



# Floyd County

## Water Quality Characterization Report

*MS4 Permit #: INR040078*

March 2023





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## Table of Revisions

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The following table summarizes revisions, additions, deletions, etcetera to the contents of this report:

Date	Revised Pages/Appendices	Summary of Change



## Primary MS4 Contact

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## WQCR Certification

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

### Qualified Professional:

Name: Allison Padron, PE  
Title: Project Manager, OHM Advisors  
Signature:   
Date: 3/17/2023

### MS4 Operator or Designee:

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Signature: \_\_\_\_\_  
Date: \_\_\_\_\_





## 1.0 Purpose

This water quality assessment report is intended to accompany the Southern Indiana Stormwater Advisory Committee (SWAC) Water Quality Characterization Report (WQCR). This component of the WQCR contains information specific to Floyd County as a method for further analyzing water quality within the MS4 boundaries, and using that information to guide their MS4 Program as they begin implementing the Indiana MS4 General Permit (INR040000) and Indiana Construction Stormwater General Permit (INRA00000).

## 2.0 Assessment of Land Use

Floyd County is in the central portion of southern Indiana along the north shore of the Ohio River, east of Harrison County and west of Clark County, as shown on the MS4 map in Figure 1. The County encompasses approximately 131 square miles (83,804.7 acres). Incorporated areas include the City of New Albany, the Town of Georgetown, and the Town of Greenville, which are excluded from Floyd County's MS4 area. Over 85% of the Floyd County MS4 area is forested or agricultural, while developed areas account for less than 11.1% of the MS4 area. Land use acreages within the Floyd County MS4 area can be seen in Table 1.

