76 FERC ¶ 61,152

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Elizabeth Anne Moler, Chair;
Vicky A. Bailey, James J. Hoecker,
William L. Massey, and Donald F. Santa, Jr.

Niagara Mohawk Power Corporation) Project No. 2645-029

ORDER APPROVING SETTLEMENT AGREEMENT AND ISSUING NEW LICENSE

(Issued August 2, 1996)

Niagara Mohawk Power Corporation (Niagara Mohawk) has filed an application for a new license, 1/ pursuant to Sections 4(e) and 15 of the Federal Power Act (FPA), 2/ authorizing the continued operation and maintenance of the 44.8-megawatt (MW) Beaver River Project, located on the Beaver River 3/ in the Towns of Croghan and Watson in Lewis County and in the Town of Webb in Herkimer County, New York. The project comprises eight developments spanning 18 miles. They are (in descending order) Moshier, Eagle, Soft Maple, Effley, Elmer, Taylorville, Belfort, and High Falls.

On May 30, 1995, Niagara Mohawk amended its license application by filing a Settlement Offer dated February 7, 1995, and amended March 8, 1995, and May 19, 1995. The Settlement Offer, which is unopposed and is signed by most of the parties to the relicense proceeding, contains certain revised and additional environmental measures. We are approving the Settlement and incorporating all appropriate provisions thereof into Niagara Mohawk's license.

1/ Niagara Mohawk was issued an original license for the project in 1978, 4 FERC ¶ 61,009, effective April 1, 1962, and expiring December 31, 1993. The application for a new license was filed on November 29, 1991. Since expiration of the original license, Niagara Mohawk has been operating the project under annual license. See Section 15(a)(1) of the FPA, 16 U.S.C. § 808(a)(1).

2/ 16 U.S.C. §§ 797(e), 808.

3/ The Beaver River is a navigable waterway of the United States. See 40 FPC 364 (1968). Therefore, Section 23(b)(1) of the FPA, 16 U.S.C. § 817(1), requires the project to be licensed.

I. BACKGROUND

In response to the published notice of Niagara Mohawk's license application, 4/ timely motions to intervene were filed by the Adirondack Park Agency (the Park Agency), U.S. Department of the Interior (Interior), New York State Department of Environmental Conservation (NYSDEC), the City of Watertown, New York, Adirondack Mountain Club, New York Rivers United (New York Rivers), American Whitewater Affiliation (Whitewater), American Rivers, Inc. (American Rivers), Adirondack Council, Association for the Protection of the Adirondacks, National Audubon Society, Trout Unlimited (on its own behalf and, in a separate motion, together with the New York Council of Trout Unlimited), and Natural Heritage Institute. The Park Agency submitted letters in both 1992 and 1993. Interior and Trout Unlimited/New York Council opposed the relicense application as filed.

The Settlement Offer filed in May 1995 is the product of negotiations begun after NYSDEC, in 1992, denied the Beaver River Project water quality certification, which is a prerequisite to licensing. All intervenors in both the Commission proceeding and the certification proceeding were invited to participate in the negotiations. All licensing intervenors signed the Agreement, except the City of Watertown and the Natural Heritage Institute. 5/

On June 14, 1995, the Commission issued notice that the license application, as amended by the offer of settlement, was ready for environmental analysis. On October 23, 1995, Commission staff issued a Draft Environmental Assessment (Draft EA) on the application. Comments on the Draft EA were filed by Niagara Mohawk, the U.S. Environmental Protection Agency (EPA), the National Park Service (Park Service), the U.S. Fish and Wildlife Service (FWS), and the Adirondack Mountain Club. These comments were considered in preparing the Final Environmental Assessment (Final EA), which is attached to this order. Background information, analysis of impacts, and the basis for a finding of no significant impact on the environment are contained

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4/ 58 Fed. Reg. 13477 (March 11, 1993).

5/ The signatories are Niagara Mohawk, NYSDEC, the Adirondack Council, Interior's Fish and Wildlife Service, American Whitewater, the Park Agency, the New York State Council of Trout Unlimited, New York Rivers, National Audubon Society, New York State Conservation Council, American Canoe Association, Association for the Protection of the Adirondacks, Adirondack Mountain Club, American Rivers, and the National Park Service.

in the Final EA. 6/ All comments received from interested agencies and individuals have been fully considered in determining whether, and under what conditions, to issue this license.

II. PROJECT DESCRIPTION

The Beaver River Project's eight developments extend upstream from the High Falls Development at river mile (RM) 11 to the Moshier Development at RM 27.5. The developments are operated in a coordinated manner as store-and-release facilities primarily to meet peak demand in the Niagara Mohawk system. Flows reaching the project are controlled by releases from the Hudson River-Black River Regulating District's (Hudson-Black) Stillwater Reservoir Project No. 6743, located approximately five miles upstream of the most upstream Beaver River Project development, Moshier. 7/

The project was constructed between 1903 and 1930. Four of the developments -- Moshier, Eagle, Soft Maple, and Taylorville -- have extensive bypassed reaches. These range from about 3,850 feet at Eagle to over 11,700 feet at Moshier.

We describe each of the eight developments in the following section. More detailed descriptions are set forth in ordering paragraph (B)(2) of this order.

Moshier Development

The Moshier Development includes: (1) a 920-foot-long by 93-foot-high earth embankment dam containing a 200-foot-long concrete spillway topped with two-foot-high flashboards and a 53-foot-long non-overflow concrete abutment; (2) a reservoir with a surface area of 340 acres, a gross storage capacity of 7,339 acre-feet, and a usable capacity of 4,463 acre-feet; (3) a 9,360-foot-long, 7-foot-diameter penstock; and (4) a

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6/ The Commission staff also prepared a Safety and Design Assessment (February 16, 1996), which is available in the Commission's public file for this project.

7/ On March 16, 1984, Hudson-Black was granted an exemption from licensing under Part I of the FPA for the 1.2-MW Stillwater Reservoir Project No. 6743. See 26 FERC ¶ 62,247. Hudson-Black's lessee, Stillwater Associates, regulates the headpond levels for flood control in the Hudson River and Black River Basins and to provide headwater benefits in terms of guaranteed minimum water releases to downstream users.

concrete/masonry powerhouse containing two generators, each with a rated capacity of 4,000 kilowatts (kW).

Eagle Development

The Eagle Development includes: (1) a 365-foot-long by 21-foot-high concrete gravity dam containing a 185-foot long ogee spillway topped with one-foot-high flashboards and an 85-foot-long, non-overflow concrete abutment; (2) a reservoir with a surface area of 138 acres, a gross storage capacity of 668 acre-feet, and a usable capacity of 123 acre-feet; (3) a 2,725-foot-long, 9-foot-diameter penstock; and (4) a concrete/masonry powerhouse containing four generators, with rated capacities of 1,350 kW (units 1 through 3) and 2,000 kW (unit 4).

Soft Maple Development

The Soft Maple Development includes: (1) five earth embankment dikes; (2) a 910-foot-long, 115-foot-high earth embankment diversion dam; (3) a 720-foot-long earth, 100-foot-high earth embankment terminal dam; (4) an impoundment with a surface area of 400 acres, a gross storage capacity of 2,678 acre-feet, and a usable capacity of 1,150 acre-feet; (5) two 530-foot-long, 11.5-foot-diameter steel penstocks; and (6) a concrete/masonry powerhouse containing two generators, each with a rated capacity of 7,500 kW.

Effley Development

The Effley Development includes: (1) a 647-foot-long by 30-foot-high concrete gravity dam, containing a 430-foot-long by 30-foot-high concrete ogee spillway and a 188-foot-long non-overflow concrete abutment; (2) a reservoir with a surface area of 340 acres, a gross storage capacity of 3,140 acre-feet, and a usable capacity of 1,420 acre-feet; (2) three 87-foot-long by 5-foot-diameter steel penstocks and one 148-foot-long by 8-foot-diameter steel penstock; and (3) two concrete/masonry powerhouses, one containing three generators rated at 400 kW (units 1 and 2) and 560 kW (unit 3) and the second containing a single generator rated at 1,600 kW.

Elmer Development

The Elmer Development includes: (1) a 238-foot-long by 23-foot-high concrete gravity spillway; (2) a 25-foot-wide sluice gate with needle beams; (3) an impoundment with a surface area of 34 acres, a gross storage capacity of 345 acre-feet, and a usable capacity of 138 acre-feet; (5) a 39-foot-wide concrete intake structure; and (6) a concrete/masonry powerhouse containing two generators, each with a rated capacity of 750 kW.

Taylorville Development

The Taylorville Development includes: (1) a 1,003-foot-long by 23-foot-high concrete gravity dam; (2) an impoundment with a surface area of 170 acres, a gross storage capacity of 1,091 acre-feet, and a usable capacity of 406 acre-feet; (3) a 2,725-foot-long by 9.5-foot-diameter steel penstock; and (4) a concrete/masonry powerhouse containing four generators, with rated capacities of 1,100 kW (units 1 and 2), 1,372 kW (unit 3), and 1,200 kW (unit 4).

Belfort Development

The Belfort Development includes: (1) a 206-foot-long by 17-foot-high concrete gravity dam with a 161-foot-long concrete ogee spillway; (2) an impoundment with a surface area of 50 acres, a gross storage capacity of 120 acre-feet, and a usable capacity of 73 acre-feet; (3) a 62-foot-wide concrete intake structure; (4) one 52-foot-long by 7-foot-diameter steel penstock and one 52-foot-long by 7.5-foot-diameter steel penstock and penstock bifurcation; and (5) a concrete/masonry powerhouse containing three generators, with a rated capacity of 400 kW (unit 1), 640 kW (unit 2), and 1,000 kW (unit 3).

High Falls Development

The High Falls Development includes: (1) a 1,233-foot-long, 50-foot-high concrete gravity dam containing a 470-foot-long non-overflow concrete gravity section and a 650-foot-long concrete ogee spillway; (2) an impoundment with a surface area of 145 acres, a gross storage capacity of 1,058 acre-feet, and a usable capacity of 135 acre-feet; (3) a 64 foot-wide by 29-foot-high concrete intake structure; (4) a 605-foot-long, 12-foot-diameter steel penstock; and (5) a concrete/masonry powerhouse containing three generators, each with a rated capacity of 1,600 kW.

Project Operations

As noted, the Beaver River Project operations are controlled by the daily releases of the upstream Stillwater Reservoir, which is operated by Hudson-Black, 8/ an entity created by New York to regulate river flows, principally for the purposes of flood control and flow augmentation. Niagara Mohawk operates its eight developments as store-and-release facilities that operate in a peaking mode. Niagara Mohawk discharges water in a concentrated time frame associated with peak electric demand periods, usually weekday hours. Discharges are curtailed during off-peak hours. The Soft Maple Development has the greatest discharge capacity

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8/ See n. 7, supra.

and, therefore, operates with the highest concentration of power generation. At the succeeding downstream developments, water is stored and released at lower generation levels over longer peak demand periods. Together, the developments convert (reregulate) the peaking flow into a steadier continuous flow at the furthest downstream development, High Falls, which maintains a base minimum flow of 250 cubic feet per second (cfs) downstream of the powerhouse. During periods of reduced flow from the Stillwater Reservoir, Niagara Mohawk draws water from the storage at the Moshier, Soft Maple, Effley, and High Falls Developments to maintain the base minimum flow.

The units at the developments usually operate at the "efficient gate." 9/ However, when the river flow exceeds the capacity of the units' efficient gate, they operate at full gate. 10/ Flows in excess of the full gate and minimum flows are spilled over the dam or released through the gates.

The Moshier, Eagle, Soft Maple, and Taylorville Developments currently maintain minimum flows for aquatic habitat in their respective bypassed reaches of 30, 30, 20, and 30 cfs.

III. DESCRIPTION OF THE SETTLEMENT AGREEMENT

Niagara Mohawk's relicense application proposed a variety of environmental resource measures, 11/ most of which are included in the Settlement. 12/ The Settlement is organized

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9/ The "efficient gate" is that gate setting (opening) that provides the greatest power production for the water used. It corresponds to approximately 85 percent of the hydraulic capacity of the turbines.

10/ "Full gate" is when the gate is open as far as possible, at the maximum hydraulic capacity of the turbine. This is not necessarily the most efficient setting.

11/ These proposals were supplemented by Niagara Mohawk's additional information submittals of August 21, October 13, and November 24, 1992; November 20 and December 21, 1993; January 3 and 24, 1994; and April 3, 1995.

12/ Settlement section X.K.1. A copy of the Settlement is included as Appendix A of the attached Final EA.

The Settlement provides that it "shall be enforceable by any party to the extent that the [Settlement] is accepted and approved by NYSDEC and/or FERC and incorporated into the terms and conditions of any § 401 water quality certificate

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in sections pertaining to each of the eight project developments. For convenience, we will summarize the Settlement by topic.

A. Flows

Niagara Mohawk will submit for Commission approval a flow monitoring plan, including specified gaging equipment to determine stream stage and/or flow, other project flows, and headpond and tailwater elevations.

Niagara Mohawk will provide releases for whitewater recreation at Moshier, Eagle, and Taylorville Developments. Unless modified by agreement, there will be one release of 400 cfs for four hours in September or October at Moshier, five 4-hour releases of at least 200 cfs in September or October at Eagle, and five 4-hour releases not to exceed 400 cfs in September or October at Taylorville. Ramping flows (200/100 cfs) and a maximum equivalent lost energy (96,600 kWh) are also specified. 13/

Minimum flows in the bypassed reaches are specified at each development as follows:

Moshier:	45 cfs.
Eagle:	45 cfs, with a possible reduction to 30 cfs.
Soft Maple:	35 cfs.
Effley:	20 cfs.
Elmer:	20 cfs, with a possible reduction to 10 cfs.
Taylorville:	60 cfs, with a possible reduction to 45 cfs.
Belfort:	20 cfs.
High Falls:	30 cfs.

The method of release and time of implementation are also provided. Year-round flows of 250 cfs will be provided at High

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12/(...continued)
issued by NYSDEC or any new license issued by FERC." Settlement section X.C. The Settlement also provides that if either NYSDEC or the Commission modifies any settlement provision when issuing (respectively) the project water quality certification or a license, the Settlement Offer shall be considered modified accordingly, unless any signatory to the Settlement notifies the other signatories within 60 days of the pertinent issuance that it objects to the modification.

13/ Ramping means gradually increasing or decreasing outflows following project shut-down or unusually high-volume releases.

Falls. Under low-flow conditions, Niagara Mohawk will take additional steps to maintain the flow to the extent feasible.

B. Structural Enhancements

Existing trashracks at the intake for each development will be replaced with new trashracks with one-inch clear bar spacing to exclude adult fish. The new trashracks are to be in place on a specified schedule.

New gate structures will be designed and built to provide for flow releases or fish conveyance as follows:

Moshier:	minimum flow, fish passage, whitewater release.
Effley:	minimum flow, fish passage.
Elmer:	fish passage.
Belfort:	minimum flow, fish passage.
High Falls:	minimum flow, fish passage.

The Settlement states that a release device for the minimum flows through the diversion tunnel at Soft Maple remains to be designed.

Screening for fish protection will be installed on the upstream end of the diversion tunnel at Soft Maple. Fish conveyance measures associated with downstream passage must be developed and installed at Moshier, Eagle, Effley, Elmer, Taylorville, Belfort, and High Falls.

C. Reservoir Fluctuations

Maximum daily reservoir fluctuations under normal flow conditions will be limited as follows:

Moshier:	1.5 feet from July 1 to April 30, 1 foot from May 1 to June 30.
Eagle:	1 foot.
Soft Maple:	1.5 feet from July 1 to April 30, 1 foot from May 1 to June 30.
Effley:	1.5 feet from July 1 to April 30, 1 foot from May 1 to June 30.
Elmer:	1 foot.
Taylorville:	1 foot.
Belfort:	1 foot.
High Falls:	1.5 feet.

During low-flow periods, an additional fluctuation of 3 feet is permitted at Moshier, Soft Maple, Effley, and High Falls.

Niagara Mohawk will implement minor channel modifications for downstream fish passage at Eagle and Taylorville, and will maintain streamflow gaging records to the satisfaction of NYSDEC. If required after a fisheries investigation on brook trout at Soft Maple, Niagara Mohawk will participate in a three-year transplanting program by providing two fisheries biologists for three days each year and equipment to transport fish. It will also provide enhanced recreational opportunities, primarily in the areas of canoeing and hiking, at Moshier, Eagle, Soft Maple, Effley, and Belfort.

D. Beaver River Fund

The Settlement provides for the establishment of the Beaver River Advisory Committee, which will manage a Beaver River Fund. 14/ The Fund would be administratively managed by Niagara Mohawk and used according to the recommendation of the Advisory Council, which would be chaired by NYSDEC and comprise representatives of a number of federal, state, and local agencies and nongovernmental organizations.

Niagara Mohawk's initial contribution to the Fund would be used for the State of New York's acquisition of a 25-foot-wide conservation easement around the Moshier Development impoundment; sand and gravel rights along the Moshier bypassed reach; and fee title to abutting acreage and to a parcel of land partly within the Project's Eagle Development's boundary.

E. Dispute Resolution

The Settlement contains a Dispute Resolution clause (Section X.L.), which requires a 90-day process among the signatories to resolve conflicts over proper compliance with the terms of the Settlement. This provision also states that, failing resolution of the dispute under such process, the dispute may be referred to the Commission for resolution pursuant to the Commission's Rules of Practice and Procedure.

VI. WATER QUALITY CERTIFICATION

Under Section 401(a)(1) of the Clean Water Act, 15/ the Commission may not issue a license for a hydroelectric project unless the state certifying agency has issued water quality certification for the project or has waived certification by

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14/ See the Settlement, sections X.A. and B. and Attachments 1 and 2.

15/ 33 U.S.C. § 1341(a)(1).

failing to act on a request for certification within a reasonable time, not to exceed one year. 16/

On August 24, 1995, NYSDEC issued the Beaver River Project water quality certification, conditioned on the terms of the Settlement described above, and on Niagara Mohawk's compliance with certain standard terms. 17/

The standard certification conditions provide for: (1) NYSDEC representatives' authority to inspect the project and project records in order to ensure compliance with the certification terms; (2) cessation of flow through the turbine prior to maintenance dredging in the intake/forebay; (3) testing of sediments to be removed and prior approval of disposal locations of any contaminated sediments; (4) approval and implementation of an erosion and sediment control plan to deal with activities that could adversely affect water quality; (5) design of structures which encroach on the bed or banks of the

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16/ Section 401(a)(1) requires an applicant for a federal license or permit to conduct any activity which may result in any discharge into navigable waters of the United States to obtain from the state in which the discharge originates certification that any such discharge will comply with applicable state water quality standards.

17/ On November 25, 1991, Niagara Mohawk submitted a request for water quality certification to NYSDEC. On November 19, 1992, NYSDEC denied the request without prejudice. On December 23, 1992, Niagara Mohawk submitted a request for a NYSDEC hearing on the certification denial. Subsequent negotiations led to the Settlement Offer, which was filed in both the certification and licensing proceedings.

The certification (at 2) states that NYSDEC reserves its "right to reconsider the entire certification if there is a significant change in the scope of the proposal or the project license, or in the event the referenced application or Settlement Agreement are further amended." To the extent this reservation deals with pre-relicensing amendments to the project proposal, the need for reconsideration of the certification is governed by 18 C.F.R. § 4.38(f)(7)(iii) (new certification request required if amendment would have a material adverse effect on the water quality in the project discharge). To the extent the reservation purports to reserve NYSDEC's right to revise the certification after the license is issued and final, we reject such condition as outside the scope of CWA Section 401. See Tunbridge Mill Corp., 68 FERC ¶ 61,078 (1994), reh'g denied, 75 FERC ¶ 61,175 (1996).

river to be in accordance with the erosion and sediment control plan; (6) maintenance of flows to maintain water quality standards throughout periods of construction; (7) monitoring of potential turbidity during construction, and corrective action when turbidity occurs; and (8) notification to NYSDEC prior to commencing work subject to these conditions. These are valid certification conditions, and they will be adopted by the Commission as conditions of the new license being issued to Niagara Mohawk.

