Renewable World Energies

February 27, 2020

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

RE: Winter Hydroelectric Project
FERC Project Number P-2064
Flambeau Hydro LLC
Final Report 2019 Water Quality Monitoring Data

Dear Ms. Bose:

On behalf of Flambeau Hydro LLC, "Flambeau" (Licensee), Renewable World Energies, LLC (RWE) is submitting a copy of the *Final Report 2019 Water Quality Monitoring Data* for the Winter Hydroelectric Project. The Federal Energy Regulatory Commission "FERC" issued a License to Flambeau on August 12, 2005. A revised Water Quality Certification was issued August 19, 2008. This report is submitted as a requirement of that License pursuant to License Article 401 Condition N, Appendix A. 2019 was the 13th year monitoring was conducted since the license was issued, but is the 8th year of submittal by RWE on the behalf of the Licensee.

Monitoring was conducted on April 22, July 22, and August 12, 2019. No issues were encountered during the 2019 monitoring season. The draft report was sent to the agencies by an attachment to an email on November 26, 2019 for review and comment. Cheryl Laatsch of the DNR did send a reply of "thank you" after the data was sent. The next scheduled monitoring event will be conducted in 2020.

If you have any questions concerning this submittal, please contact Brian Kreuscher at the Renewable World Energies, LLC offices @ 855-994-9376 Ext 230. He can also be reached by e-mail at bkreuscher@rwehydro.com.

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Sincerely,
Renewable World Energies, LLC
Agent for Licensee

FOS Mr. Jason Kreuscher
Vice President, Operations

Attachment: Final Report 2019 Water Quality Monitoring Data
Correspondence

Cc: Mr. Paul Strong, USFS
Ms. Sue Reinecke, USFS
Ms. Cheryl Laatsch, WDNR
Mr. Nick Utrup, USFWS

Report

2019 Water Quality Monitoring Data

for the

Winter Hydroelectric Project

FERC Project #2064

Flambeau Hydro, LLC

East Fork of the Chippewa River,
Sawyer County, Wisconsin

Respectfully Submitted by:

Angie Stine

WHITE WATER ASSOCIATES, INC.

429 River Lane, P.O. Box 27
Amasa, Michigan 49903

Phone: 906-822-7889

Summary Winter Hydroelectric Project – FERC #2064

2019 marked the thirteenth year of water quality sampling under FERC License issued August 12, 2006 Per Article 401, Water Quality Certification Condition N, Appendix A for the Winter Hydroelectric Project – FERC Project # 2064 – Flambeau Hydro LLC. Monitoring was conducted on April 22, July 22, and August 12, 2019. This document contains all of the associated records for the 2019 monitoring along with summary figures and tables in four appendices: (1) Appendix A (Figures 1-4), (2) Appendix B (Tables 1-3), (3) Appendix C (sampling logs by date), and (4) Appendix D (laboratory reports and chains of custody).

A map of the Winter Hydroelectric Project is shown in Figure 1 indicating the water quality sampling location.

Monitoring results for 2019 are shown in Table 1. No unusual Temperature (Figure 2) or Dissolved Oxygen (Figure 3) readings were observed. The Secchi depths are shown in Figure 4.

In general, the weather (temperature and rainfall) during 2019 monitoring season appeared slightly warmer in May, June, and July, & August, with lower than normal precipitation in January, March, April, June, July and August, and normal to high precipitation in the months of October, December, February, May, and September (Table 2). Sampling and testing of the samples was coordinated with the sampling done at the Flambeau Projects (Upper, Lower, Pixley, Crowley). These projects are located on the North Fork of the Flambeau River, Price County, Wisconsin. Protocol, procedures, and sampling design followed that of the Flambeau Projects.

Ice-Out occurred on the East Fork of the Chippewa sometime during the week beginning April 18, 2019. The Ice-Out sampling event occurred on April 22, 2019. River flow, based on the Winter Hydroelectric Project records, was approximately 3796 cubic feet per second. Sampling occurred between 1415 and 1425. Samples were taken without incident. No unusual D.O. or Temperature readings were observed. Samples for laboratory analysis were delivered to White Water Associates, Inc. laboratory in Amasa, MI on April 24, 2019. White Water Associates, Inc. issued a laboratory report on May 21, 2019. No unusual levels of Chlorophyll *a*, True Color, or Total Phosphorus were noted in the laboratory reports.

River flow, based on the Winter Hydroelectric Project records, was approximately 310 cubic feet per second during the July 22, 2019 sampling event. Sampling occurred between 1400 and 1436. Samples were taken without incident. No unusual D.O. or Temperature readings were observed. Samples for laboratory analysis were delivered to White Water Associates, Inc. laboratory in Amasa, MI on July 25, 2019. White Water Associates, Inc. issued a laboratory report on August 27, 2019. No unusual levels of Chlorophyll *a*, True Color, or Total Phosphorus were noted in the laboratory reports.

River flow, based on the Winter Hydroelectric Project records, was approximately 100 cubic feet per second during the August 12, 2019 sampling event. Sampling occurred between 1452 and 1459. Samples were taken without incident. No unusual D.O. or Temperature readings were observed. Samples for laboratory analysis were delivered to White Water Associates, Inc. laboratory in Amasa, MI on August

15, 2019. White Water Associates, Inc. issued a laboratory report on September 13, 2019. No unusual levels of Chlorophyll *a*, True Color, or Total Phosphorus were noted in the laboratory reports.

A summary of a comparison between the 2012 thru 2019 (Table 3) sampling results are as follows:

1. Water Clarity – Secchi Decreased Ice Out, Increased July and August
2. Chlorophyll a – Increased Ice Out & July, decreased July
3. Color –Decreased Ice Out and August, increased July
4. Total Phosphorus – Increased Ice Out, July & August
5. Overall, D.O. – Increased Ice Out, July and August
6. Water Temperatures – Decreased Ice Out and July, increased August

The next scheduled Water Quality Monitoring at the Winter Hydroelectric Project is set to take place in 2020 beginning with the Ice-Out sampling event.

