Water Quality, Phytoplankton, and Aquatic Invasive Species Survey of Eagle, Crooked, and Bass Lakes in Texas Charter Township of Kalamazoo, Michigan

December 6, 2018

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1.0 Introduction

Advanced Ecological Management, LLC (AEM) has contracted with the Charter Township of Texas located in Kalamazoo County, Michigan to conduct a water quality survey of Eagle Lake, Crooked Lake, and Bass Lake, which are located within Township 3 South, Range 12 West of Texas Township (Figure 1). The goal of this survey was to provide water quality information to the Township that could be used by the Michigan Department of Environmental Quality (MDEQ) and the Township to develop a plan to manage and reduce high water levels within Eagle and Crooked Lakes by potentially diverting water from these lakes into Bass Lake, which is located downgradient of Eagle and Crooked Lakes, and outlets to the West Fork of Portage Creek. The objectives of this survey were to provide data regarding water quality, the phytoplankton community, and aquatic invasive vegetation that may be present within the lakes. These water quality, phytoplankton and aquatic invasive vegetation data will allow Texas Township and the MDEQ to gain a better understanding of how pumping water from each lake into Bass Lake could potentially affect the Bass Lake ecosystem.

2.0 Sampling Methodology

AEM collected water samples for analyses and conducted a survey for aquatic invasive vegetation species of Crooked and Bass Lake on October 28, 2018. AEM conducted a similar survey of Eagle Lake on November 4, 2018. Water samples were collected from three locations in each lake (Figures 2-4).

Prior to collecting water samples, AEM coordinated with Mr. Derek Haroldson of the MDEQ to identify water quality parameters he would like to evaluate for potentially permitting the pumping of water from Eagle Lake and Crooked Lake into Bass Lake as a temporary means of water level management. Mr. Haroldson indicated that he would like to evaluate at least three samples from each lake. He also indicated that the following water quality parameters should be collected from each location:

- Specific conductance
- Dissolved oxygen
- Temperature
- pH
- Total phosphorus
- Soluble reactive phosphorus
- Ammonia
- Nitrate-nitrite
- Total Kjeldahl nitrogen
- Total suspended solids
- Chlorophyll concentrations via a composite in the photic zone
- Secchi disk transparency

AEM was also asked by the Township to collect water samples for the analyses of *E. coli* and hydrocarbon presence, and to collect sediment samples for nutrient analyses from each of the three sample locations within each lake. AEM collected surface grab samples that were analyzed at Trace Analytical Laboratories of Muskegon, Michigan for total phosphorus, soluble reactive phosphorus, ammonia, nitrate-nitrite, total Kjeldahl nitrogen, total suspended solids, hydrocarbons, and *E. coli* in each sample location. AEM recorded the Secchi depth at each sample location and used a Kemmerer water sampling device to collect a composite sample from the photic zone (twice the Secchi depth) for later evaluation of chlorophyll-*a* concentration. AEM also collected sediment samples using a petite PONAR sediment grabbing device

from each sample location that were analyzed by Trace Analytical Laboratories for total phosphorus and total Kjeldahl nitrogen.

The total coliform test is used to indicate the presence of coliform forming colonies, which include bacteria found in soil, water that has been influenced by surface water, and in human or animal waste. The *E. coli* test is typically used to indicate the concentration of coliform colonies that are specific to feces. Per the laboratory, *E. coli* samples typically require a holding time of no more than eight hours before analyses. The *E. coli* samples were collected on Sunday and were delivered to the lab the following Monday morning. The *E. coli* samples were held longer than the maximum eight hour holding time for each lake. However, AEM refrigerated the *E. coli* samples from each lake to minimize loss or over development of the samples.

All water samples were delivered by AEM personnel to Trace Analytical Laboratories for analyses early the next day after the samples were collected. Other water quality data, such as water temperature, conductivity, pH, dissolved oxygen, and percent saturation of dissolved oxygen were measured in-situ using a Yellow Springs Instrument YSI® Professional Plus hand-held water quality meter. The in-situ water quality data were collected at one or two-foot intervals from the surface to the bottom of each lake in each sample location.

A plankton net was also vertically towed through the photic zone of each sample location to provide a phytoplankton sample of each sample location. In addition to the pelagic plankton, one water sample was also collected at each lake access point along the shoreline to provide a sample of shore-oriented (littoral) plankton.

3.0 Results

None of the three lakes appeared to be thermally stratified during the October 28, 2018 or the November 4, 2018 surveys. Water quality data within each lake that were collected using the YSI Professional Plus handheld meter are presented in detail in Appendix A. Summary data from the hand-held meter are presented below along with the water chemistry results from laboratory analyses, phytoplankton community descriptions, and aquatic invasive vegetation species presence:

Eagle Lake

The total depth of water at location 1 of Eagle Lake (Eagle Lake 1, Figure 2) was 9.4 feet, where the Secchi disk was visible to the substrate of the lake (Table 1). AEM was only able to measure Secchi depth in Eagle Lake 3 where the depth was 12.0 feet (Table 1). The Secchi disk was visible to the substrate in locations 1 and 2. Water temperature within Eagle Lake 1 was measured at one-foot intervals and did not vary from the surface to nine feet (Appendix A). The average water temperature was 8.8 °C and was the lowest average water temperature among the three Eagle Lake sample locations (Table 1). The average dissolved oxygen in location 1 was the highest among the three Eagle Lake sample locations and was 9.2 milligrams of oxygen per liter (Table 1). The average specific conductance and pH in location 1 were consistent among the three Eagle Lake sample locations.

Total phosphorus was low among all three Eagle Lake surface water samples (0.01 milligrams per liter or below the detectable limit of the test) and soluble reactive phosphorus was below the detectable limit of the test among all three samples (Table 2). Ammonia ranged from below the detectable limit of the test in location 1 (Eagle Lake 1, Figure 2), to a maximum of 0.026 milligrams per liter (mg/L) in location 3 (Eagle Lake 3, Figure 2, Table 2). Nitrate-nitrite concentration was below the detectable limit of the test for all three samples, and total Kjeldahl nitrogen was 0.9 mg/L in locations 1 and 2, and was below the detectable

limit of the test in location 3. The total suspended solids were below the detectable limit of the test among all three sample locations, and chlorophyll-A concentrations were low or negative, which is typically indicative of low concentrations below the detectable limit of the test (Table 2).

No hydrocarbons were detected among any Eagle Lake samples (Table 2). The *E. coli* concentration was below the detectable test limit in locations 2 and 3, and was low within location 1, where the reported value was 2 colony forming units per 100 milliliters. The average total Kjeldhal nitrogen in the sediment samples was 13,667 mg/L and ranged from a minimum of 11,000 mg/L in location 3 to a maximum of 17,000 mg/L in location 1 (Table 2). The average total phosphorus in the sediment samples was 640 mg/L and ranged from a minimum of 600 mg/L in location 2 to a maximum of 690 mg/L in location 3 (Table 2).

A total of 13 species of phytoplankton were observed in Eagle Lake (Table 3). Green algae genera that were frequently observed in Eagle Lake, included *Chlorella* and *Gleocystis*. The only aquatic invasive vegetation species observed by AEM personnel was the Eurasian watermilfoil (*Myriophyllum spicatum*). However according to the *Eagle Lake State of the Lake Report and 2016 Management Recommendations* (Restoration Lake Services, 2015), curly leaf pondweed (*Potamogeton crispus*) has also been observed in the lake.

Crooked Lake

The total depth of water at location 1 of Crooked Lake (Crooked Lake 1, Figure 3) was 33.0 feet, where the Secchi was 17.7 feet (Table 1). The water depth in locations 2 and 3 of Crooked Lake were eight feet and the Secchi disk was visible to the substrate in those locations. Water temperature within location 1 was measured at two-foot intervals and ranged from 11.4 to 11.5 °C (Appendix A), with an average water temperature of 11.4 °C, which was the highest average water temperature among the three Crooked Lake sample locations (Table 1). The average dissolved oxygen at Crooked Lake 1 was the lowest among the three Crooked Lake sample locations and was 8.9 milligrams of oxygen per liter (Table 1). The average specific conductance was consistent among the three Crooked Lake sample locations. The average pH ranged from 8.2 in location 2 to a maximum of 8.6 in location 3 (Table 1).

Total phosphorus was low among all three Crooked Lake surface water samples and ranged from a minimum of 0.011 mg/L in location 3 to a maximum of 0.015 mg/L in location 1 (Table 2). Soluble reactive phosphorus was below the detectable limit of the test among all three samples (Table 2). Ammonia ranged from 0.01 mg/L in location 1 to a maximum of 0.013 mg/L in location 3 (Table 2). Nitrate-nitrite and total Kjeldahl nitrogen concentrations were below the detectable limit of the test for all three samples. The total suspended solids were also below the detectable limit of the test among all three sample locations, and chlorophyll-A concentrations were low or negative, which is typically indicative of low concentrations below the detectable limit of the test (Table 2).

Hydrocarbons were not detected in any of the Crooked Lake water samples (Table 2). The *E. coli* samples were either less than the detectable limit or were observed at a concentration of 1 colony forming unit per 100 milliliters in location 1 of Crooked Lake (Table 2). The average total Kjeldhal nitrogen in the sediment samples was 11,033 mg/L and ranged from a minimum of 1,500 mg/L in location 2 to a maximum of 22,000 mg/L in location 3 (Table 2). The average total phosphorus in the sediment samples was 434 mg/L and ranged from a minimum of 82 mg/L in location 2 to a maximum of 780 mg/L in location 1 (Table 2).

A total of 11 species of phytoplankton were observed in Crooked Lake (Table 3). The filamentous planktonic genus *Tribonema* was the most frequently observed taxa in Crooked Lake. AEM personnel

observed invasive aquatic vegetation species including, Eurasian watermilfoil, curly leaf pondweed, starry stonewort (*Nitellopsis obtuse*), and purple loosestrife (*Lythrum salicaria*).

Bass Lake

The total depth of water at location 1 of Bass Lake (Bass Lake 1, Figure 2) was 30.0 feet, where the Secchi was 9.0 feet (Table 1). The water depth in locations 2 and 3 of Bass Lake were 25.6 feet and 23.0 feet respectively. The Secchi depth was 8.5 feet in those locations. The water temperature within location 1 was measured at two-foot intervals and ranged from 9.5 to 10.1 °C (Appendix A), with an average water temperature of 10.0 °C, which was consistent with the other Bass Lake sample locations (Table 1). The average dissolved oxygen at location 1 was the lowest among the three Bass Lake sample locations and was 4.9 milligrams of oxygen per liter (Table 1). The maximum average dissolved oxygen level was observed in location 3 and was 6.8 milligrams of oxygen per liter. The average specific conductance and pH were consistent among all three sample locations (Table 1).

Total phosphorus was low among all three Bass Lake water samples and ranged from a minimum of 0.012 mg/L in location 3 (Bass Lake 3, Figure 4) to a maximum of 0.017 mg/L in location 1 (Bass Lake 1, Figure4, Table 2). Soluble reactive phosphorus was below the detectable limit of the test among all three samples (Table 2). Ammonia concentrations ranged from 0.049 mg/L in location 3, to a maximum of 0.055 mg/L in location 2 and were higher than concentrations observed in Eagle or Crooked Lakes (Table 2). Nitrate-nitrite concentrations in all three sample locations and the total Kjeldahl nitrogen concentrations in locations 2 and 3 were below the detectable limit of the test. The total Kjeldahl nitrogen concentration in location 1 was 0.63 mg/L. The total suspended solids were also below the detectable limit of the test among all three sample locations, and chlorophyll-A concentrations were all negative, which is typically indicative of low concentrations below the detectable limit of the test (Table 2).

Hydrocarbons were not detected in any of the Bass Lake water samples (Table 2). The *E. coli* samples were either less than the detectable limit or were observed at a concentration of 1 colony forming unit per 100 milliliters in location 1 of Bass Lake (Table 2). The average total Kjeldhal nitrogen in the sediment samples was 23,000 mg/L and ranged from a minimum of 16,000 mg/L in location 2 to a maximum of 27,000 mg/L in location 3 (Table 2). The average total phosphorus in the sediment samples was 1,600 mg/L and ranged from a minimum of 1,100 mg/L in location 2 to a maximum of 2,000 mg/L in location 2 (Table 2).

A total of 10 species of phytoplankton were observed in Bass Lake (Table 3). The dinoflagellate representative of the genus *Ceratium* and the diatom representative of the genus *Fragilaria* were the most frequently observed phytoplankton taxa observed in Bass Lake. No aquatic invasive species were observed in Bass Lake or along the shoreline during the October 2018 survey.

4.0 Summary

The average water temperature among all measurements in all locations within Eagle Lake was 8.9°C and was the lowest among the three lakes (Bass Lake average water temperature among all measurements was 10.0°C and Crooked Lake was 10.6°C). However, the water temperature was similar among all three lakes, which is expected in the fall when northern temperate lakes typically transition from their stratified summer temperature profiles to a uniform temperature profile.

Dissolved oxygen concentrations were generally higher in Eagle and Crooke Lakes compared to Bass Lake (Table 1). Excluding the Bass Lake dissolved oxygen measurements deeper than 20 feet, most of the Bass Lake dissolved oxygen concentrations ranged between six and seven milligrams of oxygen per liter. Most

of the dissolved oxygen concentrations in Eagle and Crooked Lakes ranged between 8.5 and 10 milligrams of oxygen per liter.

Specific conductance was consistent throughout each lake and increased from approximately 0.2 milliSiemens per centimeter in Eagle Lake to 0.4 milliSiemens per centimeter in Bass Lake (Table 1). The pH was consistent among Eagle and Crooked Lakes and was only slightly lower in Bass Lake (Table 1).

Nitrate-nitrite, soluble reactive phosphorus, and total suspended solids were at concentrations below the detectable test limit in all three lakes (Table 2). Ammonia occurred at concentrations that were approximately four times lower in Eagle and Crooked Lakes compared to Bass Lake (Table 2). The total Kjeldhal nitrogen (TKN) was below the detectable test limit in most sample locations among all three lakes except for location 1 in Bass Lake where the TKN was 0.63 mg/L and locations 1 and 2 in Eagle Lake where TKN was 0.9 mg/L in both locations (Table 2). Total phosphorus was the lowest in Eagle Lake (average concentration was 0.01 mg/L or less), slightly higher in Crooked Lake (average concentration was 0.013 mg/L) and was only slightly higher in Bass Lake compared to Crooked Lake (average concentration was 0.015 mg/L, Table 2).

No hydrocarbons were detected in the surface water any of the three lakes that were sampled for this investigation. The *E. coli* concentrations were low or below the detectable limit of the test in all lakes (Table 2).

Chlorophyll *a* concentrations were low in all samples among all lakes (Table 2). The average TKN and total phosphorus concentrations were the highest in Bass Lake compared to Eagle and Crooked Lakes. TKN and total phosphorus varied the most among sample locations in Crooked Lake (Table 2).

The phytoplankton community composition among all three lakes was different, including the predominant species present in each lake (Table 3). However, some genera were present in all three lakes or were shared by two lakes. Invasive aquatic vegetation species were observed in Eagle and Crooked Lakes, and no invasive aquatic vegetation species were observed at the time of the survey in Bass Lake. Because of the survey occurring shortly after the end of the growing season, it is possible that invasive species could have evaded detection in any of the three lakes.

The transfer of water from Eagle and Crooked Lakes into Bass Lake as a measure to manage the high-water levels will likely require filtration of the water pumped from Crooked Lake into Bass Lake to eliminate the potential introduction of the invasive species that currently occupy Crooked Lake. The mesh size of the filtration system must be small enough to accommodate the smallest viable fragment of aquatic vegetation found in Crooked Lake. Although literature is sparse regarding the minimum viable size for the invasive aquatic vegetation, curly leaf pondweed is known to develop turions (small viable portion of the plant) that are approximately 1-2 centimeters in length. The bulbil is a small viable portion of the starry stonewort that is approximately the size of a grain of rice. The mesh size for filtration must be at least small enough to capture turions of curly leaf pondweed and bulbils of the starry stonewort.

Based on existing knowledge about invasive species found in Eagle Lake and Crooked Lake, the transfer of water from Eagle Lake into Crooked Lake is not expected to introduce invasive aquatic vegetation species from Eagle Lake into Crooked Lake. Therefore, I would not expect the need to conduct any filtration of water from Eagle Lake into Crooked Lake.

Soluble reactive phosphorus and nitrates are the forms of phosphorus and nitrogen that readily contribute to primary productivity within aquatic systems. Soluble reactive phosphorus and nitrate-nitrite were at concentrations below the detectable test limits in all three lakes indicating that a surface water transfer from one lake to another is not likely to enrich the receiving waters from the pumping.

Bypassing Bass Lake and discharging the pumped water from Eagle Lake and Crooked Lake directly into the outlet of Bass Lake (West Fork of Portage Creek) may be an effective approach to avoiding potential introductions of invasive vegetation species and any other unintended change of water quality or change of the aquatic biota. There appears to be a well-developed riparian wetland along the margins of the West Fork of Portage Creek that would likely serve to mitigate changes in water quality, including the proliferation of invasive vegetation species, such as starry stonewort, which may eliminate the need to filter water for invasive species.

