



*Aquatic Enhancement  
& Survey, Inc.*

---

**Draft 2024 Water Quality Sampling Report  
Steuben County Lakes Council  
Steuben County, Indiana**

---

December 5, 2024



Aquatic Enhancement  
& Survey, Inc.  
P.O. Box 1036  
Angola, IN 46703

1-888-867-5253  
260-665-8226  
[www.aquaticenhancement.com](http://www.aquaticenhancement.com)

## **Acknowledgements**

I would like to thank the following people for making possible the 2023 season sampling and the preparation of this report: Bill Schmidt, Cheri Stroh, and the membership of the Steuben County Lakes Council, the Anthony Wayne Council, Keith Chrysler, and Dean Rosener. Laboratory analysis for this work was performed by Sandhill Environmental, Waterloo Indiana. Field work and report preparation was performed by Scott Banfield, Tyler Harrington, Gunnar Psurny, and Sue Smith of Aquatic Enhancement & Survey, Inc.

## Table of Contents

Page

|                                 |    |
|---------------------------------|----|
| 1. Project Overview and Purpose | 4  |
| 2. Methods                      | 5  |
| 3. Results May Sampling         | 15 |
| 4. Results: July Sampling       | 15 |
| 5. Results: August Sampling     | 15 |
| 6. Conclusions                  | 16 |

### List of Figures

|                               |   |
|-------------------------------|---|
| Figure 1 Project Location Map | 4 |
| Figure 2 Sampling Site Map    | 6 |

### List of Tables

|  |    |
|--|----|
| Table 1 Descriptions of numbered sampling sites  | 7  |
| Table 2 May data for sites 1 through 39  | 8  |
| Table 3 May/June data for sites 40 through 76  | 9  |
| Table 4 July data for sites 1 through 39   | 10 |
| Table 5 July data for sites 40 through 76  | 11 |
| Table 6 August data for sites 1 through 39   | 12 |
| Table 7 August data for sites 40 through 76  | 13 |
| Table 8 Indiana Department of Environmental Quality Table of Water Quality Targets                               | 14 |
| Table 9 Average of IDEM-collected probabilistic Indiana stream data for the St Joseph River Watershed 2000-2005. | 15 |

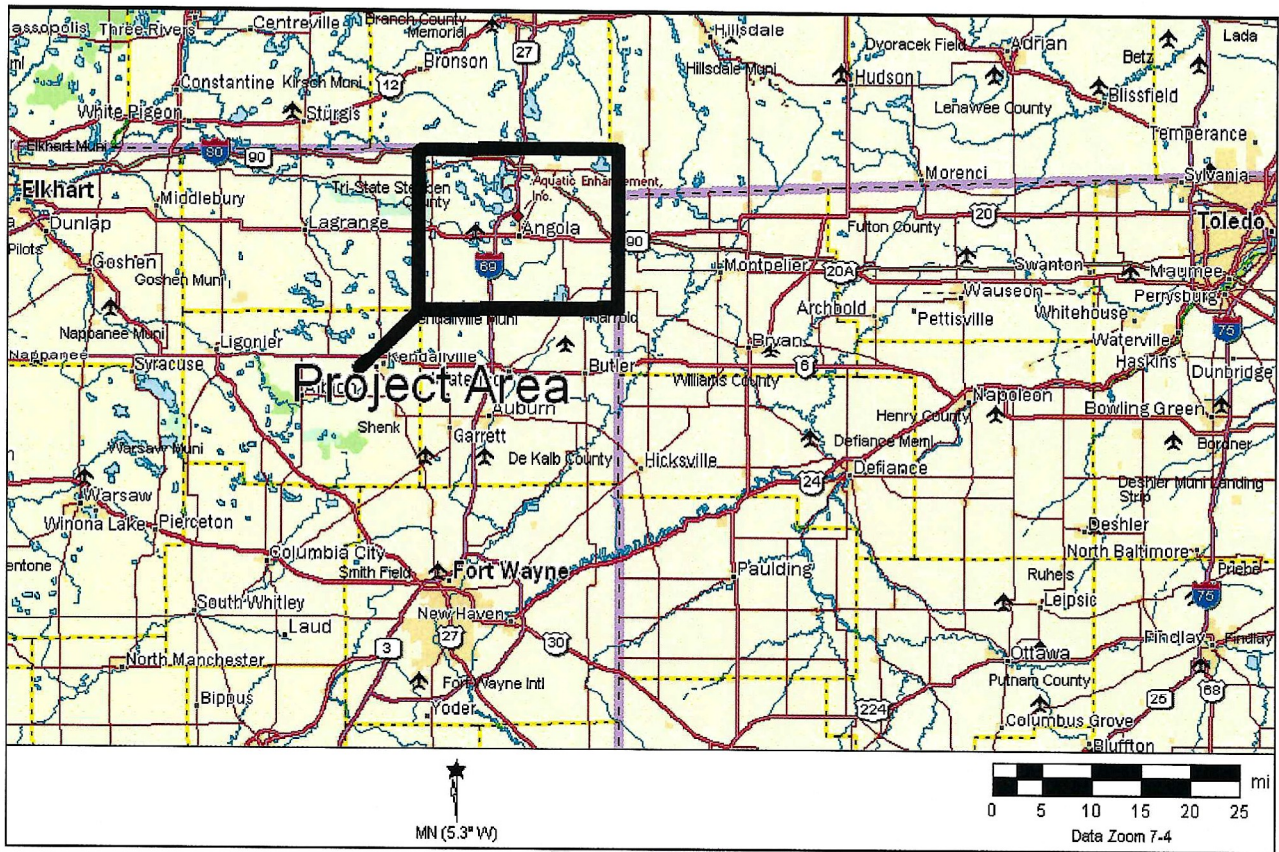


Figure 1 Project location map

## 1. Project Overview and Purpose:

This project was completed by Aquatic Enhancement & Survey, Inc. under contract with the Steuben County Lakes Council (SCLC) and Angola/Trine MS4. Also partnered with the SCLC in support of this work was the Steuben County Surveyor's Office, the Clear Lake Township Land Conservancy, and the Lake George Conservancy. Basic water quality data and stream flow (discharge) measurements were collected from 47 sites on several streams and lakes in Steuben County, Indiana, LaGrange County, Indiana, and Branch County, Michigan. Two additional sites were sampled by volunteers and included in the data in this report. Sampling reported in this work was completed in May, July, August and September of 2023. Figure 2 (page 6) displays sampling locations and associated surface water features. For most sites, measured parameters included total phosphorus, total suspended solids, pH, dissolved oxygen, temperature, specific conductance, and E-coli. A basic measurement of stream flow-rate (discharge) at each sampling site was taken when conditions permitted.

Total phosphorus and total suspended solids loading figures were calculated for certain sites at which these measurements were detectable and at which a flow measurement was taken. The purpose of the sampling was to gain a basic understanding of the fate and source of contaminants in these systems with a goal of directing future sampling or directing remediation of watershed point and non-point pollution sources. Table 1 provides a site key showing brief written descriptions of each numbered sampling site. Collected data and calculated loading rates are provided in tables 1-6.

## **2. Methods:**

All samples collected were grab samples. All samples were placed on ice immediately after collection. Measurements for temperature, dissolved oxygen, and specific conductance were taken in the field using a meter. Measurements of pH were taken in the field using a meter or measured in the laboratory. Meters were calibrated at the beginning of each sampling day.

Where possible, stream flows were calculated using measurements of the stream cross-sectional area and stream velocity. Stream flow cross-sectional area was calculated by measuring stream width using a tape measure and calculating average stream depth by measuring depth at multiple equidistant points using a measuring staff or tape measure. Quality Assurance Procedures and EPA method codes for laboratory analysis are available upon request.