We note however that it is the Commission, and not the certifying agency, that enforces such license conditions and controls the timing of actions under the license. Thus, for example, it will be the Commission that ensures compliance with the requirement that the licensee permit inspections by state officials, and, while Niagara Mohawk must notify the state prior to beginning certain activities covered by the certification, it will be the Commission that authorizes Niagara Mohawk to commence those activities. 18/

IV. ENVIRONMENTAL ANALYSIS

The environmental analysis of Niagara Mohawk's license application, as amended by the offer of settlement, included an examination of water quality, the maintenance of stable minimum flows, fisheries (including fish passage), vegetation and wildlife, geological resources, visual resources, cultural resources, aesthetic resources, and recreation.

Niagara Mohawk's proposed project conditions will have many beneficial effects. Water level fluctuations in the project reservoirs will be restricted, enhancing conditions for fisheries and wetlands and reducing the potential for erosion of the shoreline. Minimum flows will be provided in all bypassed reaches and increased in the bypassed reaches of four of the developments, 19/ thus improving and stabilizing the fisheries. Fish protection measures will be installed at all eight developments and fish passage will be provided at seven developments. Recreational enhancements, including whitewater releases, access trails, campgrounds, canoe/boat take-outs and put-ins, and portage trails, will be developed to better serve the public. Required flows will be monitored. Some short-term erosion may occur where new facilities are constructed.

18/ See Tunbridge Mill, supra.

19/ In 1987 and 1991, the Commission required minimum flows in the bypassed reaches at the Moshier, Eagle, Soft Maple, and Taylorville Developments. See 38 FERC ¶ 62,266 (1987) and 57 FERC ¶ 62,182 (1991).

Based on the environmental analysis conducted for this project, the Commission concludes that issuance of a new license for the Beaver River Project, as conditioned herein, will not constitute a major federal action significantly affecting the quality of the human environment.

V. DISCUSSION

The Settlement Agreement proffered by the majority of the parties to this proceeding resolves a range of resource use issues, and we commend the parties for their successful efforts. While we may not, absent the Settlement, have conditioned a new license for this project with all the terms we herein approve, we conclude that the agreement negotiated by the parties is in the public interest, and we include in the license the terms of the Settlement, 20/ along with provisions to enable the Commission to ensure compliance with all license conditions. 21/

We do note, however, that the Settlement's dispute resolution process must not be allowed to inhibit Niagara Mohawk's compliance with its license. 22/ Thus, Niagara Mohawk will remain obligated to comply with Commission orders, even if the orders relate to a matter currently subject to dispute resolution, and Niagara Mohawk may not perform actions subject to Commission approval until it has received such approval, even if such actions are required by the result of the dispute resolution process.

Finally, with respect to the provisions for Niagara Mohawk to transfer certain property rights to NYSDEC, 23/ the terms of such conveyances must ensure that Niagara Mohawk retains all rights necessary to carry out not just hydropower operations but all project purposes identified in the license. 24/ The

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20/ Accordingly, our approval of this Settlement does not create a precedent on any specific matters thereunder.

21/ See, e.g., Consumers Power Co., 68 FERC ¶ 61,077 (1994) (order accepting comprehensive settlement involving 11 relicense proceedings).

22/ See Consumers Power Co., supra, at pp. 61,372, 61,374.

23/ See the Beaver River Fund discussion, supra.

24/ See, e.g., Consumers Power Co., 73 FERC ¶ 61,093 (1995). Niagara Mohawk is required, under the terms of Articles 5 and 418 of the license we issue today, to obtain prior Commission approval for the conveyance of certain interests

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transfer of these lands to NYSDEC does not extinguish our regulatory jurisdiction over the property; rather, NYSDEC will be in the position of a landowner whose property rights are subject to a binding easement.

VII. SECTION 18 FISHWAY PRESCRIPTION

Section 18 of the FPA, 16 U.S.C. § 811, states that the Commission shall require construction, maintenance, and operation by a licensee of such fishways as the Secretaries of Commerce or the Interior may prescribe. By letter filed July 13, 1995, Interior stated that it is not necessary to prescribe fishways at this time, but requested that the Commission reserve authority to require the construction, operation, and maintenance of fishways subsequently prescribed by Interior. Consistent with Commission practice, Article 414 includes the requested reservation. 25/

VIII. RECOMMENDATIONS OF FEDERAL AND STATE FISH AND WILDLIFE AGENCIES AND THE SECTION 10(j) PROCESS

Section 10(j)(1) of the FPA 26/ requires the Commission, when issuing a license, to include conditions based upon recommendations of federal and state fish and wildlife agencies, submitted pursuant to the Fish and Wildlife Coordination Act, 27/ for the protection and enhancement of fish and wildlife and their habitat affected by the project. The recommendations of the fish and wildlife agencies for the Beaver River Project, as now reflected in the Settlement Offer, are included in the license.

24/(...continued)
in project property. Thus, prior to making the conveyances required by the Settlement, Niagara Mohawk must obtain Commission approval of the transfer instruments. This requirement is consistent with the Settlement, which notes, in Section X.F., that its terms do not preclude Niagara Mohawk from complying with its obligations under, inter alia, the Federal Power Act.

25/ See Wisconsin Public Service Corporation, 62 FERC ¶ 61,095 (1993); aff'd, Wisconsin Public Service Corporation v. FERC, 32 F.3d 1165 (1994).

26/ 16 U.S.C. § 803(j)(1).

27/ 16 U.S.C. § 661 et seq.

IX. CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2)(A) of the FPA 28/ 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. 29/ Federal and state agencies filed 27 qualifying comprehensive plans, of which we identified seven state and three federal comprehensive plans that are applicable. 30/ We did not find any conflicts.

X. APPLICANT'S PLANS AND CAPABILITIES

In accordance with Sections 10 and 15 of the FPA, 31/ we have evaluated Niagara Mohawk's record as a licensee for these areas: (1) consumption efficiency improvement program; (2) compliance history and ability to comply with the new license;

28/ 16 U.S.C. § 803(a)(2).

29/ Comprehensive plans are defined at 18 C.F.R. § 2.19 (1995).

30/ (1) National Park Service, National Rivers Inventory, U.S. Department of the Interior, Washington, D.C., January 1982; (2) Fish and Wildlife and Canadian Wildlife Service, North American Waterfowl Management Plan: A Strategy for Cooperation, U.S. Department of the Interior and Environment Canada, Washington, D.C. 1986; (3) Fish and Wildlife, Fisheries USA: The Recreational Fisheries Policy of the U.S. Fish and Wildlife Service, Washington D.C., undated; (4) Adirondack Park Agency, Adirondack Park State Land Master Plan, Ray Brook, New York, January 1985; (5) Adirondack Park Agency, New York State wild, scenic, and recreational rivers system field investigation summaries, Albany, New York, 21 reports, undated; (6) FWS, New York State Department of Environmental Conservation, Fisheries Enhancement Plan for the Black River, New York, Department of the Interior, Amherst, New York, March 1994; (7) New York Department, New York State Wild, Scenic, and Recreational River System Act, Albany, New York, March 1985; (8) New York State Executive Law, Article 27- Adirondack Park Agency Act, Albany, New York, July 15, 1981; (9) New York Department, Regulation for administration and management of the wild, scenic, and recreational rivers systems in New York State excepting the Adirondack Park, Albany, New York, March 26, 1986; (10) New York State Parks, Recreation, and Historic Preservation, State Comprehensive Outdoor recreation Plan, 1994.

31/ 16 U.S.C. §§ 803 and 808.

(3) safe management, operation, and maintenance of the project; (4) ability to provide efficient and reliable electric service; (5) need for power; (6) transmission services; (7) cost effectiveness of plans; and (8) actions affecting the public.

A. Consumption Efficiency Improvement Program (Section 10(a)(2)(C))

In 1990, Niagara Mohawk prepared a Demand-Side Management Program (DSM) Plan in response to New York State Public Service Commission Opinion No. 89-15. Niagara Mohawk's goal with respect to DSM is to encourage efficient use of energy resources. Niagara Mohawk has twelve large scale DSM programs. The energy-efficiency programs are basically conservation programs and include measures ranging from water heater wraps to high efficiency lighting and equipment. Niagara Mohawk also has innovative rate options which include new time-of-use rates, real-time pricing, and voluntary interruptible and curtailable rate programs.

Niagara Mohawk views the innovative rate programs as one of the most promising. The general policy is that rates should be designed to encourage efficiency in consumption and production. Efficient rate design would encourage conservation when rates are high and encourage consumption when rates are low. In 1990, Niagara Mohawk's goal was to reduce summer and winter peak load by 145 MW and 150 MW, respectively, and reduce annual energy use by 133,000 MWh.

Niagara Mohawk's conservation and load management programs, as described, show that it has made an effort to conserve electricity and reduce peak hour demands. We conclude that Niagara Mohawk is making a satisfactory good faith effort to comply with Section 10(a)(2)(C) of the FPA.

B. Compliance History and Ability to Comply with the New License (Section 15(a)(2)(A))

We have reviewed Niagara Mohawk's license application in order to judge its ability to comply with the conditions of any license issued, and with applicable provisions of Part I of the FPA. We have also reviewed Niagara Mohawk's record of compliance with Commission requirements under its prior license.

Our review shows that Niagara Mohawk has a satisfactory record of filing submissions in a timely manner and of generally complying with the terms of its existing license. Therefore, we conclude that Niagara Mohawk has acquired or can acquire the resources and experience necessary to carry out its plans and to comply with all conditions of a new license and applicable provisions of Part I of the FPA.

C. Safe Management, Operation, and Maintenance of the Project (Section 15(a)(2)(B))

Niagara Mohawk owns and operates a series of hydroelectric developments along the Beaver River. The developments are inspected daily and serviced periodically by Niagara Mohawk's operating department. During flood conditions, personnel are sent to the site to monitor conditions and take protective measures as appropriate. To date, Niagara Mohawk has not needed to restrict project operation.

All of the dams at the project have boat barriers as part of the ongoing maintenance program. These barriers are used along with warning signs to warn recreational users of hazards. An Emergency Action Plan has been filed to comply with the Commission's requirements. 32/

Niagara Mohawk retains an independent consultant to make a complete inspection of the Moshier, Soft Maple, Effley and High Falls Developments every five years in accordance with Part 12 of the Commission's regulations.

Measures taken to ensure public safety include warning signs, fencing around project facilities, and monitoring the activities of the public. There are no records of drownings at the project.

As a result of our review of Niagara Mohawk's plans, we conclude that it will be able to manage, operate, and maintain the Beaver River Project in a safe manner.

D. Ability to Provide Efficient and Reliable Electric Service (Section 15(a)(2)(C))

We reviewed Niagara Mohawk's plans and its ability to operate and maintain the project in a manner most likely to provide efficient and reliable electric service.

Over the past several years many capital improvements have been performed on the developments since the issuance of the original license. These improvements include work on the penstocks, generators, spillways and gates.

Niagara Mohawk has an ongoing preventative maintenance tracking system. Maintenance personnel routinely perform service and repair tasks to keep the developments in good operating condition. Daily checks of the equipment are made at the

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32/ See 18 C.F.R. Part 12 (1995), "Safety of Water Power Projects and Project Works."

developments by a travelling operator, who can send maintenance crews to repair and restore operation in a timely manner to reduce downtime losses.

Based on our review of the information, we conclude that Niagara Mohawk has been operating the project in an efficient manner within the constraints of the prior license and that it will continue to provide efficient and reliable electric services in the future.

E. Need for Power (Section 15(a)(2)(D))

Niagara Mohawk's operation of the 44.8-MW Beaver River Project under the requirements of this license will result in an estimated annual net energy production of 190 gigawatt-hours (GWh) of renewable energy.

Hydroelectric generation accounts for approximately 10 percent of Niagara Mohawk's total owned generation capability. The Beaver River Project has provided and can continue to provide a portion of Niagara Mohawk's power requirements, and contribute to Niagara Mohawk's resource diversity, as well as to the capacity needs of the New York Power Pool (NYPP) area of the Northeast Power Coordination Council (NPCC) region.

The NYPP forecasts an average annual increase in peak capacity demand of 0.8 percent during the summer months and 0.9 percent during the winter months for the 1995 to 2004 planning period. During the same period, NYPP forecasts an increase in planned capacity of 0.2 percent during the summer and 0.1 percent during the winter. Based on these estimates, current capacity reserve margins, while adequate, may diminish in the short run. Relicensing the project will contribute to maintaining available capacity.

We conclude that Niagara Mohawk will continue to need power for the short and long term, and that the Beaver River Project can contribute to meeting that need.

F. Transmission Services (Section 15(a)(2)(E))

Niagara Mohawk states that the existing transmission facilities at the Beaver River Project are adequate for the existing and proposed generation. If another licensee were to take over the project, interconnection costs and construction activities would be required for the new owner to distribute the power from the project site.

We have considered Niagara Mohawk's transmission system with respect to the application for new license, and we find that

licensing the project to continue operations would have no significant effect on the existing or planned transmission system.

The effects on Niagara Mohawk's transmission system of replacing the power from the project are uncertain, because the effects would depend on the type, location, and size of the next available least-cost resource.

G. Cost-Effectiveness of Plans (Section 15(a)(2)(F))

We conclude, based on the license application, Niagara Mohawk's past practice, and the provisions of the Settlement, that Niagara Mohawk's continued operation of the project under a new license will be achieved in a cost-effective manner.

H. Actions Affecting the Public (Section 15(a)(3)(A) and (B))

The Beaver River Project generates electricity which is used to serve Niagara Mohawk and other customers. Niagara Mohawk pays taxes annually to local and state governments. The project also provides employment opportunities and attracts tourists who patronize local businesses.

XI. COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE

Sections 4(e) and 10(a)(1) of the FPA 33/ require the Commission, in acting on applications for a license, to give equal consideration to the power and development purposes and to the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of fish and wildlife, the protection of recreational opportunities, and the preservation of other aspects of environmental quality. Any license issued shall be such as in the Commission's judgment will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for beneficial public uses. The decision to issue a license for this project, and the terms and conditions included herein, reflects such consideration.

The issuance of a new license for the Beaver River Project with the enhancement measures provided in the Settlement will allow Niagara Mohawk to continue to operate the project as an economically beneficial, dependable, and inexpensive source of electric energy for its customers. The beneficial effects on the environment associated with relicensing the project will result from the enhancement measures proposed in the Settlement. The nondevelopment benefits of these measures include improvements in

33/ 16 U.S.C. §§ 797(e) and 803(a)(1).

habitat and production conditions for resident fish, fish protection at intakes, wildlife habitat in the basin, recreational facilities, visual quality, erosion control, in project impoundments, protection and knowledge about archaeologic and historic resources.

We find the project to be economic even with the resource measures included in the license. The electricity generated from the Beaver River Project will be beneficial, because it will continue to reduce the use of fossil-fueled electric generating plants, conserve nonrenewable energy resources, and reduce atmospheric pollution.

XII. LICENSE TERM

Pursuant to Section 15(e) of the FPA, 34/ relicense terms shall be not less than 30 years nor more than 50 years. According to the Settlement Offer filed in this proceeding, the parties contemplate a 30-year license for the Beaver River Project. Because the term of the new license was likely an important element in the negotiations which led to the Settlement, we will issue the license for a 30-year term.

XIII. SUMMARY

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 Final Environmental Analysis. Issuance of this license is not a major federal action significantly affecting the quality of the human environment.

In light of all of the above, including our review of the environmental analysis of the proposed project and its alternative conducted by our staff, we conclude that issuing a new license for the Beaver River Project with the requirements included herein will not conflict with any planned or authorized development and will best adapt the project to a comprehensive plan for developing the Beaver River for beneficial public purposes.

The Commission orders:

(A) This license is issued to Niagara Mohawk Power Corporation (licensee) for a term of 30 years, effective the first day of the month in which the license is issued, to operate and maintain the Beaver River Project No. 2645. This license is subject to the terms and conditions of the Federal Power Act

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34/ 16 U.S.C. § 808(e).

(FPA), which is incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provisions of the FPA.

(B) The project consists of:

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

Exhibit G	FERC No. 2645-	Showing
1	1	Project Boundary and Location Map
2	2	Project Boundary and Location Map
3	3	Project Boundary and Location Map
4	4	Project Boundary and Location Map
5	5	Project Boundary and Location Map
6	6	Project Boundary and Location Map
7	7	Project Boundary and Location Map
8	8	Project Boundary and Location Map
9	9	Project Boundary and Location Map

(2) The Beaver River Project consists of eight developments extending from the High Falls Development at river mile 11 to the Moshier Development at river mile 27.5.

Moshier Development

The Moshier Development consists of: (1) a 920-foot-long by 93-foot-high earth embankment dam containing a 200-foot-long concrete spillway topped with 2-foot-high flashboards and a 53-foot-long non-overflow concrete abutment; (2) an impoundment which, at the normal maximum surface elevation of 1,641 feet National Geodetic Vertical Datum (NGVD), has a surface area of 340 acres, a gross storage capacity of 7,339 acre-feet, and a usable capacity of 4,463 acre-feet; (3) a 28-foot-wide by 51-foot-high concrete intake structure containing two 11-foot-wide by 51.5-foot-high trashracks and two 10-foot-wide by 12-foot-high steel slide gates; (4) a 3,740-foot-long by 10-foot-diameter steel penstock connected to a 5,620-foot-long by 10-foot-diameter fiberglass reinforced plastic penstock for a total penstock length of 9,360 feet; (5) an excavated tailrace channel; (6) a 30-foot-diameter steel surge tank; (7) a penstock bifurcation downstream of the surge tank that divides into two 70-foot-long by 7-foot-diameter steel penstocks; (8) a 34-foot-wide by 70-foot-long concrete/masonry powerhouse containing two vertical Francis turbines connected to direct-drive synchronous generators, each with a rated capacity of 4,000 kW, a hydraulic capacity of 330 cfs, and a design head of 196 feet; (9) a 36-

inch-diameter minimum flow pipe and butterfly valve; (10) an 11-mile-long, 115-kV transmission line; and (11) appurtenant equipment.

Eagle Development

The Eagle Development consists of: (1) a 365-foot-long by 21-foot-high concrete gravity dam containing a 185-foot-long ogee spillway topped with 1-foot flashboards and an 85-foot-long, non-overflow concrete abutment; (2) an impoundment which, at the normal maximum surface elevation of 1,426.2 feet (NGVD), has a surface area of 138 acres, a gross storage capacity of 668 acre-feet, and a usable capacity of 123 acre-feet; (3) a 20-foot-wide gated log sluice; (4) a 50-foot-long headgate structure with four 9.5-foot-wide stop log slots and four 9.5-foot by 9.5-foot trashracks; (5) an 18-foot-wide by 16-foot-deep by 540-foot-long forebay canal; (6) a concrete intake structure containing three 10-foot-wide by 7-foot-high timber slide gates; (7) a 2,725-foot-long by 9-foot-diameter steel penstock; (8) a 63-foot-wide by 87-foot-long concrete/masonry powerhouse containing four horizontal Francis turbines connected to direct-drive synchronous generators, with rated capacities of 1,350 kW (units 1 through 3) and 2,000 kW (unit 4), hydraulic capacities of 150 cfs (units 1 through 3) and 200 cfs (unit 4), and design heads of 135 feet (units 1 through 3) and 125 feet (unit 4); (9) a 5-foot-wide aluminum slide gate that supplies minimum flow to the bypass; (10) a 300-foot-long tailrace channel; (11) a 160-foot-long, 115-kV transmission line; and (12) appurtenant equipment.

