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UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Consolidated Water Power Company — Project No. 1953-003
Wisconsin

ORDER ISSUING NEW LICENSE
(Major Project)

OCT 24 1991

Consolidated Water Power Company filed a new license application under Part I of the Federal Power Act (Act) to operate and maintain the constructed 7.2-megawatt DuBay Project located on the Wisconsin River, in Marathon, Portage, and Wood Counties, Wisconsin. The Wisconsin River is a navigable waterway of the United States. 1/

Notice of the application has been published. The comments filed by agencies and individuals have been fully considered in determining whether to issue this license. The Wisconsin Department of Natural Resources (WDNR), and the DuBay Property Owners Association, Inc. were granted intervention to be a party to this proceeding.

Comprehensive Development

Sections 4(e) and 10(a)(1) of the Act, 16 U.S.C. §797(e) and §803(a)(1), respectively, require the Commission to give equal consideration to all uses of the waterway on which a project is located. When the Commission reviews a proposed project, the recreational, fish and wildlife, and other nondevelopmental values of the involved waterway are considered equally with power and other developmental values. In determining whether, and under what conditions, a hydropower license should be issued, the Commission must weigh the various economic and environmental tradeoffs involved in the decision.

No reasonable action alternative to the proposed project has been identified for assessment (see section C.4, page 4). Based on our independent review and evaluation of the proposed project and the no-action alternative, we have selected the proposed project, with our additional required enhancement measures, as the preferred option. We recommend this option because the net benefits of the project outweigh the consequences associated with taking no action.

The proposed project would provide a number of benefits. An estimated 43.6 GWh of relatively low-cost electricity, currently

1/ See 14 FERC 926 (1955).

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worth about $1,600,000 2/, would be generated annually from a clean, domestic, reliable, and renewable energy resource for use by Consolidated Water's customers 3/. Establishing prescribed reservoir elevations would have positive, long-term impacts on water quality, wildlife and fisheries habitat, aesthetics, recreational values, and would be consistent with fisheries management goals established for the reservoir. Monitoring northern pike in the DuBay Flowage would assure that maintenance of spring time reservoir elevations has the desired effect or may uncover the need for further enhancement measures. DO monitoring and installation of a skimmer weir if DO concentrations fall below the state standard of 5.0 mg/l would protect and enhance the water quality of the Wisconsin River downstream from the project. Implementation of the erosion control plan would help maintain water quality in the DuBay Flowage and protect aesthetic and cultural resources at the project. The Cooperative Wildlife Management Agreement between Consolidated Water and WDNR and implementation of wildlife and wetland management practices on project lands would serve to enhance and protect wildlife and waterfowl habitat. Implementation of the bald eagle management plan would help protect this federally listed threatened species and could contribute towards its recovery. Implementation of a Programmatic Agreement among the staff, the Wisconsin SHPO, and the Council would protect properties listed on or eligible for listing on the National Register of Historic Places. Finally, the implementation of the recreational plan for the project would provide for the recreational needs of the project area.

The project's costs would be: a. to operate and maintain the entire hydropower complex; b. to implement erosion control measures; c. to install staff gages to allow public monitoring of reservoir elevations; d. to monitor northern pike populations; e. to monitor DO concentrations and to install and operate a skimmer weir ($12,500 for the skimmer weir and about $3,890 annually for its operation and water quality monitoring); f. to implement wildlife and wetland management practices; g. to implement a bald eagle management plan; h. to implement a cultural resources protection plan; and i. various minor, short-and long-term

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2/ 43.6 GWh at 36 mills/kWh.

3/ The electricity potentially generated by the proposed project is equivalent to the energy that would be produced by burning 73,524 barrels of oil or 18,197 tons of coal annually in a steam-electric power plant. Coal-fired, steam-electric power plants, generating the amount of energy equivalent to that which would be generated by the proposed project, would produce about 9.81 tons of sulfur dioxide and 50,881 tons of carbon dioxide annually. Sulfur dioxide is considered to be a prime contributor to acid rain and carbon dioxide is considered to be a prime contributor to global warming.

adverse environmental impacts (after enhancement) to soils, water quality, vegetation, wildlife, and aesthetic conditions.

We analyzed the economic feasibility of the estimated costs associated with Consolidated Waters' and our required enhancement measures for the overall project (see section C.2, page 3). Consolidated Water states the annual value of energy from the existing project to be 36 mills per kWh and the current annual costs to be 27.4 mills per kWh. At an average annual generation of about 43.6 GWh, the project would have a net economic benefit of about 8.6 mills per kWh or about $374,960 annually less expensive than power from regional fossil-fuel generating plants. We have also determined that our requirement to stabilize or gradually increase water surface elevations, during the period of April 10 to May 10 in order to improve pike spawning and recruitment, would not significantly affect the project's power generation.

The above economic analysis results do not include the costs associated however, with our requirements to: (1) monitor northern pike populations; (2) require reservation of authority for fish passage facilities and future fish and wildlife enhancement measures; and (3) provide cultural resources protection measures.

Water level fluctuations may have a direct and adverse impact on the spawning success and recruitment of northern pike in the project area. Consolidated Water should monitor the effectiveness of protective measures, including the evaluation of maintaining stable pool elevations on northern pike spawning, recruitment, population structure, and habitat. The cost of this measure is expected to be negligible in relation to the hydropower generation by the project and the beneficial effect on the fisheries.

Overall we believe that the costs incurred by the licensee for our required enhancement measures are justified based on the benefits that accrue to the environmental resources.

Section 10(a)(2) of the Act requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project.

Under section 10(a)(2), federal and state agencies filed 38 comprehensive plans that address various resources in Wisconsin.

Of these, the staff identified and reviewed 4 plans relevant to this project 4/. No conflicts were found.

Based upon a review of the agency and public comments filed in this proceeding, and on the staff's independent analysis, the DuBay Project is best adapted to a comprehensive plan for the Wisconsin River.

Recommendations of Federal and State Fish and Wildlife Agencies

Section 10(j) of the Act requires the Commission to include license conditions, based on recommendations of federal and state fish and wildlife agencies, for the protection, mitigation, and enhancement of fish and wildlife. In the EA for the DuBay Hydroelectric Project attached to and made part of this license, the staff addresses the concerns of the federal and state fish and wildlife agencies, and the license includes conditions consistent with the recommendations of the agencies.

ECPA Findings

Section 15(a)(2)(A): The plans and abilities of the applicant to comply with the articles, terms and conditions of any license issued to it and other applicable provisions of Part I of the Act

To judge Consolidated Water's ability to comply with the articles, terms, and conditions of any license issued and with other applicable provisions of this part of the Act, we reviewed Consolidated Water's license application and its record of compliance with the existing license.

According to our records, Consolidated Water's compliance with the terms and conditions of its existing license has been unsatisfactory with compliance occurring only after extensive prodding by the Commission staff. Therefore, we have included the discussions in Section 15(a)(3)(A) and 15(a)(3)(B).

Section 15(a)(2)(B): The plans of the applicant to manage, operate and maintain the project safely

Consolidated Water developed an emergency action plan providing a notification procedure in the event of the failure of a dam structure or earthen dike. The emergency action plan includes monitoring flows and headwater elevations.

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4/ Wisconsin Statewide Comprehensive Outdoor Recreation Plan, 1986-1991., September 1985; Wisconsin Water Quality: Report to Congress, 1986; A Nonpoint Source Control Plan for the Upper Big Eau Pleine River Priority Watershed Project, 1987; and North American Waterfowl Management Plan, 1986.

Consolidated Water proposes no change in project operation that would adversely affect the project's safety. Based on information from Consolidated Water, on how the project affects public safety, and on project records, we find Consolidated Water's plans are adequate.

Section 15(a)(2)(C): The plans and abilities of the applicant to operate and maintain the project in a manner most likely to provide efficient and reliable electric service

We reviewed Consolidated Water's plans and its ability to operate and maintain the project in a manner most likely to provide efficient and reliable electric service. Consolidated Water is operating the project efficiently and reliably.

Consolidated Water evaluated several alternatives for expanding or upgrading the plant. These alternatives included adding new capacity to the project, upgrading the existing units and modifying the method of operation. Staff concurs with Consolidated Water that the existing plant provides the most efficient reliable electric service.

Section 15(a)(2)(D): The need of the applicant over the short and long term for the electricity generated by the project to serve its customers

The existing 7.2-MW DuBay Project is one of seven hydroelectric developments along the Wisconsin River which are centrally controlled and owned in whole or in part by Consolidated Water, for a total owned hydroelectric generating capacity of 44.7 MW. This capacity comprises the whole of Consolidated Water's generating resources, except for some cogeneration capacity in the pulp and paper mills, of its parent company, the power from which is totally consumed in the manufacturing process.

Consolidated Water serves about 1,000 retail customers in the town of Biron, Wisconsin, although Consolidated Paper is its major customer, purchasing about 98.8 percent of Consolidated Water's generated and imported power. In weighing the need for power, we decided it is proper to consider Consolidated Water and Consolidated Paper together.

The DuBay Project generates an average of 43.6 GWh annually, while the total generation of all of Consolidated Water's hydroelectric facilities averages about 269 GWh per year. Consolidated Water's annual system energy requirements are much greater than its hydroelectric power generating capability, requiring that it import makeup power from Wisconsin Public Service Co. (WPSC). For example, in 1988, Consolidated Water's total energy consumption was over 1,000 Gwh, some 70 percent of

which was imported from WPSC and generated mostly from fossil-fueled resources.

The regular and aggressive expansion of Consolidated Paper's pulp- and paper-making capacity has far exceeded Consolidated Water's development of economic hydro sites in the area. All additional power needed to supply the expansion of Consolidated Paper's manufacturing facilities and its other retail customer needs in the future is expected to be purchased from WPSC. The DuBay Project's contribution to these needs is small, compared to Consolidated Water's total requirements, and therefore has a small effect on its overall need for power. However, the project is an inexpensive and renewable source of energy and, due to its adaptability for peak shaving, permits Consolidated Water to negotiate very favorable terms for the purchase of capacity and energy from WPSC. Hence, from the local perspective, there is a definite need for power from the project, both on a short- and long-term basis.

The project is located in the Mid-America Interconnected Network (MAIN) Regional Electric Reliability Council area covering utilities in Michigan's upper peninsula, east-central Wisconsin, Illinois, and northern Missouri. The 1989 MAIN Coordinated Bulk Power Supply Report (DOE Code IE-411) projects an annual average growth rate in summer peak demand of 1.4 percent for the 1989-1998 planning period, based on a projected 1989 base level of energy requirement of 190,644 GWh. About 55 percent of MAIN's 1989 energy requirements will be produced by the combustion of fossil fuels, increasing to about 58.5 percent by 1998. Therefore, from both an ecological and fossil fuel conservation standpoint, there is a standing need for the power from clean, renewable resources such as this project.

Section 15(a)(2)(E): The applicant's existing and planned transmission services

Consolidated Water indicates that any redistribution of power flows in its transmission system that would result from not receiving a new license for the DuBay Project would not require any new construction of transmission lines nor upgrading of existing transmission facilities. It bases its conclusion on the fact that its transmission grid is flexible enough and has more than adequate capacity to meet all loads of its and Consolidated Paper's retail customers. The replacement power for the DuBay generation would probably enter Consolidated Water's grid at the Grand Rapids substation through a 115-kV tie with WPSC where both the transformer capacity and the transmission capacity to its Biron Division are at least twice the current loads. This additional capacity was installed to provide full redundancy and high reliability for Consolidated Paper's paper-making operations.

The benefit of Consolidated Water's transmission system is that it provides a path for the project power to any of the six manufacturing sites connected to the transmission grid, thus providing maximum flexibility to the utilization of the DuBay generation.

Section 15(a)(2)(F): Whether the plans of the applicant will be achieved, to the extent possible, in a cost effective manner

Consolidated Water plans no project changes except those periodically required to ensure the project safety. The project, as presently constructed and as Consolidated Water proposes to operate it, fully develops the economical hydropower potential of the site.

Section 15(a)(3)(A) and 15(a)(3)(B): The applicant's record of compliance with the terms and conditions of the existing license and the actions of the applicant related to the project which affect the public

The compliance record of Consolidated Water with the terms and conditions of the existing license is unsatisfactory. Consolidated Water failed to timely file the following documents: Part 12 Safety Reports (3 times), a Form 80 Recreation Report, Updated Emergency Action Plans (3 times), and an operation inspection follow-up report. As a result, Commission staff sent numerous non-compliance and reminder letters before receiving late filings.

With respect to other written requests by staff for two reports concerning operation inspection follow-up, plans for a boat barrier and signs, and a revised Emergency Action Plan, the licensee did not respond. Further, the licensee did not comply with the Commission's request for cooperation in preparation of public safety data.

The instances of non-compliance described above occurred between August 1970 and March 1986.

The compliance record described above does not warrant the denial of Consolidated Water's application for a new license. However, because of the licensee's compliance history, special consideration must be given in this license to ensure that the licensee complies with the terms and conditions of this new license. Therefore, Article 501 has been added to the license requiring the licensee to develop, and file for Commission approval, a Hydropower Compliance Management Program that will ensure compliance with the terms and conditions of the new license and allow the Commission to monitor progress toward compliance.

The licensee is hereby put on notice that its failure to comply with the terms and conditions of this license will subject it to the enforcement and penalty provisions of section 31 of the Act, including civil penalties of up to $10,000 per day for each violation or revocation of the license.

Term of License

Section 15 of the Act specifies that any license issued shall be for a term which the Commission determines to be in the public interest, but not less than 30 years, nor more then 50 years. This provision is consistent with Commission policy which establishes 30-year terms for those projects which proposed no new construction of capacity, 40-year terms for those projects that proposed a moderate amount of new development, and 50-year terms for those projects that proposed a substantial amount of new development.

Consolidated Water proposes no modification to the existing project facilities or changes in operation of the project. Accordingly, the new license for the DuBay project will be for a term of 30 years.

Summary of Findings

An EA was issued for this project. Background information, analysis of impacts, support for related license articles, and the basis for a finding of no significant impact on the environment are contained in the EA attached to this order. Issuance of this license is not a major federal action significantly affecting the quality of the human environment.

The design of this project is consistent with the engineering standards governing dam safety. The project will be safe if operated and maintained in accordance with the requirements of this license. Analysis of related issues is provided in the Safety and Design Assessment attached to this order.

The Director, Office of Hydropower Licensing, concludes that the project would not conflict with any planned or authorized development, and would be best adapted to comprehensive development of the waterway for beneficial public uses.

The Director orders:

(A) This license is issued to Consolidated Water Power Company (licensee), for a period of 30 years, effective on the issuance date of this order, to operate and maintain the DuBay Project. This license is subject to the terms and conditions of the Act, which is incorporated by reference as part of this

license, and subject to the regulations the Commission issues under the provisions of the Act.

(B) The project consists of:

(1) All lands, to the extent of the licensee's interests in those lands, enclosed by the project boundary shown by exhibit G:

| Exhibit G- | FERC No. 1953 - | Showing |
|---|---|---|
| G-1 | 13 | Project Boundary Location |
| G-2 | 14 | " " " |
| G-3 | 15 | " " " |
| G-4 | 16 | " " " |
| G-5 | 17 | " " " |
| G-6 | 18 | " " " |
| G-7 | 19 | " " " |

(2) Project works consisting of the following: (a) a 730-foot-long concrete gravity dam comprising 3 non-overflow sections; a spillway section with 11 tainter gates and an intake section varying in height from 20 feet to 38 feet; a 7,900-foot-long earthen dike on the west abutment and a short earthen dike at the east abutment; (b) an impoundment having a surface area of 7,800 acres with a storage capacity of 128,000 acre-feet and normal water surface elevation of 1,116.2 feet msl; (c) an integral intake powerhouse containing four generating units having a total installed capacity of 7,200 kW; (d) a substation containing three single-phase OA/FA type, 2,500 kVA oil-filled transformers 4.14/46 kV; (e) a 21-mile-long, 46-kV transmission line; and (f) appurtenant facilities.

The project works generally described above are more specifically shown and described by those portions of exhibits A and F recommended for approval in the attached Safety and Design Assessment.

(3) All of the structures, fixtures, equipment or facilities used to operate or maintain the project and located within the project boundary, all portable property that may be employed in connection with the project and located within or outside the project boundary, and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

(C) The exhibit G described above and those sections of exhibits A and F recommended for approval in the attached Safety and Design Assessment are approved and made part of the license.

