	Technical Seminar - Conveyance, Infiltration, Storage, Quality and Reline	Stephan, Hooper, Stewart	4/18/2019
10	Project Management Insights from the Project Engineer's Perspective	Stewart	12/11/2019
11	Advancing the Civil Design Review Process with Model-Based Reviews	Stewart	12/11/2019
12	Best-by-Test Foundation Solution for Traffic Signs, Bollards, etc.	Stewart	12/16/2019
13	The Appropriate Use of Engineered Earth Solutions	Stewart	12/17/2019
14	Practical Design Considerations that Can Extend the Service Life of Metal Buried - Bridge and Culvert Structures	Stewart	12/17/2019
15	Precast Structural Alternatives for a Green Solution	Stewart	12/17/2019
16	Introduction to Designing and Sizing Hydrodynamic Separators	Stewart	12/17/2019
17	Predicting Performance in Articulating Concrete Blocks: Block Geometry	Stewart	12/17/2019
Municipal Service Center			
18	Stormwater-Related Training	Number of Employees 46	2019

Stormwater-Related Training

City of Leavenworth
Grease Prevention Program
2019 Summary

February 5, 2020

The City of Leavenworth's Building Inspections Office continues to oversee a grease trap/interceptor inspection and maintenance program as part of the effort to prevent backups in the sewer lines. This effort is expected to reduce the number of instances where the contents of the sanitary sewer overflowed into homes, yards or streets.

The ongoing efforts include the following general activity:

1. Contact property owners and tenants whose buildings require a grease trap/interceptor with a letter informing them that the devices are required and that the devices require routine maintenance to operate properly
2. Perform annual inspections of the grease traps/interceptors to ensure that they are installed and maintained correctly
3. Communicate the need for routine maintenance by sending letters, requesting copies of maintenance records

Utilizing records from 2018, there were 67 businesses identified at the beginning of 2019 that staff believed may require a grease trap/interceptor.

The program goal was to send two letters to each business during the 2018 calendar year. One letter requested copies of maintenance records, and the second letter requested that the establishment contact the Building Inspection office and schedule an inspection of the grease trap/interceptor at their location, Approximately 72 letters were sent in 2019.

As a result of the response from the letters, staff determined that there are now 67 businesses that may require grease trap/interceptor. One establishment were removed from the list after additional information was received.

Staff performed 35 documented inspections on grease traps in 2019. Two establishments that were required to, but did not have a grease trap/interceptor previously, hired plumbing contractors and had grease traps installed in 2019.

Additional businesses were visited to verify grease interceptors were in place, but no actual inspections were performed on these devices due to the design of the devices.

There were five establishments that did not respond to the request for on-site inspections.

As other establishments are built or identified as needing to have a grease trap/interceptor, the establishment will be added to the programs records.

An adequate response related to copies of inspection records has been received, although multiple requests are necessary at times. Staff received copies of maintenance records from 22 of the businesses identified.

There are plans to change the program in 2020. Staff is proposing that an annual grease trap/interceptor license will be issued to each establishment. An annual inspection and copies of maintenance records for the previous year will be required before the licenses can be issued/renewed. There will also be fines for operating without a license and not maintaining the devices in proper working conditions.

YTD – GREASE TRAP/INTERCEPTOR SURVEY

12-31-19

NUMBER OF BUSINESSES CONTACTED	72
INSPECTION REQUESTS OR RECORD REQUEST LETTER MAILED OUT	72
NUMBER OF BUSINESSES THAT REQUIRE TRAPS/INTERCEPTORS	67
BUSINESS EXEMPT FROM GREASE EQUIPMENT	5
BUSINESSES NOT YET INSPECTED	26
NUMBER OF SITE INSPECTIONS OF GREASE TRAP	35
NUMBER OF MAINTENCE RECORDS RECEIVED	22

Appendix D (Continued)

Selected Supporting Documentation for Stormwater Management Program (Stormwater Annual Report - Section E) (BMP Number 4)

BMP 4 - Construction Site Stormwater Runoff Control

Examples of:

- Erosion and Sediment Control Inspection Report Forms
- Inspection of Runoff Control
- Detention Basin Inspection Form
- Letter Referencing Erosion Control
- Land Disturbance Permit Applications

4.4
4.6

Erosion and Sediment Control Inspection Report Form

Project Name and Location 2019 Pmp 894

Weather: clear

Rain in last 24 hrs (inches): .50

Owner / Permittee: Mc ANAVY

A. Current Construction / Active Areas:

Pollution Control Measures (BMP) Checklist:

- Inlet Barrier (i.e.: gravel bags)
- Sediment Barriers (i.e.: ditch checks)
- Erosion Blankets, Hydromulch / Seed, etc
- Stabilized Construction Entrance
- Stream Crossings
- Seed / Sod Areas
- Sediment Basins & Discharge Locations
- Borrow Areas
- General Site Condition (trash, etc)

B. Problem Areas / Special Observations (*Note problem areas ONLY below*):

BMP	Location	Observations, Effectiveness, & Corrective Actions Ordered

C. Listing of Areas where construction operations have permanently or temporarily stopped; stabilization measures initiated.

D. Have items noted on last inspection been corrected? Yes No (if No, Explain:)

Note: Inspection comments above indicate deficiencies only. Deficiencies must be corrected within 24 hours, unless otherwise noted. All other BMP's on site are considered to be in good working condition.

9-23-19
Date of Inspection


Inspector Signature

- 6 Goals • No Sediment Leaves the Site • Lines of Defense Everywhere & Always • Cover Quickly
- Protect the Swale, Ditch, and Channel • Keep Clean Water Clean • Inspect, Clean & Fix

4.4
4.6

Erosion and Sediment Control Inspection Report Form

Project Name and Location <i>16th TERR & HOUGHTON 828</i>		
Weather: <i>clear</i>	Pollution Control Measures (BMP) Checklist:	
Rain in last 24 hrs (inches): <i>4.5 WEEKEND</i>	<input type="checkbox"/> Inlet Barrier (i.e.: gravel bags) <input type="checkbox"/> Sediment Barriers (i.e.: ditch checks) <input checked="" type="checkbox"/> Erosion Blankets, Hydromulch / Seed, etc <input type="checkbox"/> Stabilized Construction Entrance <input type="checkbox"/> Stream Crossings <input checked="" type="checkbox"/> Seed / Sod Areas <input type="checkbox"/> Sediment Basins & Discharge Locations <input type="checkbox"/> Borrow Areas <input checked="" type="checkbox"/> General Site Condition (trash, etc)	
Owner / Permittee: <i>LINAWEAVER</i>		
A. Current Construction / Active Areas: <i>NONE</i>		
B. Problem Areas / Special Observations (*Note problem areas ONLY below*):		
BMP	Location	Observations, Effectiveness, & Corrective Actions Ordered
C. Listing of Areas where construction operations have permanently or temporarily stopped; stabilization measures initiated.		
D. Have items noted on last inspection been corrected? Yes No (if No, Explain:)		

Note: Inspection comments above indicate deficiencies only. Deficiencies must be corrected within 24 hours, unless otherwise noted. All other BMP's on site are considered to be in good working condition.

June 24, 2019
Date of
Inspection

[Signature]
Inspector Signature

- 6 Goals • No Sediment Leaves the Site • Lines of Defense Everywhere & Always • Cover Quickly
• Protect the Swale, Ditch, and Channel • Keep Clean Water Clean • Inspect, Clean & Fix

4.6

DAILY REPORT

DATE: 7-05-19

PREPARED BY: BARRY SMITH
CITY OF LEAVENWORTH, ENGINEERING DEPARTMENT

PROJECT	2015-830 14th & Pawnee RCB			SUPERINTENDENT:	
CONTRACTOR	Cohorst Enterprises			Justin Spring/Jeremy Cohorst	
START TIME	7:00 AM	TEMP AM		PRECIPITATION (in)	0
END TIME	5:00 PM	TEMP PM			
CALENDAR DAYS					
NTP	6/17/2019	END DATE		RAIN DAYS	
SITE CONDITIONS: Dry and Sunny					
CONSTRUCTION ACTIVITES: No contractors on sight. It appears silt fence was installed in some areas on 7-03-19 but not in areas that will protect the creek. Mike Stephan issued stop work order by email to Cohorst.					

u.6

DAILY REPORT

DATE: 7-08-19

PREPARED BY: BARRY SMITH
CITY OF LEAVENWORTH, ENGINEERING DEPARTMENT

PROJECT	2015-830 14th & Pawnee RCB			SUPERINTENDENT:	
CONTRACTOR	Cohorst Enterprises			Justin Spring/Jeremy Cohorst	
START TIME	7:00 AM	TEMP AM		PRECIPITATION (in)	0
END TIME	5:00 PM	TEMP PM			
CALENDAR DAYS					
NTP	6/17/2019	END DATE		RAIN DAYS	
SITE CONDITIONS: Dry and Sunny					
CONSTRUCTION ACTIVITIES: Ohmeire on site. No new erosion control installed since 7-03-19. Cohorst no there or erosion control contractor. I asked Ohmeire to leave the job site because it was under a stop work order due to not enough erosion control. Mike Stephan emailed Cohorst and they showed up on site at about 10 a.m. with an erosion control contractor (Gordon). When they were approximately 75% complete with erosion control I lifted the stop work order and allowed Ohmeire back on site at approximately 11:30 a.m. to set forms for the floor of the RCB. Erosion control was completed to the City's satisfaction.					

Detention Basin Inspection

Basin Address and Location: Saint Marys

Owner Name and Address: _____

Inspection Date: 11/22/19

Inspected By: Berry Smith

Y N N/A Last Maintenance Date

Are inlet/outlet structures free of debris, trash, sediment, and leaves? _____

Repairs/Comments: 5 cascading basins, numbered 1 to 5 from top to bottom

Is rip rap in place and free of sediment? _____

Repairs/Comments: Top basin is full of sediment

Are embankments and structures free of trees? _____

Repairs/Comments: _____

Are embankments and structures damaged or eroded? _____

Repairs/Comments: Some spots have been repaired with rip rap

Is the facility mowed and free of trash? _____

Repairs/Comments: _____

Is there excess sediment in the basin? _____

Repairs/Comments: Top basin

Is the trickle channel damaged by erosion? _____

Repairs/Comments: _____

Is the out flow of water causing damage to adjacent property? _____

Repairs/Comments: _____

Is there exposed soil with no vegetation growing? _____

Repairs/Comments: _____

Is the facility draining properly according to as built plans? _____

Repairs/Comments: _____



COPY

4.6

September 3, 2019

James & Catherine McLin
1720 Lecompton Rd.
Leavenworth, KS 66048

RE: Grading & Clearing on Vacant Property
Marsh's Pilot Knob Sub., Block 1,

Dear Property Owner,

It has been brought to the attention of this office that ground clearing operations are or have taken place on the above referenced property owned by you. A recent inspection of City records has verified that no Land Disturbance Permit was issued for the work and a site inspection has verified that no erosion control measures are in place.

This act is a violation of the Federal Clean Water Act (CWA), Section 301(a), 33 U.S.C. § 1311(a), which prohibits the unauthorized discharge of any pollutant into the waters of the United States by any person from a point source into a navigable water of the United States and the Kansas Department of Health and Environment (KDHE) Stormwater Program National Pollutant Discharge Elimination System (NPDES) General Permit.

Coverage under the NPDES general permit authorizes the discharge of stormwater runoff from construction activities for sites where the discharge point is located in Kansas and for discharges and construction activities that are conducted in accordance with the provisions and requirements of this permit and in accordance with a site specific stormwater pollution prevention plan. Owners or operators of any project or combination of projects who engage in construction activities which will disturb one (1) or more acres must have authorization to discharge stormwater under the Stormwater Runoff from Construction Activities General Permit S-MCST-1703-1. Construction activities consist of any activity (e.g. clearing, grubbing, excavating, and grading) which disturb a cumulative total of one (1.0) or more acres. Coverage continues from the date of Authorization until the site is stabilized and the construction stormwater discharge Notice of Termination (NOT) is received by KDHE or the permit is revoked/terminated for cause by KDHE.

