Renewable World Energies

February 27, 2018

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

RE: Winter Hydroelectric Project, FERC Project #2064
Flambeau Hydro LLC
Final Report 2017 Land & Wildlife Management Report

FERC License Article 404
USDA Forest Service 4(e), Condition 10
Wisconsin DNR 401 Water Quality Certification, Item Letter P, Q, R

Dear Ms. Bose:

On behalf of Flambeau Hydro LLC, Licensee, Renewable World Energies LLC hereby submits the Licensee's 2017 Final Land and Wildlife Management Report for the Winter Hydroelectric Project FERC #2064. The Draft Report was sent to the agencies by letter dated November, 2017, and attached to an e-mail dated November 16, 2017 asking for comment. There were no comments.

Background

The Federal Energy Regulatory Commission "FERC" issued a License to Flambeau on August 12, 2005. Portions of the original Certification were contested by the Licensee. The Wisconsin Department of Natural Resources (WDNR) submitted a revised Water Quality Certification, Dated at Park Falls, WI:

August 19, 2008 that replaced the original certification of June 21, 2005. Only conditions E, F, and J were modified and a footnote was added to condition D according to the Final Settlement Agreement.

The submitted report is a requirement of the License pursuant to Article 404, Forest Service (FS) Condition 10, and WDNR Water Quality Certification Item Letter P, Q, and R. The Land & Wildlife Management Plan was filed with FERC on December 19, 2008. FERC issued an Order Modifying and Approving the plan on June 3, 2011.

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2017 Results

Wood Turtle Survey

The wood turtle survey was conducted on June 14, 2017. The tailrace (9:30-10:10), the impoundment (10:18-12:15), and the bypass channel (12:30-1:00) were surveyed in succession. No wood turtles were sighted by the licensee although two painted turtles and one spiny soft shell turtle were observed in the impoundment basking on rocks. Two trumpeter swans, a king fisher, and a muskrat were also noticed. An eagle's nest was observed on the north side of the stream in a white pine (45.93200, -90.93633). As noted in previous reports, RWE has notified the WDNR, FS and USFWS of this eagle's nest. One mature eagle was sighted by a nest 6/14/2017. Snapping turtle eggs and evidence of snapping turtles were observed in the tailrace. Three map turtles and three spiny softshell turtles (Figure 2) were observed in the power canal as the field crew drove to the upper end of the bypass channel. The next survey will be completed in the summer of 2018.

Invasive Species Survey

The survey was conducted by White Water Associates on August 9, 2017. No aquatic or terrestrial invasive species were observed on in or adjacent to the Flambeau Hydro LLC land, adjacent to the tailrace, or adjacent to the bypass channel. The impoundment was surveyed and purple loosestrife and narrow-leaved cattails were found in or adjacent to the impoundment. The next formal survey to be conducted will be in 2017.

Purple Loosestrife Survey

The survey was conducted by White Water Associates on August 9, 2017 in conjunction with the Invasive Species Survey. The Tailrace, Bypass Reach, and FHLLC Property were surveyed and no purple loosestrife plants were observed. Three (3) instances of Purple loosestrife were observed at WNTRPL003(20 plants, some pulled), WNTRPL005(8 plants all pulled), and WNTRPL005a(25+ plants none pulled) in locations adjacent to the Impoundment. The sites all had previous occurrences of the invasive plant. No purple loosestrife was observed on Flambeau Hydro LLC land, adjacent to the tailrace, or adjacent to the bypass channel. The next formal survey to be conducted will be in 2018.

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Erosion Survey

On June 14, 2017 White Water Associates, Inc. performed an erosion survey at the Winter Hydroelectric Project. The tailrace reach was surveyed on foot and no unusual erosion sites were observed. The *FHLLC owned property within the project boundary* was surveyed on foot and one (1) minor erosion site was observed. The site appears much the same as it did in past surveys. Human activity at this site appears to be what has caused this to be classed as an erosion site. It is unlikely to contribute noticeable sediment discharge to the river in its current condition. The *bypass reach* had fifteen (15) new erosion sites due to the heavy rain events in 2016. Slumping of the bank due to weathering was the cause of the erosion at these sites. The *impoundment* was surveyed by boat and one (1) erosion site was observed. It is not located on FHLLC property, is considered minor, and has been growing more grass than in previous surveys. The next formal spring inspection will be performed in 2020.

Wolf Survey

Formal surveys were conducted for the gray wolf at the Winter Hydro Project in 2016 per approved protocol and began on the first snowfall on November 13, 2015. They ended with the last snowfall on March 17, 2016. No wolves or dens were noted. However, wolf scat was observed at the end of the canoe portage trail during the wood turtle survey on June 20th, 2016. The 2016-2017 wolf survey began November 24, 2017 and ended April 11, 2017. There were no wolves, dens, or scat noted. The next Wolf survey (2017 – 2018) will begin with the first snow fall in the fall of 2017 and end on March 31, 2018. This will be reported in the 2018 report.

Bald Eagle Survey

No formal surveys were conducted for the Bald Eagle at the Winter Hydro Project in 2017 per approved plan which said agencies would be notified should any Eagle Nests be found located within the project boundary but while conducting the turtle survey in 2016 a nest was observed and in 2017 the same nest had an eagle perched next to it (Figure 1). One nest was observed during the wood turtle survey on June 20, 2016. It did not appear active. It was observed on the north side of the stream in a white pine (45.93200, -90.93633). As noted in previous reports, RWE has notified the WDNR, USFS and USFWS of this eagle's nest. On June, 14, 2017 an eagle's nest was found in the same location as in 2016 and there was an adult eagle perched near the nest. A data sheet is attached at the end of the report. RWE will continue to monitor the nest during the other surveys conducted throughout the monitoring season. It will be re-visited again during the 2018 season but *no formal survey will be conducted.*

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

Sincerely,
Renewable World Energies, LLC
Agent for Licensee

For Mr. Jason Kreuscher
Vice President

Attachment: Final Report 2017 Land & Wildlife Management Report
Correspondence

Cc: RWE Corporate
Mr. Nick Utrup, USFWS
Ms. Cheryl Laatsch, WDNR
Mr. Paul Strong, Forest Supervisor, FS
Ms. Sue Reinecke, FS
Mr. Dale Higgins, FS

2017 LAND & WILDLIFE MANAGEMENT FINAL REPORT

(Per FERC License Article 404)

Per USDA Forest Service 4(e) Condition 10
Per WDNR Revised 401 Water Quality Certification Item Letter P, Q, R

Winter Hydroelectric Project
FERC Project #2064
Flambeau Hydro, LLC

East Fork of the Chippewa River, Sawyer County, Wisconsin

Respectfully Submitted by:

Renewable World Energies
100 South State Street
Neshkoro, Wisconsin 54960

Final Report – December 2017

Table of Contents

Appendices

I
Plan Requirements & Approval

1. The Federal Energy Regulatory Commission (FERC) issued a new license on August 12, 2005 to Flambeau Hydro LLC. The license is for the continued operation and maintenance of the 600 KW Winter Project (No. 2064), located in Sawyer County on the East Fork of the Chippewa River. As such, the Federal Energy Regulatory Commission incorporated the following requirement into the new license:

FERC License Article 404 - Land and Wildlife Management Plan

Within six months of license issuance, the licensee shall file for Commission approval a plan to manage land and wildlife at the project. The plan shall be prepared after consultation with the Wisconsin Department of Natural Resources (Wisconsin DNR), the U.S. Forest Service, and the U.S. Fish and Wildlife Service (FWS). Measures to protect threatened and endangered species (i.e., bald eagle, gray wolf) at the project, as well as other wildlife habitat of concern, shall be included in the land and wildlife management plan. In addition, the plan shall include guidelines for the managing vegetation, habitat, and ground-disturbing activities in accordance with condition 10 in appendix B of this license, and shall be consistent with the bald eagle and gray wolf management guidelines of the FWS, Forest Service, and Wisconsin DNR. The plan shall include, at a minimum, the following:

1. *Procedures for obtaining and documenting bald eagle nesting activity and the presence of gray wolves on an annual basis, and for maintaining the information on project maps for use when planning land disturbing activities such as vegetation control or recreation facility development;*

2. *Consultation with the Wisconsin DNR, Forest Service, and FWS prior to conducting land disturbing activities that could affect any of the threatened and endangered species using project land;*

3. *Measures to protect Regional Forester Sensitive Species and Management Indicator Species; and*

4. *Measures to control erosion from trails, parking lots and shoreline areas; and; annual consultation with the resource agencies to allow for periodic management plan updates and to obtain agency input regarding proposed management decisions.*

The licensee shall include with the land and wildlife management plan documentation of agency consultation, including copies of agency comments and recommendations on the draft plan, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations, before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. The land and Wildlife management plan shall not be implemented until the licensee is notified that the plan is approved. Upon approval, the licensee shall implement the plan according to the approved schedule, including any changes required by the Commission.