Soft Maple Development

The Soft Maple Development consists of: (1) five earth embankment dikes; (2) a 910-foot-long by 115-foot-high earth embankment diversion dam; (3) a 720-foot-long by 100-foot-high earth embankment terminal dam; (4) an impoundment which, at the normal maximum surface elevation of 1,289.9 feet (NGVD), has a surface area of 400 acres, a gross storage capacity of 2,678 acre-feet, and a usable capacity of 1,150 acre-feet; (5) a 144-foot-long concrete ogee spillway with 1.5-foot-high flashboards; (6) two 10-foot-wide aluminum sluice gates; (7) a 600-foot-long forebay; (8) an 81.5-foot-wide concrete intake structure containing three 26-foot-wide by 33.5-foot-high trashracks; (9) two 530-foot-long by 11.5-foot-diameter steel penstocks; (10) intake facilities for an additional penstock; (11) an 82-foot-wide by 50-foot-long concrete/masonry powerhouse containing two identical vertical Francis turbines connected to direct-drive synchronous generators, each with a rated capacity of 7,500 kW, a hydraulic capacity of 860 cfs, and a design head at 121.5 feet; (12) an excavated tailrace channel; (13) a 20-foot-long, 115-kV transmission line; and (14) appurtenant equipment.

Effley Development

The Effley Development consists of: (1) a 647-foot-long by 30-foot-high concrete gravity dam containing a 430-foot-long by 30-foot-high concrete ogee spillway and a 188-foot-long non-overflow concrete abutment; (2) a gated 29-foot-long log chute; (3) an impoundment which, at the normal maximum surface elevation of 1,163 feet (NGVD), has a surface area of 340 acres, a gross storage capacity of 3,140 acre-feet, and a usable capacity of 1,420 acre-feet; (4) a 100-foot-long forebay; (5) a 38.5-foot-wide intake structure containing a 22-foot-wide by 22-foot-high trashrack and three 6-foot-wide by 8-foot-high timber slide gates; (6) a 36-foot-wide concrete intake structure containing a 20-foot-wide by 27-foot-high trashrack and an 11-foot by 11-foot slide gate; (7) three 87-foot-long by 5-foot-diameter steel penstocks and one 148-foot-long by 8-foot-diameter steel penstock; (8) two concrete/masonry powerhouses, one that is 58-feet-wide by 53-feet-long containing three horizontal Francis turbines connected to direct-drive synchronous generators rated at 400 kW (units 1 and 2) and 560 kW (unit 3) with hydraulic capacities of 135 cfs (units 1 and 2) and 200 cfs (unit 3) and design heads of 55 feet (units 1 and 2) and 54 feet (unit 3) and the second that is 42.5-feet-wide by 44-feet-long containing a single vertical Francis turbine connected to a direct-drive synchronous generator rated at 1,600 kW, with a hydraulic capacity of 450 cfs and a design head of 52.6 feet; (9) excavated tailrace channels; (10) a 2.3-mile-long, 23-kV transmission line; and (11) appurtenant equipment.

Elmer Development

The Elmer Development consists of: (1) a 238-foot-long by 23-foot-high concrete gravity spillway; (2) a 25-foot-wide sluice gate with needle beams; (3) an impoundment which, at the normal maximum surface elevation of 1,108 feet (NGVD), has a surface area of 34 acres, a gross storage capacity of 345 acre-feet, and a usable capacity of 138 acre-feet; (4) a forebay; (5) a 39-foot-wide concrete intake structure containing two 16.5-foot-wide by 21.5-foot-high trashracks and four 6-foot-wide by 11-foot-high timber slide gates; (6) a 78-foot-wide by 34-foot-long concrete/masonry powerhouse containing two vertical Francis turbines connected to direct-drive synchronous generators, each with a rated capacity of 750 kW, a hydraulic capacity of 290 cfs, and a design head of 37 feet; (7) an excavated tailrace channel; (8) a 2,270-foot-long, 23-kV transmission line; and (9) appurtenant equipment.

Taylorville Development

The Taylorville Development consists of: (1) a 1,003-foot-long by 23-foot-high concrete gravity dam; (2) an impoundment

which, at the normal maximum surface elevation of 1,076.6 feet (NGVD), has a surface area of 170 acres, a gross storage capacity of 1,091 acre-feet, and a usable capacity of 406 acre-feet; (3) a 33-foot-wide concrete intake structure containing a 25-foot-wide by 20-foot-high trashrack and three 5.5-foot-wide by 13-foot-high timber slide gates; (4) a 2,725-foot-long by 9.5-foot-diameter steel penstock; (5) an 18-foot-diameter surge tank located about 40 feet upstream of the powerhouse; (6) a 93-foot-wide by 62.5-foot-long concrete/masonry powerhouse containing four horizontal Francis turbines connected to direct-drive synchronous generators, with rated capacities of 1,100 kW (units 1 and 2), 1,372 kW (unit 3), and 1,200 kW (unit 4), each with a hydraulic capacity of 180 cfs, and a design head of 96.6 feet; (7) an excavated tailrace channel; (8) two 7.5-foot-wide aluminum slide gates for minimum flows; (9) a 400-foot-long, 23-kV transmission line; and (10) appurtenant equipment.

Belfort Development

The Belfort Development consists of: (1) a 206-foot-long by 17-foot-high concrete gravity dam with a 161-foot-long concrete ogee spillway equipped with 2-foot-high flashboards; (2) an impoundment which, at the normal maximum surface elevation of 966 feet (NGVD), has a surface area of 50 acres, a gross storage capacity of 120 acre-feet, and a usable capacity of 73 acre-feet; (3) a 120-foot-long forebay; (4) a 62-foot-wide concrete intake structure containing one 12-foot-wide by 17-foot-high trashrack, one 12-foot-wide by 23-foot-high trashrack, and two 11-foot by 11-foot timber slide gates; (5) one 52-foot-long by 7-foot-diameter steel penstock and one 52-foot-long by 7.5-foot-diameter steel penstock and penstock bifurcation; (6) a 78-foot-wide by 39-foot-long concrete/masonry powerhouse containing three horizontal Francis turbines connected to direct-drive synchronous generators, with a rated capacity of 400 kW (unit 1), 640 kW (unit 2), and 1,000 kW (unit 3), with hydraulic capacities of 200 cfs (units 1 and 2) and 310 cfs (unit 3), each with a design head of 48 feet; (7) a 400-foot-long tailrace channel; (8) a 3,540-foot-long, 23-kV transmission line; and (9) appurtenant equipment.

High Falls Development

The High Falls Development consists of: (1) a 1,233-foot-long, 50-foot-high concrete gravity dam containing a 470-foot-long non-overflow concrete gravity section and a 650-foot-long concrete ogee spillway; (2) an impoundment which, at the normal maximum surface elevation of 915 feet (NGVD), has a surface area of 145 acres, a gross storage capacity of 1,058 acre-feet, and a usable capacity of 135 acre-feet; (3) a 64 foot-wide by 29-foot-high concrete intake structure containing four 12-foot-wide by 20.5-foot-high trashracks and four steel slide gates; (4) a 49-

foot-wide log sluice that has been sealed; (5) a 605-foot-long by 12-foot-diameter riveted steel penstock; (6) a 34-foot-wide by 99-foot-long concrete/masonry powerhouse containing three vertical Francis turbines connected to direct-drive synchronous generators, each with a rated capacity of 1,600 kW, a hydraulic capacity of 300 cfs, and a design head of 100 feet; (7) a spare turbine bay for future expansion; (8) a 3.7-mile-long, 23 kV transmission line; and (9) appurtenant equipment.

The project works generally described above are more specifically shown and described by those portions of Exhibits A and F below:

Exhibit A:

Pages A-4 through A-26 describing the existing mechanical, electrical and transmission equipment, filed November 29, 1991.

Exhibit F Drawings	FERC No. 2645-	Showing
1	1	General Plan and Details of Pipeline
2	2	Details of Intake and Minimum Flow Pipe
3	3	Dam and Spillway Plan, Elevation and Sections
4	4	Surge Tank, Penstock and Powerhouse Plan and Section
5	5	General Plan and Details of Dam and Penstock
6	6	General Plan and Details Minimum - Flow Unit and Minimum - Flow Gate
7	7	Intake Canal and Gatehouse Plans and Sections
8	8	Powerhouse Plans and Sections
9	9	General Plan and Details Dams, Dikes and Canals
10	10	Spillway Dam Plan and Sections
11	11	Powerhouse and Penstock Plans and Sections
12	12	General Plan and Details of Dam, Canal and Intake
13	13	Powerhouse and Penstock Plan, Profile and Sections
14	14	Powerhouse Plan Elevations and Sections
15	15	General Plan and Sections of Dam and Sluice
16	16	Powerhouse and Racks Plans and Sections

17	17	General Plan Dam and Sections
18	18	Intake, Pipeline and Surge Tank Plans and Sections
19	19	Powerhouse Plans and Sections General Plan and Details
20	20	General Plan and Details Dam, Intake and Powerhouse
21	21	General Plan and Details Dam, Intake and Powerhouse
22	22	General Plan-Dam and Sections
23	23	Powerhouse and Penstock-Plan and Sections

(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 Exhibits A, F, and G described above are approved and made part of the license.

(D) This license is subject to the articles set forth in Form L-5 (October 1975), entitled "Terms and Conditions of License for Constructed Major Project Affecting Navigable Waters of the United States," and the following additional articles.

Article 201. The licensee shall pay the United States an annual charge effective the first day of the month in which this license is issued, for the purpose of reimbursing the United States for the Commission's administrative costs, pursuant to Part I of the Federal Power Act, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for that purpose is 44,800 kilowatts.

Article 202. Pursuant to Section 10(d) of the Federal Power 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 301. Within 90 days of completion of construction of the facilities directed by any article of this license (trashracks, fish passage, recreation, etc.), the licensee shall file for Commission approval revised Exhibits A, F, and G, as appropriate, to show those project facilities as built.

Article 401. Within two years of license issuance, the licensee shall release from the Moshier Development into the bypassed reach a year-round minimum flow of 45 cubic feet per second. The release will be through the existing minimum flow discharge pipe and orifice plate and through a new slide gate structure to be installed within two years of the issuance date of this license and which will also accommodate whitewater releases and downstream fish passage.

This flow may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods upon agreement between the licensee and the New York State Department of Environmental Conservation (NYSDEC). If

the flow is so modified, the licensee shall notify the Commission as soon as possible, but not later than 10 days after each such incident.

Within one year of the issuance date of this license, the licensee shall file, for Commission approval, detailed design drawings of the licensee's proposed slide gate structure together with a schedule to construct/install the structure.

The licensee shall prepare the aforementioned drawings and schedule after consultation with the U.S. Fish & Wildlife Service and NYSDEC. The licensee shall include with the drawings documentation of consultation, copies of agency comments and recommendations on the drawings and schedule after they have been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the licensee's facilities. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the drawings and schedule 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 proposed facilities and schedule. Construction of new minimum flow facilities shall not begin until the licensee is notified by the Commission that the filing is approved. Upon Commission approval, the licensee shall implement the proposal, including any changes required by the Commission.

Article 402. Within one year of license issuance, the licensee shall release from the Eagle Development into the bypassed reach a year-round minimum flow of 45 cubic feet per second (cfs). The release will be through the existing minimum flow slide gate.

This flow may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods upon agreement between the licensee and the New York State Department of Environmental Conservation (NYSDEC). If the flow is so modified, the licensee shall notify the Commission as soon as possible, but not later than 10 days after each such incident.

In accordance with Section III (B) of the Settlement, the minimum flow may be reduced to as low as 30 cfs based on two bypassed reach site inspections and with the mutual agreement of NYSDEC and U.S. Fish and Wildlife Service (FWS) after consultation with the Beaver River Advisory Council and within two years of license issuance. The reduction would occur from October 1 to the end of spring runoff when uncontrolled spillage ceases or May 31, whichever comes first. Modification of the

required minimum flow at this development or any other in this project on other than the temporary basis noted is subject to prior approval of the Commission. To obtain this approval, the licensee must apply for an amendment to the conditions of this license.

Article 403. Within two years of license issuance, the licensee shall release from the Soft Maple Development into the bypassed reach a year-round minimum flow of 35 cubic feet per second (cfs). The release of 15 cfs will be through the existing slide gates at the spillway. The remaining 20 cfs will be provided through the existing diversion tunnel and a new release structure. The release structure is to be installed within two years of the issuance date of this license.

This flow may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods upon agreement between the licensee and the New York State Department of Environmental Conservation (NYSDEC). If the flow is so modified, the licensee shall notify the Commission as soon as possible, but not later than 10 days after each such incident.

Within one year of the issuance date of this license, the licensee shall file, for Commission approval, detailed design drawings of the licensee's proposed release structure together with a schedule to construct and install the structure. The drawings shall include the fish screen (or equivalent) proposed for the upstream end of the diversion tunnel.

The licensee shall prepare the aforementioned drawings and schedule after consultation with the U.S. Fish and Wildlife Service and NYSDEC. The licensee shall include with the drawings documentation of consultation, copies of agency comments and recommendations on the drawings and schedule after they have been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the licensee's facilities. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the drawings and schedule 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 proposed structures and schedule. Construction of the new release structure and screen shall not begin until the licensee is notified by the Commission that the filing is approved. Upon Commission approval, the licensee shall implement the proposal, including any changes required by the Commission.

After three full years of these minimum flows being provided, NYSDEC will conduct a fisheries investigation on resident brook trout in the bypassed reach. If the investigation reveals the need to supplement the existing brook trout population, then NYSDEC will commence a four-year program of transplanting native brook trout from local heritage streams to enhance prospects for a sustainable brook trout fishery in the bypassed reach. The licensee will provide two fisheries biologists for three days in each year of the transplant program and equipment necessary for safe transport of fish during this effort.

Article 404. Within two years of license issuance, the licensee shall release from the Effley Development into the bypassed reach a year-round minimum flow of 20 cubic feet per second. The release will be through a new gate structure in the north side of the spillway to be installed within two years of the issuance date of this license and which will also accommodate downstream fish passage.

This flow may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods upon agreement between the licensee and NYSDEC. If the flow is so modified, the licensee shall notify the Commission as soon as possible, but no later than 10 days after each such incident.

Within one year of the issuance date of this license, the licensee shall file, for Commission approval, detailed design drawings of the licensee's proposed gate structure together with a schedule to construct and install the structure.

The licensee shall prepare the aforementioned drawings and schedule after consultation with the U.S. Fish and Wildlife Service and NYSDEC. The licensee shall include with the drawings documentation of consultation, copies of agency comments and recommendations on the drawings and schedule after they have been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the licensee's facilities. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the drawings and schedule 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 proposed facilities and schedule. Construction of new minimum flow facilities shall not begin until the licensee is notified by the Commission that the filing is approved. Upon Commission approval, the licensee shall implement the proposal, including any changes required by the Commission.

Article 405. Within two years of license issuance, the licensee shall release from the Elmer Development into the bypassed reach a year-round minimum flow of 20 cubic feet per second. The release will be through a new release structure that will be designed in the existing needle beam structure in the middle of the spillway to be installed within two years of the issuance date of this license and which will also accommodate downstream fish passage.

This flow may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods upon agreement between the licensee and NYSDEC. If the flow is so modified, the licensee shall notify the Commission as soon as possible, but not later than 10 days after each such incident.

The minimum flow may be reduced by U.S. Fish and Wildlife Service after consultation with the Beaver River Advisory Council to no less than 10 cubic feet per second within one year of license issuance, in accordance with Section VI (B) of the Settlement. Modification of the required minimum flows at this development on other than the temporary basis noted in the previous paragraph is subject to prior approval of the Commission. To obtain this approval, the licensee must apply for an amendment to the conditions of this license.

Within one year of the issuance date of this license, the licensee shall file, for Commission approval, detailed design drawings of the licensee's proposed release structure together with a schedule to construct and install the structure.

The licensee shall prepare the aforementioned drawings and schedule after consultation with the U.S. Fish & Wildlife Service and NYSDEC. The licensee shall include with the drawings documentation of consultation, copies of agency comments and recommendations on the drawings and schedule after they have been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the licensee's facilities. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the drawings and schedule 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 proposed facilities and schedule. Construction of new minimum flow facilities shall not begin until the licensee is notified by the Commission that the filing is approved. Upon Commission approval, the licensee shall implement the proposal, including any changes required by the Commission.

Article 406. Within one year of license issuance, the licensee shall release from the Taylorville Development into the bypassed reach a year-round minimum flow of 60 cubic feet per second. The release will be through the existing minimum flow slide gate which will also accommodate downstream fish passage.

This flow may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods upon agreement between the licensee and the NYSDEC. If the flow is so modified, the licensee shall notify the Commission as soon as possible, but not later than 10 days after each such incident.

The minimum flow may be reduced to between 45 and 60 cubic feet per second based on the results of a bypassed reach site inspection and with the mutual agreement of NYSDEC and the U.S. Fish and Wildlife Service after consultation with the Beaver River Advisory Council and within one year of license issuance, in accordance with Section VII.B. of the Settlement. Modification of the required minimum flow at this development on other than the temporary basis noted just above is subject to prior approval of the Commission. To obtain this approval, the licensee must apply for an amendment to the conditions of this license.

Article 407. Within two years of license issuance, the licensee shall release from the Belfort Development into the bypassed reach a year-round minimum flow of 20 cubic feet per second. The release will be through a new gate structure located on the south side of the spillway to be installed within two years of the issuance date of this license and which will also accommodate downstream fish passage.

This flow may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods upon agreement between the licensee and NYSDEC. If the flow is so modified, the licensee shall notify the Commission as soon as possible, but not later than 10 days after each such incident.

Within one year of the issuance date of this license, the licensee shall file, for Commission approval, detailed design drawings of the licensee's proposed gate structure together with a schedule to construct and install the structure.

The licensee shall prepare the aforementioned drawings and schedule after consultation with the U.S. Fish & Wildlife Service and NYSDEC. The licensee shall include with the drawings documentation of consultation, copies of agency comments and recommendations on the drawings and schedule after they have been prepared and provided to the agencies, and specific descriptions

of how the agencies' comments are accommodated by the licensee's facilities. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the drawings and schedule 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 proposed facilities and schedule. Construction of new minimum flow facilities shall not begin until the licensee is notified by the Commission that the filing is approved. Upon Commission approval, the licensee shall implement the proposal, including any changes required by the Commission.

Article 408. Within two years of license issuance, the licensee shall release from the High Falls Development into the bypassed reach a year-round nominal flow of 30 cubic feet per second (cfs). The release of 10 cfs will be through the existing low-level slide gate structure in the middle of the spillway. The remaining 20 cfs will be provided through a new gate structure at the north side of the spillway to be installed within two years of the issuance date of this license and which will also accommodate downstream fish passage.

This flow may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods upon agreement between the licensee and NYSDEC. If the flow is so modified, the licensee shall notify the Commission as soon as possible, but not later than 10 days after each such incident.

Within one year of the issuance date of this license, the licensee shall file, for Commission approval, detailed design drawings of the licensee's proposed gate structure together with a schedule to construct and install the structure.

The licensee shall prepare the aforementioned drawings and schedule after consultation with the U.S. Fish & Wildlife Service and NYSDEC. The licensee shall include with the drawings documentation of consultation, copies of agency comments and recommendations on the drawings and schedule after they have been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the licensee's facilities. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the drawings and schedule 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 proposed facilities and schedule. Construction of new minimum

flow facilities shall not begin until the licensee is notified by the Commission that the filing is approved. Upon Commission approval, the licensee shall implement the proposal, including any changes required by the Commission.

Article 409. Within two years of license issuance, the licensee shall release from the High Falls Development into the Beaver River a year-round base flow of at least 250 cubic feet per second. The release will be through the existing units and a new minimum flow release structure to be installed within two years of the issuance date of this license. The release shall be measured and monitored by the licensee using a United States Geological Survey type stream flow gage located at Croghan.

