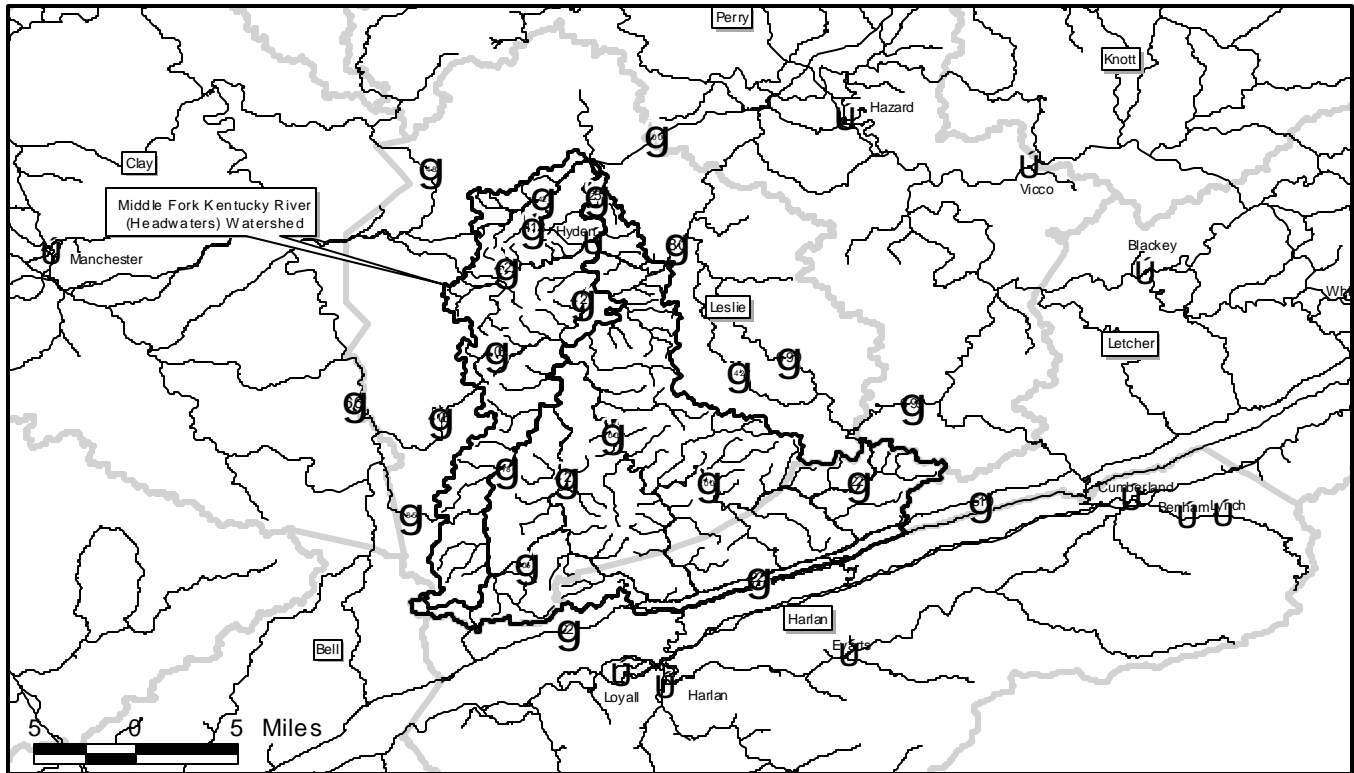


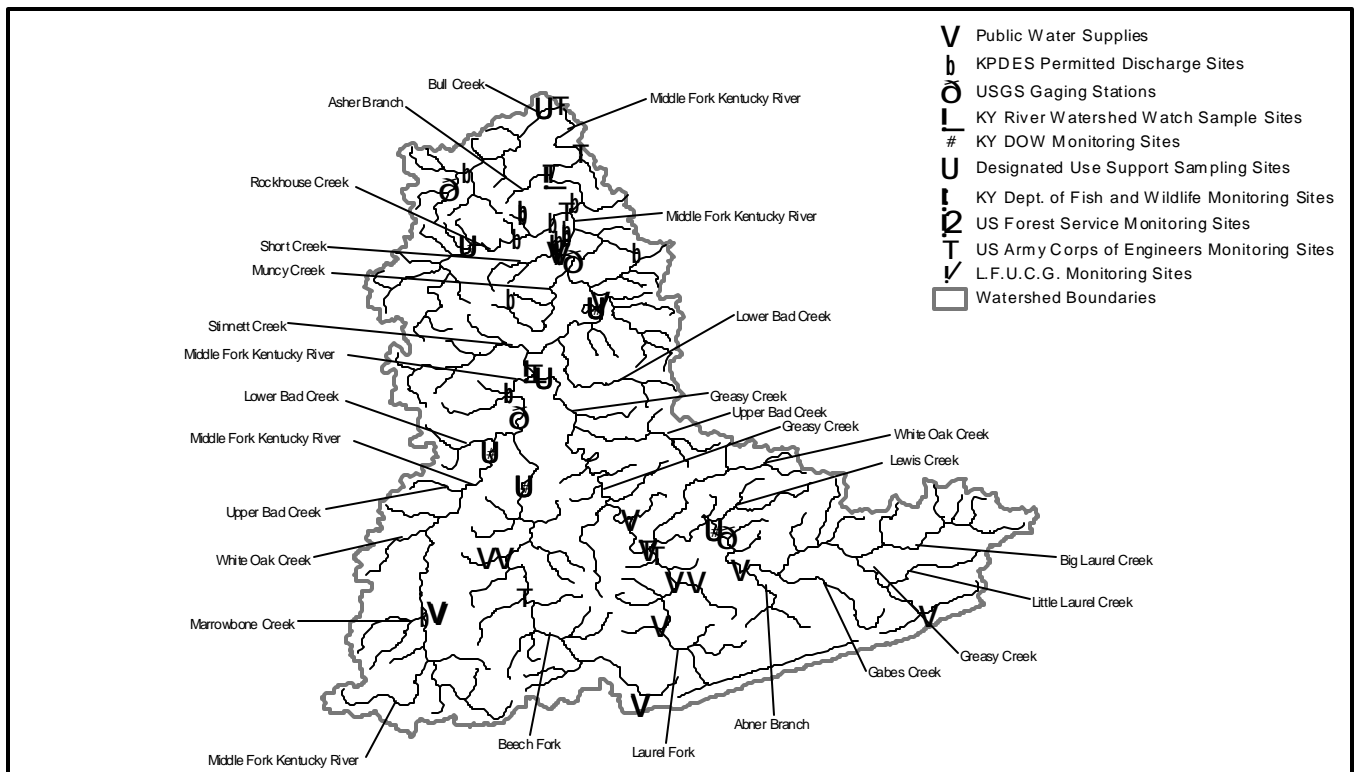
Middle Fork Kentucky River (Headwaters) Watershed

Watershed Number: 05100202010

Location Map



Watershed Features



Geography. The Middle Fork Kentucky River (headwaters) watershed occupies much of central Leslie County and the northern edge of Harlan County. The land is in the Eastern Kentucky Coal Field physiographic region, characterized by mountainous terrain, rapid surface runoff, and moderate rates of groundwater drainage. The watershed is underlain by coals, sandstones, and shales: this geology is generally conducive to productive wells, although water quality may be low for wells that draw from coal layers.

Waterways. The Middle Fork Kentucky River (headwaters) watershed includes the Middle Fork up to its confluence with Cutshin Creek at Dryhill (near the Boone Parkway). Among the other creeks that feed the river in this watershed are Greasy Creek, Beech Fork, Stinnett Creek, Rockhouse Creek, and Bull Creek.

Land and water use. Land in the watershed is rural and wooded. The surface waters of the watershed supply the drinking water for the Green Hills and Hyden Leslie County Water Districts. Nineteen businesses and organizations hold permits for discharges into the creeks. See tables for details.

Agency data assessment. The assessed creek segments in this watershed fully support their designated uses, based on biological and/or water-quality data. One segment of Greasy Creek is designated as threatened. See tables for details.

Watershed rankings. The ranking formula provides a preliminary ranking by synthesizing a broad spectrum of watershed characteristics, current conditions, and threats. This watershed ranks in the group with the highest need for protection and/or restoration. This rating is for the watershed on average: particular sites and particular waters within the watershed may vary widely. See tables for details.

Volunteer data. Data show high levels of bacteria (above 200 colonies/ml) indicative of fecal contamination at one of two sites sampled in 1999. Data also show elevated sulfate and chromium at one site and elevated antimony, chromium, selenium, and thallium at the other. See tables for details.