(D) This license is subject to the articles set forth in Form L-3, (October 1975), entitled "Terms and Conditions of

License for Constructed Major Project Affecting Navigable Water of the United States," and to the following additional articles.

Article 201. The Licensee shall pay the United States the following annual charge, as determined by the Commission, effective the date on which this license is issued for the purpose of:

a. reimbursing the United States for the cost of administration of Part I of the Act. The authorized installed capacity for that purpose is 9,600 horsepower.

Article 202. Pursuant to Section 10(d) of the Act, a specified reasonable rate of return upon the net investment in the project shall be used for determining surplus earnings of the project for the establishment and maintenance of amortization reserves. The Licensee shall set aside in a project amortization reserve account at the end of each fiscal year one half of the project surplus earnings, if any, in excess of the specified rate of return per annum on the net investment. To the extent that there is a deficiency of project earnings below the specified rate of return per annum for any fiscal year, the Licensee shall deduct the amount of that deficiency from the amount of any surplus earnings subsequently accumulated, until absorbed. The Licensee shall set aside one-half of the remaining surplus earnings, if any, cumulatively computed, in the project amortization reserve account. The Licensee shall maintain the amounts established in the project amortization reserve account until further order of the Commission.

The specified reasonable rate of return used in computing amortization reserves shall be calculated annually based on current capital ratios developed from an average of 13 monthly balances of amounts properly includible in the Licensee's long-term debt and proprietary capital accounts as listed in the Commission's Uniform System of Accounts. The cost rate for such ratios shall be the weighted average cost of long-term debt and preferred stock for the year, and the cost of common equity shall be the interest rate on 10-year government bonds (reported as the Treasury Department's 10 year constant maturity series) computed on the monthly average for the year in question plus four percentage points (400 basis points).

Article 203. If the Licensee's project was directly benefitted by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement during the term of the original license (including extensions of that term by annual licenses), and if those headwater benefits were not previously assessed and reimbursed to the owner of the headwater improvement, the Licensee shall reimburse the owner of the headwater improvement for those benefits, at such time as they are assessed, in the

same manner as for benefits received during the term of this new license.

Article 401. The Licensee shall implement the erosion control plan (ECP) filed on March 28, 1990, and consisting of 22 pages. The ECP identifies the areas of potential and active eroding shoreline and proposes stabilization and monitoring measures.

Article 402. The Licensee shall operate the DuBay Project to control fluctuations of the reservoir surface elevation for the protection of fish, wildlife, and recreational resources in the DuBay Flowage. The Licensee shall act at all times (except as necessary to provide flood protection in the Wisconsin River) to maintain the reservoir surface elevations, as measured immediately upstream of the project dam, as follows:

(1) From June 15 through January 1, each year -- maintain the reservoir surface elevation between 1,113.7 and 1,115.2 feet National Geodetic Vertical Datum (NGVD) to protect wetland wildlife habitat and to enhance recreational use;

(2) From January 2 through April 9, each year -- maintain the reservoir surface elevation no lower than 1,109.2 feet NGVD during the winter drawdown;

(3) From April 10 through May 10, each year -- maintain the reservoir surface elevation at 1,115.2 feet NGVD to protect and enhance northern pike spawning and egg incubation, with an allowance to increase the reservoir surface elevation to 1116.2 feet NGVD; and

(4) From May 11 through June 14, each year -- lower the reservoir surface elevation to 1115.2 feet NGVD, if not already at this elevation.

During any lowering of the reservoir surface elevation, the Licensee shall limit the drawdown rates to a maximum of one inch per hour.

In addition, the Licensee shall maintain a minimum surface water elevation in the tailwater of 1,086.9 feet NGVD at all times, in order to protect aquatic habitat in the project's tailwater.

These modes of operation may be temporarily modified if required by operating emergencies beyond the control of the Licensee or for short periods upon mutual agreement between the Licensee and the Wisconsin Department of Natural Resources (WDNR). The Licensee shall not lower the reservoir surface elevations below the elevations stipulated above without notifying the WDNR and the Commission's Chicago Regional Office.

Article 403. Within 6 months after the date of issuance of this license, Licensee, after consulting with the U.S. Fish and Wildlife Service (FWS), the U.S. Geological Survey (USGS), and the Wisconsin Department of Natural Resources (WDNR), shall develop and file for Commission approval, a plan to install streamflow monitoring equipment in the project's reservoir and the Wisconsin River to monitor compliance with the operational requirements stipulated by article 402.

The monitoring plan shall include, but not be limited to: (1) an implementation schedule; (2) the proposed location, design, and calibration of the monitoring equipment; (3) the method of flow data collection; and (4) a provision for providing flow data to the FWS, USGS, and the WDNR within 30 days from the date of the agency's request for the data.

In addition, the applicant shall also include in the plan a provision to install and maintain a gage at the project which would be clearly visible to the public at all times, and would provide boaters and other recreational users an indication of high and low water conditions at the project.

The Licensee shall include documentation of consultation with the agencies before preparing the plan, copies of agency comments or recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how all the agency comments are accommodated by the plan. The Licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations prior to 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.

Upon Commission approval, the Licensee shall implement the plan, including any changes required by the Commission.

Article 404. Within 6 months after the date of issuance of this license, Licensee shall file with the Commission for approval, a plan to monitor the effectiveness of the modified spring operation, as stipulated in article 402 (item 3), to enhance northern pike spawning and recruitment in the DuBay Flowage.

The plan shall include: (1) methods to provide an evaluation of the effectiveness of maintaining stable water surface elevations on northern pike spawning, recruitment, population structure, and habitat; and (2) a schedule for conducting the monitoring and a schedule for filing the results of the monitoring in a final report to the Commission. The Licensee shall prepare the plan after consultation with the U. S. Fish and Wildlife Service (FWS) and the Wisconsin Department of Natural

Resources (WDNR). The Licensee shall include with the plan documentation of consultation and copies of comments or recommendations on the completed plan after it has been prepared and provided to the agencies, 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 prior to 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. Upon approval by the Commission, the Licensee shall implement the monitoring plan, including any changes required by the Commission, according to the approved schedule.

If the results of the monitoring indicate that alternative measures need to be implemented at the project to enhance northern pike spawning and recruitment in DuBay Flowage, then the Licensee shall include in the final report, for Commission approval, recommendations or the needed measures to enhance the northern pike populations, including a schedule for implementation of the recommended measures. The recommended measures to enhance the fishery shall be developed in consultation with the FWS and the WDNR.

The Licensee shall allow a minimum of 30 days for the consulted agencies to comment and to make their own recommendations, based on the results of the monitoring, on needed measures to enhance northern pike populations in the DuBay Flowage, prior to filing the report with the Commission. Upon approval by the Commission, the Licensee shall implement the measures needed to enhance the northern pike populations. The Commission reserves the right to require modifications to the recommendations included in the final report.

Article 405. To ensure the protection of downstream dissolved oxygen (DO) in the Wisconsin River, the Licensee shall install a skimmer weir at the bottom of the stop gate slots in each of two forebays of one of the large turbine units whenever DO concentrations measured in the project tailrace approach the state DO standard of 5 milligrams per liter (mg/l).

Article 406. Within 6 months after the date of issuance of this license, the Licensee, shall file for Commission approval, a plan to monitor dissolved oxygen (DO) concentrations and water temperatures in the project tailrace, and to determine the effectiveness of the skimmer weir, required by Article 405, in maintaining DO concentrations in the project tailrace of at least the state standard of 5 mg/l.

The Licensee shall prepare the plan after consultation with the U.S. Fish and Wildlife Service (FWS) and the Wisconsin

Department of Natural Resources (WDNR). The Licensee shall include with the plan documentation of consultation and copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how all 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 prior to 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. Upon approval by the Commission, the Licensee shall implement the plan, including any changes required by the Commission.

The results of the water quality monitoring shall be filed with the Commission as a final report according to the approved schedule, along with comments from the consulted agencies. If the results of the monitoring indicate that additional measures need to be implemented at the project to improve DO concentrations to at least the state standard, then the Licensee shall include in the final report, for Commission approval, recommendations on needed measures to improve DO concentrations. Any recommendations provided in the report shall also include a schedule for implementing the measures at the project.

The recommended measures to improve downstream DO concentrations shall be developed in consultation with the FWS and the WDNR. The Licensee shall allow a minimum of 30 days for the consulted agencies to comment and to make their own recommendations, based on the results of the water quality monitoring, on needed measures to improve DO concentrations in the project tailrace, prior to filing the report with the Commission. Upon approval by the Commission, the Licensee shall implement the measures needed to improve DO concentrations. The Commission reserves the right to require modifications to the recommendations included in the final report or to impose our own conditions to enhance DO concentrations, based upon the results of the monitoring.

Article 407. Authority is reserved to the Commission to require the Licensee to construct, operate, and maintain, or to provide for the construction, operation, and maintenance of, such fishways, as may be prescribed by the Secretary of the Interior.

Article 408. The Licensee shall implement the wildlife management plan, filed on March 28, 1990, as pages 12 through 15 and 18 through 22 of the Report on Fish, Wildlife, and Botanical Resources of Exhibit E, volume II, section E-3b, of its license application, and the bald eagle management and protection plan, filed with the Commission on March 28, 1990 and consisting of 6 pages, including 2 figures. These plans will protect and enhance wildlife habitat on project lands. This habitat includes

wetlands and bald eagle (Haliaeetus leucocephalus) habitat, a federally listed threatened species.

Article 409. The Licensee shall implement the recreation plan filed on June 29, 1989, as pages 35 through 52, Tables 5-1 through 5-6, figures 5-1 through 5-13 and Appendix C in section E-5 of the Exhibit E of its license application, and responses to questions 4 through 8 of the additional information filed on March 28, 1990. The plan provides for the development of recreational facilities to accommodate recreational demand to the year 2000 and for reevaluating recreational needs at 10-year intervals to accommodate recreational demand. Any changes in sequence of construction or composition of the proposed recreation facilities shall be discussed with the Wisconsin Department of Natural Resources, the U.S. Fish and Wildlife Service, the Marathon County Park Commission, and the Portage County Parks Department and approved by the Commission prior to implementation.

Within 90 days after completing construction of the recreation facilities, the Licensee shall file with the Commission as-built drawings showing the recreation facilities. In addition, the Licensee shall operate and maintain or arrange for the operation and maintenance of the recreation facilities during the term of the license. If the Licensee arranges for another party to operate and maintain these facilities, the Licensee shall have a written agreement with the other entity which holds the entity accountable for this responsibility. If the other entity fails to operate and maintain the facilities, the Licensee must promptly assume this responsibility.

Article 410. The Licensee shall implement the land management plan filed on June 29, 1989 as pages 10 through 21 of the Report on Land Management and Aesthetics, volume III section E-6, of Exhibit E of its license application. This plan with the following additional provisions, which shall also be implemented by the Licensee, will provide for the protection and enhancement of the project's aesthetic values:

(1) The Licensee shall consult with the Wisconsin Department of Natural Resources (WDNR) and refer to the WDNR's Silvicultural and Forest Aesthetics Handbook for further advice and assistance on how to correctly implement the aesthetic guidelines of the land management plan.

(2) Prescribed visual buffer zones along the flowage shoreline shall be measured from elevation 1,116.2 feet NGVD, and buffer strips along project area roadways shall be measured from the edge of the roads' rights-of-way.

(3) The Licensee shall include in the "managed open space" category of the land management plan, guidelines for

aesthetically maintain the project's existing transmission line corridor. The guidelines shall emphasize the use of selective right-of-way vegetation clearing methods to eliminate or reduce extended views of the line and to retain a visual buffer.

(4) the Licensee shall periodically (not less than every 6 months) conduct a visual inspection of project lands to identify features in need of screening, and to subsequently schedule and fund the necessary design and installation work for those features identified as requiring such treatment.

(5) In consultation with the WDNR and the DuBay Property Owners, the Licensee shall consider extending its shoreline stabilization efforts to any eroding island shorelines that are located near areas identified as scenic shorelines on figure 6-2 of the license application, and are within the viewshed of critical viewpoints shown on this figure.

The Licensee shall file a compliance report with the Commission every five years that documents the consistency of its land management and shoreline erosion control practices with the objectives, guidelines, and activities described in these plans. The first report is due five years from the effective date of this license.

This report shall include, but not be limited to: (1) a description of any significant land-disturbing activities that the Licensee or other entity (with the Licensee's permission) undertook that affected the visual character of the project land or water; (2) a description of any significant shoreline erosion problems resulting from land-disturbing activities, reservoir fluctuations, or reservoir wave action; (3) a description of the measures taken to avoid or mitigate these effects as prescribed by the land management plan and shoreline erosion control plan; and (4) copies of any letters from entities or individuals that may have expressed concern for the visual quality of the project or erosion problems during this 5 year period.

Article 411. The Licensee shall implement the provisions of the "Programmatic Agreement among the Federal Energy Regulatory Commission, the Advisory Council on Historic Preservation, and the Wisconsin State Historic Preservation Office for the Management of Historic Properties Affected by the DuBay Hydroelectric Project," executed on October 4, 1991, and summarized in the environmental assessment attached to this order. The Commission reserves the authority to require changes to any Cultural Resource Management Plan or plans at any time during the term of the license.

Article 412. The Licensee, before starting any land-clearing or ground-disturbing activities within the project boundaries, other than those specifically authorized in this license, shall

consult with the Wisconsin State Historic Preservation Officer (SHPO).

If the Licensee discovers any previously unidentified archeological or historic property during recreational development or during project operation, as a result of monitoring the project reservoir shoreline, reservoir drawdown, surveying the lands included in the Cooperative Management Agreement, or any other means, the Licensee shall stop all land-clearing and ground-disturbing activities in the vicinity of the discovered property, shall take measures necessary to stabilize and to otherwise protect the discovered property from further effect, and shall consult with the SHPO.

In either instance, the Licensee shall file for Commission approval, and upon approval, shall implement a cultural resource management plan prepared by a qualified cultural resource specialist after having consulted with the SHPO. The management plan shall include the following items:

(1) a description of each discovered property indicating whether it is listed on or eligible to be listed on the National Register of Historic Places;

(2) a description of the potential effect on each discovered property;

(3) proposed measures for avoiding or mitigating effects;

(4) documentation of the nature and extent of consultation;

(5) copies of comments and other correspondence from the SHPO; and

(6) a schedule for mitigating effects and conducting additional studies.

The Commission may require changes to the plan.

The Licensee shall not begin land-clearing or ground-disturbing activities, other than those specifically authorized in this license, or resume such activities in the vicinity of a discovered property, until informed that the requirements of this article have been fulfilled.

Neither this license nor any part of this license shall be construed as permitting ground disturbance solely for the purpose of implementing any wildlife management plan or any other environmental management plan without specific Commission approval as required under the provisions this article.

Article 413. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, cancelling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The type of use and occupancy of project lands and water for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 watercraft at a time and where said facility is intended to serve single-family type dwellings; (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline; and (4) food plots and other wildlife enhancement. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee shall: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the reservoir shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of

a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of, project lands for: (1) replacement, expansion, realignment, or maintenance of bridges or roads where all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir. No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed. If no conveyance was made during the prior calendar year, the Licensee shall so inform the Commission and the Regional Director in writing no later than January 31 of each year.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certification or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 watercraft at a time and are located at least one-half mile (measured over project waters) from any other private or public marina; (6) recreational development consistent with an approved Exhibit R or approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from project waters at normal surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 60 days before conveying any interest

in project lands under this paragraph (d), the licensee must submit a letter to the Director, Office of Hydropower Licensing, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked exhibit G or K map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraph (c) or (d) of this article:

(1) Before conveying the interest, the licensee shall consult with federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the licensee shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved exhibit R or approved report on recreational resources of an exhibit E; or, if the project does not have an approved exhibit R or approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include the following covenants running with the land : (i) the use of the lands conveyed shall not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; (ii) the grantee shall take all reasonable precautions to insure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project; and (iii) the grantee shall not unduly restrict public access to project waters.

(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised exhibit G or K drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not

necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project shall be consolidated for consideration when revised exhibit G or K drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

Article 501. (1) The licensee, within 4 months of the effective date of this license, shall file a Hydropower Compliance Management Program (HCMP) for Commission approval. The HCMP shall include the following elements for each license requirement:

a. The identification of, and a schedule for, each action necessary to complete the license requirement;

b. A schedule for the start and completion of the consultation process with each resource agency required to be consulted for each action necessary to complete the license requirement; and

c. The identification of specific individuals in each agency that need to be consulted on each action necessary to complete the license requirement;

(2) The licensee shall file a quarterly report with the Commission, starting 8 months after issuance of this license, that demonstrates the progress made toward completion of each license requirement under the schedules presented in the HCMP.

