Renewable World Energies

December 16, 2013

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

RE: Flambeau Hydroelectric Projects
FERC Project Number 2640 **FERC Project Number 2421**
FERC Project Number 2395 **FERC Project Number 2473**
Flambeau Hydro LLC
Final Report 2013 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 2013 Water Quality Monitoring Data* for each of the (4) Flambeau Hydroelectric Projects (Flambeau Upper, Flambeau Lower, Flambeau Pixley, and Flambeau Crowley). The report is a requirement of Flambeau's Federal license pursuant to articles 406 and 408 and the approved Water Quality Monitoring Plans for each. 2013 was the tenth year monitoring was conducted since the license was issued, but is the 2nd year of submittal by RWE on the behalf of the Licensee.

Monitoring was conducted on July 9, and August 6, 2013. The only issue encountered was some below standard D O measurements taken on the July 9th at Crowley. Agencies were notified by e-mail dated July 10, 2013 of the issue. No sampling was conducted during the Ice-Out period due to high and dangerous water conditions as documented in the correspondence sections of the reports. The draft report was sent to the agencies by a letter dated November 6, 2013 for review and comment. No comments have been received from WDNR or USFW concerning the reports as of the date of this letter. The next scheduled monitoring event will be conducted in 2014.

If you have any questions concerning this submittal, please contact Mr. Gary Rast at the Renewable World Energies, LLC offices @ 855-994-9376 Ext 105. He can also be reached by e-mail at grast@rwehydro.com.

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www.renewableworldenergies.com

Administrative Office
1001 Stephenson Street
Norway, MI 49870
Fax: 906-563-9344

Renewable World Energies

Sincerely,
Renewable World Energies, LLC
Agent for Licensee

for Gary Rast
Mr. Jason Kreuscher
Vice President, Operations

Attachments: Flambeau Upper Final Report 2013 Water Quality Monitoring Data-December 16, 2013

Flambeau Lower Final Report 2013 Water Quality Monitoring Data-December 16, 2013

Flambeau Pixley Final Report 2013 Water Quality Monitoring Data-December 16, 2013

Flambeau Crowley Final Report 2013 Water Quality Monitoring Data-December 16, 2013

Cc: Ms. Cheryl Laatsch, WDNR
Mr. Nick Utrup, USFWS
RWE, Corporate

Final Report

2013 Water Quality Monitoring Data

For the

Flambeau (Upper) Hydroelectric Project
FERC Project #2640
Flambeau Hydro, LLC

North Fork of the Flambeau River, Price County, Wisconsin

Respectfully Submitted by:

Renewable World Energies, LLC
100 State Street – P.O. Box 264
Neshkoro, Wisconsin 54960

Final – December 16, 2013

Table of Contents

Summary

2013 marked the tenth year of water quality sampling under the FERC approved "Water Quality Monitoring Plan Per License Article 408 for the Flambeau (Upper) Hydroelectric Project – FERC Project # 2640 – Flambeau Hydro, LLC". Sampling was accomplished according to the plan and was un-eventful, with no major problems or concerns.

Ice-Out occurred between Agenda and Nine Mile Landing on the North Fork of the Flambeau River during the week beginning April 28, 2013. **The Ice-Out sampling event did not occur.** The Licensee traveled to the region during the 1st and 3rd weeks of May, but could not accomplish the sampling because of high river flows, 4229 CFS & 4982 CFS respectively. Consultation with the WDNR was done by phone on May 22, 2013 as well as an e-mail being sent to the agencies describing the agreement to skip the Ice-Out sampling event this year. The decision was due to dangerous river conditions and the fact that the sampling would have to be done too far outside the Ice-Out time frame to be of value.

River flow, based on Flambeau (Upper) Hydroelectric Project records, was approximately 856 cubic feet per second during the July 9, 2013 sampling event. Sampling occurred between 7:30 a.m. and 7:52 a.m. Samples were taken without incident. No unusual D.O or Temperature readings were observed. Samples for laboratory analysis were delivered to Northern Lake Service, Inc in Crandon, WI on July 10, 2013. Northern Lake Service, Inc issued a laboratory report on July 15, 2013. No unusual levels of Chlorophyll a, True Color, or Total Phosphorus were noted in the laboratory reports.

River flow, based on Flambeau (Upper) Hydroelectric Project records, was approximately 725 cubic feet per second during the August 6, 2013 sampling event. Sampling occurred between 7:15 a.m. and 7:37 a.m. Samples were taken without incident. No unusual D.O. or Temperature readings were observed. Samples for laboratory analysis were delivered to Northern Lake Service, Inc in Crandon, WI on August 7, 2013. Northern Lake Service, Inc issued a laboratory report on August 14, 2013. No unusual levels of Chlorophyll a, True Color, or Total Phosphorus were noted in the laboratory reports.

In general, the weather (temperature and rainfall) during the 2013 monitoring season appeared cooler in April/May with higher than normal precipitation in the months of April/May/June. Temperatures in June/July/August were about 1to5 degrees higher than normal but precipitation was about 50% below normal for July/August. (**Refer to 2013 Monthly Temperature and Precipitation Table page 7**)

A summary of a comparison between the 2011 thru 2013 (**Refer to 2013 Flambeau Upper Project Sampling Comparison Table 2011-2013 page 8**) sampling results are as follows:

1. Water Clarity – No sampling in May – Decreased in July and Increased in August
2. Chlorophyll a – No sampling in May – Decreased
3. Color – No sampling in May – Increased
4. Total Phosphorus – No sampling in May – Decreased July and Increased in August
5. Overall, D.O. – No sampling in May – Decreased
6. Water Temperatures – No sampling in May – Decreased

Correspondence from the agencies during 2010 indicated they would prefer that notifications of incidents be by e-mail only and that telephone contacts are not needed. All other correspondence can be found on page 13, **Appendix D**. The next scheduled Water Quality Monitoring at the Upper Hydroelectric Project is set to take place in 2014 beginning with the Ice-Out sampling event.

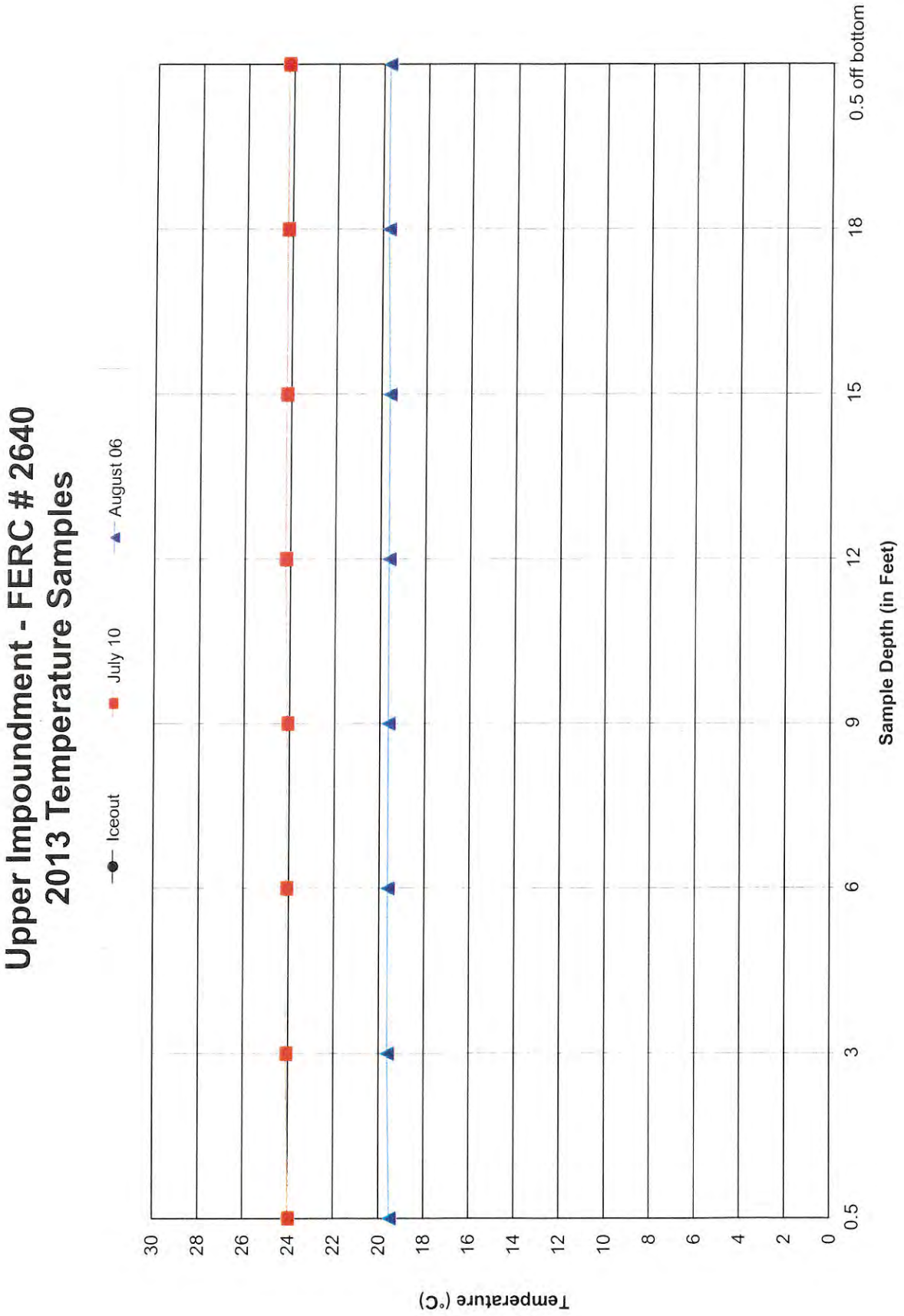
2013
Sampling Results
Table

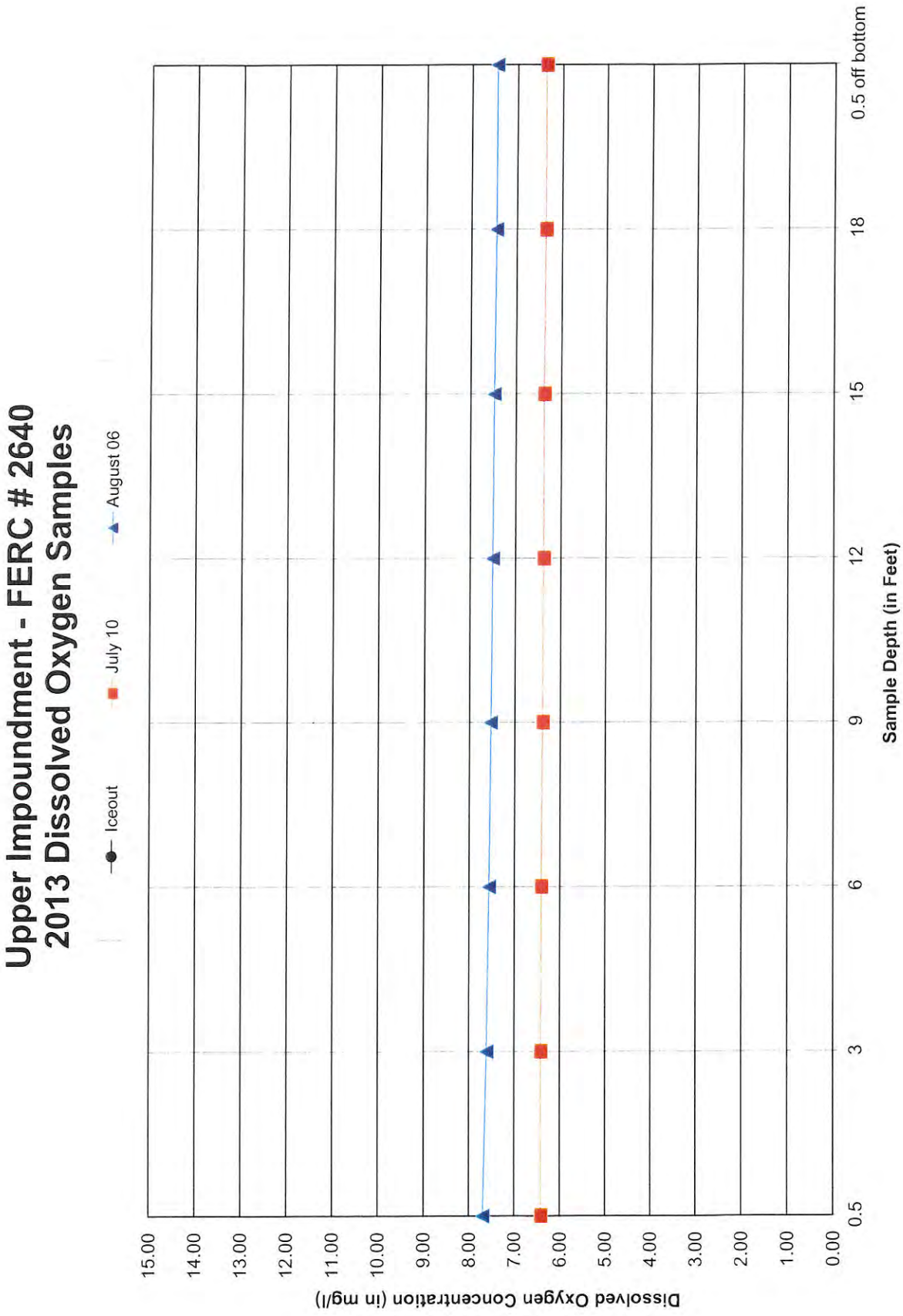
Flambeau (Upper) Hydroelectric Project - FERC Project # 2640
2013 Water Quality Sampling Data

	Iceout 2013			July 9, 2013			August 6, 2013		
Project Flow (c.f.s.)	N/A			856			725		
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 feet below surface	N/A	N/A	N/A	7:40 AM	6.41	24.00	7:30 AM	7.69	19.50
3 feet below surface	N/A	N/A	N/A	7:41 AM	6.41	24.10	7:31 AM	7.61	19.60
6 feet below surface	N/A	N/A	N/A	7:42 AM	6.40	24.10	7:32 AM	7.56	19.60
9 feet below surface	N/A	N/A	N/A	7:45 AM	6.38	24.10	7:33 AM	7.53	19.60
12 feet below surface	N/A	N/A	N/A	7:47 AM	6.37	24.20	7:34 AM	7.50	19.60
15 feet below surface	N/A	N/A	N/A	7:48 AM	6.37	24.20	7:35 AM	7.48	19.60
18 feet below surface	N/A	N/A	N/A	7:50 AM	6.35	24.20	7:36 AM	7.45	19.70
0.5 feet above bottom	N/A	N/A	N/A	7:52 AM	6.35	24.20	7:37 AM	7.45	19.70
Secchi Disk	**Time**	**Depth (ft)**		**Time**	**Depth (ft)**		**Time**	**Depth (ft)**	
Feet below surface	N/A	N/A		7:38 AM	3.1		7:20 AM	3.30	
Chlorophyll a	**Time**	**ug/L**		**Time**	**ug/L**		**Time**	**ug/L**	
3 feet below surface	N/A	N/A		7:30 AM	1.6		7:21 AM	6.0	
Color (True)	**Time**	**C.P.U. Units**	**LOD**	**Time**	**C.P.U. Units**	**LOD**	**Time**	**C.P.U. Units**	**LOD**
3 feet below surface	N/A	N/A	N/A	7:32 AM	150.0	50*	7:24 AM	130.0	25*
Total Phosphorus	**Time**	**mg/L**	**LOD**	**Time**	**mg/L**	**LOD**	**Time**	**mg/L**	**LOD**
3 feet below surface	N/A	N/A	N/A	7:34 AM	0.026	0.0070*	7:25 AM	0.066	0.0070*
3 feet above bottom	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Considered Reporting Limits

2013 Temperature and Dissolved Oxygen Graphs




Upper Impoundment - FERC # 2640
2013 Dissolved Oxygen Samples
Iceout
July 10
August 06
Dissolved Oxygen Concentration (in mg/l)
15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
0.5
3
6
9
12
15
18
0.5 off bottom
Sample Depth (in Feet)

2013
Monthly Temperature
and
Precipitation
Table

2013 Water Year Monthly Temperature and Precipitation for Park Falls, 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-12	74	22	42.5	-0.7	691	678	1.34	1.1	2.85	47%
November-12	53	0	30.9	2.1	1015	1088	1.33	10.1	2.09	64%
December-12	48	-7	18.4	3.6	1438	1556	1.44	13.2	1.21	119%
January-13	42	-21	12.1	1.9	1631	1691	1.39	9.2	0.96	145%
February-13	38	-22	14.6	-0.5	1405	1399	1.16	19.1	0.81	70%
March-13	53	-13	21.8	-4.1	1333	1200	2.04	25.8	1.49	137%
April-13	68	8	34.4	-5.2	908	762	5.04	50.8	2.43	207%
May-13	80	27	49.5	-1.9	471	426	3.71	Trace	3.23	115%
June-13	87	37	61.6	1.5	146	179	4.54	0.0	4.23	107%
July-13	94	47	67.8	2.0	47	63	1.73	0.0	3.85	45%
August-13	94	43	69.0	4.7	27	86	1.98	0.0	3.70	54%
September-13	88	37	59.9	4.3	168	298	1.26	0.0	4.11	31%

Source: NOAA/Duluth, MN

2013
Flambeau Upper
Sampling Comparison Table
2011—2013

Flambeau Upper
Project Sampling Comparison Table
2011 Thru Current Year

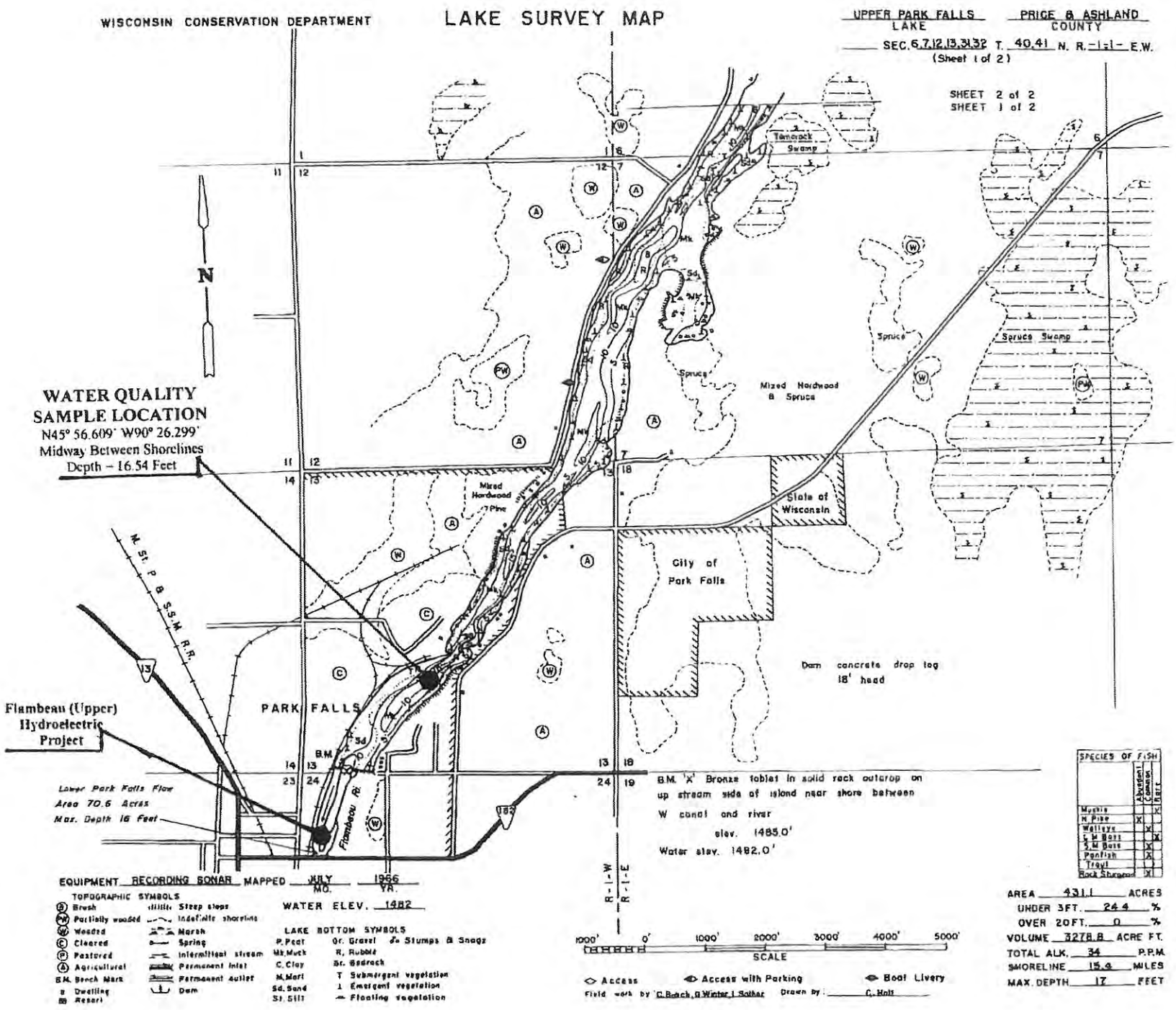
Year	Month	Secchi Depth (m)	Chlorophyll a ug/l	Color (True) C.P.U. Units	Total Phosphorus Below Surface mg/l	Total Phosphorus Above Bottom mg/l	Low D.O. mg/l	High D.O. mg/l	Low Water Temp. °C	High Water Temp. °C
2011	April	3.50	0.51	100.00	0.025	0.028	12.63	12.91	5.90	6.40
2012	April	3.50	1.00	100.00	0.027		12.01	11.71	8.50	8.90
2013	May									
Minimum	April/May	3.50	0.51	100.00	0.025	0.028	12.01	11.71	5.90	6.40
Maximum	April/May	3.50	1.00	100.00	0.027	0.028	12.63	12.91	8.50	8.90
Average	April/May	3.50	0.76	100.00	0.026	0.028	12.32	12.31	7.20	7.65
2011	July	3.80	5.80	70.00	0.038		7.37	7.70	24.40	25.20
2012	July	3.50	5.90	70.00	0.036		6.56	6.91	24.30	24.80
2013	July	3.10	1.60	150.00	0.026		6.35	6.41	24.00	24.20
Minimum	July	3.10	1.60	70.00	0.026	0.000	6.35	6.41	24.00	24.20
Maximum	July	3.80	5.90	150.00	0.038	0.000	7.37	7.70	24.40	25.20
Average	July	3.47	4.43	96.67	0.033	#DIV/0!	6.76	7.01	24.23	24.73
2011	August	2.90	11.00	120.00	0.033		8.13	8.43	22.20	22.90
2012	August	2.70	12.00	70.00	0.037		7.61	8.08	22.70	22.90
2013	August	3.30	6.00	130.00	0.066		7.45	7.69	19.50	19.70
Minimum	August	2.70	6.00	70.00	0.033	0.000	7.45	7.69	19.50	19.70
Maximum	August	3.30	12.00	130.00	0.066	0.000	8.13	8.43	22.70	22.90
Average	August	2.97	9.67	106.67	0.045	#DIV/0!	7.73	8.07	21.47	21.83

No Sample or Discontinued

Upper Impoundment

Sampling Location

Map



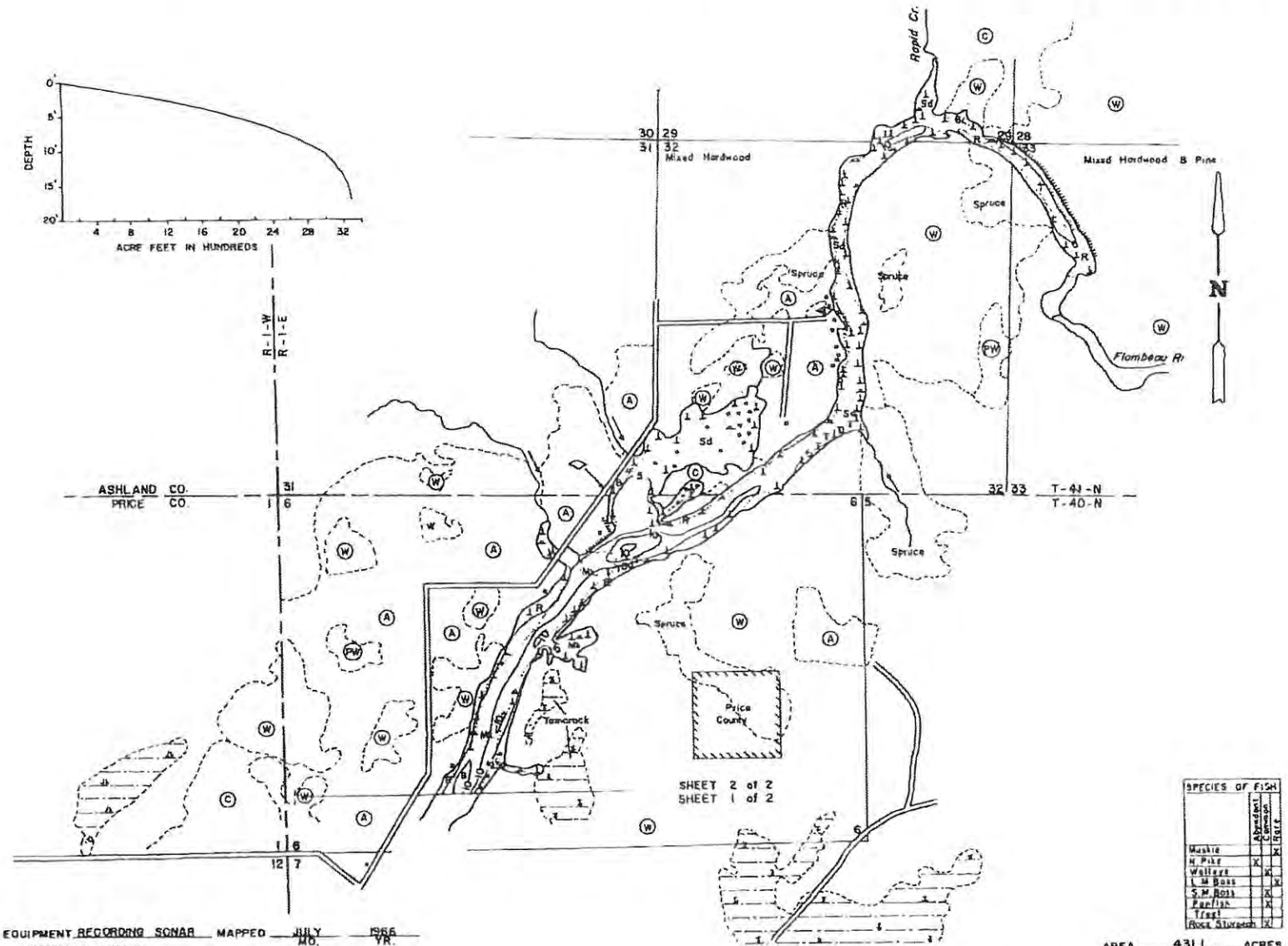
WISCONSIN CONSERVATION DEPARTMENT

LAKE SURVEY MAP

UPPER PARK FALLS LAKE — PRICE & ASHLAND COUNTY

SEC. 6,7,12,13,31,32 T. 40,41 N. R. 1 E. 1 W. E.W.