2. Attached to the FERC License, and as Appendix B, are the USDA Forest Service Conditions. As such the USDA Forest Service incorporated the following condition into the FERC License:

USDA Forest Service Condition No. 10 – Vegetation, Habitat and Ground-disturbing Activities on National Forest System Lands

Within one year of license issuance or at least 90 days prior to vegetation, habitat, and/or ground-disturbing activity, whichever comes first the Licensee shall file with the Commission a Vegetation, Habitat, and Ground-Disturbing Management Plan (Plan) that is approved by the Forest Service. The Plan shall be site specific and be prepared in consultation with the appropriate Federal and State resource agencies for all tree or vegetation removal, habitat, and/or ground-disturbing activities on, or effecting, National Forest System lands.

The Plan shall implement measures to prevent the Spread of non-native invasive species; minimize erosion as well as sedimentation; protect, mitigate, or enhance terrestrial and fisheries habitat; and provide for adaptive management measures based on prescribed monitoring objectives over the life of the license. The Licensee shall not file any such plans with the Commission or commence any such activities without written approval from the USDA Forest Service.

At a minimum, and where relevant, the Plan shall include the following provisions:

Notification to the Chequamegon-Nicolet National Forest before the Licensee begins any vegetation or ground disturbing work;
The Licensee's plan shall comply with USDA Forest Service and Chequamegon-Nicolet National Forest sensitive species and non-native invasive species management guidelines and protocols, including prevention, control, and monitoring protocols;
Identification of methods for prevention and control of non-native invasive species. Treatment of existing infestations of highest priority non-native invasive species shall be initiated immediately upon completion of appropriate National Environmental Policy Act (NEPA) documentation and approval of the Plan by the Commission;
Notification to the Chequamegon-Nicolet National Forest upon the Licensee finding new locations for any listed non-native invasive species and/or prior to any independent actions at non-native invasive species control efforts;
Timing to establish vegetation of disturbed soils as soon as possible;
Identification and prioritization of any erosion areas to be re-vegetated or rehabilitated;
Procedures for identification of additional measures that the Licensee shall implement if monitoring reveals that re-vegetation and vegetation control is not successful or does not meet intended objectives;
Disclosure of any temporary habitat and/or ground-disturbing measures the Licensee will use;
A list of species to be used, planting location, and site preparation methods.
Emphasis shall be to use native species and to follow the Forest's Land and Recourse Management Plan as well as the Wisconsin's Forestry Best Management practices for Water Quality, Identification of measures the Licensee will use to mitigate project effects on terrestrial and aquatic habitat including any identified habitat threats, as well as measures designed to enhance habitat, including restoration of wetland, riparian, and aquatic systems;

Be updated to meet standards and guidelines that are applicable to the Chequamegon-Nicolet National Forest;
Be updated as new information is obtained in consultation with the agencies and submit the updated plan to the Forest Service and Commission for approval;
A monitoring program to evaluate the effectiveness of re-vegetation, vegetation control and/or non-native invasive species control measures; and Identify a timeline for accomplishing plan objectives.

3. Attached to the FERC License, and as Appendix A, are the Wisconsin Department of Natural Resources (WDNR) 401 Revised Water Quality Certification Dated at Park Falls WI: August 19, 2008 Item Letter P, Q, and R. As such the WDNR incorporated the following conditions into the FERC License:

Wisconsin Department of Natural Resources 401 Water Quality Certification Item Letter P, Q, and R

P. The licensee shall annually inspect the entire shoreline of the project waters for purple loosestrife (Lythrum salicaria) and map its distribution and relative abundance. Inspections should be scheduled in August while plants are flowering so purple loosestrife can be readily identified. The licensee should submit a report of the monitoring results to the Department by December 31 each year. If the Department deems it necessary to initiate or expand efforts to control purple loosestrife in the East Fork Chippewa River, the licensee shall provide reasonable cooperation in those efforts.

Q. The licensee shall monitor the shoreline of the project reservoir, power canal, tailrace, and bypassed channel for erosion, and if necessary, prepare an erosion control plan in consultation with the Department. Inspections should be conducted at three-year intervals in spring before vegetation develops, so eroded areas can be readily identified. The licensee shall submit to the Department a report of monitoring results by December 31 in the year of each inspection.

R. Before engaging in any activity that may introduce zebra mussels into project waters, the licensee shall provide or demand (through contract clause or other binding agreement) evidence of effective decontamination of barges, tools, boats, construction equipment, or other items capable of transferring water containing larval or adult zebra mussels. Effective decontamination may include steam-cleaning, chemical treatment, physical treatment, or other suitable procedures.

4. FERC PLAN APPROVAL

The Land and Wildlife Management Plan was submitted to the Federal Energy Regulatory Commission December 19, 2008. It was approved by an *Order Modifying And Approving Land And Wildlife Management Plan Issued June 3, 2011.*

II
Description of Winter Hydroelectric Project

Project Description

The project is located on the East Fork of the Chippewa River, near the town of Winter, in Sawyer County, Wisconsin. The Project reservoir has been determined to be approximately 30 acres at the project's normal pool elevation. The USDA Forest Service portion of the reservoir, as defined to the natural thread of the river, would amount to a very tiny area of approximately 15 acres. Additionally, there are approximately 11 tiny acres of USDA Forest Service lands below the dam, making the total acreage of Federal lands at the project to be approximately only 26 acres.

The overall configuration of the project is as follows:

- Diversion Dam: A 14-foot-high, 140 foot-long concrete dam section (8 bays total) with steel gates on top of wooden stop logs in 7 bays and one bay with a 6'x16' steel lift gate operated with an electric motor and mechanical ball-screw. The diversion dam allows the water to be apportioned either to the by-passed reach or down the power canal and into the hydroelectric units.

- Power Canal: The power canal consists of earth embankments and is approximately 2,100 feet in length. The canal is approximately 20 feet wide at the bottom and has flanked earth embankments to retain the water.

- Intake Structure: The intake structures consist of reinforced concrete structure housing a common intake rack that conveys water to (2) two 5 foot – 6 inch penstock tubes.

- Powerhouse and the Tailrace: The powerhouse is a concrete structure (with a total of 24.5 feet of head) that houses two generators coupled to vertical Francis turbines. Unit 1 has a load capacity of 200 KW, and with a 174 CFS flow capacity. Unit 2 has a load capacity of 400 KW, with a 224 CFS flow capacity. The tailrace of the powerhouse is approximately 700 feet in length.

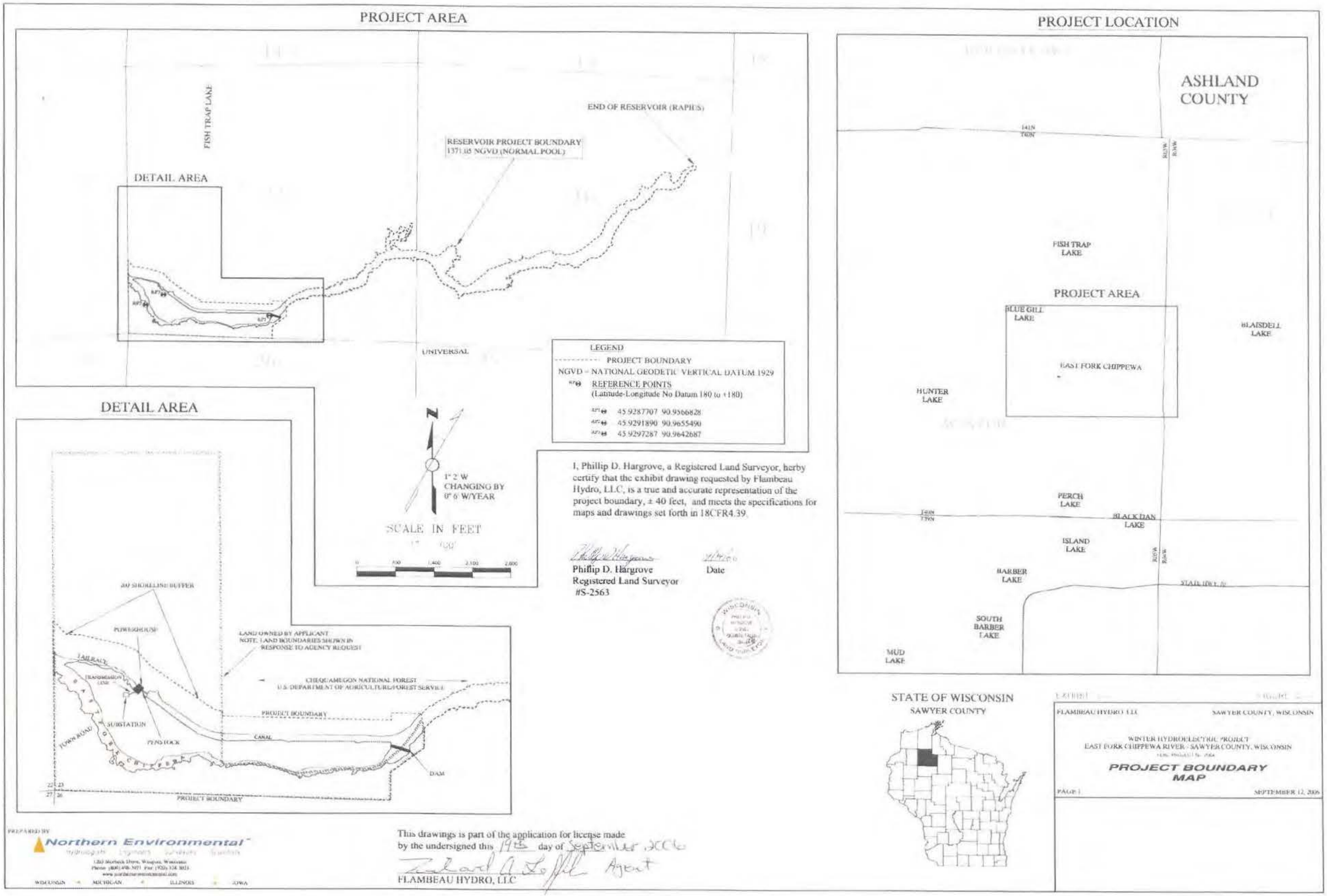
- USDA Forest Service Lands: The Forest Service lands are approximately 300 feet wide by 1600 feet long, or approximately 11 acres. However, this 300 foot strip includes; ½ of the river, the Diversion Dam, the Project's power canal, the diversion dam's access road and the left and right embankments for the power canal. (please refer to the Plan's map; Forest Service Lands at the Winter Project).

