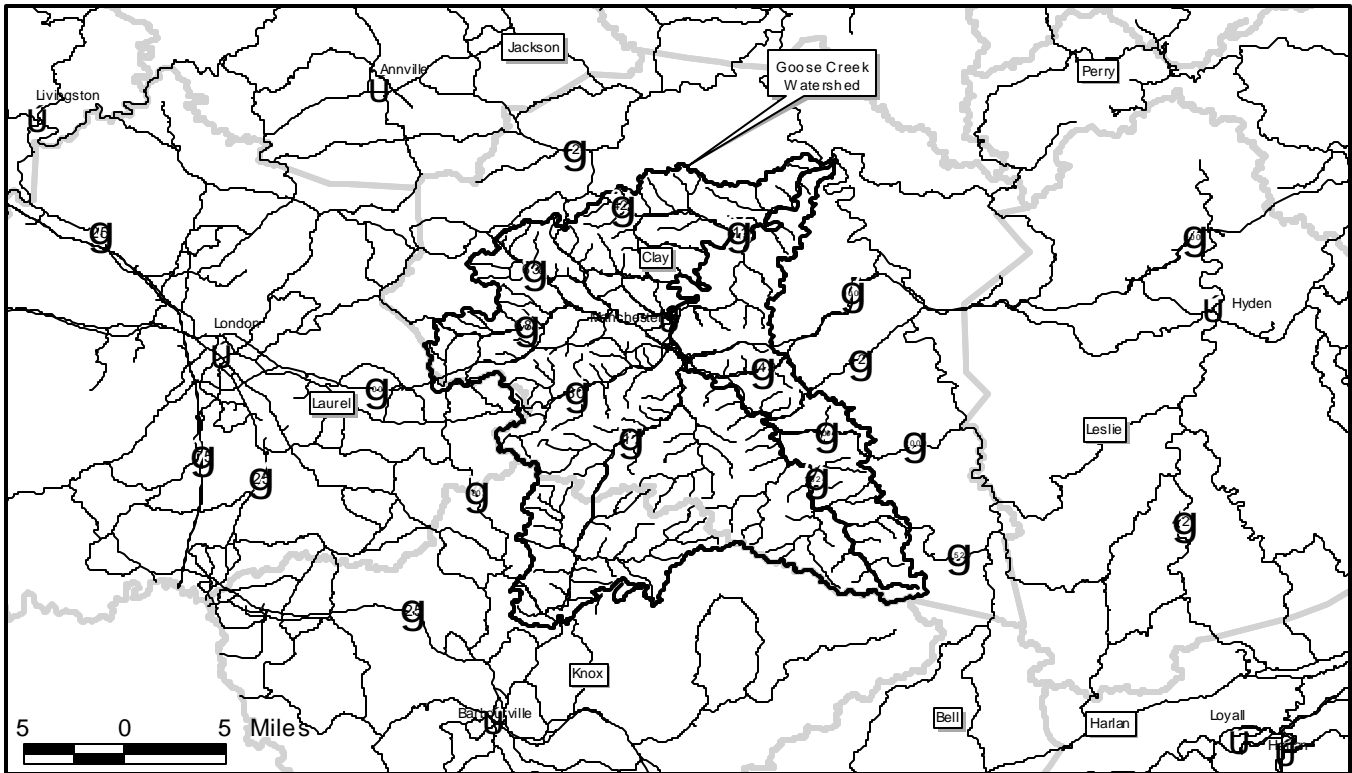


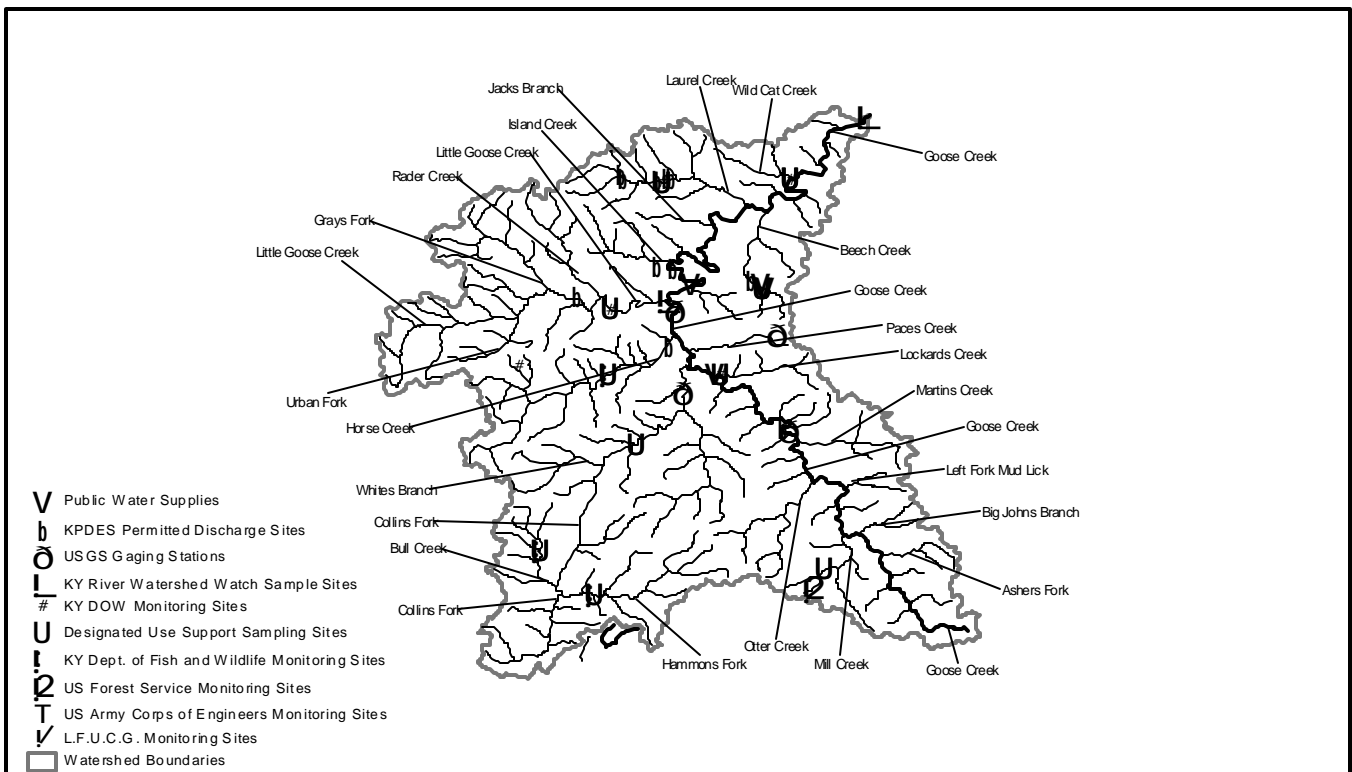
Goose Creek Watershed

Watershed Number: 05100203040

Location Map



Watershed Features



Geography. The Goose Creek watershed covers southwest Clay County, northern Knox County, and slivers of Laurel 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. Goose Creek empties into the South Fork Kentucky River near Oneida. Among the creeks that feed it are Bull Creek, Collins Fork, Hammons Fork, Horse Creek, Laurel Creek, Paces Creek, and Little Goose Creek.

Land and water use. Land in the watershed is mainly rural and wooded; less than 10% is agricultural. The surface waters of the watershed supply the drinking water for the municipal system in Manchester. Eleven businesses and organizations hold permits for discharges into the creeks. See tables for details.

Agency data assessment. The assessed creek segments in this watershed include several that only partially support their designated uses, based on biological and/or water-quality data. Siltation and pathogens contribute to the impairment of these streams. 