(Sheet 2 of 2)



EQUIPMENT RECORDING SONAR MAPPED JULY 1966 (MO. / YR.)

WATER ELEV. 1482

TOPOGRAPHIC SYMBOLS

- Brush
- Partially wooded
- Wooded
- Cleared
- Pastured
- Agricultural
- B.M. Bench Mark
- Dwelling
- Resort
- Steep slope
- Indefinite shoreline
- Marsh
- Spring
- Intermittent stream
- Permanent inlet
- Permanent outlet
- Dam

LAKE BOTTOM SYMBOLS

- P. Peat
- Mk. Muck
- C. Clay
- M. Marl
- Sd. Sand
- St. Stil
- Gr. Gravel
- Stumps & Snags
- R. Rubble
- Br. Bedrock
- Submergent vegetation
- Emergent vegetation
- Floating vegetation

1000' 0' 1000' 2000' 3000' 4000' 5000'

SCALE

◇ Access ◈ Access with Parking ◈ Boat Livery

Field work by C.Rusch, G.Winter, J. Sather Drawn By C. Holt

SPECIES OF FISH	Abundant	Common	Rare
Muskie			X
N. Pike	X		
Walleye		X	
L.M. Bass			X
S.M. Bass		X	
Panfish		X	
Trout			
Rock Sturgeon			X

AREA 431.1 ACRES

UNDER 3FT. 24.4 %

OVER 20FT. 0 %

VOLUME 3278.8 ACRE FT.

TOTAL ALK. 34 P.P.M.

SHORELINE 15.4 MILES

MAX. DEPTH 17 FEET

Appendix A

Ice-Out 2013 Sampling Documents
No Sampling Done

Appendix B

July 9, 2013 Sampling Documents

IMPOUNDMENT SAMPLING LOG

2013 Water Quality Study - Flambeau Upper Hydroelectric Project - FERC #2640

HW - 1486.559
TWL - 1487.2

Date: 7-9-13

Pre-Sampling Data:

Time: 7 30 Barometer: 29.9 Air Temp: 22 °C Wind Speed 5- 6mph

Sky Conditions: Cloudy

Precipitation within Last 24 Hours: RD

D.O. Meter Calibration: Instrument Model Used: Hach HQ40d

Were The Batterys Changed? ☐ Yes ☒ No If Yes, When Changed: _____

Battery Status: 75% Charge

Calibration Time: MARCH 1, 2013 Method: Factory

Sampling Depth Profile: Measured Depth to Bottom of the Impoundment: 19' Feet

Secchi Disk Depth: (E0.1 Foot) 3.1 Feet Time: 7:38

Chlorophyll a (3 Feet Below Surface)

Lab Sample I.D.#: 07092031A

Time	Quantity (ml)	Filtered
7 32	1000	N/O

True Color (3 Feet Below Surface)

Lab Sample I.D.#: 07092013B

Time	Quantity (ml)
7:32	250

D.O. Sample Data

Depth	Time	D.O. (mg/l)	°C
.5 Ft Below Surface	7:40	6.41	24.0
3 Feet	7:41	6.41	24.1
6 Feet	7:42	6.40	24.1
9 Feet	7:45	6.38	24.1
12 Feet	7:47	6.37	24.2
15 Feet	7:48	6.37	24.2
18 Feet	7:50	6.35	24.2
21 Feet			
24 Feet			
.5 Ft Above Bottom	7:50	6.35	24.2

Phosphorus

Lab Sample I.D.#: 07092013C
(3 Feet Below Surface)

Time	Preserved?
7 34	H2SO4

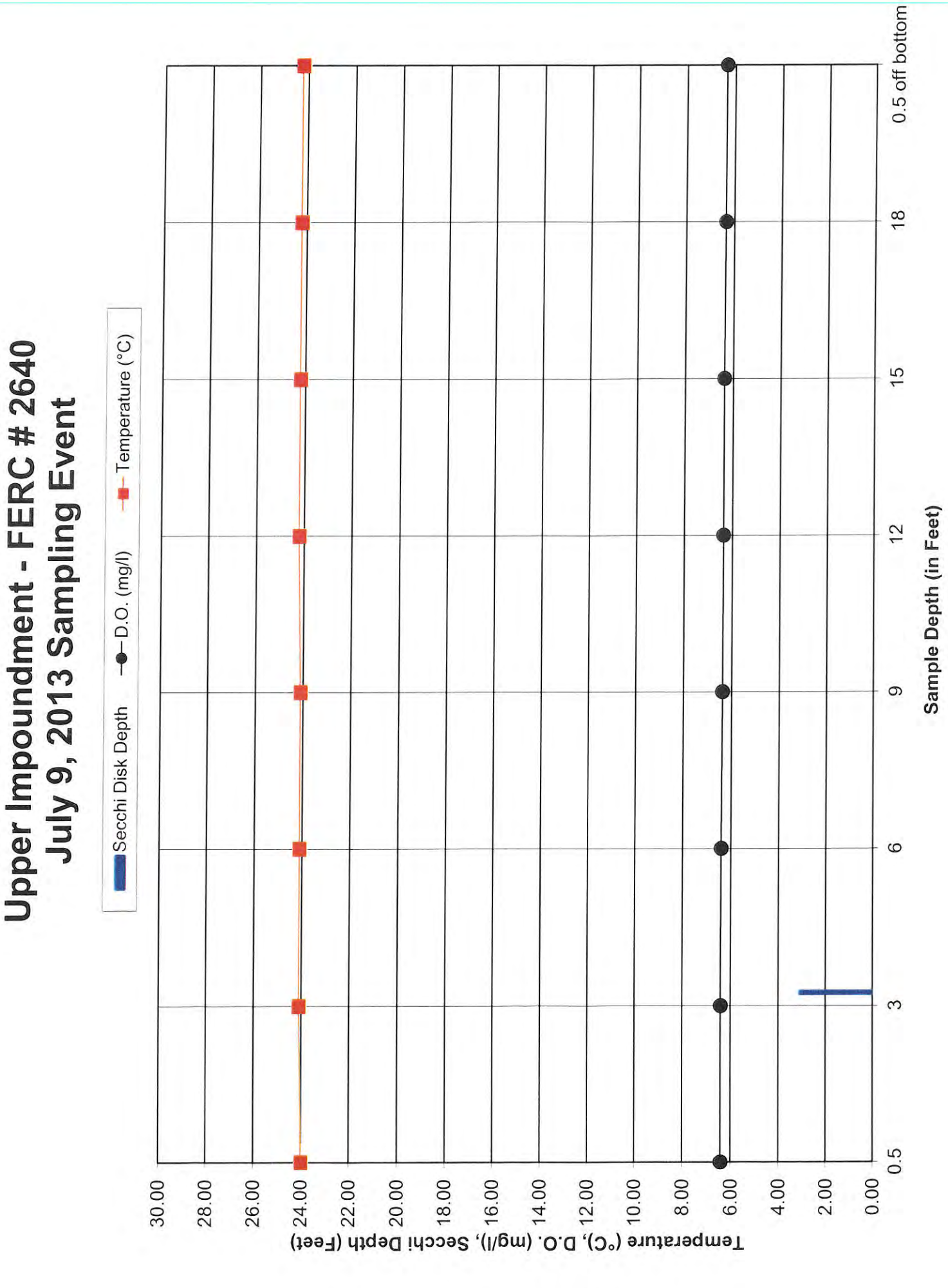
Lab Sample I.D.#: 07092013D
(3 Feet Above Bottom)

Time	Preserved?
7 35	H2SO4

Sample Location: N45° 56.609' W90° 26.299'

Comments:

Performed By: ANETA R + GARY R



NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

RECEIVED
JUL 16 2013

NLS Project: 200316
NLS Customer: 102823
Phone: 855 994 9376

Client: Renewable World Energies
Attn: Gary Rast
100 State Street
P.O. Box 264
Neshkoro, WI 54960

Project: Flambeau (4)

07092013 1A NLS ID: 729864
COC: 153593:1 Matrix: SW
Collected: 07/09/13 07:34 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					07/12/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					07/10/13	NA	721026460

07092013 1B NLS ID: 729865
COC: 153593:1 Matrix: SW
Collected: 07/09/13 07:34 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	150	C.P.U.	10	50*		07/10/13	SM 2120-B 20ed	721026460

07092013 1C NLS ID: 729866
COC: 153593:1 Matrix: SW
Collected: 07/09/13 07:34 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.026	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 2A NLS ID: 729867
COC: 153593:2 Matrix: SW
Collected: 07/09/13 09:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					07/12/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					07/10/13	NA	721026460

07092013 2B NLS ID: 729868
COC: 153593:2 Matrix: SW
Collected: 07/09/13 09:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	150	C.P.U.	5	25*		07/10/13	SM 2120-B 20ed	721026460

07092013 2C NLS ID: 729869
COC: 153593:2 Matrix: SW
Collected: 07/09/13 09:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.041	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 2D NLS ID: 729870
COC: 153593:2 Matrix: SW
Collected: 07/09/13 09:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.041	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 3A NLS ID: 729871
COC: 153593:3 Matrix: SW
Collected: 07/09/13 11:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					07/12/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					07/10/13	NA	721026460

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

Client: Renewable World Energies
Attn: Gary Rast
100 State Street
P.O. Box 264
Neshkoro, WI 54960

NLS Project: 200316
NLS Customer: 102823
Phone: 855 994 9376

Project: Flambeau (4)

07092013 3B NLS ID: 729872
COC: 153593:3 Matrix: SW
Collected: 07/09/13 11:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	150	C.P.U.	5	25*		07/10/13	SM 2120-B 20ed	721026460

07092013 3C NLS ID: 729873
COC: 153593:3 Matrix: SW
Collected: 07/09/13 11:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.044	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 3D NLS ID: 729874
COC: 153593:3 Matrix: SW
Collected: 07/09/13 11:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.043	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 4A NLS ID: 729875
COC: 153593:4 Matrix: SW
Collected: 07/09/13 13:09 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					07/12/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					07/10/13	NA	721026460

07092013 4B NLS ID: 729876
COC: 153593:4 Matrix: SW
Collected: 07/09/13 13:09 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	150	C.P.U.	5	25*		07/10/13	SM 2120-B 20ed	721026460

07092013 4C NLS ID: 729877
COC: 153593:4 Matrix: SW
Collected: 07/09/13 13:09 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.046	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 4D NLS ID: 729878
COC: 153593:4 Matrix: SW
Collected: 07/09/13 13:09 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.045	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation" LOD and/or LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
MCL = Maximum Contaminant Levels for Drinking Water Samples. Shaded results indicate >MCL.

Reviewed by

Authorized by
R T Krueger
President

Northern Lake Service, Inc.
Chlorophyll Results

Customer: Renewable World Energies
Project: 200316
Flambeau (4)

Sample	Description	CC a	Pheo a	TC a	TC b	TC c
729864	07092013 1A	1.2	0.6	1.6	0.0*	0.1
729867	07092013 2A	2.7	0.61	3.2	0.0*	0.35
729871	07092013 3A	5.1	1.4	6.2	0.0*	0.53
729875	07092013 4A	4.7	1.1	5.5	0.049	0.47

CC a = Corrected Chlorophyll a
Pheo a = Pheophytin a
TC a = Trichromatic Chlorophyll a
TC b = Trichromatic Chlorophyll b
TC c = Trichromatic Chlorophyll c
Units = ug/L for Water, ug/cm² for periphyton samplers

*: The complex calculations used to differentiate the various chlorophyll species magnify error at low concentrations and sometimes produce negative values, which are reported as 0.0 on this report.

Appendix C

August 6, 2013 Sampling Documents

IMPOUNDMENT SAMPLING LOG

2013 Water Quality Study - Flambeau Upper Hydroelectric Project - FERC #2640

Pre-Sampling Data: HWL - 1486.73 TWL - 1467.2 Date: 8/6/13 CFS - 725

Time: 7:15 Barometer: 29.81 Air Temp: 17 °C Wind Speed SW 6 MPH

Sky Conditions: FOG, MIST, & CLOUDY

Precipitation within Last 24 Hours: YES

D.O. Meter Calibration: Instrument Model Used: Hach HQ40d

Were The Batterys Changed? ☐ Yes ☒ No If Yes, When Changed: _____

Battery Status: 100% Charge

Calibration Time: APRIL 2013 Method: Factory

Sampling Depth Profile: Measured Depth to Bottom of the Impoundment: 19.3 Feet

Secchi Disk Depth: (E0.1 Foot) 3.3 Feet Time: 7:20

Chlorophyll a (3 Feet Below Surface)

Lab Sample I.D.# : 08062013-1A

Time	Quantity (ml)	Filtered
7:21	1000	NO

True Color (3 Feet Below Surface)

Lab Sample I.D.# : 08062013-1B

Time	Quantity (ml)
7:24	250

D.O. Sample Data

Depth	Time	D.O. (mg/l)	°C
.5 Ft Below Surface	7:30	7.69	19.5
3 Feet	7:31	7.61	19.6
6 Feet	7:32	7.56	19.6
9 Feet	7:33	7.53	19.6
12 Feet	7:34	7.50	19.6
15 Feet	7:35	7.48	19.6
18 Feet	7:36	7.45	19.7
21 Feet			
24 Feet			
5 Ft Above Bottom	7:37	7.45	19.7

Phosphorus

Lab Sample I.D.# : 08062013-1C

(3 Feet Below Surface)

Time	Preserved?
7:25	H2SO4

Lab Sample I.D.# :

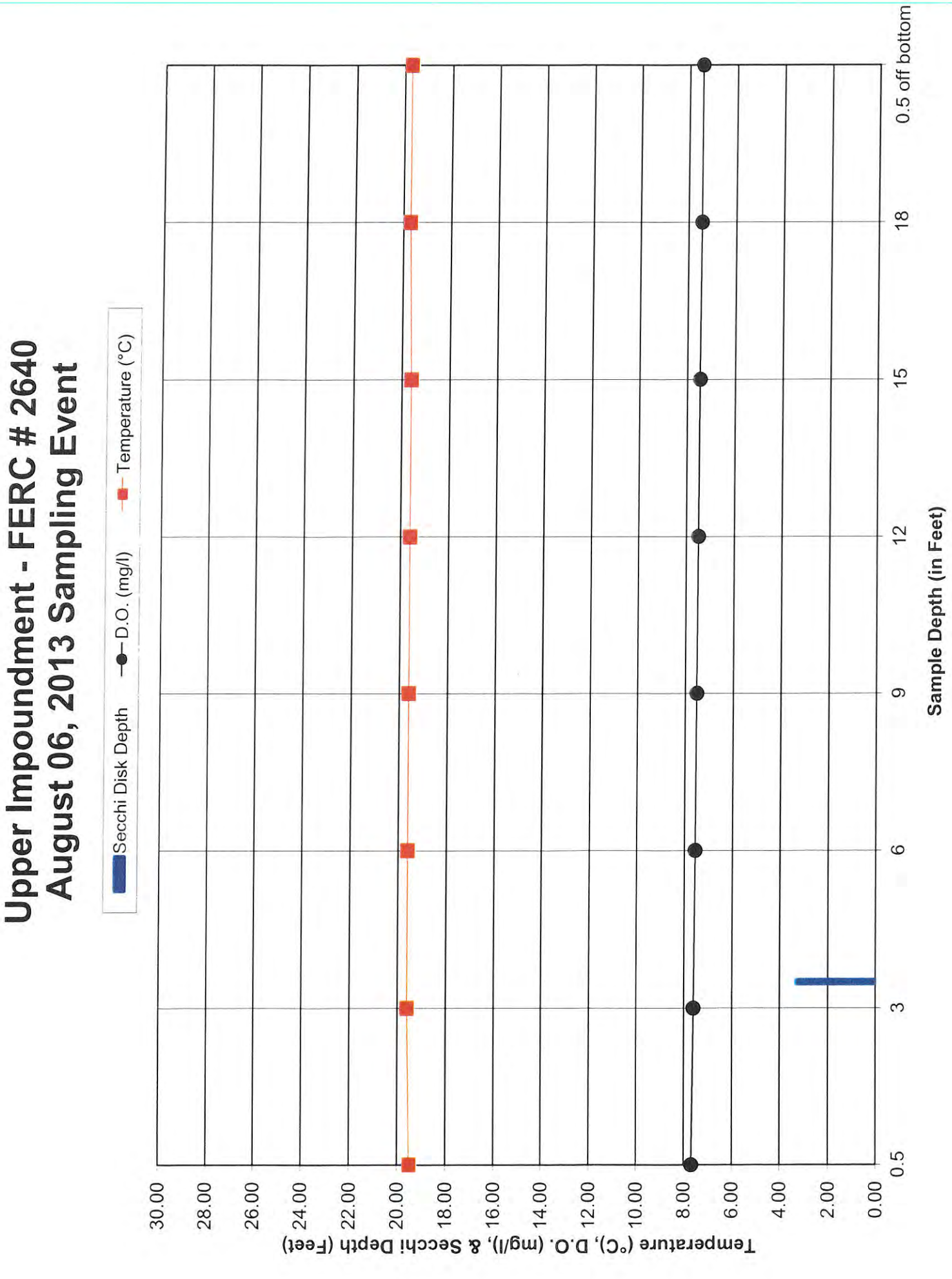
(3 Feet Above Bottom)

Time	Preserved?

Sample Location: N45° 56.609' W90° 26.299'

Comments:

Performed By: GARY RAST & JIM TESCH


Upper Impoundment - FERC # 2640
August 06, 2013 Sampling Event
Secchi Disk Depth
D.O. (mg/l)
Temperature (°C)
Temperature (°C), D.O. (mg/l), & Secchi Depth (Feet)
30.00
28.00
26.00
24.00
22.00
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
0.5
3
6
9
12
15
18
0.5 off bottom
Sample Depth (in Feet)

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

RECEIVED
AUG 19 2013

Client: Renewable World Energies
Attn: Gary Rast
100 State Street
P.O. Box 264
Neshkoro, WI 54960

NLS Project: 202117
NLS Customer: 102823
Phone: 855 994 9376

Project: Flambeau (4)

08062013-1A NLS ID: 735574
COC: 162646:1 Matrix: SW
Collected: 08/06/13 07:25 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					08/13/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					08/07/13	NA	721026460

08062013-1B NLS ID: 735575
COC: 162646:1 Matrix: SW
Collected: 08/06/13 07:25 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	130	C.P.U.	5	25*		08/07/13	SM 2120-B 20ed	721026460

08062013-1C NLS ID: 735576
COC: 162646:1 Matrix: SW
Collected: 08/06/13 07:25 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.066	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-2A NLS ID: 735577
COC: 162646:2 Matrix: SW
Collected: 08/06/13 09:12 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					08/13/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					08/07/13	NA	721026460

08062013-2B NLS ID: 735578
COC: 162646:2 Matrix: SW
Collected: 08/06/13 09:12 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	130	C.P.U.	5	25*		08/07/13	SM 2120-B 20ed	721026460

08062013-2C NLS ID: 735579
COC: 162646:2 Matrix: SW
Collected: 08/06/13 09:12 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.071	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-2D NLS ID: 735580
COC: 162646:2 Matrix: SW
Collected: 08/06/13 09:12 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.11	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-3A NLS ID: 735581
COC: 162646:3 Matrix: SW
Collected: 08/06/13 11:15 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					08/13/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					08/07/13	NA	721026460

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

NLS Project: 202117
NLS Customer: 102823
Phone: 855 994 9376

Client: Renewable World Energies
Attn: Gary Rast
100 State Street
P.O. Box 264
Neshkoro, WI 54960

Project: Flambeau (4)

08062013-3B NLS ID: 735582
COC: 162646:3 Matrix: SW
Collected: 08/06/13 11:15 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	150	C.P.U.	5	25*		08/07/13	SM 2120-B 20ed	721026460

08062013-3C NLS ID: 735583
COC: 162646:3 Matrix: SW
Collected: 08/06/13 11:15 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.11	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-3D NLS ID: 735584
COC: 162646:3 Matrix: SW
Collected: 08/06/13 11:15 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.071	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-4A NLS ID: 735585
COC: 162646:4 Matrix: SW
Collected: 08/06/13 13:13 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					08/13/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					08/07/13	NA	721026460

08062013-4B NLS ID: 735586
COC: 162646:4 Matrix: SW
Collected: 08/06/13 13:13 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	130	C.P.U.	5	25*		08/07/13	SM 2120-B 20ed	721026460

08062013-4C NLS ID: 735587
COC: 162646:4 Matrix: SW
Collected: 08/06/13 13:13 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.099	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-4D NLS ID: 735588
COC: 162646:4 Matrix: SW
Collected: 08/06/13 13:13 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.063	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and/or LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
MCL = Maximum Contaminant Levels for Drinking Water Samples. Shaded results indicate >MCL

Reviewed by:

Authorized by
R. T. Krueger
President

Northern Lake Service, Inc.
Chlorophyll Results

Customer: Renewable World Energies
Project: 202117
Flambeau (4)

Sample	Description	CC a	Pheo a	TC a	TC b	TC c
735574	08062013-1A	5.4	0.74	6	0.12	0.65
735577	08062013-2A	4.8	0.67	5.3	0.1	0.42
735581	08062013-3A	5.7	0.57	6.3	0.14	0.59
735585	08062013-4A	4	1.2	4.8	0.059	0.36

CC a = Corrected Chlorophyll a
Pheo a = Pheophytin a
TC a = Trichromatic Chlorophyll a
TC b = Trichromatic Chlorophyll b
TC c = Trichromatic Chlorophyll c
Units = ug/L for Water, ug/cm^2 for periphyton samplers

*: The complex calculations used to differentiate the various chlorophyll species magnify error at low concentrations and sometimes produce negative values, which are reported as 0.0 on this report.

Appendix D

Agency Correspondence

Renewable World Energies

COPY

November 6, 2013

Mr. Nick Utrup
U.S. Fish and Wildlife Service
WI MN Ecological Services Field Office
4101 American Boulevard East
Bloomington, MN 55425

Ms. Cheryl Laatsch
Statewide FERC Coordinator
Wisconsin Dept. of Natural Resources
N7725 HWY 28
Horicon, WI 53032

Re: **Flambeau Hydroelectric Projects**
FERC Project Numbers-Upper FERC # 2640, Lower FERC # 2421,
Pixley FERC # 2395, Crowley FERC # 2473
Flambeau Hydro LLC
Draft Reports 2013 Water Quality Monitoring Data

Dear Agencies:

On behalf of Flambeau Hydro LLC ("Flambeau"), Licensee, Renewable World Energies, LLC is submitting a copy of its *Draft Report 2013 Water Quality Monitoring Data* for each of the Flambeau Projects. No problems were encountered with equipment, data, or the monitoring schedule in general. The report is a requirement of Flambeau's Federal license pursuant to article 406 and 408 and the approved Water Quality Monitoring Plans. The purpose of this letter is to formally invite you to comment on the draft reports. The Federal Energy Regulatory Commission's regulations allow for a 30 day formal review and comment period. Nothing out of the ordinary was experienced during the 2013 monitoring season except as noted in the reports. Thank you in advance for providing your responses in a timely manner so we can include your comments and recommendations, as appropriate, into our reports.