This flow may be temporarily modified if required by operating emergencies beyond the control of the licensee and for short periods upon the mutual agreement of the licensee and New York State Department of Environmental Conservation. If the flow is so modified, the licensee shall notify the Commission as soon as possible, but not later than 10 days after each such incident.

Within one year of the issuance date of this license, the licensee shall file, for Commission approval, detailed design drawings of the licensee's proposed flow release structure together with a schedule to construct/install the structure.

The licensee shall prepare the aforementioned drawings and schedule after consultation with the U.S. Fish & Wildlife Service and NYSDEC. The licensee shall include with the drawings documentation of consultation, copies of agency comments and recommendations on the drawings and schedule after they have been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the licensee's facilities. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the drawings and schedule 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 proposed facilities and schedule. Construction of new minimum flow facilities shall not begin until the licensee is notified by the Commission that the filing is approved. Upon Commission approval, the licensee shall implement the proposal, including any changes required by the Commission.

Article 410. Within one year of license issuance, the licensee shall operate the Beaver River Project to control fluctuations of the reservoir surface elevations for the

protection of wetlands, wildlife, and fish habitat impoundment water surface elevations, as measured at each development's dam, as follows:

Moshier: From July 1 to April 30, the maximum daily reservoir fluctuation will be limited to 1.5 feet from the normal maximum headwater elevation. This fluctuation is between elevations 1639.5 and 1641.0 feet with flashboards and between elevations 1637.5 and 1639.0 feet without flashboards.

From May 1 to June 30, the maximum daily reservoir fluctuation will be limited to 1.0 foot from the normal maximum headwater elevation. This fluctuation is between elevations 1640.0 and 1641.0 feet with flashboards and between elevations 1638.0 and 1639.0 feet without flashboards. If flashboards are down or fail during this period, the flashboards will not be replaced until July 1 or later.

During low flow conditions (when Beaver River inflow to Moshier plus flow from all intervening tributaries from Moshier to High Falls is less than 250 cubic feet per second (cfs) daily average), the daily maximum reservoir fluctuation will be limited to 3.0 feet, corresponding to fluctuations between elevation 1638.0 and 1641.0 feet with flashboards. This fluctuation is to be used only under specific conditions as described in Article 411.

Eagle: The maximum daily and seasonal reservoir fluctuation will be limited to 1.0 foot from the normal maximum headwater elevation. This fluctuation is between elevations 1425.2 and 1426.2 feet with flashboards and between elevations 1424.2 and 1425.2 feet without flashboards. Flashboards will not be erected or replaced during the period May 1 through June 30 so as to protect nests of reservoir spawning fish and of nesting birds.

Soft Maple: The maximum daily reservoir fluctuation will be limited to 1.5 feet from the normal maximum headwater elevation. This fluctuation is between elevations 1288.4 and 1289.9 feet with flashboards and between elevations 1286.9 and 1288.4 feet without flashboards.

From May 1 to June 30, the maximum daily reservoir fluctuation will be limited to 1.0 foot from the normal maximum headwater elevation. If flashboards are down or fail during this period, they will not be replaced until July 1 or later.

During low flow periods (when Beaver River inflow to Moshier plus flow from all intervening tributaries from Moshier to High Falls is less than 250 cfs daily average), the daily maximum reservoir fluctuation will be limited to 3.0 feet, corresponding to fluctuations between elevations 1286.9 without flashboards and 1289.9 feet with flashboards. This fluctuation is to be used only under specific conditions as described in Article 411.

Effley: The maximum daily reservoir fluctuation will be limited to 1.5 feet from the normal maximum headwater elevation. This fluctuation is between elevations 1161.5 and 1163.0 feet without flashboards as there are no flashboards.

During the period from May 1 to June 30, fluctuations will be limited to 1.0 foot to protect reservoir spawning fish and nesting birds. This 1.0-foot fluctuation corresponds to fluctuations between elevations 1162.0 and 1163.0 feet.

During low flow periods (when Beaver River inflow to Moshier plus flow from all intervening tributaries from Moshier to High Falls is less than 250 cfs daily average), the daily maximum reservoir fluctuation will be limited to 3.0 feet, corresponding to fluctuations between elevations 1160.0 and 1163.0 feet. This fluctuation is to be used only under specific conditions as described in Article 411.

Elmer: The maximum daily reservoir fluctuations will be limited to 1.0 foot from the normal maximum headwater elevation. This fluctuation is between elevations 1107.0 and 1108.0 feet without flashboards as there are no flashboards.

Taylorville: The maximum daily and seasonal reservoir fluctuations will be limited to 1.0 foot from the normal and maximum headwater elevation. This fluctuation is between elevations 1069.6 and 1070.6 feet with flashboards and between elevation 1068.8 and 1069.8 without flashboards. Flashboards will not be replaced during the May 1 through June 30 period.

Belfort: The maximum daily reservoir fluctuation will be limited to 1.0 foot from the normal maximum headwater elevation. The fluctuation is between elevation 965.0 and 966.0 feet with flashboards and between 964.0 and 965.0 feet without flashboards. Flashboards will not be replaced during the May 1 through June 30 period.

High Falls: The maximum daily reservoir fluctuation will be limited to 1.5 feet from the normal maximum headwater

elevation. This fluctuation is between elevations 913.5 and 915.0 feet without flashboards as there are no flashboards.

During low flow periods (when Beaver River inflow to Moshier plus flow from all intervening tributaries from Moshier to High Falls is less than 250 cubic feet per second daily average), the daily maximum reservoir fluctuations will be limited to 3.0 feet, corresponding to fluctuations between elevations 912.0 and 915.0 feet. This fluctuation is to be used only under specific conditions as described in Article 411.

Article 411. The licensee shall, during periods when the daily average inflow below High Falls is less than 250 cfs, contact the Hudson River Black River Regulating District (Hudson-Black) and seek its assistance in increasing flows, if possible, to address the low flow condition. In the event that a flow of 250 cfs below High Falls can not be ensured by Hudson-Black, the licensee will provide supplemental flow by drawing on additional storage capacity at Moshier, Soft Maple, Effley and High Falls by using the daily maximum reservoir fluctuation of 3.0 feet, noted in Article 410. The licensee will provide the maximum continuously available flow below High Falls, up to 250 cfs.

The licensee, within six months of issuance of this license, shall file, for Commission approval, a plan for consulting with Hudson-Black, deciding whether supplemental flows are needed, and providing supplemental flow from Moshier, Soft Maple, Effley and High Falls, such plan to remain in effect throughout the term of the license.

The licensee shall prepare the plan after consultation with the U.S. Fish & Wildlife Service, Hudson-Black, and the New York State Department of Environmental Conservation. The licensee shall include with the plan documentation of consultation, copies of comments and 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 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

Article 412. Within six months of the issuance date of this license, the licensee shall file, for Commission approval, a plan for streamflow and headpond elevation monitoring at each of the

Beaver River Project's developments and below High Falls Development at Croghan. The purposes of this plan include: (1) determining the stage and/or flow of the stream on which the project is located; (2) determining all other project flows including the flow through the turbine(s) and any other bypass/diversion flows; and (3) determining project headpond and tailwater elevations. The plan shall include, but not be limited to:

(1) a description of the type and location of all gaging and ancillary equipment, including the headpond and tailwater gages;

(2) a gage calibration plan, capable of ongoing performance at NYSDEC standards;

(3) confirmation that headpond and tailrace elevations shall be gaged and recorded to the nearest 0.1 feet;

(4) provision for installation and maintenance of a U.S. Geological Survey gaging station unless an alternative gaging system is justified;

(5) a description of permanent staff gages to be installed to allow independent verification of headpond and tailwater elevations;

(6) stage versus discharge ratings calibrations.

(7) a plan to keep accurate and sufficient records of flow/stage data and to provide data to NYSDEC in an appropriate format and at a planned interval; and

(8) a means to allow record inspection within five business days of a written request by a signatory to the Settlement Agreement.

The licensee shall prepare the plan after consultation with the U.S. Fish & Wildlife Service, Hudson-Black, and the New York State Department of Environmental Conservation.

The licensee shall include with the plan documentation of consultation, copies of comments and 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 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Monitoring facilities shall not be installed until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

Article 413. Within one year of the date of issuance of this license, the licensee shall file, for Commission approval, detailed design drawings for the licensee's proposed new trashracks (or equivalent) with one inch clear bar spacing for installation at each of the eight developments. The schedule for each development in terms of the date of issuance of this license is as follows:

Moshier:	within 2 years.
Eagle:	within 10 years.
Soft Maple:	within 2 years.
Effley:	within 6 years.
Elmer:	within 14 years.
Taylorville:	within 10 years.
Belfort:	within 14 years.
High Falls:	within 6 years.

The filing shall also include descriptions and drawings of any fish protection and conveyance measures (e.g., distribution of flows, minor channel modifications, plunge pools, piping, etc.) found to be needed for downstream fish passage routes at any of the developments except Soft Maple. These measures are to be installed within two years of license issuance.

The filing shall include, in addition to descriptions and drawings, information on maximum intake approach velocities and the methods and detailed schedules to complete the installations.

The licensee shall prepare the aforementioned drawings and schedule after consultation with the U.S. Fish & Wildlife Service and the New York State Department of Environmental Conservation. The licensee shall include with the drawings documentation of consultation, copies of agency comments and recommendations on the drawings and schedule after they have been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the licensee's facilities. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the drawings and schedule 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 proposed facilities and schedule. Trashrack replacement or installation of conveyance measures shall not begin until the

licensee is notified by the Commission that the filing is approved. Upon Commission approval, the licensee shall implement the proposal, including any changes required by the Commission.

Article 414. Authority is reserved by the Commission to require the licensee to construct, operate, and maintain, or to provide for construction, operation, and maintenance of, such fish passage facilities as may be prescribed by the Secretary of the Interior under Section 18 of the Federal Power Act.

Article 415. Within six months of license issuance, the licensee shall file for Commission approval a detailed plan for constructing, operating, and maintaining the recreational facilities at the project developments specified in: Pages E.5-9 to E.5-14 of the application for relicense, filed on November 29, 1991; the responses to Additional Information Request Nos. 11, 13, and 15, dated August 21, 1992; and recreation enhancements described in the Settlement Agreement filed with the Commission on May 30, 1995.

The recreation plan shall include, but not be limited to:

(1) a provision for annual whitewater boating releases commencing in 1997 at the Moshier, Eagle, and Taylorville bypass reaches in accordance with the following schedule for each development: (a) Moshier - one 4-hour release of 400 cubic feet per second (cfs) in September or October (prior to October 15) of each year. Ramping flows not to exceed 200 cfs will be provided for two hours before and two hours after the boating flow release. The total volume of each release, including ramping flows, shall not exceed 2,400 cfs-hrs; (b) Eagle - five 4-hour releases of at least 200 cfs will be provided in September and October of each year. Ramping flows not to exceed 100 cfs will be provided for one hour before and one hour after the boating flow releases. The total volume of each release, including ramping flows, shall not exceed 1,000 cfs-hrs; (c) Taylorville - five 4-hour releases not to exceed 400 cfs will be provided in September and October of each year. Ramping flows not to exceed 200 cfs will be made before and after boating flow releases for a total duration of time, not to exceed three hours. The total volume of each release, including ramping flows, shall not exceed 2,200 cfs-hrs. The releases at the three developments shall be coordinated with one another to the extent feasible. The exact timing of the releases will be determined by the licensee and American Whitewater Affiliation (AWA), in consultation with the Beaver River Advisory Council (BRAC). The schedule and flows for releases from all

three developments may be modified by the licensee and AWA, based on the recommendations of BRAC, but the total of all the releases shall not exceed the equivalent of 96,600 kilowatt-hours (kWh).

(2) new recreation facilities and measures including but not limited to those described at each of the following developments:

Moshier: a canoe/boat take-out at the southwest corner of the downstream end of the Moshier impoundment near the end of the existing access road; a new gravel parking area and two trash receptacles in the vicinity of the powerhouse; minor improvements to the canoe portage made in consultation with the Adirondack Mountain Club (Adirondack), including widening of the footbridge; a kiosk adjacent to the canoe put-in that provides a map and a description of the Beaver River canoe route, portage, and foot trails; a sign-in register; a whitewater canoe put-in and four-car parking lot at the upper end of the bypass reach; replacement of existing trail markers to the bypass reach trail with new trail markers placed in consultation with Adirondack; manual brushing of the Pepperbox Wilderness Access Trail, the bypass reach trail, and the canoe route access trail; and removal of trash in the areas;

Eagle: a fishing access trail to the bypass reach, including a widened roadside gravel parking area adjacent to the trailhead with a vehicle barrier and trash receptacle; trail markers; a provision to provide access for the public to the road along the pipeline; a canoe rest and bench mid-way along the portage trail; and working with the Adirondack Mountain Club to make other minor improvements to the canoe portage and put-in near the tailrace;

Soft Maple: ten tent and recreational vehicle campsites and an 800-foot gravel access road on a peninsula of land on the south shore of the Soft Maple impoundment accessible from Eagle Falls Road; one car-top boat launch; one 1,000-square foot caretaker's cabin and one 500-square foot garage; one 20-car gravel parking lot with a gravel access road adjacent to the proposed campsites, boat launch, and picnic area; a picnic area, including 15 picnic tables, grills, and trash receptacles, four restrooms, and a 200 foot trail extending from the south end of the parking lot adjacent to the boat launch and camping area; seven primitive canoe campsites on islands and isolated

peninsulas in the reservoir; new trail markers at the existing informal primitive trails to the south side of the bypass reach; a 150-foot scenic overlook trail; one 20-car parking lot in the abandoned gravel pit area at the head of the bypass reach access trails; one 4-car road widening on Soft Maple Road at the head of the new access trail to the scenic overlook; manual brushing of trails along the south side of the bypass reach; minor improvements made in consultation with the Adirondack Mountain Club, including a new footbridge, to the canoe portage and put-in near the tailrace of the powerhouse; and a small parking area near the powerhouse to allow access to the canoe route;

Taylorville: one car-top boat launch and parking lot north of the dam; a kiosk at the existing parking lot that provides a map and a description of the Beaver River canoe route, portage and foot trails; a picnic area including four picnic tables, four grills, six trash receptacles, and two restrooms adjacent to the car-top boat launch; non-vehicular access trails to the bypass reach area, including barrier-free trails accessible by persons with disabilities; a canoe portage, including two benches, two canoe rests, and a downriver put-in;

Belfort: a canoe portage, including a bench, canoe rest, and downriver put-in developed in consultation with the ADK; one 600-square foot, barrier-free fishing deck and a gravel parking lot for six vehicles off Belfort Road providing fishing access to Belfort reservoir for persons with disabilities; a sign-in register and two trash receptacles adjacent to the parking lot; and signs along Belfort Road indicating the location of boat access points and parking facilities at Taylorville;

High Falls: five primitive campsites on islands in the High Falls Reservoir; a canoe portage and downriver put-in; two picnic tables, grills, and trash receptacles at the existing Cooperative Day Use area;

(3) final site plans for the facilities;

(4) the name of the entity or entities responsible for operating and maintaining the facilities;

(5) a discussion of how the design of the facilities take into consideration the guidelines established by the Architectural and Transportation Barriers Compliance Board (36 C.F.R. Part 1191) and designing facilities

wherever practicable to meet these guidelines using the U.S. Forest Service's Design Guide for Accessible Outdoor Recreation;

(6) erosion and sediment control measures and measures for revegetation of disturbed areas to be implemented during and after construction of the new recreational facilities; and

(7) a schedule for constructing the facilities within one year of plan approval.

The licensee shall file the plan after consultation with the Beaver River Advisory Council (BRAC). The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the BRAC, and specific descriptions of how the BRAC's comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the BRAC 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. No ground-disturbing or land-clearing activities shall begin until the licensee is notified that the plan is approved. Upon approval, the licensee shall implement the plan, including any changes required by the Commission. Within 90 days after completion of construction, the licensee shall file as-built drawings of the recreation facilities with the Commission.

Article 416. Within 90 days from the date of this order, the licensee shall file for Commission approval a detailed plan for the licensee's participation in and management of the Beaver River Fund, as set forth in Attachment 2 to the Settlement approved and made part of the new license issued for the Beaver River Project. On or before October 1 of each year, in accordance with the articles of this license and the Commission's Uniform System of Accounts, the licensee shall file for Commission approval a plan which shows the amount of money that the licensee will spend or contribute to the Beaver River Fund for the following year, pursuant to the funding provisions set forth in the Settlement. The Commission reserves the right to require changes in the plan. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission. The Commission also reserves the right, after notice and opportunity for hearing, to modify the funding arrangement, including ordering a suspension or cessation of contributions and expenditures, should it be necessary or appropriate.

The licensee shall also file, on or before April 1 of each year, a statement for the previous calendar year, in accordance with the articles of this license and the Commission's Uniform System of Accounts, showing the amounts of money the licensee has spent or contributed to the Beaver River Fund, and the purposes for which these amounts have been spent or contributed. The statement shall be sufficiently detailed to show whether the money has been spent on the purposes approved in the license.

Article 417. The licensee shall implement the Programmatic Agreement Among the Federal Energy Regulatory Commission, the Advisory Council on Historic Preservation, and the New York State Historic Preservation Officer for Managing Historic Properties That may be Affected by a License Issuing to the Niagara Mohawk Power Corporation for the Continued Operation of Eleven Hydroelectric Projects in New York," executed on July 19, 1996, including but not limited to the Cultural Resources Management Plan (CRMP) for the project. In the event that the Programmatic Agreement is terminated, the licensee shall implement the provisions of its approved CRMP. The Commission reserves the authority to require changes to the CRMP at any time during the term of the license. If the Programmatic Agreement is terminated prior to Commission approval of the CRMP, the licensee shall obtain approval before engaging in any ground-disturbing activities or taking any other action that may affect any historic properties within the project's area of potential effect.

Article 418. (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, canceling 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 the 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;

(6) 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.

(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 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.

(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 final unless a request for rehearing is filed within 30 days from the date of its issuance, as provided in Section 313(a) of the Federal Power Act. The filing of a request for rehearing does not operate as a stay of the effective

date of this license or of any other date specified in this order, except as specifically ordered by the Commission. The licensee's failure to file a request for rehearing shall constitute acceptance of this license.

By the Commission.

(S E A L)

Lois D. Cashell,
Secretary.

ENVIRONMENTAL ASSESSMENT
FOR HYDROPOWER LICENSE

Beaver River Hydroelectric Project
FERC Project No. 2645
New York

Federal Energy Regulatory Commission
Office of Hydropower Licensing
Division of Project Review
888 First Street, N.E.
Washington, DC 20426

(Issued August 2, 1996)

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SUMMARY

On November 29, 1991, Niagara Mohawk Power Corporation (NMPC) filed an application with the Federal Energy Regulatory Commission (Commission) for a major new license (relicense) for the 44.8-megawatt (MW) Beaver River Project (FERC No. 2645). The project includes eight developments: Moshier, Eagle, Soft Maple, Effley, Elmer, Taylorville, Belfort, and High Falls. The application was amended and supplemented by NMPC's responses to information requests issued by the Commission on August 22, 1992, and February 10, 1993. The project is located on a reach of the Beaver River between 11 and 29 miles upstream of the confluence with the Black River in Herkimer and Lewis Counties, east of Carthage, New York. The current license for the project expired at the end of 1993. No new capacity is proposed at the project.