Appendix A – Winter Hydroelectric Project Figures

Figure 1. Winter Impoundment Project Map

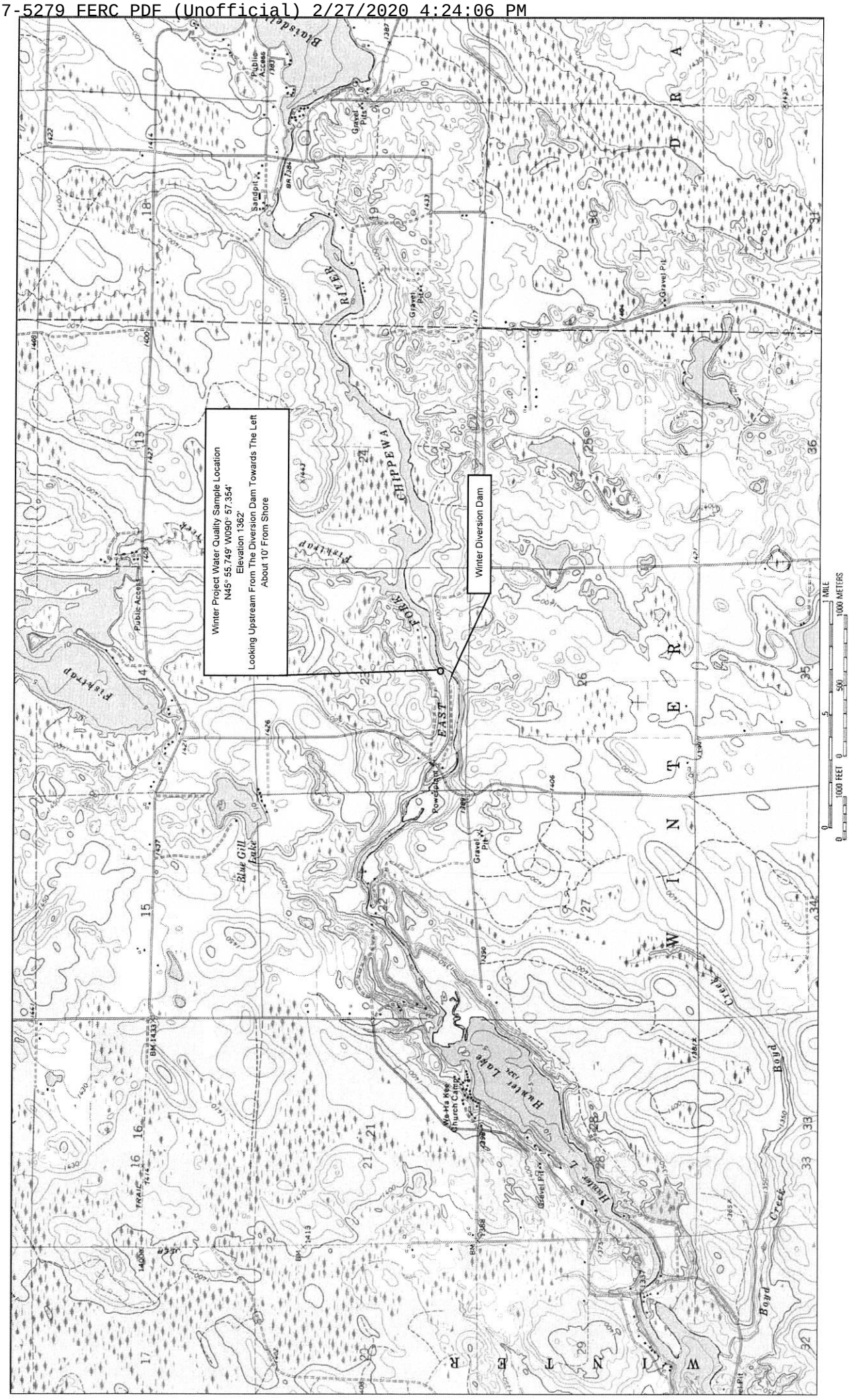


Figure 2. Winter Impoundment - FERC #2064
2019 Temperature Profiles

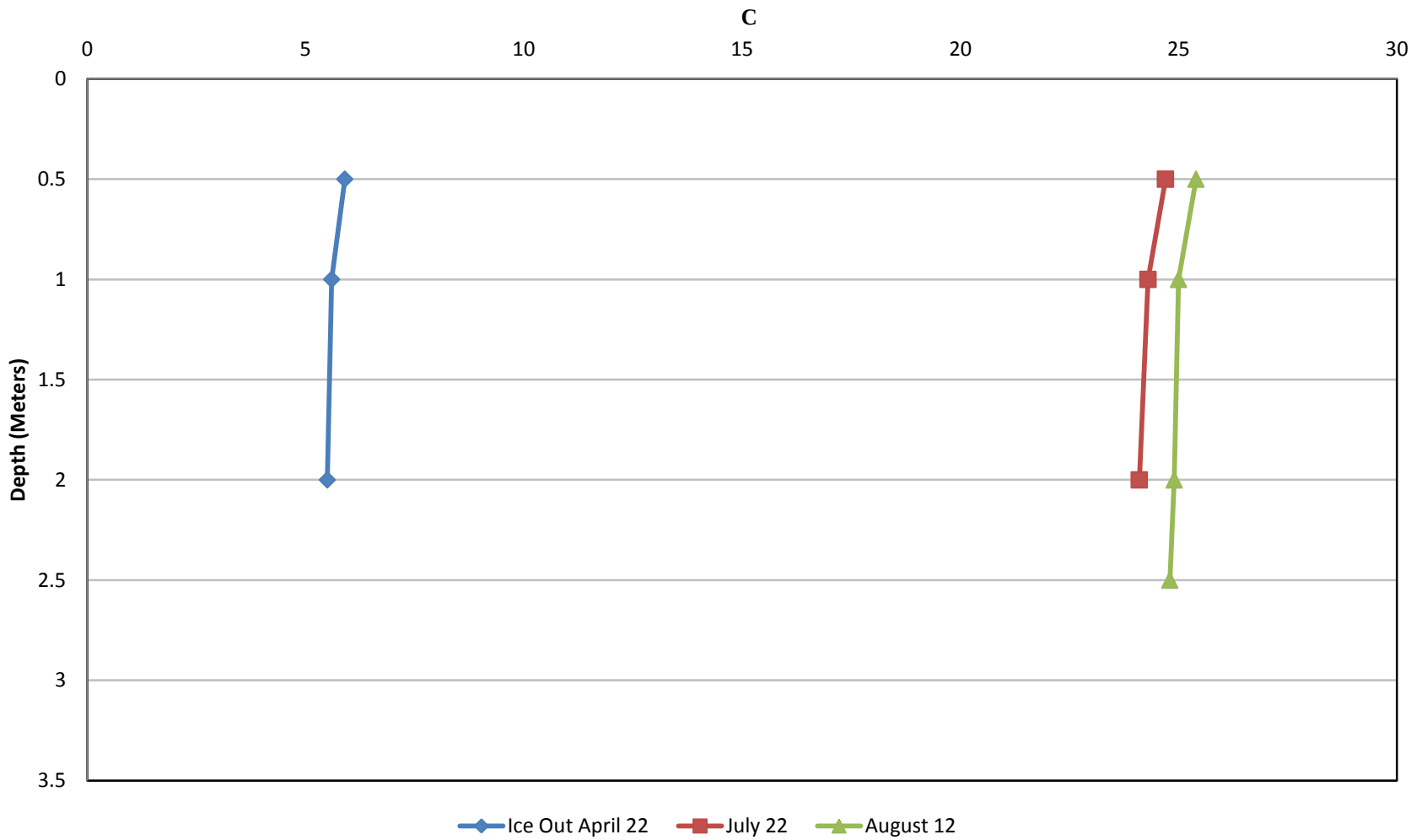
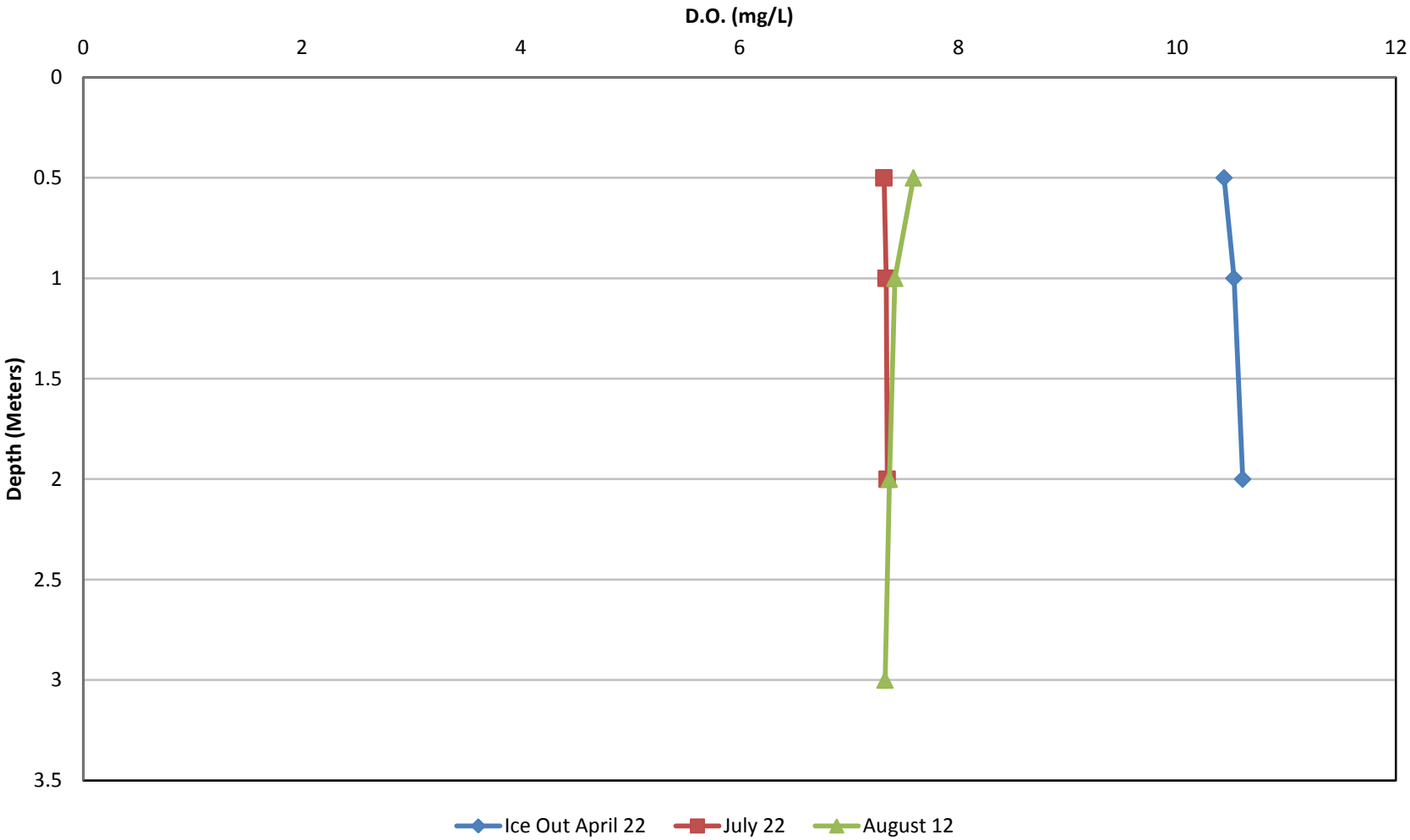