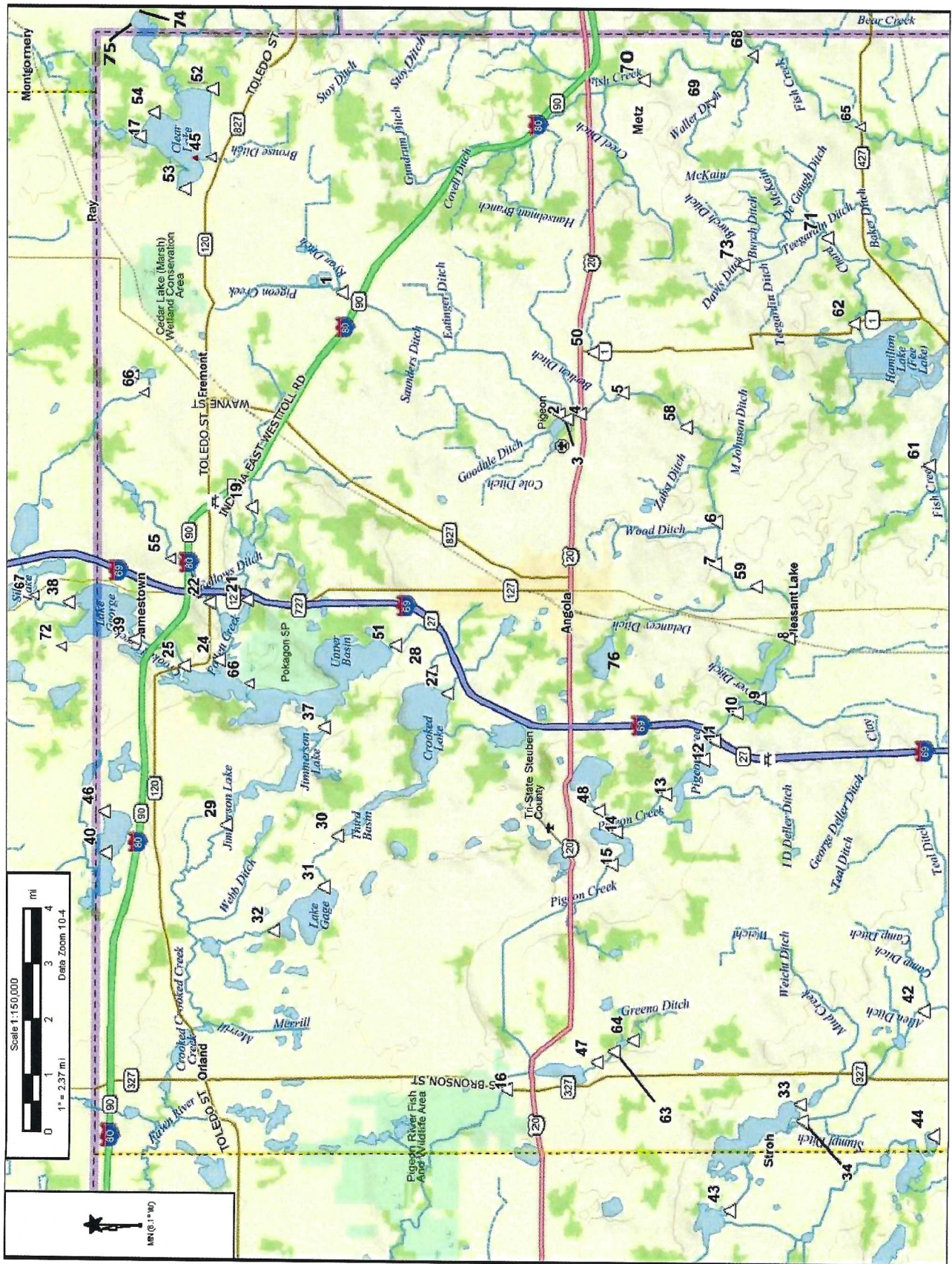


Figure 2 Sampling site map

| Samp Site | SCLC funded | At or near HUC 12 Outlet (10) | At or near HUC14 Outlet Site (13) | Steuben Surveyor Funding (6) | MS4 Funding (2 sites) | Clear Lake funding (2) | Ham. Funding (2) | George Funding (2) | Snow Funding (1) | Location Description   |
|-----------|-------------|-------------------------------|-----------------------------------|------------------------------|-----------------------|------------------------|------------------|--------------------|------------------|--|
| 1.        | yes         |                               | yes                               |                              |                       |                        |                  |                    |                  | Pigeon, East Ray Clark Road at culvert, below juncture with the Ryan Ditch.      |
| 2.        | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Pigeon Creek, Pigeon Lake Inlet.   |
| 3.*       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Pigeon Creek, Pigeon Lake Outlet. *May only                                      |
| 4.        | yes         | yes                           | yes                               |                              |                       |                        |                  |                    |                  | Pigeon, U.S. 20 Bridge, Below juncture with Berlien Ditch.                       |
| 5.        | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Pigeon Creek, Metz Road.   |
| 7.        |             |                               |                                   |                              | yes                   |                        |                  |                    |                  | Pigeon Creek, Meridian Road.   |
| 8.        | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Pigeon Creek, Long Lake Inlet.   |
| 9.*       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Pigeon Creek, Long Lake Outlet. *May only  |
| 10.       | yes         | yes                           | yes                               |                              |                       |                        |                  |                    |                  | Pigeon Creek, Mud Lake Outlet just west of Long Lake, Johnson Ditch from Ashley. |
| 11.*      | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Pigeon Creek, Big Bower Lake Inlet. *May only                                    |
| 12.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Pigeon Creek, Big Bower Lake Outlet/Golden Lake Inlet.                           |
| 13.*      | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Pigeon Creek, Golden Lake Outlet. *May only                                      |
| 14.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Pigeon Creek, Hogback Lake Inlet.  |
| 15.       | yes         | yes                           | yes                               |                              |                       |                        |                  |                    |                  | Pigeon Creek, Hogback Lake Outlet.   |
| 16.       | yes         | yes*                          | yes*                              |                              |                       |                        |                  |                    |                  | Pigeon Creek at 327.   |
| 17.       | yes         |                               | yes                               |                              |                       |                        |                  |                    |                  | Clear Lake Outlet.   |
| 19.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Crane Marsh Outlet, (tributary to Marsh Lake).                                   |
| 21.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Follet Creek, Little Otter Lake Inlet.   |
| 22.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Walter's Lakes Drain (tributary to Big Otter Lake).                              |
| 24.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Follet Creek, Snow Lake Inlet.   |
| 25.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Crooked Creek at 120 (Tributary to Snow Lake).                                   |
| 26.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Carpenter Ditch (outlet from Center Lake)  |
| 27.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Carpenter Ditch (Tributary to Crooked Lake).                                     |
| 28.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Palfreyman Ditch (Tributary to Crooked Lake).                                    |
| 29. *     | yes         | yes*                          | yes*                              |                              |                       |                        |                  |                    |                  | Crooked Ck (Jimm. Outlet Nevada Mills). *May only                                |
| 30.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Concorde Creek (Outlet from Crooked Lake).                                       |
| 31.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Concorde Creek (Inlet to Lake Gage).   |
| 32.       | yes         | yes*                          | yes*                              |                              |                       |                        |                  |                    |                  | Concorde Creek (Outlet from Lime Lake).  |
| 33.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Dewitt Ditch (Tributary to Big Turkey Lake).                                     |
| 34.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Turkey Creek (Tributary to Big Turkey Lake).                                     |
| 35.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Fox Lake Outlet  |
| 37.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Crooked Creek (James Outlet, Jimmerson Inlet at 4 corners).                      |
| 38.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Lake George NE tributary (from Silver Lake).                                     |
| 39.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Crooked Creek (Lake George Outlet).  |
| 40.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Lake Pleasant.   |
| 42.       | yes         | yes                           | yes                               |                              |                       |                        |                  |                    |                  | Turkey Ck at 700S east of 800W, below Little Turkey and Deetz Ditch juncture.    |
| 43.       | yes         | yes*                          | yes*                              |                              |                       |                        |                  |                    |                  | Big Turkey Outlet at 350S on curve north of Stroh or west of Turkey Lake Tavern. |
| 44.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Trib. To McClish Lake (east end).  |
| 45.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Trib. To Clear Lake (Cyrus Brouse Ditch).  |
| 46.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Trib. To Lake Pleasant (East End).   |
| 47.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Trib. To West Otter (Between Arrowhead and Otter).                               |
| 48.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Trib. Between Silver and Hogback.  |
| 50.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | William Jack Ditch (at State Rd. 1).   |
| 51.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Croxton Ditch (at West 275 North).   |
| 52.       |             |                               |                                   | yes                          |                       |                        |                  |                    |                  | Clear Lake Trib. (Harry Teeters Ditch).  |
| 53.       |             |                               |                                   |                              |                       | yes                    |                  |                    |                  | Clear Lake Trib. (Peter Smith Ditch).  |
| 54.       |             |                               |                                   |                              |                       | yes                    |                  |                    |                  | Clear Lake Trib. (Alvin Patterson Ditch).  |
| 58.       |             |                               |                                   |                              | yes                   |                        |                  |                    |                  | Pigeon Creek at Hanselman.   |
| 61.       |             |                               |                                   | yes                          |                       |                        |                  |                    |                  | Tributary to Ball Lake.  |
| 62.       |             |                               |                                   | yes                          |                       |                        |                  |                    |                  | Black Creek, Tributary to Hamilton Lake.   |
| 63.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Tributary just downstream of Arrowhead Lake.                                     |
| 64.       |             |                               |                                   | yes                          |                       |                        |                  |                    |                  | Tributary to Arrowhead Lake at south end of Arrowhead Lake                       |
| 65.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Fish Creek at 427  |
| 68.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Fish Creek at E 400 S  |
| 69.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Fish Creek at S 850 E (S/19/17 upstream of S 850 E)                              |
| 70.       | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Fish Creek at E Metz Rd.   |
| 72.       |             |                               |                                   |                              |                       |                        |                  | yes                |                  | Trib. to Lake George at 150 W, N. of launch                                      |
| 74*       | yes         | VOLUNTEER SAMPLED             |                                   |                              |                       |                        |                  |                    |                  | East Trib. to Little Long Lake * volunteer sampled                               |
| 75*       | yes         | VOLUNTEER SAMPLED             |                                   |                              |                       |                        |                  |                    |                  | Trib. to Lit. Long Lake, Derr Drain * volunteer sampled                          |
| 76        | yes         |                               |                                   |                              |                       |                        |                  |                    |                  | Fox Lake Beach   |

