

MEETING NOTES
of the
STORMWATER STAKEHOLDER ADVISORY COMMITTEE (SSAC)
Lexington-Fayette Urban County Government (LFUCG)

Meeting: June 7, 2024
Time of Meeting: 9:07 a.m.
Location of Meeting: Phoenix Building – 3rd Floor Conference Room

Attendees:

COMMITTEE MEMBERS

Doug Burton – LFUCG Division of Engineering
Jennifer Carey – LFUCG Division of Environmental Services
Jim Conner – Cane Run Watershed At-Large
Ken Cooke – Friends of Wolf Run
Steve Garland – East Hickman Watershed At-Large
Jim Griggs – Boone Creek Watershed At-Large
Don Hill – Fayette County Neighborhood Council
Amy Sohner – Chair, Bluegrass Greensource
Russ Turpin – Wolf Run Watershed At-Large
Tom Martin – LFUCG Division of Planning (for Jim Duncan)
Jerry Weisenfluh – Kentucky River Watershed Watch

LFUCG STAFF AND REPRESENTATIVES

Denice Bullock – LFUCG Division of Water Quality
Sarah Donaldson – LFUCG Division of Environmental Services
Jason Drew – LFUCG Division of Water Quality
Brian Hayes – LFUCG Division of Engineering
Gabe Hensley – LFUCG Division of Water Quality
Becky Irwin – LFUCG Division of Water Quality
Greg Lubeck – LFUCG Division of Water Quality
Frank Mabson – LFUCG Division of Water Quality
Craig Morgan – LFUCG Division of Water Quality
Jennifer Myatt – LFUCG Division of Environmental Services
Angela Poe – LFUCG Division of Environmental Services
Mark Sanders – LFUCG Division of Water Quality
Abby Terry – Tetra Tech, LFUCG MS4 Program Management
Richard Walker – Tetra Tech, LFUCG MS4 Program Management
Heather Wilson – LFUCG Division of Environmental Services
Bailee Young – LFUCG Division of Water Quality

OTHER ATTENDEES

Eileen Burk – Kentucky American Water
Jerry Davis – Friends of Wolf Run
Andrea Drayer – University of Kentucky, KWRI
Nathan Krebs – Stantec
Lee Moser – University of Kentucky Research Foundation
John Pike – Hickman Creek Conservancy
Steve Vogel – Strand Associates
Jack Wilson – NUSEC
Rachel Patton – Bluegrass Greensource
Wes Morris – BCTC
Scott Southall – ECD/West Hickman

Opening Remarks

Amy Sohner opened the March meeting at 9:07 a.m. and asked those in attendance to introduce themselves and their organization when speaking.

Approval of 3/1/24 Minutes

Ms. Sohner asked if there were any additions or corrections to the March 1st minutes. There were none.

A motion was made by Scott Southall, seconded by Jennifer Carey, and carried unanimously to approve the minutes of the March 1, 2024, meeting.

Wolf Run Watershed-Focused Monitoring Results – Mac Hall and Bert Remley, Third Rock Consultants

Mac Hall and Bert Remley, Third Rock Consultants, presented a PowerPoint presentation on the LFUCG Watershed-Focused Monitoring.

Mr. Hall indicated that the goals of watershed-focus monitoring include:

- Characterize the pollutant load of streams, tributaries, and major outfalls.
- Characterize and rank stream habitat and hydrogeomorphic function.
- Enhance illicit discharge identification in prioritized sub-watersheds.
- Engage volunteers and the scientific community in data collection efforts.
- Lay the foundation for watershed-based plans and TMDL implementation.

He displayed the Watershed Map, noting the location of the Urban Service Boundary adding that sampling occurred primarily within the Urban Service Boundary through this program. He gave a brief description of the Monitoring Schedule for the program noting that Wolf Run was the last section to complete.

Watershed	Screening Year	Monitoring Year	Reporting Year
Cane Run	2016	2017	2018
South Elkhorn Creek	2017	2018	2019
West Hickman Creek	2018	2019	2020
East Hickman Creek	2019	2020	2021
Town Branch	2020	2021	2022
North Elkhorn Creek	2021	2022	2023
Wolf Run	2022	2023	2024

Mr. Hall said that the LFUCG's WFMP consists of five elements:

- Water quality at in-stream sites and major outfalls.
- Stream corridor habitat, substrate, and macroinvertebrate presence.
- Stream biology (macroinvertebrates).
- Neighborhood sources and potential generators in priority upland areas.
- Microbial sources and optical brighteners to trace illicit discharges.

The water quality monitoring consisted of two (2) phases. The first Phase (I) was the screening that included:

- 4 dry weather events (defined as 72 hours with less than a 0.10 of an inch of rain)
- 2 events by trained volunteers/2 events by LFUCG staff
- In-stream (15) and all major outfalls (40) within the Wolf Run watershed
- Stream sites distributed across the watershed
- Target major tributaries
- Determine "flowing" outfalls
- 88 samples collected
- If a field or lab result was above an action limit, an illicit discharge investigation was initiated

Action limits

Parameter	Limit
Conductivity	>1,000 uS/cm
Chlorine	>0.25 mg/L
Temperature	>90°F or >32.2 °C
Ammonia – Nitrogen	>0.5 mg/L
pH	<6 or > 9 SU
Dissolved Oxygen	< 4 mg/L

He presented a series of maps illustrating Phase I water quality sites and described how each group of volunteers would be responsible for collecting water samples at the instream sites or outfalls.