If you have any questions concerning the report, please contact Mr. Gary Rast at the Renewable World Energies, LLC offices @ 855-994-9376 ext. 105, or by email at: grast@rwehydro.com

Corporate Office
P.O. Box 264
100 S. State Street
Neshkoro, WI 54960
Fax: 920-293-4100

Phone: 855-99HYDRO
(855-994-9376)
www.renewableworldenergies.com

Administrative Office
1001 Stephenson Street
Norway, MI 49870
Fax: 906-563-9344

Renewable World Energies

Sincerely,
Renewable World Energies, LLC
Agent For Licensee

Mr. Jason Kreutscher
Vice President, Operations

Attachments: Draft Report 2013 Water Quality Monitoring Data Flambeau Upper Hydroelectric Project – November 1, 2013

Draft Report 2013 Water Quality Monitoring Data Flambeau Lower Hydroelectric Project – November 4, 2013

Draft Report 2013 Water Quality Monitoring Data Flambeau Pixley Hydroelectric Project – November 5, 2013

Draft Report 2013 Water Quality Monitoring Data Flambeau Crowley Hydroelectric Project – November 6, 2013

Cc: RWE, Corporate

Gary Rast

From: Gary Rast
Sent: Wednesday, May 22, 2013 4:02 PM
To: Laatsch, Cheryl - DNR (Cheryl.Laatsch@Wisconsin.gov); Aartila, Tom P - DNR (Tom.Aartila@Wisconsin.gov); Nick Utrup (nick_utrup@fws.gov); Jeffrey.Scheirer@Wisconsin.gov
Cc: 'Jason Kreuscher'; Shawn Wille; Aneta Rietveld
Subject: Flambeau Upper Lower Pixley Crowley Ice Out WQ Sampling

Everyone,

About 1to 1.5 weeks ago I notified you that because of water conditions and no boat barriers being installed at the Flambeau projects the Ice-Out WQ monitoring would or could not be performed during the 2 week time period following Ice-Out. On Monday 5/20 I was notified that the barriers were installed and river conditions were approaching more normal conditions. Because weather looked favorable for Thursday 5/23 I made plans for that day. I was not aware that the area had received so much rain in the past couple of days and that runoff from surrounding areas were contributing so much. River conditions today 5/22 are horrible to say the least, about 1000 CFS more than when you were originally notified. I believe they are slightly one side or the other of 4000 CFS. I have been informed that another 500 CFS is to be released from the flowage later today, so conditions will worsen. I spoke to Jeff less than an hour ago and discussed doing some sort of modified monitoring while I am here. We agreed that was not a good thing because comparison to other years Ice-Out results would be very hard to make and the effort would not be worth much. Jeff and I agreed to skip the Ice-Out sampling all together because the effort would not yield good results and the safety concerns involving the monitoring. RWE asks for your understanding and agreement. Thanks

Gary

Gary Rast
Regulatory/Compliance Manager

Renewable World Energies

Renewable World Energies, LLC
100 S. State Street
P.O. Box 264
Neshkoro, WI 54960
Phone: 855-994-9376 Ext. 105
Fax: 920-293-4100
Cell: 920-570-0995
E-mail: grast@rwehydro.com

Gary Rast

From: Gary Rast
Sent: Monday, May 13, 2013 10:13 AM
To: Laatsch, Cheryl - DNR (Cheryl.Laatsch@Wisconsin.gov); Nick Utrup (nick_utrup@fws.gov)
Cc: 'Jason Kreuscher'; Shawn Wille
Subject: Flambeau Ice Out Water Quality Sampling
Attachments: Flam Upper.JPG; Flam Lower.JPG; Flam Pixley.JPG; Flam Crowley.JPG

Cheryl and Nick,

Was up in North West Wisconsin and did Ice Out sampling at Winter, Clam River, and Danbury hydro projects. Water was high but boat buoys were in and was able to accomplish the sampling event. However, attached are photos from the 4 Flambeau projects from mid – week (5-5 thru 5-11) showing conditions. I was not able to sample because of high water conditions. The fact that the boat buoys are not in place yet because of those conditions made it even more dangerous. Technically this week is the 2nd week after Ice-Out which is the time frame allotted by the WQ Monitoring Plans. Just want to inform you that this sampling event will not happen this week because conditions have not improved and will be done outside of the approved time frame following Ice-Out. When conditions improve and boat buoys are installed RWE will perform the Ice-Out sampling at these projects.

Thanks for your understanding.

Gary

Gary Rast
Regulatory/Compliance Manager

Renewable World Energies

Renewable World Energies, LLC
100 S. State Street
P.O. Box 264
Neshkoro, WI 54960
Phone: 855-994-9376 Ext. 105
Fax: 920-293-4100
Cell: 920-570-0995
E-mail: grast@rwehydro.com

Final Report

2013 Water Quality Monitoring Data

For the

Flambeau (Lower) Hydroelectric Project
FERC Project #2421
Flambeau Hydro, LLC

North Fork of the Flambeau River, Price County, Wisconsin

Respectfully Submitted by:

Renewable World Energies, LLC
100 State Street – P.O. Box 264
Neshkoro, Wisconsin 54960

Final – December 16, 2013

Table of Contents

Summary

2013 marked the tenth year of water quality sampling under the FERC approved "Water Quality Monitoring Plan Per License Article 406 for the Flambeau (Lower) Hydroelectric Project – FERC Project # 2421 – Flambeau Hydro, LLC.

Ice-Out occurred between Agenda and Nine Mile Landing on the North Fork of the Flambeau River during the week beginning April 28, 2013. **The Ice-Out sampling event did not occur.** The Licensee traveled to the region during the 1st and 3rd weeks of May, but could not accomplish the sampling because of high river flows, 4232 CFS & 5071 CFS respectively. Consultation with the WDNR was done by phone on May 22, 2013 as well as an e-mail being sent to the agencies describing the agreement to skip the Ice-Out sampling event this year. The decision was due to dangerous river conditions and the fact that the sampling would have to be done too far outside the Ice-Out time frame to be of value.

River flow, based on Flambeau (Lower) Hydroelectric Project records, was approximately 782 cubic feet per second during the July 9, 2013 sampling event. Sampling occurred between 9:00 am. and 9:20 a.m. Samples were taken without incident. No unusual D.O. or Temperature readings were observed. Samples for laboratory analysis were delivered to Northern Lake Service, Inc in Crandon, WI on July 10, 2013. Northern Lake Service, Inc issued a laboratory report on July 15, 2013. No unusual levels of Chlorophyll a, True Color, or Total Phosphorus were noted in the laboratory reports.

River flow, based on Flambeau (Lower) Hydroelectric Project records, was approximately 687 cubic feet per second during the August 6, 2013 sampling event. Sampling occurred between 9:00 a.m. and 9:23 a.m. Samples were taken without incident. No unusual D.O. or Temperature readings were observed. Samples for laboratory analysis were delivered to Northern Lake Service, Inc in Crandon, WI on August 7, 2013. Northern Lake Service, Inc issued a laboratory report on August 14, 2013. No unusual levels of Chlorophyll a, True Color, or Total Phosphorus were noted in the laboratory reports.

In general, the weather (temperature and rainfall) during the 2013 monitoring season appeared cooler in April/May with higher than normal precipitation in the months of April/May/June. Temperatures in June/July/August were about 1to5 degrees higher than normal but precipitation was about 50% below normal for July/August. **(Refer to 2013 Monthly Temperature and Precipitation Table page 7)**

A summary of a comparison between the 2011 thru 2013 **(Refer to 2013 Flambeau Lower Project Sampling Comparison Table 2011-2013 page 8)** sampling results are as follows:

1. Water Clarity – No sampling in May – Decreased in July and Increased in August
2. Chlorophyll a – No sampling in May – Decreased
3. Color – No sampling in May – Increased
4. Total Phosphorus – No sampling in May – Increased
5. Overall, D.O. – No sampling in May – Increased
6. Water Temperatures – No sampling in May – Remained same in July and Decreased in August

Correspondence from the agencies during 2010 indicated they would prefer that notifications of incidents be by e-mail only and that telephone contacts are not needed. All other correspondence can be found on page 13, **Appendix D**. The next scheduled Water Quality Monitoring at the Lower Hydroelectric Project is set to take place in 2014 beginning with the Ice-Out sampling event.

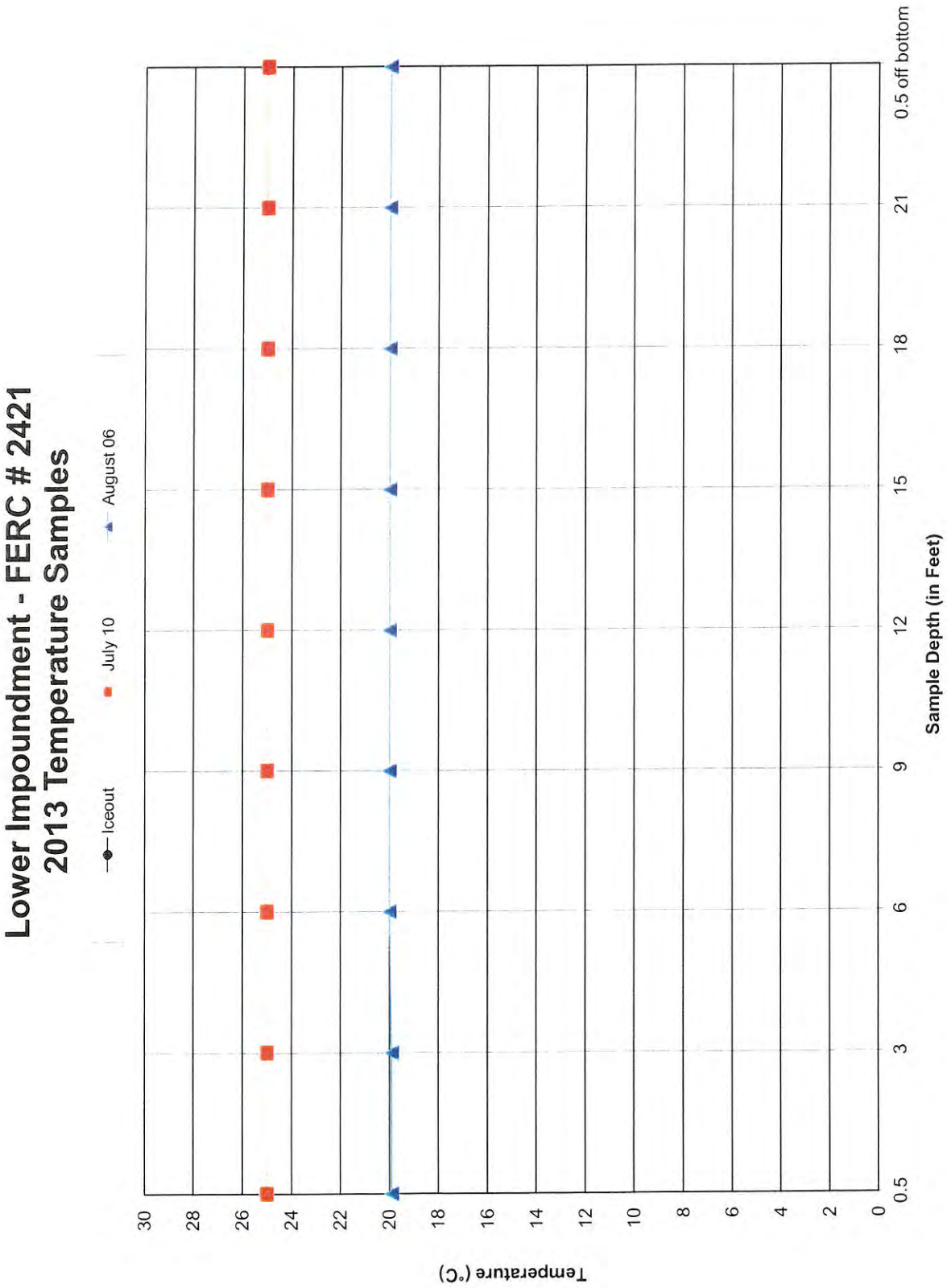
2013
Sampling Results
Table

Flambeau (Lower) Hydroelectric Project - FERC Project # 2421
2013 Water Quality Sampling Data

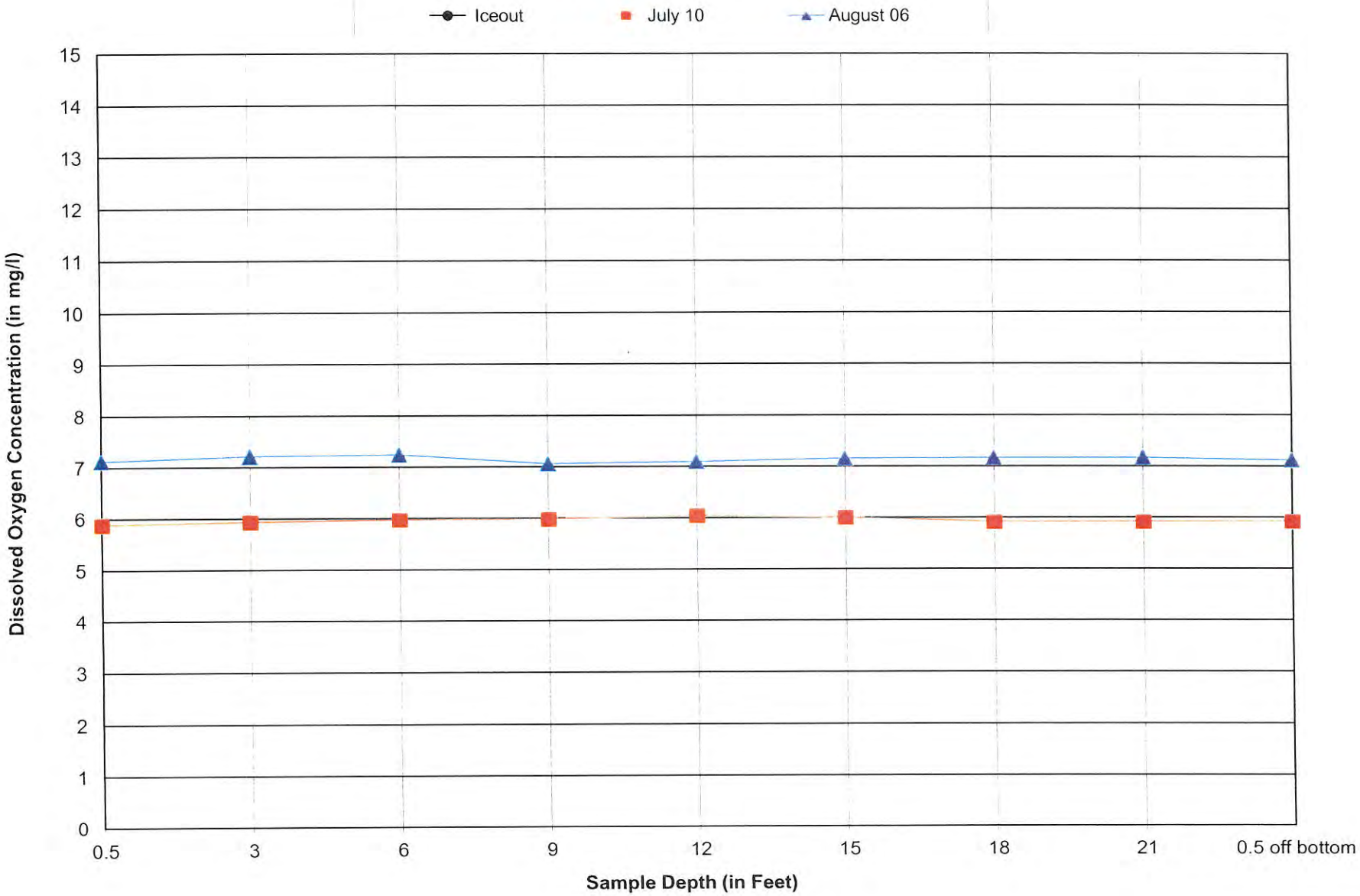
	Iceout 2013			July 9, 2013			August 6, 2013		
Project Flow (c.f.s.)	N/A			782			687		
Dissolved Oxygen	**Time**	**D.O. (mg/L)**	**Water Temp. (°C)**	**Time**	**D.O. (mg/L)**	**Water Temp. (°C)**	**Time**	**D.O. (mg/L)**	**Water Temp. (°C)**
0.5 feet below surface	N/A	N/A	N/A	9:11 AM	5.88	25.00	9:15 AM	7.12	19.90
3 feet below surface	N/A	N/A	N/A	9:12 AM	5.93	25.00	9:16 AM	7.21	19.00
6 feet below surface	N/A	N/A	N/A	9:13 AM	5.97	25.00	9:17 AM	7.24	19.90
9 feet below surface	N/A	N/A	N/A	9:14 AM	5.98	25.00	9:18 AM	7.06	20.00
12 feet below surface	N/A	N/A	N/A	9:16 AM	6.04	25.00	9:19 AM	7.10	20.00
15 feet below surface	N/A	N/A	N/A	9:17 AM	6.00	25.00	9:20 AM	7.16	20.00
18 feet below surface	N/A	N/A	N/A	9:18 AM	5.91	25.00	9:21 AM	7.17	20.00
21 feet below surface	N/A	N/A	N/A	9:19 AM	5.91	25.00	9:22 AM	7.17	20.00
0.5 feet above bottom	N/A	N/A	N/A	9:20 AM	5.91	25.00	9:23 AM	7.12	20.00
Secchi Disk	**Time**	**Depth (ft)**		**Time**	**Depth (ft)**		**Time**	**Depth (ft)**	
3 feet below surface	N/A	N/A		9:10 AM	3.50		9:05 AM	3.20	
Chlorophyll a	**Time**	**ug/L**		**Time**	**ug/L**		**Time**	**ug/L**	
3 feet below surface	N/A	N/A		9:01 AM	3.20		9:07 AM	5.30	
Color (True)	**Time**	**C.P.U. Units**	**LOD**	**Time**	**C.P.U Units**	**LOD**	**Time**	**C.P.U. Units**	**LOD**
3 feet below surface	N/A	N/A	N/A	9:03 AM	150.0	25*	9:09 AM	130.0	25*
Total Phosphorus	**Time**	**mg/L**	**LOD**	**Time**	**mg/L**	**LOD**	**Time**	**mg/L**	**LOD**
3 feet below surface	N/A	N/A	N/A	9:04 AM	0.041	0.0070*	9:10 AM	0.071	0.0070*
3 feet above bottom	N/A	N/A	N/A	9:06 AM	0.041	0.0070*	9:12 AM	0.110	0.0070*

* Considered Reporting Limits

2013
Temperature
And
Dissolved Oxygen
Graphs



Lower Impoundment - FERC # 2421
2013 Dissolved Oxygen Samples



2013
Monthly Temperature
And
Precipitation
Table

2013 Water Year Monthly Temperature and Precipitation for Park Falls, 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-12	74	22	42.5	-0.7	691	678	1.34	1.1	2.85	47%
November-12	53	0	30.9	2.1	1015	1088	1.33	10.1	2.09	64%
December-12	48	-7	18.4	3.6	1438	1556	1.44	13.2	1.21	119%
January-13	42	-21	12.1	1.9	1631	1691	1.39	9.2	0.96	145%
February-13	38	-22	14.6	-0.5	1405	1399	1.16	19.1	0.81	70%
March-13	53	-13	21.8	-4.1	1333	1200	2.04	25.8	1.49	137%
April-13	68	8	34.4	-5.2	908	762	5.04	50.8	2.43	207%
May-13	80	27	49.5	-1.9	471	426	3.71	Trace	3.23	115%
June-13	87	37	61.6	1.5	146	179	4.54	0.0	4.23	107%
July-13	94	47	67.8	2.0	47	63	1.73	0.0	3.85	45%
August-13	94	43	69.0	4.7	27	86	1.98	0.0	3.70	54%
September-13	88	37	59.9	4.3	168	298	1.26	0.0	4.11	31%

Source: NOAA/Duluth, MN

2013
Flambeau Lower
Sampling Comparison Table
2011—2013

Flambeau Lower
Project Sampling Comparison Table
2011 Thru Current Year

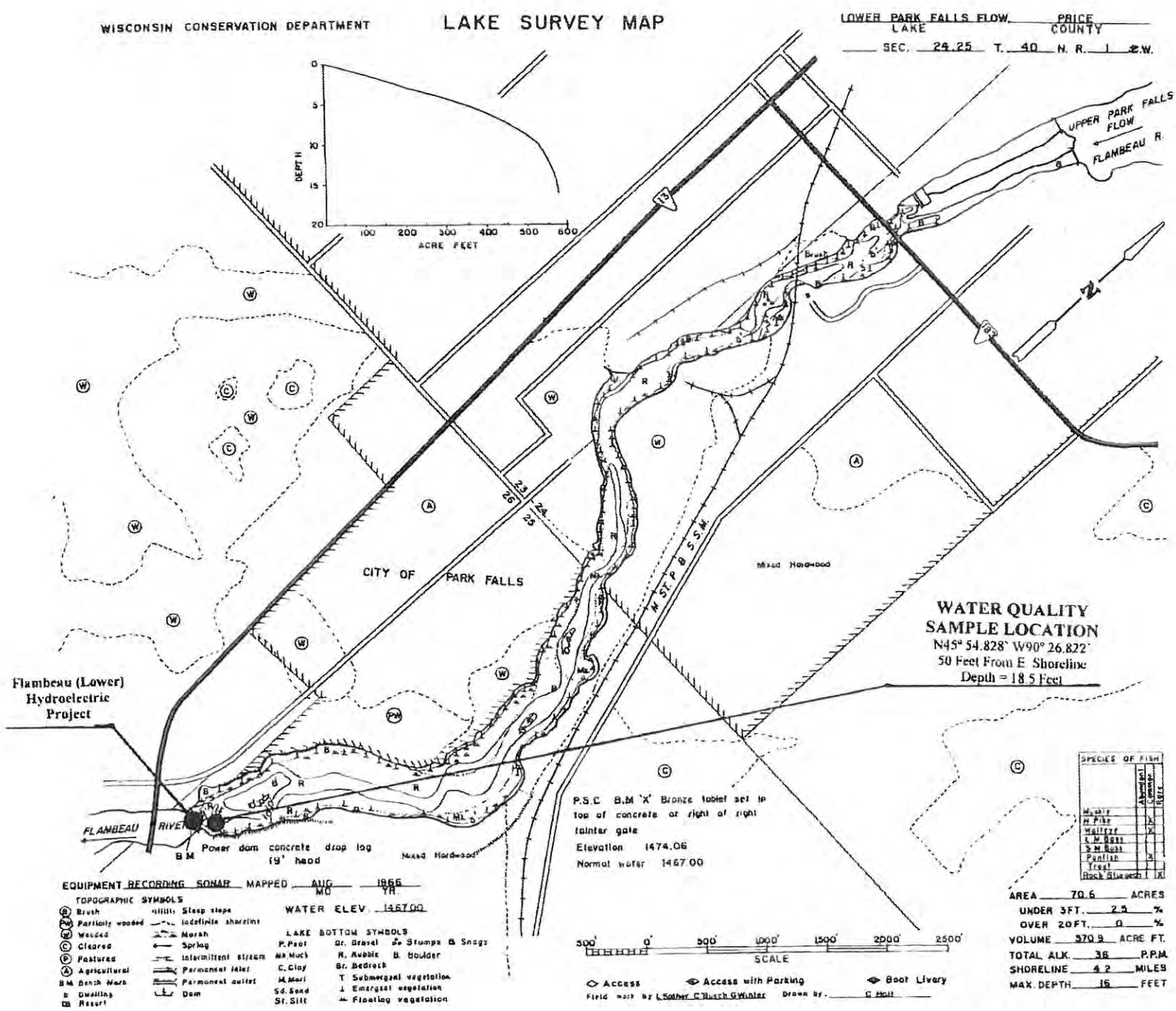
Year	Month	Secchi Depth (m)	Chlorophyll a ug/l	Color (True) C.P.U. Units	Total Phosphorus Below Surface mg/l	Total Phosphorus Above Bottom mg/l	Low D.O. mg/l	High D.O. mg/l	Low Water Temp. °C	High Water Temp. °C
2011	April	2.70	0.77	80.00	0.028	0.031	11.64	12.48	5.90	8.00
2012	April	2.60	2.10	120.00	0.038	0.055	10.94	11.35	8.80	9.00
2013	May									
Minimum	April/May	2.60	0.77	80.00	0.028	0.031	10.94	11.35	5.90	8.00
Maximum	April/May	2.70	2.10	120.00	0.038	0.055	11.64	12.48	8.80	9.00
Average	April/May	2.65	1.44	100.00	0.033	0.043	11.29	11.92	7.35	8.50
2011	July	3.70	5.60	80.00	0.042	0.041	6.62	6.91	24.90	25.30
2012	July	4.70	4.00	80.00	0.038	0.041	5.52	6.15	25.30	25.90
2013	July	3.50	3.20	150.00	0.041	0.041	5.91	6.04	25.00	25.00
Minimum	July	3.50	3.20	80.00	0.038	0.041	5.52	6.04	24.90	25.00
Maximum	July	4.70	5.60	150.00	0.042	0.041	6.62	6.91	25.30	25.90
Average	July	3.97	4.27	103.33	0.040	0.041	6.02	6.37	25.07	25.40
2011	August	3.25	13.00	120.00	0.048	0.047	7.74	7.14	23.20	24.30
2012	August	2.75	14.00	80.00	0.051	0.050	5.93	6.75	23.50	23.70
2013	August	3.20	5.30	130.00	0.071	0.110	7.06	7.24	19.90	20.00
Minimum	August	2.75	5.30	80.00	0.048	0.047	5.93	6.75	19.90	20.00
Maximum	August	3.25	14.00	130.00	0.071	0.110	7.74	7.24	23.50	24.30
Average	August	3.07	10.77	110.00	0.057	0.069	6.91	7.04	22.20	22.67