Table 1. Summary water quality data collected among all depths measured in each sample location within Eagle Lake, Crooked Lake, and Bass Lake using YSI Professional Plus handheld meter.

			Average value among all depths at each sample location				
Lake/Sample Location	Total Depth (feet)	Sechhi Depth (feet)	Temp. (°C)	Percent DO	DO	Specific Conductance (milliSiemens/centimeter)	pH
Eagle Lake 1	9.4	9.4	8.8	82.5	9.6	0.2	8.1
Eagle Lake 2	10	10	8.9	81.4	9.4	0.2	8.2
Eagle Lake 3	14.5	12	9.1	75.0	8.7	0.2	8.1
Crooked Lake 1	33	17.7	11.4	81.9	8.9	0.3	8.3
Crooked Lake 2	8	8	10.2	82.7	9.3	0.3	8.2
Crooked Lake 3	8	8	9.1	94.5	10.9	0.3	8.6
Bass Lake 1	30	9	10.0	43.4	4.9	0.4	7.7
Bass Lake 2	25.6	8.5	10.0	57.5	6.5	0.4	7.8
Bass Lake 3	23	8.5	10.0	62.6	6.8	0.4	7.9

DO – Dissolved oxygen measured in milligrams of oxygen per liter.
Temp. – Water temperature

Table 2. Summary water quality laboratory results from samples collected by AEM from Eagle Lake, Crooked Lake, and Bass Lake in October and November 2018.

Parameter	Eagle 1	Eagle 2	Eagle 3	Crooked 1	Crooked 2	Crooked 3	Bass 1	Bass 2	Bass 3
Hydrocarbons*	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrate-Nitrite*	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia*	<0.01	0.016	0.026	0.010	0.012	0.013	0.051	0.055	0.049
TKN*	0.9	0.9	<0.5	<0.5	<0.5	<0.5	0.63	<0.5	<0.5
SRP*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TP*	0.011	0.01	<0.01	0.015	0.012	0.011	0.017	0.016	0.012
TSS*	<10	<10	<10	<10	<10	<10	<10	<10	<10
Total coliform[Ŧ]	480	280	640	91	55	120	140	340	140
E. coli[Ŧ]	2.0	<2.0	<2.0	1.0	<1.0	<1.0	1.0	<1.0	<1.0
Chlorophyll *a***	-1.07	0.00	-0.534	1.60	-0.178	-0.763	-2.97	-1.33	-1.60
Pheophytin *a***	1.57	4.61	12.7	0.641	0.676	0.362	3.68	4.89	2.72
Sediment									
TKN	17,000	13,000	11,000	9,600	1,500	22,000	26,000	16,000	27,000
TP	630	600	690	780	82	440	1,700	1,100	2,000

* – Units are reported as milligrams per liter

[Ŧ]– Units are reported as Colony Forming Unit per 100 milliliters

**– Units are reported as micrograms per liter

ND – Less than the detectable limit of the test

TKN – Total Kjeldhal Nitrogen

SRP – Soluble Reactive Phosphorus

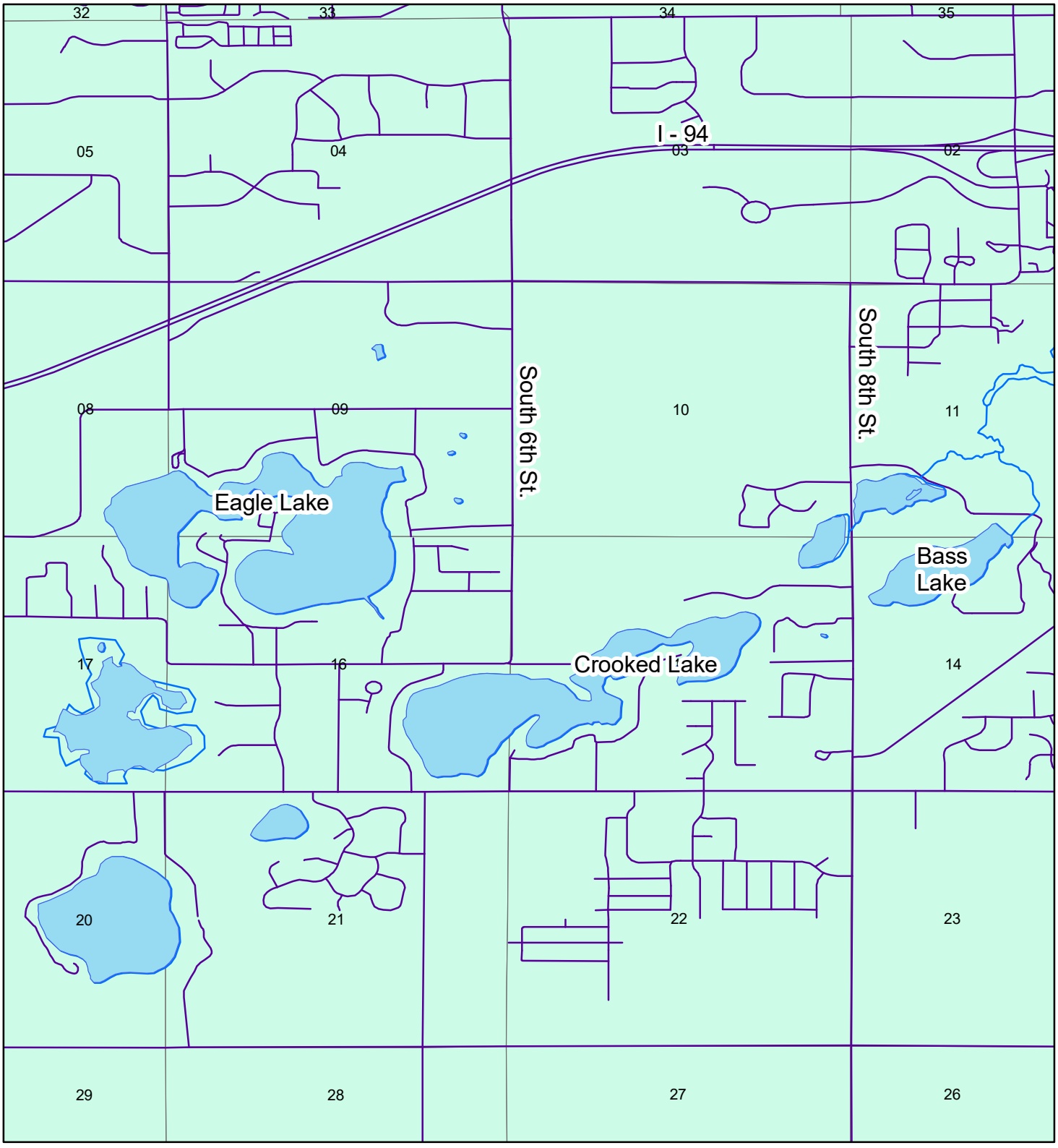
TP – Total phosphorus

TSS – Total suspended solids

Table 3. List of phytoplankton collected from Eagle, Crooked, and Bass Lakes by AEM in October and November 2018.

Plankton Genus	Eagle Lake	Crooked Lake	Bass Lake
Anabaena	X	X	
Ceratium		X	X
Chlorella	X	X	
Cladophora	X	X	
Cyclotella			X
Diatoma		X	X
Dinobryon	X		X
Euglena	X		
Fragilaria		X	X
Gleocystis	X		X
Mougeotia	X		X
Navicula	X		
Oscillatoria	X	X	X
Pediastrum	X		
Peridinium			X
Scendesmus	X		
Spirogyra		X	
Staurastrum		X	
Tribonema	X	X	X
Ulothrix		X	
Volvox	X		

5.0 Report Figures



N

Miles

0 0.2 0.4 0.8 1.2 1.6

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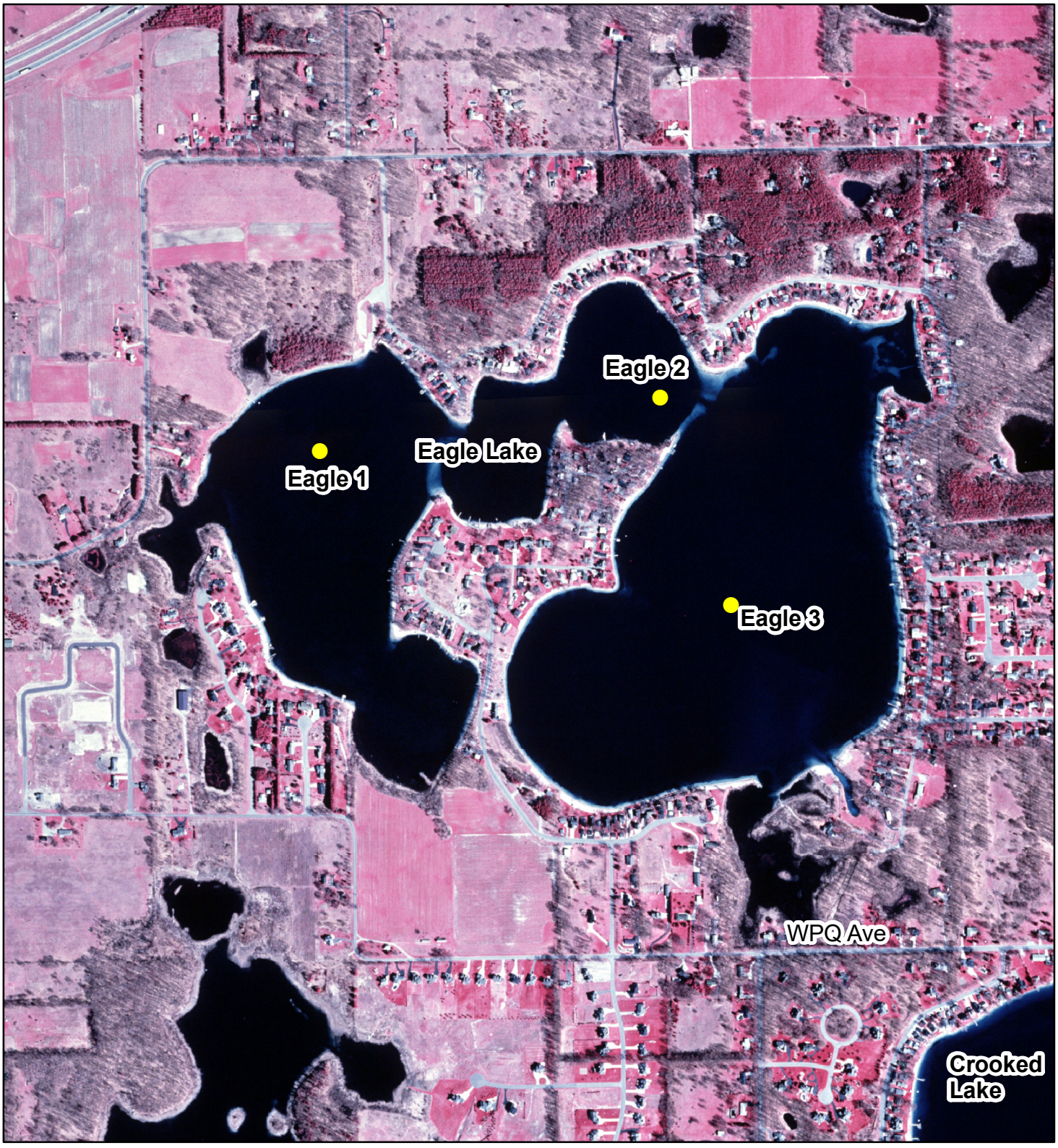
PROJECT
Texas Township Water Quality Lake Survey

TITLE
Project Location

FIGURE
1 of 4



Legend

- Sample Locations

N

0 0.05 0.1 0.2 0.3 0.4 Miles

AeM ADVANCED ECOLOGICAL MANAGEMENT

PROJECT	Texas Township Water Quality Lake Survey
TITLE	Eagle Lake
FIGURE	2 of 4

Legend

- Sample Locations

N

0 0.05 0.1 0.2 0.3 0.4 Miles

AeM ADVANCED ECOLOGICAL MANAGEMENT

PROJECT	Texas Township Water Quality Lake Survey
TITLE	Crooked Lake
FIGURE	3 of 4

Legend

- Sample Locations

N

0 0.04 0.08 0.16 0.24 0.32 Miles

AeM ADVANCED ECOLOGICAL MANAGEMENT

PROJECT	Texas Township Water Quality Lake Survey
TITLE	Bass Lake
FIGURE	4 of 4

6.0 Appendix A

Handheld Water Meter Data

Eagle Lake 1		Date:	11-4-2018	Time:	9:17
Depth	**Water Temperature**	**%DO**	**DO**	**Specific Conductivity**	**pH**
0	8.8	83.3	9.7	0.200	8.1
1	8.8	82.4	9.6	0.200	8.1
2	8.8	82.9	9.6	0.200	8.1
3	8.8	83	9.6	0.200	8.1
4	8.8	81.9	9.5	0.200	8.1
5	8.8	82.6	9.6	0.200	8.1
6	8.8	82.5	9.6	0.200	8.1
7	8.8	82.6	9.6	0.200	8.1
8	8.8	82.4	9.6	0.200	8.1
9	8.8	81.8	9.5	0.200	8.1
Minimum	8.8	81.8	9.5	0.200	8.1
Maximum	8.8	83.3	9.7	0.200	8.1
Average	8.8	82.5	9.6	0.200	8.1
Variance	0.0	0.2	0.0	0.000	0.0

% DO – Percent dissolved oxygen
DO – Dissolved oxygen (milligrams/liter)
Water Temperature - °C
Specific Conductivity – milliSiemens/centimeter

Eagle Lake 2		Date:	11-4-2018	Time:	10:19
Depth	**Water Temperature**	**%DO**	**DO**	**Specific Conductivity**	**pH**
0	8.9	84.0	9.8	0.200	8.2
1	8.9	83.4	9.6	0.200	8.2
2	8.9	82.6	9.6	0.200	8.2
3	8.9	81.4	9.4	0.200	8.2
4	8.9	81.5	9.5	0.200	8.2
5	8.9	81.0	9.4	0.200	8.2
6	8.9	80.9	9.4	0.200	8.2
7	8.9	80.4	9.3	0.200	8.3
8	8.9	80.3	9.3	0.200	8.2
9	8.9	80.2	9.3	0.200	8.2
10	8.9	79.2	9.2	0.200	8.2
Minimum	8.9	79.2	9.2	0.200	8.2
Maximum	8.9	84.0	9.8	0.200	8.3
Average	8.9	81.4	9.4	0.200	8.2
Variance	0.0	2.1	0.0	0.000	0.0

% DO – Percent dissolved oxygen
DO – Dissolved oxygen (milligrams/liter)
Water Temperature - °C
Specific Conductivity – milliSiemens/centimeter

Eagle Lake 3		Date:	11-4-2018	Time:	10:59
Depth	**Water Temperature**	**%DO**	**DO**	**Specific Conductivity**	**pH**
0	9.0	77.8	9.0	0.205	8.1
1	9.0	77.0	8.9	0.205	8.1
2	9.0	76.2	8.8	0.205	8.1
3	9.1	75.6	8.7	0.205	8.1
4	9.1	75.1	8.7	0.205	8.1
5	9.1	74.9	8.6	0.206	8.1
6	9.1	75.3	8.7	0.205	8.1
7	9.1	74.8	8.6	0.205	8.1
8	9.1	74.1	8.6	0.205	8.1
9	9.0	74.2	8.6	0.205	8.1
10	9.1	74.4	8.6	0.205	8.1
11	9.1	74.1	8.6	0.205	8.1
12	9.1	73.6	8.5	0.205	8.1
13	9.1	74.3	8.6	0.205	8.1
14	9.1	74.0	8.5	0.206	8.1
Minimum	9.0	73.6	8.5	0.205	8.1
Maximum	9.1	77.8	9.0	0.206	8.1
Average	9.1	75.0	8.7	0.205	8.1
Variance	0.0	1.4	0.0	0.000	0.0

% DO – Percent dissolved oxygen
DO – Dissolved oxygen (milligrams/liter)
Water Temperature - °C
Specific Conductivity – milliSiemens/centimeter

Crooked Lake 1		Date:	10-28-2018	Time:	10:52
Depth	**Water Temperature**	**%DO**	**DO**	**Specific Conductivity**	**pH**
0	11.4	80.8	8.8	0.321	8.3
2	11.4	82.0	9.0	0.320	8.3
4	11.5	82.2	8.9	0.320	8.3
6	11.5	81.8	8.9	0.320	8.3
8	11.5	82.2	9.0	0.320	8.3
10	11.5	82.7	8.9	0.320	8.3
12	11.5	82.3	9.0	0.319	8.3
14	11.5	81.9	8.9	0.319	8.3
16	11.5	81.8	8.9	0.319	8.3
18	11.4	82.4	9.0	0.319	8.3
20	11.4	82.4	9.0	0.319	8.3
22	11.4	80.8	8.8	0.319	8.3
24	11.4	82.3	9.0	0.319	8.3
26	11.4	81.6	8.9	0.318	8.3
28	11.4	81.8	8.9	0.318	8.3
30	11.4	82.0	9.0	0.318	8.3
32	11.4	81.5	8.9	0.318	8.2
33	11.4	80.9	8.8	0.318	8.2
Minimum	11.4	80.8	8.8	0.318	8.2
Maximum	11.5	82.7	9.0	0.321	8.3
Average	11.4	81.9	8.9	0.319	8.3
Variance	0.0	0.3	0.0	0.000	0.0