The second Phase (II) was the monitoring that included:

- 10 events, any weather
- May through September 2023, by LFUCG Staff and volunteers
- In-stream (15) and major outfalls with flow during 50% of Phase I screening visits (11)
- Collected 273 water quality samples
- *In situ* measurements: flow (by water depth), conductivity, dissolved oxygen, water temperature, pH, and Chlorine (by field kit)
- Lab parameters: Ammonia – N, Nitrate – N, Total Suspended Solids, Total Phosphorus, Detergents, Fluoride, and *E. coli*

He presented a series of maps illustrating Phase II water quality sites and described the location of the major outfalls (noted in red) and instream sites (noted in blue).

After the data was collected the water quality health grades were created to help implement future BMPs or remediation in the watersheds. He noted that the grades were created based on the Kentucky Division of Water's methods of evaluating data.

Water Quality Health Grades

Established based on the % of time a parameter exceeded the project benchmark.

Parameter	Benchmark	% of Results Exceeding Benchmark				
		A	B	C	D	F
pH (SU)	6-9	0-5%	6-10%	11-25%	26-66%	67-100%
Dissolved Oxygen (mg/L)	4	0-5%	6-10%	11-25%	26-66%	67-100%
Conductivity (uS/cm)	500	0-10%	11-25%	26-50%	51-66%	67-100%
Detergents (mg/L)	0.5	0-10%	11-25%	26-50%	51-66%	67-100%
Chlorine (mg/L)	0.019	0-10%	11-25%	26-50%	51-66%	67-100%
Fluoride (mg/L)	0.5	0-10%	11-25%	26-50%	51-66%	67-100%
Ammonia - Nitrogen (mg/L)	0.5	0-10%	11-25%	26-50%	51-66%	67-100%
Nitrate - Nitrogen (mg/L)	2	0-10%	11-25%	26-50%	51-66%	67-100%
Total Phosphorus (mg/L)	0.5	0-10%	11-25%	26-50%	51-66%	67-100%
Total Suspended Solids (mg/L)	90	0-10%	11-25%	26-50%	51-66%	67-100%
<i>E. coli</i> , PCR (MPN/100 mLs)	240	0-10%	11-20%	21-33%	34-66%	67-100%
<i>E. coli</i> , SCR (MPN/100 mLs)	676	0-10%	11-20%	21-33%	34-66%	67-100%

Mr. Hall indicated that for the Phase II results, they were looking at the percent exceedance for each parameter in the watershed. They applied the water quality health grade to these results, and by doing so they could quickly see what outfalls were regularly discharging pollutants during the sampling events.

Benchmark	6 - 9	4	500	31.7	0.5	0.019	0.5	0.5	2	0.5	80	240	676
Site ID	pH (SU)	Diss. Oxy (mg/L)	Cond. (uS/cm)	Temp (°C)	NH3-N (mg/L)	Chlorine (mg/L)	Fluoride (mg/L)	DTRG (mg/L)	NO3-N (mg/L)	Total Phos. (mg/L)	TSS (mg/L)	PCR E. coli (MPN/100mLs)	SCR E. coli (MPN/100mLs)
50503	0%	15%	92%	0%	0%	46%	0%	8%	0%	23%	0%	38%	23%
50008	9%	0%	45%	0%	9%	27%	0%	9%	82%	0%	0%	64%	64%
50515	0%	18%	91%	0%	9%	73%	0%	0%	0%	45%	0%	55%	18%
50013	0%	0%	86%	0%	0%	57%	0%	0%	64%	0%	0%	93%	79%
50011	8%	31%	46%	0%	8%	38%	15%	0%	62%	23%	0%	77%	77%
50020	0%	14%	71%	0%	29%	93%	50%	0%	14%	29%	0%	21%	21%
50520	0%	17%	67%	0%	0%	33%	0%	17%	17%	0%	0%	100%	100%
50025	0%	8%	85%	0%	8%	69%	8%	0%	15%	0%	0%	92%	69%
50026	0%	0%	82%	0%	9%	18%	0%	9%	9%	9%	9%	91%	82%
50027	0%	13%	75%	0%	0%	38%	0%	0%	25%	0%	0%	100%	88%
50028	0%	8%	85%	0%	0%	54%	0%	0%	0%	8%	0%	46%	31%
WR-1	0%	0%	93%	0%	0%	43%	0%	0%	21%	7%	0%	79%	36%
WR-2	0%	7%	86%	0%	0%	21%	0%	0%	50%	7%	0%	43%	21%
WR-3	0%	14%	79%	0%	0%	50%	0%	0%	29%	21%	0%	79%	57%
WR-4	0%	0%	57%	0%	0%	36%	0%	0%	29%	7%	0%	86%	71%
WR-5	0%	23%	69%	0%	8%	69%	0%	8%	31%	23%	8%	85%	62%
WR-6	0%	7%	71%	0%	0%	14%	0%	0%	43%	29%	0%	93%	64%
WR-7	0%	36%	27%	0%	9%	18%	0%	9%	45%	18%	9%	82%	82%
WR-8	0%	36%	79%	0%	0%	36%	0%	0%	50%	14%	0%	93%	79%
WR-9	0%	8%	54%	0%	0%	38%	0%	0%	100%	31%	0%	54%	31%
WR-11	0%	10%	70%	10%	10%	60%	0%	0%	20%	10%	0%	60%	40%
WR-12	0%	0%	86%	0%	0%	50%	0%	0%	50%	0%	0%	86%	64%
WR-13	0%	0%	86%	0%	7%	43%	0%	0%	79%	14%	0%	79%	71%
WR-14	0%	8%	85%	0%	8%	15%	0%	8%	46%	8%	0%	77%	69%
WR-15	0%	21%	93%	0%	0%	36%	0%	0%	29%	0%	0%	50%	36%

This data helped prioritize the areas for potential BMPs in the future or helps future authors of a watershed-based plan to see what needs to be done in certain areas.