NMPC revised its application on May 30, 1995, by filing a Settlement Offer (Settlement) dated February 7, 1995, and amended March 8, 1995. The purpose of the Settlement is to highlight, summarize, and document the areas of agreement that exist as a result of settlement discussions among the signatories with regard to the operation and maintenance of the Beaver River Project. NMPC negotiated the Settlement with 13 parties, including the New York Department of Environmental Conservation, the Adirondack Council, the U.S. Fish and Wildlife Service, the American Whitewater Affiliation, the Adirondack Park Agency, Trout Unlimited, New York Rivers United, the National Audubon Society, the New York State Conservation Council, the American Canoe Association, the Association for the Protection of the Adirondacks, the Adirondack Mountain Club, and American Rivers. The Settlement contains NMPC's revised proposals for environmental enhancement measures.

This final environmental assessment (EA) prepared for the Beaver River Project analyzes and evaluates the effects associated with the issuance of a new license for the existing hydropower developments and recommends terms and conditions to become a part of any license issued. For any license issued, the Commission must determine that the project licensed will be best adapted to a comprehensive plan for improving or developing the waterway. In addition to the power and development purposes for which licenses are issued, the Commission must give equal consideration to the following purposes: energy conservation; the protection and enhancement of fish and wildlife; aesthetics; cultural resources; and the protection of recreational opportunities. This final EA for the Beaver River Project reflects staff's consideration of these factors.

Based on our consideration of all developmental and nondevelopment resource interests related to the project, the following measures to protect and enhance environmental resource values should be included in any license issued for the Beaver River Project.

The licensee should: (1) plan and implement an effective streamflow monitoring system; (2) provide specified whitewater releases; (3) provide canoe portages as part of an unimpeded route through the project area; (4) maintain minimum flows in all bypassed reaches; (5) replace trashracks at all developments; (6) construct, operate and maintain new gate structures at Moshier, Effley, Belfort, and High Falls and a new release structure at Elmer; (7) plan and implement fish protection screening and trashracks at Soft Maple and fish protection trashracks and conveyance measures at Moshier, Eagle, Effley, Elmer, Taylorville, Belfort, and High Falls; (8) institute reservoir fluctuation limits at each development; (9) make minor channel modifications at Eagle and Taylorville; (10) put a fish screen on the entrance to the existing diversion tunnel at Soft Maple; (11) participate with NYSDEC, if warranted, in a trout transplanting program at Soft Maple; and (12) establish and maintain a 250 cfs baseline flow downstream of High Falls.

These environmental measures are recommended to protect or enhance fishery resources, water quality, recreational and aesthetic resources and undiscovered properties listed on or eligible for listing on the National Register of Historic Places. In addition, the electricity generated from the project will be beneficial because it would: continue to reduce the use of fossil-fuel, electric generating plants; conserve nonrenewable energy resources; and continue to reduce atmospheric pollution.

The environmental impacts of the proposed action (relicensing the Beaver River Project under the proposed Offer of Settlement), are the effects of operational changes that would occur if such a new license were issued. Many of the terms of the Settlement propose enhancements to resources of the baseline environment as it exists today. As part of our independent analysis of the proposed Settlement, we also considered, although not in great detail, other methods of enhancing environmental resources. For example, we compared the effects on water quality parameters such as pH (a measure of acidity) of minimum flows proposed in NMPC's application as filed with the minimum flows proposed in the Settlement. Also, we have considered and are not recommending as a license requirement the provisions of the Settlement establishing the Beaver River Fund and Advisory Council.

Retirement alternatives to the project were considered and rejected in the DEA. The no-action alternative (which we use as the environmental baseline) was considered and is addressed in the environmental analysis and the comprehensive development sections of this EA. Denial of the license would mean that about 190 gigawatt-hours (GWh) of electric energy generation per year would be lost, and no measures would be implemented to protect or enhance existing environmental resources.

NMPC filed an application for a Water Quality Certificate (WQC) from the New York State Department of Environmental Conservation (NYSDEC) for the Beaver River Project. The application was denied without prejudice on November 19, 1992. Subsequent activities eventually led to settlement talks, resulting in the Settlement. As part of the Settlement, NYSDEC issued on August 24, 1995, a §401 WQC which is based on the Settlement.

Pursuant to Section 10(j) of the Federal Power Act (FPA), we make a determination that the recommendations of the federal and state fish and wildlife agencies are consistent with the purposes and requirements of Part I of the FPA and applicable law. Section 10(j) of the FPA requires the Commission to include license conditions, based on recommendations of federal and state fish and wildlife agencies, for the protection and enhancement of fish and wildlife resources. For the Beaver River Project, these recommendations have been incorporated into the Settlement. Thus, we have addressed the concerns of the federal and state fish and wildlife agencies and made recommendations consistent with those of the agencies.

Under Section 18 of the FPA, the U.S. Department of the Interior has reserved authority to prescribe the construction, operation, and maintenance of fishways at the project.

Based on our independent analysis of the project, including our consideration of all relevant economic and environmental concerns, we conclude in this EA that: (1) the Beaver River Project, as proposed in the revised application and with other special license conditions, would be best adapted to a comprehensive plan for the proper use, conservation, and development of the Beaver River and other project-related resources; and (2) issuance of a new license for the project would not constitute a major Federal action significantly affecting the quality of the human environment.

ENVIRONMENTAL ASSESSMENT

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

Beaver River Hydroelectric Project
FERC Project No. 2645
New York

INTRODUCTION

The Federal Energy Regulatory Commission issued the Beaver River Hydroelectric Project Draft Environmental Assessment (DEA) for comment on October 23, 1995. We received five comment letters. Those commentors are listed in Section IV.C., Comments on the DEA. All timely-filed comment letters were reviewed by the staff. The sections of the DEA that have been modified as a result of comments received are identified in the staff responses to the right of the letters of comments, in Appendix B.

I. APPLICATION

On November 29, 1991, Niagara Mohawk Power Corporation (NMPC) filed an application for a major new license (relicense) for the Beaver River Project (FERC No. 2645), which consists of eight developments on the Beaver River in the towns of Webb (Herkimer County), Watson, and Croghan (Lewis County), New York (Figure 1). The project is located on a reach of the Beaver River between 11 and 29 miles upstream of the confluence with the Black River and has a total installed capacity of 44.8 megawatts (MW). The project does not occupy any United States lands.

On May 30, 1995, NMPC revised its application to the Commission by filing an Offer of Settlement (Settlement) dated February 7, 1995, and amended March 8, 1995. The Settlement (Appendix A) has been signed by: the New York Department of Environmental Conservation (NYSDEC), the Adirondack Council, the U.S. Fish and Wildlife Service, the American Whitewater Affiliation, the Adirondack Park Agency, Trout Unlimited, New York Rivers United, the National Audubon Society, the New York State Conservation Council, the American Canoe Association, the Association for the Protection of the Adirondacks, the Adirondack Mountain Club, and American Rivers.

II. PURPOSE AND NEED FOR ACTION

A. Purpose of Action

In this final Environmental Assessment (EA), we analyze the impacts of continued operation of the constructed project, evaluate alternatives to the proposed project, and make recommendations to the Commission on whether to issue a license,

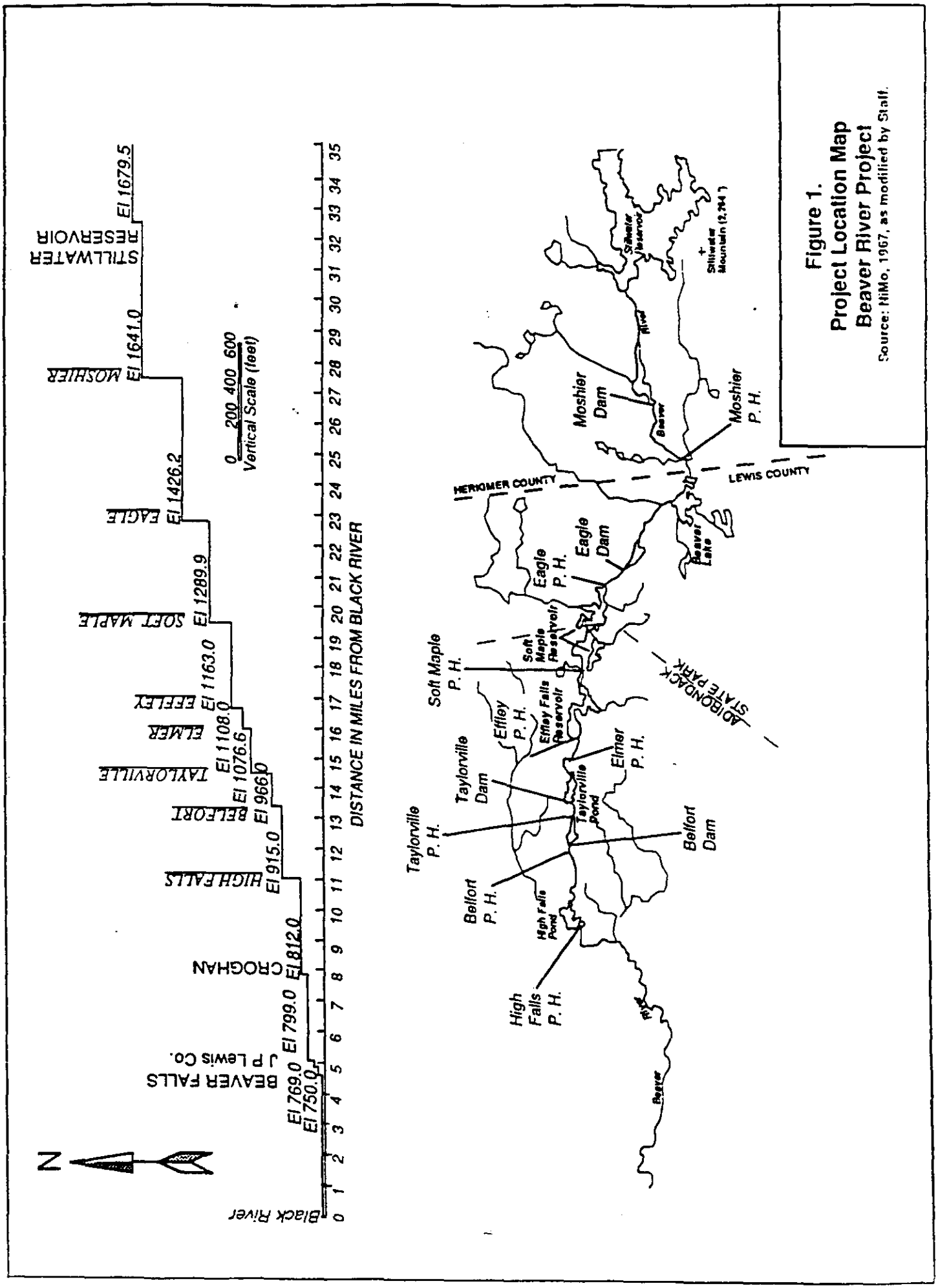


Figure 1.
Project Location Map
Beaver River Project
Source: NiMo, 1967, as modified by Staff.
N
Black River
BEAVER FALLS
L P Lewis Co.
CROGHAN
HIGH FALLS
BELFORT
TAYLORVILLE
ELMER
EFFLEY
SOFT MAPLE
EAGLE
MOSHIER
STILLWATER RESERVOIR
El 769.0
El 750.0
El 799.0
El 812.0
El 915.0
El 966.0
El 1076.6
El 1108.0
El 1163.0
El 1289.9
El 1426.2
El 1641.0
El 1679.5
0 200 400 600
Vertical Scale (feet)
DISTANCE IN MILES FROM BLACK RIVER
HERKIMER COUNTY
LEWIS COUNTY
Moshier Dam
Moshier P. H.
Stillwater Reservoir
Stillwater Mountain (2,744')
Beaver River
Beaver Lake
Eagle Dam
Eagle P. H.
Soft Maple Reservoir
Soft Maple P. H.
Effley Falls Reservoir
Effley P. H.
Taylorville Dam
Taylorville Pond
Taylorville P. H.
Elmer P. H.
Belfort Dam
Belfort P. H.
High Falls Pond
High Falls P. H.
ADIRONDACK STATE PARK

and if so, recommend terms and conditions to become part of any license issued. The Federal Power Act (FPA) provides the Commission with the exclusive authority to license nonfederal water power projects on navigable waterways and federal lands.

In deciding whether to issue any license, the Commission must determine that the project adopted will be best adapted to a comprehensive plan for improving or developing a waterway. In addition to the power and developmental purposes for which licenses are issued, the Commission must give equal consideration to the purposes of energy conservation; the protection of, mitigation of damage to, and enhancement of fish and wildlife; the protection of recreation opportunities; and the preservation of other aspects of environmental quality.

B. Need for Power

If the licensee's proposal is approved and a new license is issued, NMPC would continue to operate the eight developments of the Beaver River Project. This would result in an estimated annual net energy production of 190 gigawatt-hours (GWh).

The eight developments are in the New York Power Pool (NYPP) area of the Northeast Power Coordination Council (NPCC) Region of the North American Electric Reliability Council (NERC). NYPP forecasts an average annual increase in peak capacity demand of 0.8 percent during the summer months and 0.9 percent during the winter months for the 1995 to 2004 planning period. During the same period, NYPP forecasts an increase in planned capacity of 0.2 percent during the summer and 0.1 percent during the winter.

NYPP forecasts a capacity margin, the difference between the planned capacity and the capacity demand, ranging from a high of 34.8 percent during the winter of 1995 to a low of 18.6 percent during the summer of 2003. During this same time period, NERC reports that the forecasted average capacity margin in the United States ranges from a high of 28.9 percent during the winter of 1995 to a low of 15.1 percent during the summer of 2004. The relicensing of the Beaver River Project would contribute to maintaining available capacity.

NYPP requires NMPC to have available additional capacity (capacity margin) equal to 18 percent of the peak demand to provide an adequate level of system reliability. In the short and long term, the capacity supplied by the project would help NMPC maintain sufficient capacity to meet NYPP requirements.

III. PROPOSED ACTION AND ALTERNATIVES

A. Proposed Action

1. Project Description

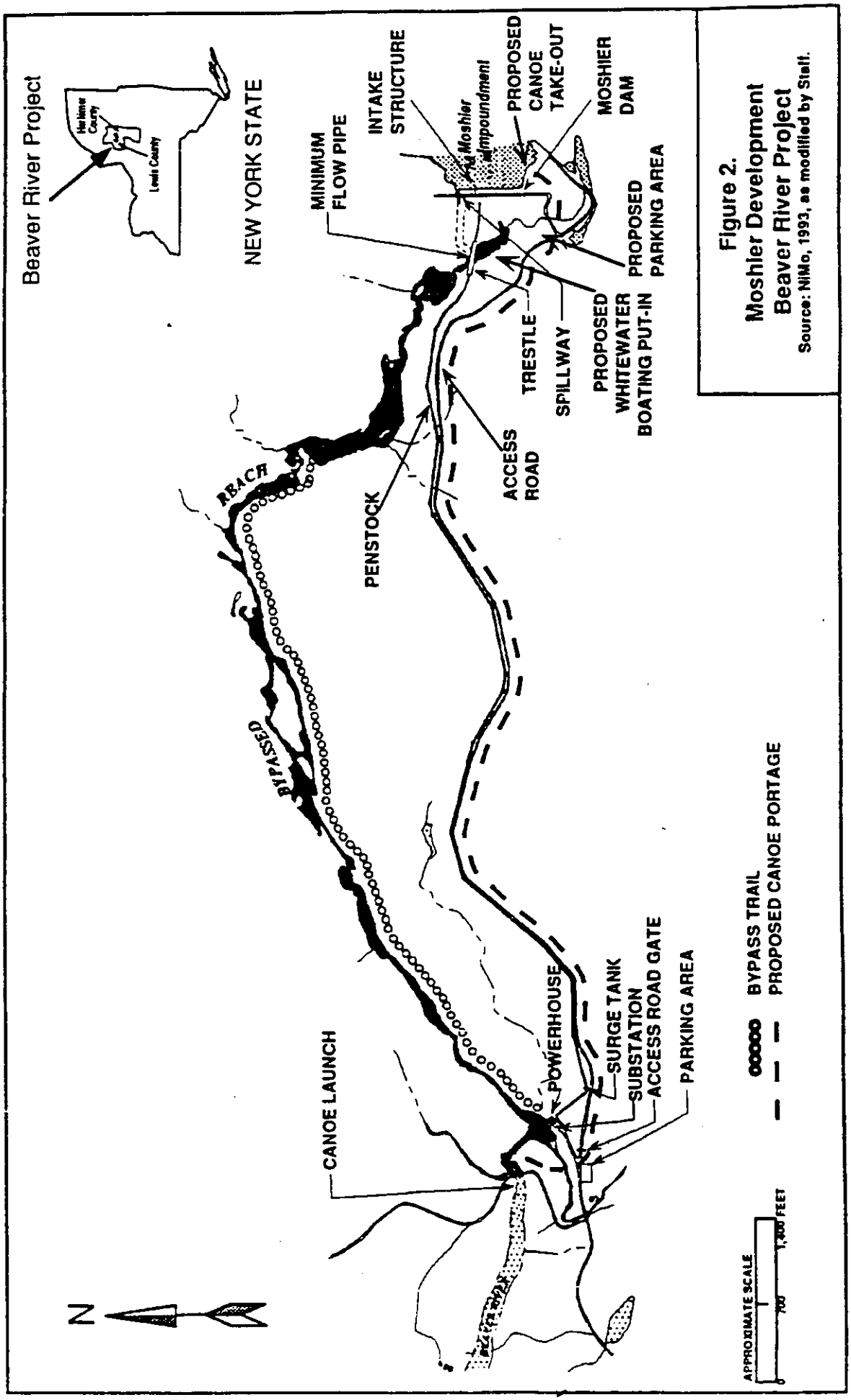
The Beaver River Project is composed of eight developments extending from the High Falls Development at river mile (RM) 11 to the Moshier Development at RM 27.5. The developments are operated in a coordinated manner as store and release facilities primarily to meet peak demand in the NMPC system. Flows through the project are also controlled by releases from Stillwater Reservoir, upstream of the Moshier Development.

The project was constructed between 1898 and 1930. Four of the developments, Moshier, Eagle, Soft Maple, and Taylorville, have extensive bypassed reaches. These range from about 3,850 feet at Eagle to over 11,700 feet at Moshier.

We describe each of the eight developments in the following section.

Moshier Development

Figure 2 shows the site plan for the Moshier Development, which includes: (1) a 920-foot-long by 93-foot-high earth embankment dam containing a 200-foot-long concrete spillway topped with 2-foot-high flashboards and a 53-foot-long non-overflow concrete abutment; (2) an impoundment which, at the normal maximum surface elevation of 1,641 feet National Geodetic Vertical Datum (NGVD (formerly mean sea level), as calculated by the U.S. Geological Survey), has a surface area of 340 acres, a gross storage capacity of 7,339 acre-feet (ac-ft), and a usable capacity of 4,463 ac-ft; (3) a 28-foot-wide by 51-foot-high concrete intake structure containing two 11-foot-wide by 51.5-foot-high trashracks and two 10-foot-wide by 12-foot-high steel slide gates; (4) a 3,740-foot-long by 10-foot-diameter steel penstock connected to a 5,620-foot-long by 10-foot-diameter fiberglass reinforced plastic penstock for a total penstock length of 9,360 feet; (5) an excavated tailrace channel; (6) a 30-foot-diameter steel surge tank; (7) a penstock bifurcation downstream of the surge tank that divides into two 70-foot-long by 7-foot-diameter steel penstocks; (8) a 34-foot-wide by 70-foot-long concrete/masonry powerhouse containing two vertical Francis turbines connected to direct-drive synchronous generators, each with a rated capacity of 4,000 kilowatts (kW), a hydraulic capacity of 330 cfs, and a design head of 196 feet; (9) a 36-inch-diameter minimum flow pipe and butterfly valve; (10) an 11-mile-long, 115-kV transmission line; and (11) appurtenant equipment.