(3) The licensee shall file an annual monitoring report with the Commission, starting one year after the issuance of this license, documenting the licensee's compliance with all requirements of the license that do not require specific filings with the Commission.

Seven copies of all submissions under this article must be filed with the Secretary of the Commission. One copy of each submission must also be filed with any agency consulted under element (1)b above.

(E) The licensee shall serve copies of any Commission filing required by this order on any entity specified in this order to be consulted on matters related to that filing. Proof of service on these entities must accompany the filing with the

Commission.

(F) This order is issued under authority delegated to the Director and constitutes final agency action. Requests for rehearing by the Commission may be filed within 30 days from the issuance date of this order, pursuant to 18 C.F.R. §385.713.

Fred E. Springer
Director, Office of
Hydropower Licensing

# ENVIRONMENTAL ASSESSMENT

**FEDERAL ENERGY REGULATORY COMMISSION**
**OFFICE OF HYDROPOWER LICENSING**
**DIVISION OF PROJECT REVIEW**

Date: July 31, 1991

Project name: DuBay Hydroelectric Project

FERC Project No. 1953-003

## A. APPLICATION

1. Application type: New major license
2. Date filed with the Commission: June 29, 1989
3. Applicant: (Consolidated Water) Power Company
4. Water body: Wisconsin River River basin: Mississippi
5. Nearest city or town: Mosinee
6. County: Marathon, Portage State: Wisconsin

## B. PURPOSE AND NEED FOR ACTION

1. Purpose. The existing project generates an estimated 43.6 gigawatthours (Gwh) of electric energy per year which would continue to be utilized by a paper mill operated by Consolidated Papers, Inc (Consolidated Paper), Consolidated Water's parent company.

2. Need for power. The existing 7.2-megawatt (MW) DuBay Project is one of seven hydroelectric installations along the Wisconsin River which are centrally controlled and owned in whole or in part by Consolidated Water, for a total owned hydroelectric generating capacity of 44.7 MW. This capacity comprises the whole of its generating resources, except for some cogeneration in the pulp and paper mills of its parent company, Consolidated Paper, power from which is totally consumed in the manufacturing process.

Consolidated Water serves about 1,000 retail customers in the town of Biron, Wisconsin, although Consolidated Paper is its major customer, purchasing about 98.8 percent of Consolidated Water's generated and imported power. In weighing the need for power, it is therefore useful to consider Consolidated Water and Consolidated Paper together.

The DuBay Project generates an average of 43.6 Gwh annually, while the total generation of all of Consolidated Water's hydroelectric facilities averages about 269 GWh per year. However, Consolidated Water's system annual energy requirements are much greater than its hydroelectric generating capability,

and it needs to import makeup power from Wisconsin Public Service Company (WPSC). For example, in 1988, its total energy consumption was over 1,000 GWh, some 70 percent of which was imported from WPSC and generated mostly from fossil-fueled resources.

The regular and aggressive expansion of Consolidated Paper's pulp and papermaking capacity has far exceeded Consolidated Water's development of economic hydro sites in the area. All additional power needed to supply expansion of Consolidated Paper's manufacturing facilities and its other retail customer needs in the future is expected to be purchased from WPSC. The DuBay Project's contribution to these needs is small, compared to Consolidated Water's total requirements, and therefore has a small effect on its overall need for power. However, the project is an inexpensive and renewable source of energy, and, due to its adaptability for peak shaving, it permits Consolidated Water to negotiate very favorable terms for the purchase of capacity and energy from WPSC. Hence, from the local perspective, there is a definite need for power from the project, both on a short and long-term basis.

The project is located in Mid-America Interconnected Network (MAIN) Regional Electric Reliability Council area covering utilities in the Michigan upper peninsula, east-central Wisconsin, Illinois, and northern Missouri. The 1989 MAIN Coordinated Bulk Power Supply Report (DOE Code IE-411) projects an annual average growth rate in summer peak demand of 1.4 percent for the 1989-1998 planning period, based on a projected 1989 base level energy need of 190,644 GWh. Some 55 percent of MAIN's 1989 energy requirements will be produced by the combustion of fossil fuels, which is expected to increase to about 58.5 percent by 1998. Therefore, from both an environmental protection and fossil-fuel conservation standpoint, there is a need in the region for power from clean, renewable resources such as this project.

## C. PROPOSED PROJECT AND ALTERNATIVES

1. Description of the proposed action (see Figure 2, page 46). Consolidated Water does not propose any modifications or additions to the existing structures or powerhouse. However, Consolidated Water proposes to improve recreational facilities and to make improvements to benefit wildlife. The primary purposes of the existing development are generation of electricity and flood control.

The project consists of the following: (1) a 730-foot-long concrete gravity dam, having 3 nonoverflow sections; a spillway section with 11 Taintor gates and an intake varying in height from 20 feet to 38 feet; a 7,900-foot-long earthen dike section on the west abutment; and a short earthen dike section on the

east abutment; (2) a reservoir with a surface area of about 7,800 acres (at normal water surface elevation), a storage capacity of about 128,000 acre-feet, and a normal water surface elevation of 1,116.2 feet 3/; (3) a powerhouse, with an integral intake, with four generating units having a total installed capacity of 7,200 kilowatts (kW); (4) a substation with three single-phase OA/FA- type, 2,500-kilovoltampere (kVA) oil-filled 4.14/46-kilovolt (kV) transformers; (5) a 21-mile-long, 46-kV transmission line; and (6) appurtenant facilities. Consolidated Water does not propose any changes to the existing project works.

2. Applicant's proposed enhancement measures.

a. Construction. Consolidated Water proposes to minimize erosion runoff and turbidity caused by construction of recreation improvements at existing and new recreational development sites by intercepting construction area runoff, timely revegetation of disturbed areas, and scheduling boat ramp improvements during the late winter/early spring draw-down periods to the extent possible.

b. Operation. Consolidated Water proposes to:

(1) implement an erosion control plan (ECP) to stabilize actively eroding shoreline, and monitor shoreline erosion (discussed further in section G.1, page 17);

(2) maintain the reservoir's water surface elevation between 1,113.7 and 1,115.2 feet from June 15 to winter drawdown (January 1) each year to protect wetlands, furbearer habitat, fishery resources, and recreational fishing (discussed further in section G.3, page 20);

(3) maintain a minimum tailwater surface elevation of 1,086.9 feet to prevent dewatering of the river immediately below the dam (discussed further in section G.3, page 20);

(4) establish the reservoir's water surface elevation at 1,115.2 feet on or about April 10 and to maintain that elevation, or gradually raise the pool to a maximum of 1,116.2 feet until about May 10 to protect and enhance northern pike spawning and egg incubation (discussed further in section G.3, page 20 and section G.4, page 23);

(5) monitor tailrace dissolved oxygen (DO) (discussed further in section G.5, page 25);

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3/ All reservoir elevations indicated in this environmental assessment are above the National Geodetic Vertical Datum (NGVD), unless other wise indicated.

(6) implement vegetation and wildlife management measures (discussed further in section G.6, page 27);

(7) execute a cooperative agreement with the Wisconsin Department of Natural Resources (WDNR) for wildlife management of Consolidated Water's lands (discussed further in sections G.6 and G.10, pages 27 and 37, respectively);

(8) implement a bald eagle protection plan (discussed further in section G.7, page 28);

(9) implement a cultural resources management plan;

(10) implement a land management plan to protect the project area's natural, aesthetic, and recreational values (discussed further in sections G.6, G.9, and G.10, pages 27, 35, and 37, respectively); and

(11) implement a recreation plan to accommodate recreation demand to the year 2000 which, also, reserves lands for future recreation development (summarized in Table 1, page 16 and discussed further in section G.10, page 37).

3. Federal lands affected.

_X_ No ___ Yes; _____; acreage = ____;
(agency)

4. Alternatives to the proposed project.

a. Action alternatives.

(1) Alternative Project Operations: Alternative modes of operation of the project are discussed in section G.3 of this report.

(2) Issuance of an Annual License: Section 15(a) of the Federal Power Act (Act), 16 U.S.C. §808(a), provides for the issuance of annual licenses to the prior licensee if the license expires pending the relicensing determination.

When an annual license is issued, existing facilities would continue to operate until reevaluation of the project according to today's standards and procedures occurs. This license will expire on June 30, 1991, thus the project will operate on an annual license until a new license is issued.

(3) Issuance of Nonpower License: Section 15(f) of the Act, 16 U.S.C. §808(b), authorizes the Commission to issue a license for nonpower use when the Commission "finds that in conformity with a comprehensive plan for improving or developing a waterway or waterways for beneficial public uses all or part of

any licensed project should no longer be used or adapted for use for power purposes." A license that is granted by the Commission for nonpower use is temporary. When the Commission finds that a state, municipality, interstate agency, or another federal agency is authorized and willing to assume regulatory supervision of the lands and facilities included under the nonpower license, and does so, the Commission would terminate the nonpower license.

If a nonpower license is issued, Consolidated Water would have to find a replacement source of power. No entity has recommended that a nonpower license should be considered.

(4) Denial of License Application: Denial of the license application could lead to removal of the power facilities or removal of all project works. Consolidated Water would have to find a replacement source of energy.

Either alternative number (3), issuance of a non-power license, or alternative number (4), denial of license, would result in the cessation of generation of power by the project and would force Consolidated Water to replace lower-cost, non-polluting generation derived from a renewable primary energy resource with increased purchases of higher-cost capacity and energy from another source at generally higher costs.

Possible alternative sources of power to the DuBay Project include construction of a coal-fueled condensing steam turbine-generator, a coal-fueled cogeneration unit, diesel generation, combustion turbines, and additional purchases from WPSC. However, each of these alternative power sources rely on the consumption of nonrenewable fuels.

Denial of the license application would also result in no requirement for Consolidated Water to provide enhancement measures discussed in sections C.2 and G of this report and no dam safety oversight by the Commission.

For these reasons, we conclude that neither alternative number (3), issuance of a non-power license, or alternative number (4), denial of license, are in the public interest and, therefore, are not reasonable alternatives.

a. Alternative of no action. No action would result in relicensing the existing project with no changes in project operation or enhancement measures. No changes to the existing environment would result.

**D. CONSULTATION AND COMPLIANCE**

1. Fish and wildlife agency consultation (Fish & Wildlife Coordination Act).

a. U.S. Fish & Wildlife Service (FWS): _X_ Yes. ___ No.
b. State(s): _X_ Yes. ___ No.
c. National Marine Fisheries Service (NMFS): _X_ Yes. ___ No.

2. Section 7 consultation (Endangered Species Act)

a. Listed species: ___ None. _X_ Present: Bald eagles (Haliaeetus leucocephalus), a federally listed threatened species (in Wisconsin), nest on project lands.

b. Consultation: _X_ Not required.

Remarks: Consolidated Water proposes measures that would provide for the protection of nesting bald eagles in the project area.

3. Section 401 certification (Clean Water Act).
_X_ Required; applicant requested certification on 2/28/89.
Status: Waived by the certifying agency on 5/17/89.

4. Cultural resource consultation (Historic Preservation Act).

a. State Historic Preservation Officer: _X_ Yes ___ No.
b. National Park Service (NPS): _X_ Yes ___ No.
c. National Register status: ___ None _X_ Eligible or listed.
d. Council: ___ Not required. _X_ Yes.
e. Further consultation: ___ Not required. _X_ Required.

Remarks: Through consultations with the SHPO and the Council, we have proposed a Programmatic Agreement, pursuant to the Council's regulations (36 CFR 800) for the SHPO, the Council, Consolidated, and us to sign.

5. Recreational consultation (Federal Power Act).

a. U.S. Owners: ___ Yes. _X_ No.
b. NPS: _X_ Yes. ___ No.
c. State(s): _X_ Yes. ___ No.

6. Wild and scenic rivers (Wild and Scenic Rivers Act).

Status: _X_ None ___ Listed. Determination completed: _____.

Administering agency: _____.

7. Land and Water Conservation Fund lands and facilities (Land and Water Conservation Fund Act).

Status: _X_ None. ___Designated.
___Determination completed: _____.
Administering agency: _____.

E. COMMENTS

1. The following agencies and entities provided comments on the application or filed a motion to intervene in response to the public notice dated November 14, 1989.

| Commenting agencies and other entities | Date of letter |
|---|---|
| Department of the Interior | March 5, 1990 |
| **Motions to intervene** | **Date of motion** |
| Wisconsin Department of Natural Resources | January 23, 1990 |
| DuBay Property Owners Association, Inc. | January 24, 1990 |

2. _X_ Consolidated Water responded to the comments or motion(s) to intervene by letter(s) dated June 26, 1990.

___Consolidated Water did not respond to the comments or motion(s) to intervene.

F. AFFECTED ENVIRONMENT

1. General description of the locale.

a. Description of the Wisconsin River Basin. The Wisconsin River drains an area of 11,728 square miles; at the DuBay Project, the drainage area is 4,900 square miles. The Wisconsin River is 435 miles long, flowing north to south for the first 310 miles, then to the west for the final 120 miles to its confluence with the Mississippi River.

The Wisconsin River between Brokaw and the DuBay Flowage (the project's reservoir), designated Segment BC of the Upper Wisconsin River by the WDNR, is 35 miles long and is augmented by four major tributaries: Big Rib, Big Eau Pleine, Little Eau Pleine, and Eau Claire Rivers. Flow in the Wisconsin River is regulated by a series of 21 storage reservoirs, operated by Wisconsin Valley Improvement Company (FERC Project No. 2113). These reservoirs provide flow augmentation and flood control for the Wisconsin River. There are 13 hydropower dams upstream of the DuBay Project.

The topography in the Wisconsin River Basin is the result of a continental glacier receding about 11,000 years ago. It is characterized by forested rolling hills and a mosaic of wetlands and lakes. Land use adjacent to the project area is primarily forestry and agricultural. The average temperature varies from 66 degrees Fahrenheit (°F) in July to 15°F in January. Annual precipitation averages about 30 inches per year. The area's average yearly snowfall is 50 to 60 inches.

b. Existing licensed projects and exempted projects (indicated by an " * " after the FERC Project No.) in the river basin, as of 6/1/91.

| Project | Project name | Water body |
|---|---|---|
| 1984 | Castle Rock | Wisconsin |
| 1984 | Petenwell | " |
| 2292 | Nekoosa | " |
| 2291 | Port Edwards | " |
| 2255 | Centralia | " |
| 2256 | Wisconsin Rapids | " |
| 2192 | Biron | " |
| 1967◂ | Whiting Plover | " |
| 2590 | Wisconsin River Division | " |
| 2110 | Stevens Point | " |
| 1953 | DuBay | " |
| 2207 | Mosinee | " |
| 2212 | Rothschild | " |
| 1999 | Wausau | " |
| 1989* | Merrill | " |
| 1979 | Alexander | " |
| 1966 | Grandfather Falls | " |
| 2180 | Grandmother | " |
| 1940 | Tomahawk | " |
| 2476 | Jersey | Tomahawk |
| 2239 | Kings Dam | Wisconsin |
| 1968* | Hat Rapids | " |
| 2161 | Rhinelander | " |
| 1957 | Otter Rapids | " |
| 2113 | Wisconsin Headwaters | " |

◂ = surrender of license has been approved by the Federal Energy Regulatory Commission.

c. Pending license applications and exemption applications in the basin, as of 6/1/91. (Exemption applications are indicated by an " * " after the FERC Project No.)

| Project No. | Project name |
|---|---|
| None | |

d. Cumulative Impacts 4/

A target resource is an important resource that may be cumulatively affected by multiple development within the basin. The staff based its selection of target resources on the regional significance and geographic distribution of the resource within the river basin.

Target resource

(1) Wetlands

(2) Recreational boating

The target resources listed above are described below in section F.2. Impacts to target resources, if any, are discussed in sections G.6 and G.9. No adverse impacts to target resources would result.

2. Descriptions of the resources in the project impact area (Source: DuBay Hydroelectric Project, application, exhibit E, unless otherwise indicated).

a. Geology and soils: The project area is underlain by granitic bedrock. The sandy soils (sand, loamy sand, and sandy loam) that are common to the area were formed in the glacial outwash and recent alluvial and organic deposits that lie on top of the granitic bedrock. Of the 70 miles of reservoir shoreline, Consolidated Water reports a total of 17,000 feet with a potential for erosion and 12,200 feet with active erosion (Consolidated Water Power Company, 1990).