Hall presented a series of maps to illustrate that by applying the water quality health grades with the same color code to each Phase II major outfall, they can isolate areas to inspect for pollution or implement Best Management Practices in the future.

He gave a brief description of comparing the data from the Wolf Run Watershed-Based Plan Sampling in 2013 to the Wolf Run Watershed-Focused Monitoring Program Sampling in 2023. He displayed the following table showing the percent change in average between the 2013 and 2023 data.

Site ID	NH3-N (mg/L)	NO3-N (mg/L)	Total Phos. (mg/L)	TSS (mg/L)	PCR E. coli (MPN/100mLs)
WR-1	-32%	-17%	18%	-83%	-91%
WR-2	-14%	-29%	4%	-65%	-58%
WR-3	-9%	-31%	37%	-63%	-66%
WR-4	127%	1%	-1%	-80%	-2%
WR-5	57%	-24%	42%	-27%	-40%
WR-6	142%	-24%	35%	-35%	274%
WR-7	45%	17%	5%	-17%	255%
WR-8	61%	-7%	50%	-61%	-38%
WR-9	-76%	73%	75%	-73%	-93%
WR-10	778%	-55%	3%	-75%	41%
WR-11	279%	-46%	-32%	-52%	14%
WR-12	163%	18%	90%	-72%	170%

Statistical trends cannot be proven since data was not collected during the time between the 2013 WBP and the 2023 WFMP; therefore, only general conclusions on the results can be made.

Mr. Hall said that they also wanted to look at the change in percent exceedance of each site. Just because there is an increase in average, doesn't necessarily mean that it was going above or below the benchmark, so they wanted to compare the two different methods of looking at the data between the watershed-based plan results versus the Watershed-Focused Monitoring Program. Even though some sites had an increase in average, it's important to see if those increases resulted in more exceedances of the WQ benchmark.

Site ID	pH (SU)	Diss. Oxy (mg/L)	Cond. (uS/cm)	Temp (°C)	NH3-N (mg/L)	NO3-N (mg/L)	Total Phos. (mg/L)	TSS (mg/L)	PCR E. coli (MPN/100 mLs)	SCR E. coli (MPN/100 mLs)
WR-1	0%	0%	29%	0%	0%	-29%	-3%	-20%	-7%	-29%
WR-2	0%	7%	0%	0%	0%	-40%	-3%	0%	-36%	-14%
WR-3	0%	14%	14%	0%	0%	-21%	21%	-20%	0%	0%
WR-4	0%	0%	-7%	0%	0%	-21%	-13%	-20%	0%	7%
WR-5	0%	15%	-9%	0%	8%	-29%	23%	-2%	-1%	19%
WR-6	0%	7%	0%	0%	0%	-17%	29%	0%	21%	-7%
WR-7	0%	27%	-42%	0%	9%	-5%	-2%	9%	-18%	-18%
WR-8	0%	36%	17%	0%	0%	-10%	14%	0%	14%	7%
WR-9	0%	8%	-15%	0%	0%	40%	31%	-20%	-46%	-69%
WR-10	0%	14%	2%	0%	29%	-66%	-1%	-20%	-57%	-36%
WR-11	0%	10%	-3%	10%	10%	-43%	-15%	-13%	-40%	-52%
WR-12	0%	0%	16%	0%	0%	0%	0%	0%	0%	-7%

Mr. Remley indicated that the Stream Corridor Characterization for Wolf Run was divided into 30 half-mile segments 28 of those 30 were able to be evaluated. The vast majority of the characterization was performed by Dr. Westmore's students, and the reaches were characterized by trained volunteers and Third Rock personnel. Remley said that each reach was characterized by stream habitat, substrate, and macroinvertebrate presence.

