

Hydropower Project Summary

FOX RIVER, WI

BADGER-RAPIDE CROCHE HYDROELECTRIC PROJECT (P-2677)



New Badger Facility-completed January 2014

Photo Credit: Kaukauna Utilities

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Hydropower Reform Coalition

and

River Management Society

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BADGER-RAPIDE CROCHE HYDROELECTRIC PROJECT (P-2677)

DESCRIPTION:

The Badger-Rapide Croche (Badger) Development is located in the City of Kaukauna (Kaukauna), Wisconsin at the U.S. Army Corps of Engineers (Corps) Kaukauna dam on the Fox River. The project is approximately 1,800 feet downstream of the Kaukauna dam and utilizes the head created by the 22-foot-high dam and a power canal. Flows, therefore, used for generation bypass the natural river channel. Although a 30-year license for the project was issued in 1989, Kaukauna filed an application to amend the license requesting an accelerated expiration date in order to begin repairs on facilities that had deteriorated due to age. The new license includes the decommissioning of the Old Badger powerhouse (built in 1908), demolition of the New Badger powerhouse (built in 1929), and construct a new 7-MW powerhouse about 150 feet upstream from the existing New Badger powerhouse site. The proposed project works would consist of: (1) a modified power canal; (2) a new powerhouse with integral intake; and (3) two new identical 3.5- to 3.6-MW horizontal Kaplan “S” type turbines. The Old Badger powerhouse would be converted to an alternative use. The New Badger powerhouse would be decommissioned, demolished, and removed. The existing service road and bridge that provide access from Kaukauna’s offices and garage to the existing New Badger powerhouse would be demolished and removed. The tailrace area associated with the existing Old Badger powerhouse would be filled with soil and a new service road would be constructed over the filled area.

The impounded and free-flowing sections of the Fox River upstream and downstream of the Badger and Rapide Croche Hydroelectric Projects are classified as *warm water sport fish communities* capable of supporting a community of warm water sport fish or serving as a spawning area for warm water sport fish. In addition to fishing, the waterway is also a navigable waterway currently providing recreational activities including picnicking, hiking and whitewater boating. The new license therefore requires measures to protect water quality, protect or enhance conditions for aquatic, terrestrial, and riparian resources associated with the project.

The U.S. Department of the Interior (Interior), the National Park Service (Park Service), the Wisconsin Department of Natural Resources (Wisconsin DNR), American Whitewater, and River Alliance of Wisconsin either filed notices of intervention or comments and recommendations.

A. SUMMARY

1. License application filed: August 29, 2007
2. License Issued: May 18, 2011
3. License expiration: May 31, 2061
4. Waterway: Fox River in Outagamie County, Wisconsin
5. Capacity: 9.40 MW
6. Licensee: City of Kaukauna, Wisconsin
7. Licensee address: Kaukauna Utilities
 PO Box 1777
 777 Island Streets
 Kaukauna, WI 54130-7077
8. County: Outagamie
9. Project area: The existing project boundary for the Badger-Rapide Croche Project includes the two developments, the Rapide Croche Park, and the transmission line right-of-way easement connecting the two developments. The transmission line is approximately 5 miles long and is immediately adjacent to County Road ZZ. The transmission line right of- way easement varies in width from 50 feet to 116 feet; however, along most of its length it is approximately 60 feet wide (encompassing the road).
10. Project Facilities: The existing Badger Development is situated on the south side of the Fox River, approximately 1,800 feet downstream of the Corps' Kaukauna dam. The Badger Development utilizes the head created by the 22-foot-high Kaukauna dam and consists of:
 - a. A 2,100-foot-long, 100-foot-wide power canal that bifurcates into a 260-foot-long, 200-foot-wide canal leading to the Old Badger powerhouse (1908), and a 250-foot-long, 80-footwide power canal leading to the New Badger powerhouse (1929);
 - b. The Old Badger powerhouse containing two 1,000-kilowatt (kW) generating units for a total installed capacity of 2,000 kW;
 - c. The New Badger powerhouse, containing two 1,800-kW generating units for a total installed capacity of 3,600 kW;
 - d. A 3,000-foot-long bypassed reach extends from the Corps' Kaukuana dam downstream to the impoundment of the City Plant Dam;
 - e. Flashboards atop the Kaukauna and Rapide Croche dams; and
 - f. Rapide Croche Park including amenities provided at the park such as drinking water, a parking area, toilet facilities, picnic tables and grills, hiking trails, and protective fencing.