Figure 3. Winter Impoundment - FERC #2064
2019 Dissolved Oxygen Profiles



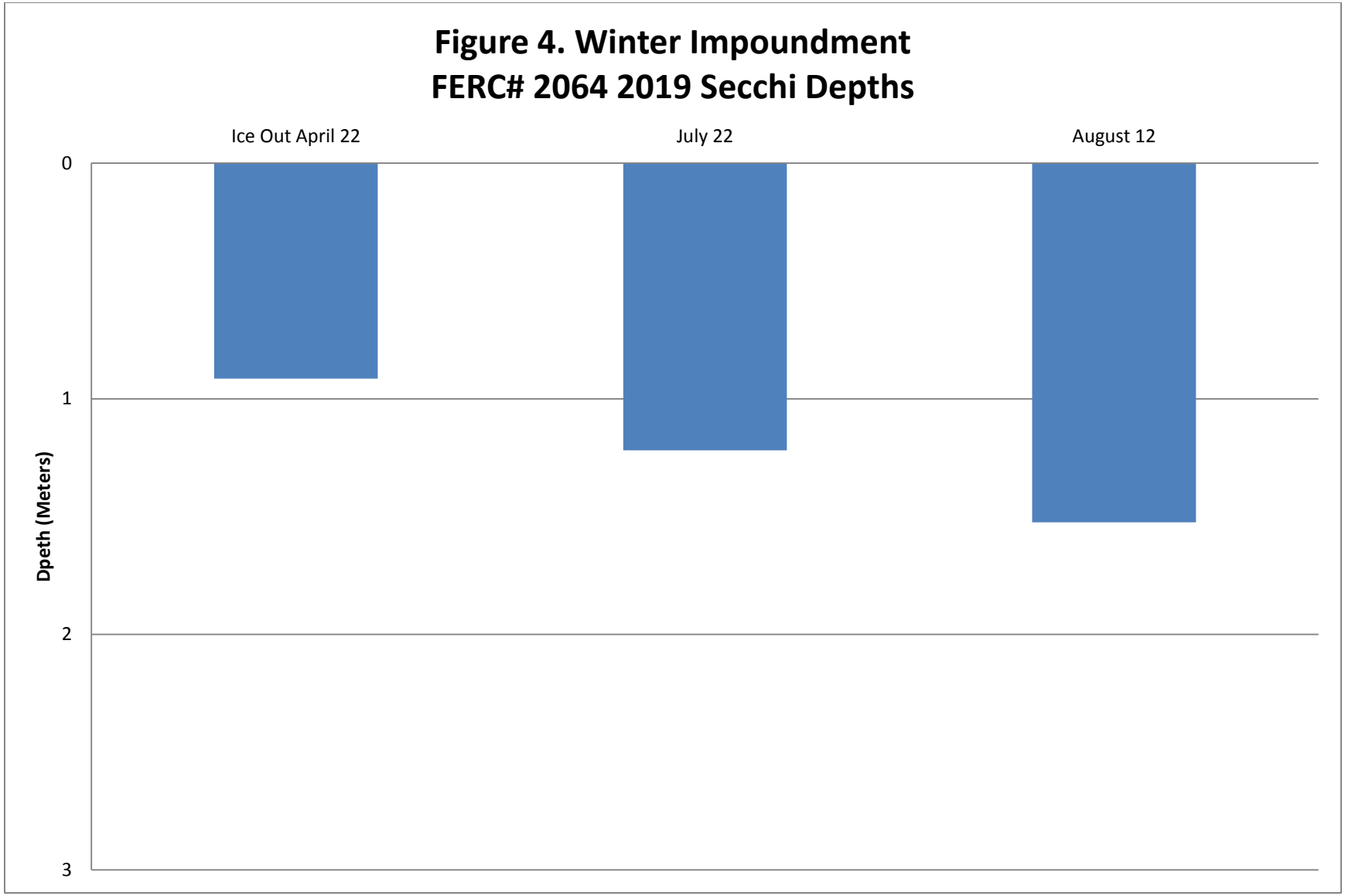


Figure 4. Winter Impoundment
FERC# 2064 2019 Secchi Depths
Ice Out April 22
July 22
August 12
0
1
2
3
Dpeth (Meters)

Appendix B – Winter Hydroelectric Project Tables

Table 1. Winter Hydroelectric Project – FERC Project # 2064: 2019 Water Quality Sampling Data