III Project Drawings

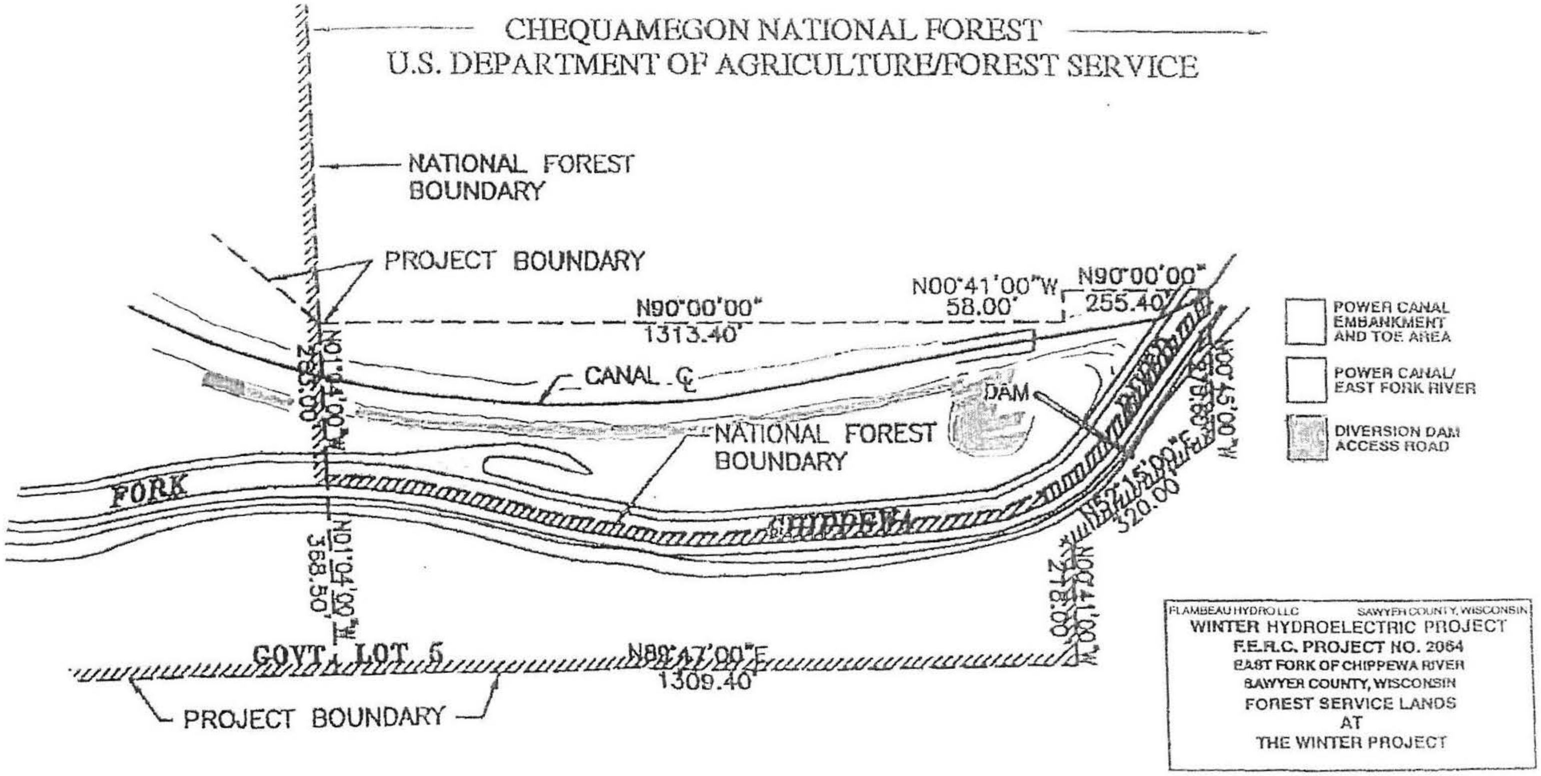
1. Winter Hydroelectric Project Boundary

2. Forest Service Lands at the Winter Project

1. Winter Hydroelectric Project Boundary


PROJECT AREA
FISH TRAP LAKE
END OF RESERVOIR (RAPIDS)
RESERVOIR PROJECT BOUNDARY
1371.05 NGVD (NORMAL POOL)
DETAIL AREA
UNIVERSAL
LEGEND
PROJECT BOUNDARY
NGVD = NATIONAL GEODETIC VERTICAL DATUM 1929
REFERENCE POINTS
(Latitude-Longitude No Datum 180 to +180)
45.9287707 90.9366828
45.9291890 90.9655490
45.9297287 90.9642687
DETAIL AREA
1° 2' W
CHANGING BY
0° 6' W/YEAR
SCALE IN FEET
I, Phillip D. Hargrove, a Registered Land Surveyor, herby certify that the exhibit drawing requested by Flambeau Hydro, LLC, is a true and accurate representation of the project boundary, ± 40 feet, and meets the specifications for maps and drawings set forth in 18CFR4.39.
Phillip D. Hargrove
Registered Land Surveyor
#S-2563
Date
POWERHOUSE
LAND OWNED BY APPLICANT
NOTE: LAND BOUNDARIES SHOWN IN RESPONSE TO AGENCY REQUEST
CHEQUAMEGON NATIONAL FOREST
U.S. DEPARTMENT OF AGRICULTURE/FOREST SERVICE
PROJECT BOUNDARY
SUBSTATION
PENSTOCK
CANAL
TOWN ROAD
DAM
PROJECT BOUNDARY
PROJECT LOCATION
ASHLAND
COUNTY
FISH TRAP
LAKE
PROJECT AREA
BLUE GILL
LAKE
BLAISDELL
LAKE
EAST FORK CHIPPEWA
HUNTER
LAKE
PERCH
LAKE
BLACK DAN
LAKE
ISLAND
LAKE
BARBER
LAKE
SOUTH
BARBER
LAKE
MUD
LAKE
STATE OF WISCONSIN
SAWYER COUNTY
FLAMBEAU HYDRO LLC
SAWYER COUNTY, WISCONSIN
WINTER HYDROELECTRIC PROJECT
EAST FORK CHIPPEWA RIVER - SAWYER COUNTY, WISCONSIN
PROJECT BOUNDARY
MAP
SEPTEMBER 12, 2006
Northern Environmental
This drawings is part of the application for license made by the undersigned this 19th day of September 2006
Agent
FLAMBEAU HYDRO, LLC

2. Forest Service Lands at the Winter Project



CHEQUAMEGON NATIONAL FOREST
U.S. DEPARTMENT OF AGRICULTURE/FOREST SERVICE
NATIONAL FOREST BOUNDARY
PROJECT BOUNDARY
N90°00'00"
1313.40'
N00°41'00"W
58.00'
N90°00'00"
255.40'
CANAL
DAM
NATIONAL FOREST BOUNDARY
FORK
GOVT. LOT 5
N89°47'00"E
1309.40'
PROJECT BOUNDARY
POWER CANAL EMBANKMENT AND TOE AREA
POWER CANAL/ EAST FORK RIVER
DIVERSION DAM ACCESS ROAD
FLAMBEAU HYDRO LLC
SAWYER COUNTY, WISCONSIN
WINTER HYDROELECTRIC PROJECT
F.E.R.C. PROJECT NO. 2064
EAST FORK OF CHIPPEWA RIVER
SAWYER COUNTY, WISCONSIN
FOREST SERVICE LANDS
AT
THE WINTER PROJECT

IV
Land & Wildlife Survey Results

1. Bald Eagle

No formal bald eagle surveys were conducted at the Winter Hydro Project in 2017 per approved plan which said agencies would be notified should any eagle nests be found located within the project boundary but while conducting the turtle survey in 2016 a nest was observed and in 2017 the same nest had an eagle perched next to it (Figure 1). One nest was observed during the wood turtle survey on June 20, 2016. It did not appear active. It was observed on the north side of the stream in a white pine (45.93200, -90.93633). As noted in previous reports, RWE has notified the WDNR, USFS and USFWS of this eagle's nest. On June, 14, 2017 an eagle's nest was found in the same location as in 2016 and there was an adult eagle perched near the nest. A data sheet is attached at the end of the report.