% DO – Percent dissolved oxygen
DO – Dissolved oxygen (milligrams/liter)
Water Temperature - °C
Specific Conductivity – milliSiemens/centimeter

Crooked Lake 2		Date:	10-28-2018	Time:	11:48
Depth	Water Temperature	%DO	DO	Specific Conductivity	pH
0	10.2	85.2	9.6	0.310	8.3
1	10.2	84.1	9.4	0.310	8.3
2	10.2	82.7	9.3	0.310	8.3
3	10.2	83.2	9.3	0.310	8.3
4	10.2	82.5	9.3	0.310	8.3
5	10.2	82.6	9.3	0.310	8.3
6	10.0	80.6	9.1	0.308	8.2
7	10.0	80.6	9.1	0.308	8.2
Minimum	10.0	80.6	9.1	0.308	8.2
Maximum	10.2	85.2	9.6	0.310	8.3
Average	10.2	82.7	9.3	0.310	8.2
Variance	0.0	2.5	0.0	0.000	0.0

% DO – Percent dissolved oxygen
DO – Dissolved oxygen (milligrams/liter)
Water Temperature - °C
Specific Conductivity – milliSiemens/centimeter

Crooked Lake 3		Date:	10-28-2018	Time:	12:18
Depth	Water Temperature	%DO	DO	Specific Conductivity	pH
0	9.1	94.5	10.9	0.291	8.6
1	9.1	94.5	10.9	0.291	8.6
2	9.1	94.0	10.8	0.291	8.6
3	9.1	94.6	10.9	0.291	8.6
4	9.1	94.6	10.9	0.291	8.6
5	9.1	94.4	10.9	0.290	8.6
6	9.1	95.2	11.0	0.291	8.6
7	9.1	94.5	10.9	0.290	8.6
Minimum	9.1	94.0	10.8	0.290	8.6
Maximum	9.1	95.2	11.0	0.291	8.6
Average	9.1	94.5	10.9	0.291	8.6
Variance	0.0	0.1	0.0	0.000	0.0

% DO – Percent dissolved oxygen
DO – Dissolved oxygen (milligrams/liter)
Water Temperature - °C
Specific Conductivity – milliSiemens/centimeter

Bass Lake 1		Date:	10-28-2018	Time:	15:44
Depth	**Water Temperature**	**%DO**	**DO**	**Specific Conductivity**	**pH**
0	10.1	60.6	6.9	0.398	7.6
2	10.0	59.6	6.7	0.398	7.9
4	10.1	56.8	6.4	0.398	7.8
6	10.1	56.2	6.3	0.399	7.8
8	10.0	56.2	6.4	0.400	7.8
10	10.1	55.7	6.3	0.400	7.8
12	10.0	55.6	6.3	0.400	7.8
14	10.0	55.6	6.3	0.400	7.8
16	10.0	55.4	6.3	0.400	7.8
18	10.0	55.1	6.2	0.400	7.8
20	10.0	53.2	6.0	0.400	7.8
22	10.0	44.6	5.1	0.404	7.8
24	10.0	27.0	3.0	0.414	7.6
26	9.9	1.6	0.2	0.429	7.4
28	9.6	0.7	0.1	0.442	7.4
29	9.5	0.8	0.1	0.498	7.2
Minimum	9.5	0.7	0.1	0.398	7.2
Maximum	10.1	60.6	6.9	0.498	7.9
Average	10.0	43.4	4.9	0.411	7.7
Variance	0.0	503.1	6.4	0.001	0.0

% DO – Percent dissolved oxygen
DO – Dissolved oxygen (milligrams/liter)
Water Temperature - °C
Specific Conductivity – milliSiemens/centimeter

Bass Lake 2		Date:	10-28-2018	Time:	16:34
Depth	Water Temperature	%DO	DO	Specific Conductivity	pH
0	10.0	63.1	7.1	0.397	7.9
2	10.0	61.9	7.0	0.397	7.9
4	10.0	58.6	6.6	0.398	7.9
6	10.0	58.3	6.6	0.398	7.8
8	10.0	57.7	6.5	0.398	7.8
10	10.0	57.1	6.4	0.398	7.8
12	10.0	57.0	6.4	0.398	7.8
14	10.0	56.6	6.4	0.398	7.8
16	10.0	56.0	6.3	0.398	7.8
18	10.0	56.1	6.3	0.398	7.9
20	10.0	55.8	6.3	0.398	7.9
22	9.9	54.4	6.1	0.398	7.9
24	9.9	54.4	6.2	0.397	7.8
Minimum	9.9	54.4	6.1	0.397	7.8
Maximum	10.0	63.1	7.1	0.398	7.9
Average	10.0	57.5	6.5	0.398	7.8
Variance	0.0	6.7	0.1	0.000	0.0

% DO – Percent dissolved oxygen
DO – Dissolved oxygen (milligrams/liter)
Water Temperature - °C
Specific Conductivity – milliSiemens/centimeter

Bass Lake 3		Date:	10-28-2018	Time:	16:34
Depth	Water Temperature	%DO	DO	Specific Conductivity	pH
0	10.0	69.0	7.8	0.396	7.9
2	10.0	91.0	6.9	0.396	7.9
4	10.0	60.4	6.8	0.396	7.9
6	10.0	60.0	6.8	0.396	7.9
8	10.0	59.8	6.7	0.397	7.9
10	10.0	59.4	6.7	0.397	7.9
12	10.0	58.8	6.6	0.396	7.9
14	10.0	58.9	6.7	0.396	7.8
16	10.0	58.9	6.7	0.396	7.9
18	10.0	58.7	6.6	0.396	7.9
20	10.0	58.7	6.6	0.396	7.9
22	9.9	57.3	6.5	0.396	7.9
Minimum	9.9	57.3	6.5	0.396	7.8
Maximum	10.0	91.0	7.8	0.397	7.9
Average	10.0	62.6	6.8	0.396	7.9
Variance	0.0	88.9	0.1	0.000	0.0

% DO – Percent dissolved oxygen
DO – Dissolved oxygen (milligrams/liter)
Water Temperature - °C
Specific Conductivity – milliSiemens/centimeter

7.0 Appendix B

Water Quality Analyses Laboratory Data

Trace Analytical Laboratories, Inc.
2241 Black Creek Road
Muskegon, MI 49444-2673

TRACE
ANALYTICAL LABORATORIES, INC.

231-773-5998 Phone
888-979-4469 Fax
www.trace-labs.com

December 06, 2018

Mr. Doug Workman
Advanced Ecological Management
22071 7 Mile Road
Reed City, MI 49677

Phone: (231) 832-3200

RE: Trace Project T18K067
Client Project Texas Township

Dear Mr. Workman:

Enclosed are your analytical results. The results of this report relate only to the samples listed in the body of this report.

All reports were examined through Trace's validation process to ensure that requirements for quality and completeness were satisfied. All reported analytical results were obtained in accordance with the methods referenced on the reports. Every practical effort was made to meet the reporting limit specifications for this work, however, some results may have raised reporting limits to correct for percent solids.

For clients that require NELAC Accreditation, Trace certifies that these test results meet all requirements of the NELAC Standard, except for those analytes with a "N" notation. These analytes have not been evaluated by NELAC at Trace's discretion and will not be reported unless requested by client.

If you have questions concerning this report, please contact me at 231.773.5998 or by email at jmink@trace-labs.com.

Sincerely,

Jon Mink
Senior Project Manager
Enclosures

ACCREDITED IN ACCORDANCE WITH nelac
NJDEP Accreditation No. MI008

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SAMPLE SUMMARY

Trace Project ID: T18K067
Client Project ID: Texas Township

Trace ID	Sample ID	Matrix	Collected By	Date Collected	Date Received
T18K067-01	Eagle 1	Water	dw	11/04/18 09:29	11/05/18 08:33
T18K067-02	Eagle 1	Sediment	dw	11/04/18 09:29	11/05/18 08:33
T18K067-03	Eagle 2	Water	dw	11/04/18 10:19	11/05/18 08:33
T18K067-04	Eagle 2	Sediment	dw	11/04/18 10:19	11/05/18 08:33
T18K067-05	Eagle 3	Water	dw	11/04/18 10:59	11/05/18 08:33
T18K067-06	Eagle 3	Sediment	dw	11/04/18 10:59	11/05/18 08:33
T18K067-07	Trip Blank	Water	Client	11/04/18	11/05/18 08:33

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AN EXPLANATION OF TERMS AND SYMBOLS WHICH MAY OCCUR IN THIS REPORT

DEFINITIONS

LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference
DUP	Matrix Duplicate
RDL	Reporting Detection Limit
MCL	Maximum Contamination Limit
TIC	Tentatively Identified Compound
<, ND or U	Indicates the compound was analyzed for but not detected
*	Indicates a result that exceeds its associated MCL or Surrogate control limits
N	Indicates that the compound has not been evaluated by NELAC
NA	Indicates that the compound is not available.

NOTE: Samples for volatiles that have been extracted with a water miscible solvent were corrected for the total volume of the solvent/water mixture.
Solid matrices Method Blanks are at 100% solids as such results are the same wet or dry.

DATA QUALIFIERS

Trace ID: T18K067-01

Analysis: HACH M-Coli Blue 24

E. Coli	Note 511 : The sample was received and, therefore, analyzed beyond the established EPA hold time. The result must be considered estimated.
Total Coliform	Note 511 : The sample was received and, therefore, analyzed beyond the established EPA hold time. The result must be considered estimated.

Trace ID: T18K067-03

Analysis: HACH M-Coli Blue 24

E. Coli	Note 511 : The sample was received and, therefore, analyzed beyond the established EPA hold time. The result must be considered estimated.
Total Coliform	Note 511 : The sample was received and, therefore, analyzed beyond the established EPA hold time. The result must be considered estimated.

Trace ID: T18K067-05

Analysis: HACH M-Coli Blue 24

E. Coli	Note 511 : The sample was received and, therefore, analyzed beyond the established EPA hold time. The result must be considered estimated.
Total Coliform	Note 511 : The sample was received and, therefore, analyzed beyond the established EPA hold time. The result must be considered estimated.

CERTIFICATE OF ANALYSIS

Trace Analytical Laboratories, Inc.
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ANALYTICAL RESULTS

Trace Project ID: T18K067
Client Project ID: Texas Township

Trace ID: T18K067-01 | Date Collected: 11/04/18 09:29 | Matrix: Water
Sample ID: Eagle 1 | Date Received: 11/05/18 08:33

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
METALS, TOTAL										
Analysis Method: EPA 200.7 Rev. 4.4										
Batch: T081900										
Phosphorus	**0.011**	**mg/L**	**0.010**	**1**	**11/05/18**	**dcl**	**11/06/18**	**jbb**	**N**	
WET CHEMISTRY										
Analysis Method: EPA 353.2 Rev. 2.0										
Batch: [CALC]										
Total Inorganic Nitrogen	<0.010	mg/L	0.010	1	11/14/18		11/14/18	laboffice	N	
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
Analysis Method: EPA 8260C										
Batch: T082157										
Dichlorodifluoromethane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Chloromethane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Vinyl chloride	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Bromomethane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Chloroethane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Trichlorofluoromethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Diethyl ether	<10	ug/L	10	1	11/13/18	gmr	11/13/18	was	N	
Tert-butyl alcohol	<50	ug/L	50	1	11/13/18	gmr	11/13/18	was	N	
1,1-Dichloroethene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Acetone	<50	ug/L	50	1	11/13/18	gmr	11/13/18	was	N	
Iodomethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Carbon disulfide	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Methyl-tert-butyl ether	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Methylene chloride	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Acrylonitrile	<2.0	ug/L	2.0	1	11/13/18	gmr	11/13/18	was	N	
trans-1,2-Dichloroethene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,1-Dichloroethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Diisopropyl Ether	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
2-Butanone	<25	ug/L	25	1	11/13/18	gmr	11/13/18	was	N	
cis-1,2-Dichloroethene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
t-Butyl Ethyl Ether	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	

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ANALYTICAL RESULTS

Trace Project ID: T18K067
Client Project ID: Texas Township

Trace ID: T18K067-01 Date Collected: 11/04/18 09:29 Matrix: Water
Sample ID: Eagle 1 Date Received: 11/05/18 08:33

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
Bromochloromethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Tetrahydrofuran	<90	ug/L	90	1	11/13/18	gmr	11/13/18	was	N	
Chloroform	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,1,1-Trichloroethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Carbon tetrachloride	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Benzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
t-Amyl Methyl Ether	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
1,2-Dichloroethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Cyclohexane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Trichloroethene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,2-Dichloropropane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Dibromomethane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Bromodichloromethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
cis-1,3-Dichloropropene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
4-Methyl-2-pentanone	<50	ug/L	50	1	11/13/18	gmr	11/13/18	was	N	
Toluene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
trans-1,3-Dichloropropene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,1,2-Trichloroethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Tetrachloroethene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
2-Hexanone	<50	ug/L	50	1	11/13/18	gmr	11/13/18	was	N	
Dibromochloromethane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
1,2-Dibromoethane (EDB)	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Chlorobenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,1,1,2-Tetrachloroethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Ethylbenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
m,p-Xylene	<2.0	ug/L	2.0	1	11/13/18	gmr	11/13/18	was	N	
o-Xylene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Xylenes, total	<3.0	ug/L	3.0	1	11/13/18	gmr	11/13/18	was	N	
Styrene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Bromoform	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Isopropylbenzene	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
1,1,2,2-Tetrachloroethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,2,3-Trichloropropane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	

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ANALYTICAL RESULTS

Trace Project ID: T18K067
Client Project ID: Texas Township

Trace ID: T18K067-01 Date Collected: 11/04/18 09:29 Matrix: Water
Sample ID: Eagle 1 Date Received: 11/05/18 08:33

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
trans-1,4-Dichloro-2-butene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Bromobenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
n-Propylbenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,3,5-Trimethylbenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
t-Butyl Benzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,2,4-Trimethylbenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
sec-Butylbenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
p-Isopropyltoluene	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
1,3-Dichlorobenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,4-Dichlorobenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
n-Butylbenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,2,3-Trimethylbenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,2-Dichlorobenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Hexachloroethane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
1,2,4-Trichlorobenzene	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Naphthalene	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
1,2,3-Trichlorobenzene	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
2-Methylnaphthalene	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Surrogates:										
1,2-Dichloroethane-d4	112	%	68-133	1	11/13/18	gmr	11/13/18	was	N	
Toluene-d8	102	%	75-120	1	11/13/18	gmr	11/13/18	was	N	
4-Bromofluorobenzene	93	%	69-119	1	11/13/18	gmr	11/13/18	was	N	
1,2-Dichlorobenzene-d4	95	%	72-127	1	11/13/18	gmr	11/13/18	was	N	
WET CHEMISTRY										
Analysis Method: EPA 350.1 Rev. 2.0										
Batch: T081894										
Ammonia as N	<0.010	mg/L	0.010	1	11/05/18	ans	11/05/18	ans	N	
Analysis Method: EPA 351.2 Rev. 2.0										
Batch: T081898										
Total Kjeldahl Nitrogen	**0.90**	**mg/L**	**0.50**	**1**	**11/08/18**	**nw**	**11/09/18**	**pn**	**N**	

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ANALYTICAL RESULTS

Trace Project ID: T18K067
Client Project ID: Texas Township

Trace ID: T18K067-01 Date Collected: 11/04/18 09:29 Matrix: Water
Sample ID: Eagle 1 Date Received: 11/05/18 08:33

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
WET CHEMISTRY										
Analysis Method: EPA 353.2 Rev. 2.0										
Batch: T082198										
Nitrate/Nitrite as N	<0.050	mg/L	0.050	1	11/14/18	jma	11/14/18	laboffice	N	
Analysis Method: EPA 365.1 Rev. 2.0										
Batch: T081959										
Soluble Reactive Phosphate	<0.010	mg/L	0.010	1	11/06/18	ns	11/06/18	ns	N	
Analysis Method: HACH M-Coli Blue 24										
Batch: T081896										
Total Coliform	**480**	**CFU/100 ml**	**1.0**	**1**	**11/05/18**	**nw**	**11/06/18**	**nw**	**511, N**	
E. Coli	**2.0**	**CFU/100 ml**	**2.0**	**2**	**11/05/18**	**nw**	**11/06/18**	**nw**	**511, N**	
Analysis Method: SM 10200H										
Batch: T081907										
Chlorophyll A	**-2.94**	**mg/m³**	**-100**	**1**	**11/05/18**	**ans**	**11/07/18**	**ans**	**N**	
Pheophytin A	**3.68**	**mg/m³**	**-100**	**1**	**11/05/18**	**ans**	**11/07/18**	**ans**	**N**	
Analysis Method: SM 2540 D-11										
Batch: T082047										
Total Suspended Solids	<10	mg/L	10	1	11/08/18	ans	11/08/18	ans	N	