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 a moderate 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. Both Goose Creek sites showed elevated levels of copper, and one showed elevated chromium. 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:

Total Land Area (Acres):	166,632	Acres	% of Total		
Residential Area:	424		0.3	Number of Mine Permits:	155
Commercial Area:	336		0.2	Total Permitted Mining Area (Acres):	1,110
Industrial Area:	12		0.0	Number of Identified Wetland Areas:	16
Agricultural Area:	11,600		7.0	Total Wetland Area (Acres):	21
Rural and Wooded Area:	152,418		91.6		
Other Land-use Area:	1,617		1.0		

Withdrawal and Discharge Sites:

Number of Public Water Supplies and Water Withdrawal Sites:	5	Number of KPDES Discharge Permits:	11
Surface Water Withdrawals:	4		
Groundwater Withdrawals:	1		
No. of Potable Water Treatment Facilities:	1		

Sampling Site Statistics:

Number of USGS Gaging Stations:	0
Number of Kentucky Division of Water Sampling Sites:	5
Number of Kentucky Dept. of Fish and Wildlife Sampling Sites:	3
Number of US Forest Service Sampling Sites:	1
Number of US Army Corps of Engineers Sampling Sites:	0
Number of Kentucky River Watershed Watch Sampling Sites:	2
Number of Lexington-Fayette Urban Co. Gov. Sampling Sites:	0