2. Gray Wolf

The gray wolf was relisted in December, 2015. The Licensee immediately began consultation with the agencies on how to conduct the survey, see correspondence. It was decided that **the survey would be conducted in the winter when the operator does daily checks at the project after fresh snowfall as a foot/vehicle survey of the accessible project property. The surveys would be conducted beginning with the first snowfall of the fall season and would continue through March 31st.** Formal surveys were conducted for the gray wolf at the Winter Hydro Project in 2016 per approved protocol and began on the first snowfall on November 13, 2015. They ended with the last snowfall on March 17, 2016. No wolves or dens were noted. However, wolf scat was observed at the end of the canoe portage trail during the wood turtle survey on June 20th, 2016. The 2016-2017 wolf survey began November 24, 2017 and ended April 11, 2017. There were no wolves, dens, or scat noted. Data sheets are attached at the end of the report.

3. Wood Turtle

The wood turtle survey was conducted on June 14, 2017. The tailrace (9:30-10:10), the impoundment (10:18-12:15), and the bypass channel (12:30-1:00) were surveyed in succession. Conditions for the survey were sunny and breezy. No wood turtles were sighted by White Water Associates field crew, although other animal species were seen. Two painted turtles and one spiny soft shell turtle were observed in the impoundment basking on rocks. Two trumpeter swans, a king fisher, and a muskrat were also noticed. An eagle's nest was observed on the north side of the stream in a white pine (45.93200, -90.93633). As noted in previous reports, RWE has notified the WDNR, FS and USFWS of this eagle's nest. One mature eagle was sighted by a nest 6/14/2017. Snapping turtle eggs and evidence of snapping turtles were observed in the tailrace. Three map turtles and three spiny softshell turtles (Figure 2) were observed in the power canal as the field crew drove to the upper end of the bypass channel. The next survey will be completed in the summer of 2018.

4. Non Native Invasive Species

This section of the report includes survey results for species such as:

- Asiatic honeysuckles, *Lonicera tartarica, L. morrowii, and L. x bella*
- Buckthorns, *Rhamnus cathartica and R. frangula*
- Garlic mustard, *Allaria petiolata*

- Japanese knotweed, *Polygonum cuspidatum*
- Purple loosestrife, *Lythrum salicaria*
- Curly-leaf pondweed, *Potamogeton crispus*
- Eurasian water-milfoil, *Myriophyllum spicatum*

It was agreed upon during agency consultation and during the development of the Final Land & Wildlife Management Plan that these surveys could all be conducted concurrently. However, the Final Plan devoted a separate section to purple loosestrife, which will be addressed in the next section.

The non-native invasive species survey was conducted on August 9, 2017. The tailrace, bypass reach and Flambeau Hydro LLC property were surveyed on foot from 9:20 am – 10:00 am. The HWL was 1370.38, TWL 1344.96, and Project Flow was 129 cfs. No aquatic or terrestrial non-native invasive species were observed. The impoundment was surveyed in a boat from 10:05 am to 11:35 am. Purple loosestrife (see description below) and narrow-leaved cattails (Figure 3) (N45.93114, W90.993965) were found in or adjacent to the impoundment. Data sheets are displayed at the end of this report.

5. Purple loosestrife

On August 9, 2017, White Water Associates performed an inventory of purple loosestrife plants at the Winter Project in conjunction with the above survey. The method of inventory was defined as follows:

> While purple loosestrife is blooming in July and August, the inventory should be conducted using a boat to survey the impoundment above the dam within the Project Boundary and on foot below the dam within the Project Boundary. County wetland maps may be used to determine other areas where purple loosestrife could be found on lands owned by FHLLC within the Project Boundary. Lands owned by FHLLC within the Project Boundary will be surveyed on foot. A pair of binoculars should be used to search for the purple-flowered spikes of the plant. When plants are located, the person(s) inventorying should get close enough to make a positive identification without disturbing the plants or the immediate area around the plants as this could cause them to spread. A GPS receiver will be used to establish a GPS coordinate for the location of the plants. If it is not possible to get close enough to establish an accurate location, an approximate location will be established with reference to an establish GPS coordinate. The plants should be inventoried by marking and numbering the location on a Project map along with notes approximating the size of plants, stand area, stem density, plant density, and location with reference to established GPS coordinates. Photos and/or videotape may be taken of the largest occurrences.

General observations:

The Winter Project Boundary was divided into three different areas: *the tailrace/bypass reach* (from the powerhouse to a point approximately 595 feet downstream, including the 3,028-foot long bypass reach area from the spillway to the downstream project boundary), *FHLLC-owned property within the project boundary* (FHLLC-owned property adjacent to the dam and powerhouse), and *the impoundment* (from the Winter powerhouse to the upstream project boundary, approximately 2.1 miles upstream).

On August 9, 2017 White Water Associates, Inc. performed an inventory of purple loosestrife at the Winter Hydroelectric Project in conjunction with the Invasive Species Survey (Table 1). Three locations had purple loosestrife. Site WNTR PL003 (Figure 4 and 5) (45.93084, -90.94380) had approximately 20 plants which some were hand-pulled. Site WNTR PL005 (Figure 4 and 5) (45.93082, -90.94358) had approximately 8 plants and they were all hand-pulled (Figure 6). Site WNTR PL005a (same location as 005 but nearby) had approximately 25+ plants and there was no treatment. Both of these locations were located on land adjacent to the impoundment and had previous occurrences of the invasive plant. No purple loosestrife was observed on Flambeau Hydro LLC land, adjacent to the tailrace, or adjacent to the bypass channel.

6. Land Disturbance & Erosion Control

Monitoring of erosion is a requirement of Section Q of the Water Quality Certification for the Winter Project and reads as follows:

> Q. The Licensee shall monitor the shoreline of the project reservoir, power canal, tailrace, and bypassed channel for erosion, and if necessary, prepare an erosion control plan in consultation with the Department. Inspections should be conducted at three-year intervals in spring before vegetation develops, so eroded areas can be readily identified. The Licensee shall submit to the Department a report of monitoring results by December 31 in the year of each inspection.

A basic rating system of Minor, Moderate, and Severe is used to give an indication of the condition of each site with the following description for each condition:

Minor – Some unusual erosion from within the recent past is noticeable. The site is either small or stable to the point that very little or no unusual sediment is entering the river. The toe of the bank is stationary and stable with material such as rocks, logs, vegetation, etc.

Moderate – Some unusual erosion from within the recent past is noticeable. This site has areas that appear to be actively eroding into the water in places. Vegetation may be slumping into the river at a slow rate. The majority of the toe of the bank is still stable with material such as rucks, logs, vegetation, etc.

Severe – Heavy unusual erosion from the recent past is evident. The site is actively eroding into the water. Little or no vegetation is present. The entire toe of the bank is unstable and eroding in to the water.

On June 14, 2017 White Water Associates, Inc. performed an erosion survey at the Winter Hydroelectric Project (Table 2). The tailrace reach was surveyed on foot and no unusual erosion sites were observed. The *FHLLC owned property within the project boundary* was surveyed on foot and one minor erosion site (WNTR ER003) was observed.

WNTR ER003 is located on a point of land formed at the confluence of the powerhouse tailrace and the by-pass reach about 0.12 miles downstream from the powerhouse. This site is a popular fishing area located on FHLLC property and erosion here can be directly attributed to pedestrian traffic (Figure 21). This is considered a Minor site due to its small footprint and rocky characteristic that increases stability (Figure 8). No noticeable erosion has been evident during the monitoring period of 2011 through 2017 (Figure 8a). The site appears much the same as it

did in past surveys. Human activity at this site appears to be what has caused this to be classed as an erosion site. It is unlikely to contribute noticeable sediment discharge to the river in its current condition.

No other unusual erosion sites were observed on *FHLLC owned property within the project boundary*.

The *bypass reach* had fifteen new erosion sites due to the heavy rain events in 2016 (WNTR ER004 to WNTR ER014) (Figure 20). The erosion survey took place on June 14, 2017 and photos were taken. The erosion sites are summarized in Table 2 and photos follow.

WNTR ER004 was first observed in 2017 along the left bank facing upstream (Figure 22). It is Moderate in condition. Slumping of the bank due to weathering was the cause of this erosion and grasses are present (Figure 9).

WNTR ER005 was first observed in 2017 along the left bank facing upstream (Figure 22). It is Severe in condition. Slumping of the bank due to weathering was the cause of this erosion (Figure 10). The entire site is bare soil.

WNTR ER006 was first observed in 2017 along the left bank facing upstream (Figure 22). It is Moderate in condition. Slumping of the bank due to weathering was the cause of this erosion and grasses are present (Figure 11).

WNTR ER007 was first observed in 2017 along the left bank facing upstream (Figure 22). It is Moderate in condition. Slumping of the bank due to weathering was the cause of this erosion and grasses are present (Figure 12).

WNTR ER008 was first observed in 2017 along the left bank facing upstream (Figure 22). It is Moderate in condition. Slumping of the bank due to weathering was the cause of this erosion and grasses and many rocks are present (Figure 13).