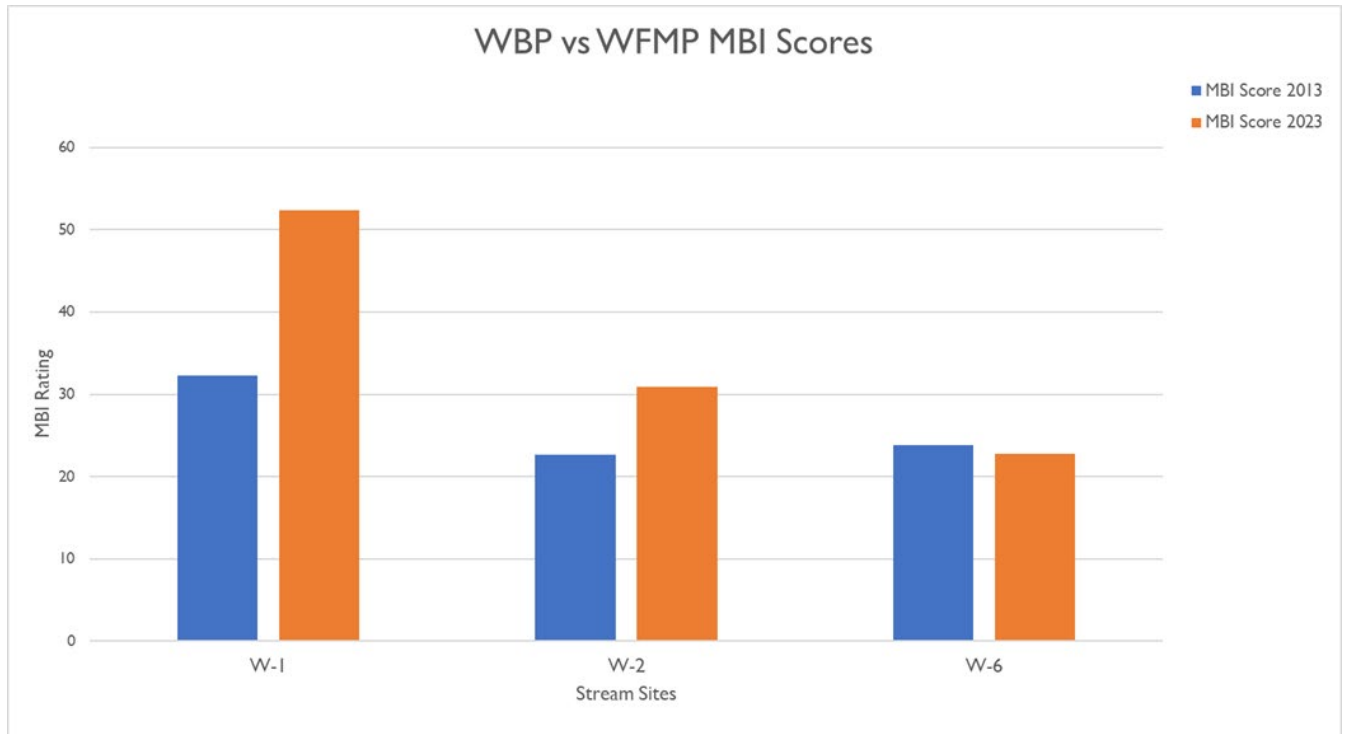
He presented a series of maps illustrating the stream habitat, substrate, and macroinvertebrates, and gave a brief explanation of each.

He explained that under KDOW protocols for stream biology, the Third Rock personnel performed riffle-kick and multi-habitat sampling at all in-stream sites. The Macroinvertebrate Bioassessment Index (MBI) results reflect similar results to the stream characterization results with scores improving from poor to fair as you move downstream.

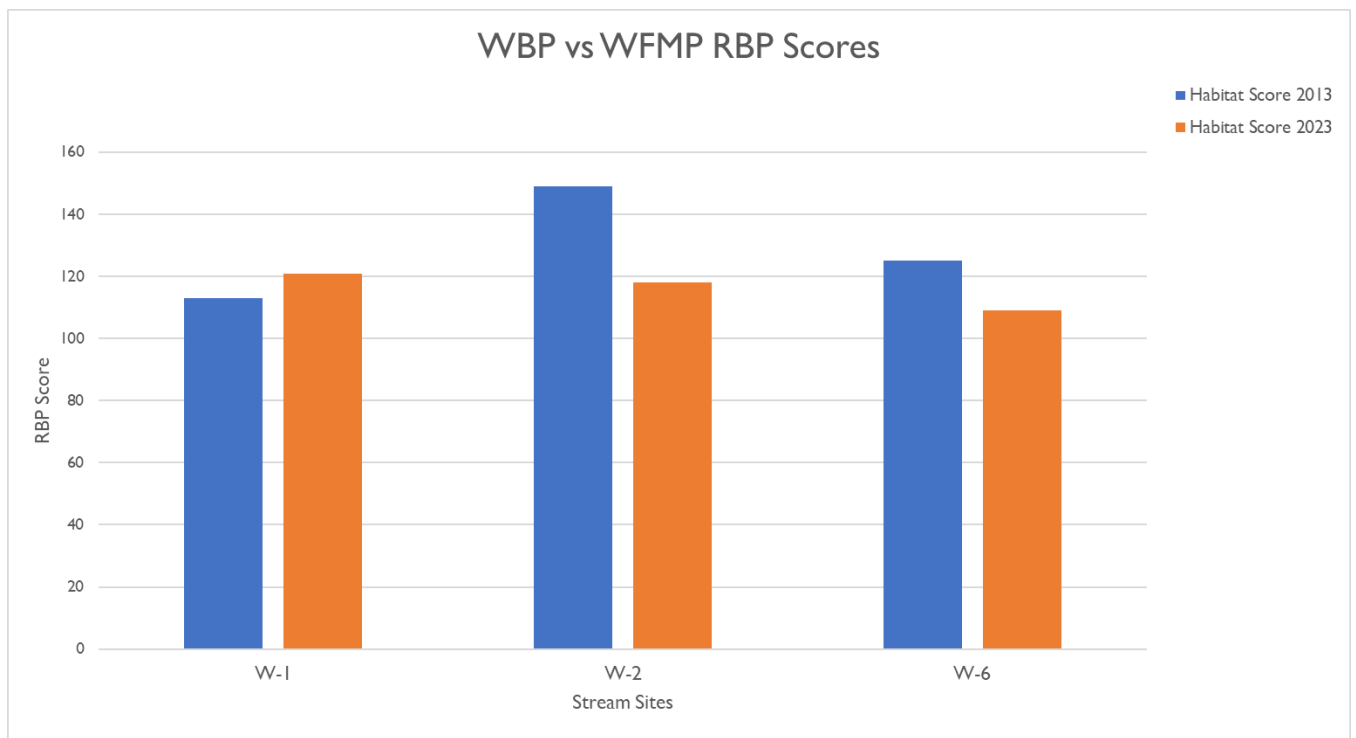
Metric	Site ID					
	WR-1	WR-2	WR-4	WR-6	WR-8	WR-10
Date sampled	5/4/23	3/28/23	5/4/23	3/29/23	3/28/23	3/29/23
Stream Class	W	H	W	H	H	H
Taxa Richness-genus level	31	18	29	16	13	10
EPT Richness-genus level	6	2	3	0	1	0
mHBI	5.44	6.70	5.33	6.38	6.35	7.53
% modified EPT	5.7	16.1	2.3	0	0.35	0
% Mayflies	1.4	0	0	0	0.35	0
% Midges & Worms	10.1	4.0	16.3	28.5	0.35	15.7
% Clingers	55.7	16.8	25.7	10.4	0.35	0
MBI Score	52.4	30.9	41	22.7	24.8	19.1
MBI Rating	Fair	Poor	Fair	Poor	Poor	Poor