Beaver River Project
NEW YORK STATE
Herkimer County
Lewis County
MINIMUM FLOW PIPE
INTAKE STRUCTURE
Moshier Impoundment
PROPOSED CANOE TAKE-OUT
MOSHIER DAM
PROPOSED PARKING AREA
PROPOSED WHITEWATER BOATING PUT-IN
SPILLWAY
TRESTLE
ACCESS ROAD
PENSTOCK
REACH
BYPASSED
CANOE LAUNCH
POWERHOUSE
SURGE TANK
SUBSTATION
ACCESS ROAD GATE
PARKING AREA
BYPASS TRAIL
PROPOSED CANOE PORTAGE
APPROXIMATE SCALE
1,000 FEET
N
Figure 2.
Moshier Development
Beaver River Project
Source: NiMo, 1993, as modified by Staff.

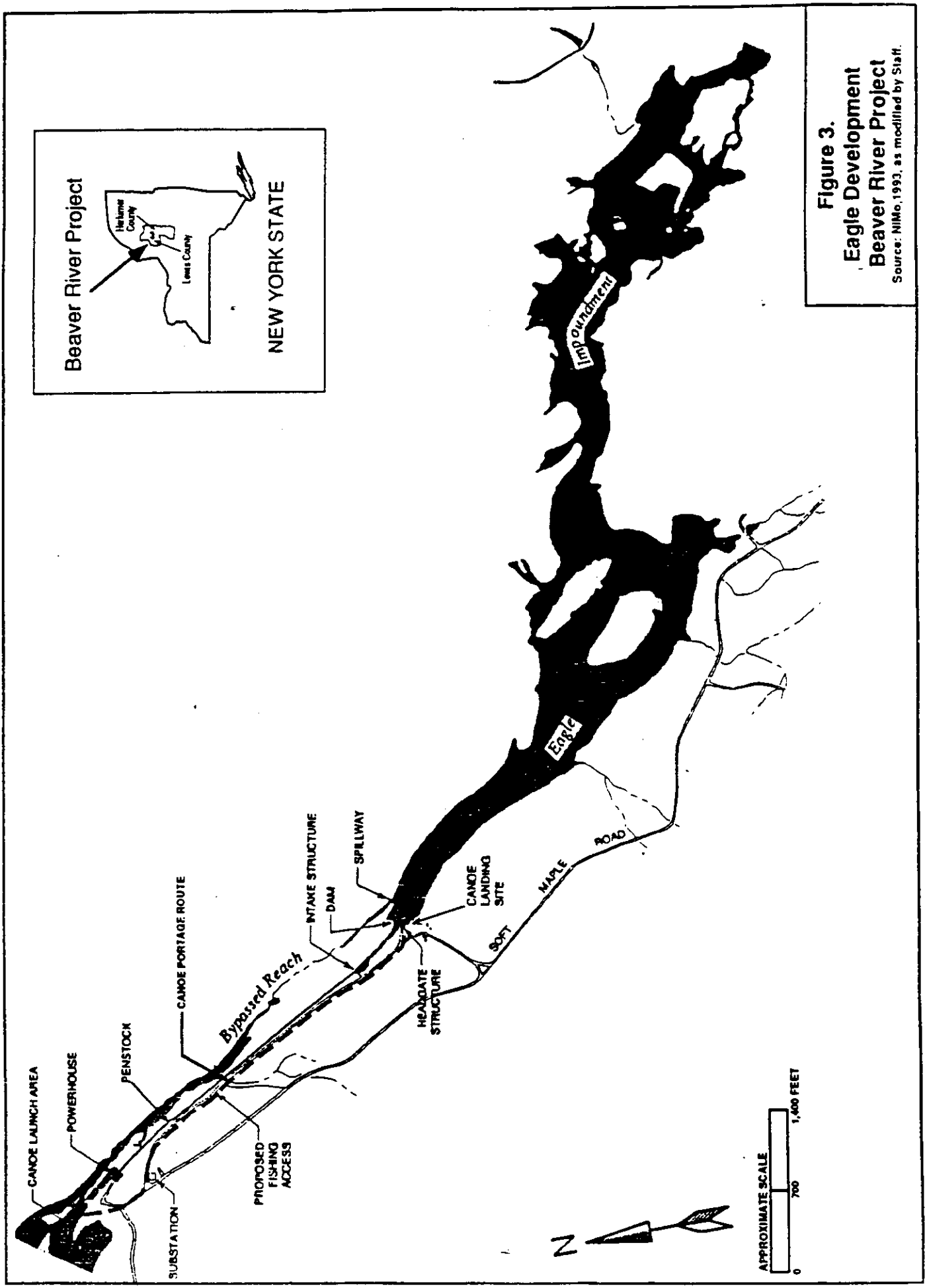


Figure 3.
Eagle Development
Beaver River Project
Source: Nilho, 1993, as modified by Staff.

Eagle Development

Figure 3 shows the site plan for the Eagle Development, which includes: (1) a 365-foot-long by 21-foot-high concrete gravity dam containing a 185-foot-long ogee spillway topped with 1-foot-high flashboards and an 85-foot-long, non-overflow concrete abutment; (2) an impoundment which, at the normal maximum surface elevation of 1,426.2 feet (NGVD), has a surface area of 138 acres, a gross storage capacity of 668 ac-ft, and a usable capacity of 123 ac-ft; (3) a 20-foot-wide gated log sluice; (4) a 50-foot-long headgate structure with four 9.5-foot-wide stop log slots and four 9.5-foot by 9.5-foot trashracks; (5) an 18-foot-wide by 16-foot-deep by 540-foot-long forebay canal; (6) a concrete intake structure containing three 10-foot-wide by 7-foot-high timber slide gates; (7) a 2,725-foot-long by 9-foot-diameter steel penstock; (8) a 63-foot-wide by 87-foot-long concrete/masonry powerhouse containing four horizontal Francis turbines connected to direct-drive synchronous generators, with rated capacities of 1,350 kW (units 1 through 3) and 2,000 kW (unit 4), hydraulic capacities of 150 cfs (units 1 through 3) and 200 cfs (unit 4), and design heads of 135 feet (units 1 through 3) and 125 feet (unit 4); (9) a 5-foot-wide aluminum slide gate that supplies minimum flow to the bypass; (10) a 300-foot-long tailrace channel; (11) a 160-foot-long, 115-kV transmission line; and (12) appurtenant equipment.

Soft Maple Development

Figure 4 shows the site plan for the Soft Maple Development, which includes: (1) five earth embankment dikes; (2) a 910-foot-long by 115-foot-high earth embankment diversion dam; (3) a 720-foot-long by 100-foot-high earth embankment terminal dam; (4) an impoundment which, at the normal maximum surface elevation of 1,289.9 feet (NGVD), has a surface area of 400 acres, a gross storage capacity of 2,678 ac-ft, and a usable capacity of 1,150 ac-ft; (5) a 144-foot-long concrete ogee spillway with 1.5-foot-high flashboards; (6) two 10-foot-wide aluminum sluice gates; (7) a 600-foot-long forebay; (8) an 81.5-foot-wide concrete intake structure containing three 26-foot-wide by 33.5-foot-high trashracks; (9) two 530-foot-long by 11.5-foot-diameter steel penstocks; (10) intake facilities for an additional penstock; (11) an 82-foot-wide by 50-foot-long concrete/masonry powerhouse containing two identical vertical Francis turbines connected to direct-drive synchronous generators, each with a rated capacity of 7,500 kW, a hydraulic capacity of 860 cfs, and a design head at 121.5 feet; (12) an excavated tailrace channel; (13) a 20-foot-long, 115-kV transmission line; and (14) appurtenant equipment.

Effley Development

Figure 5 shows the site plan for the Effley Development, which includes: (1) a 647-foot-long by 30-foot-high concrete

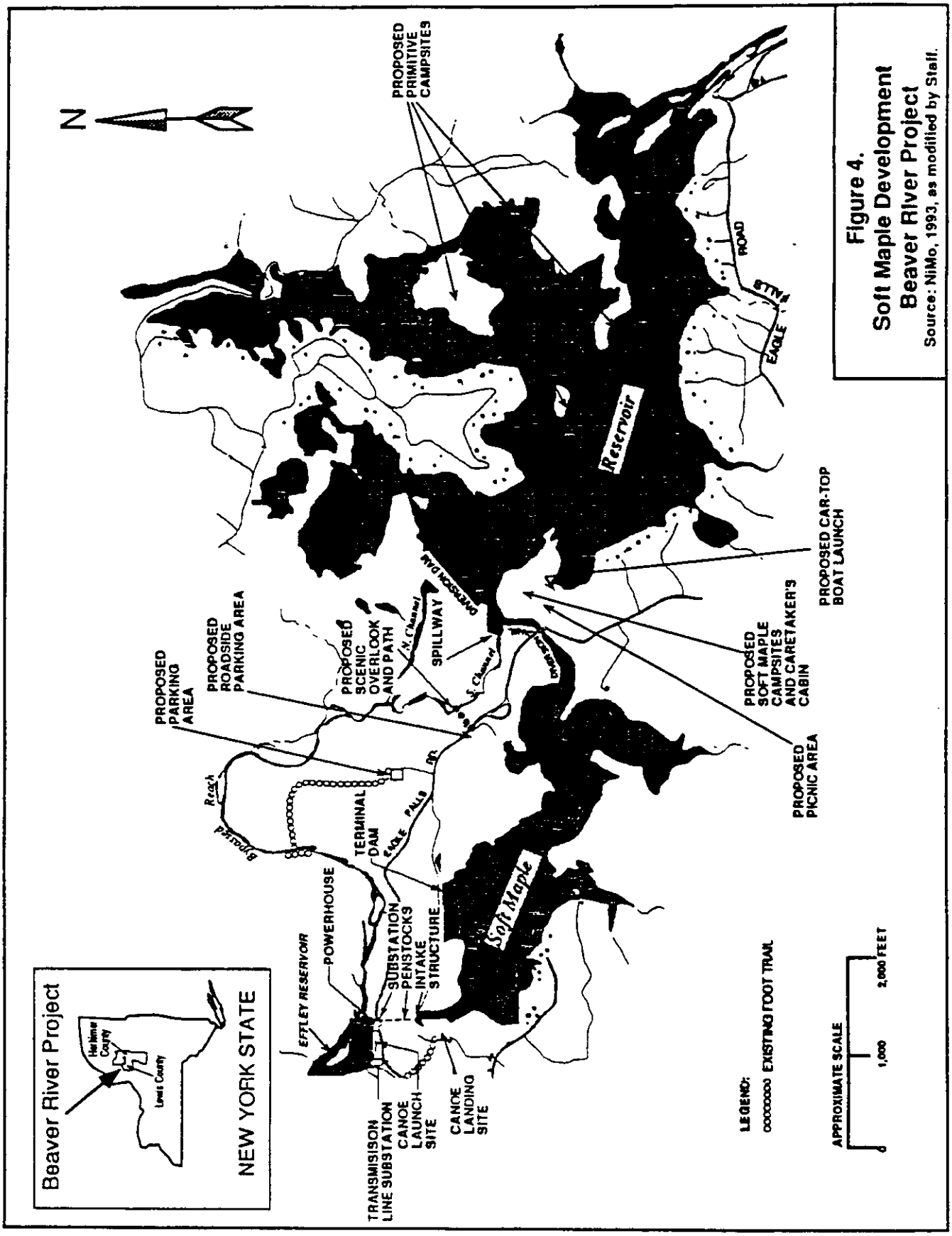


Figure 4.
Soft Maple Development
Beaver River Project
Source: NiMo, 1993, as modified by Staff.

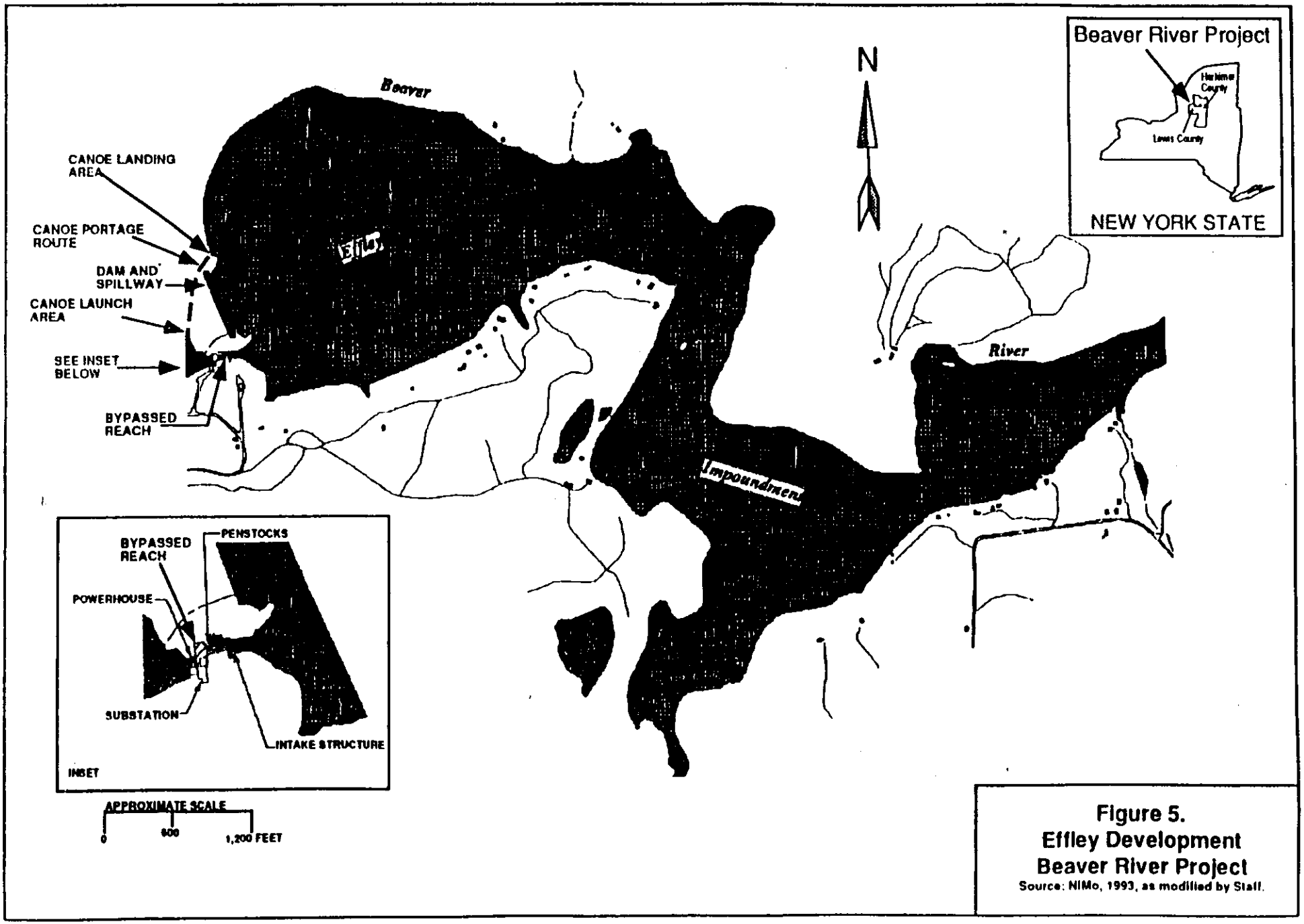


Figure 5.
Effley Development
Beaver River Project
Source: NiMo, 1993, as modified by Staff.

gravity dam containing a 430-foot-long by 30-foot-high concrete ogee spillway and a 188-foot-long non-overflow concrete abutment; (2) a gated 29-foot-long log chute; (3) an impoundment which, at the normal maximum surface elevation of 1,163 feet (NGVD), has a surface area of 340 acres, a gross storage capacity of 3,140 ac-ft, and a usable capacity of 1,420 ac-ft; (4) a 100-foot-long forebay; (5) a 38.5-foot-wide intake structure containing a 22-foot-wide by 22-foot-high trashrack and three 6-foot-wide by 8-foot-high timber slide gates; (6) a 36-foot-wide concrete intake structure containing a 20-foot-wide by 27-foot-high trashrack and an 11-foot by 11-foot slide gate; (7) three 87-foot-long by 5-foot-diameter steel penstocks and one 148-foot-long by 8-foot-diameter steel penstock; (8) two concrete/masonry powerhouses, one that is 58 feet wide by 53 feet long containing three horizontal Francis turbines connected to direct-drive synchronous generators rated at 400 kW (units 1 and 2) and 560 kW (unit 3) with hydraulic capacities of 135 cfs (units 1 and 2) and 200 cfs (unit 3) and design heads of 55 feet (units 1 and 2) and 54 feet (unit 3) and the second that is 42.5 feet wide by 44 feet long containing a single vertical Francis turbine connected to a direct-drive synchronous generator rated at 1,600 kW, with a hydraulic capacity of 450 cfs and a design head of 52.6 feet; (9) excavated tailrace channels; (10) a 2.3-mile-long, 23-kV transmission line; and (11) appurtenant equipment.

Elmer Development

Figure 6 shows the site plan for the Elmer Development, which includes: (1) a 238-foot-long by 23-foot-high concrete gravity spillway; (2) a 25-foot-wide sluice gate with needle beams; (3) an impoundment which, at the normal maximum surface elevation of 1,108 feet (NGVD), has a surface area of 34 acres, a gross storage capacity of 345 ac-ft, and a usable capacity of 138 ac-ft; (4) a forebay; (5) a 39-foot-wide concrete intake structure containing two 16.5-foot-wide by 21.5-foot-high trashracks and four 6-foot-wide by 11-foot-high timber slide gates; (6) a 78-foot-wide by 34-foot-long concrete/masonry powerhouse containing two vertical Francis turbines connected to direct-drive synchronous generators, each with a rated capacity of 750 kW, a hydraulic capacity of 290 cfs, and a design head of 37 feet; (7) an excavated tailrace channel; (8) a 2,270-foot-long, 23-kV transmission line; and (9) appurtenant equipment.