No Sample

Lower Impoundment

Sampling Location

Map



Appendix A

Ice-Out 2013 Sampling Documents
No Sampling Done

Appendix B

July 9, 2013 Sampling Documents

IMPOUNDMENT SAMPLING LOG

2013 Water Quality Study - Flambeau Lower Hydroelectric Project - FERC #2421

TWL 1448.2
TWL - 1447.182
CFS - 782

Date: 7-9-13

Pre-Sampling Data:

Time: 9:00 Barometer: 29.94 Air Temp: 22 °C Wind Speed 5-9 mph

Sky Conditions: cloudy

Precipitation within Last 24 Hours: no

D.O. Meter Calibration: Instrument Model Used: Hach HQ40d

Were The Batterys Changed? ☐ Yes ☒ No If Yes, When Changed: _____

Battery Status: 75 % Charge

Calibration Time: March 1, 2013 Method: Factory

Sampling Depth Profile: Measured Depth to Bottom of the Impoundment: 21.5 Feet

Secchi Disk Depth: (E0.1 Foot) 3.5 Feet Time: 9:10

Chlorophyll a (3 Feet Below Surface)

Lab Sample I.D.# : 07092013 2A

Time	Quantity (ml)	Filtered
9:01	1000 mL	no

True Color (3 Feet Below Surface)

Lab Sample I.D.# : 07092013 2C

Time	Quantity (ml)
9:03	250 ml

D.O. Sample Data

Depth	Time	D.O. (mg/l)	°C
.5 Ft Below Surface	9:11	5.88	25.0
3 Feet	9:12	5.93	25.0
6 Feet	9:13	5.94	25.0
9 Feet	9:14	5.98	25.0
12 Feet	9:16	6.04	25.0
15 Feet	9:17	6.00	25.0
18 Feet	9:18	5.91	25.0
21 Feet	9:19	5.91	25.0
24 Feet			
.5 Ft Above Bottom	9:20	5.91	25.0

Phosphorus

Lab Sample I.D.# : 07092013 2C

(3 Feet Below Surface)

Time	Preserved?
9:05	H_2SO_4

Lab Sample I.D.# : 07092013 2D

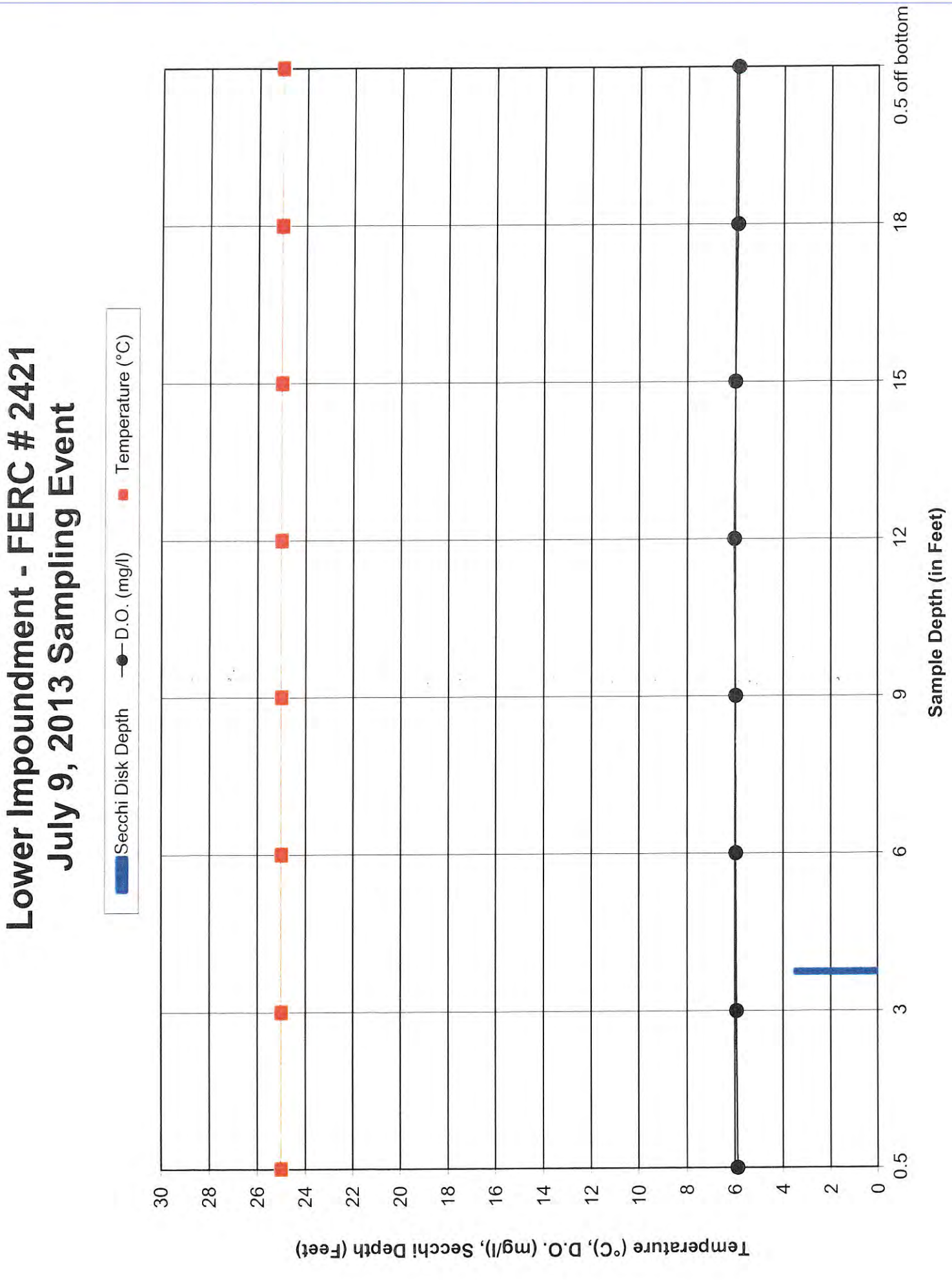
(3 Feet Above Bottom)

Time	Preserved?
9:06	H_2SO_4

Sample Location: N45° 54.828' W90° 26.822'

Comments:

Performed By: ANETAR + CHRIS



NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

RECEIVED
JUL 16 2013

NLS Project: 200316
NLS Customer: 102823
Phone: 855 994 9376

Client: Renewable World Energies
Attn: Gary Rast
100 State Street
P.O. Box 264
Neshkoro, WI 54960

Project: Flambeau (4)

07092013 1A NLS ID: 729864
COC: 153593:1 Matrix: SW
Collected: 07/09/13 07:34 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					07/12/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					07/10/13	NA	721026460

07092013 1B NLS ID: 729865
COC: 153593:1 Matrix: SW
Collected: 07/09/13 07:34 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	150	C.P.U.	10	50*		07/10/13	SM 2120-B 20ed	721026460

07092013 1C NLS ID: 729866
COC: 153593:1 Matrix: SW
Collected: 07/09/13 07:34 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.026	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 2A NLS ID: 729867
COC: 153593:2 Matrix: SW
Collected: 07/09/13 09:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					07/12/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					07/10/13	NA	721026460

07092013 2B NLS ID: 729868
COC: 153593:2 Matrix: SW
Collected: 07/09/13 09:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	150	C.P.U.	5	25*		07/10/13	SM 2120-B 20ed	721026460

07092013 2C NLS ID: 729869
COC: 153593:2 Matrix: SW
Collected: 07/09/13 09:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.041	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 2D NLS ID: 729870
COC: 153593:2 Matrix: SW
Collected: 07/09/13 09:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.041	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 3A NLS ID: 729871
COC: 153593:3 Matrix: SW
Collected: 07/09/13 11:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					07/12/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					07/10/13	NA	721026460

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

NLS Project: 200316
NLS Customer: 102823
Phone: 855 994 9376

Client: Renewable World Energies
Attn: Gary Rast
100 State Street
P.O. Box 264
Neshkoro, WI 54960

Project: Flambeau (4)

07092013 3B NLS ID: 729872
COC: 153593:3 Matrix: SW
Collected: 07/09/13 11:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	150	C.P.U.	5	25*		07/10/13	SM 2120-B 20ed	721026460

07092013 3C NLS ID: 729873
COC: 153593:3 Matrix: SW
Collected: 07/09/13 11:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.044	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 3D NLS ID: 729874
COC: 153593:3 Matrix: SW
Collected: 07/09/13 11:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.043	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 4A NLS ID: 729875
COC: 153593:4 Matrix: SW
Collected: 07/09/13 13:09 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					07/12/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					07/10/13	NA	721026460

07092013 4B NLS ID: 729876
COC: 153593:4 Matrix: SW
Collected: 07/09/13 13:09 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	150	C.P.U.	5	25*		07/10/13	SM 2120-B 20ed	721026460

07092013 4C NLS ID: 729877
COC: 153593:4 Matrix: SW
Collected: 07/09/13 13:09 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.046	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 4D NLS ID: 729878
COC: 153593:4 Matrix: SW
Collected: 07/09/13 13:09 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.045	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and/or LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
MCL = Maximum Contaminant Levels for Drinking Water Samples. Shaded results indicate >MCL.

Reviewed by

Authorized by
R. T. Krueger
President

Northern Lake Service, Inc.
Chlorophyll Results

Customer: Renewable World Energies
Project: 200316
Flambeau (4)

Sample	Description	CC a	Pheo a	TC a	TC b	TC c
729864	07092013 1A	1.2	0.6	1.6	0.0*	0.1
729867	07092013 2A	2.7	0.61	3.2	0.0*	0.35
729871	07092013 3A	5.1	1.4	6.2	0.0*	0.53
729875	07092013 4A	4.7	1.1	5.5	0.049	0.47

CC a = Corrected Chlorophyll a
Pheo a = Pheophytin a
TC a = Trichromatic Chlorophyll a
TC b = Trichromatic Chlorophyll b
TC c = Trichromatic Chlorophyll c
Units = ug/L for Water, ug/cm² for periphyton samplers

*: The complex calculations used to differentiate the various chlorophyll species magnify error at low concentrations and sometimes produce negative values, which are reported as 0.0 on this report.

Appendix C

August 6, 2013 Sampling Documents

IMPOUNDMENT SAMPLING LOG

2013 Water Quality Study - Flambeau Lower Hydroelectric Project - FERC #2421

Pre-Sampling Data: HWL - 1467.34 TWL - 1448.2 Date: 8/6/13 CFS - 687

Time: 9:00 Barometer: 29.82 Air Temp: 18 °C Wind Speed SW 6 MPH

Sky Conditions: OVERCAST + CLOUDY

Precipitation within Last 24 Hours: YES

D.O. Meter Calibration: Instrument Model Used: Hach HQ40d

Were The Batterys Changed? ☐ Yes ☒ No If Yes, When Changed: _____

Battery Status: 100% Charge

Calibration Time: APRIL 2013 Method: Factory

Sampling Depth Profile: Measured Depth to Bottom of the Impoundment: 21.5 Feet

Secchi Disk Depth: (E0.1 Foot) 3.2 Feet Time: 9:05

Chlorophyll a (3 Feet Below Surface)

Lab Sample I.D.# : 0806 2013 - 2A		
Time	Quantity (ml)	Filtered
9:07	1000	NO

True Color (3 Feet Below Surface)

Lab Sample I.D.# : 0806 2013-2B	
Time	Quantity (ml)
9:09	250

D.O. Sample Data

Depth	Time	D.O. (mg/l)	°C
.5 Ft Below Surface	9:15	7.12	19.9
3 Feet	9:16	7.21	19.9
6 Feet	9:17	7.24	20.0
9 Feet	9:18	7.30	20.0
12 Feet	9:19	7.10	20.0
15 Feet	9:20	7.16	20.0
18 Feet	9:21	7.17	20.0
21 Feet	9:22	7.17	20.0
24 Feet			
.5 Ft Above Bottom	9:23	7.2	20.0

Phosphorus

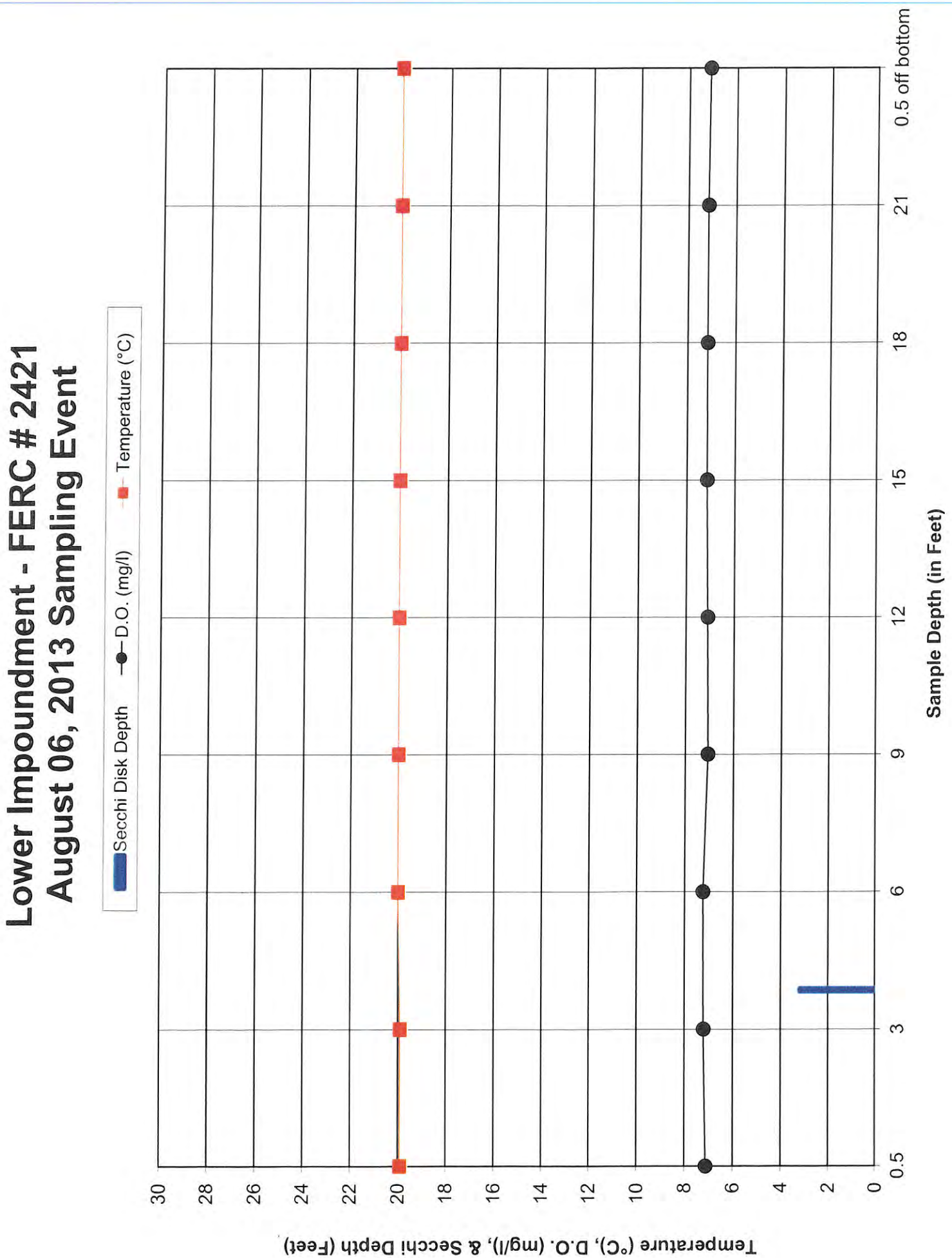
Lab Sample I.D.# : 0806 2013-2C	
(3 Feet Below Surface)	
Time	Preserved?
9:10	H_2SO_4

Lab Sample I.D.# : 0806 2013-2D	
(3 Feet Above Bottom)	
Time	Preserved?
9:12	H_2SO_4

Sample Location: N45° 54.828' W90° 26.822'

Comments: _____

Performed By: GARY RAST & JIM TESCH


Lower Impoundment - FERC # 2421
August 06, 2013 Sampling Event
Secchi Disk Depth
D.O. (mg/l)
Temperature (°C)
Temperature (°C), D.O. (mg/l), & Secchi Depth (Feet)
Sample Depth (in Feet)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
0.5
3
6
9
12
15
18
21
0.5 off bottom

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

RECEIVED
AUG 19 2013

NLS Project: 202117
NLS Customer: 102823
Phone: 855 994 9376

Client: Renewable World Energies
Attn: Gary Rast
100 State Street
P.O. Box 264
Neshkoro, WI 54960

Project: Flambeau (4)

08062013-1A NLS ID: 735574
COC: 162646:1 Matrix: SW
Collected: 08/06/13 07:25 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					08/13/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					08/07/13	NA	721026460

08062013-1B NLS ID: 735575
COC: 162646:1 Matrix: SW
Collected: 08/06/13 07:25 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	130	C.P.U.	5	25*		08/07/13	SM 2120-B 20ed	721026460

08062013-1C NLS ID: 735576
COC: 162646:1 Matrix: SW
Collected: 08/06/13 07:25 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.066	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-2A NLS ID: 735577
COC: 162646:2 Matrix: SW
Collected: 08/06/13 09:12 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					08/13/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					08/07/13	NA	721026460

08062013-2B NLS ID: 735578
COC: 162646:2 Matrix: SW
Collected: 08/06/13 09:12 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	130	C.P.U.	5	25*		08/07/13	SM 2120-B 20ed	721026460

08062013-2C NLS ID: 735579
COC: 162646:2 Matrix: SW
Collected: 08/06/13 09:12 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.071	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-2D NLS ID: 735580
COC: 162646:2 Matrix: SW
Collected: 08/06/13 09:12 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.11	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-3A NLS ID: 735581
COC: 162646:3 Matrix: SW
Collected: 08/06/13 11:15 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					08/13/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					08/07/13	NA	721026460

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

NLS Project: 202117
NLS Customer: 102823
Phone: 855 994 9376

Client: Renewable World Energies
Attn: Gary Rast
100 State Street
P.O. Box 264
Neshkoro, WI 54960

Project: Flambeau (4)

08062013-3B NLS ID: 735582
COC: 162646:3 Matrix: SW
Collected: 08/06/13 11:15 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	150	C.P.U.	5	25*		08/07/13	SM 2120-B 20ed	721026460

08062013-3C NLS ID: 735583
COC: 162646:3 Matrix: SW
Collected: 08/06/13 11:15 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.11	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-3D NLS ID: 735584
COC: 162646:3 Matrix: SW
Collected: 08/06/13 11:15 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.071	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-4A NLS ID: 735585
COC: 162646:4 Matrix: SW
Collected: 08/06/13 13:13 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					08/13/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					08/07/13	NA	721026460

08062013-4B NLS ID: 735586
COC: 162646:4 Matrix: SW
Collected: 08/06/13 13:13 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	130	C.P.U.	5	25*		08/07/13	SM 2120-B 20ed	721026460

08062013-4C NLS ID: 735587
COC: 162646:4 Matrix: SW
Collected: 08/06/13 13:13 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.099	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-4D NLS ID: 735588
COC: 162646:4 Matrix: SW
Collected: 08/06/13 13:13 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.063	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and/or LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
MCL = Maximum Contaminant Levels for Drinking Water Samples. Shaded results indicate >MCL

Reviewed by:

Authorized by
R. T. Krueger
President

Northern Lake Service, Inc.
Chlorophyll Results

Customer: Renewable World Energies
Project: 202117
Flambeau (4)

Sample	Description	CC a	Pheo a	TC a	TC b	TC c
735574	08062013-1A	5.4	0.74	6	0.12	0.65
735577	08062013-2A	4.8	0.67	5.3	0.1	0.42
735581	08062013-3A	5.7	0.57	6.3	0.14	0.59
735585	08062013-4A	4	1.2	4.8	0.059	0.36

CC a = Corrected Chlorophyll a
Pheo a = Pheophytin a
TC a = Trichromatic Chlorophyll a
TC b = Trichromatic Chlorophyll b
TC c = Trichromatic Chlorophyll c
Units = ug/L for Water, ug/cm^2 for periphyton samplers

*: The complex calculations used to differentiate the various chlorophyll species magnify error at low concentrations and sometimes produce negative values, which are reported as 0.0 on this report.

Appendix D

Agency Correspondence

Renewable World Energies

COPY

November 6, 2013

Mr. Nick Utrup
U.S. Fish and Wildlife Service
WI MN Ecological Services Field Office
4101 American Boulevard East
Bloomington, MN 55425

Ms. Cheryl Laatsch
Statewide FERC Coordinator
Wisconsin Dept. of Natural Resources
N7725 HWY 28
Horicon, WI 53032

Re: **Flambeau Hydroelectric Projects**
FERC Project Numbers-Upper FERC # 2640, Lower FERC # 2421,
Pixley FERC # 2395, Crowley FERC # 2473
Flambeau Hydro LLC
Draft Reports 2013 Water Quality Monitoring Data

Dear Agencies:

On behalf of Flambeau Hydro LLC ("Flambeau"), Licensee, Renewable World Energies, LLC is submitting a copy of its *Draft Report 2013 Water Quality Monitoring Data* for each of the Flambeau Projects. No problems were encountered with equipment, data, or the monitoring schedule in general. The report is a requirement of Flambeau's Federal license pursuant to article 406 and 408 and the approved Water Quality Monitoring Plans. The purpose of this letter is to formally invite you to comment on the draft reports. The Federal Energy Regulatory Commission's regulations allow for a 30 day formal review and comment period. Nothing out of the ordinary was experienced during the 2013 monitoring season except as noted in the reports. Thank you in advance for providing your responses in a timely manner so we can include your comments and recommendations, as appropriate, into our reports.

If you have any questions concerning the report, please contact Mr. Gary Rast at the Renewable World Energies, LLC offices @ 855-994-9376 ext. 105, or by email at: grast@rwehydro.com

Corporate Office
P.O. Box 264
100 S. State Street
Neshkoro, WI 54960
Fax: 920-293-4100

Phone: 855-99HYDRO
(855-994-9376)
www.renewableworldenergies.com

Administrative Office
1001 Stephenson Street
Norway, MI 49870
Fax: 906-563-9344

Renewable World Energies

Sincerely,
Renewable World Energies, LLC
Agent For Licensee

Mr. Jason Kreuscher
Vice President, Operations

Attachments: Draft Report 2013 Water Quality Monitoring Data Flambeau Upper Hydroelectric Project – November 1, 2013

Draft Report 2013 Water Quality Monitoring Data Flambeau Lower Hydroelectric Project – November 4, 2013

Draft Report 2013 Water Quality Monitoring Data Flambeau Pixley Hydroelectric Project – November 5, 2013

Draft Report 2013 Water Quality Monitoring Data Flambeau Crowley Hydroelectric Project – November 6, 2013

Cc: RWE, Corporate

Gary Rast

From: Gary Rast
Sent: Wednesday, May 22, 2013 4:02 PM
To: Laatsch, Cheryl - DNR (Cheryl.Laatsch@Wisconsin.gov); Aartila, Tom P - DNR (Tom.Aartila@Wisconsin.gov); Nick Utrup (nick_utrup@fws.gov); Jeffrey.Scheirer@Wisconsin.gov
Cc: 'Jason Kreuscher'; Shawn Wille; Aneta Rietveld
Subject: Flambeau Upper Lower Pixley Crowley Ice Out WQ Sampling

Everyone,

About 1to 1.5 weeks ago I notified you that because of water conditions and no boat barriers being installed at the Flambeau projects the Ice-Out WQ monitoring would or could not be performed during the 2 week time period following Ice-Out. On Monday 5/20 I was notified that the barriers were installed and river conditions were approaching more normal conditions. Because weather looked favorable for Thursday 5/23 I made plans for that day. I was not aware that the area had received so much rain in the past couple of days and that runoff from surrounding areas were contributing so much. River conditions today 5/22 are horrible to say the least, about 1000 CFS more than when you were originally notified. I believe they are slightly one side or the other of 4000 CFS. I have been informed that another 500 CFS is to be released from the flowage later today, so conditions will worsen. I spoke to Jeff less than an hour ago and discussed doing some sort of modified monitoring while I am here. We agreed that was not a good thing because comparison to other years Ice-Out results would be very hard to make and the effort would not be worth much. Jeff and I agreed to skip the Ice-Out sampling all together because the effort would not yield good results and the safety concerns involving the monitoring. RWE asks for your understanding and agreement. Thanks

Gary

Gary Rast
Regulatory/Compliance Manager

Renewable World Energies

Renewable World Energies, LLC
100 S. State Street
P.O. Box 264
Neshkoro, WI 54960
Phone: 855-994-9376 Ext. 105
Fax: 920-293-4100
Cell: 920-570-0995
E-mail: grast@rwehydro.com

Gary Rast

From: Gary Rast
Sent: Monday, May 13, 2013 10:13 AM
To: Laatsch, Cheryl - DNR (Cheryl.Laatsch@Wisconsin.gov); Nick Utrup (nick_utrup@fws.gov)
Cc: 'Jason Kreuscher'; Shawn Wille
Subject: Flambeau Ice Out Water Quality Sampling
Attachments: Flam Upper.JPG; Flam Lower.JPG; Flam Pixley.JPG; Flam Crowley.JPG

Cheryl and Nick,

Was up in North West Wisconsin and did Ice Out sampling at Winter, Clam River, and Danbury hydro projects. Water was high but boat buoys were in and was able to accomplish the sampling event. However, attached are photos from the 4 Flambeau projects from mid – week (5-5 thru 5-11) showing conditions. I was not able to sample because of high water conditions. The fact that the boat buoys are not in place yet because of those conditions made it even more dangerous. Technically this week is the 2nd week after Ice-Out which is the time frame allotted by the WQ Monitoring Plans. Just want to inform you that this sampling event will not happen this week because conditions have not improved and will be done outside of the approved time frame following Ice-Out. When conditions improve and boat buoys are installed RWE will perform the Ice-Out sampling at these projects.