He presented an image of the headwater sites noting the location of the poor versus fair sites.

Mr. Remley said that when comparing Wolf Run Watershed-Based Plan Sampling in 2013 to the Wolf Run Watershed-Focused Monitoring Program Sampling in 2023, the first site improved to a "fair" rating in 2023. Increased overall EPT taxa richness and primary clinger abundance contributed to the improved rating.



Slight increases in multiple parameters contributed to a slightly higher habitat score and rating for W-1 (113 v 121; 114 is a break between fair and poor). W-2 declined to poor from fair. Increased sedimentation and embeddedness contributed to this decline.



Mr. Hall said the Upland Visual Assessment is another program element. Based on the water quality results, they visually inspected neighborhoods and industrial areas to identify any potential sources of these pollutants that were being picked up.

The Neighborhood Source Assessment included:

- 6 neighborhoods were visually assessed for indicators of pollution.
- Selected by water quality results.
- Center for Watershed Protection methodologies
- Pollution severity rating results
- Considers housing density, percent and types of impervious cover present, density of driveways/sidewalks, observation of pet waste, downspout discharges, buffers, etc.

The Potential Generator Investigation for Industrial/Commercial/Business areas included:

- Potential generators are sites that may be generating pollutants.
- Selected by water quality results.
- The sites investigated only include sites without a permit.

Hall presented an image of the Upland Visual Assessment results and gave a brief description of the neighborhoods (noted as shaded), and the businesses (noted in green/orange color), that scored high for pollution.

Mr. Hall said that Pine Meadow neighborhood was the only neighborhood assessed that scored a high pollution severity score. This can be attributed to a combination of relatively high levels of lawn maintenance, lawn clippings being left on sidewalks and roads, a higher amount of impervious cover on lots, and observation of long-term car parking. Most of these potential sources of pollutants can be mitigated and easily restored through public service announcements and/or neighborhood campaigns.

Businesses in this area may need to alter their operations to limit the potential for pollutant runoff, in particular, two auto shops. The poor condition of containers holding liquid, car parts stored near drain outlets, and lack of runoff diversion were observed which qualified these two as hotspots. No intentional dumping was observed, but practices could be modified to prevent pollutants from entering the waterway. Perhaps these two businesses could be revisited to check for compliance, or they could be offered assistance in filling out a KPDES discharge permit.

Mr. Hall said there are two parts to the Discharge Prevention Investigation.

The Optical Brightener Survey includes:

- Detects dyes added to laundry detergents
- A simple and inexpensive way to determine wastewater discharges without being present during the “event”
- Indicative of illicit discharge of wastewater
- Sampled 11 outfalls during dry weather periods

The Microbial Source Tracking includes:

- 7 stream sites and 7 outfalls
- Locations of high E. coli and Ammonia
- Differentiates between human and animal sources of bacteria
- Human, bird, dog, cow, and horse

He presented a series of images of the Discharge Prevention Investigation and indicated that even though the Optical Brightener is quick and less expensive than the Microbial Source Tracking, rarely does it produce meaningful results. If the Optical Brightener does pick up on a positive reading, it is influenced by laundry and gray water within the waterway which is a red flag.

The Microbial Source Tracking picked up 8 sites with quantifiable results with bacteria whether it was sewage from human influence or transient, there is a human influence in the outfalls and waterways.

The bird marker is not species-specific, so it can be anything with feathered wings that is contributing to the E coli in the waterways. There are 8 sites with quantifiable bird results, so that usually means significant influence of anything with feathered wings.

The dog markers were placed in common areas like parks or neighborhoods with a high number of dog owners, and those areas indicated positive results at all sites for contributing to E coli in the waterway.

Comments and questions – In response to a question from the audience, Mr. Remley said that the flushing that is involved with strong storms would create an unstable habitat and other water chemistry aspects that would impact the fish more than it would the aquatic insect. As the levels fluctuate from night and day, fish could be killed if there is a bunch of algae in the stream, but it is probably not responsible for the aquatic insect.

In response to a question from the audience, Mr. Hall noted that the outfalls monitored during phase 2 were flowing more than 50% of the time. Mr. Hall noted the outfall drainage areas were not related to where the outfalls are positioned within the watershed, but what the outfall is receiving from the storm sewer system. He noted the areas attributed to the stream sites were from overland drainage.