B. IMPORTANT PROVISIONS AND REQUIREMENTS IN LICENSE

The license requires a number of measures to protect and enhance fish, wildlife, aesthetics, recreation, and cultural resources at the project. Among others, the license requires the development and implementation of the following:

- Water Quality Certification;
- Water Quality Monitoring Plan;
- Operations Compliance Monitoring Plan;
- Recreation Plan; and
- Whitewater Boating Flows and Monitoring Plan. .

1. Water Quality Certification [Reference: Appendix A (page 59 of the license)]

The hydropower facilities are operated in a run-of-river (ROR) mode in cooperation with the water level and flow management plan of the Corps of Engineers for the Fox River. Run-of-river projects simply imply that the outflow will be the same as the inflow. They often involve a physical structure, such as a dam, weir or a diversion, which for this license is the Kaukana dam. The licensee is required to minimize fluctuation of the reservoir surface elevation by maintaining a discharge from the Project so that, at any point in time, flows, as measured immediately downstream from the confluence of the tailrace and the bypassed channel, approximate the sum of inflows to the project reservoir.

A minimum flow of 300 cfs is required at all times to the natural bypass (main river channel downstream from the COE's Kaukauna Dam. Additional flows of 1200-1250 cfs (for a total flow of 1500-1550 cfs) are required for the natural bypass channel when water temperatures are between 38 and 50 degrees F, temperatures generally attained during the months of March and April. The 1500-1550 cfs flows are intended to support walleye spawning in the spring. Deviations of flow from ROR operations, minimum flows (300 cfs) in the natural bypass channel and spring spawning flows (1500- 1550 cfs) required notifications to DNR within 24 hours of the deviation. Additionally, ramping rates in generation flows are not to exceed more than 10% of the total inflow per hour.

Intake velocities at Rapide Croche are currently below 2.0 fps and shall remain below 2.0 fps. Intake velocities at the power canal intake trash rack for the new Badger Plant are not to exceed 2.4 fps during the months of August September and October and shall not exceed 2.9 fps at any time. Whenever practicable, the licensee is also to strive to achieve intake velocities less than 2.0 fps.

The licensee is also required to submit the following plans within a year of license issuance:

- a. Invasive Species Monitoring and Control Plan;
- b. Wildlife and Land Management Plan;
- c. Water Quality Monitoring Plan;
- d. Erosion Plan;
- e. Large Woody Debris Passage Plan;
- f. Reservoir Drawdown Plan; and
- g. Recreation Plan (See **4. Recreation Plan** of this summary report).

2. Water Quality Monitoring Plan [Reference: License Article 406 (page 43 of the license)]

The licensee is required to conduct water quality monitoring for a period of 3 years (through January 2017), to begin upon the completion of the Badger powerhouse (completed January 22, 2014) and implementation of minimum instream flows. The plan is to include a description of how the licensee will implement a 3-year water quality monitoring plan that would be used to evaluate the effects of year-round and walleye spawning flow releases on water temperature and dissolved oxygen: 1) immediately upstream of the Badger intake, 2) at the downstream end of the Badger bypassed reach, and 3) in the tailrace. The water quality monitoring plan shall be developed after consultation with Wisconsin DNR and the U.S. Fish and Wildlife Service.

3. Operation Compliance Monitoring Plan [Reference: License Article 407 (page 44 of the license)]

Within 1 year of license issuance, the licensee is required to submit a plan to meet the requirements of Water Quality Certification [Reference: License Appendix A (page 59 of the license)] including ROR, minimum flow, intake velocities and ramping rates. In addition to flow delivery and flow monitoring in the spillway channel, the licensee is required to continuously record water temperature logger (located in the Badger powerhouse or other appropriate location) to determine the start/stop dates of the walleye spawning flow releases. The operations compliance monitoring plan shall be developed after consultation with the U.S. Fish and Wildlife Service, Wisconsin DNR and the Corps.