WNTR ER009 was first observed in 2017 along the right bank and left bank (ER009b) facing upstream (Figure 22). All three sites are Moderate in condition. Slumping of the bank due to weathering was the cause of this erosion and grasses are present (Figure 14, 14a, and 14b).

WNTR ER010 was first observed in 2017 along the left bank facing upstream (Figure 22). It is Minor (ER010) and Severe (ER010a) in condition. Slumping of the bank due to weathering was the cause of this erosion and grasses are present (Figure 15 and 15a).

WNTR ER011 was first observed in 2017 along the left bank facing upstream (Figure 23). It is Moderate in condition. Slumping of the bank due to weathering was the cause of this erosion and grasses are present (Figure 16).

WNTR ER012 was first observed in 2017 along the left bank facing upstream (Figure 23). It is Moderate in condition. Slumping of the bank due to weathering was the cause of this erosion and grasses are present (Figure 17).

WNTR ER013 was first observed in 2017 along the left bank facing upstream (Figure 23). Both sites are Moderate in condition. Slumping of the bank due to weathering was the cause of this erosion and grasses are present (Figure 18).

WNTR ER014 was first observed in 2017 along the right bank facing upstream (Figure 23). Both sites are Moderate in condition. Slumping of the bank due to weathering was the cause of this erosion and grasses are present (Figure 19).

The *impoundment* was surveyed by boat and one erosion site (WNTR ER002) was observed.

WNTR ER002 is located on the right side of the river near the spillway about 0.43 miles upstream from the powerhouse (Figure 24). This site is not located on FHLLC property. It is considered a Minor site due to the small size and stability of the toe (Figure 7). The entire toe is established with rock and gravel and has been growing more grasses during the last 4 years. No noticeable erosion has been evident during the monitoring period of 2011 through 2017. It is unlikely to contribute noticeable sediment to the river in its current condition. No other unusual erosion sites were observed in the impoundment.

These erosion sites were inventoried and have been noted on the survey sheet(s) and map(s) at the end of the report.

During the inventory, a digital camera was used to document the erosion as noted in the survey comments at the end of the report.

FHLLC has been actively monitoring erosion within the Project Boundary since 2006 in order to gain an understanding of trends at potential sites. The next formal spring inspection will be performed in 2020 and will be added to the 2020 Land & Wildlife Management Report as a Tri-Annual Reporting (2015-2020).

7. Zebra Mussels

No zebra mussels were observed during the non-native invasive species survey during 2016.

8. Standards and Guidelines

Flambeau Hydro LLC realizes that during the term of the License, applicable standards and guidelines for the Chequamegon-Nicolet National Forest may change. So that the Plan can be updated and accommodate new information as it is obtained, Flambeau Hydro LLC will formally consult with the Forest Service every five (5) years to update the Plan accordingly during the term of the License. The table below shows the schedule the consultation process will follow. The first formal consultation took place in 2013.

Year	Formal Consultation
2013	Yes
2018	Yes
2023	Yes
2028	Yes
2033	Yes
2038	Yes

Under standards and guidelines (number 9) of the Land & Wildlife Management Plan, 2013 was the first year for a formal consultation between FHLLC and Chequamegon-Nicolet National Forest Service. During a phone conference call between Aneta Rietveld (RWE, Environmental Quality), Steven Spickerman (Forest Service, Plant Ecologist), and Sue Reineke (Forest Service, Fisheries Biologist), all agreed that there were no new standards and guidelines added for the Chequamegon-Nicolet National Forest during the last 5 years that RWE has not already addressed in their plan. They agreed that no changes need to be made to the Land & Wildlife Management Plan. RWE Hydro will continue to follow the plan as written unless a new environmental concern is brought to our attention before the next 5 year formal consultation.

V
Survey Documents

Bald Eagle

Figure 1. Bald eagle perched beside a nest (June 2017 photo by Angie Stine).

Bald Eagle Territory Survey Form

Wilder Hydroelectric Project – FERC #2064

Date 6-14-17 Conducted By [illegible] Haag
HWL 1370.29 TWL 1346.23 CFS 1562
Time Survey Started 10:18 Time Survey Ended 12:20 (Boat) or Foot
Latitude Start ______ Longitude End ______
Location of Survey Area: Tailrace ______ Bypass Reach ______ Impoundment X
Air Temp: ____°C Wind Speed: ______ Barometer: ______ Sky Conditions ______

Location Nesting (s) or Roosting Tree (s)	Site: GPS: WLTRBE1	Site : GPS:	Site : GPS:	Site : GPS:	Site : GPS:
Photo ID	3858				
Time of sighting	11:28				
Tree Species	White Pine				
Number of roosting trees in territory	2				
Number of nest (s) in territory	1				
Tree size	100'				
Tree condition	good				
Evidence of nesting	yes				
Nest Size	4'				
Nest Condition (intact or remnant)	Intact				
Nest maintenance	yes				
Number of birds	1				
Age of birds	Mature				
Behavior of birds (flying, perching, courtship, incubation posture)	perching				

[illegible] upstream 59-61 photo

Disturbances ______ Other Survey Information ______

Other Species Observed: ______

Signature [illegible]

Wolf

Winter Hydro Project FERC 2064 Wolf Survey Form
Year 2016 - 2017

Date	Time	Weather	Fresh Snow Y/N	Scat Y/N	Tracks Y/N	Dens Y/N	Wolves Y/N	Den Location	Notes & Conducted By
11/24	10:06	Overcast/fog	Y 2.0"	N	Y deer coyote	N	N	0	J. Tesh
11/25	9:07	Overcast/flurries	Y 3.0"	N	Y deer	N	N	0	J. Tesh
12/7	9:42	Overcast/flurries	Y 1.0"	N	Y deer	N	N	0	J Tesh
12/8	9:30	Overcast/flurries	Y .5	N	Y deer	N	N	0	J Tesh
12/11	19:11	dark/flurries	Y 3.0"	N	Y deer	N	N	0	J Tesh
12/12	8:30	clear	Y 1.0"	N	Y deer	N	N	0	J Tesh
12/13	08:25	Partly cloudy flurries	Y 1.5	N	Y deer	N	N	0	J Tesh
12/22	9:45	Sunday	Y trace	N	Y deer	N	N	0	J Tesh

Winter Hydro Project FERC 2064 Wolf Survey Form

Year

Date	Time	Weather	Fresh Snow Y/N	Scat Y/N	Tracks Y/N	Dens Y/N	Wolves Y/N	Den Location	Notes & Conducted By
12/27/16	8:48	Partly Cldy.	twice Y	N	Y Otter	N	N	—	J Tesch
12/30	9:11	Sunny	Y .10"	N	Y deer	N	N	—	J Tesch
1/2	9:35	Overcast	Y .10"	N	Y deer	N	N	—	J Tesch
1/9	10:15	Overcast	Y 1.5"	N	Y deer	N	N	—	J. Tesch
1/12	10:40	Clear/Sunny	Y trace	N	Y deer	N	N	—	J Tesch
1/25	17:18	Overcast flurries	Y trace	N	Y Turkey	N	N	—	J Tesch
1/27	15:35	Sunny/clear	N	N	Y deer	N	N	—	J Tesch
1/29	11:35	Overcast	Y .50"	N	Y deer	N	N	—	J Tesch

Winter Hydro Project FERC 2064 Wolf Survey Form

Year

Date	Time	Weather	Fresh Snow Y/N	Scat Y/N	Tracks Y/N	Dens Y/N	Wolves Y/N	Den Location	Notes & Conducted By
2/5	9:02	P/C flurries	Y .75"	N	Y deer otter	N	N	—	J Tesch
2/10	8:42	Overcast	Trace	N	Y deer otter	N	N	—	J Tesch
2/11	9:00	Overcast	N	N	Y deer otter	N	N	—	J Tesch
2/13	9:45	Sunny	N	N	Y deer	N	N	—	J Tesch
2/25	10:00	P/C	Y 2.0"	N	Y deer	N	N	—	J Tesch
3/5	8:33	Clear	Y .75"	N	Y deer squirrel	N	N	—	J Tesch
3/17	11:00	Overcast /w/ drizzle	Y 1.0"	N	Y otter	N	N	—	J Tesch
3/18	17:05	P/C	Y Trace	N	Y deer dog otter	N	N	—	J Tesch

Winter Hydro Project FERC 2064 Wolf Survey Form

Year

Date	Time	Weather	Fresh Snow Y/N	Scat Y/N	Tracks Y/N	Dens Y/N	Wolves Y/N	Den Location	Notes & Conducted By
4/11/17	5:00	P/C	.50"	N	Y Deer	N	N	N/A	J Tuck

Wood Turtle

Figure 2. Spiny softshell turtle located in the impoundment (photo by Angie Stine).