Watershed Indicators and Ranking Categories:

Overall Watershed Ranking:

Protection Ranking

Observed Impacts

Potential Impacts

Restoration Ranking

Medium

High

Medium

High

Medium

Protection Categories:

Indicator	Value	Units	Range of All Watersheds	Mean of All Watersheds
Wetland Areas	21	Acres	0 - 106	12
Surface Drinking Water Sources	4	No. of sources	0 - 14	2
Ground Drinking Water Sources	1	No. of sources	0 - 17	1
Groundwater Sensitivity	3.00	Score	2 - 5	3.21
KY Dept. of Fish and Wildlife Management Areas	0	Acres	0 - 2951	93
U.S. Forest Service Management Areas	142,004	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	0	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	1	No. of resources	0 - 8	1
Kentucky Rivers Assessment Scores	0.97	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	6	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	2.00	Score	1 - 3	1.33
Contamination Sites Impacting Human Health	3	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	1.34	Score	1 - 3	1.31
Contamination Sites Impacting Ecological Health	3	Number of sites	0 - 71	4

Potential Impact Categories:

Indicator	Value	Units	Range of All Watersheds	Mean of All Watersheds
Potential Contamination Sites	24	Number of sites	1 - 121	12
Potential Pesticide Loading	2	Est. sales in tons	0 - 45	10
Potential Fertilizer Loading	496	Est. tons applied	0 - 2747	394
Agricultural Erosion Potential	3.51	Est. tons erosion / acre	0 - 9	3.20
Livestock Operations Potential Impact	3,207	Animal units	55 - 43826	7,021
KPDES Discharge Violations	21	Number of violations	0 - 541	39
KY Division of Water Citizen Complaints	24	Number of complaints	0 - 53	9
Toxic Release Inventory	0	Score	0 - 11547626	231,638
Population Change Projection	882	Number of persons	-149 - 11030	448
Population Not on Public Sewer Systems	4,154	Number of persons	12 - 4511	1,114
Mining Area	1,116	Acres	0 - 6305	355
Surface Water Runoff Potential	60.67	SCS Curve Number	60 - 79	68
KPDES Permitted Discharges	11	Number of sites	0 - 56	6

Stream and Waterbody Use Support Summary

Total Stream Miles: 380.31	<i>Number of Seaments</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>
Segments Assessed:	10	46.2	21.3	24.9	0.0	0.0
Designated Uses						
Aquatic Life:	10	46.2	30.6	15.6	0.0	0.0
Primary Contact:	1	9.3	0.0	9.3	0.0	0.0
Fish Consumption:	1	9.3	9.3	0.0	0.0	0.0
Drinking Water:	1	0	0	0	0	0

* 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>
Bert Combs Lake	0	0	0	AL, DW	Fully Supporting
Bull Creek	0	2	2	AL	Partially Supporting
Collins Fork	2.4	6.3	3.9	AL	Partially Supporting
Goose Creek	22.6	34.5	11.9	AL	Fully Supporting
Goose Creek	0	9.3	9.3	AL, FC, PC	Partially Supporting
Hammons Fork	0	1.9	1.9	AL	Partially Supporting
Horse Creek	0	6.8	6.8	AL	Partially Supporting
Keens Fork	0	1.8	1.8	AL	Fully Supporting
Laurel Creek	3.8	4.8	1	AL	Partially Supporting
Little Goose Creek	0	7.6	7.6	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

Causes for Nonsupport or Impairment of Designated Uses					
<i>Stream or Waterbody Name *</i>	<i>Starting Milepoint</i>	<i>Ending Milepoint</i>	<i>Segment Length (miles)</i>	<i>Impaired or Threatened Designated Use</i>	<i>Level of Support</i>
Bull Creek	0	2	2	Aquatic Life Support	Partially Supporting
<i>Possible Causes of Impairment:</i> Siltation			<i>Possible Sources For Impairment:</i> Agriculture, Crop-related Sources, Nonirrigated Crop Production		
Collins Fork	2.4	6.3	3.9	Aquatic Life Support	Partially Supporting
<i>Possible Causes of Impairment:</i> Siltation			<i>Possible Sources For Impairment:</i> Habitat Modification (other than Hydromodification), Land Disposal, Onsite Wastewater Systems (Septic Tanks)		
Goose Creek	0	9.3	9.3	Primary Contact (Recr)	Partially Supporting