4. Recreation Plan[Reference: License Article 408 (page 44 of the license)]

Within 1 year of license issuance, the licensee is required to submit a final recreation plan for the project that includes the following facilities and measures:

- a. Completion of the facilities planned by the City of Kaukauna for Hydro Park (See Figure 1) as described in the licensee's revised recreation plan filed January 9, 2009:

Hydro Park is an area of open space located adjacent to the south side of the Badger power canal outside of the existing project boundary. In addition to the open space, Hydro Park includes a retired hydropower turbine on display. The City of Kaukauna intends to add trails, picnic areas, a shelter, restrooms, and a visitor kiosk that would provide information on the importance of hydroelectric generation in the Kaukauna area information on the importance of hydroelectric generation in the Kaukauna area;



FIGURE 1

- b. A new boat launch at the Rapid Croche impoundment and improvements to Rapid Croche Park as described in the licensee's revised recreation plan filed January 9, 2009;
- c. The City of Kaukauna Boat Launch at the Kaukauna impoundment;
- d. A new boater access site at Central Park as described in the Commission's Final EA issued August 12, 2010;

- e. Facilities per Water Quality Certification requirements:
 - 1) Provide public access with parking areas near the railroad bridge and Elm Street in the natural diversion channel.
 - 2) Construct a new boat launch area on the southern shoreline of the Rapide Croche impoundment to include an access road, boat ramp, parking area, and an accessible ADA compliant fishing pier with signage and lighting. In lieu of a boat landing at this location, a similar facility (subject to WDNR approval) may be constructed on other property such as “The Old Marina Bar” should those properties become available to Kaukauna Utilities within 3 years (May 2014) from the date of license approval. If no other feasible properties are available with that 3 year time period the boat landing facilities shall be complete no later than year 4 (May 2015) after license issuance.
 - 3) Provide enhancements at the existing Rapide Croche Park to include construction of a pavilion with accessible restrooms, display kiosk, replacement of existing picnic tables and grills and development of an approved fishing access trail leading down to the Rapide Croche tailwater including the installation of steps in certain locations and erosion control measures along the trail.
 - 4) Incorporate Hydro Park into the project boundary and develop new facilities including the installation of interpretive kiosks, trail surfacing, landscaping, a picnic area and restrooms.
 - 5) Continue to provide a website and staff gage to provide flow information for those planning on boating in the bypass reach.
- f. Operation and maintenance of all existing and new facilities; and
- g. Provisions to address public safety.

The plan shall be prepared after consultation with the U.S. Fish and Wildlife Service, the Wisconsin DNR, and Park Service.

5. Whitewater Boating Flows and Monitoring Plan [Reference: Article 409 (page 45 of the license)]

Within 1 year of license issuance, the licensee is required to submit a plan to provide whitewater boating flows and monitor boating use in the bypassed reach to mitigate the effects of increased hydraulic capacity associated with the new Badger powerhouse on recreational opportunities. At a minimum, the plan is required to:

- a. Provide and document four scheduled whitewater boating flows of 3,340 cfs with up-ramping and down-ramping at a rate not to exceed 10 percent per hour;
- b. Monitor, evaluate, and report recreational use of the Central Park access site and boating flows for 3 years following implementation of the first scheduled whitewater boating flow;

- c. Make flow information publicly available to assist boaters in planning their use of the bypassed reach; and notifying boaters of scheduled flow events and possible cancellations; and
- d. Coordinate with the Park Service, Wisconsin DNR, Corps, the City of Kaukauna Fire Department (Fire Department), American Whitewater, and the River Alliance of Wisconsin, to ensure that scheduled flows are compatible with operation of the Kaukauna dam, that emergency responders are notified of scheduled events, and to address other details of flow monitoring and evaluation, as needed.

The plan shall be prepared after consultation with the Park Service, Wisconsin DNR, Corps, Fire Department, American Whitewater, and River Alliance of Wisconsin

C. MAP

There are two convenient ways to become familiar with this project on the Hydropower Reform Coalition website, www.hydroreform.org.

- Go directly to the project page (<http://www.hydroreform.org/projects/badger-rapide-croche-p-2677>)
- To understand the geographical context of the project, visit the *On Your River* section of the site. This link (<http://www.hydroreform.org/on-your-river/Midwest>) will take you to the section for rivers in the Midwest. Zoom in until you can see the Green Bay. P-2677 is the bottom marker (furthest south) of the two markers to the left (southwest of Green Bay).