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ANALYTICAL RESULTS

Trace Project ID: T18K067
Client Project ID: Texas Township

Trace ID: T18K067-02 Date Collected: 11/04/18 09:29 Matrix: Sediment
Sample ID: Eagle 1 Date Received: 11/05/18 08:33

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
METALS, TOTAL										
Analysis Method: EPA 6010D										
Batch: T081917										
Phosphorus	**630**	**mg/kg dry**	**8.0**	**1**	**11/06/18**	**dcl**	**11/07/18**	**rl**	**N**	
WET CHEMISTRY										
Analysis Method: ASTM D2974-87										
Batch: T081973										
% Solids	**1.7**	**% by Wt.**	**0.10**	**1**	**11/06/18**	**gmr**	**11/06/18**	**gmr**	**N**	
Analysis Method: EPA 351.2 Rev. 2.0										
Batch: T082181										
Total Kjeldahl Nitrogen	**17000**	**mg/kg dry**	**72**	**5**	**11/14/18**	**nw**	**11/15/18**	**nw**	**N**	

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ANALYTICAL RESULTS

Trace Project ID: T18K067
Client Project ID: Texas Township

Trace ID: T18K067-03 | Date Collected: 11/04/18 10:19 | Matrix: Water
Sample ID: Eagle 2 | Date Received: 11/05/18 08:33

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
METALS, TOTAL										
Analysis Method: EPA 200.7 Rev. 4.4										
Batch: T081900										
Phosphorus	**0.010**	**mg/L**	**0.010**	**1**	**11/05/18**	**dcl**	**11/06/18**	**jbb**	**N**	
WET CHEMISTRY										
Analysis Method: EPA 353.2 Rev. 2.0										
Batch: [CALC]										
Total Inorganic Nitrogen	**0.016**	**mg/L**	**0.010**	**1**	**11/14/18**		**11/14/18**	**laboffice**	**N**	
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
Analysis Method: EPA 8260C										
Batch: T082157										
Dichlorodifluoromethane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Chloromethane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Vinyl chloride	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Bromomethane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Chloroethane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Trichlorofluoromethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Diethyl ether	<10	ug/L	10	1	11/13/18	gmr	11/13/18	was	N	
Tert-butyl alcohol	<50	ug/L	50	1	11/13/18	gmr	11/13/18	was	N	
1,1-Dichloroethene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Acetone	<50	ug/L	50	1	11/13/18	gmr	11/13/18	was	N	
Iodomethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Carbon disulfide	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Methyl-tert-butyl ether	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Methylene chloride	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Acrylonitrile	<2.0	ug/L	2.0	1	11/13/18	gmr	11/13/18	was	N	
trans-1,2-Dichloroethene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,1-Dichloroethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Diisopropyl Ether	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
2-Butanone	<25	ug/L	25	1	11/13/18	gmr	11/13/18	was	N	
cis-1,2-Dichloroethene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
t-Butyl Ethyl Ether	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	

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ANALYTICAL RESULTS

Trace Project ID: T18K067
Client Project ID: Texas Township

Trace ID: T18K067-03 Date Collected: 11/04/18 10:19 Matrix: Water
Sample ID: Eagle 2 Date Received: 11/05/18 08:33

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
Bromochloromethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Tetrahydrofuran	<90	ug/L	90	1	11/13/18	gmr	11/13/18	was	N	
Chloroform	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,1,1-Trichloroethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Carbon tetrachloride	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Benzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
t-Amyl Methyl Ether	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
1,2-Dichloroethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Cyclohexane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Trichloroethene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,2-Dichloropropane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Dibromomethane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Bromodichloromethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
cis-1,3-Dichloropropene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
4-Methyl-2-pentanone	<50	ug/L	50	1	11/13/18	gmr	11/13/18	was	N	
Toluene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
trans-1,3-Dichloropropene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,1,2-Trichloroethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Tetrachloroethene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
2-Hexanone	<50	ug/L	50	1	11/13/18	gmr	11/13/18	was	N	
Dibromochloromethane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
1,2-Dibromoethane (EDB)	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Chlorobenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,1,1,2-Tetrachloroethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Ethylbenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
m,p-Xylene	<2.0	ug/L	2.0	1	11/13/18	gmr	11/13/18	was	N	
o-Xylene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Xylenes, total	<3.0	ug/L	3.0	1	11/13/18	gmr	11/13/18	was	N	
Styrene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Bromoform	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Isopropylbenzene	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
1,1,2,2-Tetrachloroethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,2,3-Trichloropropane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	

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ANALYTICAL RESULTS

Trace Project ID: T18K067
Client Project ID: Texas Township

Trace ID: T18K067-03 Date Collected: 11/04/18 10:19 Matrix: Water
Sample ID: Eagle 2 Date Received: 11/05/18 08:33

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
trans-1,4-Dichloro-2-butene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Bromobenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
n-Propylbenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,3,5-Trimethylbenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
t-Butyl Benzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,2,4-Trimethylbenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
sec-Butylbenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
p-Isopropyltoluene	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
1,3-Dichlorobenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,4-Dichlorobenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
n-Butylbenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,2,3-Trimethylbenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,2-Dichlorobenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Hexachloroethane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
1,2,4-Trichlorobenzene	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Naphthalene	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
1,2,3-Trichlorobenzene	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
2-Methylnaphthalene	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Surrogates:										
1,2-Dichloroethane-d4	88	%	68-133	1	11/13/18	gmr	11/13/18	was	N	
Toluene-d8	99	%	75-120	1	11/13/18	gmr	11/13/18	was	N	
4-Bromofluorobenzene	98	%	69-119	1	11/13/18	gmr	11/13/18	was	N	
1,2-Dichlorobenzene-d4	100	%	72-127	1	11/13/18	gmr	11/13/18	was	N	
WET CHEMISTRY										
Analysis Method: EPA 350.1 Rev. 2.0										
Batch: T082027										
Ammonia as N	**0.016**	**mg/L**	**0.010**	**1**	**11/08/18**	**ans**	**11/08/18**	**ans**	**N**	
Analysis Method: EPA 351.2 Rev. 2.0										
Batch: T081898										
Total Kjeldahl Nitrogen	<0.50	mg/L	0.50	1	11/08/18	nw	11/09/18	pn	N	

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ANALYTICAL RESULTS

Trace Project ID: T18K067
Client Project ID: Texas Township

Trace ID: T18K067-03 | Date Collected: 11/04/18 10:19 | Matrix: Water
Sample ID: Eagle 2 | Date Received: 11/05/18 08:33

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
WET CHEMISTRY										
Analysis Method: EPA 353.2 Rev. 2.0										
Batch: T082198										
Nitrate/Nitrite as N	<0.050	mg/L	0.050	1	11/14/18	jma	11/14/18	laboffice	N	
Analysis Method: EPA 365.1 Rev. 2.0										
Batch: T081959										
Soluble Reactive Phosphate	<0.010	mg/L	0.010	1	11/06/18	ns	11/06/18	ns	N	
Analysis Method: HACH M-Coli Blue 24										
Batch: T081896										
Total Coliform	**280**	**CFU/100 ml**	**1.0**	**1**	**11/05/18**	**nw**	**11/06/18**	**nw**	**511, N**	
E. Coli	<2.0	CFU/100 ml	2.0	2	11/05/18	nw	11/06/18	nw	511, N	
Analysis Method: SM 10200H										
Batch: T081907										
Chlorophyll A	**-1.34**	**mg/m³**	**-100**	**1**	**11/05/18**	**ans**	**11/07/18**	**ans**	**N**	
Pheophytin A	**4.89**	**mg/m³**	**-100**	**1**	**11/05/18**	**ans**	**11/07/18**	**ans**	**N**	
Analysis Method: SM 2540 D-11										
Batch: T082047										
Total Suspended Solids	<10	mg/L	10	1	11/08/18	ans	11/08/18	ans	N	

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ANALYTICAL RESULTS

Trace Project ID: T18K067
Client Project ID: Texas Township

Trace ID: T18K067-04 Date Collected: 11/04/18 10:19 Matrix: Sediment
Sample ID: Eagle 2 Date Received: 11/05/18 08:33

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
METALS, TOTAL										
Analysis Method: EPA 6010D										
Batch: T081917										
Phosphorus	**600**	**mg/kg dry**	**7.3**	**1**	**11/06/18**	**dcl**	**11/07/18**	**rl**	**N**	
WET CHEMISTRY										
Analysis Method: ASTM D2974-87										
Batch: T081973										
% Solids	**5.5**	**% by Wt.**	**0.10**	**1**	**11/06/18**	**gmr**	**11/06/18**	**gmr**	**N**	
Analysis Method: EPA 351.2 Rev. 2.0										
Batch: T082181										
Total Kjeldahl Nitrogen	**13000**	**mg/kg dry**	**150**	**10**	**11/14/18**	**nw**	**11/15/18**	**nw**	**N**	

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ANALYTICAL RESULTS

Trace Project ID: T18K067
Client Project ID: Texas Township

Trace ID: T18K067-05 | Date Collected: 11/04/18 10:59 | Matrix: Water
Sample ID: Eagle 3 | Date Received: 11/05/18 08:33

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
METALS, TOTAL										
Analysis Method: EPA 200.7 Rev. 4.4										
Batch: T081900										
Phosphorus	<0.010	mg/L	0.010	1	11/05/18	dcl	11/06/18	jbb	N	
WET CHEMISTRY										
Analysis Method: EPA 353.2 Rev. 2.0										
Batch: [CALC]										
Total Inorganic Nitrogen	**0.026**	**mg/L**	**0.010**	**1**	**11/14/18**		**11/14/18**	**laboffice**	**N**	
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
Analysis Method: EPA 8260C										
Batch: T082157										
Dichlorodifluoromethane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Chloromethane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Vinyl chloride	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Bromomethane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Chloroethane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Trichlorofluoromethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Diethyl ether	<10	ug/L	10	1	11/13/18	gmr	11/13/18	was	N	
Tert-butyl alcohol	<50	ug/L	50	1	11/13/18	gmr	11/13/18	was	N	
1,1-Dichloroethene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Acetone	<50	ug/L	50	1	11/13/18	gmr	11/13/18	was	N	
Iodomethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Carbon disulfide	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Methyl-tert-butyl ether	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Methylene chloride	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Acrylonitrile	<2.0	ug/L	2.0	1	11/13/18	gmr	11/13/18	was	N	
trans-1,2-Dichloroethene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,1-Dichloroethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Diisopropyl Ether	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
2-Butanone	<25	ug/L	25	1	11/13/18	gmr	11/13/18	was	N	
cis-1,2-Dichloroethene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
t-Butyl Ethyl Ether	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	

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ANALYTICAL RESULTS

Trace Project ID: T18K067
Client Project ID: Texas Township

Trace ID: T18K067-05 Date Collected: 11/04/18 10:59 Matrix: Water
Sample ID: Eagle 3 Date Received: 11/05/18 08:33

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
Bromochloromethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Tetrahydrofuran	<90	ug/L	90	1	11/13/18	gmr	11/13/18	was	N	
Chloroform	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,1,1-Trichloroethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Carbon tetrachloride	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Benzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
t-Amyl Methyl Ether	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
1,2-Dichloroethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Cyclohexane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Trichloroethene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,2-Dichloropropane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Dibromomethane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Bromodichloromethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
cis-1,3-Dichloropropene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
4-Methyl-2-pentanone	<50	ug/L	50	1	11/13/18	gmr	11/13/18	was	N	
Toluene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
trans-1,3-Dichloropropene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,1,2-Trichloroethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Tetrachloroethene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
2-Hexanone	<50	ug/L	50	1	11/13/18	gmr	11/13/18	was	N	
Dibromochloromethane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
1,2-Dibromoethane (EDB)	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Chlorobenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,1,1,2-Tetrachloroethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Ethylbenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
m,p-Xylene	<2.0	ug/L	2.0	1	11/13/18	gmr	11/13/18	was	N	
o-Xylene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Xylenes, total	<3.0	ug/L	3.0	1	11/13/18	gmr	11/13/18	was	N	
Styrene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Bromoform	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Isopropylbenzene	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
1,1,2,2-Tetrachloroethane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,2,3-Trichloropropane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	

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ANALYTICAL RESULTS

Trace Project ID: T18K067
Client Project ID: Texas Township

Trace ID: T18K067-05 Date Collected: 11/04/18 10:59 Matrix: Water
Sample ID: Eagle 3 Date Received: 11/05/18 08:33

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
trans-1,4-Dichloro-2-butene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Bromobenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
n-Propylbenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,3,5-Trimethylbenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
t-Butyl Benzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,2,4-Trimethylbenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
sec-Butylbenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
p-Isopropyltoluene	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
1,3-Dichlorobenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,4-Dichlorobenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
n-Butylbenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,2,3-Trimethylbenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,2-Dichlorobenzene	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	1.0	1	11/13/18	gmr	11/13/18	was	N	
Hexachloroethane	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
1,2,4-Trichlorobenzene	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Naphthalene	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
1,2,3-Trichlorobenzene	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
2-Methylnaphthalene	<5.0	ug/L	5.0	1	11/13/18	gmr	11/13/18	was	N	
Surrogates:										
1,2-Dichloroethane-d4	107	%	68-133	1	11/13/18	gmr	11/13/18	was	N	
Toluene-d8	107	%	75-120	1	11/13/18	gmr	11/13/18	was	N	
4-Bromofluorobenzene	98	%	69-119	1	11/13/18	gmr	11/13/18	was	N	
1,2-Dichlorobenzene-d4	96	%	72-127	1	11/13/18	gmr	11/13/18	was	N	
WET CHEMISTRY										
Analysis Method: EPA 350.1 Rev. 2.0										
Batch: T082027										
Ammonia as N	**0.026**	**mg/L**	**0.010**	**1**	**11/08/18**	**ans**	**11/08/18**	**ans**	**N**	
Analysis Method: EPA 351.2 Rev. 2.0										
Batch: T081898										
Total Kjeldahl Nitrogen	<0.50	mg/L	0.50	1	11/08/18	nw	11/09/18	pn	N	

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ANALYTICAL RESULTS

Trace Project ID: T18K067
Client Project ID: Texas Township

Trace ID: T18K067-05 Date Collected: 11/04/18 10:59 Matrix: Water
Sample ID: Eagle 3 Date Received: 11/05/18 08:33

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
WET CHEMISTRY										
Analysis Method: EPA 353.2 Rev. 2.0										
Batch: T082198										
Nitrate/Nitrite as N	<0.050	mg/L	0.050	1	11/14/18	jma	11/14/18	laboffice	N	
Analysis Method: EPA 365.1 Rev. 2.0										
Batch: T081959										
Soluble Reactive Phosphate	<0.010	mg/L	0.010	1	11/06/18	ns	11/06/18	ns	N	
Analysis Method: HACH M-Coli Blue 24										
Batch: T081896										
Total Coliform	**640**	**CFU/100 ml**	**1.0**	**1**	**11/05/18**	**nw**	**11/06/18**	**nw**	**511, N**	
E. Coli	<2.0	CFU/100 ml	2.0	2	11/05/18	nw	11/06/18	nw	511, N	
Analysis Method: SM 10200H										
Batch: T081907										
Chlorophyll A	**-1.60**	**mg/m³**	**-100**	**1**	**11/05/18**	**ans**	**11/07/18**	**ans**	**N**	
Pheophytin A	**0.641**	**mg/m³**	**-100**	**1**	**11/05/18**	**ans**	**11/07/18**	**ans**	**N**	
Analysis Method: SM 2540 D-11										
Batch: T082047										
Total Suspended Solids	<10	mg/L	10	1	11/08/18	ans	11/08/18	ans	N	

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ANALYTICAL RESULTS

Trace Project ID: T18K067
Client Project ID: Texas Township

Trace ID: T18K067-06 Date Collected: 11/04/18 10:59 Matrix: Sediment
Sample ID: Eagle 3 Date Received: 11/05/18 08:33

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
METALS, TOTAL										
Analysis Method: EPA 6010D										
Batch: T081917										
Phosphorus	**690**	**mg/kg dry**	**6.6**	**1**	**11/06/18**	**dcl**	**11/07/18**	**rl**	**N**	
WET CHEMISTRY										
Analysis Method: ASTM D2974-87										
Batch: T081973										
% Solids	**4.4**	**% by Wt.**	**0.10**	**1**	**11/06/18**	**gmr**	**11/06/18**	**gmr**	**N**	
Analysis Method: EPA 351.2 Rev. 2.0										
Batch: T082181										
Total Kjeldahl Nitrogen	**11000**	**mg/kg dry**	**140**	**10**	**11/14/18**	**nw**	**11/15/18**	**nw**	**N**	

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TRACE ANALYTICAL LABORATORIES, INC.