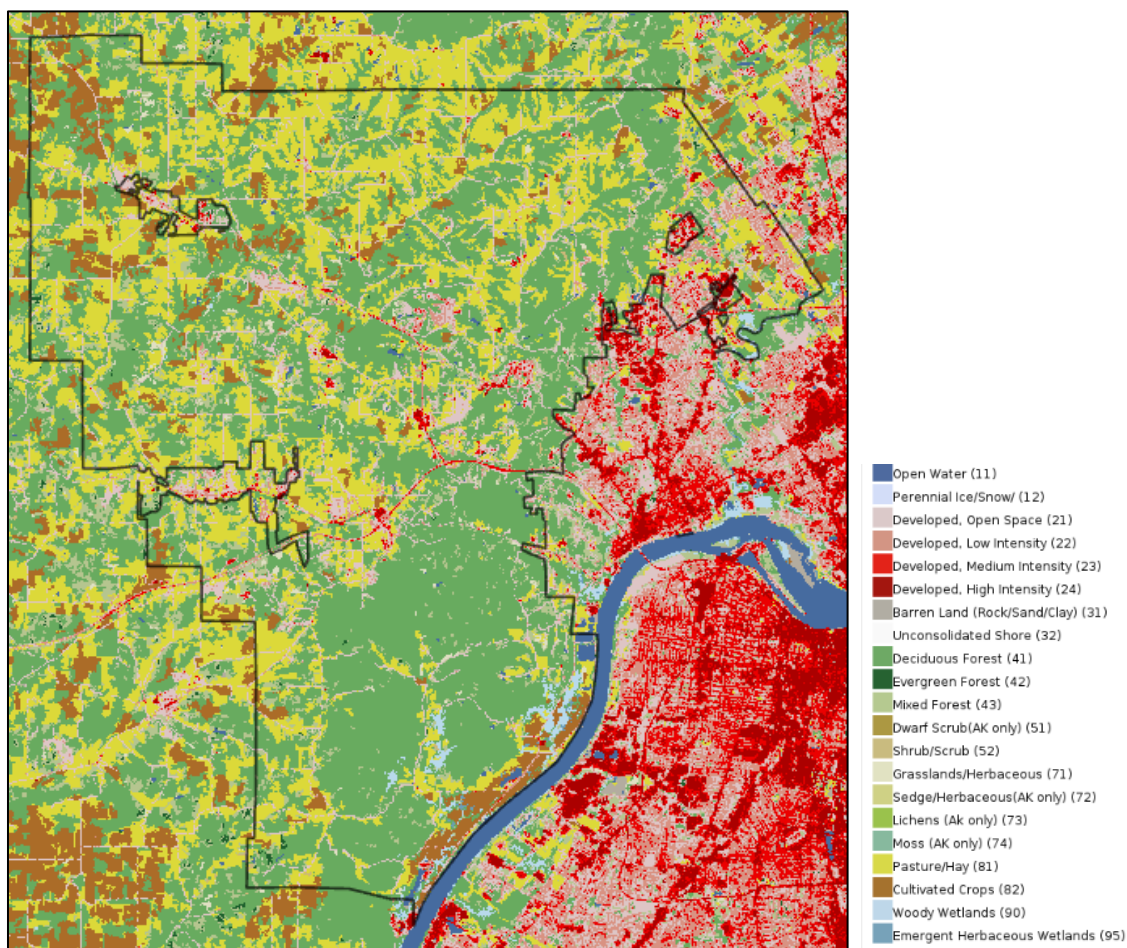


Figure 1. Land Use Map (NLCD, 2019)



**Table 1: Land Use for Floyd County MS4 Area**

Category	Acres	Percentage
Deciduous Forest	40,098.0	47.8%
Hay/Pasture	20,299.8	24.2%
Developed, Open Space	7,392.4	8.8%
Cultivated Crops	5,291.0	6.3%
Mixed Forest	4,471.6	5.3%
Developed, Low Intensity	2,705.5	3.2%
Developed, Medium Intensity	1,327.1	1.6%
Woody Wetlands	587.3	0.7%
Herbaceous	545.9	0.7%
Open Water	403.8	0.5%
Developed, High Intensity	266.9	0.3%
Shrub/Scrub	182.0	0.2%
Emergent Herbaceous Wetlands	116.2	0.1%
Evergreen Forest	79.1	0.1%
Barren Land	46.1	0.1%
<b>TOTAL:</b>	<b>83,804.7</b>	<b>100.0%</b>

Source: Land Cover for Indiana, NLCD (2019)

Developed land uses (residential, commercial, industrial) tend to occur around the incorporated areas of Floyd County, near the City of New Albany, Town of Georgetown, and Town of Greenville. Forested areas occur on the steep slopes of the knobs and agricultural areas occur in eastern Floyd County and the ridgetops and valleys of the Floyd Knobs.

### 3.0 Best Management Practices (BMPs)

The following section describes the County’s efforts to improve stormwater quality through the MS4 program by implementing the six (6) Minimum Control Measures (MCMs), including structural and non-structural BMPs.

#### 3.1 Structural BMPs

Within Floyd County’s storm sewer system, they have mapped outfalls, manholes, catch basins/inlets, pipe, and concrete/earthen/riprap channels/roadside ditches, with the data stored in GIS. The County has also mapped structural BMPs, such as detention/retention basins. The stormwater system is regularly inspected and maintained.

#### 3.2 Non-Structural BMPs

##### 3.1.1 Ordinances

Floyd County maintains legal authority to administer the MS4 program and ensure compliance through adopted ordinances. Floyd County utilizes the following ordinances:



- IDDE, EPSC, Post-Construction: Stormwater Ordinance, FCO-2019-25, adopted October 2019.
- Maintenance Standards and Controls: Ordinance Establishing Storm Water Drainage Maintenance Standards and Control, CFO-2013-IV, adopted February 19, 2013.
- Stormwater User Fees: Ordinance Authorizing and Establishing a System of Stormwater Management User Fees, FCO-2021-30, adopted December 21, 2021.

The County utilizes the Floyd County Stormwater Design Manual, which was adopted in November 2020, which contains methodologies for determining runoff rates, storage volumes, and BMP sizing. It also contains design standards and specifications for open channels, construction site stormwater pollution prevention standards, and controlling peak flows.

Floyd County adopted the Stormwater Ordinance in October 2019. This Ordinance consolidated illicit discharge, construction, and post-construction requirements into one ordinance. The post-construction requirements are for all projects disturbing one (1) or more acres of land within the County.