In response to a question from the audience, Abby Terry noted the Technical Memos for each watershed of the Water-Focused Monitoring program were uploaded to the City of Lexington's website. Ms. Terry noted that <https://www.lexingtonky.gov/stormwater-and-storm-sewer-system> is where information can be found.

Russ Turpin asked how many sampling events had more than an inch of rainfall within 24 hours of the sample collection. Mr. Hall did not have rainfall data on hand, but he indicated that there were a few events around springtime when it was more wet weather sampling than it was during Phase I or at the beginning of Phase II.

Abby Terry asked if the dog microbial source tracking was specific to domesticated pets or if could it pick up on coyotes. Mr. Hall believed it was specific to canine species so it could detect coyotes/foxes.

An attendee asked if the city issues violations for grass clippings or leaks from automobiles or do resident volunteers step in to educate the residents. Mr. Hall did not believe the city issues violations or enforcement for items such as grass clipping left on the street. He said that it is recommended to remove the grass clipping from the street and leave it on the lawn due to the stored nutrients. This will also help save money in applying phosphorus and nitrogen to the lawn as well as prevent them from entering the stormwater system.

Watershed-Focused Monitoring Program – Volunteer Appreciation – LFUCG Staff

Bailee Young, Division of Water Quality, presented a PowerPoint presentation on the LFUCG Watershed-Focused Monitoring and the Volunteer effort that went into the program.

Ms. Young recognized the Volunteers in the audience and said the staff would like to celebrate their hard work over the past 7 years.

She gave a brief overview of the Watershed-Focused Monitoring Program and the Volunteer effort that went into the program.

In 2015, the permit indicated that the LFUCG would submit a monitoring plan and then start implementing the Watershed-Focused Monitoring Plan the following year. There are 7 watersheds within the Urban Service Boundary (USB) and each year, the city staff and volunteers focused on one watershed per year ending with Wolf Run. The goal was to generate data to identify the impairments to the streams within the USB by:

- Characterize stream and corridor habitat
- Determine pollutant loads of streams/tributaries and major outfalls
- Enhance illicit discharge identification
- Engage volunteers and the scientific community in data collection efforts
- Lay the foundation for potential Watershed Based Plan, TMDL implementation, and develop solutions to improve impaired streams

Every spring and fall, the LFUCG invited residents to participate in two sampling events each year. Some volunteers expressed appreciation for the collaborative efforts as well as the ability to see real-time data that allowed them to provide feedback and increase education in the community. This also allowed the city staff to have face-to-face time with resident volunteers.

Ms. Young explained that a news article was published requesting volunteers to help with the sampling event. The goal of the article was to increase the number of volunteers, educate the reader about reducing stormwater runoff, improve water quality, and educate people on water-related issues. She said that it is important and encouraging to see residents get excited about

stream health and water quality. The City of Lexington appreciates the volunteer's efforts in providing the data needed and working with the staff to reach a common goal. The news article also spoke to illicit discharge which allowed Compliance and Monitoring to investigate the causes and identify the illicit discharge. She added that the City of Lexington appreciated Tetra Tech and Third Rock Consultants' involvement in training the volunteers each year of the program.

The Watershed-Focused Monitoring Program Schedule started in 2016 and the volunteers came on board in 2017.

Watershed	Screening Year	Monitoring Year	Reporting Year
Cane Run	2016	2017	2018
South Elkhorn Creek	2017	2018	2019
West Hickman Creek	2018	2019	2020
East Hickman Creek	2019	2020	2021
Town Branch	2020	2021	2022
North Elkhorn Creek	2021	2022	2023
Wolf Run	2022	2023	2024

She presented a series of photographs and said the City of Lexington appreciates the 7 years of effort that the volunteers were involved with and gave a brief overview of the following chart.

Watershed	No. of Samples	No. of IDDE's Detected	No. of Sites	No. of Stream Sites	No. of Outfalls	No. of Volunteers
Cane Run	221	28	28	11	17	24
South Elkhorn	328	31	33	15	18	35
West Hickman	710	79	86	18	68	57
East Hickman	319	31	37	11	26	3
Town Branch	295	36	37	11	26	20
North Elkhorn	310	36	36	11	25	19
Wolf Run	246	25	26	15	11	15
Totals	2429	266	283	92	191	107

She then gave a special thank you to the following organizations, businesses, and city staff who participated in the program.

KRWW

KWRI

Friends of Wolf Run

Cane Run Watershed Council

Hickman Creek Conservancy

Neighbors United for South Elkhorn Creek

University of Kentucky

BCTC

Tetra Tech

Third Rock Consultants

Town Branch Laboratory

Compliance & Monitoring

Division of Environmental Services

MS4 Staff

Jennifer Carey, Director of Environmental Services, said that there was a huge effort that went into making this program. Thinking back to gearing up for the program, it was Steven Evans and Bert Remley who came up with the plan, what the five components would look like, and how to engage the volunteers. She noted that Friends of Wolf Run and Kentucky River Watershed Watch supported the program.

After receiving approval from the state, the next step was determining how to implement the program. The goals of the staff were to make the volunteer time as seamless as possible, provide a good experience collecting the data, ensure the instruments worked, answer any questions they may have had; make sure they knew where the sampling site was located, and hopefully, they would want to return to help through all 7 watersheds. There was a countless amount of effort from the Town Branch Laboratory, Compliance and Monitoring, and the MS4 to make sure the program went off without a hitch. She said that the

Town Branch Laboratory staff was amazing and accommodating to the volunteers. They made sure the instrumentation was calibrated, and in addition to their workload for the wastewater treatment plants, they processed all the samples that were collected during each sampling event.