	Ice Out April 22, 2019			July 22, 2019			August 12, 2019		
Project Flow (c.f.s)	3796			310			100		
Dissolved Oxygen	**Time**	**D.O. (mg/L)**	**Water Temp. (°C)**	**Time**	**D.O. (mg/L)**	**Water Temp. (°C)**	**Time**	**D.O. (mg/L)**	**Water Temp. (°C)**
0.5 meter below surface	14:22:02	10.43	5.9	14:29:18	7.32	24.7	14:55:10	7.59	25.4
1 meter below surface	14:23:45	10.52	5.6	14:29:57	7.34	24.3	14:55:55	7.42	25.0
2 meter below surface	14:24:15	10.60	5.5	14:30:49	7.35	24.1	14:56:27	7.37	24.9
3 meter below surface	N/A	N/A	N/A	N/A	N/A	N/A	14:57:13	7.33	24.8
0.5 meter above bottom	14:25:10	10.59	5.5	14:31:15	7.36	24.0	14:59:09	7.32	24.7
Secchi Disk	**Time**	**Depth (m)**		**Time**	**Depth (m)**		**Time**	**Depth (m)**	
Meters below surface	1414	0.9		14:36	2.0		14:00	1.52	
Chlorophyll *a*	**Time**	**µg/L**		**Time**	**µg/L**		**Time**	**µg/L**	
1 meter below surface	14:18	2.10		14:33	3.50		13:52	2.70	
Color (True)	**Time**	**C.P.U. Units**	**LOD**	**Time**	**C.P.U. Units**	**LOD**	**Time**	**C.P.U. Units**	**LOD**
1 meter below surface	14:8	35.00	5*	14:36	50.00	5*	13:52	55.00	5*
Total Phosphorus	**Time**	**mg/L**	**LOD**	**Time**	**mg/L**	**LOD**	**Time**	**mg/L**	**LOD**
1 meter below surface	16:54	0.022	0.01*	14:36	0.031	0.008*	13:52	0.028	0.008*
1 meter above bottom	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
* Considered Method Detection Limit N/A = Not Applicable									

Table 2. 2018/19 Water Year Monthly Temperature and Precipitation for Winter, Wisconsin

Month	Highest Temp.	Lowest Temp.	Average Temp.	Departure From Normal	Heating Degree Days	Normal Degree Days	Total Precip.	Total Snowfall	Normal Precip.	% of Normal Precipitation
October - 18	66	26	41.0	-2.2	738	678	4.67	1.5	2.85	72
November - 18	44	-7	23.2	-5.6	1247	1088	1.67	12.2	2.09	75
December - 18	44	-9	21.6	6.8	1338	1556	1.77	19.8	1.21	78
January – 19	40	-31	7.6	-2.6	1772	1699	0.80	10.4	0.96	70
February – 19	31	-19	10.6	-4.5	1515	1399	1.88	36.4	0.81	73
March – 19	58	-19	24.9	-1.0	1237	1210	1.19	6.7	1.49	64
April – 19	74	16	40.2	0.06	737	762	2.19	6.5	2.43	65
May – 19	82	28	49.3	-2.1	478	426	3.87	13.3	3.23	65
June – 19	87	40	61.7	1.6	126	179	4.10	0.00	4.23	64
July – 19	89	49	71.1	5.3	4	63	2.63	0.00	3.85	66
August – 19	87	46	66.1	1.8	44	86	2.51	0.00	3.70	66
September - 19	83	37	59.6	4.0	172	298	5.76	0.00	4.11	74

Source: NOAA/Duluth, MN

Table 3. Winter Project Sampling Comparison Table: 2012 Thru Current Year									
Year	**Month**	**Secchi Depth**	**Chlorophyll *a***	**Color (True)**	**Total Phosphorus**	**Low D.O.**	**High D.O.**	**Low Water Temp.**	**High Water Temp.**
		meters	**µg/L**	**C.P.U. Units**	**Below Surface mg/L**	**mg/L**	**mg/L**	**° C**	**° C**
2012	April	0.50	2.30	250.00	0.048	10.55	10.73	9.90	10.60
2013	May	1.20	1.90	250.00	0.036	9.34	9.61	6.90	7.80
2014	June	1.50	2.30	300.00	0.055	6.98	7.07	19.90	20.10
2015	April	0.80	3.70	180.00	0.036	9.57	9.72	10.00	11.60
2016	March	0.67	0.41	40.00	0.020	11.30	11.49	3.10	3.60
2017	April	1.03	3.90	35.00	0.022	10.15	10.30	7.20	8.10
2018	May	0.94	ND	55.00	0.025	7.79	8.01	16.40	17.50
2019	April	0.90	2.10	35.00	0.099	10.43	10.60	5.50	5.90
Minimum	March-June	0.50	0.41	35.00	0.020	6.98	7.07	3.10	3.60
Maximum	March-June	1.50	3.90	300.00	0.099	11.30	11.49	19.90	20.10
Average	March-June	0.94	2.37	143.13	0.043	9.51	9.69	9.86	10.65
2012	July	0.60	1.80	400.00	0.082	4.67	4.75	25.50	25.90
2013	July	0.80	1.90	400.00	0.064	5.05	5.21	25.20	26.10
2014	July	0.60	1.50	250.0	0.050	6.31	6.44	19.00	19.40
2015	July	0.70	1.80	25.00	0.044	6.47	6.53	22.30	22.30
2016	July	0.70	2.20	85.00	0.035	5.77	5.86	22.60	23.10
2017	July	1.40	3.10	55.00	0.033	6.31	6.43	24.20	24.30
2018	July	0.85	3.10	10.00	0.054	5.10	5.30	25.40	26.50
2019	July	1.22	3.50	50.00	0.031	7.32	7.36	24.00	24.70
Minimum	July	0.60	1.50	10.00	0.031	4.67	4.75	19.00	19.40
Maximum	July	1.40	3.50	400.00	0.082	7.32	7.36	25.50	26.50
Average	July	0.86	2.36	159.38	0.049	5.88	5.99	23.53	24.04
2012	August	1.10	3.00	200.00	0.047	7.27	7.55	23.40	25.10
2013	August	0.90	2.00	200.00	0.120	5.49	6.10	20.00	20.10
2014	August	0.90	1.80	150.00	0.040	6.54	6.68	23.70	23.80
2015	August	0.70	3.30	300.00	0.051	5.95	6.10	22.80	23.20
2016	August	0.98	1.50	60.00	0.038	5.83	5.96	23.50	24.80
2017	August	1.40	2.80	40.00	0.023	6.66	6.79	20.30	20.30
2018	August	1.20	2.80	100.00	0.041	6.75	6.92	20.70	21.40
2019	August	1.52	2.70	55.00	0.028	7.32	7.59	24.70	25.40
Minimum	August	0.70	1.50	40.00	0.023	5.49	5.96	20.00	20.10
Maximum	August	1.52	3.30	300.00	0.120	7.32	7.59	24.70	25.40
Average	August	1.09	2.49	138.13	0.049	6.48	6.71	22.39	23.01

Appendix C – Winter Impoundment Project Sampling Logs

IMPOUNDMENT SAMPLING LOG

Water Quality Study Location Winter

Hydroelectric Project – FERC # 2064

Date: 4-22-2019

Pre-Sampling Data:

HWL 1370.58 TWL 1347.91 CFS 3796

Sample Location: N45° 56.749
W 90° 57.354

Performed by:
Angie Shin Josh G.