CHAIN-OF-CUSTODY RECORD

Trace Analytical Laboratories, Inc.
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Page 1 of 1

Trace ID No. T18K067

Report Results To:		Bill To:	Trace Use:
Company Name: ADVANCED ECOLOGICAL MGMT		PO #:	Logged By: JS
Report To: DOUG WORKMAN		Contact Name:	Checked By: [illegible]
Mailing Address: 22071 7 MILE		Billing Address (if different):	Soil Volatiles Preserved (circle if applicable): MeOH Low Level Lab
City, State, Zip Code: REED CITY MI 49677		City, State, Zip Code:	
Office Phone: 231 832 3200	Cell Phone: 231 512 0566	Phone Number:	Sampling Time:
Email Address:		Billing Email Address:	

Turnaround Requirements:
- ☐ Standard ☐ 48 Hour*
- ☐ 4 Day* ☐ 24 Hour*
- ☐ 3 Day*

** Requires Prior Approval*

Matrix Key:
S = Soil / Solid, WI = Wipes
W = Water, LW = Liquid Waste
SL = Sludge, A = Air
OI = Oil, D = Drinking Water

Project Name: TEXAS TOWNSHIP
Sampled By: DOUG WORKMAN

Analysis Requested: SRP TSS; TPhos NO2-NO3 TKN; Chl-a; Sediment TKN TPhos; Hydrocarbons; E coli

Trace No.	Date Collected	Time Collected	Client Sample ID	Metals Field Filtered (Y / N)	Matrix	Number of Containers	Cool	HCl	HNO_3	H_2SO_4	NaOH	Other	SRP TSS	TPhos NO2-NO3 TKN	Chl-a	Sediment TKN TPhos	Hydrocarbons	E coli	Remarks	Possible Health Hazards?
1/2	11-4-18	929	EAGLE 1										|	|	|	|	|	|		
3/4	11-4-18	1019	EAGLE 2										|	|	|	|	|	|		
5/6	11-4-18	1059	EAGLE 3										|	|	|	|	|	|		

Please Sign

	Released By	Received By	Date	Time	Released By	Received By	Date	Time
1) / 2)	Doug WZ	Kristine Workman	11-5-18	630am	Kristine Workman	[illegible]	11/5/18	8:33
3) / 4)								

In executing this Chain of Custody, the client acknowledges the terms as set forth at www.trace-labs.com/terms-of-agreement.

☐ Check this box if you would not like your samples analyzed if received outside of the conditions outlined in the Trace Sample Acceptance Policy at www.trace-labs.com/downloads.

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SAMPLE LOG IN CHECKLIST

Trace ID #: T18K067 Date: 12/5/18 Package Description: Cooler Temperature: -1.1

Client Name: AEW Time: 8:33 Logged in by: JS

Cooler Receipt

Cooler/samples delivered by: Trace courier ☐
Hand delivered ☒ Name of delivery person: _____
Commercial courier ☐ UPS ☐ FED EX ☐ US Mail ☐

Tracking Number: ☒ Not Applicable
Tracking #: _____

COC Seals present and intact on cooler? ☒ Not Applicable ☐ No ☐ Yes

Custody seals signed by Client? ☐ No ☐ Yes Client custody seal # (if applicable): _____

Coolant and Temperature

Type of Coolant Used

Slurry w/ crushed, cubed, or chip ice? ☒
Multiple bags of ice around samples? ☐
Ice Packs/ Blue Ice : ☐
No Coolant Present: ☐

Ice still present upon receipt (circle one):
(Yes) No N/A

Cooler Temperature

Correction Factors: •Digital Stick Thermometer CF = -0.6°C
•IR Thermometer CF = -0.8°C

Representative Sample Temperature: 3.0 °C (check one below)
☒ Temp Blank (Stick Thermometer)
☐ Client Sample (IR Thermometer)

Melt Water: none °C (Use Digital Stick Thermometer)

General

	Yes	No	NA	Comments
All bottles arrived unbroken with labels in good condition?	☒	☐	☐	
Each sample point is in a sealed plastic bag?	☐	☒	☐	
Labels filled out completely?	☒	☐	☐	
All bottle labels agree with Chain of Custody (COC)?	☒	☐	☐	
Sufficient sample to run tests requested?	☒	☐	☐	
pH checked and samples at correct pH?	☒	☐	☐	See Below*
Correct preservative added to samples?	☒	☐	☐	
Air bubbles absent from VOAs?	☐	☒	☐	
COC filled out properly and signed by client?	☒	☐	☐	
COC signed in by TRACE sample custodian?	☒	☐	☐	
Was project manager called and samples discussed?	☐	☒	☐	

Notes:

*EMD pH Test Strips Used:

☒ pH 0-2.5 Lot: HC731452 ☐ pH 11.0-13.0 Lot: HC600691

☐ Other: _____

Form 70-A.25
Effective 7/25/18

TRACE Analytical Laboratories, Inc.

CERTIFICATE OF ANALYSIS

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November 28, 2018

Mr. Doug Workman
Advanced Ecological Management
22071 7 Mile Road
Reed City, MI 49677

Phone: (231) 832-3200

RE: Trace Project T18J691
Client Project Crooked Lake and Bass Lake Samples

Dear Mr. Workman:

Enclosed are your analytical results. The results of this report relate only to the samples listed in the body of this report.

All reports were examined through Trace's validation process to ensure that requirements for quality and completeness were satisfied. All reported analytical results were obtained in accordance with the methods referenced on the reports. Every practical effort was made to meet the reporting limit specifications for this work, however, some results may have raised reporting limits to correct for percent solids.

For clients that require NELAC Accreditation, Trace certifies that these test results meet all requirements of the NELAC Standard, except for those analytes with a "N" notation. These analytes have not been evaluated by NELAC at Trace's discretion and will not be reported unless requested by client.

If you have questions concerning this report, please contact me at 231.773.5998 or by email at jmink@trace-labs.com.

Sincerely,

Jon Mink
Senior Project Manager
Enclosures

ACCREDITED IN ACCORDANCE WITH nelac

NJDEP Accreditation No. MI008

Trace Analytical Laboratories, Inc.
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SAMPLE SUMMARY

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID	Sample ID	Matrix	Collected By	Date Collected	Date Received
T18J691-01	Crooked Lake 1	Aqueous	Client	10/28/18 11:15	10/29/18 08:56
T18J691-02	Crooked Lake 2	Aqueous	Client	10/28/18 11:56	10/29/18 08:56
T18J691-03	Crooked Lake 3	Aqueous	Client	10/28/18 13:25	10/29/18 08:56
T18J691-04	Bass Lake 1	Aqueous	Client	10/28/18 16:08	10/29/18 08:56
T18J691-05	Bass Lake 2	Aqueous	Client	10/28/18 16:47	10/29/18 08:56
T18J691-06	Bass Lake 3	Aqueous	Client	10/28/18 17:17	10/29/18 08:56
T18J691-08	Crooked Lake 1	Solid	Client	10/28/18 11:15	10/29/18 08:56
T18J691-09	Crooked Lake 2	Solid	Client	10/28/18 11:56	10/29/18 08:56
T18J691-10	Crooked Lake 3	Solid	Client	10/28/18 13:25	10/29/18 08:56
T18J691-11	Bass Lake 1	Solid	Client	10/28/18 16:08	10/29/18 08:56
T18J691-12	Bass Lake 2	Solid	Client	10/28/18 16:47	10/29/18 08:56
T18J691-13	Bass Lake 3	Solid	Client	10/28/18 17:17	10/29/18 08:56

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AN EXPLANATION OF TERMS AND SYMBOLS WHICH MAY OCCUR IN THIS REPORT

DEFINITIONS

LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MS	Matrix Spike
MSD	Matrix Spike Duplicate
RPD	Relative Percent Difference
DUP	Matrix Duplicate
RDL	Reporting Detection Limit
MCL	Maximum Contamination Limit
TIC	Tentatively Identified Compound
<, ND or U	Indicates the compound was analyzed for but not detected
*	Indicates a result that exceeds its associated MCL or Surrogate control limits
N	Indicates that the compound has not been evaluated by NELAC
NA	Indicates that the compound is not available.

NOTE: Samples for volatiles that have been extracted with a water miscible solvent were corrected for the total volume of the solvent/water mixture.
Solid matrices Method Blanks are at 100% solids as such results are the same wet or dry.

DATA QUALIFIERS

Trace ID: T18J691-01

Analysis: HACH M-Coli Blue 24

E. Coli	Note 511 : The sample was received and, therefore, analyzed beyond the established EPA hold time. The result must be considered estimated.
Total Coliform	Note 511 : The sample was received and, therefore, analyzed beyond the established EPA hold time. The result must be considered estimated.

Trace ID: T18J691-02

Analysis: HACH M-Coli Blue 24

E. Coli	Note 511 : The sample was received and, therefore, analyzed beyond the established EPA hold time. The result must be considered estimated.
Total Coliform	Note 511 : The sample was received and, therefore, analyzed beyond the established EPA hold time. The result must be considered estimated.

Trace ID: T18J691-03

Analysis: HACH M-Coli Blue 24

E. Coli	Note 511 : The sample was received and, therefore, analyzed beyond the established EPA hold time. The result must be considered estimated.
Total Coliform	Note 511 : The sample was received and, therefore, analyzed beyond the established EPA hold time. The result must be considered estimated.

Trace ID: T18J691-04

Analysis: HACH M-Coli Blue 24

E. Coli	Note 511 : The sample was received and, therefore, analyzed beyond the established EPA hold time. The result must be considered estimated.

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Total Coliform	Note 511 : The sample was received and, therefore, analyzed beyond the established EPA hold time. The result must be considered estimated.

Trace ID: T18J691-05

Analysis: HACH M-Coli Blue 24

E. Coli	Note 511 : The sample was received and, therefore, analyzed beyond the established EPA hold time. The result must be considered estimated.
Total Coliform	Note 511 : The sample was received and, therefore, analyzed beyond the established EPA hold time. The result must be considered estimated.

Trace ID: T18J691-06

Analysis: HACH M-Coli Blue 24

E. Coli	Note 511 : The sample was received and, therefore, analyzed beyond the established EPA hold time. The result must be considered estimated.
Total Coliform	Note 511 : The sample was received and, therefore, analyzed beyond the established EPA hold time. The result must be considered estimated.

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-01 | Date Collected: 10/28/18 11:15 | Matrix: Aqueous
Sample ID: Crooked Lake 1 | Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
WET CHEMISTRY										
Analysis Method: Calculation										
Batch: [CALC]										
Total Inorganic Nitrogen	**0.010**	**mg/L**	**0.010**	**1**	**11/20/18**		**11/20/18**	**nw**	**N**	
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
Analysis Method: EPA 8260C										
Batch: T081946										
Dichlorodifluoromethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Chloromethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Vinyl chloride	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Bromomethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Chloroethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Trichlorofluoromethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Diethyl ether	<10	ug/L	10	1	11/06/18	was	11/06/18	was	N	
Tert-butyl alcohol	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
1,1-Dichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Acetone	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
Iodomethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Carbon disulfide	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Methyl-tert-butyl ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Methylene chloride	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Acrylonitrile	<2.0	ug/L	2.0	1	11/06/18	was	11/06/18	was	N	
trans-1,2-Dichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1-Dichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Diisopropyl Ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
2-Butanone	<25	ug/L	25	1	11/06/18	was	11/06/18	was	N	
cis-1,2-Dichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
t-Butyl Ethyl Ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Bromochloromethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Tetrahydrofuran	<90	ug/L	90	1	11/06/18	was	11/06/18	was	N	
Chloroform	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1,1-Trichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Carbon tetrachloride	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	

CERTIFICATE OF ANALYSIS

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-01 Date Collected: 10/28/18 11:15 Matrix: Aqueous
Sample ID: Crooked Lake 1 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
Benzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
t-Amyl Methyl Ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Cyclohexane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Trichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dichloropropane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Dibromomethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Bromodichloromethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
cis-1,3-Dichloropropene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
4-Methyl-2-pentanone	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
Toluene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
trans-1,3-Dichloropropene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1,2-Trichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Tetrachloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
2-Hexanone	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
Dibromochloromethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dibromoethane (EDB)	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Chlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1,1,2-Tetrachloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Ethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
m,p-Xylene	<2.0	ug/L	2.0	1	11/06/18	was	11/06/18	was	N	
o-Xylene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Xylenes, total	<3.0	ug/L	3.0	1	11/06/18	was	11/06/18	was	N	
Styrene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Bromoform	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Isopropylbenzene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,1,2,2-Tetrachloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2,3-Trichloropropane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
trans-1,4-Dichloro-2-butene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Bromobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
n-Propylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,3,5-Trimethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
t-Butyl Benzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-01 Date Collected: 10/28/18 11:15 Matrix: Aqueous
Sample ID: Crooked Lake 1 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
1,2,4-Trimethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
sec-Butylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
p-Isopropyltoluene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,3-Dichlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,4-Dichlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
n-Butylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2,3-Trimethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dichlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Hexachloroethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2,4-Trichlorobenzene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Naphthalene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2,3-Trichlorobenzene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
2-Methylnaphthalene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Surrogates:										
1,2-Dichloroethane-d4	106	%	68-133	1	11/06/18	was	11/06/18	was	N	
Toluene-d8	106	%	75-120	1	11/06/18	was	11/06/18	was	N	
4-Bromofluorobenzene	87	%	69-119	1	11/06/18	was	11/06/18	was	N	
1,2-Dichlorobenzene-d4	91	%	72-127	1	11/06/18	was	11/06/18	was	N	
WET CHEMISTRY										
Analysis Method: EPA 300.0 Rev. 2.1										
Batch: T081692										
Nitrate as N	<0.020	mg/L	0.020	1	10/29/18	nw	10/30/18	nw	N	
Nitrite as N	<0.020	mg/L	0.020	1	10/29/18	nw	10/30/18	nw	N	
Analysis Method: EPA 350.1 Rev. 2.0										
Batch: T082306										
Ammonia as N	**0.010**	**mg/L**	**0.010**	**1**	**11/20/18**	**ns**	**11/20/18**	**ans**	**N**	
Analysis Method: EPA 351.2 Rev. 2.0										
Batch: T081823										
Total Kjeldahl Nitrogen	<0.50	mg/L	0.50	1	11/01/18	nw	11/02/18	nw	N	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-01 Date Collected: 10/28/18 11:15 Matrix: Aqueous
Sample ID: Crooked Lake 1 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
WET CHEMISTRY										
Analysis Method: EPA 365.1 Rev. 2.0										
Batch: T081704										
Soluble Reactive Phosphate	<0.010	mg/L	0.010	1	10/29/18	ns	10/29/18	ns	N	
Analysis Method: HACH M-Coli Blue 24										
Batch: T081707										
Total Coliform	**91**	**CFU/100 ml**	**1.0**	**1**	**10/29/18**	**jma**	**10/30/18**	**jma**	**511, N**	
E. Coli	**1.0**	**CFU/100 ml**	**1.0**	**1**	**10/29/18**	**jma**	**10/30/18**	**jma**	**511, N**	
Analysis Method: SM 10200H										
Batch: T081715										
Chlorophyll A	**1.60**	**mg/m³**	**-100**	**1**	**10/29/18**	**ans**	**11/07/18**	**ans**	**N**	
Pheophytin A	**0.641**	**mg/m³**	**-100**	**1**	**10/29/18**	**ans**	**11/07/18**	**ans**	**N**	
Analysis Method: SM 2540 D-11										
Batch: T081806										
Total Suspended Solids	<10	mg/L	10	1	10/31/18	ns	10/31/18	ans	N	
Analysis Method: SM 4500-P E-11										
Batch: T081984										
Phosphorus-Total (as P)	**0.015**	**mg/L**	**0.010**	**1**	**11/07/18**	**ns**	**11/07/18**	**ns**	**N**	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-02 | Date Collected: 10/28/18 11:56 | Matrix: Aqueous
Sample ID: Crooked Lake 2 | Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
WET CHEMISTRY										
Analysis Method: EPA 353.2 Rev. 2.0										
Batch: [CALC]										
Total Inorganic Nitrogen	**0.012**	**mg/L**	**0.010**	**1**	**11/26/18**		**11/26/18**	**jma**	**N**	
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
Analysis Method: EPA 8260C										
Batch: T081946										
Dichlorodifluoromethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Chloromethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Vinyl chloride	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Bromomethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Chloroethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Trichlorofluoromethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Diethyl ether	<10	ug/L	10	1	11/06/18	was	11/06/18	was	N	
Tert-butyl alcohol	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
1,1-Dichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Acetone	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
Iodomethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Carbon disulfide	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Methyl-tert-butyl ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Methylene chloride	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Acrylonitrile	<2.0	ug/L	2.0	1	11/06/18	was	11/06/18	was	N	
trans-1,2-Dichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1-Dichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Diisopropyl Ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
2-Butanone	<25	ug/L	25	1	11/06/18	was	11/06/18	was	N	
cis-1,2-Dichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
t-Butyl Ethyl Ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Bromochloromethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Tetrahydrofuran	<90	ug/L	90	1	11/06/18	was	11/06/18	was	N	
Chloroform	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1,1-Trichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Carbon tetrachloride	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-02 Date Collected: 10/28/18 11:56 Matrix: Aqueous
Sample ID: Crooked Lake 2 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
Benzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
t-Amyl Methyl Ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Cyclohexane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Trichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dichloropropane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Dibromomethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Bromodichloromethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
cis-1,3-Dichloropropene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
4-Methyl-2-pentanone	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
Toluene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
trans-1,3-Dichloropropene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1,2-Trichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Tetrachloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
2-Hexanone	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
Dibromochloromethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dibromoethane (EDB)	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Chlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1,1,2-Tetrachloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Ethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
m,p-Xylene	<2.0	ug/L	2.0	1	11/06/18	was	11/06/18	was	N	
o-Xylene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Xylenes, total	<3.0	ug/L	3.0	1	11/06/18	was	11/06/18	was	N	
Styrene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Bromoform	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Isopropylbenzene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,1,2,2-Tetrachloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2,3-Trichloropropane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
trans-1,4-Dichloro-2-butene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Bromobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
n-Propylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,3,5-Trimethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
t-Butyl Benzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-02 Date Collected: 10/28/18 11:56 Matrix: Aqueous
Sample ID: Crooked Lake 2 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
1,2,4-Trimethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
sec-Butylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
p-Isopropyltoluene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,3-Dichlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,4-Dichlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
n-Butylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2,3-Trimethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dichlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Hexachloroethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2,4-Trichlorobenzene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Naphthalene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2,3-Trichlorobenzene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
2-Methylnaphthalene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Surrogates:										
1,2-Dichloroethane-d4	107	%	68-133	1	11/06/18	was	11/06/18	was	N	
Toluene-d8	101	%	75-120	1	11/06/18	was	11/06/18	was	N	
4-Bromofluorobenzene	82	%	69-119	1	11/06/18	was	11/06/18	was	N	
1,2-Dichlorobenzene-d4	92	%	72-127	1	11/06/18	was	11/06/18	was	N	
WET CHEMISTRY										
Analysis Method: EPA 350.1 Rev. 2.0										
Batch: T082306										
Ammonia as N	**0.012**	**mg/L**	**0.010**	**1**	**11/20/18**	**ns**	**11/20/18**	**ans**	**N**	
Analysis Method: EPA 351.2 Rev. 2.0										
Batch: T081823										
Total Kjeldahl Nitrogen	<0.50	mg/L	0.50	1	11/01/18	nw	11/02/18	nw	N	
Analysis Method: EPA 353.2 Rev. 2.0										
Batch: T082463										
Nitrate/Nitrite as N	<0.050	mg/L	0.050	1	11/26/18	jma	11/26/18	jma	N	
Analysis Method: EPA 365.1 Rev. 2.0										
Batch: T081704										