Cane Run was the first watershed where samples were collected strictly by volunteers. She said that the former Compliance and Monitoring manager came up with the idea of how to collaborate the staff involvement with the volunteers. By involving the staff there was more trust as to how the samples were collected and a more understanding of how the results would be used for illicit discharge investigations. The staff teaming up with the volunteers was a success for this program.

A lot of thought went into the schedule itself. The staff started with Cane Run because it was one of the smaller watersheds within the Urban Service Boundary then larger watersheds were added to the schedule. The timing of the schedule was well thought out because there was already an interest in the State to add a Watershed-Based Plan. The Watershed-Based Plan was originally developed for the North Farm, a part of the University of Kentucky's extended campus. The state wanted to extend the Watershed-Based Plan to include the Cane Run Watershed. The Watershed-Focused Monitoring Program picked up the area of Cane Run within the Urban Service Area. This involved several UK professors from the College of Agriculture because they were keenly interested in seeing the data collected. Wolf Run Watershed was saved for last so the data from the approved Watershed-Based Plan could be compared to current data being collected. The staff wanted to do a watershed-based plan for West Hickman Creek but needed to grow interest in the area. The Watershed Council for West Hickman Creek was established which eventually became Hickman Creek Conservancy. The Hickman Creek Conservancy was a group of volunteers that were able to engage with West Hickman Creek in 2019. During 2020, no volunteers were helping with the sampling.

Ms. Carey thanked the volunteers and said the staff hopes that everyone who is here today had a great experience in the Watershed-Focused Monitoring Program.

UK CUP Stormwater Harvesting Project – Britney Ragland, University of Kentucky

Britney Ragland, University of Kentucky, presented a PowerPoint presentation on the UK CUP Stormwater Harvesting Project.

She said that the staff is learning and growing from this ongoing project and are looking forward to what they can do in the future.

She introduced some of the key players with this project.

Name	Title	Role
Graham Gray	Executive Director - Utilities	Leadership and technical support
Britney Ragland	Associate Director - Utilities	Principal Investigator (PI) for Grant, Engineering Support
Carter Whitton	Engineering Support - Utilities	Operational Oversight
Shane Tedder	Sustainability Coordinator - UK Facilities Management	Alignment of project design with campus sustainability strategic priorities; Co-PI
Kevin Lewis	UK Water Quality Compliance Manager, UK's Environmental Management Department	Regulatory support, monitoring of stormwater BMPs
Bell Engineering	Consulting Engineers	Design, Technical assistance as needed
Jennifer Bowski	UK Chemical engineering, student	
Karen Keener	UK Civil Engineering, student	

The presentation outline include:

- Proposal Summary
- Background and Context
- Timeline
- How It Works
- Photos
- Outreach & Education
- Lessons Learned

Ms. Ragland presented an image of the University of Kentucky campus and pointed out the project area and the surrounding uses.

She indicated that this project was partly funded through the LFUCG Stormwater Quality Projects Incentive Grant Program and is expected to improve the quality and decrease the quantity of stormwater flowing to Wolf Run Creek. This project will harvest stormwater for use in the University of Kentucky's Cooling Towers at Central Utility Plant #4 (CUP). This will be accomplished by installing a water harvesting system to remove, filter, and transfer the stormwater to cooling towers for evaporation. There will also be positive educational benefits and the project will be formally connected with the University's outreach and public education efforts through the Stormwater Quality Plan.

She presented an image of the UK CUP Stormwater Harvesting Project and gave a brief description of the site.

- There is a 200-acre campus watershed that drains to Wolf Run via the Simpson Avenue outfall point through an 8' x 8' partially exposed box culvert.
- This area of the campus is intensely developed and more than 50% of the watershed is covered with impervious surfaces.
- The cooling towers in Central Utility Plant #4 consume over 45,000,000 gallons of water per year as of FY21. This plant is adjacent to the Simpson Avenue outfall point.
- The University conducted a feasibility study and found that the flow in this stormwater conduit ranged from 56,000 gallons to 15,500,000 gallons per day between May and October of 2017.
- The University may potentially divert 23,000,000 gallons/year from Wolf Run, assuming a harvesting efficiency of 25% of available flow (170 million gallons).
- Savings for water costs are expected to be \$139,000, and sanitary sewer costs are \$65,000, for a total of \$204,000 in savings annually.

She spoke to the following timeline for the project.

- 2017 – Study performed; design concept & budget developed
- July 2018 – The project applied for the grant
- July 2019 – The project re-applied for the grant
- October 2019 - WQFB requested a presentation for clarification and an award was made shortly thereafter.
- March 2020 – COVID19 impacts regular operations
- September 2020 – Approved Grant Award Agreement delivered to UK
- Summer 2021 – Completion of project plans by Bell Engineering
- November 2021 – Quotes for project construction obtained at \$650k; project placed on hold for evaluation
- April 2022 – Project issued for bid in parallel with the request for additional funding from LFUCG (\$360k at 50/50 match)
- May 2022 – Bid awarded for Construction
- August 2022 – Site mobilization and construction begins
- Spring 2023 – Substantial completion and soft startup after significant supply chain delays
- Fall 2023 – Full startup of system with ongoing tuning

She presented aerial views/project photographs and explained each of the slides.