As part of the Post-Construction Stormwater Management Ordinance, the owners of approved BMPs are required to execute a Long-Term Maintenance and Operations Agreements with the County. The Agreements are required to be filed with the property deed.

### **3.1.2 Partnerships**

Floyd County actively participates in the Southern Indiana Stormwater Advisory Committee (SWAC), which provides a forum for public education, outreach, participation and involvement as well as coordinated implementation of the MS4 program in participating communities. Participating communities include: Floyd County, the City of Jeffersonville, the Town of Sellersburg, the Town of Clarksville, the City of New Albany, the Oak Park Conservancy District, and the City of Madison.

### **3.1.3 MCM 1 & 2 – Public Education and Outreach; Participation and Involvement**

The County publishes and distributes stormwater information in flyers and brochures focused on educating residents including children, commercial entities, the construction industry. The County maintains a stormwater webpage with relevant information regarding the MS4 program. The SWAC also maintains a website and social media page where the educational content developed by the group are made available for download.

The County typically educates residents and students about stormwater at several events per year using stormwater exhibits at the annual county 4-H fair. Through the SWAC, the County hosts Stormwater Awareness Week each year, culminating in a volunteer event, the ORSANCO River Sweep, to clean the shores of the Ohio River.

### **3.1.4 MCM 3 – Illicit Discharge Detection and Elimination**

The Stormwater Ordinance includes Illicit Discharge Detection and Elimination (IDDE) requirements, which defines and prohibits illicit discharges and establishes an escalating enforcement policy. The County has mapped 100% of the stormwater drainage system, including outfalls and conveyances, and utilizes the IDDE Standard Operating Procedure (SOP) to specify procedures for identifying illicit discharges via a dry weather screening



program, conducted in conjunction with MS4 mapping. Illicit discharges that are detected through citizen complaints or municipal staff are investigated and eliminated. Floyd County continues to educate citizens and trained public employees about the hazards associated with illicit discharges and improper waste disposal.

### **3.1.5 MCM 4 & 5 – Construction Site and Post-Construction Stormwater Runoff**

The County’s Stormwater Ordinance includes the Construction Site Runoff Control requirements which govern storm water run-off associated with construction activity. The County continues to implement this ordinance, which specifies requirements for review of construction site BMP plans, installation of erosion prevention and sediment control BMPs, inspection and escalating enforcement procedures. Floyd County has successfully updated the Stormwater Design Manual as of November 2020. The Design Manual serves as a guide for the planning and design of stormwater systems, erosion control structures, and associated activities for Floyd County. The guidelines and general design procedures in the manual were approved by the Floyd County Stormwater Board.

Via a MOA with a local engineering firm, Floyd County reviews construction plans, and associated storm water pollution prevention plans (SWPPP) and issues Perimeter Control Permits and Stormwater Quality Management Permits. The County has implemented requirements for self-inspections and formal inspections of construction sites to ensure compliance with the Construction Site Runoff Control Ordinance. Floyd County adopted requirements that construction site stormwater BMP self-inspections be conducted by a Qualified Professional (QP) via provisions in the Construction Site Runoff Controls Ordinance. Floyd County successfully implemented the Qualified Professional Inspector Program (QPI). The QPI program is designed to train developers, contractors, and governmental agencies to comply with the National Pollutant Discharge Elimination System (NPDES) Stormwater General Permit for Construction by offering a one-day training course, a QPI training manual, and an exam. After passing the exam, applicants are eligible to obtain a QPI registration or license from the community prior to initiating inspection of construction site stormwater BMPs.

### **3.1.6 MCM 6 - Municipal Operations Pollution Prevention and Good Housekeeping**

Floyd County implements pollution prevention and good housekeeping practices to prevent or reduce pollutant runoff from municipal operations, such as regular stormwater drainage system maintenance and cleaning, street sweeping, and leaf and woody debris collections. Also, controls for reducing discharges from county facilities and operations have been put in place through implementing BMPs at municipal fueling stations, minimizing the use of herbicides, pesticides and fertilizers, and minimizing the impact of deicing material storage and utilization.