Time: 14:15 Barometer: 30.04

Air Temp: 41 °F = 5°C Wind Speed: NNE 7mph

Sky Conditions: 100 Clouds

Precipitation within Last 24 Hours: 0.8"

D.O. Meter Calibration:

Instrument Model Used: HQ40D

Were the batteries changed? ☒ Yes ☐ No

If yes, when were they changed: 4-22-19

Battery Status: 100 % Charge

Calibration Method: Factory

Sampling Depth Profile: Measured depth to bottom of impoundment: 5 ~~Meters~~/ft

Secchi Depth (± 0.1)			
Time	14:14	3 (Feet)	Meters

0.9 Meters

Comments:

Chlorophyll *a* (1 Meter below surface horizontal sampler)		
Time	Quantity (ml)	Filtered
14:18	1000	In Lab
Preservative		$MgCO_3$

True Color (1 Meter below surface horizontal sampler)
Time 14:18

Total Phosphorus (1 Meter below surface horizontal sampler)	
Time 14:18	Preservative
	H_2SO_4

Total Phosphorus (1 Meter above bottom horizontal sampler)	
Time	Preservative
	H_2SO_4

D.O. and Temperature Profile			
Depth (Meters)	Time	D.O. (mg/L)	Temperature °C
0.5 below surface	14:22:02	10:43	5.9
1	14:23:45	10.52	5.6
2	14:24:15	10.60	5.5
3			
4			
5			
6			
7			
8			
0.5 above bottom	14:25:10	10.59	5.5

*If D.O. is below 5.0 mg/L notify agency and measure D.O. at 1.0 foot intervals if <5.0 mg/L.

WHITE WATER ASSOCIATES, INC.

IMPOUNDMENT SAMPLING LOG

Water Quality Study Location Wintu

Hydroelectric Project – FERC # 2064

Date: 8-12-19

Pre-Sampling Data:

HWL 1370.41 TWL 1344.71 CFS 100

Sample Location: N45° 55, 749
W90° 57, 354

Performed by:
Ingi Stin Emma

Time: 14,52 Barometer: 29,87

Air Temp: 72 °F Wind Speed: NE 3mpH

Sky Conditions: 100 Clouds

Precipitation within Last 24 Hours: yes

D.O. Meter Calibration:

Instrument Model Used: HQ40D

Were the batteries changed? ☐ Yes ☒ No

If yes, when were they changed: _____

Battery Status: 70 % Charge

Calibration Method: Factory

Sampling Depth Profile: Measured depth to bottom of impoundment: 2 Meters

Secchi Depth (± 0.1)		
Time 14:00	5 Feet	1,52 Meters

Comments:

Chlorophyll *a* (1 Meter below surface horizontal sampler)		
Time 13,52	Quantity (ml)	Filtered
	1000	In Lab
Preservative	$MgCO_3$	

True Color (1 Meter below surface horizontal sampler)
Time 13,52

Total Phosphorus (1 Meter below surface horizontal sampler)	
Time 13,52	Preservative
	H_2SO_4

Total Phosphorus (1 Meter above bottom horizontal sampler)	
Time	Preservative
	H_2SO_4

D.O. and Temperature Profile			
Depth (Meters)	Time	D.O. (mg/L)	Temperature ° C
0.5 below surface	14:55:10	7.59	25.4
1	14:55:55	7.43	25.0
2	14:56:27	7.37	24.9
3	14:57:13	7.33	24.8
4			
5			
6			
7			
8			
0.5 above bottom	14:59:09	7.32	24.7

*If D.O. is below 5.0 mg/L notify agency and measure D.O. at 1.0 foot intervals if <5.0 mg/L.

WHITE WATER ASSOCIATES, INC.

Appendix D – Winter Hydroelectric Project Lab Reports and Chains of Custody

IMPOUNDMENT SAMPLING LOG

Water Quality Study Location Winter

Hydroelectric Project – FERC # 2064

Date: 7-22-2019

Pre-Sampling Data:

HWL 1370.16 TWL 1346.17 CFS 310

Sample Location: N45° 55.749
W90° 57.354

Performed by:
A. Stine

Time: 14:00 Barometer: 30.1

Air Temp: 77°F Wind Speed: NW 7mph

Sky Conditions: Partly cloudy

Precipitation within Last 24 Hours: no

D.O. Meter Calibration:

Instrument Model Used: HQ40D

Were the batteries changed? ☐ Yes ☒ No

If yes, when were they changed: _____

Battery Status: 90 % Charge

Calibration Method: Factory

Sampling Depth Profile: Measured depth to bottom of impoundment: 2 Meters 6.5 feet

Secchi Depth (± 0.1)			
Time 14:34	4	Feet	1.2 Meters

Chlorophyll *a* (1 Meter below surface horizontal sampler)		
Time 14:33	Quantity (ml)	Filtered
	1000	In Lab
Preservative		$MgCO_3$

True Color (1 Meter below surface horizontal sampler)
Time 14:36

Total Phosphorus (1 Meter below surface horizontal sampler)	
Time 14:36	Preservative
	H_2SO_4

Total Phosphorus (1 Meter above bottom horizontal sampler)	
Time	Preservative
	H_2SO_4

D.O. and Temperature Profile			
Depth (Meters)	Time	D.O. (mg/L)	Temperature °C
0.5 below surface	14:29:18	7.32	24.7
1	14:29:57	7.34	24.3
2	14:30:39	7.25	24.1
3			
4			
5			
6			
7			
8			
0.5 above bottom	14:31:15	7.36	24.0

*If D.O. is below 5.0 mg/L notify agency and measure D.O. at 1.0 foot intervals if <5.0 mg/L.

saw snapper

Comments:

WHITE WATER ASSOCIATES, INC.

Cover Page

ANALYTICAL REPORT

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • Ph (906) 822-7889 • Fax -7977

Client: RWE **WWA Job #:** 82124

Project: Monitoring

Date Received: 4/24/2019 **Date Reported:** 5/21/2019

Sample Number	Client Sample ID	Date Sampled	Sample Matrix
82124-001	Winter	04/22/19	Water

Comments (if any):

82124-001 Insufficient sample to rerun sample within WI DNR certification for chlorophyll a.

Key to Laboratory Flags:

*: RPD exceeds limits.
B: The analyte was found in the associated blank as well as in the sample.
J: The quantitation is an estimated value because the result is less than the sample quantitation limit but greater than the detection limit.
M: A matrix effect was present.
Q: Batch QC data associated with the analysis does not meet the stated objectives
H: Indicates analytical holding time exceedance.
U: The analyte was analyzed for, but not detected.
P: A manual peak selection or manual integration was performed to correct an erroneous software selection.

ND = Not Detected, MDL = Method Detection Limit, MQL = Method Quantitation Limit
ppm = mg/L (liquid) or mg/kg (solid), ppb = ug/L (liquid) or ug/kg (solid)
For coliform, Negative = No coliform bacteria detected, Positive = Coliform bacteria detected

Sample Types:
S = Solids, DW = Drinking water, D = Dissolved, T = Total, TC = TCLP extract, SP = SPLP extract

All samples were received intact and properly preserved unless otherwise noted. The results reported relate only to the samples tested. This report shall not be reproduced, except in full, without the written approval of this laboratory. The Chain of Custody is attached.