Table 1 Descriptions of numbered sampling sites

|    | Date    | E-coli                   | CFM Discharge | Total Phos. | Total Phos. Loading | TSS   | TSS Loading | D.O. | pH   | Temp (F) | Specific Conductance | Post rain event * |
|----|---------|--------------------------|---------------|-------------|---------------------|-------|-------------|------|------|----------|----------------------|-------------------|
|    |         | (CFU or colonies/100 ml) |               | (ppm)       | (kg/day)            | (ppm) | (kg/day)    |      |      |          |                      |                   |
| 1  | 5/28/24 | 272.3                    | 110.70        | 0.025       | 0.11                | 13.0  | 58.69       | 8.2  | 7.73 | 56.2     | 836                  |                   |
| 2  | 5/28/24 | 46.1                     | 700.94        | 0.042       | 1.20                | 16.0  | 457.36      | 9.0  | 7.89 | 57.7     | 790                  |                   |
| 3  | 5/28/24 | 39.9                     | 830.18        | 0.021       | 0.71                | 4.8   | 162.51      | 9.7  | 8.34 | 65.2     | 671                  |                   |
| 4  | 5/28/24 | 1119.9                   | 572.90        | 0.033       | 0.77                | 7.6   | 177.56      | 8.1  | 8.11 | 64.8     | 703                  |                   |
| 5  | 5/28/24 | 98.7                     | 1611.69       | 0.058       | 3.81                | 5.8   | 381.21      | 7.3  | 7.93 | 65.7     | 735                  |                   |
| 7  | 5/28/24 | 1986.3                   | 2625.69       | 0.100       | 10.71               | 19.0  | 2034.48     | 8.0  | 7.87 | 63.0     | 779                  |                   |
| 8  | 5/28/24 | 1203.3                   | nd            | 0.084       | nd                  | 17.0  | nd          | 8.6  | 7.88 | 64.0     | 760                  |                   |
| 9  | 5/28/24 | 24.1                     | 690.03        | 0.035       | 0.98                | 5.4   | 151.96      | 8.9  | 8.05 | 67.2     | 708                  |                   |
| 10 | 5/28/24 | 172.3                    | nd            | 0.042       | nd                  | 5.8   | nd          | 9.4  | 8.02 | 66.8     | 765                  |                   |
| 11 | 5/28/24 | 272.3                    | nd            | 0.031       | nd                  | 9.6   | nd          | 8.7  | 8.02 | 67.6     | 743                  |                   |
| 12 | 5/28/24 | 65.0                     | 1984.08       | 0.039       | 3.16                | 6.2   | 501.66      | 8.8  | 8.06 | 67.6     | 749                  |                   |
| 13 | 5/29/24 | 21.6                     | nd            | 0.032       | nd                  | 2.1   | nd          | 7.0  | 8.22 | 69.2     | 682                  |                   |
| 14 | 5/29/24 | 133.3                    | 3077.87       | 0.020       | 2.51                | 2.1   | 263.59      | 6.8  | 8.05 | 67.2     | 684                  |                   |
| 15 | 5/29/24 | 920.8                    | 3415.23       | 0.099       | 13.79               | 5.9   | 821.73      | 7.4  | 8.20 | 68.8     | 647                  |                   |
| 16 | 5/29/24 | 1732.9                   | 2550.20       | 0.020       | 2.08                | 3.7   | 384.80      | 7.7  | 7.89 | 64.5     | 654                  |                   |
| 17 | 5/23/24 | 10.9                     | nd            | 0.010       | nd                  | 1.9   | nd          | 8.6  | 8.61 | 72.0     | 317                  |                   |
| 19 | 5/30/24 | 196.8                    | 559.84        | 0.021       | 0.48                | 7.2   | 164.38      | 7.9  | 7.95 | 59.9     | 834                  |                   |
| 21 | 5/30/24 | 48.0                     | 1205.21       | <.007*      | nd                  | 1.9   | 93.38       | 7.0  | 8.03 | 64.7     | 696                  |                   |
| 22 | 5/30/24 | 143.0                    | 97.89         | 0.045       | 0.18                | <1.1* | nd          | 5.2  | 7.52 | 61.5     | 915                  |                   |
| 24 | 5/30/24 | 35.0                     | nd            | <.007*      | nd                  | 2.6   | nd          | 6.6  | 8.01 | 66.7     | 683                  |                   |
| 25 | 5/30/24 | 57.3                     | 539.63        | <.007*      | nd                  | <1.3* | nd          | 6.7  | 7.73 | 66.5     | 406                  |                   |
| 26 | 5/31/24 | 159.7                    | 135.58        | 0.070       | 0.39                | 12.0  | 66.35       | 8.1  | 7.95 | 68.0     | 455                  |                   |
| 27 | 5/31/24 | 45.5                     | 110.44        | 0.031       | 0.14                | <.20* | nd          | 8.5  | 7.95 | 66.7     | 481                  |                   |
| 28 | 5/31/24 | 410.6                    | 171.73        | 0.066       | 0.46                | 13.0  | 91.04       | 8.4  | 7.88 | 61.4     | 493                  |                   |
| 29 | 5/30/24 | 21.1                     | 1507.42       | <.007*      | nd                  | 1.8   | 110.65      | 8.3  | 8.06 | 73.1     | 510                  |                   |
| 30 | 5/30/24 | 17.3                     | 702.72        | <.007*      | nd                  | 5.0   | 143.29      | 7.7  | 8.12 | 71.5     | 428                  |                   |
| 31 | 5/30/24 | 86.0                     | 519.91        | 0.013       | 0.28                | 3.4   | 72.09       | 8.3  | 8.06 | 68.7     | 439                  |                   |
| 32 | 5/30/24 | 12.1                     | 557.93        | <0.007*     | nd                  | <1.1* | nd          | 8.5  | 8.33 | 69.5     | 440                  |                   |
| 33 | 5/29/24 | 45.0                     | 126.25        | <0.007*     | nd                  | 3.9   | 20.08       | 8.6  | 8.07 | 68.7     | 664                  |                   |
| 34 | 5/29/24 | 178.0                    | 1074.51       | 0.041       | 1.80                | 5.0   | 219.10      | 9.1  | 7.72 | 66.0     | 674                  |                   |
| 35 | 5/30/24 | 4.1                      | 188.69        | <.007*      | nd                  | 1.8   | 13.85       | 9.1  | 8.35 | 72.9     | 462                  |                   |
| 37 | 5/30/24 | 26.9                     | nd            | <.007*      | nd                  | 2.0   | nd          | 9.8  | 8.35 | 70.9     | 503                  |                   |
| 38 | 5/30/24 | 290.9                    | 317.81        | <.007*      | nd                  | <2.0* | nd          | 6.1  | 7.45 | 66.4     | 365                  |                   |
| 39 | 5/30/24 | 12.1                     | nd            | <.007*      | nd                  | <1.1* | nd          | nd   | 8.65 | nd       | nd                   |                   |