Floyd County maintains an oil-water separator at the Public Works Facility that is regularly pumped out. The County conducts a formal annual inspection of their municipal facilities to ensure that stormwater BMPs are maintained in compliance with the Post-Construction Stormwater Management Ordinance. Self-inspections are required on a quarterly basis for municipal facilities.





## 4.0 Receiving Waters

Floyd County has 56 receiving waters totaling 344.34 miles. Table 2 lists the name, length and each receiving waters percentage of the total receiving water area.

Table 2: Floyd County Receiving Waters

Receiving Water	Total Length (miles)	Percentage
Unnamed Tributaries	228.02	66.21%
Little Indian Creek	17.33	5.03%
Indian Creek	14.00	4.07%
Knob Creek	9.90	2.87%
Richland Creek	6.44	1.87%
Georgetown Creek	4.80	1.39%
French Creek	4.11	1.19%
Yellow Fork	3.63	1.05%
Jacobs Creek	3.61	1.05%
Corn Creek	3.26	0.95%
Lewis Branch	2.81	0.81%
Middle Fork Indian Creek	2.51	0.73%
Bald Knob Creek	2.41	0.70%
Jersey Park Creek	2.34	0.68%
Silver Creek	1.97	0.57%
Black Creek	1.86	0.54%
Bannamon Creek	1.78	0.52%
Uphill Run	1.77	0.51%
James Branch	1.76	0.51%
Woertz Creek	1.75	0.51%
Miller Branch	1.69	0.49%
Elk Run	1.57	0.46%
Lazy Creek	1.51	0.44%
Atkins Run	1.33	0.39%
Pine Run	1.30	0.38%
Chapel Branch	1.27	0.37%
Crooked Run	1.25	0.36%
Clear Fork	1.24	0.36%
Bear Creek	1.22	0.35%
Campbell Branch	1.14	0.33%
Buck Creek	1.07	0.31%
Thompson Creek	1.05	0.30%
Lost Knob Brook	1.00	0.29%
Flat Run	0.91	0.26%
Blackiston Run	0.87	0.25%
Carters Run	0.75	0.22%



Receiving Water	Total Length (miles)	Percentage
Falling Run	0.73	0.21%
Friendship Run	0.73	0.21%
Bow Run	0.70	0.20%
East Fork Pilot Grove Creek	0.68	0.20%
War Run	0.68	0.20%
Slate Run	0.65	0.19%
Saint Marys Run	0.64	0.18%
Hill Brook	0.57	0.17%
Lamb Run	0.53	0.15%
Jay Run	0.52	0.15%
Floyds Creek	0.49	0.14%
Arrow Run	0.49	0.14%
Vincennes Run	0.49	0.14%
Church Run	0.47	0.14%
Green Run	0.29	0.08%
Union Creek	0.23	0.07%
Cross Brook	0.12	0.04%
Fork Run	0.11	0.03%
Plum Run	0.03	0.01%
Rail Run	0.00	0.00%
<b>TOTAL</b>	<b>433.34</b>	<b>100%</b>

Floyd County is bisected by many different watersheds, with a primary watershed being the Indian Creek watershed which drains into Harrison County. The majority of the remaining portion of the county drains directly to the Ohio River, although may pass through the incorporated City of New Albany first. A map showing the major receiving waters and watersheds can be seen in Figure 2 below.