Taylorville Development

Figure 7 shows the site plan for the Taylorville Development, which includes: (1) a 1,003-foot-long by 23-foot-high concrete gravity dam; (2) an impoundment which, at the normal maximum surface elevation of 1,076.6 feet (NGVD), has a surface area of 170 acres, a gross storage capacity of 1,091 ac-ft, and a usable capacity of 406 ac-ft; (3) a 33-foot-wide concrete intake structure containing a 25-foot-wide by 20-foot-high trashrack and three 5.5-foot-wide by 13-foot-high timber

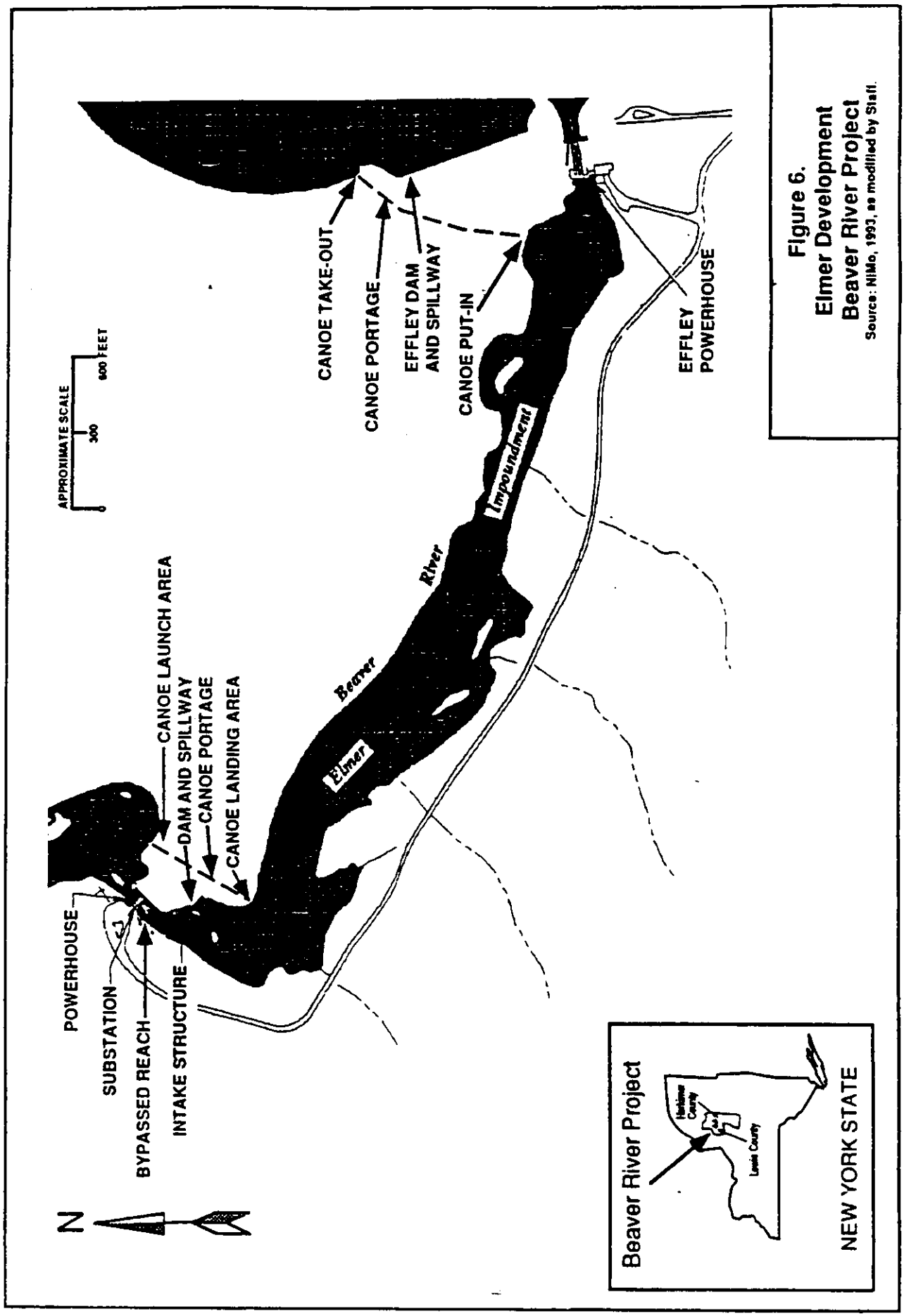


Figure 6.
Elmer Development
Beaver River Project
Source: NiMo, 1993, as modified by Staff.

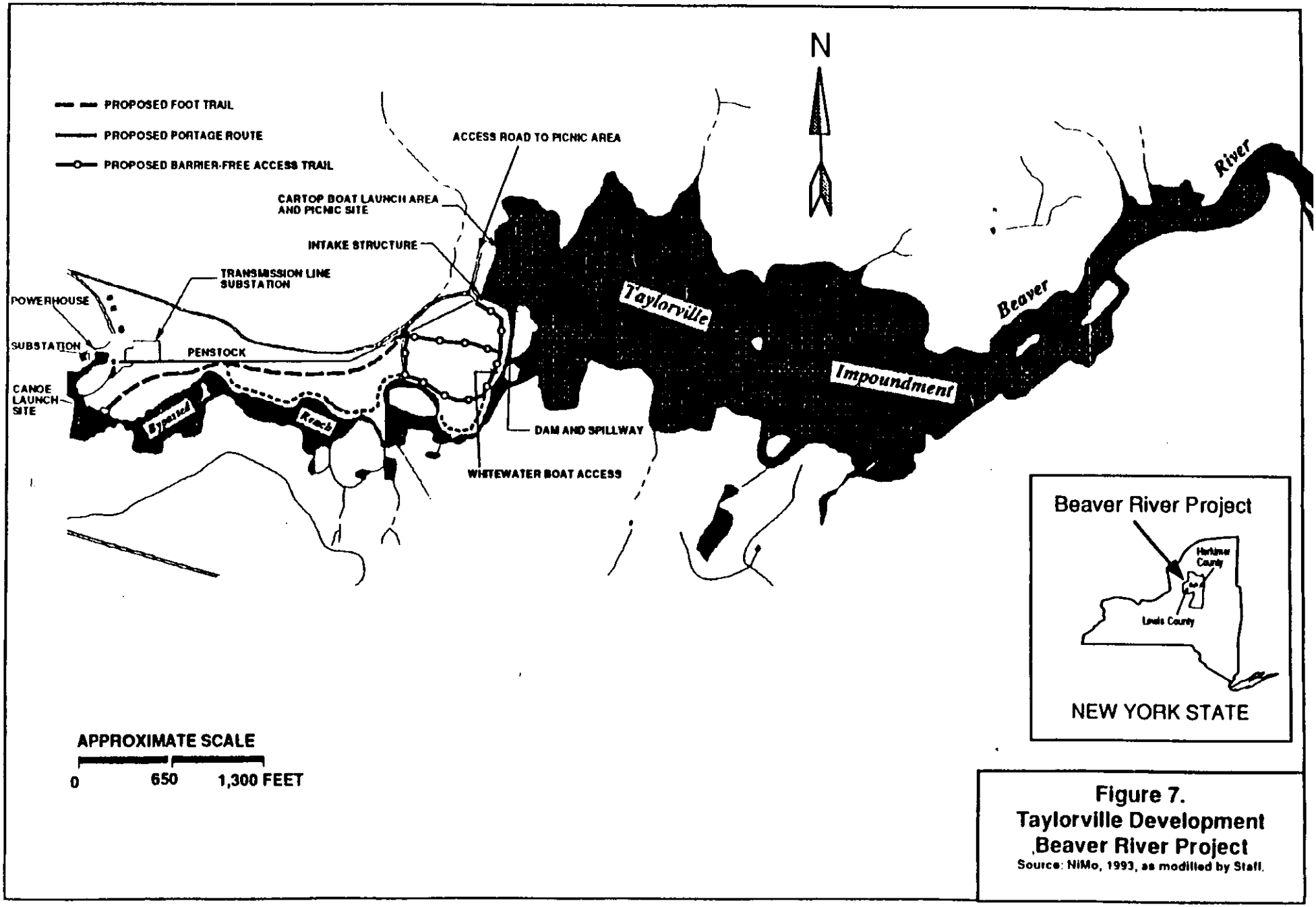


Figure 7.
Taylorville Development
Beaver River Project
Source: NiMo, 1993, as modified by Staff.

slide gates; (4) a 2,725-foot-long by 9.5-foot-diameter steel penstock; (5) an 18-foot-diameter surge tank located about 40 feet upstream of the powerhouse; (6) a 93-foot-wide by 62.5-foot-long concrete/masonry powerhouse containing four horizontal Francis turbines connected to direct-drive synchronous generators, with rated capacities of 1,100 kW (units 1 and 2), 1,372 kW (unit 3), and 1,200 kW (unit 4), each with a hydraulic capacity of 180 cfs, and a design head of 96.6 feet; (7) an excavated tailrace channel; (8) two 7.5-foot-wide aluminum slide gates for minimum flows; (9) a 400-foot-long, 23-kV transmission line; and (10) appurtenant equipment.

Belfort Development

Figure 8 shows the site plan for the Belfort Development, which includes: (1) a 206-foot-long by 17-foot-high concrete gravity dam with a 161-foot-long concrete ogee spillway equipped with 2-foot-high flashboards; (2) an impoundment which, at the normal maximum surface elevation of 966 feet (NGVD), has a surface area of 50 acres, a gross storage capacity of 120 ac-ft, and a usable capacity of 73 ac-ft; (3) a 120-foot-long forebay; (4) a 62-foot-wide concrete intake structure containing one 12-foot-wide by 17-foot-high trashrack, one 12-foot-wide by 23-foot-high trashrack, and two 11-foot by 11-foot timber slide gates; (5) one 52-foot-long by 7-foot-diameter steel penstock and one 52-foot-long by 7.5-foot-diameter steel penstock and penstock bifurcation; (6) a 78-foot-wide by 39-foot-long concrete/masonry powerhouse containing three horizontal Francis turbines connected to direct-drive synchronous generators, with a rated capacity of 400 kW (unit 1), 640 kW (unit 2), and 1,000 kW (unit 3), with hydraulic capacities of 200 cfs (units 1 and 2) and 310 cfs (unit 3), each with a design head of 48 feet; (7) a 400-foot-long tailrace channel; (8) a 3,540-foot-long, 23-kV transmission line; and (9) appurtenant equipment.

High Falls Development

Figure 9 shows the site plan for the High Falls Development, which includes: (1) a 1,233-foot-long concrete gravity dam containing a 470-foot-long non-overflow concrete gravity section and a 650-foot-long concrete ogee spillway; (2) an impoundment which, at the normal maximum surface elevation of 915 feet (NGVD), has a surface area of 145 acres, a gross storage capacity of 1,058 ac-ft, and a usable capacity of 135 ac-ft; (3) a 64 foot-wide by 29-foot-high concrete intake structure containing four 12-foot-wide by 20.5-foot-high trashracks and four steel slide gates; (4) a 49-foot-wide log sluice that has been sealed; (5) a 605-foot-long by 12-foot-diameter riveted steel penstock; (6) a 34-foot-wide by 99-foot-long concrete/masonry powerhouse

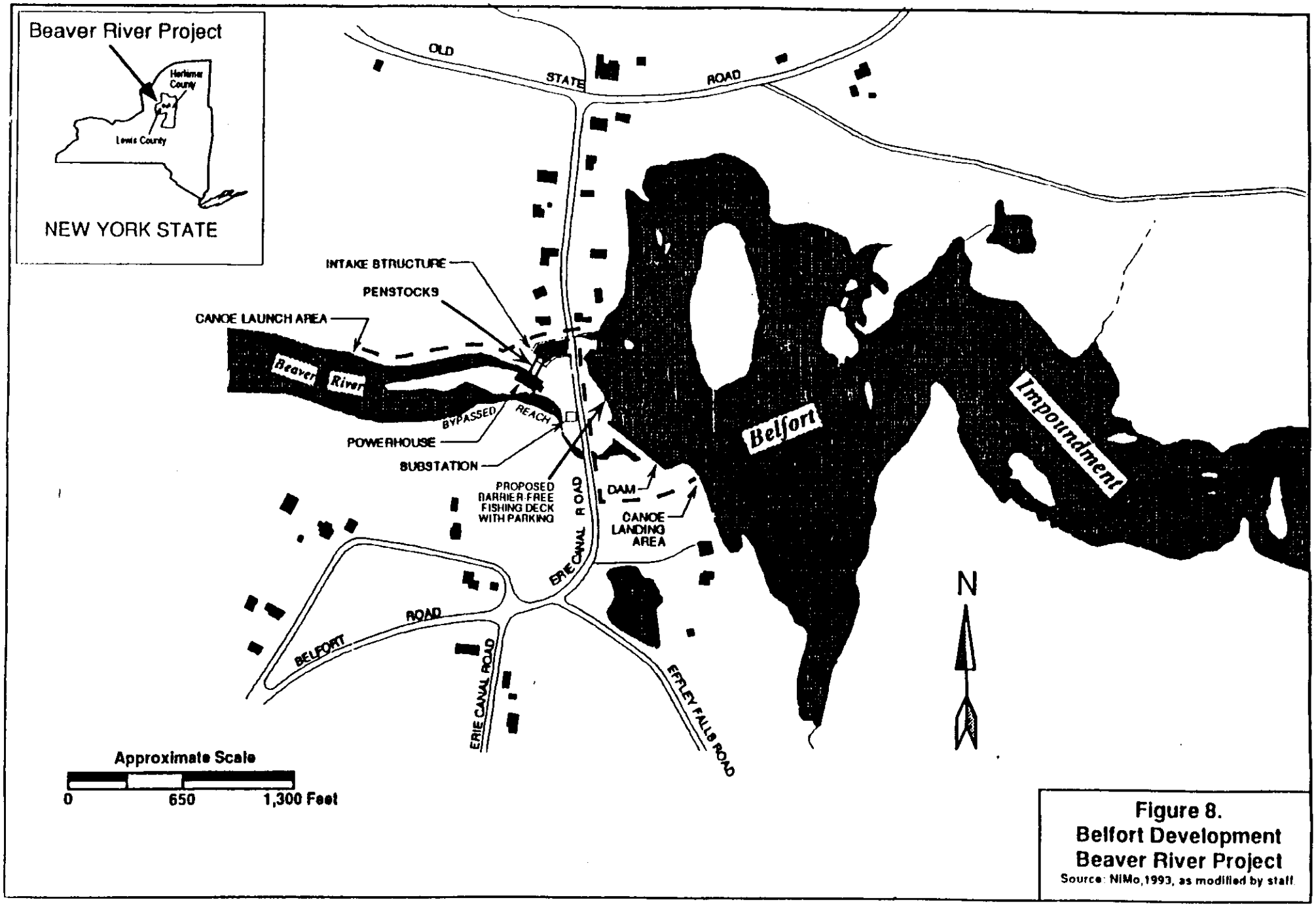


Figure 8.
Belfort Development
Beaver River Project
Source: NiMo, 1993, as modified by staff

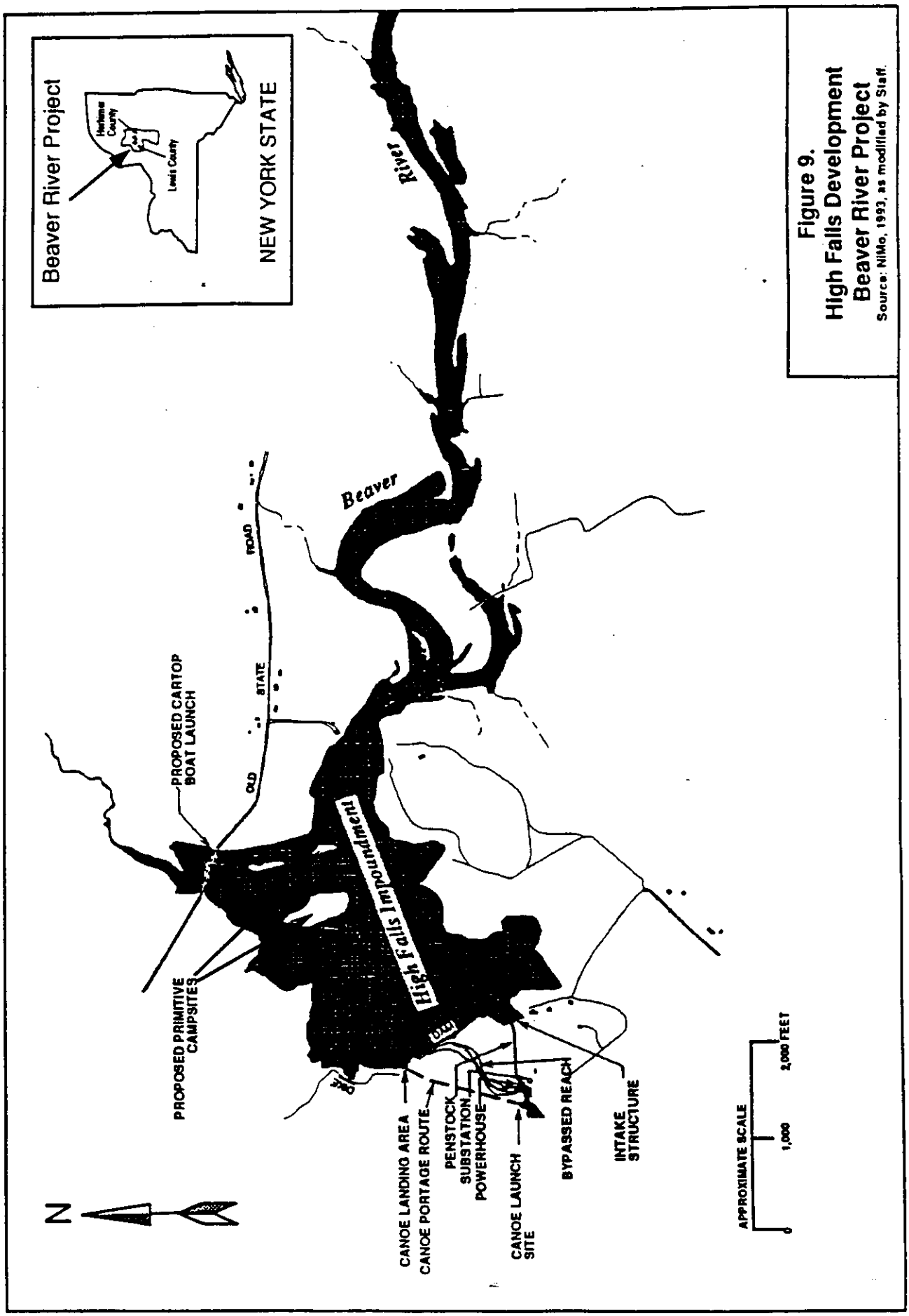


Figure 9.
High Falls Development
Beaver River Project
Source: NiMo, 1993, as modified by Staff.

containing three vertical Francis turbines connected to direct-drive synchronous generators, each with a rated capacity of 1,600 kW, a hydraulic capacity of 300 cfs, and a design head of 100 feet; (7) a spare turbine bay for future expansion; (8) a 3.7-mile-long, 23 kV transmission line; and (9) appurtenant equipment.

2. Project Operation

The Beaver River Project operates in conjunction with the daily releases of the Stillwater Reservoir located upstream of the Moshier Development. The Stillwater Reservoir is operated by the Hudson River-Black River Regulatory District (HRBRRD), an entity created by New York to regulate river flows, principally for the purpose of flood control. NMPC operates the eight developments as store and release facilities that operate in a peaking mode. NMPC discharges water in a concentrated time frame associated with peak electric demand periods, usually weekday hours. Discharges are curtailed during off-peak hours. The Soft Maple Development has the greatest discharge capacity, and therefore, operates with the highest concentration of power generation. At the succeeding downstream developments, water is stored and released at lower discharge levels over longer peak demand periods. Together, the developments convert the peaking flow into a steadier continuous flow at the High Falls Development. The High Falls Development is operated to maintain a base flow of 250 cfs downstream of the powerhouse to supply projects downstream. During periods of reduced flow from the Stillwater Reservoir, NMPC uses water from the reservoir storage capacity at the Moshier, Soft Maple, Effley, and High Falls Developments to supply the water.

The units at the developments usually operate at the efficient gate, approximately 85 percent of the hydraulic capacity of the turbines. However, when the river flow exceeds the capacity of the units' efficient gate, the units operate at full gate. Flows in excess of the full gate and minimum flows are spilled over the dam or released through the gates.

The Moshier, Eagle, Soft Maple, and Taylorville Developments currently maintain environmental minimum flows in the bypassed reach of 30, 30, 20, and 30 cfs, respectively.

3. Proposed Environmental Measures

NMPC proposed environmental enhancement measures both in its application for relicensing and in subsequent filings of information requested by the staff. Most of the significant measures were formalized in the Settlement. These measures are described in detail in the Settlement (Appendix A of this EA), and are summarized below:

- plan and implement an effective streamflow monitoring system;
- provide specified whitewater releases;
- maintain minimum flows in all bypassed reaches;
- replace trashracks at all developments;
- construct, operate, and maintain a new gate structure at Moshier, Effley, Belfort, and High Falls and a new release structure at Elmer;
- plan and implement fish protection screening and trashracks at Soft Maple and fish protection trashracks and conveyance measures at Moshier, Eagle, Effley, Elmer, Taylorville, Belfort, and High Falls;
- institute reservoir fluctuation limits at each development;
- make minor channel modifications at Eagle and Taylorville;
- screen the diversion tunnel at Soft Maple;
- participate in the trout transplant program at Soft Maple; and
- establish and maintain a 250 cfs base flow downstream of High Falls.