Additional violations include, the Environmental Protection Agency's (EPA's) Construction and Development Effluent Guideline Standard (40 CFR 450), and the Leavenworth City Code, Chapter 46, Environment, Article III, Stormwater, Section 46-268.

You are hereby notified that all construction and/or clearing activities must cease and the disturbed areas must be stabilized in accordance with standard practice to prevent the erosion of soil and flow of stormwater run-off into the streamway within 7 days of the date of this letter.

100 N. 5th Street • Leavenworth, Kansas 66048-1970 • (913) 684-0378

www.lvks.org

Additionally, an NOI permit must be obtained from KDHE, and a Land Disturbance Permit must be obtained from the City of Leavenworth.

Failure on your part to complete the items necessary to by the times and dates identified above, will result in the City initiating all necessary methods to stabilize the construction area and prevent stormwater from exiting the site. Additional measures may be taken by the City to ensure the proper measures are taken to remedy the violations to include the filing a complaint in Municipal Court. All costs to include administrative costs, materials, equipment, and personnel will be charged to the property owner.

If you have any questions regarding this letter or the information included herein, don't hesitate to contact me at 913-684-0375 or by email at mhooper@firstcity.org.

Sincerely,

Mike Hooper
Deputy Director of Public Works
City of Leavenworth, Kansas

LAND DISTURBANCE PERMIT APPLICATION

(Fill Permits Require An Additional Application)

City of Leavenworth Public Works

100 N. 5th Street
Leavenworth, KS. 66048
913 684 0375

Date 5/31/18

Reviewed By: [Signature]

Applicant Name: Reilly Homes LLC

Phone: 913-727-6400 / 913-683-0165

Address: P.O. Box 9 Leavenworth

Zip Code: 66048

Email: joan@reillyhomesinc.com

Fax: 913-727-5757

Project Type

[X] Single Family Home

Utility Extension

Commercial/Mutli-family

General Grading/Filling

[X] Single Family Subdivision

Public Improvement Project

Building Addition

Other: explain Below

Project Location

Property Address: 1620 Shadow Dr

Name of Project or Subdivision: West Glenn Subdivision

Owner of Record : Phone number: 913-727-6400

Proposed Land Use:

Total Site Area: Acres/or Sq. Feet

Total Area of Land

Disturbance: Acres/or Sq. Feet

Describe the Proposed work: New Home Construction

FINAL LDP PIC ATTACHED TO APP 4.4

Address 11620 SHADON

Final Inspection of Erosion and Sediment Control

LDP Number 4752 Description NEWSPEC Owner/Contractor Permy
Date 10/21/19 Time 10:10 City Inspector Mama Kammur

Project Overview

- How Many Acres Total Does the Project Disturb? 1
- Project Start Date 8/29/19 Project End Date 10/21/19

Paperwork

- Is the SWPPP Notebook onsite? Yes No N/A
- Has a copy of the SWPPP been given to City staff? Yes No N/A

Final Site Preparation*

- Has the concrete wash-out area been cleaned? Yes No N/A
- Is the site free of construction trash? Yes No N/A
(cups, lunch sacks, material packaging, wood debris, etc.)
- Have perimeter sediment controls been taken down? Yes No N/A
- Have indications of the construction limits been taken down? (fencing, staking, physical barriers) Yes No N/A
- Has all the dirt on the site been covered? Yes No N/A
- Have appropriate grasses/sod/trees been planted? Yes No N/A
- Have the plants accepted? Yes No N/A
- Have gutters and streets been cleaned of soil/trash? Yes No N/A
- Have all erosion controls been removed? Yes No N/A
- Has all erosion control has been removed from City Right of way? Yes No N/A

* Must be "yes" or N/A in order for inspection to be "satisfactory".

Approval

City staff initial for approval:

A Compliance Certificate will be submitted, as this site has met all the requirements of the City of Leavenworth's General Guidelines for Stormwater and Drainage standards.

A Compliance Certificate will not be submitted until all above requirements of the City of Leavenworth's General Guidelines for Stormwater and Drainage standards have been met. The items below must be completed in order to have a satisfactory inspection:

1. _____
2. _____
3. _____
4. _____

Appendix D (Continued)

Selected Supporting Documentation for Stormwater Management Program (Stormwater Annual Report - Section E) (BMP Number 5)

BMP 5 - Post-Construction Site Stormwater Management in New Development and Redevelopment

- Stormwater Treatment Facilities Overview
- BMP Stormwater Facilities within City Limits
- Detention Basin Documents for Annual Meeting
 - a. Sample Letter
 - b. Public Meeting Agenda
 - c. Sign-In Sheet
 - d. Contamination Action Plan
 - e. Sample Checklist for Contamination Spills
 - f. Basin Information Pamphlets
 - g. Detention Basin Inspection Sample Form
- Examples of Rainfall and Detention Basin Monitoring and Sharing

February 21, 2019
Barry Smith
City of Leavenworth Engineering Technician
bsmith@firstcity.org

City of Leavenworth Stormwater BMP Outreach Efforts

2019 STORMWATER TREATMENT FACILITIES OVERVIEW

2019 DETENTION BASIN OWNERS/OPERATORS MEETING

A total of 28 invitations were sent to property owners. Nine people were present for the meeting that was held on March 14, 2019; including City officials. The sign-in sheet is on file. Attendees showed up at different times between 4:00 p.m. and 6:00 p.m. The detention basins were discussed on an individual basis with the property owners or their representatives. Attendees were given a packet with the agenda and a basic overview of detention basin maintenance. The packet also included examples of an emergency spill plan and an inspection form. A slide show of BMP examples was shown and basic maintenance and function were discussed.

2019 OVERVIEW OF STORMWATER TREATMENT FACILITIES

In 2019 five new stormwater treatment facilities were added to the City's assets. There are currently 62 stormwater treatment facilities. This includes bio-swales/inlets, dry/wet basins, underground basins, pervious pavement, and trash collectors. All the facilities appear to be functioning as designed. 50 hours were spent this year to inspect all stormwater facilities. Some privately owned facilities lack maintenance and owners have been notified by phone or at the 2020 BMP meeting of the need to improve and maintain their BMPs.

City of Leavenworth

Listing of BMP Stormwater Facilities City-Wide as of December 31, 2019

No.	Owner	Location Notes	Address/Owner Notes	Description
1	Core Civic	South of Facility	100 Highway Terrace	Dry Basin
2	Townplace Sullis	1001 n 4th st	300 Wyandotte KCMO 64105	Dry Basin
3	Casey's 10th & Eisenhower	Casey's 10th & Eisenhower	3B's, CDS LLC c/o Carol Bohannon, 16214 Nicole Ln (913) 626-4338	Dry Basin
4	Zeck Ford	Behind Overflow Parking Lot	4701 s 4th st Zeck Bros Development	Dry Basin
5	Armed Forces Insurance	550 Eisenhower Rd	Armed Forces Insurance 550 Eisenhower Rd	Wet Basin
6	Calvary Baptist Church	SE of Church Parking Lots	Calvary Baptist Church, 4451 10th Ave (913) 682-3790	Dry Basin
7	Southwind Subdivision	841 Meadow	Charles O Thomas at 3030 Girard and Thome Trust 841 Meadow Ln	Dry Basin
8	Business and Technology Park	North basin	City of Leavenworth	Dry Basin
9	Business and Technology Park	South Basin	City of Leavenworth	Dry Basin
10	16th_Terr_DB	End of Dead End Street	City of Leavenworth	Dry Basin
11	Ottawa st	North Side	City of Leavenworth	Bioswale
12	Ottawa st	South Side	City of Leavenworth	Bioswale
13	Kiowa	South Side	City of Leavenworth	Bioswale
14	Dakota	North Side	City of Leavenworth	Bioswale
15	Dakota	South Side	City of Leavenworth	Bioswale
16	Kickapoo	South Side	City of Leavenworth	Bioswale
17	Miami	South Side	City of Leavenworth	Bioswale
18	West City Hall Parking Lot N	North Side	City of Leavenworth	Bioswale
19	West City Hall Parking Lot S	South Side	City of Leavenworth	Bioswale
20	2nd and Cherokee City Parking Lot	East Side	City of Leavenworth	Bioswale
21	2nd and Cherokee City Parking Lot	West Side	City of Leavenworth	Bioswale
22	6th and And Cherokee Parking Lot	West Center	City of Leavenworth	Bioswale
23	7th and And Cherokee Parking Lot	Center with Swale	City of Leavenworth	Detention Basin
24	8th and And Cherokee Parking Lot	East Side	City of Leavenworth	Bioswale
25	Trash Collector	Thorton and 5th Ave	City of Leavenworth	CDS
26	Fraternal Order of Eagles	20th and Shawnee	City of Leavenworth	Dry Basin
27	Dillon's NE Parking Lot (underground)	NE Side	Dillons Food Stores 2700 E 4th Ave Hutchinson, KS 67507	Underground Basin
28	Dillon's SW Parking Lot (underground)	SW Side	Dillons Food Stores 2700 E 4th Ave Hutchinson, KS 67508	Underground Basin
29	Crown Estates 2	SE of Randolph Ct	Ed McIntosh, Crown Estates LLC, 13677 214th St., Linwood, KS 64155 (913) 724-1765	Dry Basin
30	Ben Day Lofts	1100 3rd Ave	Exact Properties BD LLC, 6112 Double Eagle Ct, Parkville, Mo 64153	Dry Basin
31	Hampion Inn	SE Corner of Parking Lot	Hampion Inn, 405 Choctaw St	Dry Basin
31	Highland Pointe SD	SW Corner of Park Lane & Muncie Rd	HOA	Dry Basin
33	Shenandoah Heights SD	Between Clayton Ct and Gettysburg D	HOA	Wet Basin
34	Shenandoah Heights SD	3700 Blk Clayton Ct	HOA	Wet Basin
35	Pine Meadow Place Subdivision	4800 Block Parkway Drive	James Perry 4907 Parkway Dr	Dry Basin
36	1028 Madison St	1028 Madison St	Joseph J Maroec	Dry Basin
37	Henry M Leavenworth Elementary School	West Side of School Property	Leavenworth Public Schools	Dry Basin
38	Lawson Elementary School	820 N 5th St	Leavenworth Public Schools	Dry Basin
39	Leavenworth High School	2012 10th Avenue	Leavenworth Public Schools	Dry Basin
40	Nettie Hartnett School	Nettie Hartnett School	Leavenworth Public Schools	Dry Basin
41	Anthony Elementary School	570 Evergreen St	Leavenworth Public Schools	Dry Basin
42	Anthony Elementary	Anthony Elementary	Leavenworth Public Schools	Dry Basin
43	David Brewer Elementary School	David Brewer Elementary	Leavenworth Public Schools	Dry Basin
44	Henry M Leavenworth Elementary School	NE Corner of School Property	Leavenworth Public Schools	Dry Basin
45	Leintz Funeral Home	4701 10th Avenue	Leintz Funeral (913) 351-0200	Dry Basin
46	Home 2 Suites	250 Delaware	MDG-Leavenworth Land LLC, 1401 s Brentwood BLVD Suite 675, St Louis, MO 63144	Pervious Pavement
47	Woods on Muncie/Wellington SD	SE of Grand Ave/Wallis Lane	No HOA	Dry Basin
48	Woods on Muncie/Wellington SD	West of Ironwood Cul-de-sac	No HOA	Dry Basin
49	Location	Location	Owner	SubType
50	Stove Factory Lofts	NE Corner of Property	Stove Factory Lofts LLC, 8201 nw 97th Terrace , KCMO 64153	Underground Basin
51	Home Depot	SW Corner of Property	The Home Depot, 500 S 4th St	Dry Basin
52	Cereal Ingredients	North Side	Tim Moore 4720 South 13th Street Leavenworth, KS 66048 PH: 913-727-3434	Dry Basin
53	Cereal Ingredients	South	Tim Moore 4720 South 13th Street Leavenworth, KS 66048 PH: 913-727-3435	Dry Basin
54	The Branches SD	2100 Blk Birch St	Tripple R Properties	Dry Basin
55	University of St Mary	McDonald and Hughs Rd	University of St. Mary	Dry Basin
56	University of St Mary	McDonald and Hughs Rd	University of St. Mary	Dry Basin
57	University of St Mary	McDonald and Hughs Rd	University of St. Mary	Dry Basin
58	University of St Mary	McDonald and Hughs Rd	University of St. Mary	Dry Basin
59	University of St Mary	McDonald and Hughs Rd	University of St. Mary	Dry Basin
60	US Army Reserve Center	20th St & Metropolitan	US Army Reserve Center, Leavenworth, KS 66048	Dry Basin
61	Wal-Mart	5000 10th Ave , West Side of Wal-Mart	Wal-Mart, 500 S. 10th Avenue	Dry Basin
62	Westside Family Church	Pond Behind Church	Westside Family Church, 8500 Woodside Drive	Wet Basin



J.4

February 13, 2019

Armed Forces Insurance
550 Eisenhower Rd
Leavenworth, KS 66048

Subject: Detention Basin – Annual Meeting March 14, 2019

Dear Property Owners,

Our records indicate that you own or are responsible for operating and/or maintaining a detention basin or similar installation within the City of Leavenworth.