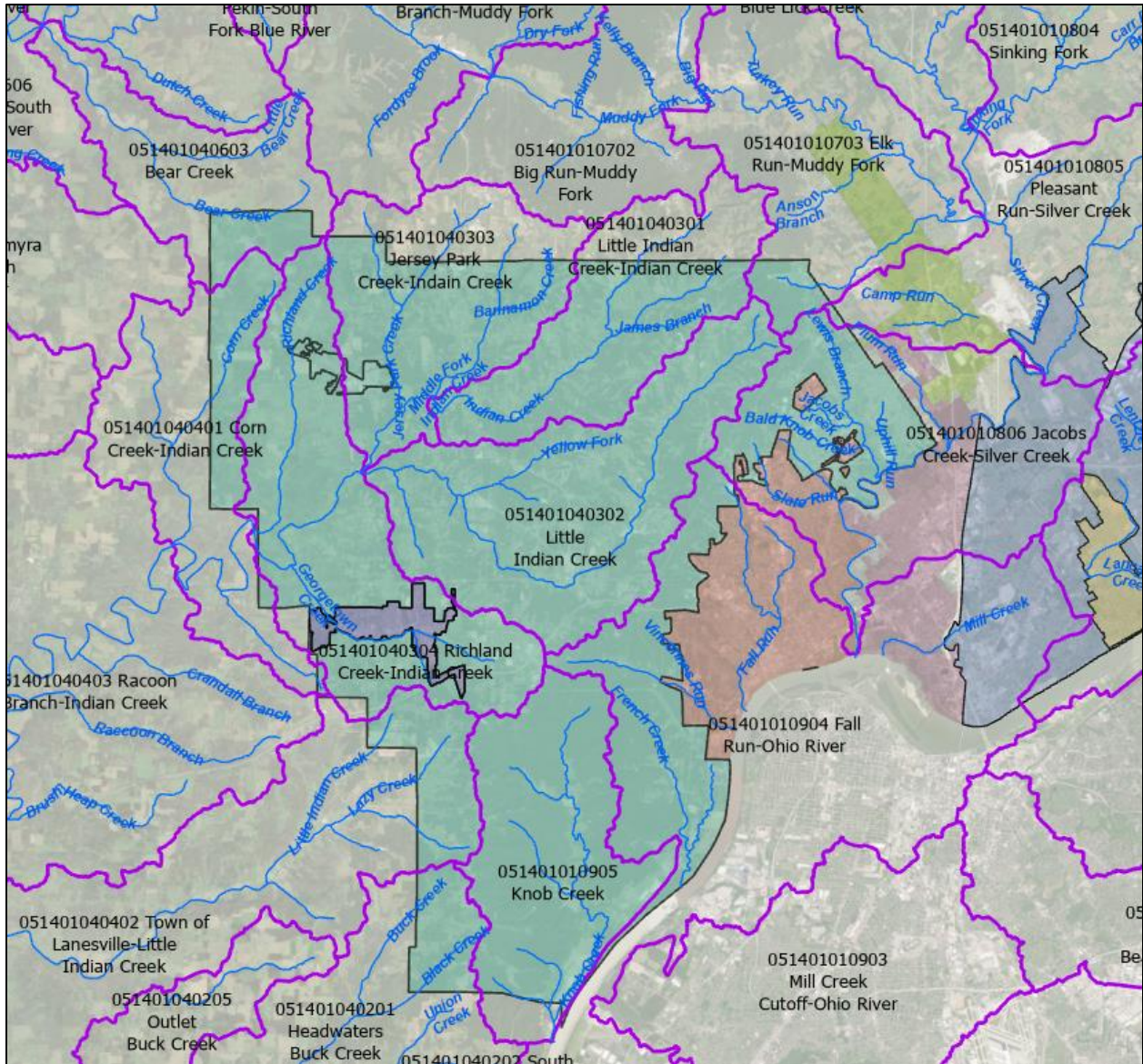


Figure 2. Major Receiving Waters and Watersheds for Floyd County

## 5.0 303(d) Impaired Waters

The 2022 Integrated Water Monitoring and Assessment Report published by IDEM includes the 303(d) List of Impaired Streams for Indiana. Four (4) stream segments in the Floyd County MS4 area were listed on the 2022 303(d) List, seen in Figure 3. A 1.9-mile segment of Indian Creek on the western side of the county was listed as being impaired due to elevated E. coli bacteria. Another 17.7-mile segment of Indian Creek was listed as being impaired due to elevated E. coli bacteria as well as elevated nutrient levels. Several beginning segments of tributaries of Falling Run Creek are located in the Floyd County MS4 area, although the vast majority of the stream is located in New Albany, which is impaired due to E. coli, as well as low dissolved oxygen. Floyd County's MS4 area likely has little impact to Falling Run Creek. A 12.2-mile segment of French Creek is