This report satisfies the requirements of your project but has not been prepared to comply with NELAP reporting requirements.

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and White Water Associates Standard Operating Procedures. Exceptions, if any, are discussed in the accompanying sample narrative. Release of this Final Report is authorized by White Water Associates management, as is verified by the following signature.

Approved By: Jessi L Haag

WI DNR Lab Certification Number: 999971280
MI DEQ Certification Number: 9306
DoD-ELAP Accreditation Number: 65802
ISO/IEC 17025:2005 Accredited

ANALYTICAL REPORT

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • Ph (906) 822-7889 • Fax -7977

Client: RWE **WWA Job #:** 82124

Project: Monitoring

Date Received: 4/24/2019 **Date Reported:** 5/21/2019

Sample Results

Sample No. / ID / Description / Matrix	Result	Flags	Units	Date/Time	Method	MDL	MQL	Analyst
82124-001 / Winter / Water								
General Chemistry Parameters								
Chlorophyll a	2.1		mg/m3	4/24/2019 14:15	10200H	NA	NA	CA
Color	35		CU	4/24/2019 11:05	2120B	5	5	AH
Total Phosphorus LL (t)	0.099	M	mg/L	5/15/2019 12:27	365.4	0.008	0.050	NK

82124-001 Insufficient sample to rerun sample within WI DNR certification for chlorophyll a.

ND = Not Detected, MDL = Method Detection Limit, MQL = Method Quantitation Limit,
ppm = mg/L (liquid) or mg/kg (solid), ppb = ug/L (liquid) or ug/kg (solid)

Login Checklist

WHITE WATER ASSOCIATES, INC.

Project No.:	82124	**Date logged in.:**	4/24/2019	**Login person's initials:**	ER
Client:	RWE			**Number of coolers:**	1
Project name:	Monitoring			**Courier/shipper:**	WWA

- ☑ **1. Custody seals/original packing tape were intact (if applicable).**
- ☑ **2. Samples are in good condition, i.e. not broken or leaking.**
- ☑ **3. Samples were received within holding times.**
- ☑ **4. Samples were received on ice (ice in direct contact with the samples).**
- ☐ **5. Temperature of the samples was between 0-6°C. Temp.:** -1

  NOTE: Samples not between 0-6°C that are received at the laboratory on the day of sample collections do not require client notification.
- ☑ **6. Samples matched the Chain of Custody (COC).**
- ☑ **7. Proper containers were used.**
- ☑ **8. Samples were collected in White Water lab containers.**
- ☑ **9. There is adequate sample volume for requested analyses and QC.**
- ☐ **10. For water VOC samples, headspace is less than the size of a pea.**
- ☑ **11. Samples are preserved to the proper pH. Sample bottles and preservation are noted in LIMS Sample Container Section.**
- ☑ **12. The COC is signed. (either Sampler or Relinquished by)**
- ☐ **13. Sub-sampling (SS) is required. Bottles created are noted in sample containers section of log-in form.**
- ☑ **14. For Dissolved Analysis (when applicable), samples were filtered in the lab.**
- ☐ **15. For soil VOCs, methanol preserved samples were received.**
- ☐ **16. For Soil VOCs, samples were preserved with methanol in the lab.**
- ☐ **17. Client contact is necessary. Provide documentation below.**

COMMENTS/CORRECTIVE ACTION

CLIENT RESPONSE

Note: If hold time, volume, and received on ice or temperature criteria are not met when required by the method, results may not be able to be used for regulatory purposes. Check with your reporting agency for more information.

JGH 4/25/19
Version 160504

Job # (WWA office use): 82124 -

CHAIN-OF-CUSTODY RECORD

WHITE WATER ASSOCIATES, INC.

429 River Lane, P.O. Box 27
Amasa, Michigan 49903

Phone: (906) 822-7889, Fax -7977
Web: white-water-associates.com

CLIENT NAME / BILL TO: RWE			EMAIL ADDRESS
ADDRESS			TELEPHONE
CITY	STATE	ZIP	CONTRACT / PO / PROJECT NAME / WSSN#: Monitoring
SAMPLER NAME (print first/last name): Amie Stine			COUNTY OF LOCATION / PAGE: 1 OF 1 (Indicate if more than one page of COC records used)
SAMPLER'S SIGNATURE			Check off preservatives for each bottle upon arrival and indicate total number of bottles. WWA database contains bottle preservation details.

SAMPLE ID AND LOCATION (Containers for each sample may be combined on one line.)	DATE	TIME	SAMPLE MATRIX: Drinking water	Aqueous	Sed.	Soil	Other:	CONTAINERS / PRESERVATIVES: None	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Na Thio	Total Number of Containers	ANALYSIS TYPE REQUESTED: Chl a (mg/m3)	T Phos	Color
Winter	4-22-18	14:18		X				X	X						3	X	X	X

Instructions to White Water
Send my report by:
____ email
____ mail

Unless otherwise noted, drinking water report copies are sent to MDEQ and Health Dept.

REMARKS (Note any special instructions provided by client or conditions of receipt noted by WWA lab staff. Also note any residual chlorine.)

Relinquished by:	Date: 4-23-19	Time: 1648	Received by: Stine ①	Date: 4/23/19	Time: 17
Relinquished by:	Date:	Time:	Received by: ②	Date: 4-24-19	Time: 830

Comments/Sample temp. on receipt: -1

Packing: Ice ✓ Cooler

UPS☐ FedEx☐ USPS☐ Client☐ Other WWA

WHITE - RETURN W/ REPORT CANARY - W/ SAMPLES PINK - CUSTOMER

Cover Page

ANALYTICAL REPORT

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • Ph (906) 822-7889 • Fax -7977

Client: RWE **WWA Job #:** 84250

Project: Monitoring

Date Received: 7/25/2019 **Date Reported:** 8/27/2019

Sample Number	Client Sample ID	Date Sampled	Sample Matrix
84250-001	Winter	07/22/19	Water

Comments (if any):

Key to Laboratory Flags:

*: RPD/RSD exceeds limits.
B: The analyte was found in the associated blank as well as in the sample.
J: The quantitation is an estimated value because the result is less than the sample quantitation limit but greater than the detection limit.
M: A matrix effect was present.
Q: Batch QC data associated with the analysis does not meet the stated objectives
H: Indicates analytical holding time exceedance.
P: A manual peak selection or manual integration was performed to correct an erroneous software selection.
N: For reporting results that are non-target analytes, when requested by client for Mass Spec reporting.
T: Tentatively Identified Compound.
ND = Not Detected, MDL = Method Detection Limit, MQL = Method Quantitation Limit
ppm = mg/L (liquid) or mg/kg (solid), ppb = ug/L (liquid) or ug/kg (solid)
For coliform, Negative = No coliform bacteria detected, Positive = Coliform bacteria detected

Sample Types:
S = Solids, DW = Drinking water, D = Dissolved, T = Total, TC = TCLP extract, SP = SPLP extract

All samples were received intact and properly preserved unless otherwise noted. The results reported relate only to the samples tested. This report shall not be reproduced, except in full, without the written approval of this laboratory. The Chain of Custody is attached.

This report satisfies the requirements of your project but has not been prepared to comply with NELAP reporting requirements.

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and White Water Associates Standard Operating Procedures. Exceptions, if any, are discussed in the accompanying sample narrative. Release of this Final Report is authorized by White Water Associates management, as is verified by the following signature.