**Table 2 May data for sites 1 through 39. The notation “nd” denotes that no data was collected or calculated due to a result below lab detection limits or the constraints of field conditions. Data shaded exceeds certain water quality standards selected from those provided by IDEM (see corresponding shaded standards in table 8). An asterisk (\*) in the post rain event column indicated sample collection occurred within 48 hours of .5 inches of rainfall or more.**



| Site | Date    | E-coli<br>(CFU or colonies/100 ml) | CFM Discharge | Total Phos.<br>(ppm) | Total Phos. Loading<br>(kg/day) | TSS<br>(ppm) | TSS Loading<br>(kg/day) | D.O. | pH   | Temp (F) | Specific Conductance | Post rain event * |
|------|---------|------------------------------------|---------------|----------------------|---------------------------------|--------------|-------------------------|------|------|----------|----------------------|-------------------|
| 40   | 5/30/24 | 1.0                                | nd            | <.007*               | nd                              | <1.1*        | nd                      | nd   | 8.53 | nd       | nd                   |                   |
| 42   | 5/29/24 | >4839.2*                           | 874.71        | 0.334                | 11.91                           | 12.0         | 428.06                  | 8.7  | 7.72 | 65.9     | 633                  |                   |
| 43   | 5/29/24 | 11.9                               | 1761.99       | 0.010                | 0.72                            | 1.4          | 100.60                  | 8.2  | 8.19 | 71.3     | 586                  |                   |
| 44   | 5/29/24 | 178.9                              | 159.94        | 0.011                | 0.07                            | 10.0         | 65.22                   | 8.7  | 7.67 | 59.6     | 764                  |                   |
| 45   | 5/23/24 | 920.8                              | 43.5          | 0.070                | 0.12                            | 5.8          | 10.28                   | 7.0  | 7.81 | 63.6     | 663.0                |                   |
| 46   | 5/30/24 | 517.2                              | nd            | <.007*               | nd                              | 3.9          | nd                      | nd   | 7.44 | nd       | nd                   |                   |
| 47   | 5/29/24 | 209.8                              | 214.98        | 0.035                | 0.31                            | 6.6          | 57.86                   | 8.1  | 8.15 | 66.7     | 535                  |                   |
| 48   | 5/29/24 | 66.3                               | 915.52        | <.007                | nd                              | 2.0          | 74.67                   | 7.7  | 8.33 | 68.8     | 424                  |                   |
| 50   | 5/23/24 | 461.1                              | 25.03         | 0.058                | 0.06                            | 5.6          | 5.72                    | 8.1  | 7.85 | 65.8     | 684                  |                   |
| 51   | 5/31/24 | 228.2                              | 89.06         | <.007*               | nd                              | <2.0*        | nd                      | 9.7  | 7.89 | 54.1     | 911                  |                   |
| 52   | 5/23/24 | 488.4                              | 17.23         | 0.12                 | 0.09                            | 3.00         | 2.11                    | 5.7  | 7.87 | 65.1     | 678                  |                   |
| 53   | 5/23/24 | 2.0                                | 4.47          | 0.010                | 0.00                            | 2.6          | 0.47                    | 7.0  | 7.27 | 54.1     | 758                  |                   |
| 54   | 5/23/24 | nd                                 | nd            | nd                   | nd                              | nd           | nd                      | nd   | nd   | nd       | nd                   |                   |
| 58   | 5/28/24 | 3635.0                             | 2702.52       | 0.715                | 78.80                           | 260.0        | 28654.84                | 7.7  | 7.74 | 64.1     | 652                  |                   |
| 61   | 5/23/24 | 198.9                              | 381.84        | 0.178                | 2.77                            | 6.2          | 96.54                   | 7.8  | 7.93 | 66.5     | 609                  |                   |
| 62   | 5/23/24 | 218.7                              | 229.52        | 0.102                | 0.95                            | 4.8          | 44.93                   | 8.2  | 8.08 | 66.3     | 659                  |                   |
| 63   | 5/31/24 | 141.4                              | nd            | 0.030                | nd                              | 3.6          | nd                      | 8.5  | 8.36 | 65.9     | 554                  |                   |
| 64   | 5/29/24 | 1299.7                             | 245.83        | 0.136                | 1.36                            | 30.0         | 300.75                  | 8.0  | 7.81 | 62.2     | 560                  |                   |
| 65   | 5/23/24 | 410.6                              | 1309.25       | 0.146                | 7.80                            | <2.0*        | nd                      | 7.2  | 8.04 | 68.3     | 657                  |                   |
| 68   | 5/23/24 | 1732.9                             | nd            | 0.090                | nd                              | 15.0         | nd                      | 7.4  | 8.00 | 69.9     | 651                  |                   |
| 69   | 5/23/24 | 613.1                              | 1436.80       | 0.133                | 7.79                            | 13.0         | 761.72                  | 7.5  | 8.03 | 69.2     | 657                  |                   |
| 70   | 5/23/24 | 193.5                              | 479.12        | 0.067                | 1.31                            | 6.4          | 125.05                  | 7.6  | 7.82 | 65.5     | 689                  |                   |
| 72   | 5/23/24 | 221.1                              | nd            | 0.042                | nd                              | 2.9          | nd                      | nd   | 7.27 | nd       | nd                   |                   |
| 74   | 5/30/24 | 176.0                              | nd            | 0.274                | nd                              | 6.0          | nd                      | nd   | 7.36 | nd       | nd                   |                   |
| 75   | 5/30/24 | 51.8                               | nd            | 0.135                | nd                              | <1.0*        | nd                      | nd   | 6.99 | nd       | nd                   |                   |
| 76   | 5/30/24 | 6.2                                | nd            | <.007*               | nd                              | 2.4          | nd                      | nd   | 8.41 | nd       | nd                   |                   |