This report was prepared by the Kentucky Water Research Institute as a product of the statewide Kentucky Watershed Management process. Information presented in this report was collected from many sources. Reasonable attempts were made to ensure that information and figures are as accurate as possible, but no representation or guarantee is made as to either the correctness or suitability of information for particular purposes. All critical information should be independently verified. Please address questions or corrections to Basin Coordinator, KWRI, Rm. 233 Mining and Minerals Resources Building, University of Kentucky, Lexington, Kentucky 40506-0107.

Summary of Basin Characteristics and Facilities

General Land-use Characteristics:

<i>Total Land Area (Acres):</i>	<input type="text" value="155,689"/>	<i>Acres</i>	<i>% of Total</i>		
<i>Residential Area:</i>	<input type="text" value="35"/>		<input type="text" value="0.0"/>	<i>Number of Mine Permits:</i>	<input type="text" value="118"/>
<i>Commercial Area:</i>	<input type="text" value="61"/>		<input type="text" value="0.0"/>	<i>Total Permitted Mining Area (Acres):</i>	<input type="text" value="6,308"/>
<i>Industrial Area:</i>	<input type="text" value="25"/>		<input type="text" value="0.0"/>	<i>Number of Identified Wetland Areas:</i>	<input type="text" value="1"/>
<i>Agricultural Area:</i>	<input type="text" value="0"/>		<input type="text" value="0.0"/>	<i>Total Wetland Area (Acres):</i>	<input type="text" value="2"/>
<i>Rural and Wooded Area:</i>	<input type="text" value="149,476"/>		<input type="text" value="96.2"/>		
<i>Other Land-use Area:</i>	<input type="text" value="5,800"/>		<input type="text" value="3.7"/>		

Withdrawal and Discharge Sites:

<i>Number of Public Water Supplies and Water Withdrawal Sites:</i>	<input type="text" value="16"/>	<i>Number of KPDES Discharge Permits:</i>	<input type="text" value="19"/>
<i>Surface Water Withdrawals:</i>	<input type="text" value="14"/>		
<i>Groundwater Withdrawals:</i>	<input type="text" value="2"/>		
<i>No. of Potable Water Treatment Facilities:</i>	<input type="text" value="4"/>		

Sampling Site Statistics:

<i>Number of USGS Gaging Stations:</i>	<input type="text" value="1"/>
<i>Number of Kentucky Division of Water Sampling Sites:</i>	<input type="text" value="5"/>
<i>Number of Kentucky Dept. of Fish and Wildlife Sampling Sites:</i>	<input type="text" value="0"/>
<i>Number of US Forest Service Sampling Sites:</i>	<input type="text" value="0"/>
<i>Number of US Army Corps of Engineers Sampling Sites:</i>	<input type="text" value="8"/>
<i>Number of Kentucky River Watershed Watch Sampling Sites:</i>	<input type="text" value="2"/>
<i>Number of Lexington-Fayette Urban Co. Gov. Sampling Sites:</i>	<input type="text" value="0"/>

Watershed Indicators and Ranking Categories:

Overall Watershed Ranking:

Protection Ranking	Observed Impacts	Potential Impacts	Restoration Ranking
High	Medium	High	Medium

High

Protection Categories:

Indicator	Value	Units	Range of All Watersheds	Mean of All Watersheds
Wetland Areas	2	Acres	0 - 106	12
Surface Drinking Water Sources	14	No. of sources	0 - 14	2
Ground Drinking Water Sources	2	No. of sources	0 - 17	1
Groundwater Sensitivity	3.02	Score	2 - 5	3.21
KY Dept. of Fish and Wildlife Management Areas	685	Acres	0 - 2951	93
U.S. Forest Service Management Areas	155,253	Acres	0 - 155253	12,600
Kentucky State Park Areas	0	Acres	0 - 1928	42
Nature Preserves Commission Areas	0	Acres	0 - 1430	32
Nature Conservancy Areas	94	Acres	0 - 2473	28
Reference Reach Watersheds	0.00	Score	0 - 100	3.08
Outstanding Resource Watersheds	0.00	Score	0 - 0	0.00
Recognized Stream Resources	2	No. of resources	0 - 8	1
Kentucky Rivers Assessment Scores	1.01	Score	0 - 11	1.80

Observed Impact Categories:

Human Health Impact Categories:

Indicator	Value	Units	Range of All Watersheds	Mean of All Watersheds
Flood Declarations	7	Number since 1970	0 - 10	4
Water Supply Inadequacy	1.00	Score	0 - 2	0.22
Observed Impacts to Surface Drinking Water	1.00	Score	1 - 1	1.00
Observed Impacts to Fish Consumption	1.00	Score	1 - 1	1.00
Observed Impacts to Primary Water Contact	1.00	Score	1 - 3	1.33
Contamination Sites Impacting Human Health	2	Number of sites	0 - 71	4

Ecological Health Impact Categories:

Indicator	Value	Units	Range of All Watersheds	Mean of All Watersheds
Observed Impacts to Aquatic Life	1.00	Score	1 - 3	1.31
Contamination Sites Impacting Ecological Health	2	Number of sites	0 - 71	4

Potential Impact Categories:

Indicator	Value	Units	Range of All Watersheds	Mean of All Watersheds
Potential Contamination Sites	28	Number of sites	1 - 121	12
Potential Pesticide Loading	0	Est. sales in tons	0 - 45	10
Potential Fertilizer Loading	7	Est. tons applied	0 - 2747	394
Agricultural Erosion Potential	7.74	Est. tons erosion / acre	0 - 9	3.20
Livestock Operations Potential Impact	661	Animal units	55 - 43826	7,021
KPDES Discharge Violations	132	Number of violations	0 - 541	39
KY Division of Water Citizen Complaints	22	Number of complaints	0 - 53	9
Toxic Release Inventory	0	Score	0 - 11547626	231,638
Population Change Projection	77	Number of persons	-149 - 11030	448
Population Not on Public Sewer Systems	2,345	Number of persons	12 - 4511	1,114
Mining Area	6,305	Acres	0 - 6305	355
Surface Water Runoff Potential	60.57	SCS Curve Number	60 - 79	68
KPDES Permitted Discharges	19	Number of sites	0 - 56	6

Stream and Waterbody Use Support Summary

Total Stream Miles:						
<input type="text" value="329.49"/>	<i>Number of Segments</i>	<i>Stream Miles Assessed</i>	<i>Miles * Fully Supportina</i>	<i>Miles * Partially Supportina</i>	<i>Miles * Not Supportina</i>	<i>Miles * Threatened</i>
<i>Segments Assessed:</i>	7	52.1	41.9	0.0	0.0	10.2
<i>Designated Uses</i>						
<i>Aquatic Life:</i>	7	52.1	41.9	0.0	0.0	10.2
<i>Primary Contact:</i>	1	7.9	7.9	0.0	0.0	0.0
<i>Fish Consumption:</i>	2	15.9	15.9	0.0	0.0	0.0
<i>Drinking Water:</i>						

* Blank values indicate no assessed segments for this category.

Assessed Stream Segments and Waterbodies

<i>Stream or Waterbody Name *</i>	<i>Starting Milepoint</i>	<i>Ending Milepoint</i>	<i>Segment Length (miles)</i>	<i>Designated Uses *</i>	<i>Overall Level of Support</i>
Beech Fork	0	8	8	AL, FC	Fully Supporting
Bull Creek	0	4.1	4.1	AL	Fully Supporting
Greasy Creek	11.8	22	10.2	AL	Threatened
Greasy Creek	0	10	10	AL	Fully Supporting
Middle Fork Kentucky River	87.5	98.2	10.7	AL	Fully Supporting
Middle Fork Kentucky River	76.1	84	7.9	AL, FC, PC	Fully Supporting
Rockhouse Creek	4	5.2	1.2	AL	Fully Supporting

*Abbreviations: AL - Aquatic Life Support, PC - Primary Contact Recreation, SC - Secondary Contact Recreation, FC - Fish Consumption, DW - Drinking Water Supply, UT - Unnamed Tributary

Withdrawal Sites and Discharge Facilities:

<i>Public Water Supplies and Water Withdrawal</i>			
<i>Facility</i>	<i>Origin of Source</i>	<i>Type of Facility</i>	<i>Permit ID Number</i>
BLEDSON COAL CORPORATION	Surface Water	Water Withdrawal Site	WW0840
BLEDSON COAL CORPORATION	Surface Water	Water Withdrawal Site	WW0979
GREEN HILLS WATER DISTRICT	Groundwater	Water Withdrawal Site	0480341
GREEN HILLS WATER DISTRICT	Surface Water	Water Treatment Plant	0480341
HYDEN LESLIE CO WATER DIST	Surface Water	Water Treatment Plant	0660204
HYDEN LESLIE CO WATER DIST	Surface Water	Water Withdrawal Site	0660204
LEECO INC. #31	Surface Water	Water Withdrawal Site	WW0954
PINE MT SETTLEMENT SCHOOL	Surface Water	Water Treatment Plant	0483135
SHAMROCK COAL CO/MIDDLE FORK	Groundwater	Water Treatment Plant	0663241
SHAMROCK COAL COMPANY, INC.	Surface Water	Water Withdrawal Site	WW1036
SHAMROCK COAL COMPANY, INC.	Surface Water	Water Withdrawal Site	WW1037
SHAMROCK COAL COMPANY, INC.	Surface Water	Water Withdrawal Site	WW1154
STRAIGHT CREEK COAL RESOURCES CO	Surface Water	Water Withdrawal Site	WW1113
STRAIGHT CREEK COAL RESOURCES CO	Surface Water	Water Withdrawal Site	WW1114
STRAIGHT CREEK COAL RESOURCES CO	Surface Water	Water Withdrawal Site	WW1115
STRAIGHT CREEK COAL RESOURCES CO	Surface Water	Water Withdrawal Site	WW1116

<i>KPDES Permitted Discharge Facilities</i>			<i>KPDES Site ID Number</i>
<i>Facility</i>	<i>Type of Facility</i>		
APPALACHIA PROFESSIONAL PLAZA	OPER OF NONRESIDENTIAL BLDGS		KY0081256
HYCO TRAILER PARK	OPER OF RES MOBILE HOME SITES		KY0083151
HYDEN LESLIE CO WTP	WATER SUPPLY		KY0091324
HYDEN MANOR NURSING HOME	INTERMEDIATE CARE FACILITIES		KY0089982
HYDEN STP	SEWERAGE SYSTEMS		KY0021245
KTC LESLIE CO MAINT GARAGE	BUS TERMINAL & SERVICE FACILIT		KY0099091
LESLIE CO BD OF ED	ELEMENTARY & SECONDARY SCHOOLS		KY0101575
LESLIE CO HIGH & MIDDLE SCHOOL	ELEMENTARY & SECONDARY SCHOOLS		KY0098329
LESLIE CO RECREATION CENTER	SPORTING & RECREATIONAL CAMPS		KY0087670
LEWIS CONST CO RITE AID BLDG	OPER OF NONRESIDENTIAL BLDGS		KY0089362
MOORE & BRASHEAR RESIDENCES	OPER OF DWELL OTHER THAN APART		KY0095133
ROARK RESIDENCE	PRIVATE HOUSEHOLDS		KY0093653
SHAMROCK COAL CO MIDDLE FORK	COAL MINING SERVICE		KY0099945
STINNETT ELEM SCHOOL	ELEMENTARY & SECONDARY SCHOOLS		KY0093378
SWENTON, MICHAEL J	CRUDE PETROLEUM & NATURAL GAS		KY0081302
THOUSANDSTICKS UN METH CHURCH	RELIGIOUS ORGANIZATIONS		KY0094617

Gaging Stations and Sampling Sites:

<i>US Geological Survey and US Army Corps of Engineers Stream Gaging Stations</i>			
<i>Stream Location</i>	<i>Agency</i>	<i>Station ID Number</i>	<i>Sampling Parameter</i>
Bull Creek	USGS	USGS03280728	Flow
Middle Fork Kentucky River	USGS	USGS03280600	Flow
Middle Fork Kentucky River	USGS	USGS03280551	Flow
Greasy Creek	USGS	USGS03280570	Flow

KY Division of Water Sampling Sites

Watershed Name: Middle Fork Kentucky River

11-Digit Watershed Identity Number: 05100202010

<i>Stream Name</i>	<i>Type of Sampling</i>
Middle Fork Ky River	Biological Monitoring
Beech Fork	Biological Monitoring
Middle Fork Ky River	Biological Monitoring
Rockhouse Creek	Physical/Chemical Monitoring
Greasy Creek	Physical/Chemical Monitoring