Watershed Name: Goose Creek

11-Digit Watershed Identity Number: 05100203040

<i>Possible Causes of Impairment:</i> Pathogens		<i>Possible Sources For Impairment:</i> Land Disposal, Onsite Wastewater Systems (Septic Tanks)			
Hammons Fork	0	1.9	1.9	Aquatic Life Support	Partially Supporting
<i>Possible Causes of Impairment:</i> Organic enrichment/Low DO, Other habitat alterations, Siltation		<i>Possible Sources For Impairment:</i> Bank or Shoreline Modification/Destabilization, Collection System Failure, Habitat Modification (other than Hydromodification), Highway Maintenance and Runoff			
Horse Creek	0	6.8	6.8	Aquatic Life Support	Partially Supporting
<i>Possible Causes of Impairment:</i> Siltation		<i>Possible Sources For Impairment:</i> Agriculture, Bank or Shoreline Modification/Destabilization, Crop-related Sources, Habitat Modification (other than Hydromodification), Nonirrigated Crop Production, Removal of Riparian Vegetation			
Laurel Creek	3.8	4.8	1	Aquatic Life Support	Partially Supporting
<i>Possible Causes of Impairment:</i> Nutrients, Thermal modifications		<i>Possible Sources For Impairment:</i> Agriculture, Crop-related Sources, Grazing related Sources, Habitat Modification (other than Hydromodification), Nonirrigated Crop Production, Pasture grazing - Riparian and/or Upland, Removal of Riparian Vegetation			
<i>*Abbreviations: UT - Unnamed Tributary</i>					

<i>Applicable Total Maximum Daily Load (TMDL) Reports:</i>	
<i>Stream or Waterbody</i>	<i>TMDL Report Status</i>
Laurel Creek	First priority - not yet started

Watershed Name: Goose Creek

11-Digit Watershed Identity Number: 05100203040

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>
MANCHESTER WATER WORKS	Groundwater	Water Withdrawal Site	0260737
MANCHESTER WATER WORKS	Surface Water	Water Treatment Plant	0260737
MANCHESTER WATER WORKS	Surface Water	Water Withdrawal Site	0260737
MOUNTAIN CLAY, INC.	Surface Water	Water Withdrawal Site	WW0937

<i>KPDES Permitted Discharge Facilities</i>			<i>KPDES Site ID Number</i>
<i>Facility</i>	<i>Type of Facility</i>		
BM MANCHESTER BP #362	PETROL & PET PROD WHOLESALERS	KY0039390	
CLAY CO BD OF ED	ELEMENTARY & SECONDARY SCHOOLS	KY0100978	
KTC CLAY CO MAINT GARAGE	BUS TERMINAL & SERVICE FACILIT	KY0099309	
LAURA LOU MHP	OPER OF RES MOBILE HOME SITES	KY0039462	
LAUREL CREEK HEALTH CARE CTR	NURSING AND PERSONAL CARE, NEC	KY0083739	
LAUREL HEIGHTS SUBD	LAND SUBDIVIDERS & DEV, EX CEM	KY0072729	
MANCHESTER RECREATIONAL CTR	MUSEUMS AND ART GALLERIES	KY0087629	
MANCHESTER STP	SEWERAGE SYSTEMS	KY0029122	

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>
Goose Creek	USGS	USGS03281100	Flow
Paces Creek	USGS	USGS03281090	Flow
Collins Fork	USGS	USGS03281080	Flow
Goose Creek	USGS	USGS03281065	Flow

<i>KY Division of Water Sampling Sites</i>	
<i>Stream Name</i>	<i>Type of Sampling</i>
Goose Creek	Biological Monitoring
Little Goose Creek	Physical/Chemical Monitoring
Goose Creek	Physical/Chemical Monitoring
Laurel Creek	Physical/Chemical Monitoring
North Fork Kentucky River	Physical/Chemical Monitoring

<i>KY Dept of Fish and Wildlife Sampling / Assessment Sites</i>					
<i>Stream Segment</i>	<i>Upstream Description</i>	<i>Downstream Description</i>	<i>Total Length of Segment</i>	<i>Upstream Mile Point</i>	<i>Downstream Mile Point</i>
Goose Creek 8 (Hammon's Fork)	Horn Branch	Mouth	6.7	1.9	0
Goose Creek 7 (Bull Creek)	Upstream of Bull Creek	Mouth	4.6	2	0
Goose Creek 5 (Horse Creek)	Roots Branch	Upstream of Horse Creek	10	5.6	0.2