Thanks for your understanding.

Gary

Gary Rast
Regulatory/Compliance Manager

Renewable World Energies

Renewable World Energies, LLC
100 S. State Street
P.O. Box 264
Neshkoro, WI 54960
Phone: 855-994-9376 Ext. 105
Fax: 920-293-4100
Cell: 920-570-0995
E-mail: grast@rwehydro.com

Final Report

2013 Water Quality Monitoring Data

for the

Pixley Hydroelectric Project
FERC Project #2395
Flambeau Hydro, LLC

North Fork of the Flambeau River, Price County, Wisconsin

Respectfully Submitted by:

Renewable World Energies, LLC
100 State Street – P.O. Box 264
Neshkoro, Wisconsin 54960

Final – December 16, 2013

Table of Contents

Summary

2013 marked the tenth year of water quality sampling under the FERC approved "Water Quality Monitoring Plan Per License Article 406 for the Flambeau (Pixley) Hydroelectric Project – FERC Project # 2395 – Flambeau Hydro, LLC". Sampling was accomplished according to the plan and was un-eventful, with no major problems or concerns.

Ice-Out occurred between Agenda and Nine Mile Landing on the North Fork of the Flambeau River during the week beginning April 28, 2013. **The Ice-Out sampling event did not occur.** The Licensee traveled to the region during the 1st and 3rd weeks of May, but could not accomplish the sampling because of high river flows, 4251 CFS & 4683 CFS respectively. Consultation with the WDNR was done by phone on May 22, 2013 as well as an e-mail being sent to the agencies describing the agreement to skip the Ice-Out sampling event this year. The decision was due to dangerous river conditions and the fact that the sampling would have to be done too far outside the Ice-Out time frame to be of value.

River flow, based on Flambeau (Pixley) Hydroelectric Project records, was approximately 901cubic feet per second during the July 9, 2013 sampling event. Sampling occurred between 11:00 am. and 11:17 am. Samples were taken without incident. No unusual D.O. or Temperature readings were observed. Samples for laboratory analysis were delivered to Northern Lake Service, Inc. in Crandon, WI on July 10, 2013. Northern Lake Service, Inc. issued a laboratory report on July 15, 2013. No unusual levels of Chlorophyll a, True Color, or Total Phosphorus were noted in the laboratory reports.

River flow, based on Flambeau (Pixley) Hydroelectric Project records, was approximately 710 cubic feet per second during the August 06, 2013 sampling event. Sampling occurred between 11:00 a.m. and 11:24 a.m. Samples were taken without incident. No unusual D.O. or Temperature readings were observed. Samples for laboratory analysis were delivered to Northern Lake Service, Inc in Crandon, WI on August 7, 2013. Northern Lake Service, Inc issued a laboratory report on August 14, 2013. No unusual levels of Chlorophyll a, True Color, or Total Phosphorus were noted in the laboratory reports.

In general, the weather (temperature and rainfall) during the 2013 monitoring season appeared cooler in April/May with higher than normal precipitation in the months of April/May/June. Temperatures in June/July/August were about 1to5 degrees higher than normal but precipitation was about 50% below normal for July/August. **(Refer to 2013 Monthly Temperature and Precipitation Table page 7)**

A summary of a comparison between the 2011 thru 2013 **(Refer to 2013 Flambeau Pixley Project Sampling Comparison Table 2011-2013 page 8)** sampling results are as follows:

1. Water Clarity – No sampling in May – Decreased in July and Increased in August
2. Chlorophyll a – No sampling in May – Decreased
3. Color –No sampling in May - Increased
4. Total Phosphorus – No sampling in May – Decreased July and Increased in August
5. Overall D.O. – No sampling in May – Decreased
6. Water Temperatures – No sampling in May – Decreased

Correspondence from the agencies during 2010 indicated they would prefer that notifications of incidents be by e-mail only and that telephone contacts are not needed. All other correspondence can be found on page 13, **Appendix D**. The next scheduled Water Quality Monitoring at the Pixley Hydroelectric Project is set to take place in 2014 beginning with the Ice-Out sampling event.

2013
Sampling Results
Table

Pixley Hydroelectric Project - FERC Project # 2395
2013 Water Quality Sampling Data

	Iceout 2013	July 9, 2013	August 6, 2013
Project Flow (c.f.s.)	N/A	901	710

Dissolved Oxygen	Iceout 2013			July 9, 2013			August 6, 2013		
	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 feet below surface	N/A	N/A	N/A	11:08 AM	5.85	25.30	11:16 AM	6.84	20.60
3 feet below surface	N/A	N/A	N/A	11:10 AM	5.83	25.30	11:17 AM	6.81	20.50
6 feet below surface	N/A	N/A	N/A	11:11 AM	5.73	25.30	11:18 AM	6.78	20.50
9 feet below surface	N/A	N/A	N/A	11:12 AM	5.62	25.30	11:19 AM	6.81	20.40
12 feet below surface	N/A	N/A	N/A	11:13 AM	5.57	25.20	11:20 AM	6.80	20.40
15 feet below surface	N/A	N/A	N/A	11:14 AM	5.52	25.20	11:21 AM	6.74	20.40
18 feet below surface	N/A	N/A	N/A	11:15 AM	5.38	25.20	11:22 AM	6.71	20.40
21 feet below surface	N/A	N/A	N/A	11:16 AM	5.30	25.10	11:23 AM	6.67	20.30
24 feet below surface	N/A	N/A	N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
0.5 feet above bottom	N/A	N/A	N/A	11:17 AM	5.24	25.10	11:24 AM	6.41	20.10

Secchi Disk	Iceout 2013			July 9, 2013			August 6, 2013		
3 feet below surface	Time	Depth (ft)		Time	Depth (ft)		Time	Depth (ft)	
	N/A	N/A		11:07 AM	2.10		11:05 AM	3.33	

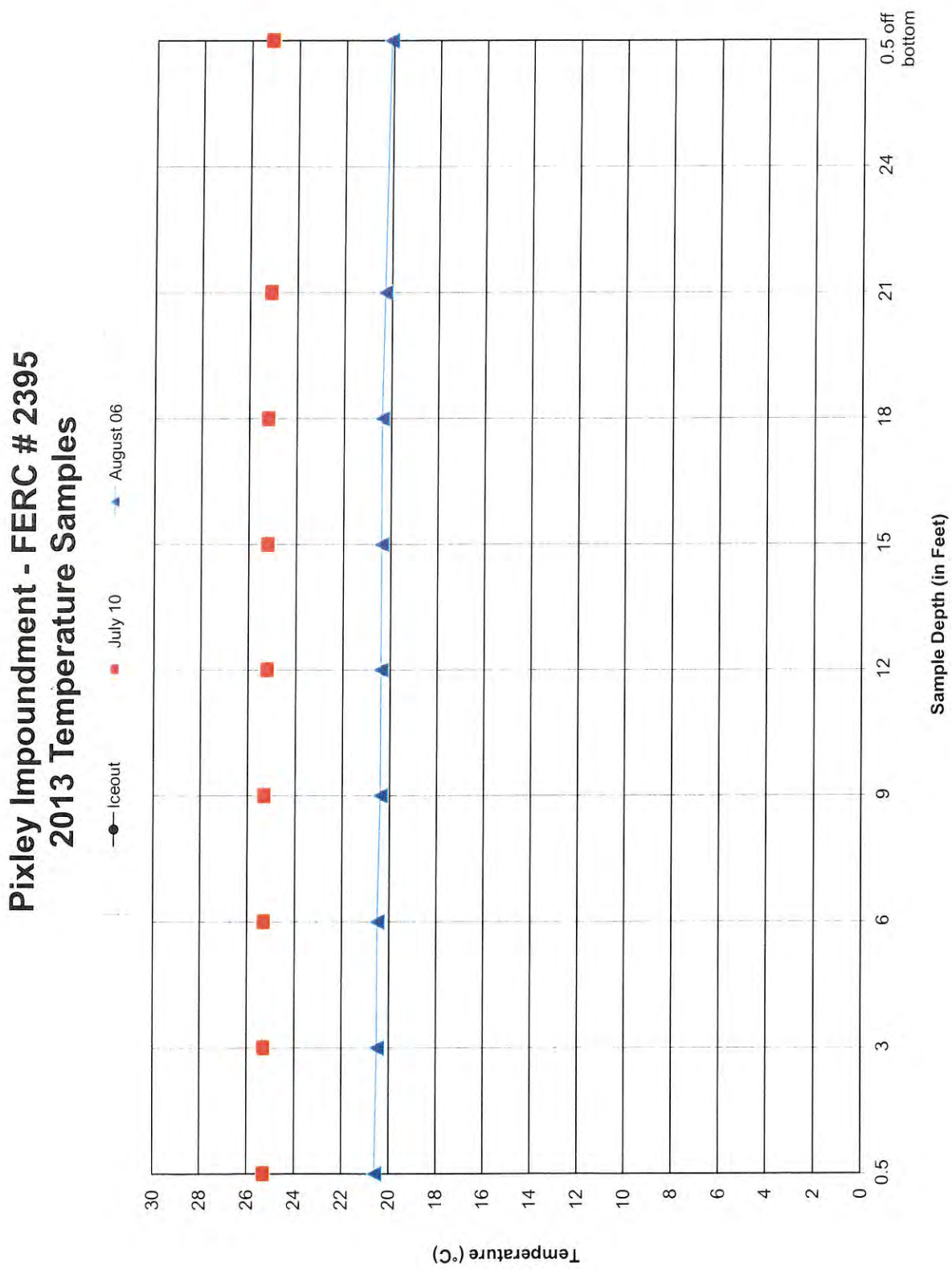
Chlorophyll a	Iceout 2013			July 9, 2013			August 6, 2013		
3 feet below surface	Time	ug/L		Time	ug/L		Time	ug/L	
	N/A	N/A		11:00 AM	6.20		11:10	6.30	

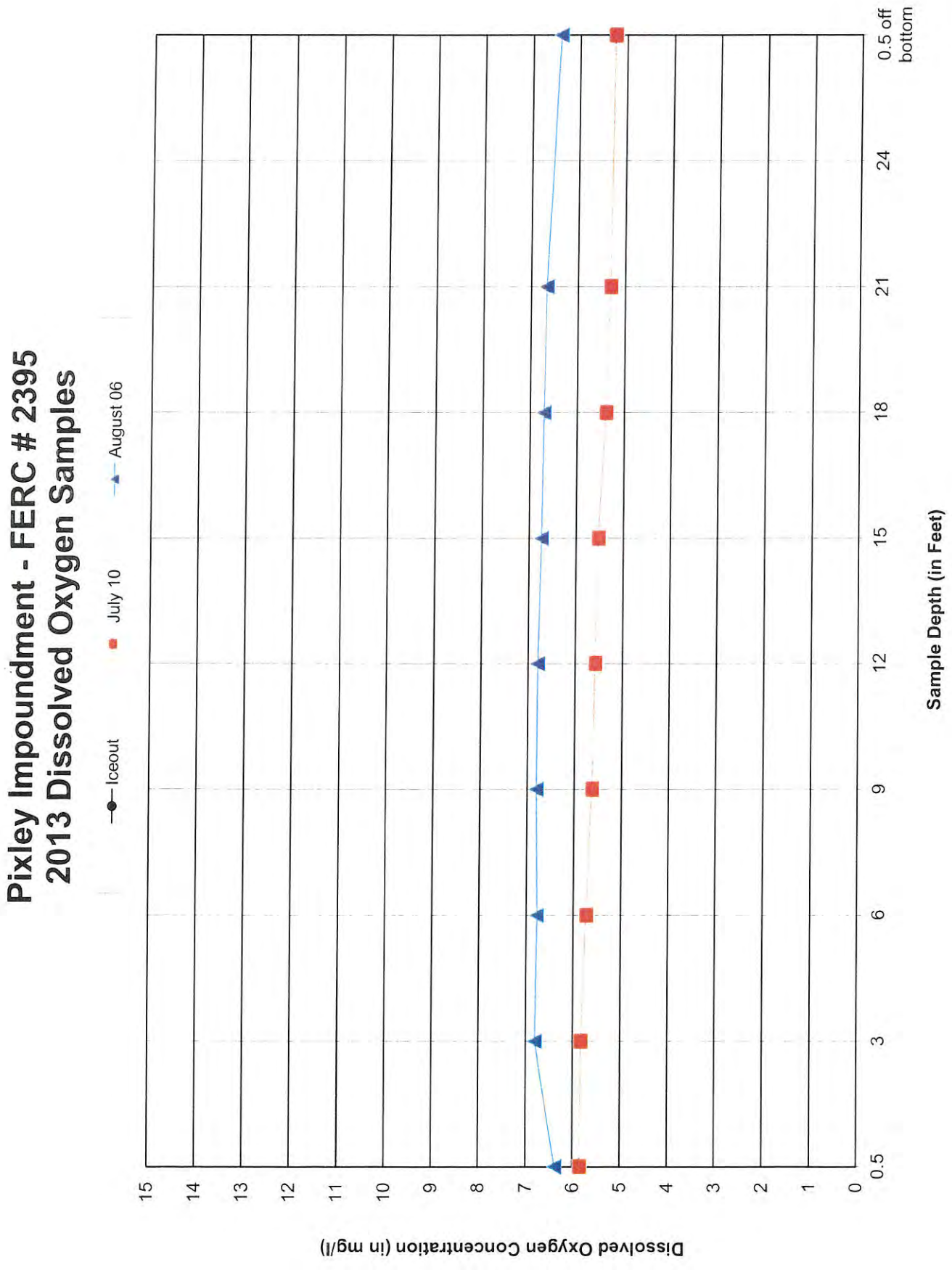
Color (True)	Iceout 2013			July 9, 2013			August 6, 2013		
3 feet below surface	Time	C.P.U. Units	LOD	Time	C.P.U. Units	LOD	Time	C.P.U Units	LOD
	N/A	N/A	N/A	11:02 AM	150.0	25*	11:12 AM	150	25*

Total Phosphorus	Iceout 2013			July 9, 2013			August 6, 2013		
	Time	mg/L	LOD	Time	mg/L	LOD	Time	mg/L	LOD
3 feet below surface	N/A	N/A	N/A	11:04 AM	0.044	0.0070*	11:14 AM	0.11	0.0070*
3 feet above bottom	N/A	N/A	N/A	11:06 AM	0.043	0.0070*	11:15 AM	0.071	0.0070*

*** Considered Reporting Limits**

2013 Temperature and Dissolved Oxygen Graphs





2013
Monthly Temperature
and
Precipitation
Table

2013 Water Year Monthly Temperature and Precipitation for Park Falls, 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-12	74	22	42.5	-0.7	691	678	1.34	1.1	2.85	47%
November-12	53	0	30.9	2.1	1015	1088	1.33	10.1	2.09	64%
December-12	48	-7	18.4	3.6	1438	1556	1.44	13.2	1.21	119%
January-13	42	-21	12.1	1.9	1631	1691	1.39	9.2	0.96	145%
February-13	38	-22	14.6	-0.5	1405	1399	1.16	19.1	0.81	70%
March-13	53	-13	21.8	-4.1	1333	1200	2.04	25.8	1.49	137%
April-13	68	8	34.4	-5.2	908	762	5.04	50.8	2.43	207%
May-13	80	27	49.5	-1.9	471	426	3.71	Trace	3.23	115%
June-13	87	37	61.6	1.5	146	179	4.54	0.0	4.23	107%
July-13	94	47	67.8	2.0	47	63	1.73	0.0	3.85	45%
August-13	94	43	69.0	4.7	27	86	1.98	0.0	3.70	54%
September-13	88	37	59.9	4.3	168	298	1.26	0.0	4.11	31%

Source: NOAA/Duluth, MN

2013
Flambeau Pixley
Sampling Comparison Table
2011—2013

Flambeau Pixley
Project Sampling Comparison Table
2011 Thru Current Year

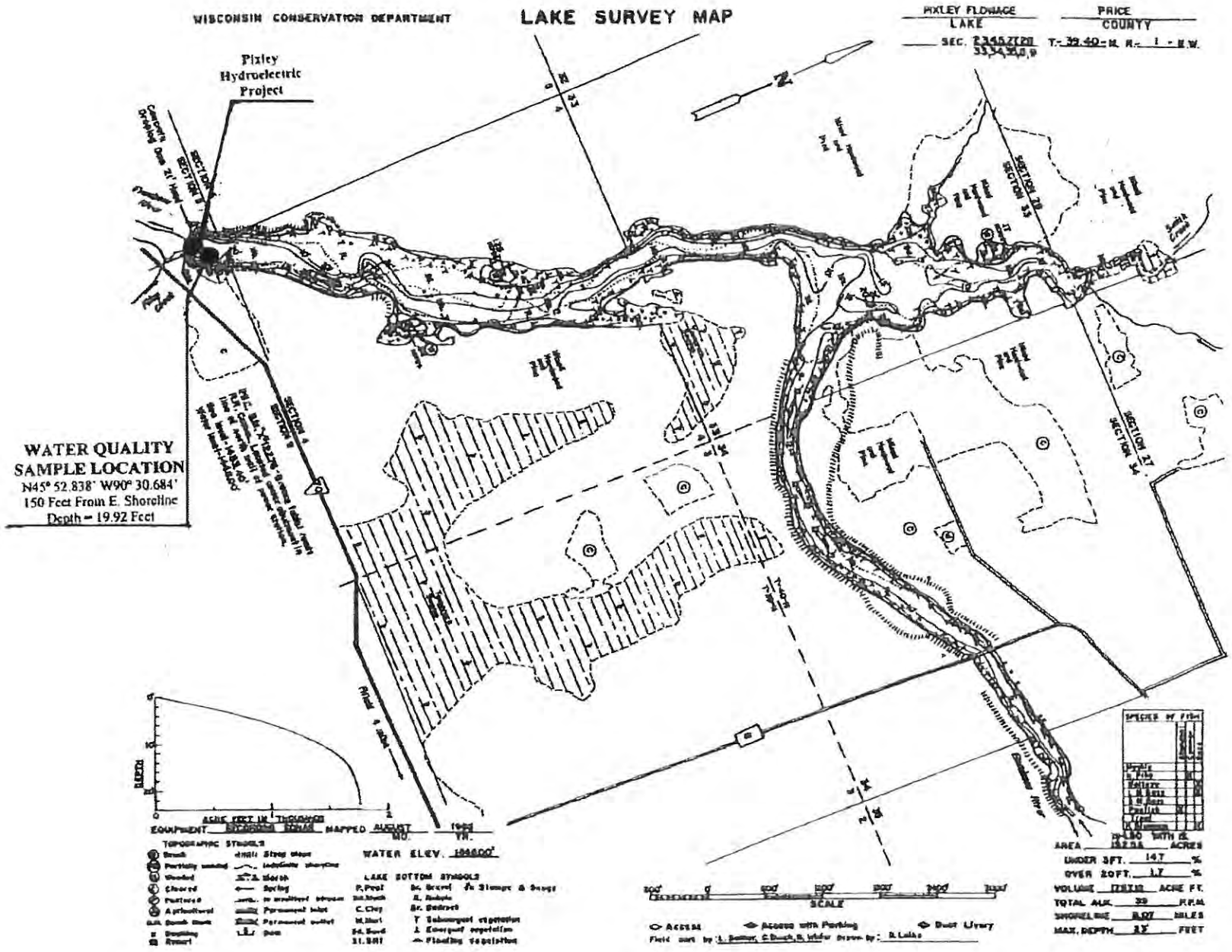
Year	Month	Secchi Depth (m)	Chlorophyll a ug/l	Color (True) C.P.U. Units	Total Phosphorus Below Surface mg/l	Total Phosphorus Above Bottom mg/l	Low D.O. mg/l	High D.O. mg/l	Low Water Temp. °C	High Water Temp. °C
2011	April	3.20	2.10	80.00	0.033	0.031	11.64	12.05	6.60	11.70
2012	April	3.10	1.70	140.00	0.039		10.94	11.26	9.30	10.00
2013	May									
Minimum	April/May	3.10	1.70	80.00	0.033	0.031	10.94	11.26	6.60	10.00
Maximum	April/May	3.20	2.10	140.00	0.039	0.031	11.64	12.05	9.30	11.70
Average	April/May	3.15	1.90	110.00	0.036	0.031	11.29	11.66	7.95	10.85
2011	July	3.00	16.00	70.00	0.057	0.041	6.62	8.25	25.40	25.80
2012	July	3.10	8.80	100.00	0.057	0.041	5.52	6.40	25.70	27.20
2013	July	2.10	6.20	150.00	0.044	0.043	5.24	5.85	25.10	25.30
Minimum	July	2.10	6.20	70.00	0.044	0.041	5.24	5.85	25.10	25.30
Maximum	July	3.10	16.00	150.00	0.057	0.043	6.62	8.25	25.70	27.20
Average	July	2.73	10.33	106.67	0.053	0.042	5.79	6.83	25.40	26.10
2011	August	3.10	14.00	140.00	0.052	0.047	7.74	7.44	23.50	26.00
2012	August	2.50	26.00	100.00	0.048	0.050	5.93	9.32	23.80	24.60
2013	August	3.33	6.30	150.00	0.110	0.071	6.41	6.84	20.10	20.60
Minimum	August	2.50	6.30	100.00	0.048	0.047	5.93	6.84	20.10	20.60
Maximum	August	3.33	26.00	150.00	0.110	0.071	7.74	9.32	23.80	26.00
Average	August	2.98	15.43	130.00	0.070	0.056	6.69	7.87	22.47	23.73

No Sample

Pixley Impoundment

Sampling Location

Map



Appendix A

Ice-Out 2013 Sampling Documents

No Sampling Done

Appendix B

July 9, 2013 Sampling Documents

IMPOUNDMENT SAMPLING LOG

2013 Water Quality Study - Flambeau Pixley Hydroelectric Project - FERC #2395

HWL 1448.58
TWL 1427.8

Date: 7-9-13

Pre-Sampling Data: CFS 401

Time: 11:00 Barometer: 29.92 Air Temp: 25° °C Wind Speed 5-10 mph

Sky Conditions: Cloudy

Precipitation within Last 24 Hours:

D.O. Meter Calibration: Instrument Model Used: Hach HQ40d

Were The Batterys Changed? ☐ Yes ☒ No If Yes, When Changed:

Battery Status: 75% Charge

Calibration Time: March 1, 2013 Method: Factory

Sampling Depth Profile: Measured Depth to Bottom of the Impoundment: 22 Feet

Secchi Disk Depth: (E0.1 Foot) 2.1 Feet Time: 11:07

Chlorophyll a (3 Feet Below Surface)

Lab Sample I.D.#: 0709 2013 3A

Time	Quantity (ml)	Filtered
11:00	1000 ml	no

True Color (3 Feet Below Surface)

Lab Sample I.D.#: 0709 2013 3B

Time	Quantity (ml)
11:02	250 mL

D.O. Sample Data

Depth	Time	D.O. (mg/l)	°C
.5 Ft Below Surface	11:08	5.85	25.3
3 Feet	11:10	5.83	25.3
6 Feet	11:11	5.73	25.3
9 Feet	11:12	5.62	25.3
12 Feet	11:13	5.57	25.2
15 Feet	11:14	5.52	25.2
18 Feet	11:15	5.38	25.2
21 Feet	11:16	5.30	25.1
24 Feet			
.5 Ft Above Bottom	11:17	5.24	25.1

Phosphorus

Lab Sample I.D.#: 0709 2013 3C
(3 Feet Below Surface)

Time	Preserved?
11:04	H_2SO_4

Lab Sample I.D.#: 0709 2013 3D
(3 Feet Above Bottom)

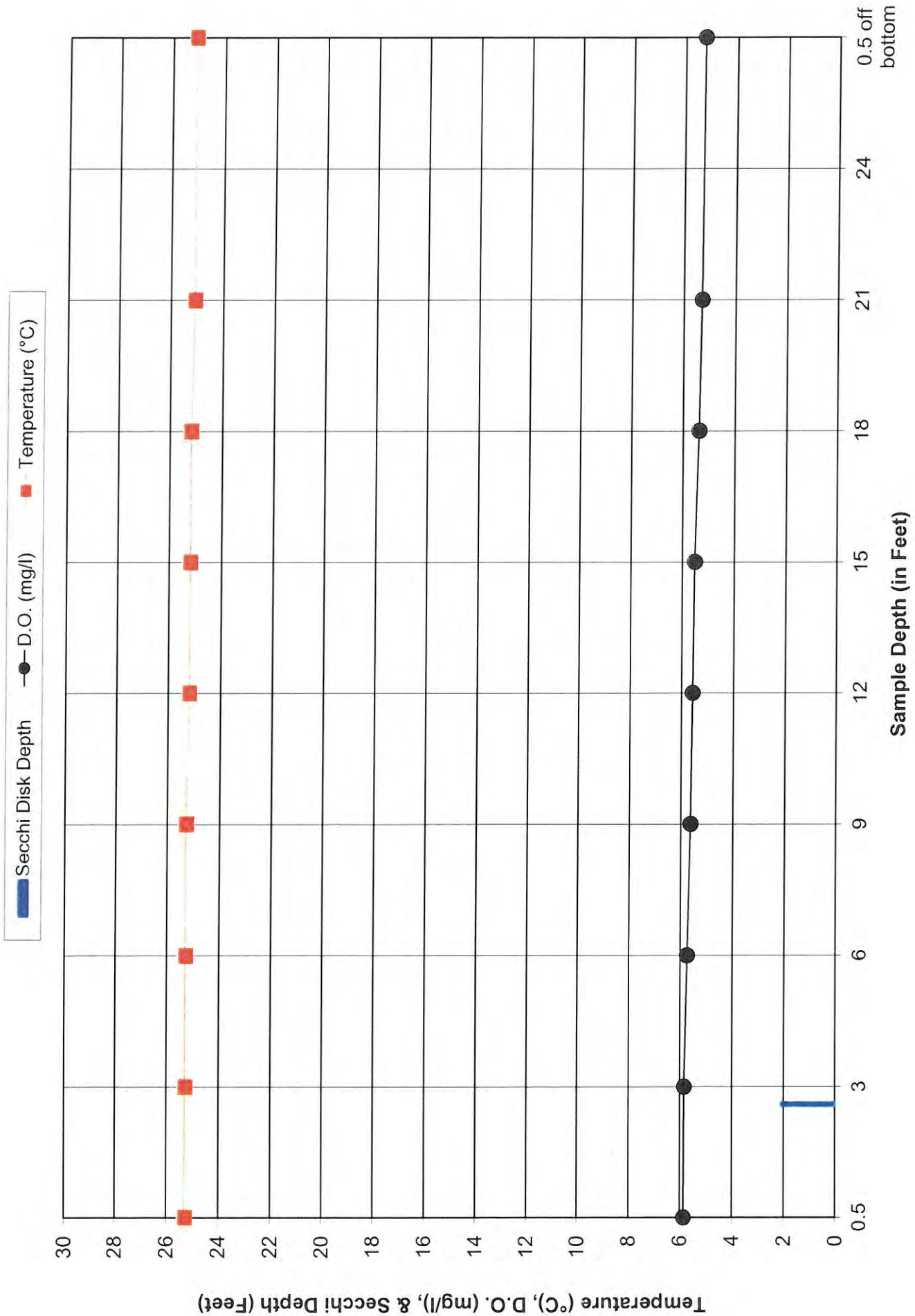
Time	Preserved?
11:06	H_2SO_4

Sample Location: N45° 52.838' W90° 30.684'

Comments:

Performed By: ANETA R. - Gary R.