The erosion control plan (ECP) defines the potentially eroding shoreline areas as being generally stable now, but showing evidence of past erosion. These areas are characterized by falling vegetation masses which have taken root and re-established themselves at the base of the bank, by the successful establishment of native plant species on the slopes, and by an overall predominance of vegetation on the bank with minimal soil exposure.

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4/ Cumulative impacts are defined as impacts on the environment that result from the incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time (40 CFR, Part 1508.7).

The ECP reports the actively eroding shoreline areas vary in vertical height from 4 feet to 30 feet, and are characterized by falling vegetation, a predominance of exposed and unvegetated soils, and slopes that are often steeper than 45 degrees. The erosion is caused by water action undermining the banks and occurs where water contacts the banks with the greatest force -- outside bends of the river channel, shorelines exposed to the greatest wave or ice action, or heavy use areas. Consolidated Water reports that higher reservoir water levels during the spring increase the erosion potential.

The ECP identifies 7 sections of project (applicant-owned) shoreline (totalling 6,450 linear feet (LF)) and 3 sections of privately-owned shoreline (totalling 5,500 LF) where active erosion is occurring. The actively eroding project sections are reported as mostly forested shorelines. At the privately-owned eroding sections, the ECP reports that removal of native vegetation by landowners, unsuccessful bank-grading activities, and ineffective private shoreline stabilization measures are contributing factors to normal processes in causing active erosion. The ECP also suggests that wave action from pleasure boating traffic congregating along residential corridors may also be a contributing factor.

The ECP also identifies about 250 LF of actively eroding shoreline in the picnic area of the Portage County DuBay Park, resulting principally from excessive use of the park shoreline, wave action from intense pleasure boating in the river channel, and fluctuating water levels. The ECP reports that the county has already stabilized other, more serious park shoreline erosion with riprap and terraces, and proposes to install terraced timber walls along the remaining 250 feet to permit user access to the shoreline.

b. Streamflow:

low flow: 864 cfs; flow parameter: min. monthly flow
high flow: 58,000 cfs; flow parameter: max. recorded flow
average flow: 4,055 cfs; flow parameter: mean recorded flow

Remarks: Streamflow data used to derive flow information were obtained from Consolidated Water. These data are recorded daily by Consolidated Water based on generator output. The relationship between generator output and streamflow was derived by Consolidated Water based on measured generator output, recorded headwater and tailwater data, and original equipment expected performance curves supplemented by equipment index tests. Data were obtained for a 47-year period of record, from 1942-1988. Two USGS gaging stations, No. 05395000, located 35 miles upstream at Merrill, and No. 05400760, located 25 miles downstream at Wisconsin Rapids, exist near the project.

c. Water quality: An automatic water quality monitoring system was installed by the WDNR in the Upper Wisconsin River in 1970-1971. This system is comprised of six monitoring stations, including one at the DuBay dam and another upstream of the DuBay Flowage, at Mosinee Dam. Discharge, water temperature, DO concentrations, pH, and conductivity are recorded at each of the six stations.

In the early 1970's, severely depressed DO concentrations were recorded upstream of the project, particularly during periods of low river flows. By 1977, most of the industries between Rothschild and DuBay dams on the Wisconsin River had secondary water treatment, which has resulted in reduced biological oxygen demand (BOD) and suspended solids loading to the river, and higher DO levels. However, violations of the state water quality standards for DO (non-trout waters, 5 mg/l) has occurred intermittently during recent years from late spring to early fall. Analysis of samples taken upstream of the dam indicated that the reservoir stratified during summer conditions such that water near the bottom was below state water quality standards for DO concentrations. Water temperatures were less than the state maximum water temperature standard for warmwater fish (31.7 degrees Celsius (°C)).

Analysis of data collected through U. S. Environmental Protection Agency's STORET (storage-retrieval) system indicates that water quality in the Wisconsin River in the project area has improved over the last decade such that fecal coliform counts have been within the state standard for recreational use (not to exceed 200 counts per 100 milliliter volume) since 1985. The BOD level was high in 1977 (15.1 mg/l), but has been below 6.4 mg/l since 1977.

Runoff of oxygen demanding materials and algae loading from the eutrophic Big Eau Pleine Reservoir contributes to depressed DO concentrations in the Wisconsin River. Agricultural runoff from dairy farming and cheese making practices along some of the tributaries of the Wisconsin River provides a major source of nitrogen and phosphorus to the Wisconsin River. Blue-green algae, especially Aphanizomenon flos-aquae, form summer blooms in the DuBay Flowage. Diatoms are also present in the reservoir. Algal toxins have been identified in the Big Eau Pleine Reservoir, but have not been found in DuBay Flowage.

Studies were conducted by Consolidated Water in the project area to assess any adverse impacts regarding contaminants associated with water level fluctuations. The toxicity equivalents of dioxin, organochlorine pesticides, polychlorinated biphenyls (PCB), and mercury in fish tissues were within the Food and Drug Administration (FDA) and Wisconsin Division of Health (WDH) standards for contaminants commonly found in sport fish. Analysis of the metals concentrations in the river upstream from

DuBay Flowage near Mosinee indicated that cadmium concentrations were above the acute criterion set by the Environmental Protection Agency; there are point discharges of cadmium and zinc upstream of DuBay Flowage (Wisconsin Department of Natural Resources 1988).

Rada et al. (1984) studied the distribution of potentially toxic metals in bed sediments, crayfish, and fish in the Upper Wisconsin River. Surficial sediments were moderately polluted with cadmium and lead, and moderately to heavily polluted with copper, zinc, and mercury. Crayfish, carp, and walleye were contaminated with mercury, but less than 1 percent of the fish contained levels in excess of the FDA's action level of 1.0 microgram per gram. Rada et al. (1984) recommended implementation of measures that would minimize disturbance of highly contaminated sediments in order to protect the aquatic biota from exposure to higher concentrations of metals.

d. Fisheries:

Anadromous: _X_ Absent. ___ Present.

Resident: ___ Absent. _X_ Present.

DuBay Flowage supports a diverse community of warmwater and coolwater fishes. Carp, bowfin, and white sucker dominate the rough fish community. Walleye, northern pike, smallmouth bass, muskellunge, yellow perch, black crappie, and bluegill comprise the resident game fish community in the flowage. Walleye is the dominant game fish in the flowage, and has consistent reproduction, and good growth rates and age-class distribution. According to WDNR records, more than 10,000 walleye are harvested annually downstream of Big Eau Pleine Dam during late winter and spring. There is a high quality fishery for trophy-sized northern pike, but its uneven age-class distribution suggests potential recruitment limitations; WDNR's 1983 data showed no evidence of natural reproduction during the previous 10 years. Stocking of large fingerling pike was initiated by WDNR in 1985 to increase the availability of large pike in the flowage.

The lake sturgeon is found in the lower Wisconsin River and is included in the FWS's list of candidate species being considered for listing as endangered or threatened. The WDNR is interested in reestablishing lake sturgeon to the Upper Wisconsin River.

The backwater effect of Steven's Point Dam extends to DuBay dam; thus, the tailwater of DuBay dam is the Steven's Point Flowage. Game fishes (with at least 0.5 percent relative abundance) collected by electroshocking and minnow seining downstream of the DuBay dam include walleye, bluegill, smallmouth bass, black crappie, yellow perch, and pumpkinseed; northern pike

and largemouth bass also occur in the flowage. Steven's Point Flowage supports a substantial spring harvest of walleye, as does the tailwaters of Mosinee Dam at the head of DuBay Flowage.

e. Vegetation: Over 4,000 acres of project lands are forested. Another 2,130 acres are wetlands. Wetlands were chosen as a target resource because river development and use can result in their incremental loss which, in turn, can result in the loss of highly productive fish spawning, fur bearer, and water fowl habitat. Continued project operation would not result in any loss of wetlands. In fact the existence of the project contributes to the maintenance of wetlands. The lands traversed by the project's transmission line, 21 miles long and encompassing about 127 acres, are primarily agricultural, or abandon fields. Ten percent of the transmission line traverses forest.

| Cover type | Dominant species |
|---|---|
| northern hemlock-white pine-hardwoods | sugar and red maple, hemlock, basswood, yellow birch, white and red pine, quaking aspen, paper birch, jack pine |
| spruce-fir | black spruce, balsam fir, northern white cedar |
| bog | black spruce, tamarack, leatherleaf, bog rosemary, bog laurel, labrador tea, blueberry, pitcher plant |
| shrub wetlands | alder, willow, red-osier dogwood |
| marsh | pickerel weed, arrowhead, sedges, grasses, rushes, cattails, water arum, wild rice |
| aquatic vegetation | water lilies, duckweed, pond weed, coontail, water milfoil, tape grass, elodea |

f. Wildlife: Common animal species in the project area include: beaver, black bear, eastern gray squirrel, eastern cottontail rabbit, fisher, mink, muskrat, raccoon, red fox, river otter, snowshoe hare, white-tailed deer, coyote, bobcat, pine marten, deer mouse, eastern chipmunk, masked shrew, redback vole, shorttail shrew, blue-winged teal, common loon, common merganser, grebe, gull, great blue heron, hooded merganser, king fisher, mallard, ring-necked duck, tern, wood duck, and bald eagle (a federally listed threatened species, in Wisconsin).

g. Cultural:

___National Register (listed and eligible) properties have not been recorded.

_X_ There are properties listed on, or eligible for listing on, the National Register of Historic Places in the area of the project's potential environmental impact.

Description: Consolidated Water conducted archaeological surveys along the reservoir, at the locations of proposed recreational development, and in areas where project works are located, and has identified 11 National Register eligible archaeological sites. These archaeological sites, in Portage (PT) and Marathon (MR) Counties (PT-91, -126, -127, -128, -129, MR-36, -37, -38, -39, -41, and -42) are eligible for listing on the National Register because they contain data important in prehistory [see National Register criterion for evaluation, 36 CFR § 60.4, criterion (d)]. Information from archaeological surveys conducted before the reservoir was created indicates there are sites (47-PT-15, -16, -32, -113, and -122) that have since been inundated. Moreover, there are large parcels of land within the DuBay Project boundary that have not been surveyed. Adequate provision must therefore be made for National Register eligible properties identified in Consolidated Water's shoreline survey, for currently inundated National Register eligible properties, and for any National Register eligible properties that have yet to be identified. The existing project facilities are not eligible for listing on the National Register.

h. Visual quality: The DuBay Flowage is visually interesting due to its complex system of tributaries, its highly irregular shoreline, and its numerous vegetated islands. The southern half of the flowage is characterized by wide expanses of open water, large embayments that are divided into smaller pools by road causeways and bridges, and shoreline areas that are about half wooded and half developed. The northern half of the flowage is more natural and riverine in appearance with little visible evidence of development. Bank erosion detracts from the visual quality of the flowage shoreline.

Consolidated Water's management of nearly 4,800 acres of land for timber production purposes is an ongoing activity that detracts from the project's natural setting. The project's existing structural works, including the flowage dike, powerhouse, and improved flowage access points, contribute to the developed character of the lower flowage viewshed. Consolidated Water's current project facility operations affect the appearance of the flowage shoreline and the river downstream of the project dam as a result of seasonal flood control drawdowns that expose the banks of the flowage, flow augmentation releases during low-flow periods that help to maintain the aesthetic value of the

river, and reservoir level stabilization efforts that protect the water body's visual quality during the summer recreation season. The appearance of Consolidated Water's existing 21-mile-long project transmission line is negatively affected by the periodic clearing of vegetation within its 50-foot-wide right-of-way, which reinforces the visual incompatibility of the linear corridor.

i. Recreation: Portage County, which surrounds the project site on the south, has 430 miles of streams and 135 lakes totaling 4,915 surface acres. The county park system, encompassing 1,278 acres, includes 18 sites which offer a variety of recreation. Also, an approximate total of 18,160 acres of land in Portage County offer fishing, hunting, hiking, and snowmobiling.

Marathon County, which surrounds the northern part of the project, has approximately 130 miles of streams and 19,000 acres of surface water. The county park system, encompassing 2,851 acres, includes 20 sites which offers a variety of recreation. The approximate 1,450-acre Big Eau Pleine Park located immediately west of the project site offers day-use facilities, boat access, trails, swimming, fishing, and camping. In addition, Marathon County has approximately 81,000 acres of public land for hunting and dispersed recreation use.

There are no current statistical records of actual flowage recreation use for Marathon County (personal communication, Charles Newby, Park Director, Marathon County Park Commission, Wausau, Wisconsin, August 17, 1990). For Portage County, recent annual records of campground occupancy at DuBay County Park indicate 6,374 camping units (1988) and 6,925 camping units (1989). One camping unit equals one campsite for one day, which averages 3.5 people per camping unit. This figure does not reflect day-use or lodge rentals. From Memorial Day through Labor Day, DuBay County Park receives tremendous use, especially on the weekends (personal communication, Gerald J. Ernst, Park Superintendent, Portage County Parks, Stevens Point, Wisconsin, August 20, 1990).

In Portage and Marathon Counties, there are 152 and 630 miles, respectively, of marked snowmobile trails which are designed to interconnect.

The project area and associated DuBay Flowage are heavily used for water-based recreation. Consolidated Water maintains 6 boat ramps with associated parking facilities for cars and trailers at 4 of the ramps (see Table 1, page 16, for a description of these existing recreational facilities at the DuBay Project). Recreational boating was chosen as a target resource because it can be cumulatively affected by reduced flows and impeded boat passage by dams in a river system.

**Table I. Existing and proposed recreational facilities at the DuBay Hydroelectric Project.**

| Recreation site | Present facilities (without enhancement) | Proposed facilities (with enhancement) |
|---|---|---|
| Sea Gull Lane Access | • launch ramp (ice-damaged)<br>• parking (12 cars/trailers) | • rehabilitate launch ramp and add another launch ramp<br>• construct day-use area (picnic, .5 acre beach, bank fishing area)<br>• install access sign |
| Old Highway 51 Access | • boat ramp<br>• parking 8-10 (cars/trailers) | • reconstruct boat ramp<br>• install 1 boat ramp<br>• parking (30 cars/trailers) and parking for 20 day-use cars<br>• construct day-use picnic area and 1-acre beach<br>• construct 4-mile hiking/cross country ski trail<br>• install access signs |
| DuBay Dam Powerhouse Area | • boat ramp (needs repair)<br>• parking (10-15 cars/trailers)<br>• .5-mile bank fishing<br>• canoe portage to existing launch ramp | • regrade boat ramp and access road<br>• construct 1 boat launch ramp<br>• develop picnic area<br>• expand parking to 25 cars/trailers plus 15 spaces for bank fishing<br>• expand bank fishing access and construct handicapped fishing access<br>• improve canoe portage |
| Portage County Wisconsin River Park | • gravel boat ramp | • improve access road<br>• parking (10 cars)<br>• regrade gravel boat ramp<br>• construct hiking/cross country ski trail |
| Hog Creek Access | • gravel boat ramp | • construct access road<br>• improve gravel boat ramp<br>• parking (25 cars/trailers) |
| Portage County DuBay Park Access | • boat ramp and convenience pier<br>• parking (30 cars/trailers<br>• restrooms | • assist Portage County in developing handicapped fishing pier<br>• support County Parks Department in effort to enforce a no-wake zone within 100 feet of shore<br>• improve CWPCO-owned boat launch site and day-use facilities |

Additional existing recreation facilities in the project area include four park sites (between 3 and 160 acres), six improved public access sites, 19 unimproved public access sites primarily used for bank fishing, and three privately-owned access sites open to the public. The existing facilities are primarily day-use areas except for one county and one private recreation site which offer overnight camping.

The Mead Wildlife Area contains approximately 28,000 acres and is located adjacent to the project to the west (Figure 2,

page 46). The primary management objective for the area is to maximize waterfowl production through habitat management. Recreational use includes hiking, cross-country skiing, hunting, and snowmobiling. Existing facilities include parking areas and approximately 70 miles of trails. Consolidated Water has enteredinto a cooperative management agreement with the WDNR for a 2,483-acre tract of Consolidated Water owned project lands and 1,185 acres of Consolidated Paper owned lands outside but adjacent to the project boundary. The purpose of the agreement is to protect natural resources, particularly waterfowl. Public access would be provided.

j. Land use: Of the estimated 6,800 acres within the project boundary, Consolidated Water owns approximately 5,000 acres and has flowage rights on the remaining lands. Of the 5,000 acres of Consolidated Water owned land, approximately 200 acres are utilized for project-related facilities and the remainder are managed for timber and wildlife production. The majority of lands adjoining the DuBay Flowage are privately-owned and total approximately 1,800 acres; exceptions include park lands totaling approximately 220 acres administered by Portage and Marathon Counties, as well as the Knowlton Lions Club. The remaining surface acres within the project boundary comprise the DuBay Flowage.