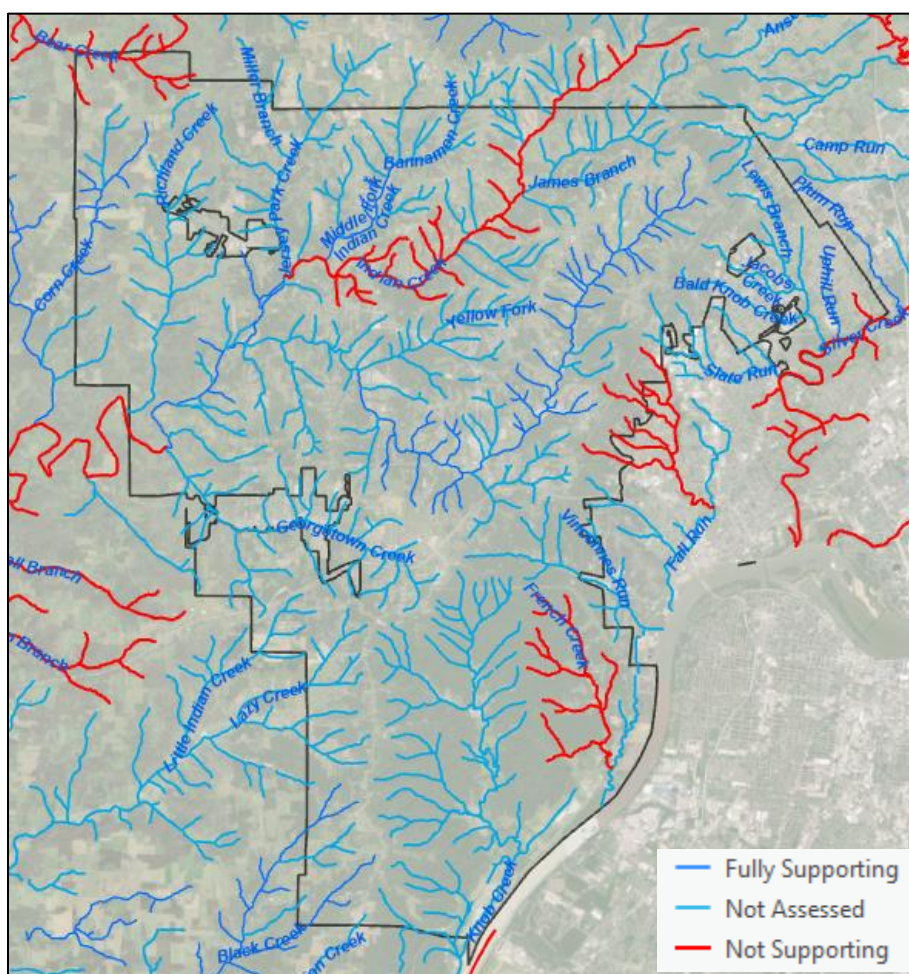




impaired due to E. coli bacteria. A 4.6-mile segment of Bear Creek was listed as being impaired due to elevated E. Coli bacteria and has a TMDL associated with it. However, Floyd County is at the very top of the watershed for Bear Creek with the majority of the creek being located in a neighboring county. Floyd County likely has very little impact on the water quality within Bear Creek.

**Table 3: Floyd County Impaired 303(d) Waters**

Stream Name	Assessment ID	Length (miles)	Impairment	TMDL
Bear Creek	INN0463_01/T1001/T1002A	4.6	E. coli	Yes
Falling Run	INN0104_T1002	3.8	E. coli, Low DO	None
French Creek	INN0194_T1006A	12.2	E. coli	None
Indian Creek	INN0431_01 through _04	17.7	E. coli, Nutrients	None
Indian Creek	INN0434_02 INN0333_01	1.9	E. coli	None
Silver Creek	INN0186_06 and _07	2.7	E. coli, PBCs	None



**Figure 2. 303(d) Impaired Waters of Floyd County**





## 6.0 Known Sensitive Areas

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Public Beaches/ Full Body Contact Recreation: There are no beaches or lakes with public swimming or recreational facilities other than enclosed public swimming pools. The County is currently not aware of any locations within the MS4 area where full body contact recreation occurs.