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-02 Date Collected: 10/28/18 11:56 Matrix: Aqueous
Sample ID: Crooked Lake 2 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
WET CHEMISTRY									
Soluble Reactive Phosphate	<0.010 mg/L	0.010	1	10/29/18	ns	10/29/18	ns	N	
Analysis Method: HACH M-Coli Blue 24									
Batch: T081707									
Total Coliform	**55 CFU/100 ml**	**1.0**	**1**	**10/29/18**	**jma**	**10/30/18**	**jma**	**511, N**	
E. Coli	<1.0 CFU/100 ml	1.0	1	10/29/18	jma	10/30/18	jma	511, N	
Analysis Method: SM 10200H									
Batch: T081715									
Chlorophyll A	**-0.178 mg/m³**	**-100**	**1**	**10/29/18**	**ans**	**11/07/18**	**ans**	**N**	
Pheophytin A	**0.676 mg/m³**	**-100**	**1**	**10/29/18**	**ans**	**11/07/18**	**ans**	**N**	
Analysis Method: SM 2540 D-11									
Batch: T081806									
Total Suspended Solids	<10 mg/L	10	1	10/31/18	ns	10/31/18	ans	N	
Analysis Method: SM 4500-P E-11									
Batch: T081984									
Phosphorus-Total (as P)	**0.012 mg/L**	**0.010**	**1**	**11/07/18**	**ns**	**11/07/18**	**ns**	**N**	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-03 Date Collected: 10/28/18 13:25 Matrix: Aqueous
Sample ID: Crooked Lake 3 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
WET CHEMISTRY										
Analysis Method: EPA 353.2 Rev. 2.0										
Batch: [CALC]										
Total Inorganic Nitrogen	**0.013**	**mg/L**	**0.010**	**1**	**11/26/18**		**11/26/18**	**jma**	**N**	
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
Analysis Method: EPA 8260C										
Batch: T081946										
Dichlorodifluoromethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Chloromethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Vinyl chloride	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Bromomethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Chloroethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Trichlorofluoromethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Diethyl ether	<10	ug/L	10	1	11/06/18	was	11/06/18	was	N	
Tert-butyl alcohol	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
1,1-Dichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Acetone	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
Iodomethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Carbon disulfide	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Methyl-tert-butyl ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Methylene chloride	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Acrylonitrile	<2.0	ug/L	2.0	1	11/06/18	was	11/06/18	was	N	
trans-1,2-Dichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1-Dichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Diisopropyl Ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
2-Butanone	<25	ug/L	25	1	11/06/18	was	11/06/18	was	N	
cis-1,2-Dichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
t-Butyl Ethyl Ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Bromochloromethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Tetrahydrofuran	<90	ug/L	90	1	11/06/18	was	11/06/18	was	N	
Chloroform	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1,1-Trichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Carbon tetrachloride	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-03 Date Collected: 10/28/18 13:25 Matrix: Aqueous
Sample ID: Crooked Lake 3 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
Benzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
t-Amyl Methyl Ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Cyclohexane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Trichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dichloropropane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Dibromomethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Bromodichloromethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
cis-1,3-Dichloropropene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
4-Methyl-2-pentanone	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
Toluene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
trans-1,3-Dichloropropene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1,2-Trichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Tetrachloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
2-Hexanone	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
Dibromochloromethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dibromoethane (EDB)	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Chlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1,1,2-Tetrachloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Ethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
m,p-Xylene	<2.0	ug/L	2.0	1	11/06/18	was	11/06/18	was	N	
o-Xylene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Xylenes, total	<3.0	ug/L	3.0	1	11/06/18	was	11/06/18	was	N	
Styrene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Bromoform	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Isopropylbenzene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,1,2,2-Tetrachloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2,3-Trichloropropane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
trans-1,4-Dichloro-2-butene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Bromobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
n-Propylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,3,5-Trimethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
t-Butyl Benzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-03 Date Collected: 10/28/18 13:25 Matrix: Aqueous
Sample ID: Crooked Lake 3 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
1,2,4-Trimethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
sec-Butylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
p-Isopropyltoluene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,3-Dichlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,4-Dichlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
n-Butylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2,3-Trimethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dichlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Hexachloroethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2,4-Trichlorobenzene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Naphthalene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2,3-Trichlorobenzene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
2-Methylnaphthalene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Surrogates:										
1,2-Dichloroethane-d4	106	%	68-133	1	11/06/18	was	11/06/18	was	N	
Toluene-d8	104	%	75-120	1	11/06/18	was	11/06/18	was	N	
4-Bromofluorobenzene	84	%	69-119	1	11/06/18	was	11/06/18	was	N	
1,2-Dichlorobenzene-d4	91	%	72-127	1	11/06/18	was	11/06/18	was	N	
WET CHEMISTRY										
Analysis Method: EPA 350.1 Rev. 2.0										
Batch: T082306										
Ammonia as N	**0.013**	**mg/L**	**0.010**	**1**	**11/20/18**	**ns**	**11/20/18**	**ans**	**N**	
Analysis Method: EPA 351.2 Rev. 2.0										
Batch: T081823										
Total Kjeldahl Nitrogen	<0.50	mg/L	0.50	1	11/01/18	nw	11/02/18	nw	N	
Analysis Method: EPA 353.2 Rev. 2.0										
Batch: T082463										
Nitrate/Nitrite as N	<0.050	mg/L	0.050	1	11/26/18	jma	11/26/18	jma	N	
Analysis Method: EPA 365.1 Rev. 2.0										
Batch: T081704										

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-03 Date Collected: 10/28/18 13:25 Matrix: Aqueous
Sample ID: Crooked Lake 3 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
WET CHEMISTRY										
Soluble Reactive Phosphate	<0.010	mg/L	0.010	1	10/29/18	ns	10/29/18	ns	N	
Analysis Method: HACH M-Coli Blue 24										
Batch: T081707										
Total Coliform	**120**	**CFU/100 ml**	**1.0**	**1**	**10/29/18**	**jma**	**10/30/18**	**jma**	**511, N**	
E. Coli	<1.0	CFU/100 ml	1.0	1	10/29/18	jma	10/30/18	jma	511, N	
Analysis Method: SM 10200H										
Batch: T081715										
Chlorophyll A	**-0.760**	**mg/m³**	**-100**	**1**	**10/29/18**	**ans**	**11/07/18**	**ans**	**N**	
Pheophytin A	**0.362**	**mg/m³**	**-100**	**1**	**10/29/18**	**ans**	**11/07/18**	**ans**	**N**	
Analysis Method: SM 2540 D-11										
Batch: T081806										
Total Suspended Solids	<10	mg/L	10	1	10/31/18	ns	10/31/18	ans	N	
Analysis Method: SM 4500-P E-11										
Batch: T081984										
Phosphorus-Total (as P)	**0.011**	**mg/L**	**0.010**	**1**	**11/07/18**	**ns**	**11/07/18**	**ns**	**N**	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-04 | Date Collected: 10/28/18 16:08 | Matrix: Aqueous
Sample ID: Bass Lake 1 | Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
WET CHEMISTRY										
Analysis Method: EPA 353.2 Rev. 2.0										
Batch: [CALC]										
Total Inorganic Nitrogen	**0.051**	**mg/L**	**0.010**	**1**	**11/26/18**		**11/26/18**	**jma**	**N**	
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
Analysis Method: EPA 8260C										
Batch: T081946										
Dichlorodifluoromethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Chloromethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Vinyl chloride	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Bromomethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Chloroethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Trichlorofluoromethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Diethyl ether	<10	ug/L	10	1	11/06/18	was	11/06/18	was	N	
Tert-butyl alcohol	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
1,1-Dichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Acetone	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
Iodomethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Carbon disulfide	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Methyl-tert-butyl ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Methylene chloride	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Acrylonitrile	<2.0	ug/L	2.0	1	11/06/18	was	11/06/18	was	N	
trans-1,2-Dichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1-Dichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Diisopropyl Ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
2-Butanone	<25	ug/L	25	1	11/06/18	was	11/06/18	was	N	
cis-1,2-Dichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
t-Butyl Ethyl Ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Bromochloromethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Tetrahydrofuran	<90	ug/L	90	1	11/06/18	was	11/06/18	was	N	
Chloroform	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1,1-Trichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Carbon tetrachloride	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-04 Date Collected: 10/28/18 16:08 Matrix: Aqueous
Sample ID: Bass Lake 1 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
Benzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
t-Amyl Methyl Ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Cyclohexane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Trichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dichloropropane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Dibromomethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Bromodichloromethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
cis-1,3-Dichloropropene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
4-Methyl-2-pentanone	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
Toluene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
trans-1,3-Dichloropropene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1,2-Trichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Tetrachloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
2-Hexanone	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
Dibromochloromethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dibromoethane (EDB)	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Chlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1,1,2-Tetrachloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Ethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
m,p-Xylene	<2.0	ug/L	2.0	1	11/06/18	was	11/06/18	was	N	
o-Xylene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Xylenes, total	<3.0	ug/L	3.0	1	11/06/18	was	11/06/18	was	N	
Styrene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Bromoform	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Isopropylbenzene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,1,2,2-Tetrachloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2,3-Trichloropropane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
trans-1,4-Dichloro-2-butene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Bromobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
n-Propylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,3,5-Trimethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
t-Butyl Benzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-04 Date Collected: 10/28/18 16:08 Matrix: Aqueous
Sample ID: Bass Lake 1 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
1,2,4-Trimethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
sec-Butylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
p-Isopropyltoluene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,3-Dichlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,4-Dichlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
n-Butylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2,3-Trimethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dichlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Hexachloroethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2,4-Trichlorobenzene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Naphthalene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2,3-Trichlorobenzene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
2-Methylnaphthalene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Surrogates:										
1,2-Dichloroethane-d4	108	%	68-133	1	11/06/18	was	11/06/18	was	N	
Toluene-d8	107	%	75-120	1	11/06/18	was	11/06/18	was	N	
4-Bromofluorobenzene	81	%	69-119	1	11/06/18	was	11/06/18	was	N	
1,2-Dichlorobenzene-d4	92	%	72-127	1	11/06/18	was	11/06/18	was	N	
WET CHEMISTRY										
Analysis Method: EPA 350.1 Rev. 2.0										
Batch: T082306										
Ammonia as N	**0.051**	**mg/L**	**0.010**	**1**	**11/20/18**	**ns**	**11/20/18**	**ans**	**N**	
Analysis Method: EPA 351.2 Rev. 2.0										
Batch: T081823										
Total Kjeldahl Nitrogen	**0.63**	**mg/L**	**0.50**	**1**	**11/01/18**	**nw**	**11/02/18**	**nw**	**N**	
Analysis Method: EPA 353.2 Rev. 2.0										
Batch: T082463										
Nitrate/Nitrite as N	<0.050	mg/L	0.050	1	11/26/18	jma	11/26/18	jma	N	
Analysis Method: EPA 365.1 Rev. 2.0										
Batch: T081704										

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-04 Date Collected: 10/28/18 16:08 Matrix: Aqueous
Sample ID: Bass Lake 1 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
WET CHEMISTRY										
Soluble Reactive Phosphate	<0.010	mg/L	0.010	1	10/29/18	ns	10/29/18	ns	N	
Analysis Method: HACH M-Coli Blue 24										
Batch: T081707										
Total Coliform	**140**	**CFU/100 ml**	**1.0**	**1**	**10/29/18**	**jma**	**10/30/18**	**jma**	**511, N**	
E. Coli	**1.0**	**CFU/100 ml**	**1.0**	**1**	**10/29/18**	**jma**	**10/30/18**	**jma**	**511, N**	
Analysis Method: SM 10200H										
Batch: T081715										
Chlorophyll A	**-1.07**	**mg/m³**	**-100**	**1**	**10/29/18**	**ans**	**11/07/18**	**ans**	**N**	
Pheophytin A	**1.57**	**mg/m³**	**-100**	**1**	**10/29/18**	**ans**	**11/07/18**	**ans**	**N**	
Analysis Method: SM 2540 D-11										
Batch: T081806										
Total Suspended Solids	<10	mg/L	10	1	10/31/18	ns	10/31/18	ans	N	
Analysis Method: SM 4500-P E-11										
Batch: T081984										
Phosphorus-Total (as P)	**0.017**	**mg/L**	**0.010**	**1**	**11/07/18**	**ns**	**11/07/18**	**ns**	**N**	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-05 Date Collected: 10/28/18 16:47 Matrix: Aqueous
Sample ID: Bass Lake 2 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
WET CHEMISTRY										
Analysis Method: EPA 353.2 Rev. 2.0										
Batch: [CALC]										
Total Inorganic Nitrogen	**0.055**	**mg/L**	**0.010**	**1**	**11/26/18**		**11/26/18**	**jma**	**N**	
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
Analysis Method: EPA 8260C										
Batch: T081946										
Dichlorodifluoromethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Chloromethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Vinyl chloride	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Bromomethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Chloroethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Trichlorofluoromethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Diethyl ether	<10	ug/L	10	1	11/06/18	was	11/06/18	was	N	
Tert-butyl alcohol	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
1,1-Dichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Acetone	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
Iodomethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Carbon disulfide	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Methyl-tert-butyl ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Methylene chloride	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Acrylonitrile	<2.0	ug/L	2.0	1	11/06/18	was	11/06/18	was	N	
trans-1,2-Dichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1-Dichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Diisopropyl Ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
2-Butanone	<25	ug/L	25	1	11/06/18	was	11/06/18	was	N	
cis-1,2-Dichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
t-Butyl Ethyl Ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Bromochloromethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Tetrahydrofuran	<90	ug/L	90	1	11/06/18	was	11/06/18	was	N	
Chloroform	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1,1-Trichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Carbon tetrachloride	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-05 Date Collected: 10/28/18 16:47 Matrix: Aqueous
Sample ID: Bass Lake 2 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
Benzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
t-Amyl Methyl Ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Cyclohexane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Trichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dichloropropane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Dibromomethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Bromodichloromethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
cis-1,3-Dichloropropene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
4-Methyl-2-pentanone	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
Toluene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
trans-1,3-Dichloropropene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1,2-Trichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Tetrachloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
2-Hexanone	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
Dibromochloromethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dibromoethane (EDB)	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Chlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1,1,2-Tetrachloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Ethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
m,p-Xylene	<2.0	ug/L	2.0	1	11/06/18	was	11/06/18	was	N	
o-Xylene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Xylenes, total	<3.0	ug/L	3.0	1	11/06/18	was	11/06/18	was	N	
Styrene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Bromoform	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Isopropylbenzene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,1,2,2-Tetrachloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2,3-Trichloropropane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
trans-1,4-Dichloro-2-butene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Bromobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
n-Propylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,3,5-Trimethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
t-Butyl Benzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-05 Date Collected: 10/28/18 16:47 Matrix: Aqueous
Sample ID: Bass Lake 2 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
1,2,4-Trimethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
sec-Butylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
p-Isopropyltoluene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,3-Dichlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,4-Dichlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
n-Butylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2,3-Trimethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dichlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Hexachloroethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2,4-Trichlorobenzene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Naphthalene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2,3-Trichlorobenzene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
2-Methylnaphthalene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Surrogates:										
1,2-Dichloroethane-d4	107	%	68-133	1	11/06/18	was	11/06/18	was	N	
Toluene-d8	104	%	75-120	1	11/06/18	was	11/06/18	was	N	
4-Bromofluorobenzene	81	%	69-119	1	11/06/18	was	11/06/18	was	N	
1,2-Dichlorobenzene-d4	92	%	72-127	1	11/06/18	was	11/06/18	was	N	
WET CHEMISTRY										
Analysis Method: EPA 350.1 Rev. 2.0										
Batch: T082306										
Ammonia as N	**0.055**	**mg/L**	**0.010**	**1**	**11/20/18**	**ns**	**11/20/18**	**ans**	**N**	
Analysis Method: EPA 351.2 Rev. 2.0										
Batch: T081823										
Total Kjeldahl Nitrogen	<0.50	mg/L	0.50	1	11/01/18	nw	11/02/18	nw	N	
Analysis Method: EPA 353.2 Rev. 2.0										
Batch: T082463										
Nitrate/Nitrite as N	<0.050	mg/L	0.050	1	11/26/18	jma	11/26/18	jma	N	
Analysis Method: EPA 365.1 Rev. 2.0										
Batch: T081704										