The existing 21-mile-long, 50-feet-wide transmission line corridor traverses the Wisconsin River, eight wetlands, seven creeks, a drainage ditch, a Christmas tree plantation, agricultural and pasture lands, and woodlands.

Consolidated Water's lands, within the project boundary, not utilized for either project-related facilities or recreation are shown in Table 2, page 17. Other land uses include agricultural, residential, commercial, and recreational development. Land use for recreational development is discussed in section F.2.i, above. The nearest cities to the project site are Mosinee,located 9 miles to the north, and Stevens Point, located 10 miles to the south.

k. Socioeconomics: The population of Marathon and Portage Counties during the 1980 census was 111,270 and 57,420, respectively. The economy of the area depends on agricultural, lumbering, and small commercial and industrial operations.

## G. ENVIRONMENTAL ISSUES AND PROPOSED RESOLUTIONS

There are 11 issues addressed below.

Table 2. Land use on Consolidated Water owned land at the DuBay Hydroelectric Project for purposes other than project related facilities or recreation.

| CWPCO Land | Acreage |
|---|---|
| Timber production | 4,798 |
| Wetlands | 2,130 1/ |
| 100-year floodplain | 3,000 2/ |
| Protected open space | 2,000 3/ |

1/ Approximately 2,130 acres of wetlands occur within the project boundary. However, 1,583 acres of wetlands, not shown in table 2, are adjacent to the project boundary.

2/ This acreage is concentrated in the upper one-third of the flowage along the Little Eau Pleine River corridor and below the DuBay dam.

3/ This acreage adjoins the Little Eau Pleine River corridor and the Mead Wildlife Area. These lands are discussed in section F.2.i.

1. Erosion and sedimentation from construction of recreation improvements: Increased potential for erosion and sediment runoff would result from ground-disturbing activities during construction of the proposed recreation improvements at existing and new sites (see discussion of issue G.10, page 37). We believe Consolidated Water's proposals to intercept construction area runoff, revegetate disturbed areas, and schedule boat ramp improvements during the late winter/early spring drawdown periods could effectively minimize the erosion and sediment impacts, but Consolidated Water doesn't include these measures in its proposed recreation plan. Therefore, to ensure that only minor, short-term erosion and sediment runoff would result from construction of the recreation improvements, we recommend that when implementing the recreation plan, Consolidated Water should use appropriate sediment runoff controls and timely revegetation of disturbed areas and should schedule boat ramp developments during the late winter/early spring drawdown periods.

2. Reservoir Shoreline Erosion: In its motion to intervene, the DuBay Property Owners' Association (Property Owners) comments that the maximum proposed spring reservoir water levels, in conjunction with increased boating use from May 15 to June 15, have caused significant shoreline erosion and may continue to do so. Consolidated Water responds that the present (and proposed, continued) reservoir operating regime permits the reservoir pool to reach elevation 1,116.2 feet, 1 foot above the maximum summer pool level, during the period April 15 - June 15. This provides temporary retention of high springtime flows as part of a coordinated flood control effort designed to moderate downstream effects of high springtime flows. Consolidated Water also notes

that from 1979 to 1989, the reservoir elevations, during the period May 15 to June 15, exceeded elevation 1,116.0 feet 8.8 percent of the time and were at or below elevation 1,115.7 feet for 57.2 percent of the time. Further, concentrated boating activity does not typically occur prior to June 15. Consolidated Water's studies conducted while preparing the ECP did not indicate any problems warranting changing the proposed operating regime, and further, the proposed monitoring program would provide adequate means for identifying the need for and taking appropriate corrective action.

Property Owners also recommends that Consolidated Water provide more definite plans for protecting the shoreline from erosion. The WDNR and the Department of the Interior (Interior) recommend that Consolidated Water execute the erosion monitoring and control plan identified in the application. In response to these three recommendations, Consolidated Water refers to the ECP that it prepared at our request and to favorable comments on the draft ECP made by the WDNR and the Property Owners.

Consolidated Water asked the WDNR and the Property Owners to comment on a draft version of the ECP. Their comments and recommendations on the draft and Consolidated Water's responses are included in the ECP filed with the Commission on March 20, 1990. We note that the WDNR and the Property Owners' comment letters on the draft ECP post-date the WDNR and the Property Owners' motions to intervene.

Although the WDNR and the Property Owners are generally supportive of Consolidated Water's proposed stabilization and monitoring programs outlined in the ECP, they did have some recommendations that Consolidated Water did not adopt.

In commenting on the draft ECP, the WDNR expressed concern that island erosion may be more significant than shoreline erosion in terms of potential impact on fish and aquatic life, and recommended that Consolidated Water reassess or describe the extent and location of island erosion in the final ECP to be submitted to the Commission (letter to Richard Hilliker from Bob Martini, Project Manager, Wisconsin Department of Natural Resources, Rhinelander, Wisconsin, February 8, 1990).

Consolidated Water responds that attempts to stabilize island shorelines would be impractical and unnecessary because: (1) no outstanding habitat or planned improvements are affected; (2) erosion of these areas is typical of normal river processes and not uniquely the result of project reservoir operations; (3) other areas where erosion is more serious have been identified and are being given higher priority; and (4) access to the island erosion areas by heavy equipment necessary to perform the stabilization work would be either impossible or prohibitively expensive (letter to Robert Martini from Richard

Hilliker, Consolidated Water Power Company, Wisconsin Rapids, Wisconsin, March 19, 1990).

The ECP also explains that the stabilization program would not encompass two sections of eroding island shorelines (totalling 3,350 LF) because those particular shoreline sections are of little value for public recreation or private development and they don't include any archaeological sites. Consolidated Water says it would continue to monitor shoreline erosion at the project and share the information with the WDNR, and, where serious erosion persists and the WDNR can point to specific impacts that warrant the unusual costs and associated impacts of stabilizing those areas, Consolidated Water would work out enhancement measures with the WDNR (letter to Robert Martini from Richard Hilliker, Consolidated Water Power Company, Wisconsin Rapids, Wisconsin, March 19, 1990). If stabilization of a particular island shoreline erosion problem is determined to be feasible and warranted, it would be placed within the shoreline stabilization work schedule with a priority agreed to by Consolidated Water and the WDNR.

Based on its review of the draft ECP, the Property Owners recommends that Consolidated Water consider providing monetary assistance to the few private owners who may not be able to finance shoreline stabilization (letter to Richard Hilliker from Susan Pohlkamp, President, DuBay Property Owners' Association, Junction City, Wisconsin, March 1, 1990). Consolidated Water responds that it cannot directly subsidize shoreline stabilization for individual property owners, but that it would take whatever steps are necessary to accomplish the work where shoreline stabilization measures are judged important to project operations (letter to Susan Pohlkamp from Richard Hilliker, Consolidated Water Power Company, Wisconsin Rapids, Wisconsin, March 7, 1990).

We conclude that Consolidated Water has adequately addressed and reasonably accommodated the concerns of Interior, the WDNR, and the Property Owners in the ECP. The 5-year stabilization and the 10-year monitoring programs, as outlined in the ECP, would be very effective in providing enduring protection of eroding and potentially eroding shorelines at the project, and thus, implementation of the ECP would produce a long-term beneficial impact. Therefore, we recommend that the ECP be approved and made a part of any license issued for the project, and that Consolidated Water be required to implement the stabilization and monitoring programs as outlined in the ECP.

3. Project operation:

a. Water surface elevations: The DuBay Project would continue to operate as a peaking project during weekdays, for which there is generation for approximately 14 hours a day. On

weekends the project generally operates 24 hours a day. The DuBay Flowage (i.e., reservoir) is an integral part of the flood control system that also includes Consolidated Water's Castle Rock and Petenwell Flowages and the 21 reservoirs located upstream of the DuBay Project that are operated by the Wisconsin Valley Improvement Company.

The water surface elevation of the DuBay Flowage has fluctuated historically within the bounds of the following water surface elevation rules:

| | |
|---|---|
| maximum: | 1,116.20 feet on March 15 to June 15 |
| | 1,115.20 feet on June 15 to March 15 |
| minimum: | 1,113.70 feet on May 1 to February 1 |
| | 1,109.20 feet on February 1 to May 1 |

In practice, the normal fluctuation in water surface elevation is usually less than 1.0 foot from May 1 to June 15 (2.5 feet allowable) and less than 0.5 feet from June 15 to February 1 except during spring filling (1.5 feet allowable)(Consolidated Water Power Company, 1989).

Consolidated Water has proposed to continue operation of the DuBay Project as in the past, with the exception of additional operational considerations to enhance northern pike spawning and recruitment during the spring. In order to enhance the northern pike fishery, Consolidated Water has proposed to change operation to establish the water surface elevation at 1,115.20 feet on or about April 10, and maintain that level or allow a gradual rise to a maximum elevation of 1,116.20 feet until on or about May 10 (except if reservoir lowering is needed for flood control).

Consolidated Water also proposed to minimize fluctuations of the reservoir surface elevation during other times of the year (except as necessary to provide flood control for the protection of downstream areas). The range in fluctuations as proposed by Consolidated Water are within the historical surface water elevations for the DuBay Project. Specifically, Consolidated Water would maintain the reservoir elevation between 1,113.7 and 1,115.2 feet during the period between June 15 and January 1 each year for the protection of wildlife habitat in wetlands and to enhance recreational use in the reservoir. Consolidated Water proposed that the winter drawdown, occurring between January 2 and April 9, annually, would not lower the reservoir elevation below 1,109.2 feet, this will provide protection of aquatic resources in the flowage. As indicated above and discussed further in this assessment (see next discussion in fisheries), Consolidated Water proposed operational considerations to maintain the headpond elevation as close to 1,115.2 feet as conditions permit, or gradually increase to 1,116.2 feet between April 10 and May 10, annually, in order to provide protection and

enhancement of northern pike spawning and egg incubation. Finally, for the period between May 11 and June 14, Consolidated Water proposed to gradually lower the reservoir to 1,115.2 feet (if not already at this level). The drawdown rates are proposed to be no greater than 1-inch per hour.

Interior stated that it seeks no net loss of in-kind wetland habitat value associated with the continued operation of the DuBay Project, and recommended that any license issued be conditioned to require maintenance of reservoir elevations between 1,113.7 and 1,115.2 feet between June 15 and winter drawdown (January 1) each year to protect wetlands and furbearer habitat in the DuBay flowage. The WDNR made the same recommendation for operation of the DuBay Project between June 15 and winter drawdown. WDNR stated that Consolidated Water's proposal to limit water surface fluctuations would ensure that aquatic vegetation and associated wildlife habitats are maintained and protected in the DuBay Flowage during this period. In addition, Consolidated Water's proposed operating rules that we have previously described for the periods between winter drawdown and June 14 are also provided in recommendations made by Interior and the WDNR; the agencies say these requirements are needed and should be implemented at the DuBay Project for the protection and enhancement of wetlands, recreation resources, and aquatic resources in the project area. Finally, Interior and WDNR state that any need for lowering the minimum elevation for winter drawdown lower than 1,109.02 feet should only be allowed with prior permission from the WDNR; Consolidated Water disagrees that operation of the DuBay Project, as authorized by the Commission also requires permission of the WDNR.

We concur with Consolidated Water's proposed limitations on reservoir elevation fluctuations and drawdown rates for the DuBay Project. Although these operational requirements can only be implemented when drawdowns are not necessary for flood control, operation of the DuBay Project according to Consolidated Water's proposals will provide for continued protection of the wetlands, recreation resources, and aquatic organisms in the DuBay Flowage. In addition, Consolidated Water's proposal to modify operation during the spring will allow for increased recruitment for northern pike populations during years when greater water surface elevation fluctuations are not necessary for flood control. A drawdown rate of 1-inch per hour will also help to prevent stranding of aquatic organisms that may inhabit the shoreline habitat. Therefore, we conclude that Consolidated Water should operate the DuBay Project with the operational requirements as proposed and discussed above. Should a winter drawdown of less than 1,109.02 feet be needed, the licensee should first notify the WDNR and the Commission's Chicago Regional Office before commencing the lowering of the elevation to less than 1,109.02 feet.

The WDNR and the FWS have also expressed concern that aquatic habitat in the project tailrace area would be adversely impacted during cessation of generation when inflow to the reservoir is less that 3,000 cfs. To address this concern, Consolidated Water conducted a shutdown test. This test demonstrated that the river would not be dewatered under shutdown conditions because water impounded by the next downstream dam (Steven's Point dam) backs up to DuBay dam. Maintenance of a minimum tailwater surface elevation of 1,086.9 feet would prevent dewatering downstream of the dam. This elevation has been historically maintained under normal operating conditions; Consolidated Water does not propose any changes in the DuBay Project that would affect this tailwater elevation. If the downstream project does lower its reservoir water surface elevation below 1,086.9 feet, then the Consolidated Water proposes to generate and spill water as necessary to maintain this elevation, unless dewatering of the downstream area is necessary for maintenance or repairs and is agreed to by the WDNR (personal communication with Kenneth Knapp, Vice President Consolidated Water, October 29, 1990). Therefore, the agencies have not recommended a minimum flow release for the project, as long as present operations continue and a minimum tailwater elevation of 1,086.9 feet is maintained. Maintenance of this tailwater elevation will ensure that there will be no dewatering of the tailwater downstream of the dam. We recommend that this tailwater elevation be maintained and included as a requirement in any license issued for the DuBay Project.

b. Streamflow gaging: The WDNR and Interior have recommended that staff gages, calibrated to a stage versus discharge relationship, be installed upstream and downstream of the dam so as to be clearly visible to the public at all tires to indicate maximum and minimum pool elevations. These agencies also recommended that Consolidated Water maintain flow records of daily operation and reservoir and tailwater elevations, and provide them to the FWS and the WDNR upon request.

Consolidated Water has installed staff gages in the reservoir and tailwater of DuBay dam, but these are not clearly visible to the public. Consolidated Water has stated that calibrated staff gages placed at other locations, where public access is practical, would not be appropriate for monitoring compliance with reservoir elevation requirements, because wind effects and the gradient caused by higher flow would often produce readings different from those at the dam. Consolidated Water has indicated, however, that it would have no objection to providing a gage that would provide the public with general water surface elevation conditions at the project.

We have determined that gages are necessary at the project in order to show compliance with the reservoir water surface elevation and tailwater elevation requirements that we have

recommended. In addition, the installation of an additional gage, as proposed by Consolidated Water, would provide information on general water surface elevation conditions for the public. Therefore, Consolidated Water should maintain reservoir and tailwater gages to demonstrate compliance with the required operation conditions. After consultation with the U.S. Geological Survey (USGS), the FWS, and the WDNR, Consolidated Water should develop a plan to install, operate, maintain and report data from gaging stations located in the project's reservoir and tailwater. In addition, the plan should include provisions to install and maintain a gage which would be clearly visible to the public at all times, in order to give boaters and other recreational users an indication of high and low water conditions. The gaging plan should be filed for Commission approval and should include a provision for providing flow data to the agencies within 30 days from the date of an agency's request.

4. Fisheries:

a. Northern pike enhancement. The WDNR has expressed concern regarding the potential adverse impacts of spring water surface elevation fluctuations of DuBay Flowage on northern pike spawning. There exists a high quality fishery for trophy-sized northern pike. However, as discussed above in section F.2.d (page 11), Fisheries, the uneven age-class distribution of northern pike suggests that recruitment is adversely affected by water surface elevation fluctuations caused by project operations in the epring. Pike spawning peaks in the area flowages about April 10-20, and it takes about 3 weeks for the eggs to develop into fry. Because the flowage has usually refilled (from spring snowmelt) by this time, the primary consideration for the protection of pike recruitment is the potential for adverse effects to the young from falling water levels. Northern pike generally spawn in areas with water depths between one and two feet. Decreases in water level during the incubation and fry development period could cause stranding, or may result in DO depletion, accumulation of hydrogen sulfide, or high water temperatures (Consolidated Water Power Company, 1989).