The City of Leavenworth has hosted a public information meeting annually regarding the function and maintenance of detention basins and “Best Management Practice” (BMP) installations within the City. This year the City is requesting that you attend this very important meeting on **Thursday, March 14th, 2019, 4:00 p.m. to 6:00 p.m. at the City Hall Commission room.**

Meeting Topics:

1. Discuss and inform owners of the operation and maintenance procedures of the BMPs.
2. Discuss proposed annual certification of detention basins.
3. Discuss proposed fines and abatement fees related to noncompliance of polices in relation to the BMPs.

The City is also requesting that you verify ownership contact information and submit all records of maintenance for BMPs from 2018. This can be accomplished at the annual meeting

If you have any questions regarding the basin inspection or maintenance reports, please email them to the City for review at bsmith@firstcity.org, or mail them to 100 N. 5th Street, ATTN: Public Works Department, Leavenworth KS. 66048.

Sincerely,

Michael G. McDonald, P.E.,
Director of Public Works

Cc: Paul Kramer, City Manager

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**DETENSION BASIN OWNER'S
INSPECTIONS AND MAINTENANCE
PUBLIC MEETING AGENDA
March 14, 2019 4:00 to 6:00 pm**

CITY OF LEAVENWORTH CONTACTS:

- Michael McDonald, Director of Public Works
1-913-684-0375, (mmcdonald@firstcity.org)
- Mike Hooper, Deputy Director of Public Works
1-913-684-0375, (mhooper@firstcity.org)
- Mike Stephan, Project Manager – Public Works Engineering
1-913-684-0375, (mstephan@firstcity.org)
- Barry Smith, Engineering Technician – Public Works Engineering
1-913-684-0375, (bsmith@firstcity.org)

TYPES OF BASINS:

- Detention Basin/Pond (Dry Pond)
 - Designed to hold back or detain storm water for a short period of time.
 - Helps prevent/reduce flooding.
- Retention Basin/Pond (Wet Pond)
 - Designed to continually hold or retain storm water for extended period of time.
 - This type will be "wet" all of the time.

OTHER TYPES OF BMP'S:

- Pervious Pavement
 - Porous concrete pavement that allows run-off water to leave a site quickly.
 - Designed to detain storm water in a clean gravel pit.
 - This is constructed under the pavement.
- Bio-Swales
 - Designed to detain storm water for a short time.
 - Uses a grate, which will take high flows.
 - Low flows will soak through special soil mix and into storm drain.
- Underground Detention Systems
 - Designed to detain storm water underground.
 - Allows site footprint to be used as parking lot or other similar uses.
 - Low flows will soak through gravel drainage bed and into the ground.
 - High flows will drain into the storm sewer when gravel drainage bed is full.

TOPICS OF CONCERN REGARDING INSPECTION & MAINTENANCE:

- Weed Control
- Brush Control
- Erosion Control
- Plan of Action for Contaminated Spills
- Inspections Completed and Reported
- Inlet & Outlet Maintenance (Keeping Clear of Growth and Debris)
- Future Fees and/or Penalties
- Possible future Engineer Stamp requirement. (Stamp is presently required on new construction)

CHANGES ARE COMING. WHAT?

- Maintenance Schedule Required.
- Maintenance records must be kept for 5 years.
- Annual maintenance report due by December 31.
- Failure to submit records can result in a fine.
- 3 year certification – by a licensed engineer certifying the facility has full storage capacity, all inlet/outlet structures are fully functional, and the facility is functional in accordance with the approved plans and specifications.
- Failure to comply.
- City can initiate repairs and assess all costs to the owner.
- City can file a complaint in court and assess fines.

CONTAMINATION ACTION PLAN!

The City of Leavenworth is required to evaluate the effectiveness of facilities constructed to address stormwater runoff within the city. Maintenance and operation of ponds and detention basins are regulated by the Environmental Protection Agency (EPA), Kansas Department of Health and Environment (KDHE), and the City of Leavenworth, Kansas. Inspection and maintenance of the facility is typically provided by the property owner and/or a home owner's association.

Owners of ponds are expected to be prepared to react in the event of a chemical spill or other contamination that impacts the water in their pond. The City of Leavenworth is requesting that you submit inspection reports and an action plan showing how you will report, contain, and protect the City stormwater system in case your detention basin is contaminated by chemical spills, sanitary sewer overflows, or other forms of contamination.

If contamination occurs within the detention basin, action needs to be taken to mitigate pollution to the water and soil within the City stormwater system. The KDHE website list actions to be taken at: www.kdheks.gov/spill/download/KS_Spill_Reporting.pdf . Below is a list of recommended immediate actions to be taken and phone numbers of authorities to be contacted.

- ✓ Containing the spillage by means of the safest practical way possible by blocking the outflow of the structure or downstream.
- ✓ If the release is not contained or threatens the health or safety of the local population dial 911.
- ✓ Contact the City Water Pollution Control 24/7: 913-682-1090.
- ✓ If a spill exceeds the reportable quantities of federally-listed hazardous materials,
 - dial 911
 - Contact Leavenworth County Emergency Management:
 - i. 913-684-0455 or
 - ii. Sheriff Office 913-682-1313
 - Work with the authorities to contain contaminants.
 - **The Kansas Commission on Emergency Planning & Response (CEPR) – 785-274-1394** – requires verbal notification and a follow-up written report within seven days after the verbal report.
- ✓ Whenever a spill exceeds the reportable quantities of federally-listed hazardous materials, it must also be reported to the National Response Center (NRC). Federal law also requires any oil spill that has impacted or threatens a waterway must be reported to the NRC. EPA Region 7 Emergency Response Branch personnel monitor the NRC reports and may call the spiller back for more information. **NRC's 24-hour number is: 800-424-8802.**
- ✓ Immediately make verbal notification to the Kansas Department of Health and Environment. **The Kansas Spill Reporting Number is: (24/7) 785-291-3333.**

SAMPLE CHECKLIST FOR CONTAMINATION SPILLS

It's a good idea to have the basic checklist, a map of the stormwater system, and a list of responsible party contact information conveniently available in the case of an emergency. Below is a basic checklist for use as an example.

- ✓ Contact the authorities and identify basic information on the spill:
 - Quantity and location of the spill.
 - Type of contaminants.
 - Time of spill.
 - Whether injuries have occurred.
 - Status of containment efforts.

- ✓ Implement the immediate action plan:
 - Obtain medical assistance if there has been an injury.
 - Prevent sources of ignition for flammable materials.
 - Contain the spill.

- ✓ Notification of governmental authorities and others may be required:
 - Identify applicable reporting requirements from laws, rules, and permits.
 - Make notification as required by law, and notify neighbors if appropriate.

- ✓ Respond and clean up as required by law:
 - Call an outside contractor?
 - Manage waste materials in accordance with the law.

- ✓ Document events, notifications, and response actions through photographs, written summaries, copies of documents, etc.

- ✓ Make written follow-up reports to government agencies and others as required by law.

- ✓ Review spill to determine root cause and opportunities for prevention of similar spills.

BASINS

INTRODUCTION

Your detention basin is a storm water best management practice (BMP) designed to temporarily capture and hold storm water runoff during periods of heavy rain, and slowly release this flow over a period of one or two days so it minimizes flooding and streambank erosion problems downstream. They also help remove sediments from storm water runoff, which helps improve the quality of local streams. Like most other things, a detention basin may not function properly or it may fail prematurely if not properly maintained. Once a detention basin fails, it is often very expensive to correct.



Many detention basins are located on private property, including parcels of land owned and maintained by a homeowners association (HOA). Local governments do not have the authority to maintain detention basins on private property. Rather, these are the responsibility of the lot owner to maintain.

Whether you are an individual property owner, a homeowner's association representative, or a residential/commercial property manager, this Guidebook will help answer questions and provide you with instructions for basin maintenance activities. Routine maintenance will prolong the life of your detention basin, improve its appearance, help prevent flooding and property damage, and enhance local streams and lakes.

WHAT ARE DETENTION BASINS AND WHY ARE THEY IMPORTANT?

When land is altered to build homes and other developments, the natural system of trees and plants over relatively spongy soil is replaced with harder surfaces like sidewalks, streets, decks, roofs, driveways and even lawns over compacted soils. As a result, less rain water soaks into the ground and more rain water, also known as storm water, flows off the land at a faster rate. This can lead to streambank erosion and possibly cause downstream flooding.



A detention basin is a man-made depression that collects and temporarily holds storm water runoff. Your detention basin (along with others in the area) helps to slow the rate of storm water runoff from the neighborhood and improve the quality of the storm water leaving the detention basin. Your detention basin is important because:

- it collects and detains storm water
- it helps settle out and hold sediment
- it protects local creeks and private property
- it reduces downstream flooding

There are different types of storm water management basins. Some basins are dry and have mowed turf grass in the bottom of them. These are referred to as dry detention basins, or simply detention basins. Others are designed to have a permanent pool of water and are commonly called wet ponds or retention basins. These wet ponds hold water throughout the year, but also have extra storage space that fills with water after a storm.