Approved By: Gerri L. Haag

WI DNR Lab Certification Number: 999971280
MI EGLE Certification Number: 9306
DoD-ELAP Accreditation Number: 65802
ISO/IEC 17025:2005 Accredited

ANALYTICAL REPORT

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • Ph (906) 822-7889 • Fax -7977

Client: RWE **WWA Job #:** 84250

Project: Monitoring

Date Received: 7/25/2019 **Date Reported:** 8/27/2019

Sample Results

Sample No. / ID / Description / Matrix	Result	Flags	Units	Date/Time	Method	MDL	MQL	Analyst
84250-001 / Winter / Water								
General Chemistry Parameters								
Chlorophyll a	3.5		mg/m3	7/25/2019 15:20	10200H	NA	NA	CA
Color	50		CU	7/25/2019 13:00	2120B	5	5	GG
Total Phosphorus LL (t)	0.031	J	mg/L	8/20/2019 12:35	365.4	0.008	0.050	NK

ND = Not Detected, MDL = Method Detection Limit, MQL = Method Quantitation Limit,
ppm = mg/L (liquid) or mg/kg (solid), ppb = ug/L (liquid) or ug/kg (solid)

Login Checklist

WHITE WATER ASSOCIATES, INC.

Project No.:	84250	**Date logged in.:**	7/25/2019	**Login person's initials:**	ER
Client:	RWE			**Number of coolers:**	1
Project name:	Monitoring			**Courier/shipper:**	WWA

- ☑ **1. Custody seals/original packing tape were intact (if applicable).**
- ☑ **2. Samples are in good condition, i.e. not broken or leaking.**
- ☐ **3. Samples were received within holding times.**
- ☑ **4. Samples were received on ice (in direct contact with the samples).**
- ☑ **5. Temperature of the samples was between 0-6°C. Temp.:** 0

NOTES on #4:

NOTE: Samples not between 0-6°C that are received at the laboratory on the day of sample collections do not require client notification.

- ☑ **6. Samples matched the Chain of Custody (COC).**
- ☑ **7. Proper containers were used.**
- ☑ **8. Samples were collected in White Water lab containers.**
- ☑ **9. There is adequate sample volume for requested analyses and QC.**
- ☐ **10. For water VOC samples, headspace is less than the size of a pea.**
- ☑ **11. Samples are preserved to the proper pH. Sample bottles and preservation are noted in LIMS Sample Container Section.**
- ☑ **12. The COC is signed. (either Sampler or Relinquished by)**
- ☐ **13. Sub-sampling (SS) is required. Bottles created are noted in sample containers section of log-in form.**
- ☑ **14. For Dissolved Analysis (when applicable), samples were filtered in the lab.**
- ☐ **15. For soil VOCs, methanol preserved samples were received.**
- ☐ **16. For Soil VOCs, samples were preserved with methanol in the lab.**
- ☐ **17. Client contact is necessary. Provide documentation below.**

COMMENTS/CORRECTIVE ACTION

190725 8:50ER color received past hold time

CLIENT RESPONSE

Note: If hold time, volume, and received on ice or temperature criteria are not met when required by the method, results may not be able to be used for regulatory purposes. Check with your reporting agency for more information.

JG# 7/29/19

Version 160504

Job # (WWA office use): 84250

CHAIN-OF-CUSTODY RECORD

WHITE WATER ASSOCIATES, INC.

429 River Lane, P.O. Box 27
Amasa, Michigan 49903

Phone: (906) 822-7889, Fax -7977
Web: white-water-associates.com

CLIENT NAME / BILL TO			EMAIL ADDRESS
RWE			
ADDRESS			TELEPHONE
CITY	STATE	ZIP	CONTRACT / PO / PROJECT NAME / WSSN#
			Monitoring
SAMPLER NAME (print first/last name)			COUNTY OF LOCATION / PAGE: 1 OF 1 (Indicate if more than one page of COC records used)
Ryan Werbie			
SAMPLER'S SIGNATURE			Check off preservatives for each bottle upon arrival and indicate total number of bottles. WWA database contains bottle preservation details.

ANALYSIS TYPE REQUESTED (Attach list if neeeded)

Instructions to White Water
Send my report by:
____ email
____ mail

Unless otherwise noted, drinking water report copies are sent to MDEQ and Health Dept.

REMARKS (Note any special instructions provided by client or conditions of receipt noted by WWA lab staff. Also note any residual chlorine.)

SAMPLE ID AND LOCATION (Containers for each sample may be combined on one line.)	DATE	TIME	SAMPLE MATRIX: Drinking water	Aqueous	Sed.	Soil	Other:	CONTAINERS / PRESERVATIVES: None	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Na Thio	Total Number of Containers	Chlg (mg/L) (d3)	TPhos	Color
Winter	7-17-19	14:33		X				X	X						3	X	X	X

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
	7/24/19	17:30			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
				7-25-19	830

Comments/Sample temp. on receipt: 10

Packing: Ice ✓ Cooler ____

UPS☐ FedEx☐ USPS☐ Client☐ Other WWA

WHITE - RETURN W/ REPORT CANARY - W/ SAMPLES PINK - CUSTOMER

Cover Page

ANALYTICAL REPORT

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • Ph (906) 822-7889 • Fax -7977

Client: RWE **WWA Job #:** 84705

Project: Monitoring

Date Received: 8/15/2019 **Date Reported:** 9/13/2019

Sample Number	Client Sample ID	Date Sampled	Sample Matrix
84705-001	Winter	08/12/19	Water

Comments (if any):

Key to Laboratory Flags:

*: RPD/RSD exceeds limits.
B: The analyte was found in the associated blank as well as in the sample.
J: The quantitation is an estimated value because the result is less than the sample quantitation limit but greater than the detection limit.
M: A matrix effect was present.
Q: Batch QC data associated with the analysis does not meet the stated objectives
H: Indicates analytical holding time exceedance.
P: A manual peak selection or manual integration was performed to correct an erroneous software selection.
N: For reporting results that are non-target analytes, when requested by client for Mass Spec reporting.
T: Tentatively Identified Compound.
ND = Not Detected, MDL = Method Detection Limit, MQL = Method Quantitation Limit
ppm = mg/L (liquid) or mg/kg (solid), ppb = ug/L (liquid) or ug/kg (solid)
For coliform, Negative = No coliform bacteria detected, Positive = Coliform bacteria detected

Sample Types:
S = Solids, DW = Drinking water, D = Dissolved, T = Total, TC = TCLP extract, SP = SPLP extract

All samples were received intact and properly preserved unless otherwise noted. The results reported relate only to the samples tested. This report shall not be reproduced, except in full, without the written approval of this laboratory. The Chain of Custody is attached.

This report satisfies the requirements of your project but has not been prepared to comply with NELAP reporting requirements.

I certify that the data contained in this Final Report has been generated and reviewed in accordance with approved methods and White Water Associates Standard Operating Procedures. Exceptions, if any, are discussed in the accompanying sample narrative. Release of this Final Report is authorized by White Water Associates management, as is verified by the following signature.