**Table 3 May data for sites 40 through 76. The notation “nd” denotes that no data was collected or calculated due to a result below lab detection limits or the constraints of field conditions. Data shaded exceeds certain water quality standards selected from those provided by IDEM (see corresponding shaded standards in table 8). An asterisk (\*) in the post rain event column indicated sample collection occurred within 48 hours of .5 inches of rainfall or more.**

| Site | Date    | E-coli<br>(CFU or colonies/100 ml) | CFM Discharge | Total Phos.<br>(ppm) | Total Phos. Loading<br>(kg/day) | TSS<br>(ppm) | TSS Loading<br>(kg/day) | D.O. | pH   | Temp (F) | Specific Conductance | Post rain event * |
|------|---------|------------------------------------|---------------|----------------------|---------------------------------|--------------|-------------------------|------|------|----------|----------------------|-------------------|
| 1    | 7/23/24 | 1158.8                             | 171.62        | 0.037                | 0.26                            | 38.0         | 265.95                  | 8.1  | 7.74 | 61.9     | 866                  |                   |
| 2    | 7/23/24 | 821.2                              | 788.84        | 0.078                | 2.51                            | 6.0          | 193.02                  | 9.8  | 7.94 | 66.7     | 820                  |                   |
| 4    | 7/23/24 | 167.2                              | 722.28        | 0.054                | 1.59                            | 21.0         | 618.56                  | 7.7  | 7.95 | 75.3     | 659                  |                   |
| 5    | 7/23/24 | 119.6                              | 1546.71       | 0.026                | 1.64                            | 9.0          | 567.68                  | 7.4  | 7.85 | 69.3     | 693                  |                   |
| 7    | 7/23/24 | 203.8                              | 2922.66       | <.007*               | nd                              | 4.2          | 500.59                  | 6.8  | 7.81 | 72.5     | 838                  |                   |
| 8    | 7/23/24 | 383.6                              | 2414.91       | 0.048                | 4.73                            | 3.4          | 334.84                  | 8.3  | 7.99 | 72.1     | 809                  |                   |
| 10   | 7/23/24 | 14.8                               | 1802.17       | 0.055                | 4.04                            | 5.4          | 396.87                  | 9.0  | 8.28 | 77.4     | 661                  |                   |
| 12   | 7/23/24 | 6.2                                | 2802.64       | 0.046                | 5.26                            | 7.0          | 800.06                  | 10.5 | 8.35 | 77.3     | 652                  |                   |
| 14   | 7/24/24 | 27.5                               | 2938.81       | <.007*               | nd                              | 8.0          | 958.78                  | 6.7  | 7.97 | 76.2     | 619                  |                   |
| 15   | 7/24/24 | 2.0                                | 3246.06       | <.007*               | nd                              | 11.0         | 1456.15                 | 4.7  | 8.32 | 77.7     | 616                  |                   |
| 16   | 7/24/24 | 113.0                              | 3580.35       | <.007*               | nd                              | 11.0         | 1606.10                 | 6.2  | 7.88 | 71.9     | 626                  |                   |
| 17   | 7/25/24 | 5.2                                | nd            | <.007*               | nd                              | 2.2          | nd                      | 7.1  | 8.18 | 76.2     | 314                  |                   |
| 19   | 7/25/24 | 387.3                              | 239.06        | 0.038                | 0.37                            | 6.2          | 60.44                   | 7.3  | 7.96 | 65.5     | 922                  |                   |
| 21   | 7/25/24 | 38.4                               | 986.35        | 0.007                | 0.28                            | <2.0*        | nd                      | 4.3  | 7.73 | 72.4     | 681                  |                   |
| 22   | 7/25/24 | 410.6                              | 88.60         | 0.085                | 0.31                            | 4.4          | 15.90                   | 2.7  | 7.45 | 69.0     | 795                  |                   |
| 24   | 7/25/24 | 2.0                                | nd            | <.007*               | nd                              | 3.8          | nd                      | 7.5  | 8.05 | 76.6     | 628                  |                   |
| 25   | 7/25/24 | 193.5                              | 1048.52       | <.007*               | nd                              | 2.8          | 119.73                  | 4.7  | 7.53 | 76.1     | 376                  |                   |
| 26   | 7/24/24 | 78.5                               | 50.84         | <.007*               | nd                              | 14.0         | 29.03                   | 6.8  | 8.04 | 76.9     | 451                  |                   |
| 27   | 7/24/24 | 161.6                              | 12.82         | 0.030                | 0.02                            | 20.0         | 10.46                   | 8.0  | 7.94 | 76.3     | 750                  |                   |
| 28   | 7/24/24 | 980.4                              | 53.04         | <.007*               | nd                              | 13.0         | 28.12                   | 7.5  | 8.10 | 72.2     | 497                  |                   |
| 30   | 7/24/24 | 36.8                               | 415.90        | <.007*               | nd                              | 2.7          | 45.79                   | 6.8  | 7.82 | 79.0     | 418                  |                   |
| 31   | 7/24/24 | 270.0                              | 299.96        | <.007*               | nd                              | 3.5          | 42.81                   | 7.4  | 8.07 | 75.6     | 436                  |                   |
| 32   | 7/24/24 | 27.2                               | 560.03        | <.007*               | nd                              | 2.0          | nd                      | 7.5  | 8.31 | 79.0     | 413                  |                   |
| 33   | 7/30/24 | 98.8                               | nd            | 0.028                | nd                              | 4.0          | nd                      | 9.1  | 8.15 | 76.9     | 578                  | *                 |
| 34   | 7/30/24 | 547.5                              | 832.14        | 0.049                | 1.66                            | 3.0          | 101.81                  | 4.0  | 7.57 | 73.2     | 507                  | *                 |
| 35   | 7/24/24 | 52.9                               | 27.53         | <.007*               | nd                              | <2.0*        | nd                      | 6.3  | 8.17 | 77.3     | 447                  |                   |
| 37   | 7/24/24 | 86.2                               | nd            | <.007*               | nd                              | 1.6          | nd                      | 8.4  | 8.40 | 78.4     | 488                  |                   |
| 38   | 7/25/24 | 125.9                              | 237.80        | 0.013                | 0.13                            | <2.0*        | nd                      | 4.0  | 7.28 | 73.3     | 359                  |                   |
| 39   | 7/25/24 | 62.0                               | 1375.09       | 0.011                | 0.62                            | 2.4          | 134.59                  | 7.1  | 8.25 | 77.7     | 343                  |                   |