DRY BASIN



WET BASIN



BASIN COMPONENTS



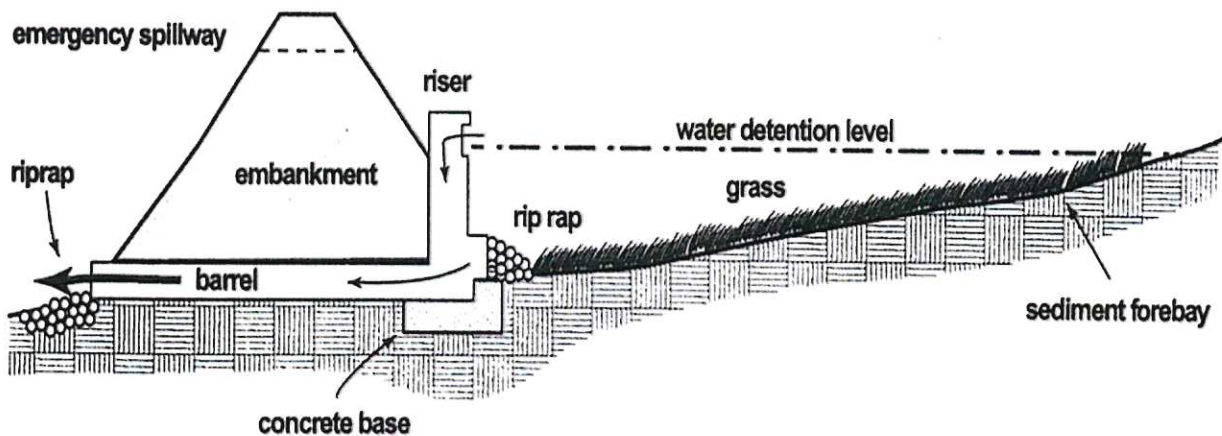
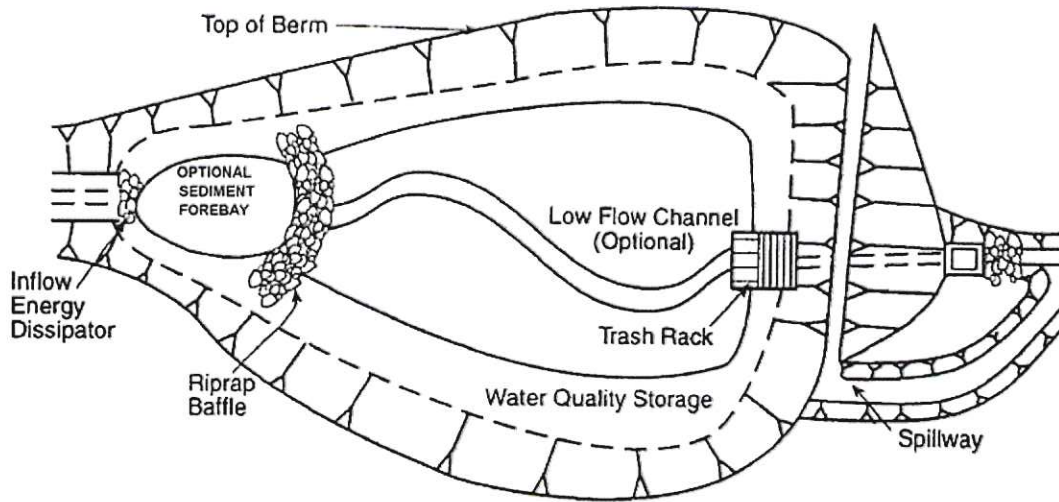
A detention basin contains different components, including inlet pipes (there may be one or multiple inlets), the side slopes and bottom, a low flow channel, the outlet structure, the outlet pipe, an embankment and emergency spillway, and rip rap that is usually placed around pipes where they enter and exit to prevent erosion.



Basin Outlet Structure

Outlet structures vary from basin to basin, but all will include a minimum of two outlets - a small diameter outlet and a larger diameter overflow. Outlets may be covered by a trash rack or metal grate.

Newer, more advanced detention basins may include a *forebay*, which is a settling pool located at the inlet to a basin, and is separated from the rest of the basin by a level dike. The purpose of the forebay is to collect sediment before it enters the main basin. By concentrating sediment in the forebay, it becomes much easier (and less expensive) to clean the sediment out. Some detention basins may also include a *micropool*, which is a small, shallow, permanent pool of water near the outlet designed to prevent re-suspension of sediment and clogging of the outlet.



BASIN MAINTENANCE

A consistent maintenance program is the best way to ensure that a detention basin will continue to perform its water quality functions. In general, a maintenance program should contain the following components:

- Maintain access for inspection and maintenance
- Regular inspections
- Debris and litter control
- Vegetation management
- Embankment and outlet stabilization
- Sediment removal



Pervious concrete pavement is a portland cement-based, rigid permeable pavement that serves not only as the surface layer of a stormwater management system, but also as a vital part of a water filtration system.



A Hydro Excavator Modified to Vacuum Sediment From Pervious Pavement

MAINTAINING YOUR DETENTION BASIN



The first step in a maintenance program is to obtain a copy of the detention basin design. Review the engineering design!

Basin Access

Insure that you have proper access to the basin for regular inspection and maintenance activities. Access should be wide enough for heavy equipment that may be needed for dredging or major repairs. Consider HOA prohibition against homeowners placing fences, outbuildings, landscaping or anything which might interfere with proper access.

Record Keeping

It is important to keep records of all inspections, maintenance activities, repairs and associated costs.



Management Costs



An effective detention basin management program does come with costs, and detention basin owners should plan accordingly. The Center for Watershed Protection has estimated that the annual cost of routine maintenance is typically about 3 to 5% of the construction cost. With good record keeping, the owner can determine annual costs more accurately. Owners should set aside money for routine maintenance as well as the occasions when outside expertise or equipment is needed to maintain, upgrade or repair a basin.



Eagles Hall Dry



Eagles Hall Detention Basin After a High Rate of Rain



A Controlled Burn May Be Necessary If The Basin Can't Be Accessed With Mowers

VEGETATION MANAGEMENT



Vegetation should be maintained throughout the basin to prevent erosion, including the basin bottom, side slopes, and both sides of the dam. Turf grass is the most common groundcover, although other vegetation, such as deep-rooted native plants, can be used to improve basin performance by allowing more water to infiltrate (to soak into the soil). If something other than turf grass is used in the basin bottom, care should be taken to use plants that can withstand temporary inundation and wet soils as well as periods of extended dryness.



If vegetation in a basin is not managed, problems can result. To stay ahead of problems:

- In the spring and fall, inspect the vegetation along the side slopes and basin bottom.
- Re-seed any barren or eroded areas which have developed.
- Any small erosion gullies which have appeared should be completely filled with well-compacted soil, re-seeded, and monitored for recurrence.
- In the spring, remove decomposing vegetation if it is clogging pipe openings.
- Mow at least twice a year if turf grass is used as the groundcover in the basin to prevent trees and woody plants from becoming established. The basin may be mowed more frequently for aesthetic purposes. It is recommended that a grass height of 2 inches be maintained.

No trees or shrubs should be planted or allowed to grow within 15 feet of inlet or outlet pipes or manmade drainage structures such as spillways or earthen embankments. Plants with roots that seek water, such as willow or poplar, should not be used within 50 feet of pipes or manmade structures.

Once a year, the detention basin should be inspected for the appearance of invasive species, including honeysuckle, Callery pear, autumn olive, buckthorn (common & glossy), purple loosestrife and phragmites. Vines can also be a nuisance around the inlet and outlet structures.

https://www.kansasforests.org/forest_health/invasivespecies.html



There are good and bad points about the common cattail. On the plus side, the common cattail (*Typha latifolia*) is a native species and is effective in removing excess nutrients from storm water runoff. On the down side, cattails have a tendency to invade and grow quickly, crowding out other desirable species. Many people also feel they are aesthetically displeasing. If you choose to allow cattails to grow in the basin, there are some important things to keep in mind. Cattails should be kept clear of the outlet structure, as they can cause blockages. Cattails should also be kept away from the dam area. Cattails can encourage muskrats, and their burrows can affect the integrity of the dam. If you wish to eliminate the cattails in the future, it is important to note that cattails can be very difficult to remove, and special equipment may be needed.

CITY ORDINANCES AND CODE ENFORCEMENT

ARTICLE V. - CUTTING OF WEEDS AND VEGETATION

Sec. 28-122. - Weeds to be removed.

It shall be unlawful for any owner, agent, lessee, tenant, or other person occupying or having charge or control of any premises to permit weeds to remain upon said premises or any area between the property lines of said premises and the centerline of any adjacent street or alley, including, but not specifically limited to, sidewalks, streets, alleys, easements, rights-of-way and all other areas, public or private. All weeds as hereinafter defined are hereby declared a nuisance and are subject to abatement as hereinafter provided. More information concerning the code of ordinances is available at the city website.

<https://library.municode.com/ks/leavenworth>

REGULAR INSPECTIONS/MAINTENANCE:

THE KEY TO KEEPING A WELL MAINTAINED BASIN



The following maintenance and inspection tasks should be conducted for basin structures. Please also refer to the inspection schedule at the back of this Guidebook.

Monthly and after major storms:

- *Inspect for sediment, trash or other debris that may be blocking the inlet or outlet pipes, as well as the spillway.* Debris and sediment commonly clog detention basins and reduce the basin's overall effectiveness. Additionally, improperly maintained basins can harbor breeding areas for mosquitoes. Any sediment or debris found to be blocking the inlets or outlet structure, even partially, should be removed. Remove accumulated sediment with a shovel and wheelbarrow if it is blocking water flow. Small amounts of removed sediment can be spread evenly on upland areas and seeded. All trash and debris throughout the basin should also be removed.



Outlet structure blocked with sediment and debris

Early spring, fall and after major storms:

- *Inspect the entire basin for debris in early spring, fall, and after major storms.* If necessary, clear large limbs and other debris that may ultimately block the outlet structure. Dead vegetation should be raked out in early spring. If the spillway structure is frequently found to be clogged or partially clogged, debris within the basin area should be cleared on a more frequent basis.
- *Check for standing pools of water, especially in the low flow channel.* Eliminate these as they are found, either by filling in low spots and seeding, or by re-grading the problem area.

Twice a year and after major storms:

- Inspect riprap at the inlet and outlet pipes. Check for erosion around the pipe. Replace riprap when missing or clogged with sediment and debris.

Annually:

- Inspect the inlet pipes and outlet pipe for structural integrity - check inlet/outlet pipes to ensure they aren't crumbling or broken. Do not enter any pipes to complete inspection (such as the outlet pipe under the embankment). Many local contractors have camera equipment that can be used to inspect these pipes.
- Inspect for excess sediment accumulation in the basin - Remove every 5-10 years or when 6-12 inches of sediment has accumulated.
- Inspect any safety-related structures, including fences and gates, for problems or defects. Correct as necessary.

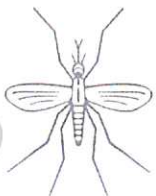
SEDIMENT REMOVAL

Excess silt and sediment can collect over time and reduce the storage capacity of the detention basin. In addition, sediment tends to collect around the outlet structure and may block the outlet. To prevent too much sediment from building up:

- Inspect the basin for sediment accumulation annually
- Remove excess sediment when six inches of sediment has accumulated in the basin, or approximately every 5-10 years.
- If the basin has a forebay, remove sediment when the forebay capacity has been decreased by 50%.

Sediment removal is fairly simple if access is available for the equipment. Front-end loaders or backhoes can be used to remove the accumulated sediment. Sediment removal should be done under the dry weather/dry soil conditions, otherwise, de-watering of the sediments might be necessary. Waste sediments are typically treated as uncontaminated soils and can be used as fill material; however, if soil is contaminated and deemed to be hazardous, it must be disposed of in a hazardous waste landfill.

MANAGING FOR MOSQUITOES



Mosquito problems may occur in detention basins that are not functioning properly and are not maintained. The best control technique is to ensure that stagnant pools of water do not develop. There are a variety of other things you can do to reduce the number of mosquitoes in your environment:

- Install bird houses or bat boxes near the basin.
- Cattails and bulrushes attract dragonflies and other mosquito-eating insects.
- Dense shrubs and brush often provide a habitat for birds and mosquito-eating insects.

BASIN MANAGEMENT

WHAT CAN THE HOMEOWNER DO?