Approved By: Terri L Haag

WI DNR Lab Certification Number: 999971280
MI EGLE Certification Number: 9306
DoD-ELAP Accreditation Number: 65802
ISO/IEC 17025:2005 Accredited

ANALYTICAL REPORT

WHITE WATER ASSOCIATES, INC.
429 River Lane • PO Box 27 Amasa, MI 49903 • Ph (906) 822-7889 • Fax -7977

Client: RWE **WWA Job #:** 84705

Project: Monitoring

Date Received: 8/15/2019 **Date Reported:** 9/13/2019

Sample Results

Sample No. / ID / Description / Matrix	Result	Flags	Units	Date/Time	Method	MDL	MQL	Analyst
84705-001 / Winter / Water								
General Chemistry Parameters								
Chlorophyll a	2.7		mg/m3	8/22/2019 15:10	10200H	NA	NA	AH
Color	55		CU	8/15/2019 13:45	2120B	5	5	AH
Total Phosphorus LL (t)	0.028	J	mg/L	8/20/2019 13:19	365.4	0.008	0.050	NK

ND = Not Detected, MDL = Method Detection Limit, MQL = Method Quantitation Limit,
ppm = mg/L (liquid) or mg/kg (solid), ppb = ug/L (liquid) or ug/kg (solid)

Login Checklist

WHITE WATER ASSOCIATES, INC.

Project No.:	84705	**Date logged in.:**	8/15/2019	**Login person's initials:**	ER
Client:	RWE			**Number of coolers:**	1
Project name:	Monitoring			**Courier/shipper:**	WWA

- ☑ **1. Custody seals/original packing tape were intact (if applicable).**
- ☑ **2. Samples are in good condition, i.e. not broken or leaking.**
- ☐ **3. Samples were received within holding times.**
- ☑ **4. Samples were received on ice (in direct contact with the samples).**
- ☑ **5. Temperature of the samples was between 0-6°C. Temp.:** 1

NOTES on #4:

NOTE: Samples not between 0-6°C that are received at the laboratory on the day of sample collections do not require client notification.

- ☑ **6. Samples matched the Chain of Custody (COC).**
- ☑ **7. Proper containers were used.**
- ☑ **8. Samples were collected in White Water lab containers.**
- ☑ **9. There is adequate sample volume for requested analyses and QC.**
- ☐ **10. For water VOC samples, headspace is less than the size of a pea.**
- ☑ **11. Samples are preserved to the proper pH. Sample bottles and preservation are noted in LIMS Sample Container Section.**
- ☑ **12. The COC is signed. (either Sampler or Relinquished by)**
- ☐ **13. Sub-sampling (SS) is required. Bottles created are noted in sample containers section of log-in form.**
- ☑ **14. For Dissolved Analysis (when applicable), samples were filtered in the lab.**
- ☐ **15. For soil VOCs, methanol preserved samples were received.**
- ☐ **16. For Soil VOCs, samples were preserved with methanol in the lab.**
- ☐ **17. Client contact is necessary. Provide documentation below.**

COMMENTS/CORRECTIVE ACTION

#3. 190815 8:50ER color received past hold time

CLIENT RESPONSE

Note: If hold time, volume, and received on ice or temperature criteria are not met when required by the method, results may not be able to be used for regulatory purposes. Check with your reporting agency for more information.

JGH 8/16/19

Version 160504

CHAIN-OF-CUSTODY RECORD

Job # (WWA office use): 84705 -

WHITE WATER ASSOCIATES, INC.

429 River Lane, P.O. Box 27
Amasa, Michigan 49903
Phone: (906) 822-7889, Fax -7977
Web: white-water-associates.com

CLIENT NAME / BILL TO: RWE -			EMAIL ADDRESS:
ADDRESS:			TELEPHONE:
CITY:	STATE:	ZIP:	CONTRACT / PO / PROJECT NAME / WSSN#: Monitoring
SAMPLER NAME (print first/last name): Angie Shin			COUNTY OF LOCATION: PAGE 1 OF 1 — Indicate if more than one page of COC records used
SAMPLER'S SIGNATURE:			Check off preservatives for each bottle upon arrival and indicate total number of bottles. WWA database contains bottle preservation details.

ANALYSIS TYPE REQUESTED (Attach list if neeeded)

Instructions to White Water
Send my report by:
____ email
____ mail

Unless otherwise noted, drinking water report copies are sent to MDEQ and Health Dept.

REMARKS (Note any special instructions provided by client or conditions of receipt noted by WWA lab staff. Also note any residual chlorine.)

SAMPLE ID AND LOCATION (Containers for each sample may be combined on one line.)	DATE	TIME	SAMPLE MATRIX: Drinking water	Aqueous	Sed.	Soil	Other:	CONTAINERS / PRESERVATIVES: None	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Na Thio	Total Number of Containers	Chla (mg/m3)	TPhos	Color
Winter	8-12-19	13:52		X				X	X						3	X	X	X

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date: 8-14-19	Time: 7:51pm	Received by:	Date: 8-15-19	Time: 830

Comments/Sample temp. on receipt: 1

Packing: Ice ✓ Cooler ____

UPS☐ FedEx☐ USPS☐ Client☐ Other WWA

WHITE - RETURN W/ REPORT CANARY - W/ SAMPLES PINK - CUSTOMER

RE: Danbury (P-9184) Clam River (P-9185) Flambeau Upper (P-2640) Flambeau Lower (P-2421) Pixley (P-2395) Crowley (P-2473) Winter (P-2064) Water Quality data spreadsheet

Laatsch, Cheryl - DNR <Cheryl.Laatsch@wisconsin.gov>
Mon 12/2/2019 9:45 AM
To: Brian Kreuscher <bkreuscher@rwehydro.com>

Thank you

We are committed to service excellence.
Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

Cheryl Laatsch
Statewide FERC Coordinator
Bureau of Environmental Analysis and Sustainability
Wisconsin Dept of Natural Resources
N7725 Hwy 28
Horicon WI 53032
(T) 920-387-7869 (Fax) 920-387-7888
Cheryl.laatsch@wisconsin.gov


dnr.wi.gov


From: Brian Kreuscher <bkreuscher@rwehydro.com>
Sent: Monday, December 02, 2019 9:35 AM
To: Laatsch, Cheryl - DNR <Cheryl.Laatsch@wisconsin.gov>; Nick Utrup <nick_utrup@fws.gov>
Subject: Danbury (P-9184) Clam River (P-9185) Flambeau Upper (P-2640) Flambeau Lower (P-2421) Pixley (P-2395) Crowley (P-2473) Winter (P-2064) Water Quality data spreadsheet

All,

In years past I had been asked for this Excel spreadsheet with water quality monitoring data. The attached spreadsheet has data for the following projects each in their own tab: Upper, Lower, Pixley, Crowley, Winter, Danbury and Clam River.

Thanks

Brian Kreuscher

Renewable World Energies

Regulatory & Compliance

855-994-9376 x230

Winter (P-2064) Draft Water Quality Report

Brian Kreuscher <bkreuscher@rwehydro.com>

Tue 11/26/2019 7:33 PM

To: Cheryl Laatsch <cheryl.laatsch@wisconsin.gov>; Nick Utrup <nick_utrup@fws.gov>; Paul Strong <pstrong@fs.fed.us>; Sue Reinecke <sreinecke@fs.fed.us>

1 attachments (2 MB)

Winter Water Quality Report 2019_COMPLETE.pdf;

All,
Attached is the Draft Water Quality Report for Winter. Please review and provide any comments you may have to me within 60 days for FERC submittal.

Thanks
Brian Kreuscher
Renewable World Energies
Regulatory & Compliance
855-994-9376 x230

Document Content(s)