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-05 Date Collected: 10/28/18 16:47 Matrix: Aqueous
Sample ID: Bass Lake 2 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
WET CHEMISTRY									
Soluble Reactive Phosphate	<0.010 mg/L	0.010	1	10/29/18	ns	10/29/18	ns	N	
Analysis Method: HACH M-Coli Blue 24									
Batch: T081707									
Total Coliform	**340 CFU/100 ml**	**1.0**	**1**	**10/29/18**	**jma**	**10/30/18**	**jma**	**511, N**	
E. Coli	<1.0 CFU/100 ml	1.0	1	10/29/18	jma	10/30/18	jma	511, N	
Analysis Method: SM 10200H									
Batch: T081715									
Chlorophyll A	0.00 mg/m³	-100	1	10/29/18	ans	11/07/18	ans	N	
Pheophytin A	**4.61 mg/m³**	**-100**	**1**	**10/29/18**	**ans**	**11/07/18**	**ans**	**N**	
Analysis Method: SM 2540 D-11									
Batch: T081806									
Total Suspended Solids	<10 mg/L	10	1	10/31/18	ns	10/31/18	ans	N	
Analysis Method: SM 4500-P E-11									
Batch: T081984									
Phosphorus-Total (as P)	**0.015 mg/L**	**0.010**	**1**	**11/07/18**	**ns**	**11/07/18**	**ns**	**N**	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-06 | Date Collected: 10/28/18 17:17 | Matrix: Aqueous
Sample ID: Bass Lake 3 | Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
WET CHEMISTRY										
Analysis Method: EPA 353.2 Rev. 2.0										
Batch: [CALC]										
Total Inorganic Nitrogen	**0.049**	**mg/L**	**0.010**	**1**	**11/26/18**		**11/26/18**	**jma**	**N**	
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
Analysis Method: EPA 8260C										
Batch: T081946										
Dichlorodifluoromethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Chloromethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Vinyl chloride	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Bromomethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Chloroethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Trichlorofluoromethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Diethyl ether	<10	ug/L	10	1	11/06/18	was	11/06/18	was	N	
Tert-butyl alcohol	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
1,1-Dichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Acetone	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
Iodomethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Carbon disulfide	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Methyl-tert-butyl ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Methylene chloride	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Acrylonitrile	<2.0	ug/L	2.0	1	11/06/18	was	11/06/18	was	N	
trans-1,2-Dichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1-Dichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Diisopropyl Ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
2-Butanone	<25	ug/L	25	1	11/06/18	was	11/06/18	was	N	
cis-1,2-Dichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
t-Butyl Ethyl Ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Bromochloromethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Tetrahydrofuran	<90	ug/L	90	1	11/06/18	was	11/06/18	was	N	
Chloroform	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1,1-Trichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Carbon tetrachloride	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-06 Date Collected: 10/28/18 17:17 Matrix: Aqueous
Sample ID: Bass Lake 3 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
Benzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
t-Amyl Methyl Ether	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Cyclohexane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Trichloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dichloropropane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Dibromomethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Bromodichloromethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
cis-1,3-Dichloropropene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
4-Methyl-2-pentanone	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
Toluene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
trans-1,3-Dichloropropene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1,2-Trichloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Tetrachloroethene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
2-Hexanone	<50	ug/L	50	1	11/06/18	was	11/06/18	was	N	
Dibromochloromethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dibromoethane (EDB)	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Chlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,1,1,2-Tetrachloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Ethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
m,p-Xylene	<2.0	ug/L	2.0	1	11/06/18	was	11/06/18	was	N	
o-Xylene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Xylenes, total	<3.0	ug/L	3.0	1	11/06/18	was	11/06/18	was	N	
Styrene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Bromoform	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Isopropylbenzene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,1,2,2-Tetrachloroethane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2,3-Trichloropropane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
trans-1,4-Dichloro-2-butene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Bromobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
n-Propylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,3,5-Trimethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
t-Butyl Benzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-06 Date Collected: 10/28/18 17:17 Matrix: Aqueous
Sample ID: Bass Lake 3 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
VOLATILE ORGANIC COMPOUNDS BY GC-MS										
1,2,4-Trimethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
sec-Butylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
p-Isopropyltoluene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,3-Dichlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,4-Dichlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
n-Butylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2,3-Trimethylbenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dichlorobenzene	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
1,2-Dibromo-3-chloropropane	<1.0	ug/L	1.0	1	11/06/18	was	11/06/18	was	N	
Hexachloroethane	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2,4-Trichlorobenzene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Naphthalene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
1,2,3-Trichlorobenzene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
2-Methylnaphthalene	<5.0	ug/L	5.0	1	11/06/18	was	11/06/18	was	N	
Surrogates:										
1,2-Dichloroethane-d4	106	%	68-133	1	11/06/18	was	11/06/18	was	N	
Toluene-d8	106	%	75-120	1	11/06/18	was	11/06/18	was	N	
4-Bromofluorobenzene	85	%	69-119	1	11/06/18	was	11/06/18	was	N	
1,2-Dichlorobenzene-d4	91	%	72-127	1	11/06/18	was	11/06/18	was	N	
WET CHEMISTRY										
Analysis Method: EPA 350.1 Rev. 2.0										
Batch: T082306										
Ammonia as N	**0.049**	**mg/L**	**0.010**	**1**	**11/20/18**	**ns**	**11/20/18**	**ans**	**N**	
Analysis Method: EPA 351.2 Rev. 2.0										
Batch: T081823										
Total Kjeldahl Nitrogen	<0.50	mg/L	0.50	1	11/01/18	nw	11/02/18	nw	N	
Analysis Method: EPA 353.2 Rev. 2.0										
Batch: T082463										
Nitrate/Nitrite as N	<0.050	mg/L	0.050	1	11/26/18	jma	11/26/18	jma	N	
Analysis Method: EPA 365.1 Rev. 2.0										
Batch: T081704										

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-06 Date Collected: 10/28/18 17:17 Matrix: Aqueous
Sample ID: Bass Lake 3 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
WET CHEMISTRY										
Soluble Reactive Phosphate	<0.010	mg/L	0.010	1	10/29/18	ns	10/29/18	ns	N	
Analysis Method: HACH M-Coli Blue 24										
Batch: T081707										
Total Coliform	**140**	**CFU/100 ml**	**1.0**	**1**	**10/29/18**	**jma**	**10/30/18**	**jma**	**511, N**	
E. Coli	<1.0	CFU/100 ml	1.0	1	10/29/18	jma	10/30/18	jma	511, N	
Analysis Method: SM 10200H										
Batch: T081715										
Chlorophyll A	**-0.534**	**mg/m³**	**-100**	**1**	**10/29/18**	**ans**	**11/07/18**	**ans**	**N**	
Pheophytin A	**12.7**	**mg/m³**	**-100**	**1**	**10/29/18**	**ans**	**11/07/18**	**ans**	**N**	
Analysis Method: SM 2540 D-11										
Batch: T081806										
Total Suspended Solids	<10	mg/L	10	1	10/31/18	ns	10/31/18	ans	N	
Analysis Method: SM 4500-P E-11										
Batch: T081984										
Phosphorus-Total (as P)	**0.12**	**mg/L**	**0.010**	**1**	**11/07/18**	**ns**	**11/07/18**	**ns**	**N**	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-08 Date Collected: 10/28/18 11:15 Matrix: Solid
Sample ID: Crooked Lake 1 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
METALS, TOTAL										
Analysis Method: EPA 6010D										
Batch: T082315										
Phosphorus	**780**	**mg/kg dry**	**6.6**	**1**	**11/19/18**	**dcl**	**11/21/18**	**rl**	**N**	
WET CHEMISTRY										
Analysis Method: ASTM D2974-87										
Batch: T082365										
% Solids	**7.6**	**% by Wt.**	**0.10**	**1**	**11/20/18**	**ns**	**11/20/18**	**ns**	**N**	
Analysis Method: EPA 351.2 Rev. 2.0										
Batch: T082406										
Total Kjeldahl Nitrogen	**9600**	**mg/kg dry**	**65**	**1**	**11/26/18**	**nw**	**11/27/18**	**nw**	**N**	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-09 Date Collected: 10/28/18 11:56 Matrix: Solid
Sample ID: Crooked Lake 2 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
METALS, TOTAL										
Analysis Method: EPA 6010D										
Batch: T082315										
Phosphorus	**82**	**mg/kg dry**	**6.4**	**1**	**11/19/18**	**dcl**	**11/21/18**	**rl**	**N**	
WET CHEMISTRY										
Analysis Method: ASTM D2974-87										
Batch: T082365										
% Solids	**57**	**% by Wt.**	**0.10**	**1**	**11/20/18**	**ns**	**11/20/18**	**ns**	**N**	
Analysis Method: EPA 351.2 Rev. 2.0										
Batch: T082406										
Total Kjeldahl Nitrogen	**1500**	**mg/kg dry**	**75**	**1**	**11/26/18**	**nw**	**11/27/18**	**nw**	**N**	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-10 Date Collected: 10/28/18 13:25 Matrix: Solid
Sample ID: Crooked Lake 3 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
METALS, TOTAL										
Analysis Method: EPA 6010D										
Batch: T082315										
Phosphorus	**440**	**mg/kg dry**	**7.7**	**1**	**11/19/18**	**dcl**	**11/21/18**	**rl**	**N**	
WET CHEMISTRY										
Analysis Method: ASTM D2974-87										
Batch: T082365										
% Solids	**4.2**	**% by Wt.**	**0.10**	**1**	**11/20/18**	**ns**	**11/20/18**	**ns**	**N**	
Analysis Method: EPA 351.2 Rev. 2.0										
Batch: T082305										
Total Kjeldahl Nitrogen	**22000**	**mg/kg dry**	**75**	**5**	**11/19/18**	**nw**	**11/20/18**	**nw**	**N**	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-11 | Date Collected: 10/28/18 16:08 | Matrix: Solid
Sample ID: Bass Lake 1 | Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
METALS, TOTAL										
Analysis Method: EPA 6010D										
Batch: T082315										
Phosphorus	**1700**	**mg/kg dry**	**10**	**1**	**11/19/18**	**dcl**	**11/21/18**	**rl**	**N**	
WET CHEMISTRY										
Analysis Method: ASTM D2974-87										
Batch: T082365										
% Solids	**3.3**	**% by Wt.**	**0.10**	**1**	**11/20/18**	**ns**	**11/20/18**	**ns**	**N**	
Analysis Method: EPA 351.2 Rev. 2.0										
Batch: T082406										
Total Kjeldahl Nitrogen	**26000**	**mg/kg dry**	**56**	**1**	**11/26/18**	**nw**	**11/27/18**	**nw**	**N**	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-12 Date Collected: 10/28/18 16:47 Matrix: Solid
Sample ID: Bass Lake 2 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
METALS, TOTAL										
Analysis Method: EPA 6010D										
Batch: T082315										
Phosphorus	**1100**	**mg/kg dry**	**6.1**	**1**	**11/19/18**	**dcl**	**11/21/18**	**rl**	**N**	
WET CHEMISTRY										
Analysis Method: ASTM D2974-87										
Batch: T082365										
% Solids	**5.2**	**% by Wt.**	**0.10**	**1**	**11/20/18**	**ns**	**11/20/18**	**ns**	**N**	
Analysis Method: EPA 351.2 Rev. 2.0										
Batch: T082406										
Total Kjeldahl Nitrogen	**16000**	**mg/kg dry**	**68**	**1**	**11/26/18**	**nw**	**11/27/18**	**nw**	**N**	

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ANALYTICAL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

Trace ID: T18J691-13 Date Collected: 10/28/18 17:17 Matrix: Solid
Sample ID: Bass Lake 3 Date Received: 10/29/18 08:56

PARAMETERS	RESULTS	UNITS	RDL	DILUTION	PREPARED	BY	ANALYZED	BY	NOTES	MCL
METALS, TOTAL										
Analysis Method: EPA 6010D										
Batch: T082315										
Phosphorus	**2000**	**mg/kg dry**	**6.7**	**1**	**11/19/18**	**dcl**	**11/21/18**	**rl**	**N**	
WET CHEMISTRY										
Analysis Method: ASTM D2974-87										
Batch: T082365										
% Solids	**4.4**	**% by Wt.**	**0.10**	**1**	**11/20/18**	**ns**	**11/20/18**	**ns**	**N**	
Analysis Method: EPA 351.2 Rev. 2.0										
Batch: T082406										
Total Kjeldahl Nitrogen	**27000**	**mg/kg dry**	**65**	**1**	**11/26/18**	**nw**	**11/27/18**	**nw**	**N**	

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QUALITY CONTROL RESULTS

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

QC Batch: T082315
Analysis Description: Phosphorus, Total
QC Batch Method: EPA 3051 Microwave Assisted Digestions for Solids
Analysis Method: EPA 6010D

METHOD BLANK: T082315-BLK1

Parameter	Units	Blank Result	Reporting Limit	Notes
Phosphorus	mg/kg dry	<6.3	6.3	

LABORATORY CONTROL SAMPLE: T082315-BS1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Phosphorus	mg/kg dry	400	363	91	80-120	

MATRIX SPIKE / MATRIX SPIKE DUPLICATE: T082315-MSD1

Original: **T18J691-09**

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Notes
Phosphorus	mg/kg dry	81.6	393	460	489	95	104	75-125	9	20	

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

QC Batch: [CALC]
Analysis Description: Total Inorganic Nitrogen (individual components)
QC Batch Method:
Analysis Method: Calculation

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

QC Batch: T081729
Analysis Description: Filtration for Dissolved Analysis
QC Batch Method: Wetchem Filter
Analysis Method: Dissolved Analysis

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

QC Batch: T082339
Analysis Description: Metals Digestion
QC Batch Method: EPA 200.2
Analysis Method: EPA 200.2

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

QC Batch: [CALC]
Analysis Description: Total Inorganic Nitrogen (combined NO2/NO3)
QC Batch Method:
Analysis Method: EPA 353.2 Rev. 2.0

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Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

QC Batch: T081946
QC Batch Method: EPA 8260C
Analysis Description: Volatiles, Full MDEQ+ List
Analysis Method: EPA 8260C