INDIVIDUAL PROPERTY MANAGEMENT WITHIN THE DRAINAGE AREA



There are many steps that property owners can take to ensure that the detention basin functions properly and to minimize long-term maintenance. A number of these activities are described below:

- Do not place yard waste such as leaves, grass clippings or brush in the detention pond, drainage ways, or in the storm drains located in the streets. Yard waste can block basin inlet and outlet pipes. This material also releases excess nutrients as it decomposes. Nutrients, such as nitrogen and phosphorus, are among the most significant pollutants of concern in local lakes and streams.
- Do not dump any materials, such as motor oil, into the storm sewer system. Improperly disposed of materials will pollute the basin. It is also illegal.
- Do not use unapproved or unnecessary amounts of pesticides, herbicides, or fertilizers. These products will wash from the basin into local streams and rivers. In addition, these chemicals can be harmful to the wildlife, such as bees, frogs, toads, fish, and dragonflies.
- If you use fertilizers, test your soil first to find out what nutrients are lacking, and apply only what is needed. Use low-phosphorus, slow-release varieties. Keep fertilizers on the lawn and not on paved areas. Fertilize after and not before a rain storm. Never fertilize when heavy rain is predicted
- Pick up and properly dispose of pet waste.
- Mow high, and avoid mowing directly to the edge of lakes and streams. Sweep grass clippings from sidewalks and curbs and either compost or bag. Do not hose off clippings from driveways and sidewalks into the storm sewer system. Grass clippings can get into the water and add excess nutrients as they break down.
- Educate your neighbors. Share information and management tips with them. If your community has a web site or social media page, post helpful tips on these.

SAMPLE INSPECTION SCHEDULE

Activity	Frequency
Inspect inlet/outlet pipes and spillway for debris, sediment accumulation or other blockages	Monthly and after major storms
Inspect side slopes for barren or eroded areas	Early spring and fall
Inspect/clear pond of debris, tree limbs, dead vegetation, etc.	Early spring, fall, and after major storms
Rip rap inspection, replace as needed	Early spring, fall, and after major storms
Check for standing pools of water, eliminate when found	Early spring, fall, and after major storms
Mowing	At least twice annually
Inspect inlet/outlet pipes for structural integrity	Annually*
Inspect safety-related structures (e.g., fences, gates) for defects	Annually
Inspect Integrity of Dam	Annually*
Inspect for invasive plant species	Annually
Inspect for sediment accumulation	Annually
Clean excess sediment from pond	When 6-12 inches has accumulated, roughly every 5-10 years.

* If indications of failure are observed, immediately seek advice from a professional engineer.

Detention Basin Inspection

5.4

Basin Address and Location: _____

Owner Name and Address: _____

Inspection Date: _____

Inspected By: _____

	Y	N	N/A	Last Maintenance Date
Are inlet/outlet structures free of debris, trash, sediment, and leaves?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

Repairs/Comments: _____

Is rip rap in place and free of sediment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
---	--------------------------	--------------------------	--------------------------	-------

Repairs/Comments: _____

Are embankments and structures free of trees?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
---	--------------------------	--------------------------	--------------------------	-------

Repairs/Comments: _____

Are embankments and structures damaged or eroded?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
---	--------------------------	--------------------------	--------------------------	-------

Repairs/Comments: _____

Is the facility mowed and free of trash?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
--	--------------------------	--------------------------	--------------------------	-------

Repairs/Comments: _____

Is there excess sediment in the basin?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
--	--------------------------	--------------------------	--------------------------	-------

Repairs/Comments: _____

Is the trickle channel damaged by erosion?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
--	--------------------------	--------------------------	--------------------------	-------

Repairs/Comments: _____

Is the out flow of water causing damage to adjacent property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
---	--------------------------	--------------------------	--------------------------	-------

Repairs/Comments: _____

Is there exposed soil with no vegetation growing?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
---	--------------------------	--------------------------	--------------------------	-------

Repairs/Comments: _____

Is the facility draining properly according to as built plans?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
--	--------------------------	--------------------------	--------------------------	-------

Repairs/Comments: _____

5.6

Mike McDonald

From: Mike McDonald
Sent: Wednesday, June 26, 2019 2:43 PM
To: brett@napiereng.com
Subject: Eagles Pond Rain and Wind June 21 2019 to June 23 2019.xlsx
Attachments: Eagles Pond Rain and Wind June 21 2019 to June 23 2019.xlsx

FYI
Mike



Mike McDonald

From: Mike McDonald
Sent: Friday, August 16, 2019 12:37 PM
To: Allan Bush ; Amy D. Kliewer (kliewerad@cdmsmith.com); Angie Morgan (angie.morgan@glmv.com); Barry Smith; Bill Yord P.E. (byord@wrs-rc.com); brett@napiereng.com; Brian Hill PE (bhill@mkec.com); Buchanan, Kimberly; Chuck Staples; Clint Robinson; Cmagaha@leavenworthcounty.org; Curtis Talcott P.E. (ctalcott@ric-consult.com); dave.stokka@usd453.org; David Griffith; David Nolte (david.nolte@ibhc.com); 'dbparke@transystems.com'; Dedeke, Matt; Donald W. Baker P. E. D. WRE CPESC (DBaker@wrs-rc.com); Gene Myracle; greg@lexeco.com; Hal Burdette; HensonJ@bv.com; James Cole (james.cole@hdrinc.com); Jeff Rupp; Jerry Richardson; Joel Mahnken; Joshua L. Erhart (jerhart@dlrgroup.com); Justin Stewart; jwiles@cityofshawnee.org; Katie Schleicher (kschleicher@trekllc.com); Katy Steinbacher; Kayla Manning; Ken Miller; Kevin.gullett@usd453.org; Kyle Kosovich; lauren@lexeco.com; 'lcmadsen@transystems.com'; Manuel Carrera; Mark Wade; Matt Harper (MHarper@wrs-rc.com); Matthew Jones (mjones@libertymo.gov); Melissa Bower; Michael Winckler; Mike (mspickelmier@leavenworthcounty.org); Mike Hooper; Mike McDonald (Home); Mike Smith, Water Resources Solutions; 'patzwald@sbcglobal.net'; Randy Gorton (randall.gorton@ibhc.com); Sara Croke; Sarah Rose Shafer (sarah@sarahrosenhenke.com); Sauer, Andrew N; Severns, Billy; Steve Grant; Tammy Snyder; thomasvmorey@yahoo.com; Tim Guardado; Viktor Hlas; Young, Patrick
Subject: Rainfall at 0300 - August 16 2019

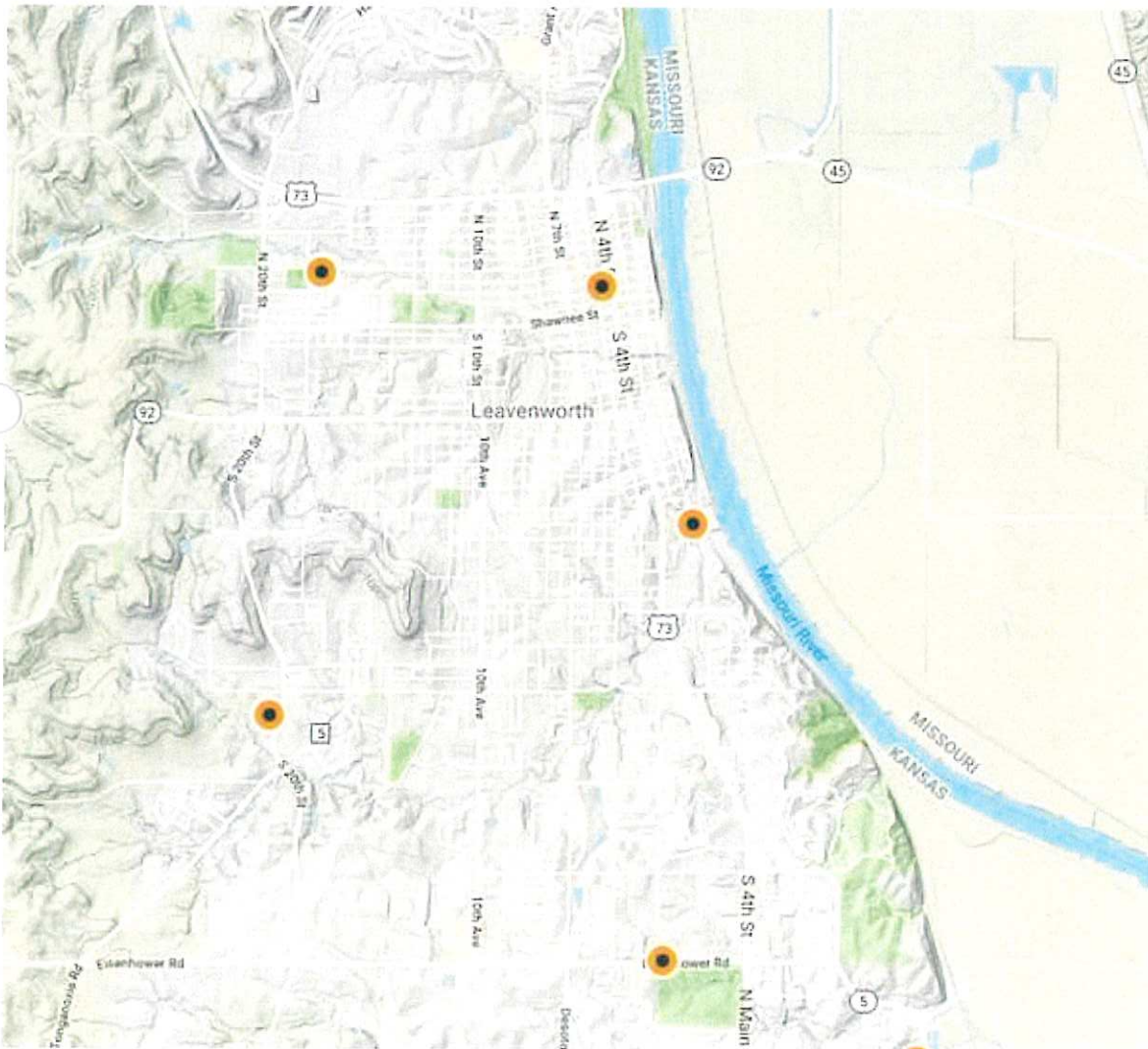
pretty intense rain last night about 0300, but falls short of a 1yr event, other than pretty close at 15 minutes (City Hall) Lansing #5 also picked up close to a 1yr event in both 15min and 30min time periods
 Thought I would put rainfall in a spreadsheet to have ready when the data loggers come back in, and share these interesting variations in the graphs/charts.
 Have a safe weekend
 Mike

City Hall –		Lansing #5	
8/16/2019 3:30	0.05	8/16/2019 3:15	0
8/16/2019 3:35	0.21	8/16/2019 3:30	0.03
8/16/2019 3:40	0.26	8/16/2019 3:45	0.13
8/16/2019 3:45	0.2	8/16/2019 4:00	0.25
8/16/2019 3:50	0.04	8/16/2019 4:15	0.61
8/16/2019 3:55	0.03	8/16/2019 4:30	0.03
8/16/2019 4:00	0.01	8/16/2019 4:45	0
8/16/2019 4:05	0.04	8/16/2019 5:00	0.01
8/16/2019 4:10	0.06		
8/16/2019 4:15	0.06		
8/16/2019 4:20	0.04		
8/16/2019 4:25	0.01		
8/16/2019 4:30	0.02		