**Table 4 July data for sites 1 through 39. The notation “nd” denotes that no data was collected or calculated due to a result below lab detection limits or the constraints of field conditions. Data shaded exceeds certain water quality standards selected from those provided by IDEM (see corresponding shaded standards in table 8). An asterisk (\*) in the post rain event column indicated sample collection occurred within 48 hours of .5 inches of rainfall or more.**

| Site | Date    | E-coli<br>(CFU or colonies/100 ml) | CFM Discharge | Total Phos.<br>(ppm) | Total Phos. Loading<br>(kg/day) | TSS<br>(ppm) | TSS Loading<br>(kg/day) | D.O. | pH   | Temp (F) | Specific Conductance | Post rain event * |
|------|---------|------------------------------------|---------------|----------------------|---------------------------------|--------------|-------------------------|------|------|----------|----------------------|-------------------|
| 40   | 7/24/24 | 1.0                                | nd            | <.007*               | nd                              | 2.1          | nd                      | 7.7  | 8.54 | 76.4     | 370                  |                   |
| 42   | 7/30/24 | >8,065.3*                          | 382.03        | 0.414                | 6.45                            | 14.0         | 218.11                  | 4.9  | 7.66 | 72.2     | 655                  | *                 |
| 43   | 7/30/24 | 235.9                              | 1441.36       | 0.020                | 1.18                            | 6.0          | 352.68                  | 6.8  | 8.00 | 78.6     | 440                  | *                 |
| 44   | 7/30/24 | 1119.9                             | 22.05         | 0.009                | 0.01                            | 5.2          | 4.68                    | 6.7  | 7.42 | 61.8     | 763                  | *                 |
| 45   | 7/25/24 | 1841.6                             | nd            | 0.105                | nd                              | 36.0         | nd                      | 7.2  | 7.85 | 62.2     | 700.0                |                   |
| 46   | 7/24/24 | 204.6                              | 29.58         | <.007*               | nd                              | 1.1          | nd                      | 8.3  | 7.52 | 62.0     | 683                  |                   |
| 47   | 7/30/24 | 1732.9                             | 48.46         | 0.082                | 0.16                            | 4.6          | 9.09                    | 5.9  | 7.86 | 72.6     | 554                  | *                 |
| 48   | 7/23/24 | nd                                 | nd            | nd                   | nd                              | nd           | nd                      | nd   | nd   | nd       | nd                   |                   |
| 50   | 7/25/24 | 574.8                              | 5.95          | 0.085                | 0.02                            | 9.6          | 2.33                    | 8.1  | 7.90 | 71.5     | 716                  |                   |
| 51   | 7/24/24 | 156.5                              | 30.48         | 0.027                | 0.03                            | 1.2          | 1.49                    | 9.5  | 8.00 | 63.9     | 916                  |                   |
| 52   | 7/25/24 | >4839.2*                           | 8.79          | 0.130                | 0.05                            | 12.0         | 4.30                    | 6.2  | 7.75 | 65.0     | 659                  |                   |
| 53   | 7/25/24 | 6.3                                | 87.43         | 0.012                | 0.04                            | 3.2          | 11.41                   | 6.8  | 7.21 | 57.1     | 772                  |                   |
| 54   | 7/25/24 | 65.0                               | nd            | 0.082                | nd                              | 5.8          | nd                      | 2.2  | 7.19 | 64.6     | 427.0                |                   |
| 58   | 7/23/24 | 254.8                              | 2702.52       | 0.034                | 3.75                            | 4.6          | 506.97                  | 7.4  | 7.90 | 73.8     | 694                  |                   |
| 61   | 7/30/24 | 467.4                              | 240.98        | 0.083                | 0.82                            | 11.0         | 108.10                  | 7.2  | 7.90 | 69.6     | 618                  | *                 |
| 62   | 7/25/24 | 206.4                              | 422.93        | 0.090                | 1.55                            | 4.2          | 72.44                   | 8.4  | 8.04 | 68.2     | 654                  |                   |
| 63   | 7/30/24 | nd                                 | nd            | nd                   | nd                              | nd           | nd                      | nd   | nd   | nd       | nd                   |                   |
| 64   | 7/30/24 | >1,119.9*                          | 44.65         | 0.081                | 0.15                            | 5.6          | 10.20                   | 5.7  | 7.79 | 69.6     | 635                  | *                 |
| 65   | 7/25/24 | 1046.2                             | 890.88        | 0.098                | 3.56                            | 4.4          | 159.86                  | 8.4  | 8.18 | 71.7     | 684                  |                   |
| 68   | 7/30/24 | 579.4                              | nd            | 0.076                | nd                              | 5.2          | nd                      | 7.4  | 8.13 | 80.3     | 644                  | *                 |
| 69   | 7/30/24 | 435.2                              | 1043.91       | 0.114                | 4.85                            | 3.2          | 136.23                  | 6.7  | 8.08 | 74.1     | 682                  | *                 |
| 70   | 7/30/24 | 624.0                              | 484.56        | 0.051                | 1.01                            | 6.4          | 126.47                  | 8.0  | 7.84 | 71.3     | 741                  | *                 |
| 72   | 7/25/24 | 166.0                              | nd            | 0.031                | nd                              | 5.8          | nd                      | 5.3  | 7.17 | 69.7     | 690                  |                   |
| 74*  | 7/15/24 | >2419.6                            | nd            | 0.421                | nd                              | 5.8          | nd                      | nd   | 7.51 | nd       | nd                   |                   |
| 75*  | 7/15/24 | 1413.6                             | nd            | 0.472                | nd                              | 5.2          | nd                      | nd   | 6.88 | nd       | nd                   |                   |
| 76   | 7/23/24 | 2.0                                | nd            | <.007*               | nd                              | 2.3          | nd                      | 8.4  | 8.63 | 82.9     | 443                  |                   |

**Table 5 July data for sites 42 through 75. The notation “nd” denotes that no data was collected or calculated due to a result below lab detection limits or the constraints of field conditions. Data shaded exceeds certain water quality standards selected from those provided by IDEM (see corresponding shaded standards in table 8). An asterisk (\*) in the post rain event column indicated sample collection occurred within 48 hours of .5 inches of rainfall or more. An asterisk (\*) after the site number indicates volunteer collected data. An asterisk (\*) on data indicates data is suspect, laboratory analysis was performed outside the hold period.**