The agencies have recommended that Consolidated Water provide stable or gradually increasing water surface elevations during the period of April 10 to May 10 in order to improve pike spawning and recruitment. Consolidated Water has agreed to these conditions and has proposed to establish the reservoir elevation at 1,115.20 feet about April 10. Consolidated Water would maintain that elevation, or allow a gradual rise to a maximum elevation of 1,116.20 feet, until about May 10, except as pond

lowering may be required for flood control 7/. Maintaining stable water surface elevations during the recruitment period (in years where a drawdown is not necessary for flood control) could enhance the northern pike fishery in the Wisconsin River, and hence, should be implemented.

The agencies have recommended that Consclidated Water monitor the effectiveness of the proposed revised operation on enhancement to the northern pike fishery during the northern pike spawning and recruitment period. Consolidated Water has agreed to monitor the effectiveness of its plans to establish the water surface elevation at 1,115.2 feet on or about April 10 and to maintain that elevation, or gradually raise the pool to a maximum of 1,116.2 feet until about May 10. Consolidated Water does not propose to develop or implement a plan to evaluate the results of maintaining stable reservoir elevations on northern pike spawning habitat or populations; Consolidated Water has stated that the WDNR should make such evaluations.

Water surface elevation fluctuations may have a direct and adverse impact on the spawning success and recruitment of northern pike in the project area. Because the operations of the DuBay Project have contributed to water surface elevation fluctuations during the spawning and recruitment period of northern pike, and therefore, may have been limiting the recruitment potential for this species, we have concluded that it is the responsibility of Consolidated Water to take measures to enhance northern pike spawning and recruitment (i.e., limiting fluctuations during this critical period, as described above), when these measures do not conflict with the need for flood control. It should also be Consolidated Water's responsibility to monitor the effectiveness of its proposed revised operation for the DuBay Project, including the evaluation of maintaining stable water surface elevations on northern pike spawning, recruitment, population structure, and habitat.

Therefore, we recommend that a northern pike monitoring plan be developed by the licensee in consultation with the FWS and the WDNR and submitted to the Commission for approval. The results of the monitoring should be submitted to the Commission along with comments from the consulted agencies on the results of the monitoring. If the results indicate that changes in project operations, different from our recommended operational requirements, are necessary to enhance northern pike spawning and

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7/ Conditions that would lead to a flood flow are rainfall of one inch or more in the Rib, Eau Claire, and/or Eau Pleine basins, and/or a strong warming trend that could lead to a snowmelt. Any of these conditions would require actions to alleviate the potential for a flood, including drawdown of DuBay Flowage by as much as two or three feet.

recruitment, then Consolidated Water should develop recommendations and a schedule for implementation of any needed changes. The changes and implementation schedule should be developed in consultation with the FWS and the WDNR; any recommendations resulting from the monitoring would also be subject to Commission approval.

b. Fish passage: The WDNR is interested in reestablishing lake sturgeon and other species whose historical range is (and/or suitable habitat is available) in the Upper Wisconsin River. Sturgeon and walleye are capable of travelling long distances and passing over dams if appropriate fish passage is provided (e.g., Holland et al., 1984). Currently, upstream and downstream passage of fish past the DuBay Project is not a management objective for the Upper Wisconsin River. Should management objectives change and subsequently require fish passage, it may be necessary for Consolidated Water to install appropriate upstream (e.g., fish ladder) and downstream (e.g., turbine bypass facility) fish passage facilities. Accordingly, Interior (letter of March 5, 1990 from Mr. Jonathan P. Deason, Director, Office of Environmental Affairs, Department of the Interior, Washington, D.C.) reserved authority to prescribe the construction, operation, and maintenance of fishways for the DuBay Project pursuant to Section 18 of the Federal Power Act (Act). Consolidated Water objects to this reservation of authority based on legal grounds.

Section 18 of the Act provides the Secretary of Interior the authority to prescribe upstream fishways 8/. Although fish passage facilities may not be recommended by Interior at the time of project licensing, such as for the DuBay Project, the Commission should include license articles which reserve Interior's prescription authority 9/. We recognize that future fish passage needs and management objectives cannot always be predicted at the time of license issuance. Under these circumstances, and upon receiving a specific request from Interior, the Commission should reserve Interior's authority to prescribe fishways.

5. Water quality: Consolidated Water proposed to monitor tailrace DO concentrations and water temperatures (in the same locations as for the July and August, 1988, water quality study) once per week in July and August following any 5-day period

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8/ Section 18 of the FPA provides: "The Commission shall require construction, maintenance, and operation by a licensee at its own expense of... such fishways as may be prescribed by the Secretary of Commerce of the Secretary of Interior as appropriate."

9/ Lynchburg Hydro Associates, 39 FERC ¶ 61,079 (1987).

during which the average river flows at DuBay dam fall below 1,500 cfs. Consolidated Water proposes to monitor DO concentrations under these conditions because violations of the state standard for DO (non-trout waters, 5 mg/l) has occurred during recent years under extreme low flow conditions of about 1,000 cfs during summer when the project reservoir has stratified. The frequency of occurrence for river flows of this magnitude or lower is 5 to 8 percent during the months of July and August (Consolidated Water Power Company, 1989). Because DO concentrations were only intermittently below the state standard of 5 mg/l in the tailrace with river flows at 1,000 cfs, Consolidated Water considered that a threshold of 1,500 cfs to monitor DO concentrations would be sufficient.

Consolidated Water proposed to install a removable skimmer weir at the bottom of the stop gate slots in each of the two forebays of one of the turbine units to improve tailrace DO concentrations if monitoring shows that DO concentrations in the tailrace falls below the state standard of 5 mg/l. This enhancement measure is proposed because DO concentration profiles taken in the reservoir near the dam (Consolidated Water Power Company, 1989) indicated that water with less than 5 mg/l of DO was usually limited to depths of 5 meters (m) or greater; the 4.5 m high skimmer weir would restrict the water entering the unit to the upper 5 m of the water column. Consolidated Water proposed to keep the weir in place until DO concentrations exceed 5 mg/l at all monitored locations and depths, and to consult with the WDNR and the FWS on the results of implementing this measure to improve downstream DO concentrations. Consolidated Water estimated the cost for fabrication of the skimmer weir to be $12,500. Consolidated Water also estimated that the water quality monitoring and operation and maintenance of the skimmer weir would cost about $3,890 annually.

Interior and the WDNR recommended that Consolidated Water develop a plan, in consultation with these agencies, to monitor the effectiveness of the proposed skimmer weir enhancement measure and to develop an alternative plan to improve low downstream DO concentrations, if the skimmer weir does not prove to be effective.

DO concentrations have historically been depressed in the Wisconsin River in the winter, as well as in the summer. For example, low flow river conditions, in combination with high point source BOD loading, caused a fish kill in the river during the 1976-1977 winter (Consolidated Water Power Company, 1989). Although there has been recent improvement in water quality due to the addition of secondary treatment for upstream waste dischargers, we have determined that monitoring of DO concentrations, beyond just the summer period is necessary to ensure that the skimmer weir will maintain state standards for DO

concentrations and to protect the fisheries in the Wisconsin River.

We recommend that the proposed skimmer weir be constructed, and operated at any time DO concentrations in the tailrace approach the state standard of 5 mg/l. Because violation of DO standards may also occur in the winter (especially during periods of low river flows), as well as during periods of heavy wasteloads in the summer, we have determined that the monitoring program proposed by Consolidated Water will not ensure protection of state DO standards throughout the year in the Wisconsin River. In order to ensure the protection of water quality, Consolidated Water, after consultation with FWS and WDNR, should develop a water quality monitoring plan, for Commission approval, to measure DO concentrations and water temperatures downstream of the project's tailrace throughout the year and to determine the effectiveness of the proposed skimmer weir to improve low DO concentrations to ensure the maintenance of the state standard of 5 mg/l.

The results of the water quality monitoring should be submitted to the Commission along with comments from the consulted agencies. If the results of the monitoring indicate that additional measures are necessary to improve DO concentrations downstream of the project in the Wisconsin River, then Consolidated Water should also file for Commission approval, recommendations for any proposed measures needed to maintain DO concentrations of at least 5 mg/l in the tailrace, including a schedule for implementation of the proposed measures. Any recommendations for proposed measures to improve downstream DO concentrations should be developed in consultation with the FWS and the WDNR.

6. Wetland protection and wildlife management: Consolidated Water proposes wildlife and land management measures (Consolidated Water Power Company, 1989) to maintain and improve the wildlife habitat value of the land associated with the project (including over 2,130 acres of wetland habitats). These measures include:

a. maintaining the reservoir elevation between 1,113.7 and 1,115.2 feet from June 15 to winter drawdown (January 1) each year to protect wetlands and furbearer habitat (discussed in section G.3);

b. inventorying the plant and animal species in a 146 acre bog and consulting with agencies to determine any measures needed to protect the bog;

c. maintaining open wet meadows by subduing woody plant encroachment with fire, mowing and herbicide;

d. managing timber harvest to benefit wildlife such as by creating openings, managing older stands through selective cutting, etc.; and

e. providing osprey nesting platforms, and maintaining kestrel and bluebird houses.

In addition to the recommendation for maintenance of reservoir elevations to protect wetlands and fish and wildlife resources, Interior has also recommended that Consolidated Water cooperate in implementing purple loosestrife control in DuBay Flowage, when appropriate, and implement the measures included in the Mead Wildlife Area Cooperative Management Plan. The WDNR has made the same recommendations.

Purple loosestrife (Lythrum salicaria) is a wetland plant introduced from Europe that has become widely naturalized in North America. The plants may proliferate profusely in wetlands at the expense of native wetland vegetation. Should it become necessary to control purple loosestrife in the DuBay Flowage, and associated wetlands, and safe control measures become available, Consolidated Water ought to cooperate with agencies to implement purple loosestrife control measures. Consolidated Water stands ready to do so.

Consolidated Water executed the Mead Wildlife Cooperative Management Agreement (Agreement) with the WDNR which commits Consolidated Water to funding 50 percent of wildlife management improvements to Consolidated Water's lands subject to the agreement, among other things. The Agreement would commit 3,668 acres of Consolidated Water and Consolidated Paper's lands, including 2,483 acres of project land (the remaining 1,185 acres are outside the project boundary) adjacent to the WDNR's 28,000 acre Mead Wildlife Management Area, to wildlife management (see Figure 2, page 46). Wildlife management improvements in the lands subject to the Agreement proposed by Consolidated Water include constructing three 3-acre wildlife ponds and a 60 to 70-acre impoundment to enhance waterfowl reproduction; wetland and upland brush control; and implementing other wildlife management practices that may be agreed to in the future.

We conclude that the wildlife and land management measures proposed by Consolidated Water would adequately protect and enhance wildlife resources in the project area during the term of the license. Further, the proposed measures are in accordance with the North American Waterfowl Management Plan (Department of the Interior and Canadian Ministry of Environment, 1986) 10/. Because loss and degradation of waterfowl habitat is the major

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10/ A plan accepted by the Commission as a comprehensive plan under section 10(a)(2) of the FPA.

waterfowl management problem in North America, this plan recommends the maintenance and, where possible, enhancement of waterfowl habitats, primarily wetlands. Consolidated Water's proposed management measures would result in the maintenance and enhancement of wetlands in the project area.

We have previously discussed our recommendations for the license to provide for the maintenance of reservoir elevations that will protect wetlands and associated wildlife habitat (see section G.3). We further recommend that the wildlife and land management measures proposed by Consolidated Water be approved and made a part of any license issued for the project. Implementation of these measures will ensure the protection and enhancement of wetlands in the project area and will therefore prevent any cumulative losses to wetlands in the Wisconsin River Basin. The Commission would also retain sufficient authority, through standard license articles included in the license, to require Consolidated Water to cooperate with the FWS and the WDNR to control purple loosestrife in the future if necessary. Finally, the Agreement between Consolidated Water and the WDNR has been executed, on July 15, 1990, and requires no approval or authorization by the Commission.

7. Threatened species protection: Federally listed threatened bald eagles (in Wisconsin) nest on and near project lands. There are 5 active and 2 currently inactive, bald eagle nest sites on project lands (Figure 3, page 47) 11/. Consolidated Water proposed to continue to assist the National Audubon Society with mid-winter efforts to survey bald eagles and continue to maintain the established buffer zones around bald eagle nests. Per U.S. Fish and Wildlife Service (undated) guidelines, there is a primary buffer zone, within 330 feet, and a secondary buffer zone, beyond 330 feet and within 660 feet, established around each active and inactive nest site. In addition, Consolidated Water prepared a bald eagle management and protection plan (filed with the Commission on March 29, 1990). Salient points of the plan include:

a. logging, land development, and chemical use is prohibited within the primary buffer zone of all known current or formerly used (currently inactive) nest sites;

b. maps showing primary and secondary buffer zones around nest sites will be provided so that logging can be avoided in the primary zone;

c. commercial activities in the secondary buffer zone, on project lands, will be prohibited and future timber cutting will be reviewed in contracts that will specify the location of

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11/ Three nests within the project are on private land.

these zones and needed precautions in the zones to protect bald eagle nests;

d. logging on project lands will be managed so that within 1,320 ft of the shoreline, 4 to 6 large trees per 320 acres will be left for eagle nesting and roosting.

e. clear cutting within 200 feet of the shore or within secondary buffer zones will not occur, except to clear severe blowdown or disease damaged trees;

f. annual meetings with the WDNR bald eagle survey coordinator will be held to identify new nests which will be subject to protection under the plan; and

g. warning signs will be placed at boat landings, warning of eagle nests and prohibiting entry into primary and secondary zones around the nest sites.

The FWS and the WDNR have reviewed Consolidated Water's bald eagle protection plan and have indicated, by letters dated February 20 and February 21, 1990, respectively, that the plan would protect bald eagles and their nesting and roosting habitat on which they depend.

We have reviewed the bald eagle protection plan and conclude that it complies with the bald eagle management guidelines (U.S. Fish and Wildlife Service, undated). These guidelines include measures for protecting nesting bald eagles from disturbance by establishing primary and secondary buffer zones around existing bald eagle nests, restricting various degrees of human disturbance from each buffer zone, and protecting potential nest sites, feeding, and roosting areas.

The bald eagle protection plan would serve to protect bald eagles and their habitat associated with the project. Bald eagles use one or more nests year after year, often alternating nests in different years. The buffer zones around all known bald eagle nests and restriction of human disturbance from these zones would protect bald eagles during nesting. Disturbances range from human entry, to commercial development and chemical use. Human entry during the critical period, between arrival of adults at the nest and fledging of any young, for example, thereby has resulted in bald eagles abandoning the nest and their young, lowering their reproductive rate. Use of chemicals that are toxic to bald eagles (e.g. mercury and lead based compounds, organochlorine pesticides), can result in direct death of bald eagles or, in relatively low concentrations, lead to failure of egg hatching.

Leaving mature trees would provide potential new nest sites and protect perch trees which bald eagles use for roosting and

feeding. Prohibiting clear cutting within 200 feet of the reservoir shoreline serves to maintain and protect the bald eagles' open water feeding areas.

We therefore recommend that the bald eagle protection plan be approved and made a part of any license issued.

8. Future recommendations to protect and enhance fish and wildlife resources in the Wisconsin River Basin: Interior stated that the WDNR and the FWS are in the process of reviewing system-wide effects of continued operation of eight hydropower projects in the Wisconsin River Basin whose licenses will expire by the year 1993. Based on this review, the agencies will likely recommend project-specific and basin-wide measures to protect and enhance fish and wildlife resources in the basin. Interior said that such measures could affect the operational conditions recommended for the DuBay Project. Subsequently, Interior recommended that the license be conditioned requiring Consolidated Water, upon order by the Commission, to implement recommendations developed by the FWS to protect and enhance fish and wildlife resources in the basin, based upon the agencies' analysis of system-wide effects of continued multiple hydropower operations.

We recognize that future changes to fish and wildlife management objectives, goals, and techniques cannot be predicted at the time of issuance of a license. Therefore, to consider these future changes, standard license articles are included in any license to allow for future project modifications. Prior to the Commission ordering specific changes, as may be recommended by the resource agencies, these standard articles allow Consolidated Water the opportunity for a hearing.