Pixley Impoundment - FERC # 2395
July 09, 2013 Sampling Event



NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

RECEIVED
JUL 16 2013

Client: Renewable World Energies
Attn: Gary Rast
100 State Street
P.O. Box 264
Neshkoro, WI 54960

NLS Project: 200316
NLS Customer: 102823
Phone: 855 994 9376

Project: Flambeau (4)

07092013 1A NLS ID: 729864
COC: 153593:1 Matrix: SW
Collected: 07/09/13 07:34 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					07/12/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					07/10/13	NA	721026460

07092013 1B NLS ID: 729865
COC: 153593:1 Matrix: SW
Collected: 07/09/13 07:34 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	150	C.P.U.	10	50*		07/10/13	SM 2120-B 20ed	721026460

07092013 1C NLS ID: 729866
COC: 153593:1 Matrix: SW
Collected: 07/09/13 07:34 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.026	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 2A NLS ID: 729867
COC: 153593:2 Matrix: SW
Collected: 07/09/13 09:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					07/12/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					07/10/13	NA	721026460

07092013 2B NLS ID: 729868
COC: 153593:2 Matrix: SW
Collected: 07/09/13 09:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	150	C.P.U.	5	25*		07/10/13	SM 2120-B 20ed	721026460

07092013 2C NLS ID: 729869
COC: 153593:2 Matrix: SW
Collected: 07/09/13 09:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.041	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 2D NLS ID: 729870
COC: 153593:2 Matrix: SW
Collected: 07/09/13 09:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.041	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 3A NLS ID: 729871
COC: 153593:3 Matrix: SW
Collected: 07/09/13 11:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					07/12/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					07/10/13	NA	721026460

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

NLS Project: 200316
NLS Customer: 102823
Phone: 855 994 9376

Client: Renewable World Energies
Attn: Gary Rast
100 State Street
P.O. Box 264
Neshkoro, WI 54960

Project: Flambeau (4)

07092013 3B NLS ID: 729872
COC: 153593:3 Matrix: SW
Collected: 07/09/13 11:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	150	C.P.U.	5	25*		07/10/13	SM 2120-B 20ed	721026460

07092013 3C NLS ID: 729873
COC: 153593:3 Matrix: SW
Collected: 07/09/13 11:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.044	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 3D NLS ID: 729874
COC: 153593:3 Matrix: SW
Collected: 07/09/13 11:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.043	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 4A NLS ID: 729875
COC: 153593:4 Matrix: SW
Collected: 07/09/13 13:09 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					07/12/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					07/10/13	NA	721026460

07092013 4B NLS ID: 729876
COC: 153593:4 Matrix: SW
Collected: 07/09/13 13:09 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	150	C.P.U.	5	25*		07/10/13	SM 2120-B 20ed	721026460

07092013 4C NLS ID: 729877
COC: 153593:4 Matrix: SW
Collected: 07/09/13 13:09 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.046	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 4D NLS ID: 729878
COC: 153593:4 Matrix: SW
Collected: 07/09/13 13:09 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.045	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and/or LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
MCL = Maximum Contaminant Levels for Drinking Water Samples. Shaded results indicate >MCL

Reviewed by

Authorized by
R. T. Krueger
President

Northern Lake Service, Inc.
Chlorophyll Results

Customer: Renewable World Energies
Project: 200316
Flambeau (4)

Sample	Description	CC a	Pheo a	TC a	TC b	TC c
729864	07092013 1A	1.2	0.6	1.6	0.0*	0.1
729867	07092013 2A	2.7	0.61	3.2	0.0*	0.35
729871	07092013 3A	5.1	1.4	6.2	0.0*	0.53
729875	07092013 4A	4.7	1.1	5.5	0.049	0.47

CC a = Corrected Chlorophyll a
Pheo a = Pheophytin a
TC a = Trichromatic Chlorophyll a
TC b = Trichromatic Chlorophyll b
TC c = Trichromatic Chlorophyll c
Units = ug/L for Water, ug/cm² for periphyton samplers

*: The complex calculations used to differentiate the various chlorophyll species magnify error at low concentrations and sometimes produce negative values, which are reported as 0.0 on this report.

Appendix C

August 6, 2013 Sampling Documents

IMPOUNDMENT SAMPLING LOG

2013 Water Quality Study - Flambeau Pixley Hydroelectric Project - FERC #2395

Pre-Sampling Data: HWL - 1448.71 TWL - 1427.6 Date: 8/6/13 CFS - 710

Time: 11:00 Barometer: 29.82 Air Temp: 21 °C Wind Speed SW 8MPH

Sky Conditions: PARTLY CLOUDY

Precipitation within Last 24 Hours: YES

D.O. Meter Calibration: Instrument Model Used: Hach HQ40d

Were The Batterys Changed? ☐ Yes ☒ No If Yes, When Changed: _____

Battery Status: 100% Charge

Calibration Time: APRIL 2013 Method: Factory

Sampling Depth Profile: Measured Depth to Bottom of the Impoundment: 22 Feet

Secchi Disk Depth: (E0 1 Foot) 3.33 Feet Time: 1105

Chlorophyll a (3 Feet Below Surface)

Lab Sample I.D.#: 08062013-3A		
Time	Quantity (ml)	Filtered
11:10	1000	NO

True Color (3 Feet Below Surface)

Lab Sample I.D.#: 08062013-3B	
Time	Quantity (ml)
11:12	250

D.O. Sample Data

Depth	Time	D.O. (mg/l)	°C
.5 Ft Below Surface	11:16	6.84	20.6
3 Feet	11:17	6.81	20.5
6 Feet	11:18	6.78	20.5
9 Feet	11:19	6.81	20.4
12 Feet	11:20	6.82	20.4
15 Feet	11:21	6.74	20.4
18 Feet	11:22	6.71	20.4
21 Feet	11:23	6.67	20.3
24 Feet			
.5 Ft Above Bottom	11:24	6.41	20.1

Phosphorus

Lab Sample I.D.#: 08062013-3C (3 Feet Below Surface)	
Time	Preserved?
11:14	H_2SO_4

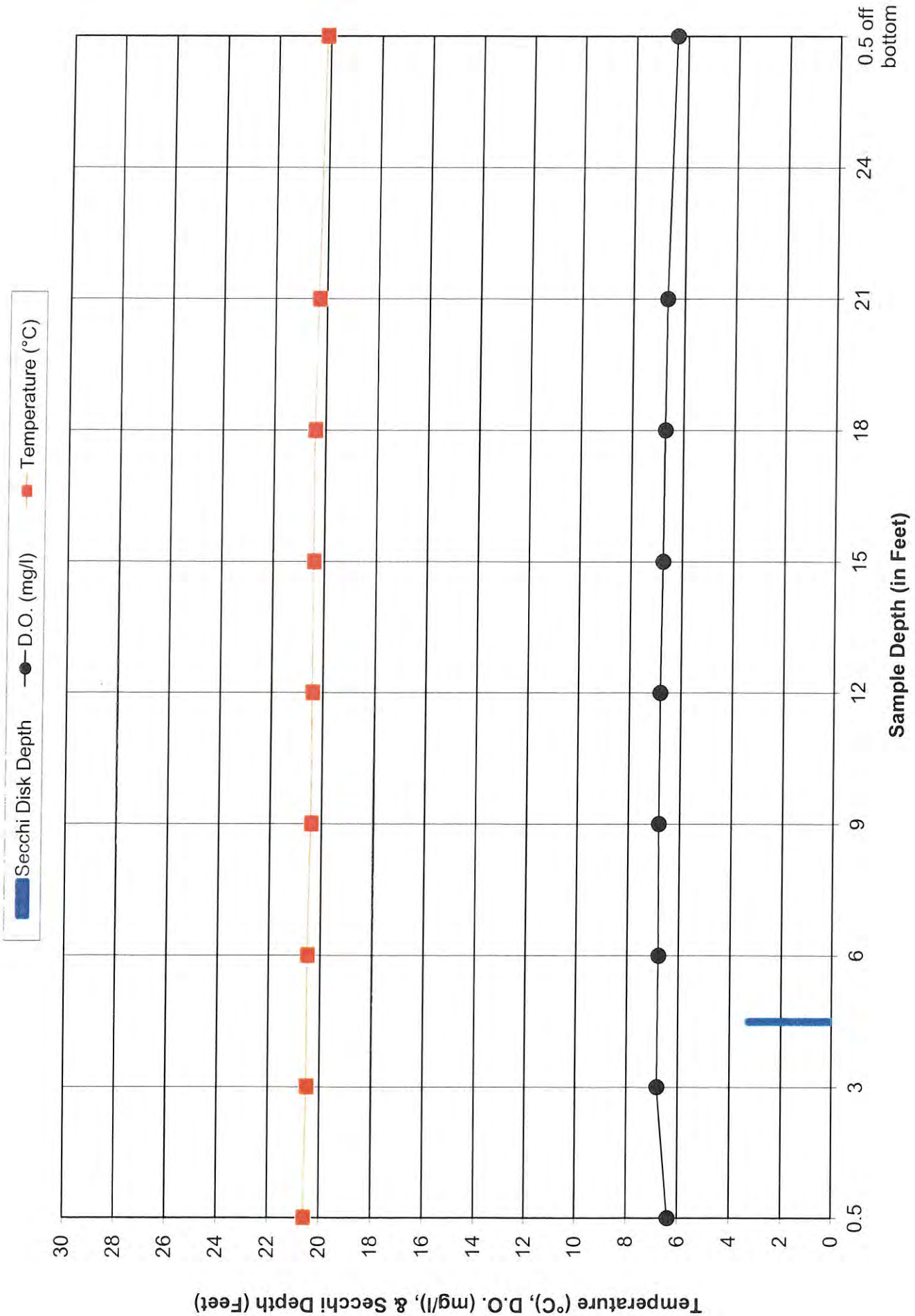
Lab Sample I.D.#: 08062013-3D (3 Feet Above Bottom)	
Time	Preserved?
11:15	H_2SO_4

Sample Location: N45° 52.838' W90° 30.684'

Comments:

Performed By: GARY RAST + JIM TESCH Gary Rast

Pixley Impoundment - FERC # 2395
August 06, 2013 Sampling Event



NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

RECEIVED
AUG 19 2013

NLS Project: 202117
NLS Customer: 102823
Phone: 855 994 9376

Client: Renewable World Energies
Attn: Gary Rast
100 State Street
P.O. Box 264
Neshkoro, WI 54960

Project: Flambeau (4)

08062013-1A NLS ID: 735574
COC: 162646:1 Matrix: SW
Collected: 08/06/13 07:25 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					08/13/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					08/07/13	NA	721026460

08062013-1B NLS ID: 735575
COC: 162646:1 Matrix: SW
Collected: 08/06/13 07:25 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	130	C.P.U.	5	25*		08/07/13	SM 2120-B 20ed	721026460

08062013-1C NLS ID: 735576
COC: 162646:1 Matrix: SW
Collected: 08/06/13 07:25 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.066	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-2A NLS ID: 735577
COC: 162646:2 Matrix: SW
Collected: 08/06/13 09:12 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					08/13/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					08/07/13	NA	721026460

08062013-2B NLS ID: 735578
COC: 162646:2 Matrix: SW
Collected: 08/06/13 09:12 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	130	C.P.U.	5	25*		08/07/13	SM 2120-B 20ed	721026460

08062013-2C NLS ID: 735579
COC: 162646:2 Matrix: SW
Collected: 08/06/13 09:12 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.071	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-2D NLS ID: 735580
COC: 162646:2 Matrix: SW
Collected: 08/06/13 09:12 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.11	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-3A NLS ID: 735581
COC: 162646:3 Matrix: SW
Collected: 08/06/13 11:15 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					08/13/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					08/07/13	NA	721026460

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

NLS Project: 202117
NLS Customer: 102823
Phone: 855 994 9376

Client: Renewable World Energies
Attn: Gary Rast
100 State Street
P.O. Box 264
Neshkoro, WI 54960

Project: Flambeau (4)

08062013-3B NLS ID: 735582
COC: 162646:3 Matrix: SW
Collected: 08/06/13 11:15 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	150	C.P.U.	5	25*		08/07/13	SM 2120-B 20ed	721026460

08062013-3C NLS ID: 735583
COC: 162646:3 Matrix: SW
Collected: 08/06/13 11:15 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.11	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-3D NLS ID: 735584
COC: 162646:3 Matrix: SW
Collected: 08/06/13 11:15 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.071	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-4A NLS ID: 735585
COC: 162646:4 Matrix: SW
Collected: 08/06/13 13:13 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					08/13/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					08/07/13	NA	721026460

08062013-4B NLS ID: 735586
COC: 162646:4 Matrix: SW
Collected: 08/06/13 13:13 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	130	C.P.U.	5	25*		08/07/13	SM 2120-B 20ed	721026460

08062013-4C NLS ID: 735587
COC: 162646:4 Matrix: SW
Collected: 08/06/13 13:13 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.099	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-4D NLS ID: 735588
COC: 162646:4 Matrix: SW
Collected: 08/06/13 13:13 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.063	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and/or LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
MCL = Maximum Contaminant Levels for Drinking Water Samples. Shaded results indicate >MCL

Reviewed by:

Authorized by
R T Krueger
President

Northern Lake Service, Inc.
Chlorophyll Results

Customer: Renewable World Energies
Project: 202117
Flambeau (4)

Sample	Description	CC a	Pheo a	TC a	TC b	TC c
735574	08062013-1A	5.4	0.74	6	0.12	0.65
735577	08062013-2A	4.8	0.67	5.3	0.1	0.42
735581	08062013-3A	5.7	0.57	6.3	0.14	0.59
735585	08062013-4A	4	1.2	4.8	0.059	0.36

CC a = Corrected Chlorophyll a
Pheo a = Pheophytin a
TC a = Trichromatic Chlorophyll a
TC b = Trichromatic Chlorophyll b
TC c = Trichromatic Chlorophyll c
Units = ug/L for Water, ug/cm² for periphyton samplers

*: The complex calculations used to differentiate the various chlorophyll species magnify error at low concentrations and sometimes produce negative values, which are reported as 0.0 on this report.

Appendix D

Agency Correspondence

Renewable World Energies

COPY

November 6, 2013

Mr. Nick Utrup
U.S. Fish and Wildlife Service
WI MN Ecological Services Field Office
4101 American Boulevard East
Bloomington, MN 55425

Ms. Cheryl Laatsch
Statewide FERC Coordinator
Wisconsin Dept. of Natural Resources
N7725 HWY 28
Horicon, WI 53032

Re: **Flambeau Hydroelectric Projects**
FERC Project Numbers-Upper FERC # 2640, Lower FERC # 2421,
Pixley FERC # 2395, Crowley FERC # 2473
Flambeau Hydro LLC
Draft Reports 2013 Water Quality Monitoring Data

Dear Agencies:

On behalf of Flambeau Hydro LLC ("Flambeau"), Licensee, Renewable World Energies, LLC is submitting a copy of its *Draft Report 2013 Water Quality Monitoring Data* for each of the Flambeau Projects. No problems were encountered with equipment, data, or the monitoring schedule in general. The report is a requirement of Flambeau's Federal license pursuant to article 406 and 408 and the approved Water Quality Monitoring Plans. The purpose of this letter is to formally invite you to comment on the draft reports. The Federal Energy Regulatory Commission's regulations allow for a 30 day formal review and comment period. Nothing out of the ordinary was experienced during the 2013 monitoring season except as noted in the reports. Thank you in advance for providing your responses in a timely manner so we can include your comments and recommendations, as appropriate, into our reports.

If you have any questions concerning the report, please contact Mr. Gary Rast at the Renewable World Energies, LLC offices @ 855-994-9376 ext. 105, or by email at: grast@rwehydro.com

Corporate Office
P.O. Box 264
100 S. State Street
Neshkoro, WI 54960
Fax: 920-293-4100

Phone: 855-99HYDRO
(855-994-9376)
www.renewableworldenergies.com

Administrative Office
1001 Stephenson Street
Norway, MI 49870
Fax: 906-563-9344

Renewable World Energies

Sincerely,
Renewable World Energies, LLC
Agent For Licensee

Mr. Jason Kreuscher
Vice President, Operations

Attachments: Draft Report 2013 Water Quality Monitoring Data Flambeau Upper Hydroelectric Project – November 1, 2013

Draft Report 2013 Water Quality Monitoring Data Flambeau Lower Hydroelectric Project – November 4, 2013

Draft Report 2013 Water Quality Monitoring Data Flambeau Pixley Hydroelectric Project – November 5, 2013

Draft Report 2013 Water Quality Monitoring Data Flambeau Crowley Hydroelectric Project – November 6, 2013

Cc: RWE, Corporate

Gary Rast

From: Gary Rast
Sent: Wednesday, May 22, 2013 4:02 PM
To: Laatsch, Cheryl - DNR (Cheryl.Laatsch@Wisconsin.gov); Aartila, Tom P - DNR (Tom.Aartila@Wisconsin.gov); Nick Utrup (nick_utrup@fws.gov); Jeffrey.Scheirer@Wisconsin.gov
Cc: 'Jason Kreuscher'; Shawn Wille; Aneta Rietveld
Subject: Flambeau Upper Lower Pixley Crowley Ice Out WQ Sampling

Everyone,

About 1to 1.5 weeks ago I notified you that because of water conditions and no boat barriers being installed at the Flambeau projects the Ice-Out WQ monitoring would or could not be performed during the 2 week time period following Ice-Out. On Monday 5/20 I was notified that the barriers were installed and river conditions were approaching more normal conditions. Because weather looked favorable for Thursday 5/23 I made plans for that day. I was not aware that the area had received so much rain in the past couple of days and that runoff from surrounding areas were contributing so much. River conditions today 5/22 are horrible to say the least, about 1000 CFS more than when you were originally notified. I believe they are slightly one side or the other of 4000 CFS. I have been informed that another 500 CFS is to be released from the flowage later today, so conditions will worsen. I spoke to Jeff less than an hour ago and discussed doing some sort of modified monitoring while I am here. We agreed that was not a good thing because comparison to other years Ice-Out results would be very hard to make and the effort would not be worth much. Jeff and I agreed to skip the Ice-Out sampling all together because the effort would not yield good results and the safety concerns involving the monitoring. RWE asks for your understanding and agreement. Thanks

Gary

Gary Rast
Regulatory/Compliance Manager

Renewable World Energies

Renewable World Energies, LLC
100 S. State Street
P.O. Box 264
Neshkoro, WI 54960
Phone: 855-994-9376 Ext. 105
Fax: 920-293-4100
Cell: 920-570-0995
E-mail: grast@rwehydro.com

Gary Rast

From: Gary Rast
Sent: Monday, May 13, 2013 10:13 AM
To: Laatsch, Cheryl - DNR (Cheryl.Laatsch@Wisconsin.gov); Nick Utrup (nick_utrup@fws.gov)
Cc: 'Jason Kreuscher'; Shawn Wille
Subject: Flambeau Ice Out Water Quality Sampling
Attachments: Flam Upper.JPG; Flam Lower.JPG; Flam Pixley.JPG; Flam Crowley.JPG

Cheryl and Nick,

Was up in North West Wisconsin and did Ice Out sampling at Winter, Clam River, and Danbury hydro projects. Water was high but boat buoys were in and was able to accomplish the sampling event. However, attached are photos from the 4 Flambeau projects from mid – week (5-5 thru 5-11) showing conditions. I was not able to sample because of high water conditions. The fact that the boat buoys are not in place yet because of those conditions made it even more dangerous. Technically this week is the 2nd week after Ice-Out which is the time frame allotted by the WQ Monitoring Plans. Just want to inform you that this sampling event will not happen this week because conditions have not improved and will be done outside of the approved time frame following Ice-Out. When conditions improve and boat buoys are installed RWE will perform the Ice-Out sampling at these projects.

Thanks for your understanding.

Gary

Gary Rast
Regulatory/Compliance Manager

Renewable World Energies

Renewable World Energies, LLC
100 S. State Street
P.O. Box 264
Neshkoro, WI 54960
Phone: 855-994-9376 Ext. 105
Fax: 920-293-4100
Cell: 920-570-0995
E-mail: grast@rwehydro.com

Final Report

2013 Water Quality Monitoring Data

for the

Crowley Hydroelectric Project
FERC Project #2473
Flambeau Hydro, LLC

North Fork of the Flambeau River, Price County, Wisconsin

Respectfully Submitted by:

Renewable World Energies, LLC
100 State Street – P.O. Box 264
Neshkoro, Wisconsin 54960

Final – December 16, 2013

Table of Contents

Summary

2013 marked the tenth year of water quality sampling under the FERC approved "Water Quality Monitoring Plan Per License Article 406 for the Crowley Hydroelectric Project – FERC Project # 2473 – Flambeau Hydro, LLC".

Ice-Out occurred between Agenda and Nine Mile Landing on the North Fork of the Flambeau River during the week beginning April 28, 2013. **The Ice-Out sampling event did not occur.** The Licensee traveled to the region during the 1st and 3rd weeks of May, but could not accomplish the sampling because of high river flows, 4956 CFS & 4919 CFS respectively. Consultation with the WDNR was done by phone on May 22, 2013 as well as an e-mail being sent to the agencies describing the agreement to skip the Ice-Out sampling event this year. The decision was due to dangerous river conditions and the fact that the sampling would have to be done too far outside the Ice-Out time frame to be of value.

River flow, based on Crowley Hydroelectric Project records, was approximately 1230 cubic feet per second during the July 9, 2013 sampling event. Sampling occurred between 1:00 pm. and 1:23 pm. Samples were taken without incident. No unusual Temperature readings were observed. However, below standard D.O. readings were encountered at the 16 foot level (4.66) continually dropped all the way to the .5 foot level (3.83). Agencies were notified by e-mail on July 10, 2013. Samples for laboratory analysis were delivered to Northern Lake Service, Inc in Crandon, WI on July 10, 2013. Northern Lake Service, Inc. issued a laboratory report on July 15, 2013. No unusual levels of Chlorophyll a, True Color, or Total Phosphorus were noted in the laboratory reports.

River flow, based on Crowley Hydroelectric Project records, was approximately 855 cubic feet per second during the August 6, 2013 sampling event. Sampling occurred between 1:00 p.m. and 1:23 p.m. Samples were taken without incident. No unusual D.O. or Temperature readings were observed. Samples for laboratory analysis were delivered to Northern Lake Service, Inc. in Crandon, WI on August 7, 2013. Northern Lake Service, Inc issued a laboratory report on August 14, 2013. No unusual levels of Chlorophyll a, True Color, or Total Phosphorus were noted in the laboratory reports.