|    | Date    | E-coli                   | CFM Discharge | Total Phos. | Total Phos. Loading | TSS   | TSS Loading | D.O. | pH   | Temp (F) | Specific Conductance | Post rain event * |
|----|---------|--------------------------|---------------|-------------|---------------------|-------|-------------|------|------|----------|----------------------|-------------------|
|    |         | (CFU or colonies/100 ml) |               | (ppm)       | (kg/day)            | (ppm) | (kg/day)    |      |      |          |                      |                   |
| 1  | 8/22/24 | 1986.3                   | 134.52        | <.007*      | nd                  | 22.0  | 120.69      | 11.1 | 8.10 | 57.4     | 810                  |                   |
| 2  | 8/22/24 | 570.2                    | 422.13        | <.007*      | nd                  | 1.9   | 32.71       | 8.2  | 7.98 | 60.0     | 820                  |                   |
| 4  | 8/22/24 | 56.3                     | 378.50        | <.007*      | nd                  | 4.8   | 74.09       | 9.3  | 8.16 | 68.2     | 597                  |                   |
| 5  | 8/22/24 | 55.6                     | 1000.50       | <.007*      | nd                  | 4.9   | 199.93      | 7.7  | 7.96 | 68.7     | 798                  |                   |
| 7  | 8/22/24 | 82.8                     | 2938.57       | <.007*      | nd                  | 2.9   | 347.53      | 9.9  | 8.13 | 65.4     | 958                  |                   |
| 8  | 8/22/24 | 166.4                    | 2303.90       | <.007*      | nd                  | 1.1   | 103.35      | 9.3  | 8.09 | 65.0     | 907                  |                   |
| 10 | 8/22/24 | 51.2                     | 910.99        | <.007*      | nd                  | 6.2   | 230.34      | 8.1  | 8.06 | 72.3     | 763                  |                   |
| 12 | 8/22/24 | 5.2                      | 2016.17       | <.007*      | nd                  | 6.0   | 493.33      | 7.8  | 8.02 | 72.3     | 738                  |                   |
| 14 | 8/27/24 | 35.9                     | 1966.13       | 0.038       | nd                  | 2.1   | 168.38      | 3.5  | 7.63 | 78.0     | 618                  |                   |
| 15 | 8/27/24 | 6.3                      | 2894.87       | 0.04        | nd                  | 7.5   | 885.41      | 6.2  | 8.42 | 79.3     | 578                  |                   |
| 16 | 8/26/24 | 77.6                     | 1817.63       | 0.01        | nd                  | 1.9   | 140.84      | 12.4 | 8.27 | 73.4     | 618                  |                   |
| 17 | 8/20/24 | 3.1                      | nd            | 0.007       | nd                  | 1.5   | nd          | 7.0  | 8.09 | 70.6     | 305                  |                   |
| 19 | 8/20/24 | 770.1                    | 503.26        | 0.031       | 0.64                | 1.9   | 38.99       | 7.8  | 7.99 | 62.4     | 964                  |                   |
| 21 | 8/20/24 | 98.9                     | 1046.49       | <.007*      | nd                  | <1.0* | nd          | 5.6  | 7.72 | 68.3     | 709                  |                   |
| 22 | 8/20/24 | 36.3                     | 432.40        | 0.054       | 0.95                | 1.5   | 26.45       | 2.7  | 7.35 | 65.4     | 869                  |                   |
| 24 | 8/20/24 | 21.1                     | nd            | <.007*      | nd                  | 1.2   | nd          | 6.2  | 7.97 | 71.1     | 651                  |                   |
| 25 | 8/20/24 | 151.5                    | 295.07        | 0.018       | nd                  | 1.4   | 16.85       | 5.7  | 7.51 | 70.2     | 408                  |                   |
| 26 | 8/21/24 | 2419.6                   | 14.40         | 0.105       | 0.062               | 6.3   | 3.70        | 7.1  | 7.75 | 58.7     | 476                  |                   |
| 27 | 8/21/24 | 357.8                    | 16.00         | 0.055       | 0.036               | 9.8   | 6.39        | 8.5  | 8.15 | 58.8     | 573                  |                   |
| 28 | 8/21/24 | 54.6                     | 5.80          | 0.030       | 0.007               | 4.10  | 0.97        | 7.5  | 7.80 | 65.4     | 537                  |                   |
| 30 | 8/21/24 | 26.5                     | 48.07         | 0.022       | 0.043               | 2.9   | 5.68        | 6.1  | 7.61 | 68.5     | 435                  |                   |
| 31 | 8/21/24 | 155.3                    | 59.65         | 0.012       | 0.029               | 1.7   | 4.14        | 8.8  | 8.10 | 61.3     | 502                  |                   |
| 32 | 8/21/24 | 19.9                     | 338.24        | <.007*      | nd                  | 1.5   | nd          | 7.4  | 8.32 | 72.8     | 413                  |                   |
| 33 | 8/21/24 | 13.3                     | nd            | 0.034       | nd                  | 3.1   | nd          | 10.2 | 8.28 | 70.9     | 465                  |                   |
| 34 | 8/21/24 | 344.8                    | 56.81         | 0.075       | 0.17                | <1.0* | nd          | 7.0  | 7.81 | 66.8     | 545                  |                   |
| 35 | 8/21/24 | nd                       | nd            | nd          | nd                  | nd    | nd          | nd   | nd   | nd       | nd                   |                   |
| 37 | 8/20/24 | 37.3                     | nd            | <.007*      | nd                  | 1.5   | nd          | 9.0  | 8.33 | 74.2     | 480                  |                   |
| 38 | 8/20/24 | 118.7                    | 223.69        | 0.011       | 0.10                | 3.3   | nd          | 4.5  | 7.24 | 65.5     | 357                  |                   |
| 39 | 8/20/24 | 76.0                     | 148.77        | 0.035       | 0.21                | 14.0  | 84.94       | 6.6  | 7.65 | 62.3     | 680                  |                   |

Table 6 August data for sites 1 through 39. The notation “nd” denotes that no data was collected or calculated due to a result below lab detection limits or the constraints of field conditions. Data shaded exceeds certain water quality standards selected from those provided by IDEM (see corresponding shaded standards in table 8). An asterisk (\*) in the post rain event column indicated sample collection occurred within 48 hours of .5 inches of rainfall or more.

| Site | Date    | E-coli                   | CFM Discharge | Total Phos. (ppm) | Total Phos. Loading (kg/day) | TSS (ppm) | TSS Loading (kg/day) | D.O. | pH   | Temp (F) | Specific Conductance | Post rain event * |
|------|---------|--------------------------|---------------|-------------------|------------------------------|-----------|----------------------|------|------|----------|----------------------|-------------------|
|      |         | (CFU or colonies/100 ml) |               |                   |                              |           |                      |      |      |          |                      |                   |
| 40   | 8/20/24 | 1.0                      | nd            | <.007*            | nd                           | 1.9       | nd                   | 7.3  | 8.33 | 74.4     | 371                  |                   |
| 42   | 8/21/24 | 541.3                    | 29.99         | 0.082             | 0.10                         | <1.0*     | nd                   | 8.9  | 7.94 | 62.6     | 652                  |                   |
| 43   | 8/21/24 | 33.1                     | 67.95         | 0.025             | 0.07                         | 1.8       | 4.99                 | 9.1  | 8.32 | 73.4     | 431                  |                   |
| 44   | 8/26/24 | 307.6                    | 8.54          | <.007*            | nd                           | 2.1       | 0.73                 | 7.3  | 7.58 | 62.9     | 779                  |                   |
| 45   | 8/20/24 | 115.7                    | nd            | 0.075             | nd                           | 16.0      | nd                   | 8.0  | 7.85 | 56.8     | 723                  |                   |
| 46   | 8/20/24 | 53.9                     | 32.86         | <.007*            | nd                           | 1.2       | nd                   | 7.6  | 7.56 | 61.9     | 652                  |                   |
| 47   | 8/26/24 | 1046.2                   | 30.74         | 0.048             | 0.06                         | 1.0       | 1.25                 | 6.6  | 8.02 | 75.3     | 485                  |                   |
| 48   | 8/22/24 | nd                       | nd            | nd                | nd                           | nd        | nd                   | nd   | nd   | nd       | nd                   |                   |
| 50   | 8/26/24 | 579.4                    | 3.35          | 0.090             | 0.01                         | 17.0      | 2.32                 | 6.7  | 7.90 | 68.4     | 727                  |                   |
| 51   | 8/27/24 | 344.8                    | 102.44        | <.007*            | nd                           | 1.2       | 5.01                 | 8.7  | 7.95 | 62.7     | 907                  |                   |
| 52   | 8/20/24 | nd                       | nd            | nd                | nd                           | nd        | nd                   | nd   | nd   | nd       | nd                   |                   |
| 53   | 8/20/24 | 38.8                     | 5.02          | 0.015             | 0.00                         | 3.3       | 0.68                 | 6.9  | 7.28 | 56.7     | 772                  |                   |
| 54   | 8/20/24 | 167.0                    | nd            | 0.071             | nd                           | 6.4       | nd                   | 4.0  | 7.28 | 59.0     | 412.0                |                   |
| 58   | 8/22/24 | 176.4                    | 1739.03       | <.007*            | nd                           | 2.0       | 141.84               | 8.6  | 8.04 | 67.1     | 721                  |                   |
| 61   | 8/26/24 | 770.1                    | 481.08        | 0.054             | 1.06                         | 4.6       | 90.25                | 7.7  | 7.98 | 68.2     | 653                  |                   |
| 62   | 8/26/24 | 248.1                    | 40.62         | 0.042             | 0.07                         | 2.2       | 3.64                 | 7.1  | 7.98 | 66.3     | 844                  |                   |
| 63   | 8/26/24 | 64.4                     | nd            | 0.04              | nd                           | 2.50      | nd                   | 6.5  | 7.77 | 79.1     | 532                  |                   |
| 64   | 8/26/24 | 579.4                    | 292.68        | 0.098             | 1.17                         | 4.4       | 52.52                | 7.9  | 8.10 | 76.2     | 656                  |                   |
| 65   | 8/26/24 | 1203.3                   | 500.30        | 0.163             | 3.33                         | 7.0       | 142.82               | 6.8  | 8.17 | 71.2     | 700                  |                   |
| 68   | 8/26/24 | 980.4                    | nd            | 0.089             | nd                           | 5.2       | nd                   | 6.5  | 8.07 | 70.6     | 79                   |                   |
| 69   | 8/26/24 | 727.0                    | 941.73        | 0.147             | 5.65                         | 6.2       | 238.11               | 6.3  | 8.10 | 71.3     | 681                  |                   |
| 70   | 8/26/24 | 727.0                    | 222.36        | 0.044             | 0.40                         | 9.4       | 85.24                | 5.4  | 7.73 | 67.5     | 705                  |                   |
| 72   | 8/20/24 | 77.1                     | 3.30          | 0.052             | nd                           | 4.4       | nd                   | 5.8  | 7.24 | 67.1     | 526                  |                   |
| 75   | 9/4/24  | 9.8                      | nd            | 0.033             | nd                           | 3.2       | nd                   | nd   | 7.12 | nd       | nd                   |                   |
| 76   | 8/21/24 | 3.1                      | nd            | <.007*            | nd                           | 1.5       | nd                   | 7.8  | 8.41 | 75.9     | 449                  |                   |