Wood Turtle Survey Form
Winter Hydroelectric Project – FERC #2064

Date 6-14-17	Conducted by Angie Stine / Steve Hagg
Time Survey Started 10:18	Time survey Ended 12:15
Weather Conditions Sunny 95% Cloads	HWL 1370,28 TWL 1344,96 CFS 129
Dam Conditions (WL, TWL, CFS) NA	
Location of Survey Area (circle one): Tailrace Bypass Reach (Impoundment)	
Time(s) of wood turtle sighting(s): no wood turtle spotted.	
Location(s) of wood turtle sighting(s): N/A	
Number of wood turtles sighted: 0	Gender of wood turtles sighted: ____F ____M ___Unkn

Other species observed

1 Painted turtle small 11:35

1 spiny soft shell (Edge spikes - 11:40

1 painted turtle on log basking sun 11:45

Other notes

King fisher

2 trumpeter swans

muskrat

1 eagle - mature

Signature of Biologist

Wood Turtle Survey Form
Winter Hydroelectric Project – FERC #2064

Date 6-14-17	Conducted by Angie Stine / Steve Haag
Time Survey Started 12:30	Time survey Ended 1:00 pm
Weather Conditions 100% clouds 93° F	
Dam Conditions (WL, TWL, CFS)	
Location of Survey Area (circle one): Tailrace **(Bypass Reach)** Impoundment	
Time(s) of wood turtle sighting(s): 0	
Location(s) of wood turtle sighting(s): 0	
Number of wood turtles sighted: 0	Gender of wood turtles sighted: ____F ____M ___Unkn

Other species observed

3827-29 Turtle (map turtle)
On other ... (map turtle)
Big Rock
WINTER

12:04 - 1 spiny sft shell flipped over
12:05 - 1 spiny sft shell
12:06 - map turtle
12:08 - 1 spiny sft shell

Other notes

3822 -
Tracks gravel Road Bypass

Signature of Biologist [signature]

Wood Turtle Survey Form
Winter Hydroelectric Project – FERC #2064

Date 6-14-17	Conducted by
Time Survey Started 9.30	Time survey Ended 10:10

Weather Conditions 95% clouds

Dam Conditions (WL, TWL, CFS) NA

Location of Survey Area (circle one): (Tailrace) Bypass Reach Impoundment

Time(s) of wood turtle sighting(s): no wood turtle sightings

Location(s) of wood turtle sighting(s): N/A

Number of wood turtles sighted: 0	Gender of wood turtles sighted: ____F ____M ___Unkn

Other species observed

Other notes no turtles sighted but remnants of snapping turtle eggs. Nest predation. eggs eaten. photo 3830-31.

Signature of Biologist

Invasive Species

Figure 3. Narrow leaved cattail (Non-native cattail), Winter Project 2017.

Purple Loosestrife

Figure 4. Winter purple loosestrife locations, Winter Project, 2017.

Figure 5. Purple loosestrife locations, Winter Project, 2017.

Figure 6. Purple loosestrife in wetland area, Winter Project, 2017.

Year 2017 Invasive & Other Plants Survey *

Winter Hydroelectric Project – FERC #2064

Page ___ of ___

Date 8-9-17 Conducted By Stine Plummer

HWL 1370.28 TWL 1344.96 CFS 129

Air Temp: 65 °F Wind Speed: 4 mph Barometer: 30.1 Sky Conditions: 75% clouds

Time Survey Started 10:05 a.m. Time Survey Ended 11:35 a.m. (Boat) (14 ft/Canoe) or Foot

Latitude Start Dam Longitude End Dam

Location of Survey Area: Tailrace ___ Bypass Reach ___ Impoundment X FHLLC Property ___

Description of Location ___

Historic Info: 8-18-2014 Asiatic Honeysuckle

Invasive Found: Yes or No

Invasive Plant Info				
Site ID	118			
Photo ID	4136			
Time	11:09			
Latitude	N45.931149			
Longitude	W090.993965			
Species Name	Typha angustifolia narrow-leaved cattail			
Acreage (<1/2 acre, ½-1 acre, 1-10 acres, > 10 acres	1 acre			
Number of Plants				
Single or Multi-stem				
Plant height	6-7"			
Location type (lake/pond edge) (stream edge) (roadside) (ditch)	Edge			
Plant removed	NO			

Other Species Observed: See also PL Survey

* Asiatic Honeysuckles: *Lonicera tartarica, L. morrowii, L. x bella*; Buckthorns: *Rhamnus carthartica, R. fangula*; Curly Leaf Pondweed; Garlic Mustard; Eurasian Water Milfoil; Japanese Knotweed; Purple Loosestrife; etc.

Signature Angie Stine

WHITE WATER ASSOCIATES, INC.

Year 2017 Invasive & Other Plants Survey

Winter Hydroelectric Project – FERC #2064

Date 8-9-17 Conducted By Stine Plummer

HWL 1370.28 F TWL 1344.96 CFS 129

Air Temp: 68 °F Wind Speed: 5 mph Barometer: 30.1 Sky Conditions: _____

Time Survey Started 9:20 a.m. Time Survey Ended 10:00 a.m. Boat (14 ft/Canoe) or (Foot)

Latitude Start _____ Longitude End _____

Location of Survey Area: Tailrace X Bypass Reach X Impoundment ____ FHLLC Property X

Description of Location _____

Historic Info: _____

Invasive Found: Yes or (No)

Invasive Plant Info				
Site ID				
Photo ID				
Time				
Latitude				
Longitude				
Species Name				
Acreage (<1/2 acre, ½-1 acre, 1-10 acres, > 10 acres				
Number of Plants				
Single or Multi-stem				
Plant height				
Location type (lake/pond edge) (stream edge) (roadside) (ditch)				
Plant removed				

Other Species Observed: _____

* Asiatic Honeysuckles: *Lonicera tartarica, L. morrowii, L. x bella*; Buckthorns: *Rhamnus carthartica, R. fangula*; Curly Leaf Pondweed; Garlic Mustard; Eurasian Water Milfoil; Japanese Knotweed; Purple Loosestrife; etc.

Signature _____

WHITE WATER ASSOCIATES, INC.

Table 1. Purple Loosestrife Survey **Project Winter #2064**					
GPS Point	Latitude	Longitude	Plant Height	Stand Area	Comments
WNTR PL001	N45.93047	W090.9429	3’	2’ x 2’	First observed in 2007. Located on the right side of the river ~4050 ft. upstream from the diversion dam. Seed heads cut in 2007. 2008-no treatment. 2009, 2010, 2011- no plants observed. 2012 – Boat was not able to get close enough for treatment. 2013 and 2014- no plants observed. Grasses were tall. 2016-6 plants. Seed heads were cut off. 2017 no plants observed.
WNTR PL002	N45 55.868	W90 56.650	4’	~120’ x 200’	First observed in 2007. Located on the right side of the river ~3700 ft. upstream from the diversion dam. 2009, sites PL002 and 003 were grouped as one continuous site due to the close proximity of the sites. 2010 some old cane was visible with no new growth within it. 2011- No plants observed. 2012- Full bloom. 2013-in the middle of tall wetland grasses-could only see the flower spikes from distance. 2014- old cane observed-closer to river, not beetle damage.
WNTR PL003	N45 55.851	W90 56.628	4’	~10’ x 10’	Previous years described above. 2016-6 plants observed. Some plants were removed and a few the seed heads were cut off. 2017-20 plants observed. A few plants were removed that were accessible.
WNTR PL004	N45 55.904	W90 56.347	1-3’ 4’ plant	N/A	First observed in 2010. Located on the right side of the river and ~5130 ft. upstream of the diversion dam. No old cane. 2011 nothing observed or treated. 2012-no beetle damage observed and no treatment. 2013, 2014- none observed (grasses were very tall)
WNTR PLNA01	N45 56.225 est. location	W90 55.392 est. location	N/A	N/A	First observed in 2007-photos taken. Right side of the river. This site was ~240 yds. Upstream of the project boundary limits and could not be reached by boat due to rapids. 2010 only 4 areas of blooming plants were observed at this site. No treatment 2008 to 2011. 2013, 2014- None observed (grasses tall)
WNTR PL005	N45.93082	W090.94358	4’	~3’ x 3’	2017-8 plants observed. Plants were removed.
WNTR PL005a	N45.93082	W090.94358	3.5’	~ 10’ x 10’	2017-25 plus plants observed. No treatment due to accessibility.