City of Leavenworth - NOAA Atlas 14

Rainfall Interval	Recurrence Interval (Years)				
	1	2	5	10	25
5-min:	0.396	0.468	0.589	0.693	0.842
15-min:	0.707	0.836	1.050	1.240	1.500
30-min:	0.995	1.180	1.490	1.760	2.140
60-min:	1.300	1.560	2.000	2.370	2.900
2-hr:	1.610	1.940	2.500	2.980	3.650

note - rainfall in INCHES by period

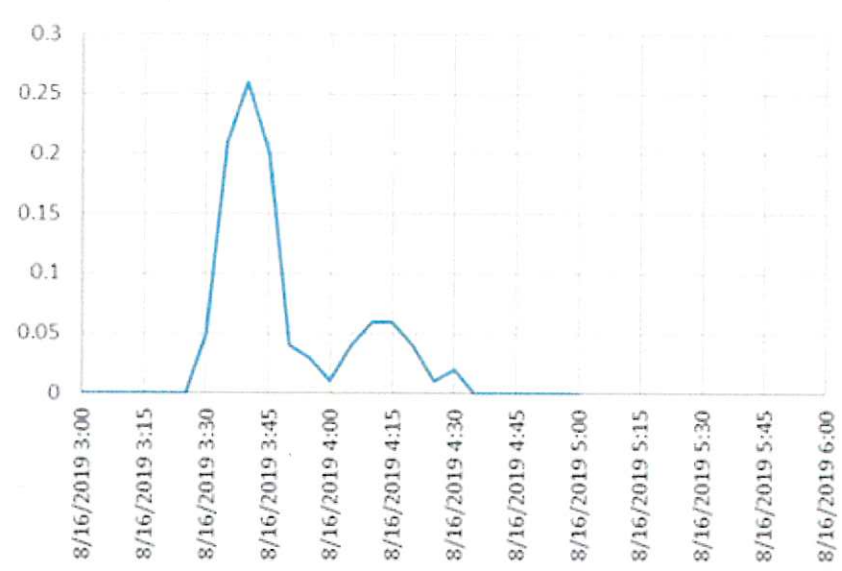


Some variations in rain

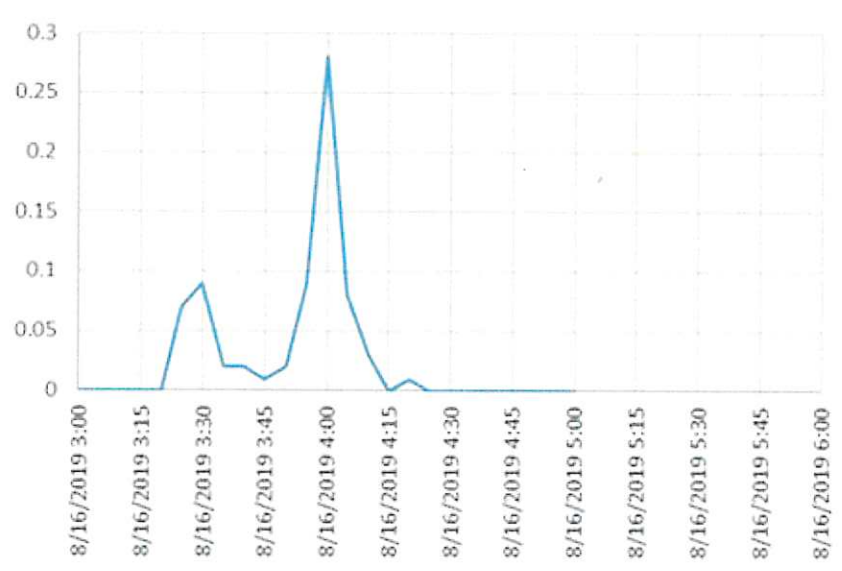
- City hall – NE
- Fire Station 1 – SW
- David Brewer – NW
- WWTP – SE
- Lansing #5 - South

5.6

Leavenworth City Hall (5-Minute)

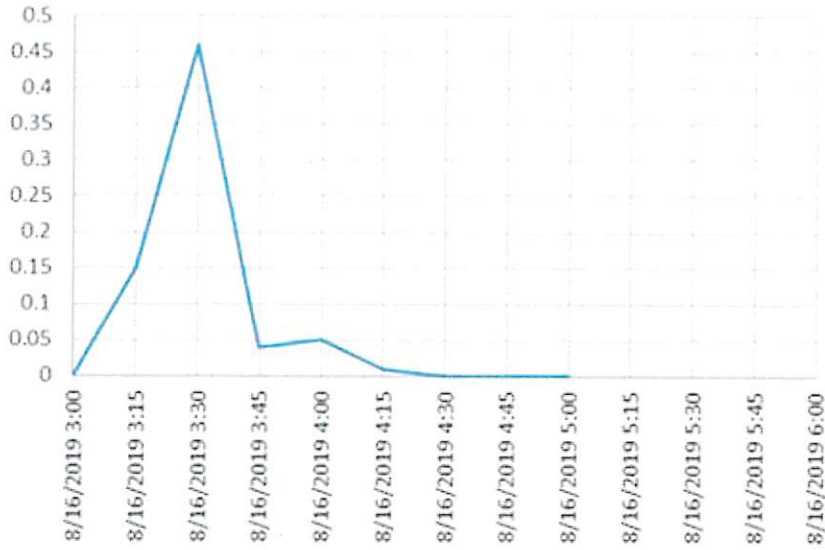


Leavenworth Fire Station 1 (5-Minute)

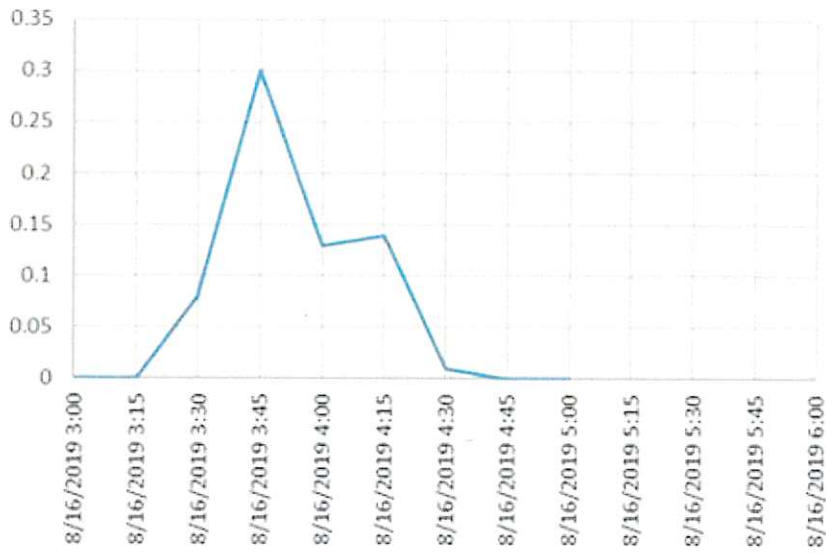


5.6

David Brewer Elementary (15-Minute)

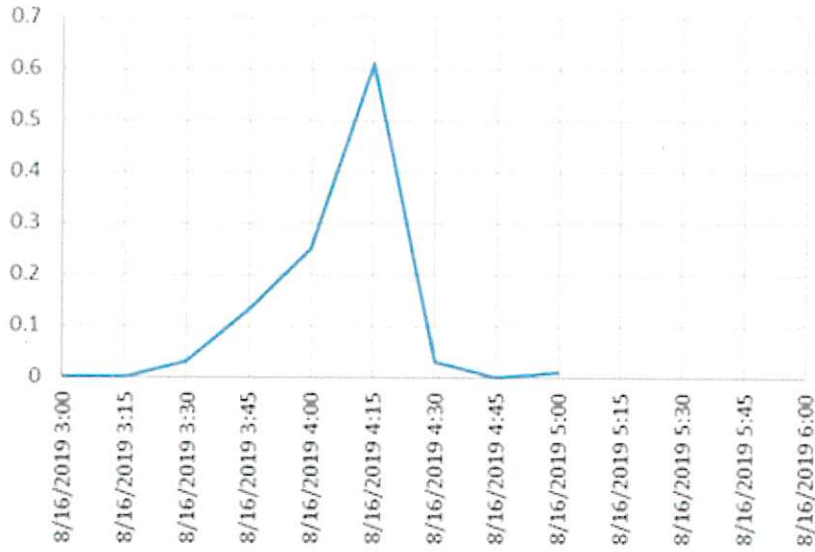


Leavenworth WWTP (15-Minute)



5.6

Lansing KS Station #5 (15-minute)



Michael G. McDonald, PE

Director of Public Works

City of Leavenworth

100 N Fifth Street

Leavenworth, KS 66048

mmcdonald@firstcity.org

713-684-0375

5.6

Mike McDonald

From: Mike McDonald
Sent: Wednesday, May 22, 2019 10:43 PM
To: Joanne Davis (southcounty@aol.com)
Subject: FW: New Member of the Family - 16th Terrace Detention Basin/Pond

From: Mike McDonald
Sent: Wednesday, May 22, 2019 10:35 PM
To: 'Allan Bush'; 'Amy D. Kliewer (kliewerad@cdmsmith.com)'; Barry Smith; 'Bill Yord P.E. (byord@wrs-rc.com)'; 'brett@napiereng.com'; 'Brian Hill PE (bhill@mkec.com)'; 'Buchanan, Kimberly'; Chuck Staples; 'Cmagaha@leavenworthcounty.org'; 'Curtis Talcott P.E. (ctalcott@ric-consult.com)'; 'dave.stokka@usd453.org'; David Griffith; 'Dedeke, Matt'; 'Donald W. Baker P. E. D. WRE CPESC (DBaker@wrs-rc.com)'; 'Gene Myracle'; 'greg@lexeco.com'; Hal Burdette; 'HensonJ@bv.com'; 'James Cole (james.cole@hdrinc.com)'; 'Jeff Rupp'; 'Jerry Richardson'; 'Joel Mahnken'; 'Joshua L. Erhart (jerhart@dlrgroup.com)'; Justin Stewart; 'jwiles@cityofshawnee.org'; 'Katie Schleicher (kschleicher@trekllc.com)'; 'Katy Steinbacher'; 'Ken Miller'; 'Kevin.gullett@usd453.org'; 'Kyle Kosovich'; 'lauren@lexeco.com'; Manuel Carrera; 'Mark Wade'; Melissa Bower; 'Mike (mspickelmier@leavenworthcounty.org)'; Mike Hooper; 'Mike McDonald (Home)'; 'Mike Smith, Water Resources Solutions'; 'patzwald@sbcglobal.net'; 'Randy Gorton (randall.gorton@ibhc.com)'; Sara Croke; 'Sauer, Andrew N'; 'Severns, Billy'; Steve Grant; 'Tammy Snyder'; 'thomasvmorey@yahoo.com'; Tim Guardado; 'Young, Patrick'
Subject: New Member of the Family - 16th Terrace Detention Basin/Pond

Recently completed, long time coming detention basin at north end of 16th Terrace off of Vilas St.

Got the data logger established in the nick of time! Good data!