**Table 7 August data for sites 40 through 76. The notation “nd” denotes that no data was collected or calculated due to a result below lab detection limits or the constraints of field conditions. Data shaded exceeds certain water quality standards selected from those provided by IDEM (see corresponding shaded standards in table 8). An asterisk (\*) in the post rain event column indicated sample collection occurred within 48 hours of .5 inches of rainfall or more. An asterisk (\*) after the site number indicates volunteer collected data. An asterisk (\*) after E-coli data indicates data is suspect, laboratory analysis was performed outside the hold period. An asterisk (\*) after T-phos. data indicates result below quantification limit, data is suspect.**

| <b>Parameter</b>                    | <b>Target</b>   | <b>Reference/other information</b>   |
|-------------------------------------|---|--|
| <b>Temperature</b>                  | Dependent on time of year and whether stream is designated as a coldwater fishery               | Indiana Administrative Code (IAC)  |
| <b>Dissolved Oxygen (DO)</b>        | Min: 4.0 mg/L Max: 12.0 mg/L  | Indiana Administrative Code (IAC)  |
|                                     | Min: 6.0 mg/L in cold water fishery streams   | Indiana Administrative Code (IAC)  |
|                                     | Min: 7.0 mg/L in spawning areas of cold water fishery streams                                   | Indiana Administrative Code (IAC)  |
| <b>E. coli</b>                      | Max: 235 CFU/ 100mL in a single sample,   | Indiana Administrative Code (IAC)  |
|                                     | Max: <u>Geometric Mean</u> of 125 CFU/ 100mL from 5 equally spaced samples over a 30-day period |  |
| <b>Total Phosphorus</b>             | Max: 0.076 mg/L   | U.S. EPA recommendation  |
|                                     | 0.07 mg/L   | Dividing line between mesotrophic and eutrophic streams (Dodd et al. 1998)                 |
|                                     | Max: 0.08 mg/L  | Ohio EPA recommendation to protect aquatic biotic integrity in WWH                         |
|                                     | Max: 0.3 mg/L   | IDEM draft TMDL target   |
| <b>Total Suspended Solids (TSS)</b> | Max: 80.0 mg/L  | Wawasee Area Conservancy Foundation recommendation to protect aquatic life in lake systems |
|                                     | Max: 30.0 mg/L  | IDEM draft TMDL target   |
|                                     | Range: 25.0-80.0 mg/L   | Concentrations within this range reduce fish concentrations (Waters, 1995)                 |
|                                     | Max: 40.0 mg/L  | New Jersey criteria for warm water streams   |
|                                     | Max: 46.0 mg/L  | Minnesota TMDL criteria for protection of fish/macrobenthic health                         |
| <b>Turbidity</b>                    | Max: 10.4 NTU   | U.S. EPA recommendation  |

**Table 8 Indiana Department of Environmental Quality Table of Water Quality Targets. Standards shaded on results tables correspond to standards shaded in this table.**

### 3. Results: May Sampling

May sampling was scheduled to include 58 sites, but only 57 sites were sampled. Site 54, Alvin Patterson Ditch was not sampled due to an elevated lake level at the collection site. The culvert the sample is normally collected from was inundated with lake water. May sampling results are listed in tables 2 and 3. The two volunteer-collected samples are also shown in the May data. Samples collected represented baseline-flow conditions at all sites. Table 8 contains a variety of stream water quality targets provided by the Indiana Department of Environmental Management (IDEM) for comparison with the 2024 season data. Also provided for comparison is table 9 containing averages of stream data from the IDEM probabilistic data set. The data used to calculate these averages was collected from Indiana Streams within the St. Joseph River watershed from year 2000 to 2005. Most of the collection sites included in the 2024 data are also within the St. Joseph River watershed and therefore represent somewhat similar soil types, topography, and land uses. This allows some amount of judgment to be made as to whether the 2023 samples were “below average”, “average” or “above average” in terms of northern Indiana stream water quality. In May 17 sites exceeded the E-coli standard of 235 MPN/100 ml and 13 sites exceeded the total phosphorus standard of .076 ppm.

| Parameter                       | IDEM Mean Stream Data             |
|---------------------------------|-----------------------------------|
|                                 | St. Joseph Watershed<br>2000-2005 |
| pH                              | n/d                               |
| D.O. (ppm)                      | 7.14                              |
| Temp. (deg C)                   | 19.91                             |
| Specific conductance<br>umho/cm | 764.19                            |
| Total Suspended Solids<br>(ppm) | 36                                |
| Total Phosphorus (ppm)          | 0.382                             |
| E-coli (CFU/100ml)/(MPN)        | 1895.58                           |

Table 9 Average of IDEM-collected probabilistic Indiana stream data for the St Joseph River Watershed 2000-2005

### 4. Results: July Sampling

July sampling was scheduled to include 53 sampling sites, but only 51 sites were sampled. Site 48 was not sampled because no flow was present at the site and site 63 was not sampled because the property owner denied permission for entry. The two volunteer-collected samples are also shown in the July data. A total of 11 sites were considered “rain event” samples in July with the remaining samples representing baseline-flow conditions. Sampling results are listed in tables 4 and 5. E-coli standards were exceeded at 24 sites. Total phosphorus standards were exceeded at 15 sites.

### 5. Results: August Sampling

August sampling was scheduled to include 53 sampling sites. Samples were collected at 50 sites. Sites 35, 48, and 52 were omitted due to “no flow” conditions. Site 75 was sampled by volunteer samplers on Sept. 4. Sampling results are listed in tables 6 and 7. All sites represented

“baseline” flow conditions. E-coli standards were exceeded at 18 sites while total phosphorus standards were exceeded at 7 sites.

## **6. Conclusions**

Over several years the SCLC has built an extensive body of local water quality data. There are many ways to examine the statistical content of the data and glean information to assist in meeting the needs of local lake residents, government agencies, and land users. The SCLC is encouraged to continue to convey the water quality information through its website, meetings, and other outlets, fostering cooperative community water-quality improvement efforts and encouraging new input and ideas to direct future sampling and steps toward water quality improvement.