9. Cultural resource protection:

On October 4, 1991, the staff, the Wisconsin SHPO, and the Council, executed a Programmatic Agreement (agreement) for handling cultural resource issues at the project, pursuant to the Council's regulations, 36 CFR at 800. The agreement requires Consolidated, within 12 of the date the agreement is executed, to develop and implement a Cultural Resources Management Plan (CRMP), and to permit the SHPO and the Council 45 days to review the CRMP. After the SHPO and the Council have reviewed the CRMP, Consolidated shall then file the CRMP for Commission approval, and upon approval, shall implement the CRMP. Execution of the agreement evidences the Commission's compliance with Section 106 of the National Historic Preservation Act. We recommend that the agreement be approved in any new license that is issued for the DuBay Project. The agreement requires that the CRMP include the following elements.

a. Shoreline sites. In consultation with the SHPO, Consolidated would develop and implement a management plan for protecting historic properties along the reservoir shoreline, including: (a) techniques to be used to stabilize the shoreline and preserve the 11 identified sites; (b) mitigative measures if stabilization techniques result in an effect to an historic property; (c) a schedule for shoreline stabilization of the identified sites, based on the severity of the impacts at each site; and (d) annual monitoring by Consolidated personnel, who are familiar with the archaeology of the reservoir shoreline, to evaluate the success of shoreline stabilization techniques or other treatment alternatives, and to record any newly exposed sites; and (e) provision for consulting with the SHPO, concerning shoreline stabilization or other treatment alternatives at newly recorded sites and at sites where shoreline stabilization or other treatment alternatives have failed, within 90 days of discovering a site or a treatment failure at a site. In-place preservation is preferred, but if Consolidated, in consultation with the SHPO, determines that this is not possible, Consolidated would develop and implement a Data Recovery Plan (DRP), that would specify at a minimum: the properties where data recovery is to be conducted; the research questions to be addressed through data recovery and an explanation of their relevance, importance, and data requirements; the methods to be used, with an explanation of their relevance and relationship to the research questions; the methods to be used in data analysis, management, and dissemination; the proposed costs for data recovery, data analysis, and report preparation; the proposed schedule for the implementation and completion of field work, data analysis, and report preparation; and a description of how the final report will be made available to the professional archaeological community and the public.

b. Inundated sites. Consolidated would develop a plan for surveying, evaluating, documenting or salvaging, as appropriate, archaeological sites 47-PT-15, -16, -32, -113, and -122, that were inundated by the Project reservoir; and would implement this plan at such time as the opportunity to do so is afforded by the sites' exposure through dewatering.

c. Unsurveyed lands. Consolidated would develop and implement a plan to identify, evaluate, and manage historic properties where ground-disturbing and land-clearing activities (e.g., the development of recreational facilities, timbering, and other land management practices) are proposed within the Project boundaries. The plan would include: (a) a description of the methods for identifying, evaluating, and managing the properties; and (b) a schedule for completing these tasks before beginning ground-disturbing and land-clearing activities.

d. Land-use map. Consolidated would develop a land-use map of the project which clearly depicts: (a) current and proposed

land uses; (b) locations and eligibility status of historic properties, including any standing structures, buildings, or bridges; (c) the Project boundaries; and (d) areas that have been surveyed. The map would be updated as data on properties become available pursuant to any activities covered under this Programmatic Agreement. An updated version of the map would be filed with the Commission and the SHPO within 30 days of any changes.

e. Accidental discoveries. If previously unidentified historic properties are discovered during land-clearing or ground-disturbing activities within the Project boundary, Consolidated would immediately alert the Commission and the SHPO to the discovery and ensure that all work that may affect the property is halted until the requirements of 36 CFR 800.11 have been satisfied. Consolidated would consult with the SHPO to assess the National Register eligibility of the discovery and the effect, and to design a plan for avoiding or mitigating adverse effects upon the discovery. Consolidated would be responsible for ensuring that work crews are informed of the requirement to identify, report, and protect any such finds.

f. General provisions. All survey strategies and DRPs would be developed and implemented in consultation with the SHPO, and upon completion, would be reviewed by the SHPO. Consolidated would conduct all surveys and implement all DRPs consistent with appropriate guidelines published by the State of Wisconsin, Department of the Interior, and the Council. The agreement would include provisions for handling objections to specific provisions in the CRMP; amending or terminating the agreement; preparing and distributing archaeological reports and annual summary reports, while limiting access to sensitive archaeological data; disposing of human remains and grave-associated artifacts; and for ensuring that all historic preservation work is carried out by or under the direct supervision of a person or persons meeting the Secretary of the Interior's "Professional Qualifications Standards."

10. Aesthetic resources management: The WDNR suggests that aesthetic resources on project lands should be protected by an aesthetics management plan, which could include classifying project lands according to the guidelines listed in chapter 11, Aesthetic Management, of the WDNR's Silvicultural and Forest Aesthetics Handbook. The WDNR also suggests that this handbook could serve as a model for the management of project-related aesthetic resources. The WDNR is especially concerned with the possible clear-cutting of timber on the east side of Dubay Flowage, which could make State Highway 51 traffic visible from the water.

Consolidated Water acknowledges the availability of the WDNR's aesthetics management handbook, and has incorporated

specific guidelines and activities to protect and maintain aesthetic values in its proposed land management and erosion control plans. In response to the WDNR's concern about the potential visual impacts that could result from Consolidated Water's timber clear-cutting activities, Consolidated Water notes that State Highway 51 traffic is presently visible from the water because of several bridges and causeways. Consolidated Water further states that its plans call for only very limited and occasional use of clear-cutting in small areas where necessary for sanitation purposes or to further aesthetic objectives along the shoreline.

In a related comment in its motion to intervene, the Property Owners states that it believes the option to clear-cut timber should not be available to Consolidated Water within buffer zones of 200 feet from the ordinary high water mark of the flowage. The Property Owners also states in its intervention motion that it feels Consolidated Water should provide more definitive plans to protect the shore of the flowage from erosion. In other comments from the Property Owners, Consolidated Water is specifically requested to riprap all eroding shoreline lands currently owned by Consolidated Water, and to provide assistance to neighboring Property Owners members in stabilizing shoreline erosion problems on their property.

The shoreline buffer zone prescriptions (and the limitations placed on timber harvesting within those buffer zones) that are included in Consolidated Water's proposed land management plan are generally consistent with the Property Owners' concerns, however Consolidated Water does not specify the flowage's ordinary high water mark as the control for measuring the width of the zones. Also, Consolidated Water proposed to maintain a minimum 100-foot-wide visual buffer for lands designated for general recreation use, and to permit minimum openings in shoreline vegetation where future recreational facility development requires construction closer to the shoreline than the prescribed 100-foot minimum setback distance.

Consolidated Water responds to Property Owners' concerns and requests regarding the stabilization of eroding shorelines in Consolidated Water's proposed ECP. The plan, discussed above in section G.2, calls for placement of riprap at the base of eroding banks to protect against wave action and ice damage, and for revegetation of upper portions of these banks. Consolidated Water states in the plan that by cooperating with adjoining landowners, as proposed, the chances of obtaining consistent and attractive results in the treatment of their common shoreline erosion problems would increase. Consolidated Water further states that it has not included actively eroding island shorelines in its control plans because the logistics and costs of gaining access to and working on the islands are prohibitive,

and because the benefits to recreation and flowage aesthetics would be minimal.

In response to further comments from the Property Owners, Consolidated Water proposed additional measures to protect aesthetic resources. These measures include: (1) limiting the placement of riprap to the toe of slopes, whenever practical, and using locally available native stone; (2) avoiding extensive unbroken stretches of riprap, and pursuing more imaginative combinations of regrading, revegetation, and rock work; (3) retaining existing vegetation wherever possible; and (4), in connection with proposed work at the Old Highway 51 access site, attempting to bury or mix the existing unsightly concrete slabs with new riprap material to achieve a more pleasing and usable shoreline surface.

With the following additional provisions, we conclude that Consolidated Water's proposed land management and erosion control plans would effectively preserve and improve the project area's aesthetic values. First, Consolidated Water should regularly consult with the WDNR and refer to the WDNR's aesthetics management handbook for further advice and assistance on how to correctly implement the aesthetic guidelines in its land management plan. Second, prescribed visual buffer zones along the flowage shoreline should be measured from elevation 1,116.2 feet, which Consolidated Water, the WDNR, and the FWS agree should be the maximum elevation allowed in the flowage; and prescribed buffers along project area roadways should be measured from the edge of the roads' rights-of-way. Third, the managed open space category of the land management plan should include a guideline for aesthetically maintaining Consolidated Water's existing transmission line corridor. The guideline should emphasize the use of selective right-of-way vegetation clearing methods to eliminate or reduce extended views of the line and to retain an effective visual buffer. Fourth, screening negative visual features is a specific aesthetic activity that Consolidated Water proposed to undertake as a part of its land management plan. Accordingly, the wording of this planned activity should be revised to reflect Consolidated Water's intention to take action to implement the proposed measure, and should specify the procedures required to carry out the screening program. Finally, Consolidated Water should consider extending its shoreline stabilization efforts to any eroding island shorelines that are located in close proximity to areas identified as scenic shorelines on figure 6-2 of the license application, and are within the viewshed of critical viewpoints shown on this figure.

We recommend that any license issued should require Consolidated Water to periodically file a compliance report with the Commission to ensure that Consolidated Water's land management and erosion control practices are consistent with the

objectives, guidelines, and activities described in the proposed plans.

11. Proposed recreation plan: Consolidated Water, in its recreation plan for the DuBay project, has proposed recreational improvements in the project area (see Table 1, page 16). These improvements include rehabilitating existing boat launch ramps, constructing new boat launch ramps, improving the canoe portage at the DuBay dam, expanding existing parking facilities, and providing new parking facilities. Consolidated Water's recreation plan is designed to accommodate recreation demand to the year 2000, and also reserves lands for future recreational development.

In its motion to intervene dated January 24, 1990, the Property Owners states that Consolidated Water's proposed access/recreational projects are excessive. Further, Property Owners states that the site selection for the proposed Marathon County Park on Wambold Drive is poor due to the proximity to a residential neighborhood and hazardous shallow water areas in the immediate vicinity of the site.

In response to the Property Owners' concern, Consolidated Water states that it developed its recreation plan in consultation with the WDNR and local park and recreation authorities. The agencies consulted have approved the recreation plan. Also, Consolidated Water states that there are four potential sites reserved for future park development and any plans for the development of the Marathon County Park would be made in consultation with the Marathon County Park Commission.

Regarding Property Owners' concern with the hazardous shallow water areas in the vicinity of the site, Consolidated Water states that the downstream segment of the shoreline at that location provides adequate boating access and shallow areas have the potential for providing beach development. Beach safety would be facilitated if the proposed site would be utilized as a county park.

The WDNR and the FWS, in letters dated January 23 and March 5, 1990, respectively, concur with all proposed recreational facilities identified in volume III, section E-5, of Consolidated Water's application, to accommodate recreational demand to the year 2000.

We conclude that the proposed recreation plan would enhance the recreational resources of the DuBay Flowage by: (1) dispersing current recreation use patterns; (2) alleviating the over use at existing recreation facilities; and (3) accommodating recreation demand to the year 2000. In addition, the proposed improvements to recreational boating facilities (boat launch ramps,; parking facilities; canoe

portage) would serve to improve recreational boating on the Wisconsin River, thereby averting adverse cumulative impacts on this resource. Therefore, we recommend that Consolidated Water should implement its proposed recreation plan for the DuBay Project. Also, the recreation plan should incorporate those recreation-related clarifications resulting from Consolidated Water's response to our request for additional information and filed with the Commission on March 28, 1990.

## H. ENVIRONMENTAL IMPACTS

1. Assessment of impacts expected from Consolidated Water's proposed project (P), with Consolidated Water's proposed enhancement and any conditions set by a federal land management agency; the proposed project with any additional enhancement recommended by the staff (Ps); and any reasonable action alternative considered (A). Assessment symbols indicate the following impact levels:

O = None; 1 = Minor; 2 = Moderate; 3 = Major;
A = Adverse; B = Beneficial; L = Long-term; S = Short-term.

| Resource | Impact P | Impact Ps | Impact A | Resource | Impact P | Impact Ps | Impact A |
|---|---|---|---|---|---|---|---|
| a. Geology-Soils | 2BL 1AS | 2BL 1AS | | f. Wildlife | 1BL | | |
| b. Streamflow | 0 | | | g. Cultural: Archaeological | 2BL | | |
| c. Water quality: Temperature | 0 | | | Historical | 2BL | | |
| Dissolved oxygen | 1BL | 1BL | | h. Visual quality | 2BL | 2BL | |
| Turbidity and sedimentation | 0 | | | i. Recreation | 2BL | | |
| d. Fisheries: Anadromous | 0 | | | j. Land use | 0 | | |
| Resident | 1BL | | | k. Socioeconomics | | | |
| e. Vegetation | 0 | | | | | | |
| | | | | | | | |

Remarks:

a. Implementation of the ECP would ensure enduring protection of eroding and potentially eroding reservoir shorelines resulting in long term beneficial impacts.

Consolidated Water's proposals to control runoff, revegetate disturbed areas, and schedule boat launch construction work during drawdown periods would minimize erosion and sediment runoff during construction of recreation improvements. The staff's additional recommendations in connection with these plans would not appreciably change the enhancement rating.

c. Monitoring DO and installing and operating a skimmer weir, if DO concentrations approach state standards, would improve DO concentrations in the Wisconsin River downstream of the project's dam. The staff's additional recommendations for DO maintennace would further enhance water quality.

d. Stable or gradually increasing water surface elevations, between 1,115.2 and 1,116.2 feet, during the period of April 10 to May 10, would improve northern pike spawning and recruitment.

f. Implementing wildlife and land management practices on project lands would serve to enhance and protect wildlife and waterfowl habitat.

g. The National Register eligible archaeological sites along the reservoir shoreline, as well as any other National Register eligible properties discovered after licensing, would be protected under a Programmatic Agreement executed by the staff, the Wisconsin SHPO, and the Council.

h. Implementation of Consolidated Water's land management plan and erosion control plan would ensure the long-term preservation and enhancement of project-related aesthetic resource values. The staff's additional aesthetic recommendations in connection with these plans would not appreciably change the impact assessment rating.

i. Implementation of the proposed recreation plan would enhance the recreational resources of the Wisconsin River Basin.

2. Impacts of the no-action alternative.

Under the no-action alternative, the project would continue to operate as it has in the past. There would be no construction or changes to the existing impacts to the physical, biological, or cultural components of the area.

## I. RECOMMENDED ALTERNATIVE

_X_ Proposed project (including proposed, required, and recommended environmental measures).

___ Action alternative.

___ No action.

1. Reason(s) for selecting the preferred alternative -- comprehensive development of the waterway: Sections 4(e) and 10(a)(1) of the Act, 16 U.S.C. §797(e) and §803(a)(1), respectively, require the Commission to give equal consideration to all uses of the waterway on which a project is located. When the Commission reviews a proposed project, the recreational, fish and wildlife, and other nondevelopmental values of the involved waterway are considered equally with power and other developmental values. In determining whether, and under what conditions, a hydropower license should be issued, the Commission must weigh the various economic and environmental tradeoffs involved in the decision.

No reasonable action alternative to the proposed project has been identified for assessment (see section C.4, page 4). Based on our independent review and evaluation of the proposed project and the no-action alternative, we have selected the proposed project, with additional staff-recommended enhancement measures, as the preferred option. We recommend this option because the net benefits of the project outweigh the consequences associated with taking no action.

The proposed project would provide a number of benefits. An estimated 43.6 GWh of relatively low-cost electricity, currently worth about $1,600,000 12/, would be generated annually from a clean, domestic, reliable, and renewable energy resource for use by Consolidated Water's customers 13/. Establishing prescribed reservoir elevations would have positive, long-term impacts on water quality, wildlife and fisheries habitat, aesthetics, recreational values, and would be consistent with fisheries management goals established for the reservoir. Monitoring northern pike in the DuBay Flowage would assure that maintenance of spring time reservoir elevations has the desired effect or may uncover the need for further enhancement measures. DO monitoring and installation of a skimmer weir if DO concentrations fall below the state standard of 5.0 mg/l would

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12/ 43.6 GWh at 36 mills/kWh.