Purple Loosestrife Survey

Winter Hydroelectric Project – FERC # 2664 Page ___ of ___

Date 8-9-17 Conducted By Shari Plummer

HWL 1370.28 TWL 1344.91 CFS 129 Equipment Used: Camera, GPS, Binoculars

Air Temp: 65 °F Wind Speed: 5 mph Barometer: 30.1 Sky Conditions: 75% clouds

Time Survey Started 9:20 Time Survey Ended 10:00 Boat (14ft or Canoe) and/or (Foot)

Latitude Start _____ Longitude End _____

Location of Survey Area: Tailrace X Bypass Reach X Impoundment ____ FHLLC Property X

Description of Location _____

Historic Info: _____

Purple Loosestrife Found: Yes or (No)

Information					
Site					
Time					
Photo ID					
Location					
Single or Multi-stem					
# of Plants					
Acreage est.					
Stand Area Density					
Size Colony S=0-5, M=6-50, L=>50~					
Plant Height ~ Ft					
Flowering %					
Beetle Feeding?					
Plant Vigor (Very poor to good)					
Plant Removed (explain)					

Information					
Site					
Time					
Photo ID					
Location					
Single or Multi-stem					
# of Plants					
Acreage est.					
Stand Area Density					
Size Colony S=0-5, M=6-50, L=>50~					
Plant Height ~ Ft					
Flowering %					
Beetle Feeding?					
Plant Vigor (Very poor to good)					
Plant Removed (explain)					

Other Species Observed:

_____

Purple Loosestrife Survey

Winter Hydroelectric Project – FERC # 2064 Page 1 of ____

Date 8-9-17 Conducted By Stani Plummer

HWL 1370.38 TWL 1341.90 CFS 129 Equipment Used: Binocular, GPS, Camera

Air Temp: 65 °F Wind Speed: 4mph Barometer: 30.1 Sky Conditions: 75% Clouds

Time Survey Started 10:05 Time Survey Ended 11:35 (Boat) (14ft or Canoe) and/or Foot

Latitude Start ______ Longitude End ______

Location of Survey Area: Tailrace ____ Bypass Reach ____ Impoundment X FHLLC Property ______

Description of Location ______

Historic Info: ______

Purple Loosestrife Found: (Yes) or No

Information		WNTR PL005	005a Same Location		
Site	PL003	117	117		
Time	10.20	1031	1035		
Photo ID	4126	4127			
Location	[illegible]		Behind [illegible]		
Single or Multi-stem	Multi	Multi	Multi		
# of Plants	20	8	25+		
Acreage est.					
Stand Area Density	10'x10'	3'x3'	10'x10'		
Size Colony S=0-5, M=6-50, L=>50~	M	M	M		
Plant Height ~ Ft	3-4'	4'	3-4'		
Flowering %	50-75%	50%	70%		
Beetle Feeding?	no	no	no		
Plant Vigor (Very poor to good)	good	good	good		
Plant Removed (explain)	some	yes	no Reach		

Information					
Site					
Time					
Photo ID					
Location					
Single or Multi-stem					
# of Plants					
Acreage est.					
Stand Area Density					
Size Colony S=0-5, M=6-50, L=>50~					
Plant Height ~ Ft					
Flowering %					
Beetle Feeding?					
Plant Vigor (Very poor to good)					
Plant Removed (explain)					

Other Species Observed:

King fisher, 3 wood ducks, 2 loons, Sleworen, Eagle, young drake

Photo 4133-4134-5 Eagle in Nest (immature), mallard

Erosion

Figure 7. WNTR ER002 (Photo ID 3852) 6/14/2017

Figure 8. WNTR ER003 (Photo ID 3835) 6/14/2017

Figure 8a. WNTR ER003a (Photo ID 3834) 6/14/2017

Figure 9. WNTR ER004 (Photo ID 3836) 6/14/2017

Figure 10. WNTR ER005 (Photo ID 3868) 6/14/2017

Figure 11. WNTR ER006 (Photo ID 3837) 6/14/2017

Figure 12. WNTR ER007 (Photo ID 3838) 6/14/2017

Figure 13. WNTR ER008 (Photo ID 3839) 6/14/2017

Figure 14. WNTR ER009 (Photo ID 3840) 6/14/2017

Figure 14a. WNTR ER009a (Photo ID 3841) 6/14/2017

Figure 14b. WNTR ER009b (Photo ID 3842) (6/14/2017

Figure 15. WNTR ER010 (Photo ID 3844) 6/14/2017

Figure 15a. WNTR ER010a (Photo ID 3845) 6/14/2017

Figure 16. WNTR ER011 (Photo ID 3846) 6/14/2017

Figure 17. WNTR ER012 (Photo ID 3847) 6/14/2017

Figure 18. WNTR ER013 (Photo ID 3849) 6/14/2017

Figure 18a. WNTR ER013a (Photo ID 3850) 6/14/2017

Figure 19. WNTR ER014 (Photo ID 3851) 6/14/2017

Table 2. Winter Erosion Survey								
GPS Point	**Bank Facing Upstream**	**Photo ID**	**Latitude**	**Longitude**	**Length of Site Approx**	**Height of Site Approx**	**Minor/Mod /Severe**	**Comments**
WNTR ER001			N45.93261	W090.94840				2011-2014 no noticeable change. Not a noticeable site in 2017
WNTR ER002	LB	3852	N45.92993	W90.955790			Moderate	2014 considered minor. 2017 considered moderate.
WNTR ER003	Point	3832-35	N45.93049	W090.96649	30’	10’	Moderate	2014 considered minor. 2017 considered moderate.
WNTR ER004	LB	3836	N45.92894	W090.96064	12’	10’	Moderate	First observed in 2017.
WNTR ER005	RB	3868	N45.92895	W090.96030	9’	7’	Severe	First observed in 2017.
WNTR ER006	LB	3837	N45.92893	W090.96032			Severe	First observed in 2017.
WNTR ER007	LB	3838	N45.92892	W090.96014	20’	15’	Moderate	First observed in 2017.
WNTR ER008	LB	3839	N45.92899	W090.95974	10’	15’	Moderate	First observed in 2017.
WNTR ER009	RB	3840	N45.92891	W90.95954			Moderate	First observed in 2017.
WNTR ER009a	RB	3841	N45.92891	W90.95954			Moderate	First observed in 2017.
WNTR ER009b	LB	3842-43	N45.92891	W90.95954			Moderate	First observed in 2017.
WNTR ER010	RB	3844	N45.92896	W090.959189	6’	5’	Minor	First observed in 2017.
WNTR ER010a	LB	3845	N45.92896	W090.959189	15’	20’	Severe	First observed in 2017.
WNTR ER011	LB	3846	N45.92896	W090.95894	14’	8’	Moderate	First observed in 2017.
WNTR ER012	LB	3847	N45.92895	W090.95871	8’	7’	Minor	First observed in 2017.
WNTR ER013	LB	3848-49	N45.92896	W090.95824	30’	5’	Moderate	First observed in 2017.
WNTR ER013a	LB	3850	N45.92896	W090.95824	14’	5’	Moderate	First observed in 2017.
WNTR ER014	RB	3851	N45.92901	W090.95756	20’	10’	Moderate	First observed in 2017.

Maps of Winter Project Erosion Sites – June 14, 2017.

Figure 20. Zoomed out photo of Winter 2017 erosion sites.

Figure 21. Tailrace erosion site 2017.

Figure 22. Bypass reach erosion sites 2017.

Figure 23. Bypass reach erosion sites 2017.

Figure 24. Impoundment erosion site 2017.

Erosion Survey Form

Winter Hydroelectric Project – FERC # 2064 Page 1 of 6

Date 6/14/17 Conducted By Shn Haag
HWL 1370.29 TWL 1346.32 CFS 1502
Time Survey Started 10:18 Time Survey Ended 12:20 Boat or Foot (Boat) also did impoundment
Latitude Start Boat Landing Longitude End
Location of Survey Area: Tailrace Bypass Reach X Impoundment
Air Temp: 77 °C Wind Speed: Barometer:
Sky Conditions:
Description of Location

WEFR001 2 = WNTR ERO04 upstream LB.

Site:	Time: 10:23	Latitude: N45.92894	Longitude: W090.96064
Photo ID: 3836		Description of location: bank by bybars	
Dimensions: 12'W X 10'H		Type of soil exposed: gravel/sand	
Minor/(Moderate)/Severe			
Vegetation Near Erosion: yes			
Manmade structures present: no		Slope of Bank: 65%	
Reason for Erosion: Heavy rain.			
Possible Management:			
Other Comments:			

WNTRER5 = WNTR ERO06

upstream LB

Site:	Time: 10:25	Latitude: N45.92893	Longitude: W090.96032
Photo ID: 3837		Description of location: Bank	
Dimensions:		Type of soil exposed: sand/gravel	
Minor/Moderate/(Severe)			
Vegetation Near Erosion: yes			
Manmade structures present: no		Slope of Bank: 70%	
Reason for Erosion: weather/current			
Possible Management:			
Other Comments:			

WNTRER06 = WNTR ER007

upstream LB

Site:	Time: 10:28	Latitude: N45.92892	Longitude: W090.96019
Photo ID: 3838		Description of location:	
Dimensions: 20'W x 15'H		Type of soil exposed: gravel/sand	
Minor/(Moderate)/Severe			
Vegetation Near Erosion: yes			
Manmade structures present: no		Slope of Bank: 75%	
Reason for Erosion: weather/			
Possible Management:			
Other Comments:			

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WI Erosion 5 = WNTR ER008

W090.95974

Site:	Time: 1030	Latitude: N45.92899	Longitude:
Photo ID: 3839		Description of location: upstream LB By Rock	
Dimensions: 10'w x 15'h		Type of soil exposed: Sand/gravel	
Minor/Moderate/Severe			
Vegetation Near Erosion: yes			
Manmade structures present: NO		Slope of Bank: 75%	
Reason for Erosion: Weathering			
Possible Management:			
Other Comments:			

WNTRER07 = WNTR ER009.