Surface Drinking Water Intakes: Drinking water sources within the Floyd County MS4 area are derived primarily from local groundwater resources.

Wetlands: Wetland areas are considered to be environmentally sensitive features and are protected by the Clean Water Act. The National Wetland Inventory (NWI) was used to estimate the extent and locations of wetlands and deep waters in Floyd County. Based on these data, there are 1,480.1 acres of wetlands and deep-water habitats within the County boundary, as shown on the Regional WQCR. The following Table 3 shows the different types of wetlands within Floyd County, as classified by the NWI (NWI, 2021).

**Table 3: Types of Wetlands in Floyd County**

Type	Square Miles	Acres
Freshwater Emergent Wetland	0.219	140.7
Freshwater Forested/Shrub Wetland	0.689	441.0
Freshwater Pond	1.151	737.1
Lake	0.252	161.3

Source: NWI, 2021.

Wellhead Protection Areas: The wellhead protection area (WHPA) for the Edwardsville Well Field is in the Floyd County MS4 area. The wellfield is located in the southern portion of the County near the Ohio River, and the associated WHPA intersects the MS4 boundary. To date, two (2) stormwater outfalls have been mapped in the WHPA. Floyd County adopted a Stormwater BMP Design Manual that encourages the use of non-infiltrative BMPs in WHPAs.

Sinkhole Areas: 231 sinkhole areas were identified in Floyd County through a review of Indiana Geological Survey (IGS) data. Most of the County’s sink hole areas are clustered along the western border.

Boat Launches: There are no known boat launches within Floyd County.

## 7.0 Existing and Available Monitoring Data

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In 2004, Harrison County to the west of Floyd County filed for a Section 205(j) funding grant to develop a Complete Indian Creek Watershed Management Plan. The plan was completed by a local firm and approved by IDEM in 2008 and includes a large portion of Floyd County and the Town of Georgetown. There was one (1) monitoring station set up in Georgetown and two (2) in Floyd County. The following results were obtained from Site 1: Indian Creek North at Banet Road, and Site 3: Indian Creek above Georgetown Creek in the County:

- Bacteria results (E. coli indicator): 147.2 (max 430) – criteria not met



- Dissolved oxygen: 5.7 mg/L – criteria met
- Habitat scores: 46 – Poor rating; 61 – Good Rating

The report identified direct sources of *E. coli* for the Indian Creek watershed as: cattle in creek, straight pipes, non-compliant wastewater treatments plants, sanitary sewer overflows (CSOs), stormwater discharges and dry-weather discharges from an illegal sanitary sewer connection. Indirect sources of *E. coli* bacterial contamination may be from overland runoff from pastures, manure piles, pet waste, wildlife, and failing septic systems.

While these monitoring data do not conclusively show that MS4 discharges from Floyd County are adversely impacting the quality of nearby surface water bodies, continued development of the SVAP will allow the County to monitor stormwater quality.

In November 2014, Washington County Soil and Water Conservation District (SWCD) received Section 205(j) funding for the South Fork Blue River Watershed Management Plan. The plan was approved in October 2017. A Total Maximum Daily Load (TMDL) has been developed for this watershed by IDEM. None of the water quality monitoring sites for the study were located in Floyd County. One site (Site 4) was located further downstream along Bear Creek, but was the closest to Floyd County. The following Table 4 was included in the report for this monitoring site, when the samples were taken in 2015.

