

February 3, 2021

Norma Somers  
Special Assessment District  
Watervliet Charter Township  
4959 N M 140, PO Box 384  
Watervliet, MI 49098

RE: 2021 Branch & Derby/Tributary Drain Water Quality Monitoring  
Scope of Services

Dear Norma,

At your request, we have compiled a cost estimate for 2021 water quality monitoring activities on a drain(s) tributary to Paw Paw Lake. Similar to previous drain monitoring plans for the Branch and Derby Intercounty Drain, 2021's plan will follow a near identical protocol in order to keep data consistent from year to year. Meaning, water quality tests will remain the same, and the number of sample events and data downloads are projected to be nearly the same as well. The Branch and Derby Intercounty Drain may be monitored during the year 2021; however, if there is desire to monitor an alternate drain(s) tributary to Paw Paw Lake, this letter agreement allows for that flexibility. Some of the field work for drain monitoring is planned on the same day as Paw Paw Lake monitoring for the sake of project efficiency. The general plan and estimated cost are outlined in the following letter.

**Task 1 – Autosampler Installation**

In 2020, sites A1 and A3 were located in the Branch and Derby Drain, while site A2 was located in the Green Drain outlet to the Branch and Derby Drain. Autosamplers are proposed to be installed in the same general locations as 2020 so that water level data remains relatively consistent. Locations are the following:

- A1: 42.21848, -86.26546
- A2: 42.229472, -86.252869
- A3: 42.229463, -86.261043

If an alternate drain is selected for water quality monitoring, three sample locations in key areas of the drain will be selected and approved by the Paw Paw Lake Improvement Board. Or, multiple drains may be selected for monitoring where up to two autosamplers may be installed on one drain. Again, samplers will be installed in key locations on the drain which provide the most valuable and relevant information. All sample sites will be reviewed and approved by the Paw Paw Lake Improvement Board. The map enclosed with this letter agreement shows drains tributary to Paw Paw Lake which may be selected for monitoring.

Autosamplers will be installed by a two-person crew. Autosampler equipment was purchased by the Lake Board in late 2016 and is intended to be used again. Equipment was inspected at the end of the 2020 monitoring season but will be inspected again prior to installation in 2021. If any equipment is not working properly, Spicer Group will notify the Lake Board prior to any equipment fixes or part purchases. The cost of equipment repair is not accounted for in the proposal.

### **Task 2 – Sample Events**

Sample events will occur during rain events. The autosamplers will be programmed to collect samples at a designated water level threshold in order to evaluate the water quality during periods of wet weather. There are a total of 24 bottles in the autosampler's base. In order to properly program to 2017, 2018, 2019 and 2020 standards, the following metrics will be programmed into the equipment:

- Sample volume per bottle: 400 mL
- Time between samples: 20 minutes
- Samples per bottle: 1
- Number of sample bottles to be filled: 24
- Sampling will be disabled after water level drops below set trigger threshold water level

In 2017 and 2018, “beginning of storm” samples and “end of storm” samples were collected and analyzed separately in order to determine if there was a water chemistry difference between the two sets of samples. It is proposed that the same protocol is followed in 2021, and that the following tests are run on the samples:

- Total phosphorus,
- Soluble reactive phosphorus,
- Total suspended solids,
- Ammonia, and
- Nitrate-nitrite.

If there is not enough sample to perform “beginning of storm” and “end of storm” analysis, the samples will be composited, and a composite sample will be submitted for total phosphorus, soluble reactive phosphorus, total suspended solids, ammonia, and nitrate-nitrite.

These tests are consistent with the suite of tests being run on Paw Paw Lake samples and may thus be compared. It is also recommended to utilize the same laboratory (Fibertec) that is analyzing Paw Paw Lake samples to analyze the drain samples. Three runoff sample events are planned with this proposal.