2.9" shown

5 Minute Data

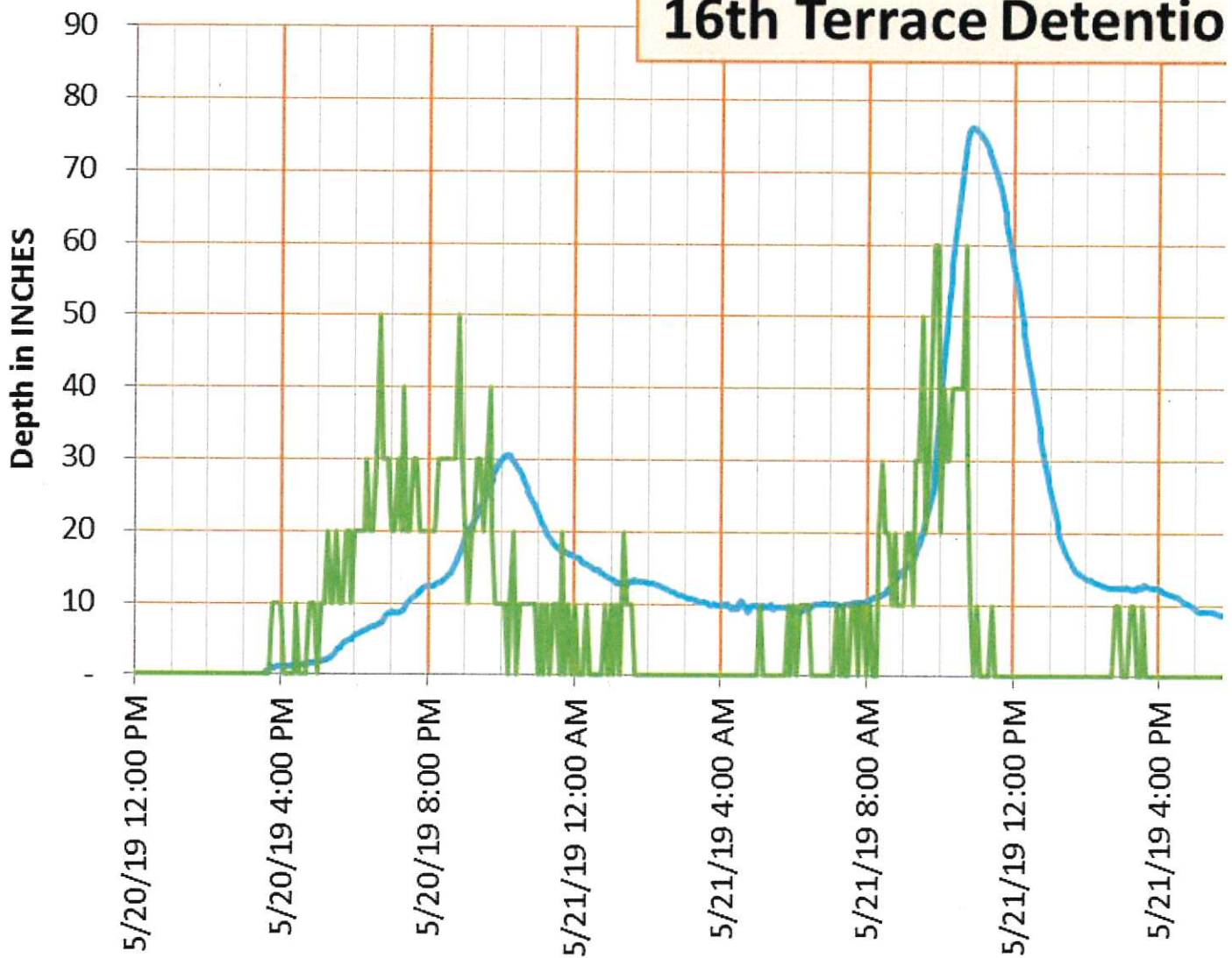
Interested Designer – we will be discussing this for yes/no meeting design expectations

Stay dry

Mike

And data on request!

City of Leavenworth 16th Terrace Detention



5.6

Mike McDonald

From: Mike McDonald
Sent: Tuesday, June 25, 2019 11:21 AM
To: Allan Bush ; Amy D. Kliewer (kliewerad@cdmsmith.com); Barry Smith; Bill Yord P.E. (byord@wrs-rc.com); brett@napiereng.com; Brian Hill PE (bhill@mkec.com); Buchanan, Kimberly; Chuck Staples; Cmagaha@leavenworthcounty.org; Curtis Talcott P.E. (ctalcott@ric-consult.com); dave.stokka@usd453.org; David Griffith; David Nolte (david.nolte@ibhc.com); Dedeke, Matt; Donald W. Baker P. E. D. WRE CPESC (DBaker@wrs-rc.com); Gene Myracle; greg@lexeco.com; Hal Burdette; HensonJ@bv.com; James Cole (james.cole@hdrinc.com); Jeff Rupp; Jerry Richardson; Joel Mahnken; John Spell; Joshua L. Erhart (jerhart@dlrgroup.com); Justin Stewart; jwiles@cityofshawnee.org; Katy Steinbacher; Kayla Manning; Ken Miller; Kevin.gullett@usd453.org; Kyle Kosovich; lauren@lexeco.com; Manuel Carrera; Mark Wade; Matt Harper (MHarper@wrs-rc.com); Matthew Jones (mjones@libertymo.gov); Melissa Bower; Mike (mspickelmier@leavenworthcounty.org); Mike Hooper; Mike McDonald (Home); Mike Smith, Water Resources Solutions; 'patzwald@sbcglobal.net'; Randy Gorton (randall.gorton@ibhc.com); Sara Croke; Sarah Rose Shafer (sarah@sarahrosehenke.com); Sauer, Andrew N; Severns, Billy; Steve Grant; Tammy Snyder; thomasvmorey@yahoo.com; Tim Guardado; Young, Patrick
Subject: 16th Terrace Pond - Real Data!

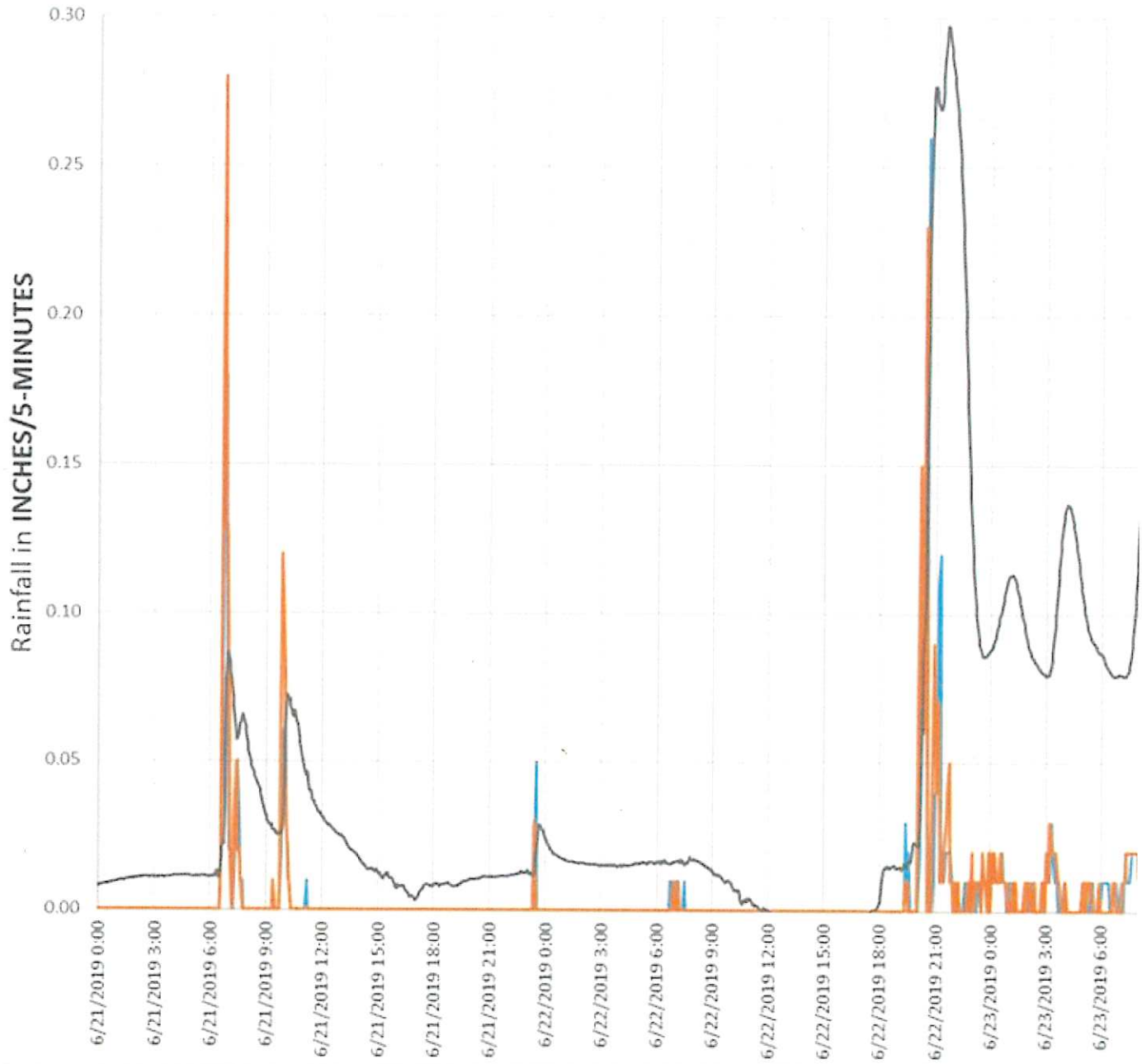
Think we may have solved the problem of kids finding "treasure" and found some of our own.

is so much fun to have real data!

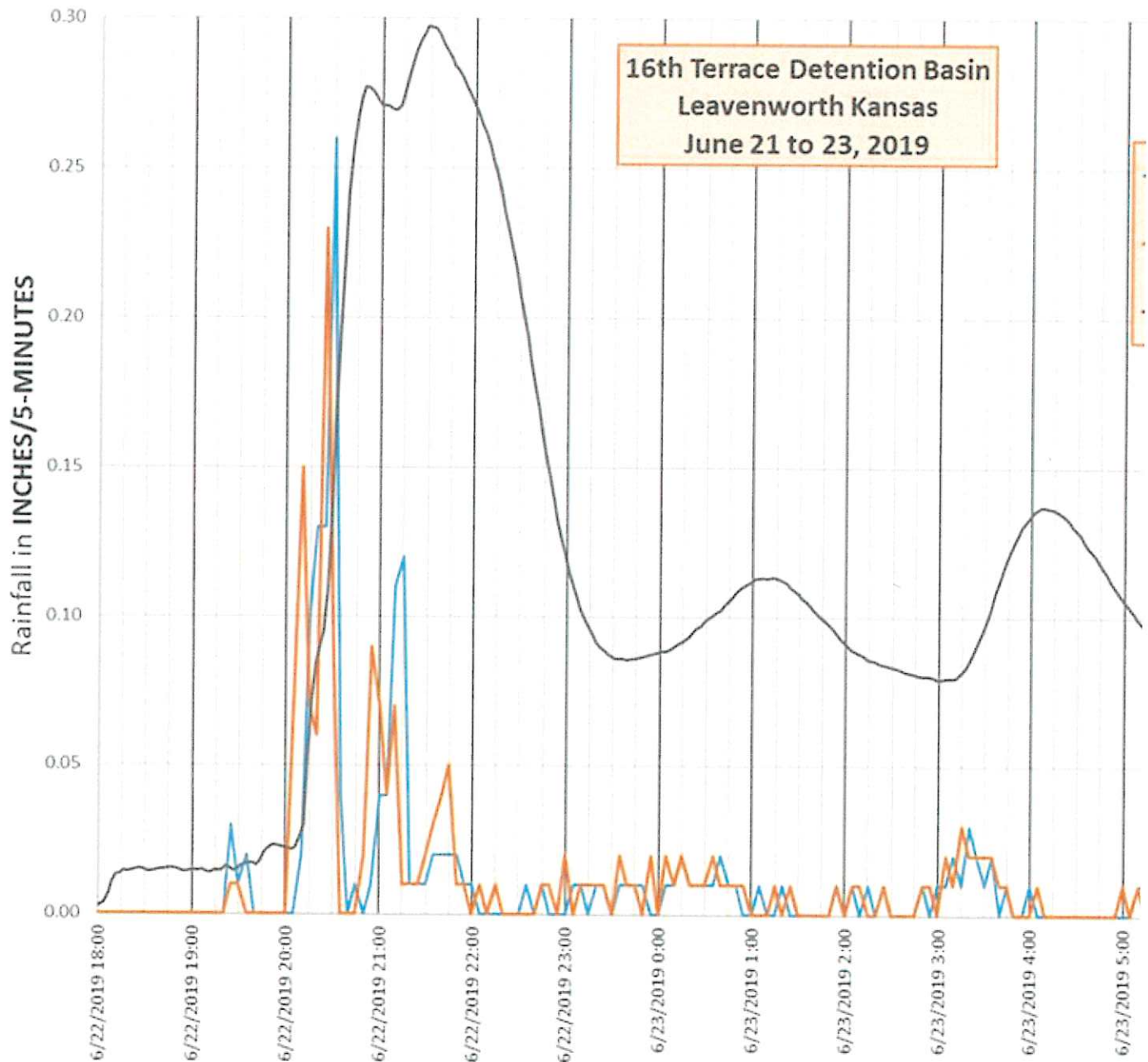
If you need any of this in EXCEL – let me know