In general, the weather (temperature and rainfall) during the 2013 monitoring season appeared cooler in April/May with higher than normal precipitation in the months of April/May/June. Temperatures in June/July/August were about 1to5 degrees higher than normal but precipitation was about 50% below normal for July/August. **(Refer to 2013 Monthly Temperature and Precipitation Table page 7)**

A summary of a comparison between the 2011 thru 2013 **(Refer to 2013 Flambeau Crowley Project Sampling Comparison Table 2011-2013 page 8)** sampling results are as follows:

1. Water Clarity – No sampling in May – Decreased in July and Increased in August
2. Chlorophyll a – No sampling in May –Decreased
3. Color – No sampling in May – Increased
4. Total Phosphorus – No sampling in May – Decreased in July and Increased in August
5. Overall, D.O. – No sampling in May – Decreased
6. Water Temperatures – No sampling in May – Decreased

Correspondence from the agencies during 2010 indicated they would prefer that notifications of incidents be by e-mail only and that telephone contacts are not needed. All other correspondence can be found on page 13, **Appendix D**. The next scheduled Water Quality Monitoring at the Crowley Hydroelectric Project is set to take place in 2014 beginning with the Ice-Out sampling event.

2013
Sampling Results
Table

Crowley Hydroelectric Project - FERC Project # 2473
2013 Water Quality Sampling Data

	Iceout 2013	July 9, 2013	August 6, 2013
Project Flow (c.f.s.)	N/A	1230	855

Dissolved Oxygen

	Iceout 2013			July 9, 2013			August 6, 2013		
	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 feet below surface	N/A	N/A	N/A	1:10 PM	5.65	24.90	1:15 PM	6.24	21.80
3 feet below surface	N/A	N/A	N/A	1:11 PM	5.57	25.10	1:16 PM	6.20	21.30
6 feet below surface	N/A	N/A	N/A	1:12 PM	5.51	25.10	1:17 PM	6.15	21.20
9 feet below surface	N/A	N/A	N/A	1:13 PM	5.50	25.20	1:18 PM	5.89	21.00
12 feet below surface	N/A	N/A	N/A	1:14 PM	5.47	25.20	1:19 PM	5.87	20.80
15 feet below surface	N/A	N/A	N/A	1:17 PM	4.91	25.10	1:20 PM	5.86	20.80
18 feet below surface	N/A	N/A	N/A	1:20 PM	4.50	24.80	1:21 PM	5.86	20.70
21 feet below surface	N/A	N/A	N/A	#N/A	#N/A	#N/A	1:22 PM	5.83	20.60
0.5 feet above bottom	N/A	N/A	N/A	1:23 PM	3.83	24.30	1:23 PM	5.65	20.60

Secchi Disk

	Iceout 2013		July 9, 2013		August 6, 2013	
	Time	Depth (ft)	Time	Depth (ft)	Time	Depth (ft)
3 feet below surface	N/A	N/A	1:00 PM	3.00	1:05 PM	3.10

Chlorophyll a

	Iceout 2013		July 9, 2013		August 6, 2013	
	Time	ug/L	Time	ug/L	Time	ug/L
3 feet below surface	N/A	N/A	1:05 PM	5.50	1:07 PM	4.80

Color (True)

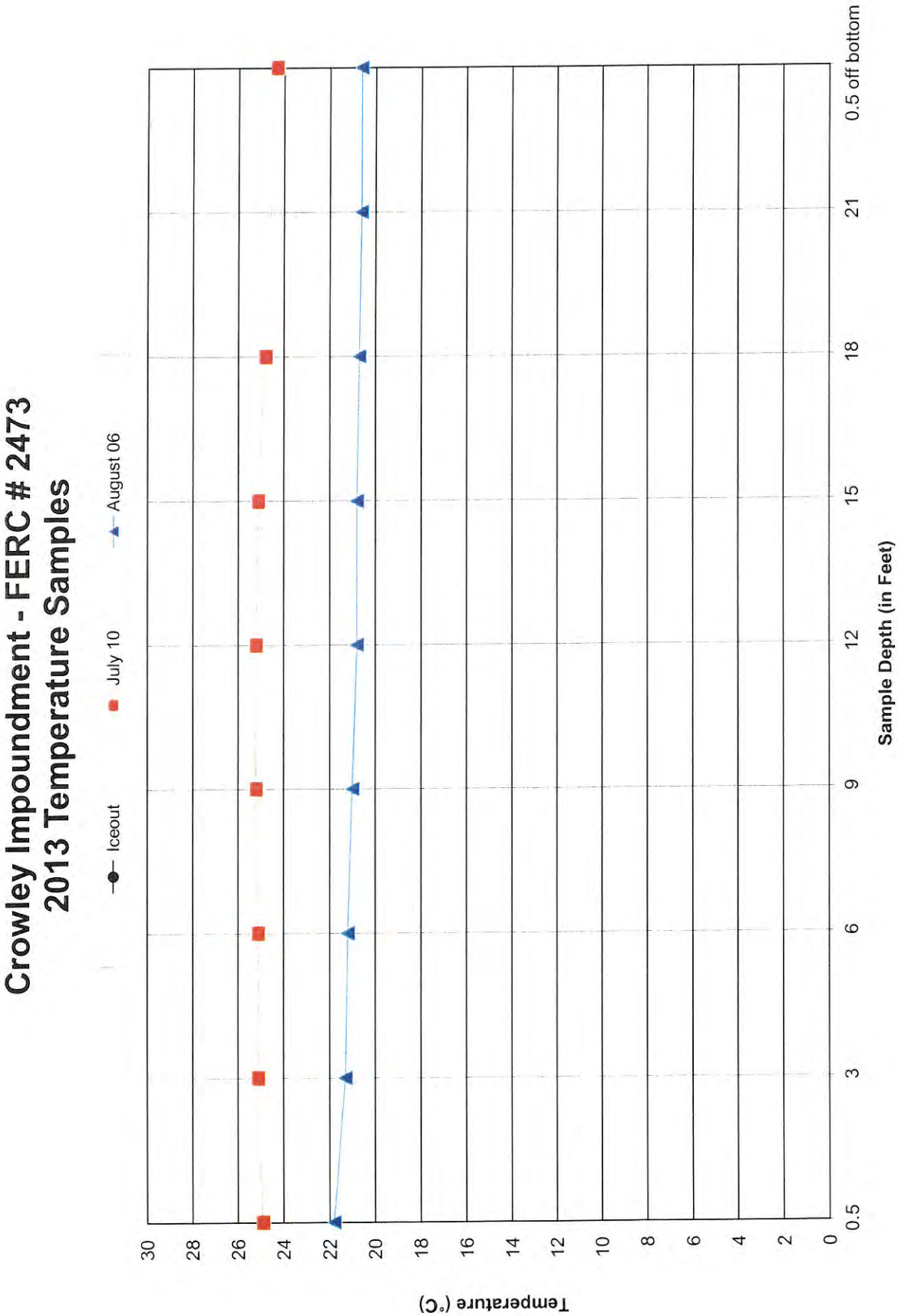
	Iceout 2013			July 9, 2013			August 6, 2013		
	Time	C.P.U. Units	LOD	Time	C.P.U. Units	LOD	Time	C.P.U. Units	LOD
3 feet below surface	N/A	N/A	N/A	1:07 PM	150.0	25*	1:09 PM	130.0	25*

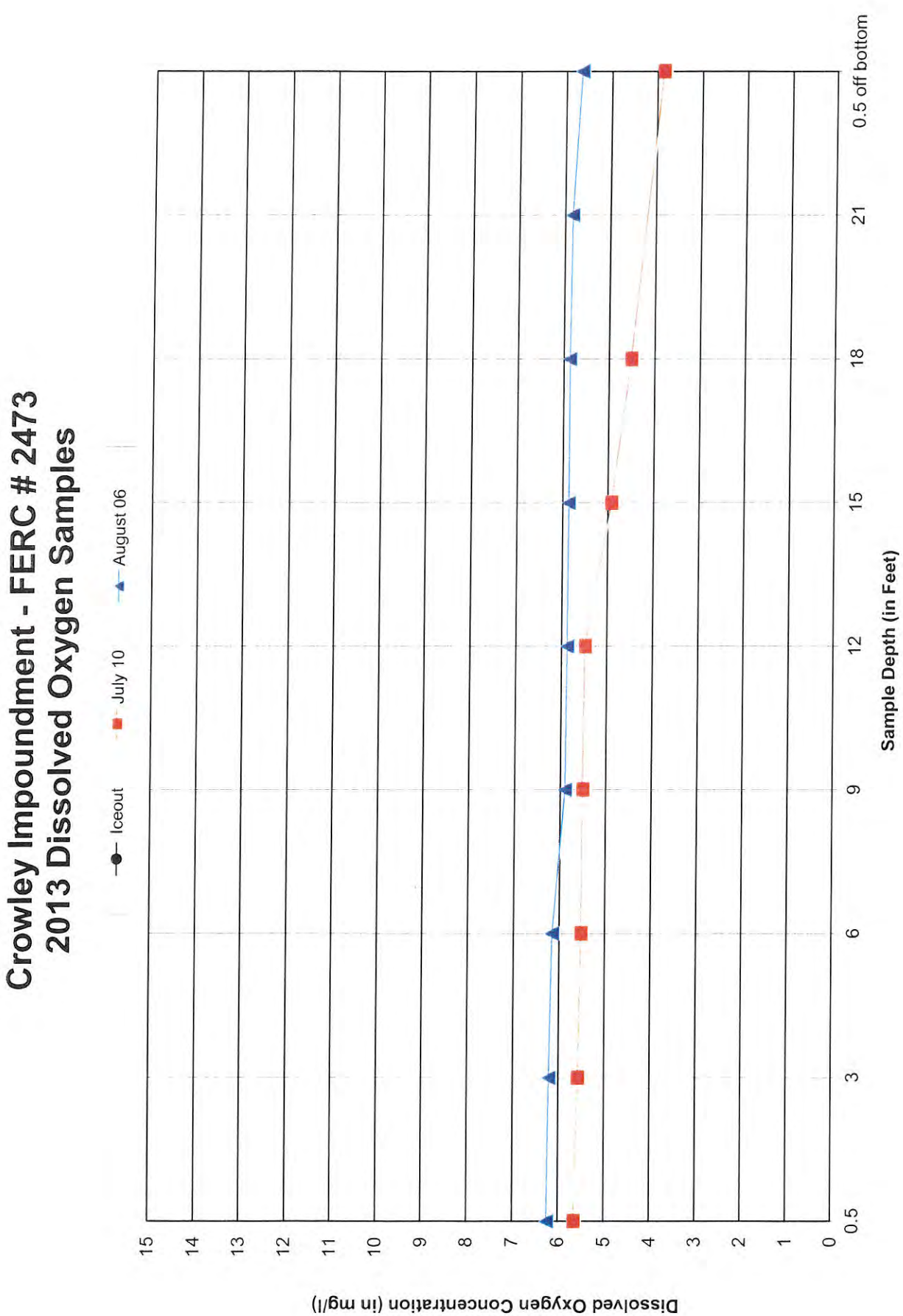
Total Phosphorus

	Iceout 2013			July 9, 2013			August 6, 2013		
	Time	mg/L	LOD	Time	mg/L	LOD	Time	mg/L	LOD
3 feet below surface	N/A	N/A	N/A	1:08 PM	0.046	0.0070*	1:11 PM	0.099	0.0070*
3 feet above bottom	N/A	N/A	N/A	1:09 PM	0.045	0.0070*	1:13 PM	0.063	0.0070*

* Considered Reporting Limits

2013 Temperature and Dissolved Oxygen Graphs





2013
Monthly Temperature
and
Precipitation
Table

2013 Water Year Monthly Temperature and Precipitation for Park Falls, 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-12	74	22	42.5	-0.7	691	678	1.34	1.1	2.85	47%
November-12	53	0	30.9	2.1	1015	1088	1.33	10.1	2.09	64%
December-12	48	-7	18.4	3.6	1438	1556	1.44	13.2	1.21	119%
January-13	42	-21	12.1	1.9	1631	1691	1.39	9.2	0.96	145%
February-13	38	-22	14.6	-0.5	1405	1399	1.16	19.1	0.81	70%
March-13	53	-13	21.8	-4.1	1333	1200	2.04	25.8	1.49	137%
April-13	68	8	34.4	-5.2	908	762	5.04	50.8	2.43	207%
May-13	80	27	49.5	-1.9	471	426	3.71	Trace	3.23	115%
June-13	87	37	61.6	1.5	146	179	4.54	0.0	4.23	107%
July-13	94	47	67.8	2.0	47	63	1.73	0.0	3.85	45%
August-13	94	43	69.0	4.7	27	86	1.98	0.0	3.70	54%
September-13	88	37	59.9	4.3	168	298	1.26	0.0	4.11	31%

Source: NOAA/Duluth, MN

2013
Flambeau Crowley
Sampling Comparison Table
2011—2013

Flambeau Crowley
Project Sampling Comparison Table
2011 Thru Current Year

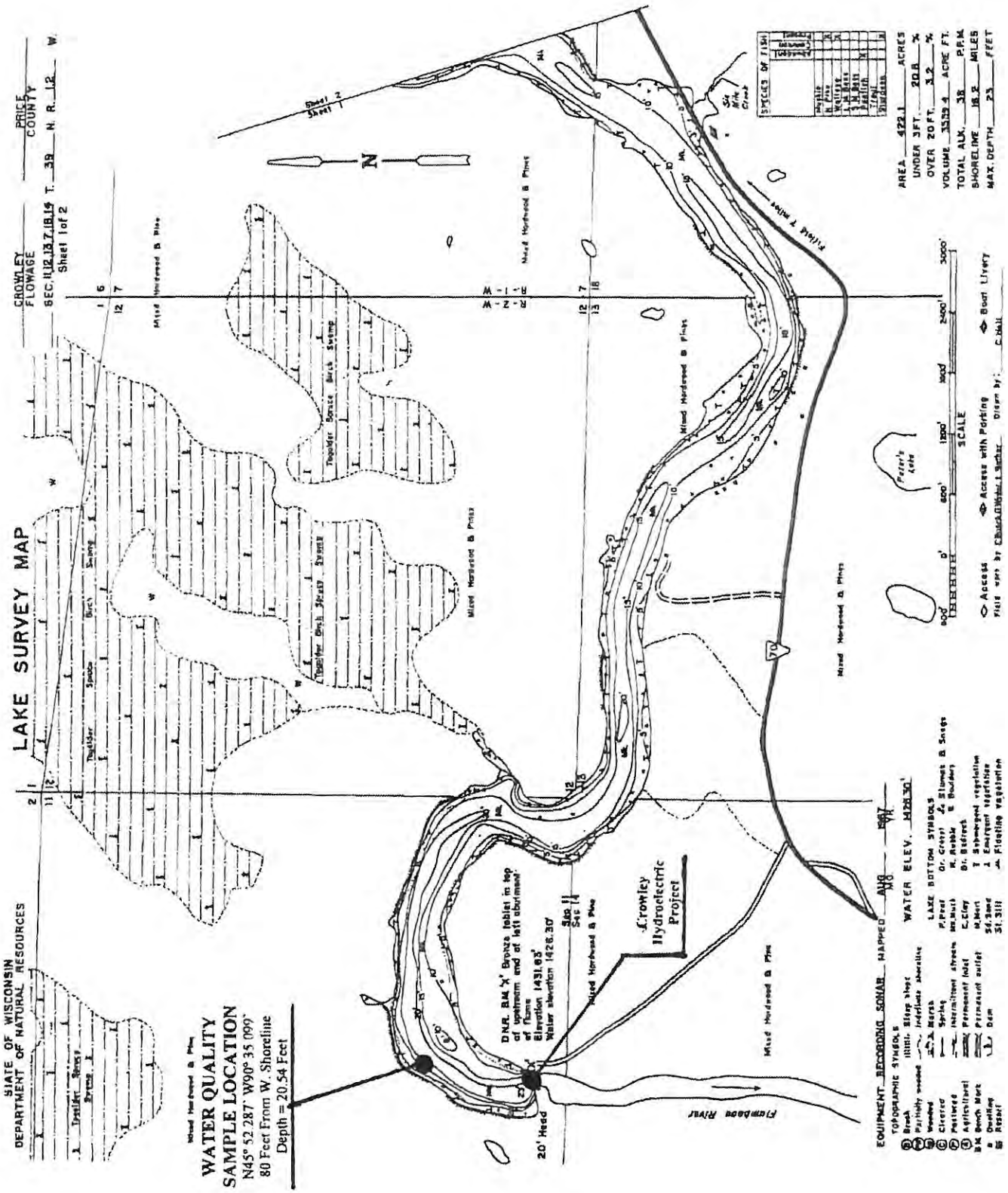
Year	Month	Secchi Depth (m)	Chlorophyll a ug/l	Color (True) C.P.U. Units	Total Phosphorus Below Surface mg/l	Total Phosphorus Above Bottom mg/l	Low D.O. mg/l	High D.O. mg/l	Low Water Temp. °C	High Water Temp. °C
2011	April	3.00	3.90	100.00	0.039	0.044	11.73	12.01	6.50	10.40
2012	April	3.30	1.70	120.00	0.041		9.30	10.37	8.80	11.80
2013	May									
Minimum	April/May	3.00	1.70	100.00	0.039	0.044	9.30	10.37	6.50	10.40
Maximum	April/May	3.30	3.90	120.00	0.041	0.044	11.73	12.01	8.80	11.80
Average	April/May	3.15	2.80	110.00	0.040	0.044	10.52	11.19	7.65	11.10
2011	July	2.90	21.00	80.00	0.061	0.075	3.52	8.90	24.40	26.20
2012	July	3.20	17.00	120.00	0.061	0.087	1.67	7.38	25.30	28.00
2013	July	3.00	5.50	150.00	0.046	0.045	3.83	5.65	24.60	25.20
Minimum	July	2.90	5.50	80.00	0.046	0.045	1.67	5.65	24.40	25.20
Maximum	July	3.20	21.00	150.00	0.061	0.087	3.83	8.90	25.30	28.00
Average	July	3.03	14.50	116.67	0.056	0.069	3.01	7.31	24.77	26.47
2011	August	3.30	14.00	140.00	0.051	0.051	7.96	7.96	22.40	25.40
2012	August	3.00	17.00	80.00	0.043	0.042	5.22	9.27	23.70	25.30
2013	August	3.10	4.80	130.00	0.099	0.063	5.65	6.24	20.60	21.80
Minimum	August	3.00	4.80	80.00	0.043	0.042	5.22	6.24	20.60	21.80
Maximum	August	3.30	17.00	140.00	0.099	0.063	7.96	9.27	23.70	25.40
Average	August	3.13	11.93	116.67	0.064	0.052	6.28	7.82	22.23	24.17

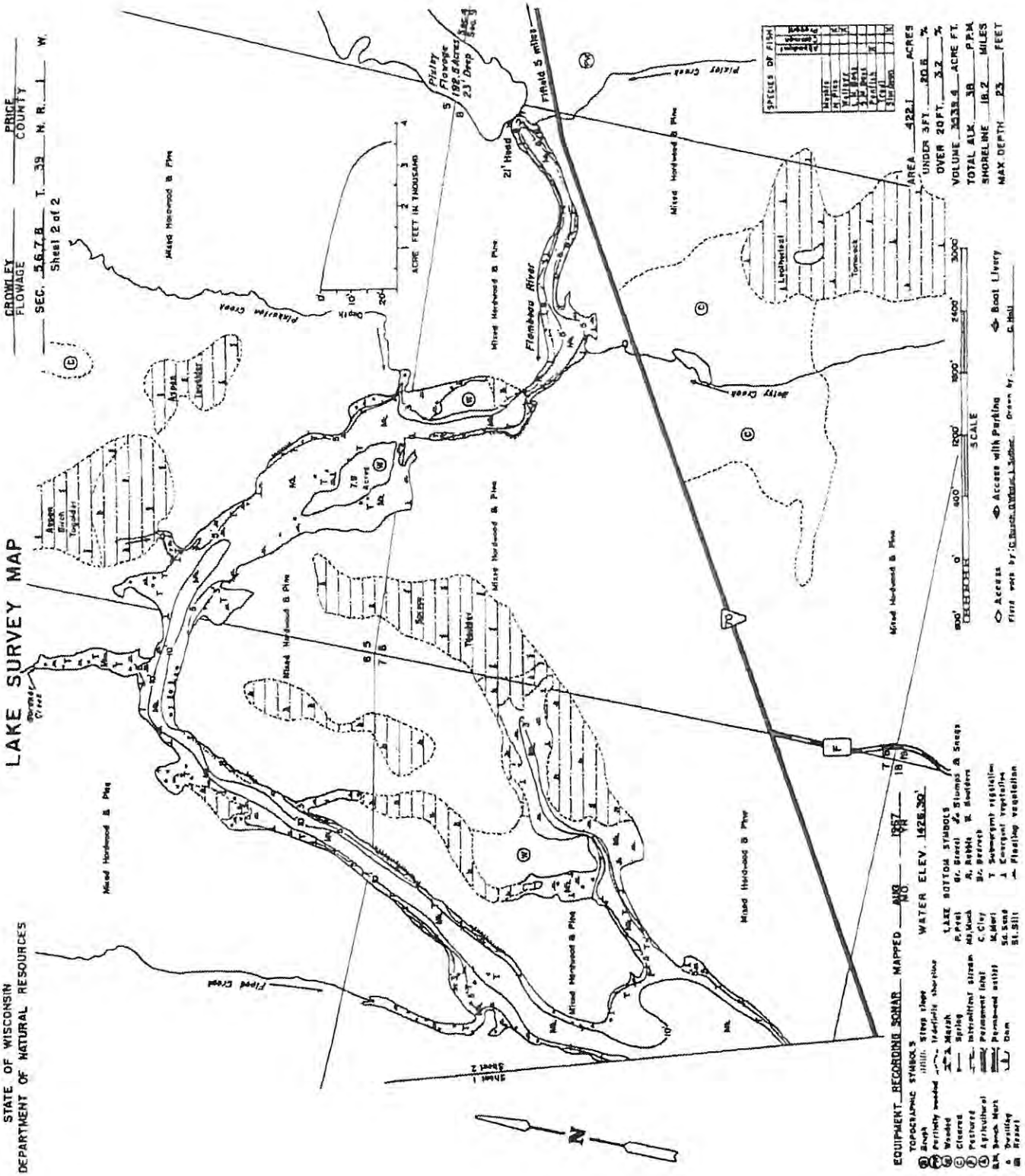
No Sample

Crowley Impoundment

Sampling Location

Map





Appendix A

Ice-Out 2013 Sampling Documents
No Sampling Done

Appendix B

July 9, 2013 Sampling Documents

IMPOUNDMENT SAMPLING LOG

2013 Water Quality Study - Flambeau Crowley Hydroelectric Project - FERC #2473

HWL - 1427.11
WL - 1406.2

Date: 7-9-13

Pre-Sampling Data: CFS 1230

Time: 1:00 Barometer: 29.8 Air Temp: 22 °C Wind Speed: 5 to 10

Sky Conditions: Cloudy - light rain off & on

Precipitation within Last 24 Hours: yes - .2 inches

D.O. Meter Calibration: Instrument Model Used: Hach HQ40d

Were The Batterys Changed? ☐ Yes ☒ No If Yes, When Changed: _____

Battery Status: 75% Charge

Calibration Time: March 1, 2013 Method: Factory

Sampling Depth Profile: Measured Depth to Bottom of the Impoundment: 22 Feet

Secchi Disk Depth: (E0.1 Foot) 3 Feet Time: 1:00

Chlorophyll a (3 Feet Below Surface)

Lab Sample I.D.#: 0709 2013 CA		
Time	Quantity (ml)	Filtered
1:05	1000 ml	NO

True Color (3 Feet Below Surface)

Lab Sample I.D.#: 0709 2013 CB	
Time	Quantity (ml)
1:07	250 mL

D.O. Sample Data

Depth	Time	D.O. (mg/l)	°C
.5 Ft Below Surface	1:10	5.65	24.9
3 Feet	1:11	5.57	25.1
6 Feet	1:12	5.51	25.1
9 Feet	1:13	5.50	25.2
12 Feet	1:14	5.47	25.2
15 Feet	1:17	4.91	25.1
18 Feet	1:20	4.50	24.8
21 Feet			
24 Feet			
.5 Ft Above Bottom	1:23	3.83	24.3

Phosphorus

Lab Sample I.D.#: 0709 2013 CC	
(3 Feet Below Surface)	
Time	Preserved?
1:08	H_2SO_4