University of Kentucky's Cooling Towers at Central Utility Plant #4 (CUP)

1. Storm Culvert to Wolf Run
2. Grit Storage Sump
3. Wet Well and Pump Station
4. Filters and Meter Vault
5. Cooling Towers for Evaporation Cooling

Ms. Ragland presented a series of slides and gave a brief description.

What's Going Well

- 2 million gallons harvested & \$30k savings in first 3 months
- No negative impact to chiller condenser tubes
- Education and outreach opportunities

What We're Learning

- Finding the right filtration
- Chemical treatment enhancements
- Bulk water storage would be a benefit
- System tuning ongoing

Ms. Ragland said that once the kinks are worked out the University of Kentucky is considering adding another plant on the North End of Campus near the Taylor Dicky area. This site has the potential to use an existing clean tank that is already in the ground to store more water. The great thing about the second plant some of the parameters could be changed or added sensors to know the differential pressure is across those filters. This would allow the staff to see if the filters are clogging up, versus waiting for the pumps to slow down.

Ms. Ragland said that they are grateful for the opportunity to do this project and look forward to seeing where the University of Kentucky can go with it in the future.

Comments and questions – In response to a question, Ms. Ragland said we are hoping for a 3-year payback but even if it is 5 or 7 years they would be thrilled. She then said because of the cooling towers most of the water is evaporated into the atmosphere. She explained that as the water evaporates concentrated sediment is left that needs to be blown down into the sanitary system which is metered.

Bert Remley asked what the conductivity levels are and how often the coarse filters are changed. Carter Whitton noted the conductivity levels will vary but the cooling tower is set to blow down when it reaches 1,600. As for the filters, getting water is not the problem, but tuning has all been filtration related. He explained that after heavy rain, debris on the roads can enter the system causing the system to become sluggish making the system run constantly. This would result in a low-flow alarm going off which meant the filters were clogged. During dry weather, the filters are changed every couple of weeks but during heavy rain, it is more frequent.

Russ Turpin said the watershed is part of a smaller tributary, not a large creek system, so when there is heavy rainfall it's a lot of water but then there are dry periods. He asked if keeping a minimum flow rate in the creek may be beneficial to the system. Carter Whitton replied the creek is free flowing, but once the level reaches the 8 ½ mark in the wet well which is the same water level in the storm culvert, the pumps shut off. Ms. Ragland said that there is a significant amount of water running through the pump system and no danger of the system becoming dry unless it is a very dry season.

Jason Drew asked where the original idea came from and if a backflow could be used to clean the filters like other filtration systems. Ms. Ragland explained that throughout the years, there were several University of Kentucky employees who engaged and contributed to this idea which snowballed into this project. As for the different methods of filtration, all are great ideas to explore to continuously keep the project running.

In response to a question, Ms. Ragland said that there is not enough stormwater capability based on their system, so some domestic water is being used. The mixing of the two is advantageous for the blow-down and the cycles of concentration but there are days where there is a lot of water being used.

Amy Clark said that there is a lot of stormwater in the Simpson area and asked when there is a storm event if there is any beneficial impact on the downstream area or if it causes more sediment. Ms. Ragland said that looking at the downstream impact would be another area to review. She said that there is some sediment entering the system that would normally go through the stream.

Amy Clark asked if the pipes installed along the culvert channel to the facility were in the railroad right-of-way or on the University of Kentucky property. Ms. Ragland replied that they did not disturb the railroad property. They did need authorization from Columbia Gas for the University of Kentucky pipeline to cross the Columbia Gas pipeline as well as to contact Kentucky Utilities due to some significant transmission overhead that feeds into the substation.

Russ Turpin said the University of Kentucky is reducing its consumption or purchase of 2 million gallons and asked how Kentucky American Water Company is handling the news. Ms. Ragland noted she was unaware if they knew about the reduced water usage.

An attendee asked if Transylvania or the other hospitals in the area could benefit from a project like this. Ms. Ragland indicated that she was not sure if those facilities were aware of the project but noted the information could be given out. Anyone using an industrial cooling system could benefit from the case study information.

Russ Turpin asked if the University of Kentucky has spoken to Lexmark about their rainwater harvesting. Ms. Ragland replied that there are some similarities and some differences, but they have not contacted them since the original site tour.

Ms. Ragland said that they would be in contact with Water Quality for a site visit and added that anyone who wants to visit the site to contact the staff.

Potential Topics for the Next Meeting

Ms. Young asked for any suggestions for potential topics for the next meeting. The following items were suggested by the audience.

- Political actions that the City of Lexington could take once a problem has been identified and what the next steps would be for remediation.
- Conversations should be had about volunteer involvement with the continuation of water monitoring.

Ms. Young mentioned that the proposed monitoring plan is being developed and should be ready to present to the Committee at the September SSAC meeting.

Announcements

- June 8th – Truck-a-Palooza
- June 15th – River Sweep – Kelley’s Landing Park at 8:30 AM.
- July 10th – 12th – Kentucky Stormwater Association 2024 Annual Conference in Owensboro, KY
- July 25th – Water Quality Fees Board Special Meeting at 9 AM.
- July 26th – FY25 Class B Infrastructure Stormwater Quality Projects Incentive Grants application deadline is 4 PM, Friday.
- September 8th – 11th – KY/TN Water Professionals Conference
- September 13th – Art by Nature Deadline to Submit
- October 18th – Art by Nature gallery opens

Adjournment

The meeting concluded at 11:00 a.m.