METHOD BLANK: T081946-BLK1

Parameter	Units	Blank Result	Reporting Limit	Notes
Dichlorodifluoromethane	ug/L	<5.0	5.0	
Chloromethane	ug/L	<5.0	5.0	
Vinyl chloride	ug/L	<1.0	1.0	
Bromomethane	ug/L	<5.0	5.0	
Chloroethane	ug/L	<5.0	5.0	
Trichlorofluoromethane	ug/L	<1.0	1.0	
Diethyl ether	ug/L	<10	10	
Tert-butyl alcohol	ug/L	<50	50	
1,1-Dichloroethene	ug/L	<1.0	1.0	
Acetone	ug/L	<50	50	
Iodomethane	ug/L	<1.0	1.0	
Carbon disulfide	ug/L	<5.0	5.0	
Methyl-tert-butyl ether	ug/L	<5.0	5.0	
Methylene chloride	ug/L	<5.0	5.0	
Acrylonitrile	ug/L	<2.0	2.0	
trans-1,2-Dichloroethene	ug/L	<1.0	1.0	
1,1-Dichloroethane	ug/L	<1.0	1.0	
Diisopropyl Ether	ug/L	<5.0	5.0	
2-Butanone	ug/L	<25	25	
cis-1,2-Dichloroethene	ug/L	<1.0	1.0	
t-Butyl Ethyl Ether	ug/L	<5.0	5.0	
Bromochloromethane	ug/L	<1.0	1.0	
Tetrahydrofuran	ug/L	<90	90	
Chloroform	ug/L	<1.0	1.0	
1,1,1-Trichloroethane	ug/L	<1.0	1.0	
Carbon tetrachloride	ug/L	<1.0	1.0	
Benzene	ug/L	<1.0	1.0	
t-Amyl Methyl Ether	ug/L	<5.0	5.0	
1,2-Dichloroethane	ug/L	<1.0	1.0	
Cyclohexane	ug/L	<5.0	5.0	
Trichloroethene	ug/L	<1.0	1.0	
1,2-Dichloropropane	ug/L	<1.0	1.0	
Dibromomethane	ug/L	<5.0	5.0	
Bromodichloromethane	ug/L	<1.0	1.0	
cis-1,3-Dichloropropene	ug/L	<1.0	1.0	
4-Methyl-2-pentanone	ug/L	<50	50	
Toluene	ug/L	<1.0	1.0	
trans-1,3-Dichloropropene	ug/L	<1.0	1.0	

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METHOD BLANK: T081946-BLK1

Parameter	Units	Blank Result	Reporting Limit	Notes
1,1,2-Trichloroethane	ug/L	<1.0	1.0	
Tetrachloroethene	ug/L	<1.0	1.0	
2-Hexanone	ug/L	<50	50	
Dibromochloromethane	ug/L	<5.0	5.0	
1,2-Dibromoethane (EDB)	ug/L	<1.0	1.0	
Chlorobenzene	ug/L	<1.0	1.0	
1,1,1,2-Tetrachloroethane	ug/L	<1.0	1.0	
Ethylbenzene	ug/L	<1.0	1.0	
m,p-Xylene	ug/L	<2.0	2.0	
o-Xylene	ug/L	<1.0	1.0	
Xylenes, total	ug/L	<3.0	3.0	
Styrene	ug/L	<1.0	1.0	
Bromoform	ug/L	<1.0	1.0	
Isopropylbenzene	ug/L	<5.0	5.0	
1,1,2,2-Tetrachloroethane	ug/L	<1.0	1.0	
1,2,3-Trichloropropane	ug/L	<1.0	1.0	
trans-1,4-Dichloro-2-butene	ug/L	<1.0	1.0	
Bromobenzene	ug/L	<1.0	1.0	
n-Propylbenzene	ug/L	<1.0	1.0	
1,3,5-Trimethylbenzene	ug/L	<1.0	1.0	
t-Butyl Benzene	ug/L	<1.0	1.0	
1,2,4-Trimethylbenzene	ug/L	<1.0	1.0	
sec-Butylbenzene	ug/L	<1.0	1.0	
p-Isopropyltoluene	ug/L	<5.0	5.0	
1,3-Dichlorobenzene	ug/L	<1.0	1.0	
1,4-Dichlorobenzene	ug/L	<1.0	1.0	
n-Butylbenzene	ug/L	<1.0	1.0	
1,2,3-Trimethylbenzene	ug/L	<1.0	1.0	
1,2-Dichlorobenzene	ug/L	<1.0	1.0	
1,2-Dibromo-3-chloropropane	ug/L	<1.0	1.0	
Hexachloroethane	ug/L	<5.0	5.0	
1,2,4-Trichlorobenzene	ug/L	<5.0	5.0	
Naphthalene	ug/L	<5.0	5.0	
1,2,3-Trichlorobenzene	ug/L	<5.0	5.0	
2-Methylnaphthalene	ug/L	<5.0	5.0	
1,2-Dichloroethane-d4 (S)	%	104	68-133	
Toluene-d8 (S)	%	98	75-120	
4-Bromofluorobenzene (S)	%	76	69-119	
1,2-Dichlorobenzene-d4 (S)	%	92	72-127	

LABORATORY CONTROL SAMPLE: T081946-BS1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
1,1-Dichloroethene	ug/L	20.0	19.2	96	64-156	

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LABORATORY CONTROL SAMPLE: T081946-BS1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Benzene	ug/L	20.0	21.3	106	80-120	
Trichloroethene	ug/L	20.0	20.5	103	69-133	
Toluene	ug/L	20.0	20.8	104	80-120	
Chlorobenzene	ug/L	20.0	20.9	104	80-120	
1,2-Dichloroethane-d4 (S)	%	70.0	70.6	101	68-133	
Toluene-d8 (S)	%	50.0	50.6	101	75-120	
4-Bromofluorobenzene (S)	%	50.0	42.0	84	69-119	
1,2-Dichlorobenzene-d4 (S)	%	50.0	45.7	91	72-127	

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

QC Batch: T082365
QC Batch Method: % Solids
Analysis Description: Solids, Dry Weight
Analysis Method: ASTM D2974-87

SAMPLE DUPLICATE: T082365-DUP1 Original: **T18J691-08**

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Notes
% Solids	% by Wt.	7.65	7.75	1	20	

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

QC Batch: T081692
QC Batch Method: IC Prep W
Analysis Description: Nitrate
Analysis Method: EPA 300.0 Rev. 2.1

METHOD BLANK: T081692-BLK1

Parameter	Units	Blank Result	Reporting Limit	Notes
Nitrate as N	mg/L	<0.020	0.020	
Nitrite as N	mg/L	<0.020	0.020	

METHOD BLANK: T081692-BLK2

Parameter	Units	Blank Result	Reporting Limit	Notes
Nitrate as N	mg/L	<0.020	0.020	
Nitrite as N	mg/L	<0.020	0.020	

LABORATORY CONTROL SAMPLE: T081692-BS1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes

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LABORATORY CONTROL SAMPLE: T081692-BS1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Nitrate as N	mg/L	0.500	0.485	97	90-110	
Nitrite as N	mg/L	0.500	0.496	99	90-110	

LABORATORY CONTROL SAMPLE: T081692-BS2

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Nitrate as N	mg/L	0.500	0.481	96	90-110	
Nitrite as N	mg/L	0.500	0.509	102	90-110	

MATRIX SPIKE: T081692-MS1 Original: **T18J691-01**

Parameter	Units	Original Result	Spike Conc.	MS Result	MS % Rec	% Rec Unit	Notes
Nitrate as N	mg/L	0	6.00	5.96	99	80-120	
Nitrite as N	mg/L	0	6.00	6.28	105	80-120	

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

QC Batch: T082306
QC Batch Method: EPA 350.1 Rev. 2.0
Analysis Description: Nitrogen, Ammonia
Analysis Method: EPA 350.1 Rev. 2.0

METHOD BLANK: T082306-BLK1

Parameter	Units	Blank Result	Reporting Limit	Notes
Ammonia as N	mg/L	<0.010	0.010	

LABORATORY CONTROL SAMPLE: T082306-BS1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Ammonia as N	mg/L	0.500	0.498	100	90-110	

MATRIX SPIKE / MATRIX SPIKE DUPLICATE: T082306-MSD1 Original: **T18J691-01**

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Notes
Ammonia as N	mg/L	0.0100	0.500	0.497	0.493	97	97	90-110	0.8	7.9	

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

QC Batch: T081823
QC Batch Method: EPA 351.2 Rev. 2.0
Analysis Description: Total Kjeldahl Nitrogen
Analysis Method: EPA 351.2 Rev. 2.0

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METHOD BLANK: T081823-BLK1

Parameter	Units	Blank Result	Reporting Limit	Notes
Total Kjeldahl Nitrogen	mg/L	<0.50	0.50	

LABORATORY CONTROL SAMPLE: T081823-BS1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Total Kjeldahl Nitrogen	mg/L	10.0	10.3	103	90-110	

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

QC Batch: T082305
QC Batch Method: EPA 351.2 Rev. 2.0
Analysis Description: Total Kjeldahl Nitrogen
Analysis Method: EPA 351.2 Rev. 2.0

METHOD BLANK: T082305-BLK1

Parameter	Units	Blank Result	Reporting Limit	Notes
Total Kjeldahl Nitrogen	mg/kg wet	<15	15	

LABORATORY CONTROL SAMPLE: T082305-BS1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Total Kjeldahl Nitrogen	mg/kg wet	250	249	100	80-125	

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

QC Batch: T082406
QC Batch Method: EPA 351.2 Rev. 2.0
Analysis Description: Total Kjeldahl Nitrogen
Analysis Method: EPA 351.2 Rev. 2.0

METHOD BLANK: T082406-BLK1

Parameter	Units	Blank Result	Reporting Limit	Notes
Total Kjeldahl Nitrogen	mg/kg wet	<15	15	

LABORATORY CONTROL SAMPLE: T082406-BS1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Total Kjeldahl Nitrogen	mg/kg wet	250	272	109	80-125	

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE: T082406-MSD1 Original: **T18J691-08**

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Notes
Total Kjeldahl Nitrogen	mg/kg dry	9580	13600	18500	23600	82	103	34-153	22	31	

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

QC Batch: T082463
QC Batch Method: EPA 353.2 Rev. 2.0
Analysis Description: Nitrate-Nitrite
Analysis Method: EPA 353.2 Rev. 2.0

METHOD BLANK: T082463-BLK1

Parameter	Units	Blank Result	Reporting Limit	Notes
Nitrate/Nitrite as N	mg/L	<0.050	0.050	

SAMPLE DUPLICATE: T082463-DUP1 Original: **T18J691-02**

Parameter	Units	Original Result	DUP Result	RPD	Max RPD	Notes
Nitrate/Nitrite as N	mg/L	0	<0.050		200	

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

QC Batch: T081704
QC Batch Method: EPA 365.1 Rev. 2.0
Analysis Description: Ortho Phosphorous (Dissolved)
Analysis Method: EPA 365.1 Rev. 2.0

METHOD BLANK: T081704-BLK1

Parameter	Units	Blank Result	Reporting Limit	Notes
Soluble Reactive Phosphate	mg/L	<0.010	0.010	

LABORATORY CONTROL SAMPLE: T081704-BS1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Soluble Reactive Phosphate	mg/L	0.0250	0.0266	106	89-118	

MATRIX SPIKE / MATRIX SPIKE DUPLICATE: T081704-MSD1 Original: **T18J691-01**

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Notes
Soluble Reactive Phosphate	mg/L	0	0.0250	0.0295	0.0298	118	119	86-121	1	20	

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

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QC Batch: T081707
QC Batch Method: HACH M-Coli Blue 24

Analysis Description: E.Coli, Hach
Analysis Method: HACH M-Coli Blue 24

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

QC Batch: T081715
QC Batch Method: SM 10200H

Analysis Description: Chlorophyll A
Analysis Method: SM 10200H

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

QC Batch: T081806
QC Batch Method: SM 2540 D-11

Analysis Description: Total Suspended Solids
Analysis Method: SM 2540 D-11

METHOD BLANK: T081806-BLK1

Parameter	Units	Blank Result	Reporting Limit	Notes
Total Suspended Solids	mg/L	<10	10	

LABORATORY CONTROL SAMPLE: T081806-BS1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Total Suspended Solids	mg/L	50.0	43.0	86	85-115	

LABORATORY CONTROL SAMPLE: T081806-BS2

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Total Suspended Solids	mg/L	50.0	46.0	92	85-115	

LABORATORY CONTROL SAMPLE: T081806-BS3

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Total Suspended Solids	mg/L	50.0	43.0	86	85-115	

LABORATORY CONTROL SAMPLE: T081806-BS4

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Total Suspended Solids	mg/L	50.0	46.0	92	85-115	

Trace Project ID: T18J691
Client Project ID: Crooked Lake and Bass Lake Samples

QC Batch: T081984
QC Batch Method: SM 4500-P E-11

Analysis Description: Total Phosphorus
Analysis Method: SM 4500-P E-11

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METHOD BLANK: T081984-BLK1

Parameter	Units	Blank Result	Reporting Limit	Notes
Phosphorus-Total (as P)	mg/L	<0.010	0.010	

LABORATORY CONTROL SAMPLE: T081984-BS1

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limit	Notes
Phosphorus-Total (as P)	mg/L	0.100	0.101	101	85-116	

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CHAIN-OF-CUSTODY RECORD

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Page 1 of 1

Trace ID No. T18J691

Report Results To:

Company Name:	ADVANCED ECOLOGICAL MGMT
Report To:	DOUG WORKMAN
Mailing Address:	22071 7mile rd
City, State, Zip Code:	Reed City, MI 49677
Office Phone:	231-832-3200
Cell Phone:	231-912-0506
Email Address:	dworkman@advancedecological.com

Bill To:

PO #:	
Contact Name:	
Billing Address (if different):	
City, State, Zip Code:	
Phone Number:	
Billing Email Address:	

Trace Use:

Logged By:	MB
Checked By:	AW
Soil Volatiles Preserved (circle if applicable): MeOH Low Level Lab	
Sampling Time:	

Turnaround Requirements:

☐ Standard ☐ 48 Hour*
☐ 4 Day* ☐ 24 Hour*
☐ 3 Day*
* Requires Prior Approval

Matrix Key:

S = Soil / Solid WI = Wipes
W = Water LW = Liquid Waste
SL = Sludge A = Air
OI = Oil D = Drinking Water

Project Name:

Sampled By:

Trace No.	Date Collected	Time Collected	Client Sample ID	Metals Field Filtered (Y / N)	Matrix	Number of Containers	Cool	HCl	HNO_3	H_2SO_4	NaOH	Other	Analysis Requested	Remarks	Possible Health Hazards?
1	10-28-18	1115	CROOKED LAKE 1												
2	10-28-18	1156	CROOKED LAKE2												
3	10-28-18	1325	CROOKED LAKE3												
4	10-28-18	1608	BASS LAKE 1												
5	10-28-18	1647	BASS LAKE 2												
6	10-28-18	1717	BASS LAKE3												
	10-28-18														
	10-28-18														
	10-28-18														
	10-28-18														

Please Sign

Released By	Received By	Date	Time	Released By	Received By	Date	Time
1) Doug Workman	Kristine Workman	10/28/18	6:30	2) Kristine Workman	Marcha	10/29/18	8:56
3)				4)			

In executing this Chain of Custody, the client acknowledges the terms as set forth at www.trace-labs.com/terms-of-agreement.

☐ Check this box if you would not like your samples analyzed if received outside of the conditions outlined in the Trace Sample Acceptance Policy at www.trace-labs.com/downloads.

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SAMPLE LOG IN CHECKLIST

Trace ID #: T18J691 Date: 10-29-18 Package Description: Cooler Temperature: -1.3

Client Name: Advanced Ecological Time: 8:56 Logged in by: MP

Cooler Receipt

Cooler/samples delivered by: Trace courier ☐
Hand delivered ☒ Name of delivery person: _____
Commercial courier ☐ UPS ☐ FED EX ☐ US Mail ☐

Tracking Number: ☐ Not Applicable
Tracking #: _____

COC Seals present and intact on cooler? ☒ Not Applicable ☐ No ☐ Yes

Custody seals signed by Client? ☐ No ☐ Yes Client custody seal # (if applicable): _____

Coolant and Temperature

Type of Coolant Used

Slurry w/ crushed, cubed, or chip ice? ☒
Multiple bags of ice around samples? ☐
Ice Packs/ Blue Ice : ☐
No Coolant Present: ☐

Ice still present upon receipt (circle one): (Yes) No N/A

Cooler Temperature

Correction Factors: •Digital Stick Thermometer CF = -0.6°C
•IR Thermometer CF = -0.8°C

Representative Sample Temperature: 3.0 °C (check one below)

☒ Temp Blank (Stick Thermometer)
☐ Client Sample (IR Thermometer)

Melt Water: D/W °C (Use Digital Stick Thermometer)

General

	Yes	No	NA	Comments
All bottles arrived unbroken with labels in good condition?	☒	☐	☐	
Each sample point is in a sealed plastic bag?	☐	☐	☒	
Labels filled out completely?	☒	☐	☐	
All bottle labels agree with Chain of Custody (COC)?	☒	☐	☐	
Sufficient sample to run tests requested?	☒	☐	☐	
pH checked and samples at correct pH?	☒	☐	☐	See Below*
Correct preservative added to samples?	☒	☐	☐	
Air bubbles absent from VOAs?	☒	☐	☐	*Some vials had air bubbles. Sample 2- both vials had large air bubbles
COC filled out properly and signed by client?	☒	☐	☐	
COC signed in by TRACE sample custodian?	☒	☐	☐	
Was project manager called and samples discussed?	☐	☐	☒	

Notes:

*EMD pH Test Strips Used:
☒ pH 0-2.5 Lot: HC731452 ☐ pH 11.0-13.0 Lot: HC600691
☐ Other: _____

Form 70-A.25
Effective 7/25/18

TRACE Analytical Laboratories, Inc.

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