**Table 4: Water Quality Monitoring Data from South Fork Blue River Watershed Management Plan for Site 4 – Downstream of Floyd County (Data collected in 2015)**

<b>Parameter</b>	<b>Mean/Score</b>	<b>Unit</b>	<b># of Times Does Not Meet Target</b>	<b>% Does Not Meet Target</b>
pH	8.21	SU	0/12	0%
Dissolved Oxygen	10.2	mg/L	0/12	0%
Temp	18.9	Celsius	0/12	0%
Nitrate+Nitrite	2.2	mg/L	7/7	100%
TKN	.19	mg/L	0/7	0%
TSS	4.4	mg/L	0/7	0%
Turbidity	7.80	NTU	1/12	8%
Total Phosphorus	.024	mg/L	0/7	0%
<i>E. coli</i>	355.1	Colonies/100 mL	8/10	80%
Fish IBI	34	-	1/1	100%
QHEI(IBI)	64	-	0/1	0%
mIBI	46	-	0/1	0%
QHEI(mIBI)	47	-	0/1	100%

According to the report, sources of *E. coli* within the Bear Creek watershed include: livestock in streams, overgrazing, manure applied to cropland, and failing septic systems. Education on fixing and maintaining septic systems and the use of buffers around agricultural and pasture area are potential ways to mitigate sources of *E. coli* from reaching waterways.

The Final Total Maximum Daily Load (TMDL) Report for the South Fork Blue River Watershed was published by IDEM in August 2017. The TMDL report utilized the data from the Complete Watershed Management Plan. The portion of the South Fork Blue River Watershed located in Floyd County is minimal



so the County has minimal opportunity to improve water quality through activities taking place within the County. Measures will continue to be taken by the County to minimize negative impacts to Bear Creek, such as inspections and educating residents.

A search for more recent (last 5 years) water quality and related data beyond the watershed studies and Impaired 303(d) List from IDEM was performed using publicly accessible reports and databases published by the Indiana Department of Natural Resources (IDNR), United States Environmental Protection Agency (USEPA), and the United States Geological Survey (USGS). These agencies had not published more recent water quality data for streams in Floyd County.

## 8.0 Areas with Potential to Contribute to Water Quality Issues

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IDEM data collected in 2022 for the 303(d) tool showed the presence of impaired biotic communities, as well as potentially high levels of *E. coli* and nutrients. The Indian Creek Watershed Management Plan and South Fork Blue River Watershed Management Plan found that, while difficult to quantify, failing and inadequate septic systems may be a likely source of *E. coli* and bacteria. Proper care and maintenance of septic systems is a primary way to keep incidental discharges from reaching local streams and water bodies. Education of residents regarding maintenance is a way to help mitigate this source of pollutant.

Within the Floyd County MS4 area, there are no known facilities that discharge stormwater from industrial activities regulated under Rule 6 (IDEM, 2023). There are fourteen active industrial stormwater permits within the City of New Albany, but these are not under the jurisdiction of Floyd County.

Floyd County has a well-maintained MS4 system that effectively addresses stormwater and drainage issues. Limited monitoring data for the County's MS4 receiving waters indicate the presence of impaired biotic communities, and potentially high levels of bacteria or nutrients. While elevated levels of *E. coli* and nutrients are common problems for waterbodies in highly agricultural areas, none of these studies were able to draw conclusions concerning the quality of stormwater from Floyd County.

The implementation of structural BMPs in new developments, as well as the continued implementation of the SVAP will ensure the continued monitoring of water quality in Floyd County. Also, ongoing public education and illicit discharge detection and elimination efforts by the County will be crucial to the continued success of the County's MS4 Program.

## 9.0 Recommendations

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Based on the findings of this water quality characterization report, Floyd County plans to continue to implement and enhance the MS4 program. The following additional BMPs are recommended for consideration.

- Finalize the development of the 2023 Qualified Professional program and implement the plan the new permit term.



- Continue to implement the SVAP monitoring protocol to collect additional data in potentially impacted streams to help distinguish between stormwater, point and non-point pollution sources.
- Utilize the Indian Creek Watershed Plan, South Fork Blue River Watershed Management Plan, and TMLD for the South Fork Blue River Watershed to assist with identification, prioritization, scheduling, and implementation of areas in need of further monitoring, education efforts, and inspection.
- Continue inspecting and monitoring stormwater management activities occurring and BMPs being implemented at municipal facilities and during municipal operations.
- Further enhance the outreach and public participation program to educate residents and visitors about stormwater quality.