- Rain on the 21st was higher intensity than the rain on the 22nd, but look at the depth response
- Appears the difference in the pond status is that rain did not stop on the 22nd – just kept raining!
- And look what it did on the 23rd – very small rainfall cause BIG jump in pond level

Mike



5.6



Michael G. McDonald, PE

Director of Public Works

City of Leavenworth

100 N Fifth Street

Leavenworth, KS 66048

mmcdonald@firstcity.org

913-684-0375

Appendix D (Continued)

Selected Supporting Documentation for Stormwater Management Program (Stormwater Annual Report - Section E) (BMP Number 6)

BMP 6 - Municipal Pollution Prevention/Housekeeping

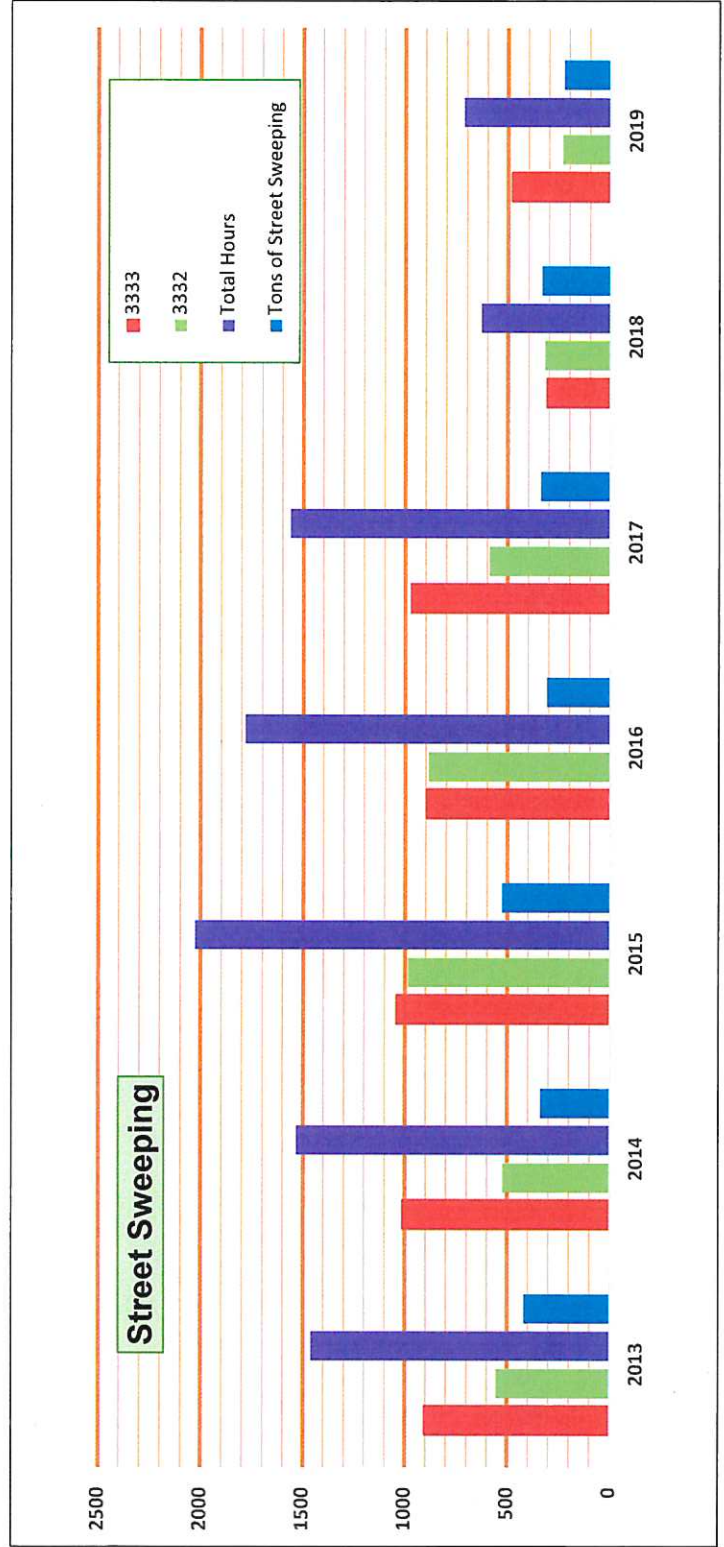
Note: City created stormwater utility fee in 2018 constructing several projects in 2019

- Street Sweeping Information
- Salt Use Summary
- New Lot at 6th & Cherokee with Water Quality Feature

City of Leavenworth - Municipal Service Center

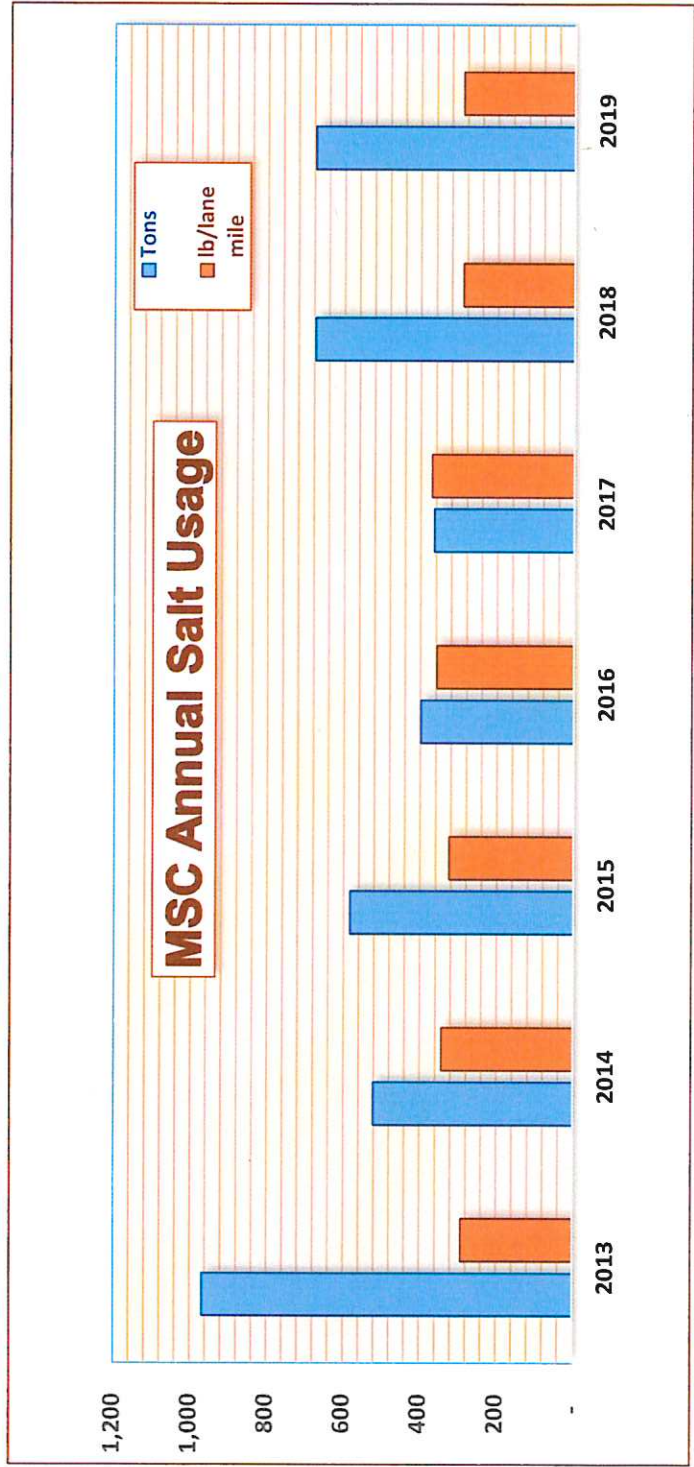
2019 Street Sweeping Data

Street Sweeping			
Year	Hours/Vehicle		Tons
	3333	3332	
2013	907	555	419
2014	1012	522	338
2015	1043	985	525
2016	896	886	308
2017	972	589	338
2018	311	320	334
2019	482.5	232	226

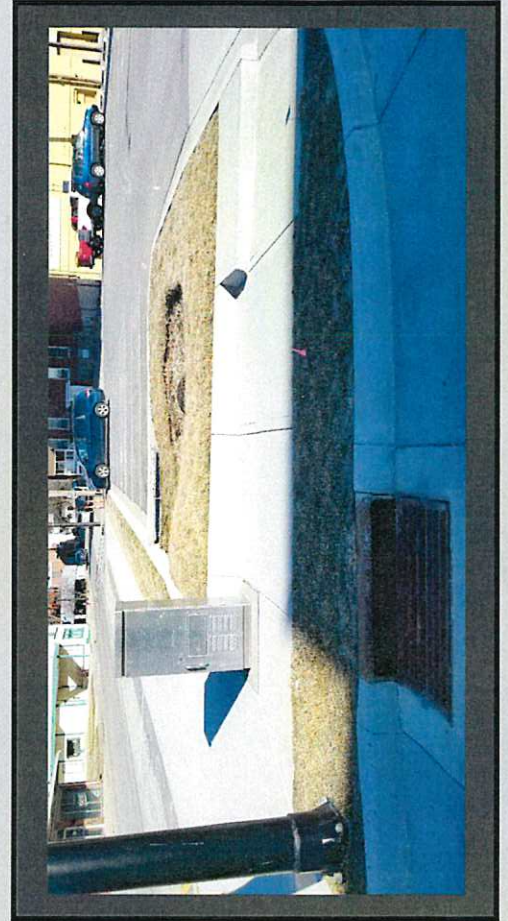


City of Leavenworth - Municipal Service Center (MSC) 2019 Salt Usage Data

Annual Salt Usage		
Year	Tons	lb/lane mile
2013	967	291
2014	520	342
2015	582	323
2016	398	356
2017	364	370
2018	675	289
2019	675	289



New Lot at 6th & Cherokee Showing the Water Quality Feature



6.1

Appendix D (Continued)
Selected Supporting Documentation for
Stormwater Management Program
(Stormwater Annual Report - Section E)
(BMP Number 7)

Sample TMDL

N/A for City of Leavenworth

Appendix E

Map Showing Stormwater System and Outfalls

A DVD containing the current Map of the City showing creeks, streams, inlets, outlets, outfalls and other stormwater-related information in PDF format will be mailed with the annual report to Rance Walker of KDHE on or before February 28, 2020.

GIS Department



City of Leavenworth GIS
Geographic Information Systems

Welcome to the City of Leavenworth GIS Department!

Click here to access the full City GIS Web Application

GIS stands for Geographic Information Systems...

- Geography refers to anything that can be located in physical space, but primarily those features that exist on the earth's surface.
- Information Systems refers to a computer-based technology that stores, retrieves, edits, analyzes and publishes geographic information.

What does the City's GIS contain?

- The City's GIS contains over 80 databases of information about the infrastructure owned by, cared for, or otherwise relates to the City of Leavenworth. That includes addresses, 911 information, buildings, streets, boundaries, properties, zoning, subdivisions, hydrological data about creeks and the Missouri River, asset inventory, utilities like stormwater, sanitary sewer and water features, also topography, census data and much more.
- It also serves many of the City's departments by providing maps and websites for the 911 system, policy and fire dispatch, police and fire vehicles, trash pickup, snow removal, sidewalk planning, sign inventory and more.

The current City mapping can be viewed online by searching for

<https://map.firstcity.org/>



and selecting "Click here to access the full City GIS Web Application" from the results, and following one of the links, or directly accessing the following address:

<https://www.leavenworthks.org/publicworks/page/mapping-gis-division>