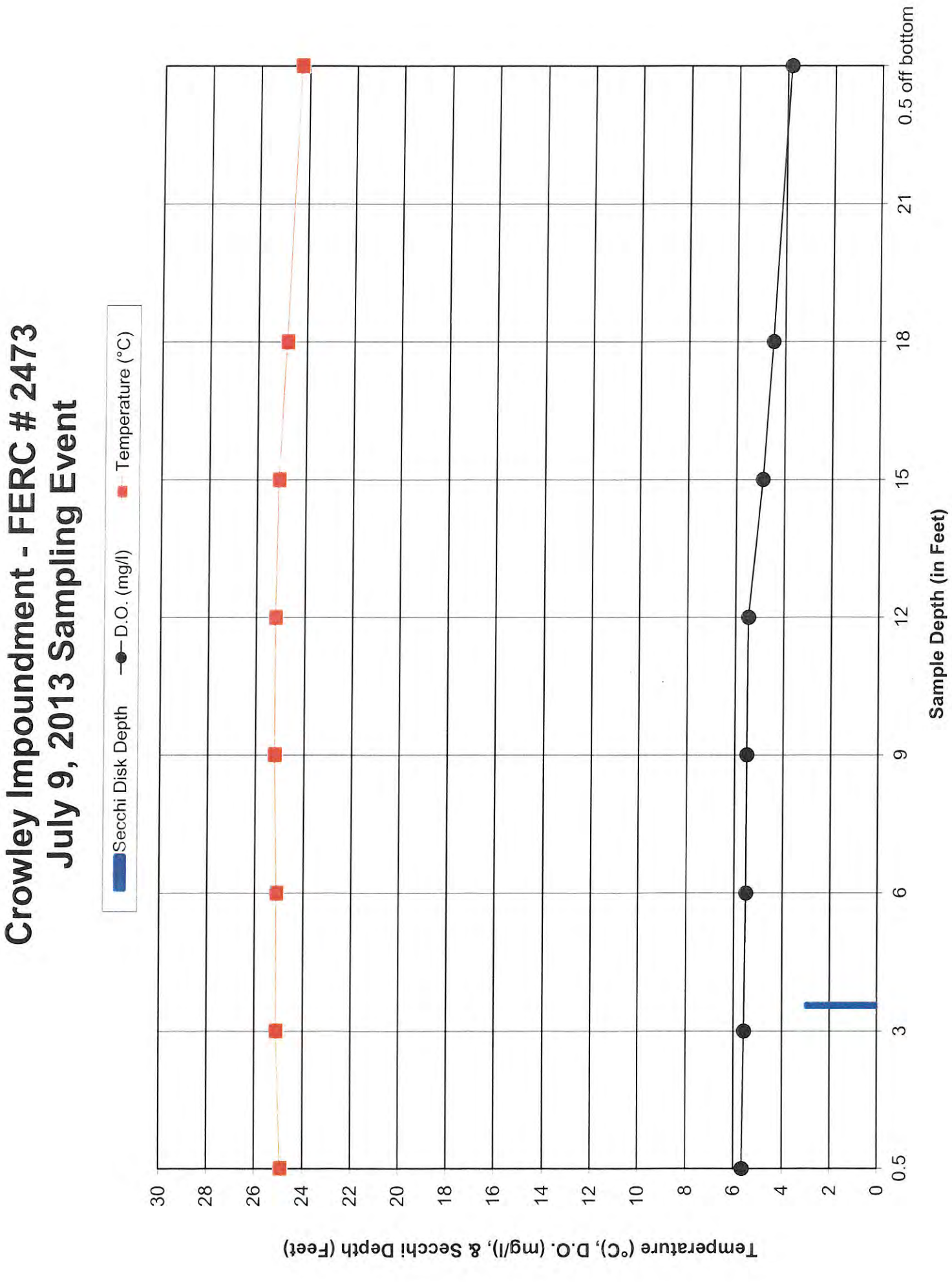
Lab Sample I.D.#: 0709 2013 CD	
(3 Feet Above Bottom)	
Time	Preserved?
1:09	H_2SO_4

Sample Location: N45° 52.287' W90° 35.099'

Comments:

31 - 1:15	5.24 mg/l	25.2°C
14' - 1:16	5.09 mg/l	25.1°C
16' - 1:18	4.66 mg/l	25.0°C
17' - 1:19	4.59 mg/l	24.9°C
19' - 1:21	4.42 mg/l	24.7°C
20 - 1:22	4.26 mg/L	24.6°C

Performed By: Anela R + Gary R



NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

NLS Project: 200316
NLS Customer: 102823
Phone: 855 994 9376

RECEIVED
JUL 16 2013

Client: Renewable World Energies
Attn: Gary Rast
100 State Street
P.O. Box 264
Neshkoro, WI 54960

Project: Flambeau (4)

07092013 1A NLS ID: 729864
COC: 153593:1 Matrix: SW
Collected: 07/09/13 07:34 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					07/12/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					07/10/13	NA	721026460

07092013 1B NLS ID: 729865
COC: 153593:1 Matrix: SW
Collected: 07/09/13 07:34 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	150	C.P.U.	10	50*		07/10/13	SM 2120-B 20ed	721026460

07092013 1C NLS ID: 729866
COC: 153593:1 Matrix: SW
Collected: 07/09/13 07:34 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.026	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 2A NLS ID: 729867
COC: 153593:2 Matrix: SW
Collected: 07/09/13 09:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					07/12/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					07/10/13	NA	721026460

07092013 2B NLS ID: 729868
COC: 153593:2 Matrix: SW
Collected: 07/09/13 09:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	150	C.P.U.	5	25*		07/10/13	SM 2120-B 20ed	721026460

07092013 2C NLS ID: 729869
COC: 153593:2 Matrix: SW
Collected: 07/09/13 09:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot as P	0.041	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 2D NLS ID: 729870
COC: 153593:2 Matrix: SW
Collected: 07/09/13 09:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.041	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 3A NLS ID: 729871
COC: 153593:3 Matrix: SW
Collected: 07/09/13 11:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					07/12/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					07/10/13	NA	721026460

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

NLS Project: 200316
NLS Customer: 102823
Phone: 855 994 9376

Client: Renewable World Energies
Attn: Gary Rast
100 State Street
P.O. Box 264
Neshkoro, WI 54960

Project: Flambeau (4)

07092013 3B NLS ID: 729872
COC: 153593:3 Matrix: SW
Collected: 07/09/13 11:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	150	C.P.U.	5	25*		07/10/13	SM 2120-B 20ed	721026460

07092013 3C NLS ID: 729873
COC: 153593:3 Matrix: SW
Collected: 07/09/13 11:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.044	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 3D NLS ID: 729874
COC: 153593:3 Matrix: SW
Collected: 07/09/13 11:06 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.043	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 4A NLS ID: 729875
COC: 153593:4 Matrix: SW
Collected: 07/09/13 13:09 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					07/12/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					07/10/13	NA	721026460

07092013 4B NLS ID: 729876
COC: 153593:4 Matrix: SW
Collected: 07/09/13 13:09 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	150	C.P.U.	5	25*		07/10/13	SM 2120-B 20ed	721026460

07092013 4C NLS ID: 729877
COC: 153593:4 Matrix: SW
Collected: 07/09/13 13:09 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.046	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

07092013 4D NLS ID: 729878
COC: 153593:4 Matrix: SW
Collected: 07/09/13 13:09 Received: 07/10/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.045	mg/L	1	0.0070*		07/11/13	SM 4500P-E 20ed	721026460

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and/or LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
MCL = Maximum Contaminant Levels for Drinking Water Samples. Shaded results indicate >MCL.

Reviewed by

Authorized by
R T Krueger
President

Northern Lake Service, Inc.
Chlorophyll Results

Customer: Renewable World Energies
Project: 200316
Flambeau (4)

Sample	Description	CC a	Pheo a	TC a	TC b	TC c
729864	07092013 1A	1.2	0.6	1.6	0.0*	0.1
729867	07092013 2A	2.7	0.61	3.2	0.0*	0.35
729871	07092013 3A	5.1	1.4	6.2	0.0*	0.53
729875	07092013 4A	4.7	1.1	5.5	0.049	0.47

CC a = Corrected Chlorophyll a
Pheo a = Pheophytin a
TC a = Trichromatic Chlorophyll a
TC b = Trichromatic Chlorophyll b
TC c = Trichromatic Chlorophyll c
Units = ug/L for Water, ug/cm² for periphyton samplers

*: The complex calculations used to differentiate the various chlorophyll species magnify error at low concentrations and sometimes produce negative values, which are reported as 0.0 on this report.

Appendix C

August 6, 2013 Sampling Documents

IMPOUNDMENT SAMPLING LOG

2013 Water Quality Study - Flambeau Crowley Hydroelectric Project - FERC #2473

Pre-Sampling Data: HWL - 1427.25 TWL - 1405.9 Date: 8/6/13 CFS - 855

Time: 1:00 Barometer: 29.81 Air Temp: 22 °C Wind Speed: SW 10MPH

Sky Conditions: PARTLY CLOUDY + PARTIAL SUN

Precipitation within Last 24 Hours: YES

D.O. Meter Calibration: Instrument Model Used: Hach HQ40d

Were The Batterys Changed? ☐ Yes ☒ No If Yes, When Changed: _____

Battery Status: 100 % Charge

Calibration Time: APRIL 2013 Method: Factory

Sampling Depth Profile: Measured Depth to Bottom of the Impoundment: 22.0 Feet

Secchi Disk Depth: (E0.1 Foot) 3.1 Feet Time: 1:05

Chlorophyll a (3 Feet Below Surface)

Lab Sample I.D.#: 0806 2013 - 4A		
Time	Quantity (ml)	Filtered
1:07	1000	NO

True Color (3 Feet Below Surface)

Lab Sample I.D.#: 0806 2013 - 4B	
Time	Quantity (ml)
1:09	250

D.O. Sample Data

Depth	Time	D.O. (mg/l)	°C
.5 Ft Below Surface	1:15	6.24	21.8
3 Feet	1:16	6.20	21.3
6 Feet	1:17	6.15	21.2
9 Feet	1:18	5.89	21.0
12 Feet	1:19	5.87	20.8
15 Feet	1:20	5.86	20.8
18 Feet	1:21	5.86	20.7
21 Feet	1:22	5.83	20.6
24 Feet			
.5 Ft Above Bottom	1:23	5.65	20.6

Phosphorus

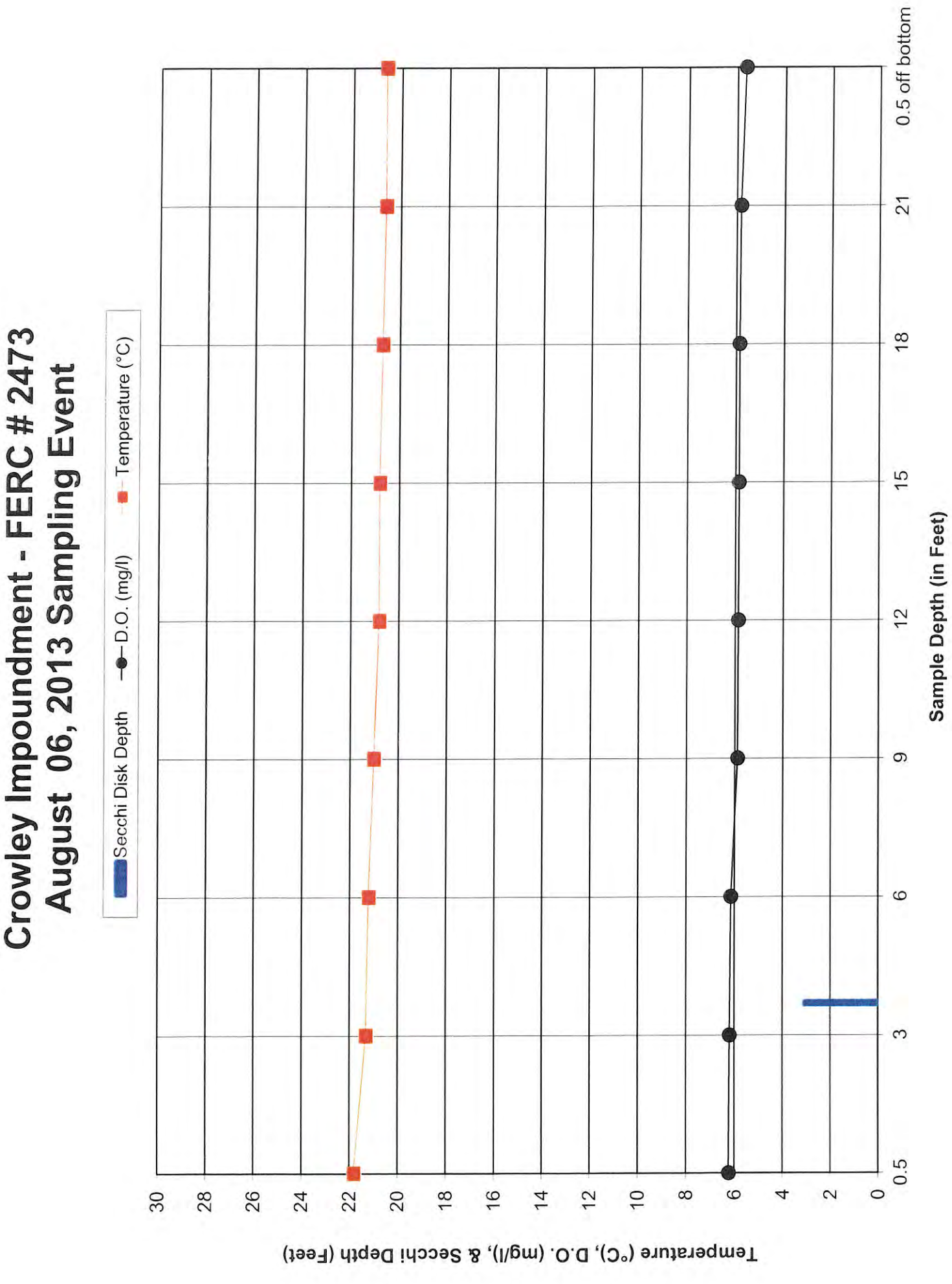
Lab Sample I.D.#: 0806 2013 - 4C (3 Feet Below Surface)	
Time	Preserved?
1:11	H_2SO_4

Lab Sample I.D.#: 0806 2013 - 4D (3 Feet Above Bottom)	
Time	Preserved?
1:13	H_2SO_4

Sample Location: N45° 52.287' W90° 35.099'

Comments: _____

Performed By: GARY RAST + JIM TESCH



NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

RECEIVED
AUG 19 2013

NLS Project: 202117
NLS Customer: 102823
Phone: 855 994 9376

Client: Renewable World Energies
Attn: Gary Rast
100 State Street
P.O. Box 264
Neshkoro, WI 54960

Project: Flambeau (4)

08062013-1A NLS ID: 735574
COC: 162646:1 Matrix: SW
Collected: 08/06/13 07:25 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					08/13/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					08/07/13	NA	721026460

08062013-1B NLS ID: 735575
COC: 162646:1 Matrix: SW
Collected: 08/06/13 07:25 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	130	C.P.U.	5	25*		08/07/13	SM 2120-B 20ed	721026460

08062013-1C NLS ID: 735576
COC: 162646:1 Matrix: SW
Collected: 08/06/13 07:25 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.066	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-2A NLS ID: 735577
COC: 162646:2 Matrix: SW
Collected: 08/06/13 09:12 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					08/13/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					08/07/13	NA	721026460

08062013-2B NLS ID: 735578
COC: 162646:2 Matrix: SW
Collected: 08/06/13 09:12 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	130	C.P.U.	5	25*		08/07/13	SM 2120-B 20ed	721026460

08062013-2C NLS ID: 735579
COC: 162646:2 Matrix: SW
Collected: 08/06/13 09:12 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.071	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-2D NLS ID: 735580
COC: 162646:2 Matrix: SW
Collected: 08/06/13 09:12 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.11	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-3A NLS ID: 735581
COC: 162646:3 Matrix: SW
Collected: 08/06/13 11:15 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					08/13/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					08/07/13	NA	721026460

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

NLS Project: 202117
NLS Customer: 102823

Client: Renewable World Energies
Attn: Gary Rast
100 State Street
P.O. Box 264
Neshkoro, WI 54960

Phone: 855 994 9376

Project: Flambeau (4)

08062013-3B NLS ID: 735582
COC: 162646:3 Matrix: SW
Collected: 08/06/13 11:15 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	150	C.P.U.	5	25*		08/07/13	SM 2120-B 20ed	721026460

08062013-3C NLS ID: 735583
COC: 162646:3 Matrix: SW
Collected: 08/06/13 11:15 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.11	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-3D NLS ID: 735584
COC: 162646:3 Matrix: SW
Collected: 08/06/13 11:15 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.071	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-4A NLS ID: 735585
COC: 162646:4 Matrix: SW
Collected: 08/06/13 13:13 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Chlorophyll, all species	see attached					08/13/13	10200-H	721026460
Lab filtration for Chlorophyll	yes					08/07/13	NA	721026460

08062013-4B NLS ID: 735586
COC: 162646:4 Matrix: SW
Collected: 08/06/13 13:13 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Color, APHA (true)	130	C.P.U.	5	25*		08/07/13	SM 2120-B 20ed	721026460

08062013-4C NLS ID: 735587
COC: 162646:4 Matrix: SW
Collected: 08/06/13 13:13 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.099	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

08062013-4D NLS ID: 735588
COC: 162646:4 Matrix: SW
Collected: 08/06/13 13:13 Received: 08/07/13

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.063	mg/L	1	0.0070*		08/07/13	SM 4500P-E 20ed	721026460

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and/or LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution.

LOD = Limit of Detection LOQ = Limit of Quantitation ND = Not Detected (< LOD) 1000 ug/L = 1 mg/L
DWB = Dry Weight Basis NA = Not Applicable %DWB = (mg/kg DWB) / 10000
MCL = Maximum Contaminant Levels for Drinking Water Samples. Shaded results indicate >MCL.

Reviewed by:

Authorized by
R. T. Krueger
President

Northern Lake Service, Inc.
Chlorophyll Results

Customer: Renewable World Energies
Project: 202117
Flambeau (4)

Sample	Description	CC a	Pheo a	TC a	TC b	TC c
735574	08062013-1A	5.4	0.74	6	0.12	0.65
735577	08062013-2A	4.8	0.67	5.3	0.1	0.42
735581	08062013-3A	5.7	0.57	6.3	0.14	0.59
735585	08062013-4A	4	1.2	4.8	0.059	0.36

CC a = Corrected Chlorophyll a
Pheo a = Pheophytin a
TC a = Trichromatic Chlorophyll a
TC b = Trichromatic Chlorophyll b
TC c = Trichromatic Chlorophyll c
Units = ug/L for Water, ug/cm² for periphyton samplers

*: The complex calculations used to differentiate the various chlorophyll species magnify error at low concentrations and sometimes produce negative values, which are reported as 0.0 on this report.

Appendix D

Agency Correspondence

Renewable World Energies

COPY

November 6, 2013

Mr. Nick Utrup
U.S. Fish and Wildlife Service
WI MN Ecological Services Field Office
4101 American Boulevard East
Bloomington, MN 55425

Ms. Cheryl Laatsch
Statewide FERC Coordinator
Wisconsin Dept. of Natural Resources
N7725 HWY 28
Horicon, WI 53032

Re: **Flambeau Hydroelectric Projects**
FERC Project Numbers-Upper FERC # 2640, Lower FERC # 2421,
Pixley FERC # 2395, Crowley FERC # 2473
Flambeau Hydro LLC
Draft Reports 2013 Water Quality Monitoring Data

Dear Agencies:

On behalf of Flambeau Hydro LLC ("Flambeau"), Licensee, Renewable World Energies, LLC is submitting a copy of its *Draft Report 2013 Water Quality Monitoring Data* for each of the Flambeau Projects. No problems were encountered with equipment, data, or the monitoring schedule in general. The report is a requirement of Flambeau's Federal license pursuant to article 406 and 408 and the approved Water Quality Monitoring Plans. The purpose of this letter is to formally invite you to comment on the draft reports. The Federal Energy Regulatory Commission's regulations allow for a 30 day formal review and comment period. Nothing out of the ordinary was experienced during the 2013 monitoring season except as noted in the reports. Thank you in advance for providing your responses in a timely manner so we can include your comments and recommendations, as appropriate, into our reports.

If you have any questions concerning the report, please contact Mr. Gary Rast at the Renewable World Energies, LLC offices @ 855-994-9376 ext. 105, or by email at: grast@rwehydro.com

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100 S. State Street
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1001 Stephenson Street
Norway, MI 49870
Fax: 906-563-9344

Renewable World Energies

Sincerely,
Renewable World Energies, LLC
Agent For Licensee

Mr. Jason Kreuscher
Vice President, Operations

Attachments: Draft Report 2013 Water Quality Monitoring Data Flambeau Upper Hydroelectric Project – November 1, 2013

Draft Report 2013 Water Quality Monitoring Data Flambeau Lower Hydroelectric Project – November 4, 2013

Draft Report 2013 Water Quality Monitoring Data Flambeau Pixley Hydroelectric Project – November 5, 2013

Draft Report 2013 Water Quality Monitoring Data Flambeau Crowley Hydroelectric Project – November 6, 2013

Cc: RWE, Corporate

Gary Rast

From: Gary Rast
Sent: Wednesday, July 10, 2013 7:56 PM
To: Laatsch, Cheryl - DNR (Cheryl.Laatsch@Wisconsin.gov); Nick Utrup (nick_utrup@fws.gov)
Cc: 'Jason Kreuscher'; Ben Richard; Shawn Wille; Aneta Rietveld; David Anderson
Subject: Below Standard DO AT Crowley, Clam River, And Danbury

Cheryl and Nick,

Performed the water quality sampling at the Flambeau projects on the 9th of July – Flambeau Upper/Flambeau Lower/Flambeau Pixley – All DO readings above 5.0 mg/l. However, the Flambeau Crowley project had DO readings below standard beginning at the 15' level of 4.91 mg/l and 24.8°C. Readings were then taken every 1' to 20' and then .5' above the bottom with DO dropping to a low of 3.83 mg/l and 24.3°C at .5' above the bottom.

Performed water quality sampling at the Clam River project on the 10th of July. DO dropped below standard at the 1 meter level with a reading of 4.90 mg/l and 24.1°C. Readings were taken every ½ meter to a depth of 7 meters and the .5 meters above the bottom. DO was the lowest at .5 meter above bottom with a reading of .97 mg/l and 23.7°C.

Performed water quality sampling at the Danbury project as well on the 10th of July. DO dropped below standard at the 1.5 meter level with a reading of 4.84 mg/l and 24.6°. Reading were taken every ½ meter to 5 meters and then .5 meters above bottom. Do was the lowest at the .5 meter above bottm with a reading of 4.37 mg/l and 24.1°C.

Full results will be provided in the year end Water Quality Monitoring Reports for each project.

Additional note: Winter project results from the 8th of July were all above standard.

Thanks

Gary

Gary Rast
Regulatory/Compliance Manager

Renewable World Energies

Renewable World Energies, LLC
100 S. State Street
P.O. Box 264
Neshkoro, WI 54960
Phone: 855-994-9376 Ext. 105
Fax: 920-293-4100
Cell: 920-570-0995
E-mail: grast@rwehydro.com

Gary Rast

From: Gary Rast
Sent: Wednesday, May 22, 2013 4:02 PM
To: Laatsch, Cheryl - DNR (Cheryl.Laatsch@Wisconsin.gov); Aartila, Tom P - DNR (Tom.Aartila@Wisconsin.gov); Nick Utrup (nick_utrup@fws.gov); Jeffrey.Scheirer@Wisconsin.gov
Cc: 'Jason Kreuscher'; Shawn Wille; Aneta Rietveld
Subject: Flambeau Upper Lower Pixley Crowley Ice Out WQ Sampling

Everyone,

About 1to 1.5 weeks ago I notified you that because of water conditions and no boat barriers being installed at the Flambeau projects the Ice-Out WQ monitoring would or could not be performed during the 2 week time period following Ice-Out. On Monday 5/20 I was notified that the barriers were installed and river conditions were approaching more normal conditions. Because weather looked favorable for Thursday 5/23 I made plans for that day. I was not aware that the area had received so much rain in the past couple of days and that runoff from surrounding areas were contributing so much. River conditions today 5/22 are horrible to say the least, about 1000 CFS more than when you were originally notified. I believe they are slightly one side or the other of 4000 CFS. I have been informed that another 500 CFS is to be released from the flowage later today, so conditions will worsen. I spoke to Jeff less than an hour ago and discussed doing some sort of modified monitoring while I am here. We agreed that was not a good thing because comparison to other years Ice-Out results would be very hard to make and the effort would not be worth much. Jeff and I agreed to skip the Ice-Out sampling all together because the effort would not yield good results and the safety concerns involving the monitoring. RWE asks for your understanding and agreement. Thanks

Gary

Gary Rast
Regulatory/Compliance Manager

Renewable World Energies

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Cell: 920-570-0995
E-mail: grast@rwehydro.com

Gary Rast

From:	Gary Rast
Sent:	Monday, May 13, 2013 10:13 AM
To:	Laatsch, Cheryl - DNR (Cheryl.Laatsch@Wisconsin.gov); Nick Utrup (nick_utrup@fws.gov)
Cc:	'Jason Kreuscher'; Shawn Wille
Subject:	Flambeau Ice Out Water Quality Sampling
Attachments:	Flam Upper.JPG; Flam Lower.JPG; Flam Pixley.JPG; Flam Crowley.JPG

Cheryl and Nick,

Was up in North West Wisconsin and did Ice Out sampling at Winter, Clam River, and Danbury hydro projects. Water was high but boat buoys were in and was able to accomplish the sampling event. However, attached are photos from the 4 Flambeau projects from mid – week (5-5 thru 5-11) showing conditions. I was not able to sample because of high water conditions. The fact that the boat buoys are not in place yet because of those conditions made it even more dangerous. Technically this week is the 2nd week after Ice-Out which is the time frame allotted by the WQ Monitoring Plans. Just want to inform you that this sampling event will not happen this week because conditions have not improved and will be done outside of the approved time frame following Ice-Out. When conditions improve and boat buoys are installed RWE will perform the Ice-Out sampling at these projects.

Thanks for your understanding.

Gary

Gary Rast
Regulatory/Compliance Manager

Renewable World Energies

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