Site:	Time: 1031	Latitude: N45.92891	Longitude: W90.95954
Photo ID: 3840		Description of location: RB upstream	
Dimensions:		Type of soil exposed: sand gravel	
Minor/Moderate/Severe			
Vegetation Near Erosion: Some			
Manmade structures present: NO		Slope of Bank: 75%	
Reason for Erosion: Weathering			
Possible Management:			
Other Comments:			

upstream RB

Same area down = WNTR ER009a

Site:	Time: 1032	Latitude: Same above	Longitude:
Photo ID: 3841		Description of location: Right of Rock	
Dimensions:		Type of soil exposed: Sand gravel	
Minor/Moderate/Severe			
Vegetation Near Erosion: yes			
Manmade structures present: NO		Slope of Bank: 75%	
Reason for Erosion:			
Possible Management:			
Other Comments:			

up Right Bank

WNTR ER009b
Same location above but LB facing upstream

Site:	Time: 1037	Latitude: Same above	Longitude:
Photo ID: 3842-43		Description of location:	
Dimensions:		Type of soil exposed:	
Vegetation Near Erosion:			
Manmade structures present:		Slope of Bank:	
Reason for Erosion:			
Possible Management:			
Other Comments: Moderate			

Other Species Observed:

Signature [signature] Signature ______________

WHITE WATER ASSOCIATES, INC.

3867-5871 shell [illegible]

Erosion Survey Form

Winter Hydroelectric Project – FERC # 2064 Page 3 of 6

Date 10-14-17 Conducted By Stina Haag

HWL 1370.29 TWL 1346.32 CFS 1502

Time Survey Started ______ Time Survey Ended ______ (Boat) or Foot

Latitude Start ______ Longitude End ______

Location of Survey Area: Tailrace ______ Bypass Reach X Impoundment ______

Air Temp: ____°C Wind Speed: ______ Barometer: ______

Sky Conditions: ______

Description of Location ______

WinER08 = WNTR ER010
RB upstream

Site:	Time: 10:38	Latitude: N45.92896	Longitude: W090.959189
Photo ID: 3844		Description of location: RB upstream	
Dimensions: 6'X 5'W		Type of soil exposed: Sand/gravel	
(Minor)/Moderate/Severe			
Vegetation Near Erosion: yes			
Manmade structures present: Road		Slope of Bank: 75%	
Reason for Erosion: Weather			
Possible Management:			
Other Comments:			

across from each other

WNTR ER010a

Site:	Time: 10:39	Latitude: Same above	Longitude:
Photo ID: 3845		Description of location: LB upstream	
Dimensions: 15'W X 20'H		Type of soil exposed: Sand/gravel	
Minor/Moderate/(Severe)			
Vegetation Near Erosion: Some			
Manmade structures present: no		Slope of Bank: 80%	
Reason for Erosion: Weather			
Possible Management: Mesh			
Other Comments:			

WNTR09 = WNTR ER011

upstream LB

Site:	Time: 10:45	Latitude: N45.92896	Longitude: W090.95894
Photo ID: 3846		Description of location: Bank	
Dimensions: 14'W X 8'H		Type of soil exposed: Sand/gravel	
Minor/(Moderate)/Severe			
Vegetation Near Erosion: yes			
Manmade structures present: no		Slope of Bank: 70%	
Reason for Erosion: Weather			
Possible Management:			
Other Comments:			

White Water Associates, Inc.

WNTRER10 = WNTRER012

up LB

Site:	Time: 10:43	Latitude: N45.92895	Longitude: W090.95871
Photo ID:	3847	Description of location:	up LB
Dimensions:	8' W x 7' H	Type of soil exposed:	Sand / gravel
Minor/Moderate/Severe (Minor circled)			
Vegetation Near Erosion:	yes		
Manmade structures present:	NO	Slope of Bank:	75%
Reason for Erosion:	Weather		
Possible Management:			
Other Comments:			

WNTRER11 = WNTRER013

Site:	Time: 10:46	Latitude: N45.92896	Longitude: W090.95824
Photo ID:	3849-3848	Description of location:	upstream LB
Dimensions:	30' W x 5' H	Type of soil exposed:	Sand / gravel
Minor/Moderate/Severe (Moderate circled)			
Vegetation Near Erosion:	yes		
Manmade structures present:	NO	Slope of Bank:	65%
Reason for Erosion:	Weather		
Possible Management:			
Other Comments:			

WNTRER11 up LB = WNTRER013a

Site:	Time: 10:47	Latitude: Same above	Longitude:
Photo ID:	3850	Description of location:	sand / gravel upstream LB
Dimensions:	14' W x 5' H	Type of soil exposed:	
Minor/Moderate/Severe (Moderate circled)			
Vegetation Near Erosion:	yes		
Manmade structures present:	NO	Slope of Bank:	65%
Reason for Erosion:	Weather		
Possible Management:			
Other Comments:			

WNTRER12 = WNTRER014

Site:	Time: 10:49	Latitude: N45.92901	Longitude: W090.95756
Photo ID:	3851	Description of location:	RB upstream Road
Dimensions:	20' W x 10' H	Type of soil exposed:	Rock / gravel / sand
Vegetation Near Erosion:	Some		
Manmade structures present:	Road	Slope of Bank:	90%
Reason for Erosion:	Weather		
Possible Management:			
Other Comments:	Moderate		

across lg Rock cover

Other Species Observed:

Signature [signature] Signature ____________

WHITE WATER ASSOCIATES, INC.

Winter #2064

6-14-17
10:54:12:12
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WNTRER002 Impoundment

Site:	Time: 10:54	Latitude: N45.92993	Longitude: W90.955790
Photo ID: 3852		Description of location: Bank	
Dimensions:		Type of soil exposed: Sand Gravel Rock	
Minor/Moderate/Severe			
Vegetation Near Erosion: yes			
Manmade structures present: no		Slope of Bank: 75%	
Reason for Erosion: tree roots			
Possible Management:			
Other Comments:			

WNTRER14 = WNTRER005 Bypass cont.

Site:	Time: 12:12	Latitude: N45.92895	Longitude: W90.96030
Photo ID: 3868		Description of location: Bank by road RB	
Dimensions: 9'W x 3'H		Type of soil exposed: Sand/gravel	
Minor/Moderate/Severe			
Vegetation Near Erosion: Some			
Manmade structures present: Road		Slope of Bank: 75	
Reason for Erosion: Weather			
Possible Management:			
Other Comments:			

Site:	Time:	Latitude:	Longitude:
Photo ID:		Description of location:	
Dimensions:		Type of soil exposed:	
Minor/Moderate/Severe			
Vegetation Near Erosion:			
Manmade structures present:		Slope of Bank:	
Reason for Erosion:			
Possible Management:			
Other Comments:			

Site:	Time:	Latitude:	Longitude:
Photo ID:		Description of location:	
Dimensions:		Type of soil exposed:	
Vegetation Near Erosion:			
Manmade structures present:		Slope of Bank:	
Reason for Erosion:			
Possible Management:			
Other Comments:			

Other Species Observed: Photo 3853 muskrat in pond area
3854 Eagle - adults in tree

Signature _____ Signature _____

WHITE WATER ASSOCIATES, INC.

Erosion Survey Form

Winter Hydroelectric Project – FERC # 2064 Page 6 of 6

Date 6-14-17 Conducted By Stine Haag

HWL 1370.29 TWL 1346.32 CFS 1502

Time Survey Started 9:30 Time Survey Ended 10:10 Boat or Foot

Latitude Start ______ Longitude End ______

Location of Survey Area: Tailrace X Bypass Reach ______ Impoundment ______

Air Temp: 73 °F Wind Speed: 5 gust Barometer: 29.7

Sky Conditions: Clear

Description of Location ______

WNTR003

Site:	Time: [illegible]	Latitude: N45.93049	Longitude: W090.96649
Photo ID: 3832-35		Description of location: [illegible]	
Dimensions: 25' x [illegible]		Type of soil exposed: [illegible] sand	
Minor/Moderate/Severe (Moderate circled)			
Vegetation Near Erosion: Some			
Manmade structures present: no		Slope of Bank:	
Reason for Erosion: [illegible]			
Possible Management:			
Other Comments:			

Site:	Time:	Latitude:	Longitude:
Photo ID:		Description of location:	
Dimensions:		Type of soil exposed:	
Minor/Moderate/Severe			
Vegetation Near Erosion:			
Manmade structures present:		Slope of Bank:	
Reason for Erosion:			
Possible Management:			
Other Comments:			

Site:	Time:	Latitude:	Longitude:
Photo ID:		Description of location:	
Dimensions:		Type of soil exposed:	
Minor/Moderate/Severe			
Vegetation Near Erosion:			
Manmade structures present:		Slope of Bank:	
Reason for Erosion:			
Possible Management:			
Other Comments:			

WHITE WATER ASSOCIATES, INC.

Appendix 1

Agency Correspondence

Brian Kreuscher

From: Brian Kreuscher
Sent: Thursday, November 16, 2017 1:49 PM
To: Cheryl Laatsch; Nick Utrup; Sue Reinecke; Paul Strong; Dale Higgins
Subject: Winter (P-2064) Draft Land and Wildlife Management Report
Attachments: WNTR 2017 Draft L W Report-Complete.pdf

All,
Attached is the Draft Land and Wildlife Management Report for the Winter Project(P-2064). Please review and provide any comments to me within 30 days for FERC submittal.

Thanks
Brian Kreuscher
Renewable World Energies
Regulatory & Compliance
855-944-9376 x230

Document Content(s)