### **Task 3 – Equipment Checks**

On the same day as Paw Paw Lake sample events, one Spicer personnel will inspect the three installed autosamplers to ensure that water level and sample collection lines are intact, that animals have not invaded the equipment, that there is no water damage to equipment, and that the batteries

running the samplers have sufficient charge for the next programmed sample event. If there are any minor issues that may be resolved at the time, the personnel will fix the problem the day of. If there are major issues that require much more time to remediate, the individual will contact the Lake Board and describe the problem and potential solutions. In total, there will be at least three equipment checks.

#### **Task 4 – Maintenance**

General maintenance tasks include washing of the sample bottles, download of field data, and download of weather data.

#### **Task 5 – Autosampler Removal**

Autosamplers are to be removed by a crew of one to two Spicer personnel. Upon removal, the equipment will be properly cleaned, inspected, and stored in a temperature-controlled building under Spicer supervision, unless otherwise notified.

#### **Task 6 – Reporting**

A small summary report will be written about the monitoring performed on the drain in 2021. The report will include a comparison to previous years' data, as well as a comparison to Paw Paw Lake's 2021 water quality conditions. Brief recommendations based off of the analysis will be provided as well. Other options for reporting of water quality data may be explored, for example a water quality dashboard.

#### **Deliverables:**

##### **2021 Tributary Drain Monitoring Summary Report**

- A. One hard copy version provided
- B. Electronic copy provided
- C. Other versions available upon request

#### **Reimbursable Expenses:**

Reimbursable expenses will be billed when they are incurred or invoiced on an hourly basis. Reimbursable expenses such as laboratory and equipment fees have been accounted for in this cost estimate. Examples of reimbursable fees include:

- A. Laboratory fees
- B. Equipment rental
- C. Deliverables beyond those included above

#### **Additional Services:**

Services not specifically listed in our scope of services are excluded from this letter agreement. We will perform additional services only after you authorize the work. Our fee for those additional services will be determined at the time they are rendered. Examples of additional services include:

- Watershed Management Plans
- Additional Deliverables
- Additional Sample Events
- EGLE Permit Compliance
- Educational Materials or Field Days

**Fee Schedule:**

Our proposed fee schedule follows. We will submit monthly invoices to you for our basic professional services, additional authorized services, and any reimbursable expenses. Where the fee is a lump sum, the invoice amount will be based on the proportion of work actually completed during the billing period. Where the fee is hourly, the invoice amount will be based on the actual hours spent by our staff on your project billed at the hourly rate of each staff member.

The scope of work outlined in this letter agreement is estimated to be \$20,900.00 and is based on hourly fees. Again, the general task outline for the scope of work is listed below:

Task 1 – Autosampler Installation

Task 2 – Sample Events (3 Rain event sample events)

Task 3 – Equipment Checks (3 Equipment checks)

Task 4 – Maintenance

Task 5 – Autosampler Removal and Storage

Task 6 – Reporting

**2021 Tributary Drain Monitoring Project Estimated Total.....\$20,900.00**

We deeply appreciate your confidence in our firm and we are looking forward to the continuation of our work with you on this project.

Sincerely,



**Emily Short**  
Project Manager



**Larry J. Protasiewicz, P.E.**  
Principal

**SPICER GROUP, INC.**  
1400 Zeeb Dr.  
St. Johns, MI 48879  
Phone: (989) 224-2355

---

Above proposal accepted and approved by Owner:

**PAW PAW LAKE IMPROVEMENT PROJECT**

By: \_\_\_\_\_  
Norma Somers

Date: \_\_\_\_\_

Enclosures:

Paw Paw Lake Tributary Drain and Sample Site Map  
Spicer Group General Conditions

cc: SGI File # 123724SG2016  
SMC, Accounting

P:\proj2016\123724SG2016\_2016PawPawLakeAeration\ProjectManagement



# PAW PAW LAKE TRIBUTARY DRAIN SAMPLE SITES 2021 BERRIEN COUNTY, MICHIGAN



## LEGEND

-  2021 Proposed Sample Sites
-  Algal Sample Sites
-  Drains
-  Watercourses
-  2021 Paw Paw Lake Sample Sites



ST. JOHN'S OFFICE  
1400 Zeeb Drive  
St. Johns, MI 48879  
Tel. 989-224-2355  
www.SpicerGroup.com