<i>US Army Corps of Engineers Sampling Sites</i>		
<i>11-Digit HUC</i>	<i>HUC Name</i>	<i>Stream Segment</i>
05100202010	Middle Fork Kentucky River (headwaters)	Kentucky River, Middle Fork
05100202010	Middle Fork Kentucky River (headwaters)	Bull Creek
05100202010	Middle Fork Kentucky River (headwaters)	Asher Branch
05100202010	Middle Fork Kentucky River (headwaters)	Rockhouse Creek
05100202010	Middle Fork Kentucky River (headwaters)	Greasy Creek
05100202010	Middle Fork Kentucky River (headwaters)	Greasy Creek
05100202010	Middle Fork Kentucky River (headwaters)	Laurel Fork
05100202010	Middle Fork Kentucky River (headwaters)	Big Branch

<i>KY River Watershed Watch Sampling Sites</i>		
<i>Stream Name</i>	<i>KRWW Sample ID No.</i>	<i>Site Description</i>
Middle Fork	K41	Below Mouth of Greasy Creek
Middle Fork	K40	Just Below Mouth of Asher Branch

Results from 1999 KY River Watershed Watch Sampling:

Conventional Parameters:

Sample ID Number: K40 Stream: Middle Fork KY River

Physical Data (May):			
pH	7.6	Alkalinity	157
Temperature	0	Total Hardness	158
Dissolved Oxygen	8.8	Chlorides	27.2
		Conductivity	719
		Total Organic Carbon	2.8
		Total Suspended Solids	

Fecal Data (July / August):		
Coliform Count	Strep Count	Coliform/Strep Ratio
July	10	110
August		0.091

Sample ID Number: K41 Stream: Middle Fork KY River

Physical Data (May):			
pH	7.2	Alkalinity	405
Temperature	0	Total Hardness	98
Dissolved Oxygen	8	Chlorides	48.9
		Conductivity	1404
		Total Organic Carbon	2.6
		Total Suspended Solids	3

Fecal Data (July / August):		
Coliform Count	Strep Count	Coliform/Strep Ratio
July	80	150
August		0.53

Note: Most indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm). Temperature is in Celsius degrees. Alkalinity and hardness are as mg/L of calcium carbonate. Bacterial counts are in colonies per 100 milliliters. Conductivity units are micro-mhos per centimeter.

Nutrient Parameters:

Sample ID Number: K40 Stream: Middle Fork KY River

Ammonia		Orthophosphate as Phosphate	0.048	Sulfate	171
Ammonia Nitrogen		Orthophosphate as Phosphorus	0.016		
Total Kjeldahl Nitrogen as NH3		Total Recoverable Phosphorus	0.08		
Total Kjeldahl Nitrogen as N					
Nitrate					
Nitrate Nitrogen					

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

Sample ID Number: K41 Stream: Middle Fork KY River

Ammonia		Orthophosphate as Phosphate	0.042	Sulfate	269
Ammonia Nitrogen		Orthophosphate as Phosphorus	0.014		
Total Kjeldahl Nitrogen as NH3		Total Recoverable Phosphorus	0.07		
Total Kjeldahl Nitrogen as N					
Nitrate					
Nitrate Nitrogen					

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

Metals and Mineral Parameters:

Sample ID Number: K40 Stream: Middle Fork KY River

Aluminum		Calcium	33.80	Lead		Selenium		Thallium	
Antimony		Chromium	0.03	Lithium	0.02	Silicon	0.79	Vanadium	
Barium	0.07	Cobalt	0.002	Magnesium	18.90	Sodium	90.29	Zinc	0.01
Beryllium	0.001	Copper		Manganese	0.04	Strontium	0.50		
Boron	0.12	Iron	0.12	Potassium	5.24	Sulfur	40.69		

Watershed Name: Middle Fork Kentucky River

11-Digit Watershed Identity Number: 05100202010

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

Sample ID Number: K41 Stream: Middle Fork KY River

Aluminum	0.04	Calcium	18.68	Lead		Selenium	0.02	Thallium	0.06
Antimony	0.13	Chromium	0.03	Lithium	0.03	Silicon	0.80	Vanadium	
Barium	0.12	Cobalt	0.003	Magnesium	13.45	Sodium	246.31	Zinc	0.01
Beryllium	0.002	Copper		Manganese	0.02	Strontium	0.41		
Boron	0.17	Iron	0.19	Potassium	5.39	Sulfur	62.14		

Note: All indicators are in milligrams per liter (mg/L) which is equivalent to parts per million (ppm).

Pesticide/Herbicide Parameters:

Sample ID No.	Stream	2,4-D	Chlorpyrifos	Triazines
K40	Middle Fork KY River			
K41	Middle Fork KY River			

Note: All indicators are in micrograms per liter which is equivalent to parts per billion (ppb).