13/ The electricity potentially generated by the proposed project is equivalent to the energy that would be produced by burning 73,524 barrels of oil or 18,197 tons of coal annually in a steam-electric power plant. Coal-fired, steam-electric power plants, generating the amount of energy equivalent to that which would be generated by the proposed project, would produce about 9.81 tons of sulfur dioxide and 50,881 tons of carbon dioxide annually. Sulfur dioxide is considered to be a prime contributor to acid rain and carbon dioxide is considered to be a prime contributor to global warming.

protect and enhance the water quality of the Wisconsin River downstream from the project. Implementation of the erosion control plan would help maintain water quality in the DuBay Flowage and protect aesthetic and cultural resources at the project. The Cooperative Wildlife Management Agreement between Consolidated Water and WDNR and implementation of wildlife and wetland management practices on project lands would serve to enhance and protect wildlife and waterfowl habitat. Implementation of the bald eagle management plan would help protect this federally listed threatened species and could contribute towards its recovery. Implementation of a Programmatic Agreement among the staff, the Wisconsin SHPO, and the Council would protect properties listed on or eligible for listing on the National Register of Historic Places. Finally, the implementation of the recreational plan for the project would provide for the recreational needs of the project area.

The project's costs would be: (1) to operate and maintain the entire hydropower complex; (2) to implement erosion control measures; (3) to install staff gages to allow public monitoring of reservoir elevations; (4) to monitor northern pike populations; (5) to monitor DO concentrations and to install and operate a skimmer weir ($12,500 for the skimmer weir and about $3,890 annually for its operation and water quality monitoring); (6) to implement wildlife and wetland management practices; (7) to implement a bald eagle management plan; (8) to implement a cultural resources protection plan; and (9) various minor, short- and long-term adverse environmental impacts (after enhancement) to soils, water quality, vegetation, wildlife, and aesthetic conditions.

We analyzed the economic feasibility of the estimated costs associated with Consolidated Waters' proposed enhancement measures for the overall project (see section C.2, page 3). Consolidated Water states the annual value of energy from the existing project to be 36 mills per kWh and the current annual costs to be 27.4 mills per kWh. At an average annual generation of about 43.6 GWh, the project would have a net economic benefit of about 8.6 mills per kWh or about $374,960 annually less expensive than power from regional fossil-fuel generating plants. We have also determined that our recommendation to stabilize or gradually increase water surface elevations, during the period of April 10 to May 10 in order to improve pike spawning and recruitment, would not significantly affect the project's power generation.

The above economic analysis results do not include the costs associated however, with our recommendations to: (1) monitor northern pike populations; (2) require reservation of authority for fish passage facilities and future fish and wildlife enhancement measures; and (3) provide cultural resources protection measures.

Water level fluctuations may have a direct and adverse impact on the spawning success and recruitment of northern pike in the project area. Consolidated Water should monitor the effectiveness of protective measures, including the evaluation of maintaining stable pool elevations on northern pike spawning, recruitment, population structure, and habitat. The cost of this measure is expected to be negligible in relation to the hydropower generation by the project and the beneficial effect on the fisheries.

Since it is not possible at this time to foresee future changes to project operations or other enhancement measures that may become necessary to protect the fishery and wildlife resources at the project, it is also not possible to estimate the costs of these measures. However, prior to the Commission ordering specific changes to project operations or other measures as may be recommended by resource agencies, Consolidated Water would be provided opportunity for a hearing. At such a hearing, any costs associated with the change affecting the economic viability of the project could be presented and considered.

2. Unavoidable adverse impacts of the recommended alternative.

Short-term impacts that would be caused by the proposed project include minor amounts of erosion and sedimentation associated with recreational facility construction.

## J. CONSISTENCY WITH FISH AND WILDLIFE AGENCY RECOMMENDATIONS

Pursuant to Section 10(j) of the Act, this EA addresses the concerns of the federal and state fish and wildlife agencies and makes recommendations consistent with those agencies.

## K. CONCLUSION

**Finding of No Significant Impact.** Approval of the recommended alternative (section I, page 40) would not constitute a major federal action significantly affecting the quality of the human environment; therefore, an environmental impact statement (EIS) will not be prepared.

## L. LITERATURE CITED

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## M. LIST OF PREPARERS

| Name | Position title |
|---|---|
| R. Feller | Ecologist (Coordinator) |
| Mary Golato | Editor |
| J.T. Griffin | Archaeologist |
| Jennifer Hill | Fisheries Biologist |
| Peter A. Leitzke | Geologist |
| Patti Leppert-Slack | Ecologist |
| C. Frank Miller | Electrical Engineer |
| Steven G. Naugle | Landscape Architect |
| M. Charlene Scott | Civil Engineer |

DUBAY HYDROELECTRIC PROJECT
FERC PROJECT NO. 1953
October 15, 1990

## PROJECT DESCRIPTION

On June 29, 1989, Consolidated Water Power Company (Consolidated Water) applied to the Federal Energy Regulatory Commission (FERC) for a new license for its existing 7.2-megawatt (MW) DuBay Water Power Project FERC No. 1953. The DuBay Project is on the Wisconsin River near the junction of the Wisconsin, Little Eau Claire, and Little Eau Pleine Rivers, near the townships of Mosinee and Stevens Point in Marathon, Portage, and Wood Counties, Wisconsin.

Consolidated Water does not propose any modifications or additions to the existing structures or powerhouse. The primary purposes of the existing development are generation of electricity and flood control. The existing project generates approximately 43.6 gigawatthours (Gwh) of energy each year.

The project consists of the following: (1) a 730-foot-long concrete gravity dam, having 3 non-overflow sections; a spillway section with 11 Taintor gates and an intake varying in height from 20 feet to 38 feet; a 7,900-foot-long earthen dike section on the west abutment; and a short earthen dike section on the east abutment; (2) a reservoir with a surface area of about 7,800 acres, a storage capacity of about 128,000 acre-feet, and a normal water surface elevation of 1,116.2 feet mean sea level (msl); (3) a powerhouse, with an integral intake, with four generating units having a total installed capacity of 7,200 kilowatts (Kw); (4) a substation with three single-phase OA/FA-type, 2,500-kilovoltampere (kVA) oil-filled 4.14/46-kV transformers; (5) a 21-mile-long, 46-kV transmission line; and (6) appurtenant facilities. Consolidated Water does not propose any changes to the existing project works.

### Determination of Licensable Transmission Facilities

The existing 7.2-MW DuBay Project comprises part of Consolidated Water's 44.7 MW of hydroelectric generating capacity. The power generated on Consolidated Water's system supplies about 30 percent of the load requirements of its parent company, Consolidated Papers, Inc. (Consolidated Paper), and some 1,000 other retail customers in the town of Biron, Wisconsin. Power to serve the remaining load is purchased from Wisconsin Public Service Company (WPS).

The project includes four generating units. Three units are General Electric synchronous generators, rated 2.0 MW each at 4.16-kV and 0.8 power factor direct-connected to vertical fixed-blade propeller turbines manufactured by James Leffel & Company, each with a rating of 3,000 hp at 150 rpm, a hydraulic capacity of 1,250 cfs at total head of 25 feet. The fourth General

Electric synchronous generator is rated 1.2 MW and is connected to a 1,680 hp turbine operating at 200 rpm, a hydraulic capacity of 750 cfs and a total head of 25 feet. The total hydraulic capacity of the turbines is 4,500 cfs. The generators are connected to a common 4.16-Kv powerhouse bus by a cable to the substation adjacent to the west end of the powerhouse. The substation contains a bank of three single-phase, 2,500-KVA OA/FA, 4.16/46-kV, oil-filled step-up transformers, plus a fourth spare unit. A 21-mile, 46-kV overhead line connects this substation with Consolidated Water's 46-kV distribution system at Biron Dam, where the DuBay Project power commingles with other power flows in the system, thereby marking the boundary of project primary electrical facilities.

The license for Project 1953 should include: (1) three General Electric synchronous generators, each rated 2.0 MW at 0.8 power factor and 4.16-kV terminal voltage; (2) three Leffel vertical-axis hydraulic turbine rated 3,000 hp at 25 feet head, at 150 rpm; (3) synchronous generator rated 1.2 MW at 0.8 power factor and 4.16-kV terminal voltage; (4) a Leffel vertical-axis hydraulic turbine rated 1,680 hp at 25 feet head, 750 cfs hydraulic capacity, and 200 rpm; (5) the 4.16-kV generator leads; the 4.16-kV powerhouse bus; (7) the 4.16-kV underground cable to the substation adjacent to the powerhouse; (8) the bank of three single-phase, 2,500-KVA OA/FA, 4.16/46-kV, oil-filled step-up transformers; (9) the 21-mile, 46-kV overhead transmission line connecting the project substation to Consolidated Water's 46-kV distribution system at Biron dam; and (10) appurtenant switching, control, protection, and station service apparatus.

## PROJECT SAFETY

On May 22, 1989, our regional office staff inspected the dam and other project works. There were no dam safety deficiencies that required any immediate remedial action. Consolidated Water has improved the drainage characteristics at the downstream toe of the right embankment by constructing lateral ditches to drain the area.

On June 29, 1989, Consolidated Water submitted a preliminary supporting design report for the dam. The dam safety analyses included stability analyses for conditions of normal operation, normal operation with ice load, seismic load, and probable maximum flood. We conducted our own stability analyses and concur with Consolidated Water's finding that the dam is safe.

Consolidated Water also conducted a dambreak analyses to determine the water surface levels downstream of the dam in the event of a dam breach. The dambreak analyses included flows up to the probable maximum flood discharge which is estimated to be about 250,000 cubic feet per second (cfs).

The river would have to be at flood stage long before a breach caused by overtopping the earth embankments could occur. Therefore, the project would only be required to safely pass the standard project flood (SPF) discharge, which is estimated by the Corps of Engineers to be about 150,000 cfs. The project's gated spillway would be able to pass about 195,000 cfs, or about 78 percent of the PMF peak flow.

WATER RESOURCE PLANNING

In 1941, the Public Service Commission of Wisconsin issued a permit to Consolidated Water to construct, operate, and maintain the DuBay Project dam on the Wisconsin River. Its primary purposes were generation of electricity and flood control.

The drainage area at the project site is 4,822 square miles. The reservoir has a normal maximum pool elevation of 1,116.2 feet msl, an area of about 7,800 acres, and an active storage volume of about 47,300 acre-feet. The river flow data were developed based on the flow records from the USGS Gaging Station No. 05395000, located 35 miles upstream at Merrill, Wisconsin, and the flow records from the USGS Gaging Station No. 05400760, located 25 miles downstream at Wisconsin Rapids. The estimated average stream flow at the site is about 4,055 cfs.

The project is operated in both peaking and run-of-river modes with no minimum flow requirements. Whenever the inflow exceeds approximately 4,300 cfs the project is operated in a run-of-river mode, in which the project is operated at full capacity and the excess water is spilled. When the inflow is less than the hydraulic capacity of the turbines, the plant is operated in a peaking mode, in which the inflow is stored and released at the full hydraulic capacity of the powerplant during daily periods of highest power value. During peaking operation, there are periods in which there are no releases from the powerhouse or spillway. There are no minimum flow requirements. The peaking operation will not affect the tailwater since the tailwater elevation is equal to the headwater elevation of the downstream dam. There have been no minimum flow requirements below the project because there is no river and only a reservoir immediately downstream. There would be no changes from the present hydropower operations.

The existing project has an installed capacity of 7.2 megawatts and a hydraulic capacity of about 4,300 cfs. The average annual energy generation is about 43.6 GWh. The annual plant factor is about 70 percent and the dependable capacity is approximately 3.4 MW.

Consolidated Water evaluated the potential for upgrading or expanding the Dubay Project. They considered (1) replacing the

runners and upgrading the generators and (2) increasing the capacity by adding a new unit to the existing project with a capacity ranging from about 2.2 to about 8.8 MW. In all, Consolidated Water evaluated 5 alternative scenarios to increase the project power production.

Consolidated Water evaluated the modifications to the project based on the value of the power to off-load power purchases from WPSCo and based on selling the project power to WPSCo at WPSCo's full avoided cost. Consolidated Water estimates the levelized value of the project generation used to displace its power purchases from WPSCo to be about 37.4 mills/kWh for peaking energy and about 32.6 mills/kWh for off-peak energy. It estimates the levelized value of the project generation, based on the avoided cost of WPSCo's generation, to be about 43 mills/kWh for on-peak energy and about 25 mills/kWh for off-peak energy. These values are close to the levelized non-peaking energy value we calculated for the midwestern region of about 37 mills for a project coming on line in 1990.

Consolidated Water calculated that the cost of the 5 alternative scenarios would range from about 49 mills/kwh to about 250 mills/kWh for the incremental energy that would be produced. Therefore, increasing the project generation by replacing the turbine runners and upgrading the generators, or by adding additional generating units, would not be economically beneficial under currently projected economic conditions.

We conclude that the existing DuBay Hydroelectric Project fully develops the currently projected economical hydroelectric potential of the waterpower resource.

Section 10(1)(2) of the Act requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. We identified 34 comprehensive plans that meet the requirements of section 10(a)(2); however, none address various resources in Wisconsin in relation to engineering considerations of hydroelectric development of the site.

The state and federal agencies made no other comments or recommendations addressing flood control, navigation, or irrigation requirements for the Wisconsin River. There are no competing applications for the site currently pending before the Commission.

We evaluated the effects of increasing the minimum reservoir elevation of the project from 1113.7 feet mean sea level (msl) to 1115.2 msl, for the months of May and June, as discussed in the Environmental Assessment. We conclude that such an increase in

the reservoir elevation would not have a significant impact on the project's power generation.

From a review of agency and public comments filed in this proceeding, and our independent analyses, we conclude that from a power development perspective, the DuBay Hydroelectric Project is best adapted to the comprehensive development of the Wisconsin River.

Section 10(a)(2)(C): Conservation Efforts

Consolidated Water's electricity consumption efficiency program has been primarily oriented toward its parent company, Consolidated Papers, Inc. (Consolidated Paper), a pulp and paper manufacturing company that consumes about 98.8 percent of Consolidated Water's net energy production. It is therefore appropriate to weigh Consolidated Water's project-related energy conservation program from the perspective of Consolidated Paper.

Consolidated Paper's activities in the area of conservation constitute an ongoing, comprehensive, and closely monitored program that has, since the Arab oil embargo, reduced its energy consumption per unit of production to 54 percent of the paper industry's pre-embargo average. Administrative responsibility for the program extends from energy coordinators and energy committees at each pulp and paper mill up to top-level management.

The pulp and paper-products industry is both highly competitive and energy-intensive. Energy consumption efficiency is a most important factor in Consolidated Paper's ability to survive and make a profit at the market place. As a result, Consolidated Paper has developed a very successful and very comprehensive energy conservation and load management program. The financial rewards of pushing such a program to the limits of cost-effectiveness, and the incentives to do so, are obvious.

All of its staff and hourly employees are encouraged to identify means of saving energy. Some typical energy-savings measures have included installation of more efficient lighting, motors, and other machinery; shutting down equipment between production runs and reducing lighting levels where safety permits; recycling of, or heat recovery from, waste hot water or hot air; lowering process temperatures and air and steam pressures to the lowest tolerable levels; improving or replacing process controls to function more precisely with less loss of energy; and having more frequent inspections to ensure that all energy systems are functioning properly.

Energy consumption data, usually based on BTU/ton of paper product, is reported monthly for each of 15 operating units, or

"divisions", whether they comprise an office building or paper mill, as well as for the corporation as a whole. These reports are reviewed by top management with prompt follow-up on any detected decreases in efficiency or deficiencies in the energy-saving program.

As a service to Consolidated Paper's 4,500 employees and Consolidated Water's 1,000 retail customers, an energy handbook, titled "Energy Tips from Consolidated Papers, Inc." was prepared to aid in energy savings at home and on the road. Over 22,000 copies of the handbook have been distributed to employees, customers, civic groups and business groups.

After reviewing the energy conservation program, we conclude Consolidated Water and Consolidated Paper have complied, in an acceptable manner, with the end-use electricity-consumption-efficiency objectives of the Electric Consumers Protection Act of 1986.

EXHIBITS

We conclude the following parts of exhibit A and the following exhibit F drawings conform to the Commission's rules and regulations and should be included in any license issued:

Exhibit A - The following sections of exhibit A filed June 29, 1989.

The description of the principal structures of the project including the spillway, powerhouse, and turbines on pages A-1 through A-6.

| Exhibit | FERC No. | Showing |
|---|---|---|
| F-1 | 1953-1 | General Project Plan |
| F-2 | 1953-2 | Plan, Elevation, and Sections of Dam and Spillway |
| F-3 | 1953-3 | Plan and Section of Powerhouse |
| F-4 | 1953-4 | Plan and Elevation of Substation and Single Line Schematic |

PREPARERS

M. Charlene Scott, Civil Engineer
C. Frank Miller, Electrical Engineer
Mary Golato, Editor

Document Content(s)