<i>US Forest Service Sampling Sites</i>		
<i>11-Digit HUC</i>	<i>HUC Name</i>	<i>US Forest Service Site ID</i>
05100203040	Goose Creek	0510020328001

Watershed Name: Goose Creek

11-Digit Watershed Identity Number: 05100203040

~~05100203040~~ ~~Goose Creek~~ ~~05100203040~~

<i>KY River Watershed Watch Sampling Sites</i>		
<i>Stream Name</i>	<i>KRWW Sample ID No.</i>	<i>Site Description</i>
Goose Creek	K69	Below Mouth of Jacks Branch
Goose Creek	K68	At mouth of Sutton Branch

Watershed Name:

Goose Creek

11-Digit Watershed Identity Number:

05100203040

Results from 1999 KY River Watershed Watch Sampling:

Conventional Parameters:

Sample ID Number: K68 Stream: Goose Creek

Physical Data (May):

pH	7	Alkalinity	90
Temperature	0	Total Hardness	168
Dissolved Oxygen	9	Chlorides	53.6
		Conductivity	575
		Total Organic Carbon	3.0
		Total Suspended Solids	10

Fecal Data (July / August):

	Coliform Count	Strep Count	Coliform/Strep Ratio
July	20	220	0.091
August			

Sample ID Number: K69 Stream: Goose Creek

Physical Data (May):

pH	7.5	Alkalinity	104
Temperature	0	Total Hardness	194
Dissolved Oxygen	9	Chlorides	31.3
		Conductivity	608
		Total Organic Carbon	3.3
		Total Suspended Solids	

Fecal Data (July / August):

	Coliform Count	Strep Count	Coliform/Strep Ratio
July	130	310	0.42
August			

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: K68 Stream: Goose Creek

Ammonia		Orthophosphate as Phosphate		Sulfate	116
Ammonia Nitrogen		Orthophosphate as Phosphorus			
Total Kjeldahl Nitrogen as NH3		Total Recoverable Phosphorus	0.08		
Total Kjeldahl Nitrogen as N					
Nitrate	0.2				
Nitrate Nitrogen	0.04				

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

Sample ID Number: K69 Stream: Goose Creek

Ammonia		Orthophosphate as Phosphate	0.033	Sulfate	140
Ammonia Nitrogen		Orthophosphate as Phosphorus	0.011		
Total Kjeldahl Nitrogen as NH3		Total Recoverable Phosphorus	0.09		
Total Kjeldahl Nitrogen as N					
Nitrate	0.5				
Nitrate Nitrogen	0.11				

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: K68 Stream: Goose Creek

Aluminum		Calcium	31.41	Lead		Selenium		Thallium	
Antimony	0.09	Chromium	0.03	Lithium	0.008	Silicon	0.94	Vanadium	0.07
Barium	0.08	Cobalt		Magnesium	18.56	Sodium	43.22	Zinc	0.01
Beryllium		Copper	0.01	Manganese	0.13	Strontium	0.34		
Boron	0.16	Iron	0.20	Potassium	4.73	Sulfur	24.46		

Watershed Name:

Goose Creek

11-Digit Watershed Identity Number:

05100203040

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

Sample ID Number: K69 Stream: Goose Creek

Aluminum	<input type="text"/>	Calcium	<input type="text" value="39.39"/>	Lead	<input type="text"/>	Selenium	<input type="text"/>	Thallium	<input type="text"/>
Antimony	<input type="text" value="0.10"/>	Chromium	<input type="text" value="0.03"/>	Lithium	<input type="text" value="0.008"/>	Silicon	<input type="text" value="0.94"/>	Vanadium	<input type="text" value="0.06"/>
Barium	<input type="text" value="0.03"/>	Cobalt	<input type="text" value="0.003"/>	Magnesium	<input type="text" value="23.84"/>	Sodium	<input type="text" value="41.85"/>	Zinc	<input type="text" value="0.01"/>
Beryllium	<input type="text"/>	Copper	<input type="text" value="0.01"/>	Manganese	<input type="text" value="0.09"/>	Strontium	<input type="text" value="0.41"/>		
Boron	<input type="text" value="0.14"/>	Iron	<input type="text" value="0.10"/>	Potassium	<input type="text" value="5.43"/>	Sulfur	<input type="text" value="35.04"/>		

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
K68	Goose Creek	<input type="text"/>	<input type="text"/>	<input type="text"/>
K69	Goose Creek	<input type="text"/>	<input type="text"/>	<input type="text" value="0.06"/>

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