B. Alternatives to the Proposed Project

Because NMPC is not pursuing its original relicense proposal, and in light of the Settlement, we have elected not to examine the proposal in this analysis. We also have not identified any other alternative project operation or enhancement measures apart from those contained in the Settlement that warrant significant consideration.

C. No-action Alternative

Under the no-action alternative, the project would continue to operate under the terms and conditions of the existing license, with no change in existing environmental conditions. Because no participant advocates continuing the status quo, we use this alternative to establish baseline environmental conditions for comparison with other alternatives. We discuss the alternative of license denial and project retirement in Section III.D.

D. Alternatives Considered but Eliminated from Detailed Study

As a part of the scoping meetings and process, we considered several other alternatives to the relicensing proposal, but eliminated them from detailed study because they are not reasonable in the circumstances of this case. They are: (1) Federal government takeover of the project; (2) issuing a non-power license; or (3) retiring the project.

We do not consider Federal takeover to be a reasonable alternative. Federal takeover of the project would require congressional approval. While that fact alone would not preclude further consideration of this alternative, there is no evidence indicating that a Federal takeover should be recommended to Congress. No party has suggested that Federal takeover would be appropriate and no Federal agency has expressed interest in operating the project.

Issuing a non-power license would not provide a long-term resolution of the issues presented. A non-power license is a temporary license that the Commission would terminate whenever it determines that another governmental agency will assume regulatory authority and supervision over the lands and facilities covered by the non-power license. In this case, no agency has suggested its willingness or ability to do so. No party has sought a non-power license, and we have no basis for concluding that the project should no longer be used to produce power. Thus, a non-power license is not a realistic alternative to relicensing in these circumstances.

The Commission could deny the new license for the project, which would in effect result in project retirement. Project retirement could be accomplished with or without dam removal. Either option would involve denial of the relicense application and surrender or termination of the existing license with appropriate conditions.

The first alternative involving surrender or termination would be to retain the dam but require removal or disabling of the equipment used to generate power. No participant has advocated removal of electric generating equipment, nor have we any basis for recommending it. Because the power supplied by the project is needed, a source of replacement power would have to identified. Under the circumstances, we do not consider this a reasonable alternative.

The second alternative is surrender or termination coupled with removal of the dam. No agency recommended that the EA consider dam removal and restoration of pre-project conditions as a present action. No agencies addressed this issue throughout the consultation process, nor have any site-specific issues been raised to compel the Commission to address dam removal as a

reasonable alternative for in-depth evaluation at this time. We note, however, that removal of the dam would introduce significant issues and impacts, including loss of important wetland areas, wildlife habitat, and recreational opportunities. We conclude that dam removal, at this time, is not a reasonable alternative to some form of new license with mitigation and enhancement measures.

IV. CONSULTATION AND COMPLIANCE

A. Agency Consultation

The Commission issued a Public Notice on June 14, 1995, indicating that the license application was ready for environmental analysis. The following entities commented on the application:

Commenting Entity	Date of Letter
Adirondack Mountain Club	July 10, 1995
U.S. Department of Interior	July 13, 1995
NYSDEC	July 19, 1995

B. Interventions

In addition to providing comments, organizations and individuals may petition to intervene and become a party to subsequent proceedings. The following entities filed for and were granted intervenor status for the Beaver River Project:

Intervenor	Date of Motion
New York Adirondack Park Agency	April 20, 1992
U.S. Department of Interior	August 10, 1992
NYSDEC	March 8, 1993
City of Watertown, NY	March 10, 1993
Adirondack Mountain Club	April 8, 1993
New York Rivers United; American Whitewater Affiliation; American Rivers, Inc.; Adirondack Council; Association for the Protection of the Adirondacks; National Audubon Society; Trout Unlimited; and Natural Heritage Institute	April 12, 1993
Trout Unlimited	April 12, 1993
New York Adirondack Park Agency	April 12, 1993

We address intervenor concerns in the environmental analysis section (Section V) of this EA.

C. Comments on the Draft Environmental Assessment

The respondents commenting on the DEA are as follows:

Commenting Entity	Date of Letter
Adirondack Mountain Club	November 21, 1995
Niagara Mohawk Power Corporation	November 21, 1995
U.S. Environmental Protection Agency	November 22, 1995
National Park Service	November 27, 1995
U.S. Fish and Wildlife Service	November 29, 1995

D. Water Quality Certification Conditions

On November 25, 1991, NMPC submitted a request for a Water Quality Certification (WQC) from NYSDEC pursuant to Section 401 of the Clean Water Act. On November 19, 1992, NYSDEC denied (without prejudice) NMPC's request for certification. On December 23, 1992, NMPC submitted a request for a NYSDEC hearing on the WQC denial. Subsequent activities eventually led to settlement talks, the Settlement, and a certification, which is based on the Settlement plus standard conditions.

On August 24, 1995, NYSDEC issued a water quality certification for the Beaver River Project. The certification could be reconsidered if there are significant changes in the project's facilities or operation, the license articles, or the Settlement. It is contingent on NMPC's meeting the Settlement conditions as well as NYSDEC's standard conditions. The standard conditions deal with the following:

- compliance inspection by NYSDEC representatives of the project and project records, including the WQC and referenced material;
- cessation of flow through the turbine prior to maintenance dredging in the intake/forebay;
- testing of sediments to be removed and prior approval of disposal locations of any contaminated sediments;
- approval and implementation of an Erosion and Sediment Control Plan (ESCP) to deal with activities that could adversely affect water quality;
- design of structures that encroach on the river bed or banks must be developed in accordance with the ESCP;
- maintenance of flows to maintain water quality standards throughout construction;
- monitoring of potential turbidity during construction and taking corrective action when turbidity occurs; and
- notification of NYSDEC prior to commencing work subject to the conditions.

E. Section 18 Fishway Prescription

Section 18 of the FPA provides the Secretary of the Interior (Interior) authority to prescribe fishways at Commission-licensed projects.1/ On July 13, 1995, Interior responded to the Commission's Notice of Ready for Environmental Assessment. The letter noted that it is not necessary at present to prescribe fishways. However, Interior requests a reservation of the authority to prescribe the construction, operation, and maintenance in the future of fishways under Section 18. The Commission's practice has been to include license articles that reserve Interior's authority to prescribe fishways.

F. Dredge and Fill Permit Conditions

Pursuant to Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers issues dredge and fill permits for specified types of construction in wetlands. These permits generally include conditions applicable to project construction activities. To date, it appears that no Section 404 permit will be required for this project and there are no applicable conditions.

G. Coastal Zone Management Program

The Beaver River Project is not in a state-designated coastal zone management area.

H. Scoping

On December 17, 1994, we issued a Scoping Document 1 (SD1) describing the environmental issues that we would and would not subject to detailed analysis in this EA. We based our preliminary conclusions on information provided in the application for relicense and in comment letters.

On January 10, 1995, we held two public meetings in Watertown, New York, to discuss the SD1 and other pertinent information concerning the projects. The meetings were attended by representatives of NMPC, U.S. Fish and Wildlife Service, New York State Department of Environmental Conservation, Trout Unlimited, New York Rivers United, the city of Watertown, and members of the public. We established a 30-day comment period to receive additional comments after the meeting.

1/ Section 18 of the FPA provides: "The Commission shall require the construction, maintenance and operation by a licensee at its own expense of ... such fishways as may be prescribed by the Secretary of the Interior or the Secretary of Commerce, as appropriate." See 16 U.S.C. § 811.

A site visit was previously conducted on December 5 through 7, 1994, with representatives of NMPC, U.S. Fish and Wildlife Service, New York State Department of Environmental Conservation, and New York Rivers United. The purpose of the site visit was to acquaint Commission staff with each of the developments and to obtain additional site-specific information.

The following entities filed comments on the SD1:

Commenting Entities	Date of Letter
U.S. Department of Interior	February 24, 1995
U.S. Environmental Protection Agency	February 24, 1995

We considered these comments as well as those from the scoping meetings in the environmental analysis section of the DEA.

V. ENVIRONMENTAL ANALYSIS2/

In this section, we present a general description of the river basin, describe existing and proposed hydropower projects in the basin, and summarize the potential for cumulative impacts on environmental resources.

We begin our detailed assessment of the potential environmental impacts on area resources resulting from relicensing the Beaver River Project by first describing the affected environment. Then we use the existing state of each resource as the baseline for measuring and defining the effects of the proposed relicensing action. Next we describe the potential effects on each environmental resource resulting from the implementation of new operational procedures and environmental enhancement measures, and the development of additional recreational facilities.

We do not discuss land use and socioeconomics because these resources would be largely unaffected by the relicensing of the project. Land transfers that result from the Settlement are discussed in Section V.C.7. These involve project lands at the Moshier and Eagle bypassed reaches and a conservation easement around Moshier reservoir. The transferred land will be provided to NYSDEC and made available for recreation.

2/ Unless otherwise indicated, the source of our information is NMPC's application filed on November 29, 1991, and its responses to requests for additional information filed on October 6, 1992, November 16, 1992 and March 20, 1995.

A. General Description of the Locale

1. Black River Basin

The Black River Basin is located east of Lake Ontario in north-central New York. The basin extends east-southeast from Lake Ontario and is approximately 75 miles long and 45 miles wide (Figure 10). The basin lies within three physiographic regions; the Adirondack Mountains, Tug Hill Plateau, and Eastern Ontario Plain (FWS, NYSDEC, 1994).

The Black River originates in the Adirondack Mountains where it flows southwest to Forestport, then northwest to Carthage, and finally west to enter Lake Ontario 112 miles downstream at Black River Bay. The river drains most of Lewis County and portions of Hamilton, Herkimer, Jefferson, and Oneida Counties. Most of the basin lies to the east of the main river. Tributaries to the Black River include the Moose, Beaver, and Independence Rivers and Otter Creek.

All areas of the basin are drained by an extensive network of streams, and there are numerous lakes, ponds and wetlands. Major bodies of water include Stillwater Reservoir, the Fulton Chain of Lakes, and Lila, Big Moose, Beaver, Old Forge, Sixth, Woodhull, Kayuta, Little Moose, North, and South Lakes.

The topography of the basin divides the river naturally into three reaches. The upper reach (Reach 3) extends upstream from the natural falls at Lyons Falls and consists of a mountainous area where the river drops 1,023 feet over a 40-mile distance. The middle reach (Reach 2) is a 42-mile stretch locally known as the Black River Flats because the river drops less than 15 feet through this region before reaching Carthage where it enters a well-defined channel in the lower reach (Reach 1). The lower reach drops 480 feet in about 30 miles as it flows west over rolling terrain to Lake Ontario. Rapids and falls are common in both the lower and upper reaches (FWS, NYSDEC, 1994).

The climate of the Black River Basin is characterized by moderate summers and cold winters. Due to its location along the slope of the Adirondack Highlands and prevailing westerly winds off Lake Ontario, the basin receives the highest annual precipitation of any watershed in New York State. Precipitation is generally uniform throughout the year, and averages about 45 inches annually.

Spring rains combined with snowmelt create heavy runoff volumes resulting in annual flooding, particularly in the central basin (Reaches 1 and 2). Streamflow generally recedes during the summer, but high flows from rain and warm weather are not uncommon during mid-winter. The average annual discharge of the Black River, measured in Watertown, is about 4,077 cubic feet per second (cfs) (FWS, NYSDEC, 1994).

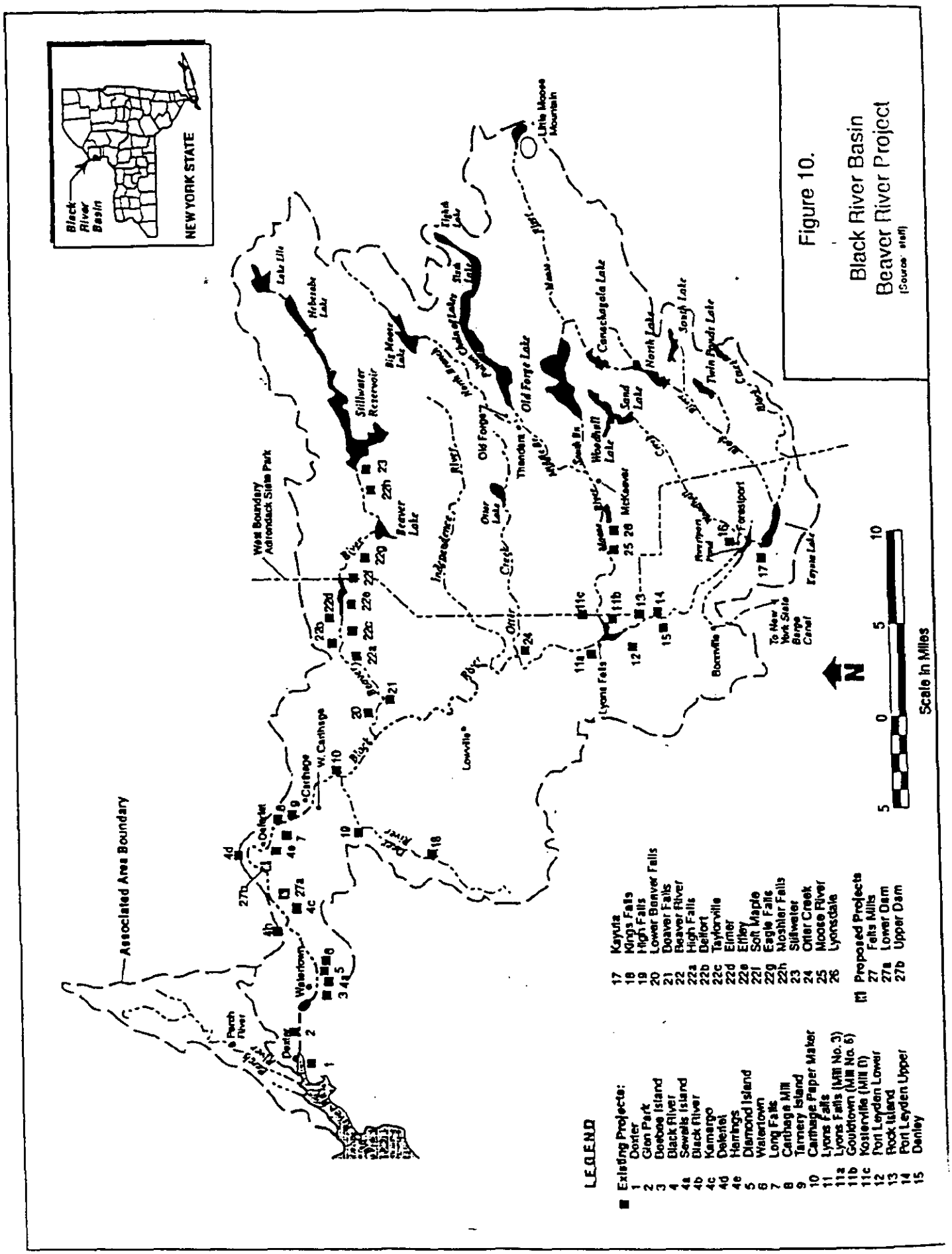


Figure 10.
Black River Basin
Beaver River Project
NEW YORK STATE
Black River Basin
Associated Area Boundary
LEGEND
Existing Projects:
1 Dexter
2 Glen Park
3 Deebee Island
4 Black River
4a Sewalls Island
4b Black River
4c Kamargo
4d Delferd
4e Herrings
5 Diamond Island
6 Watertown
7 Long Falls
8 Carthage Mill
9 Tannery Island
10 Carthage Paper Maker
11 Lyons Falls
11a Lyons Falls (Mill No. 3)
11b Gouldtown (Mill No. 6)
11c Kosterville (Mill 0)
12 Port Leyden Lower
13 Rock Island
14 Port Leyden Upper
15 Denley
17 Kayuta
18 Kings Falls
19 High Falls
20 Lower Beaver Falls
21 Beaver Falls
22 Beaver River
22a High Falls
22b Belfort
22c Taylorville
22d Elmer
22e Ettley
22f Soft Maple
22g Eagle Falls
22h Moshier Falls
23 Stillwater
24 Otter Creek
25 Moose River
26 Lyonsdale
Proposed Projects
27 Falls Mills
27a Lower Dam
27b Upper Dam
Scale in Miles
N
West Boundary Adirondack State Park
Stillwater Reservoir
Beaver Lake
Big Moose Lake
Old Forge Lake
Thendara
Otter Lake
Woodhull Lake
Sand Lake
Canachagala Lake
North Lake
South Lake
Twin Ponds Lake
Forestport
Boonville
Lowville
Carthage
W. Carthage
Watertown
Dexter
Glen Park
Deferiet
Black River
Otter Creek
Moose River
Indian River
Lyons Falls
To New York State Barge Canal
Erie Lake
Lake Lila
Honnedaga Lake
Tight Lake
Little Moose Mountain

There are approximately 14,500 acres of wetlands in the Black River Basin. A majority of the riverine wetlands along the Black River occur in the Black River Flats. About 5,216 acres are located along and hydrologically influenced by the Black River in Reach 2.

The flow in the Black River is regulated by numerous natural lakes and, to varying degrees, man-made dams on the upper Black and Beaver Rivers. The Black River and its tributaries are used extensively for hydroelectric power generation. Currently, there are 39 hydroelectric facilities in the Black River drainage; 21 are located along the Black River, 11 are on the Beaver River, 4 are on the Moose River, 2 are on the Deer River, and one is on Otter Creek. Hydropower operations along the lower Black and Beaver Rivers are strongly affected by the operation of the Stillwater Reservoir.

2. Beaver River Sub Basin

The Beaver River Project is located in northern New York in the northwestern Adirondack Mountains, on the Beaver River between RMs 11 and 28 from its confluence with the Black River (Figure 1). The Beaver River, which is a principal tributary of the Black River, has a drainage area of 338 square miles. The river's source is within the Adirondack Park in northwestern Hamilton County. From its source 1,965 feet above sea level, the river flows 51 miles westerly across steep slopes, dropping more than 1,200 feet in elevation from its headwaters to the confluence of the Black River near Castorland, less than 10 miles west of the High Falls Development.

The Beaver River drainage area above Moshier dam is 182 square miles; it is 267 square miles above High Falls dam. Like the Black River, the Beaver River is regulated by the HRBRRD at the Stillwater Reservoir. The eight developments of the Beaver River Project operate in conjunction with the daily releases from Stillwater Reservoir.

There are currently 11 hydropower developments on the Beaver River (Table 1). Two projects, Beaver Falls (FERC No. 2593) and Lower Beaver Falls (FERC No. 2832) are located below the project at RMs 5 and 4, respectively. Each development operates as run-of-the-river and has an installed total capacity of 1,500 kW. Stillwater Reservoir (FERC No. 6743) is located above the project at RM 31. It is an exempted project owned by HRBRRD with an installed capacity of 1,200 kW.

The regional climate is characterized by extremely cold, snowy winters and very cool, wet summers. The average frost-free season ranges from 85 to 140 days due to the high elevation and latitude.

Table 1. Hydropower developments on the Beaver River (Source: FWS, NYSDEC, 1994)

Project No.	Project/ Development Name	Normal Operating Mode	Pond Surface Area (Acres)	River Mile	Total Capacity (kW)
6743	Stillwater Reservoir	NA	6,200	approx. 31	1,200
2645	Moshier	Store & Release	340	29	8,000
2645	Eagle	Store & Release	138	approx. 23	6,050
2645	Soft Maple	Store & Release	400	approx. 20	15,000
2645	Effley	Store & Release	340	approx. 16	2,960
2645	Elmer	Store & Release	34	approx. 15	1,500
2645	Taylorville	Store & Release	170	approx. 14	4,772
2645	Belfort	Store & Release	50	approx. 13	2,040
2645	High Falls	Store & Release	145	11	4,800
2593	Beaver Falls	ROR	48	approx. 5	1,500
2832	Lower Beaver Falls	ROR	4	approx. 4	1,500

The project lies within the Adirondack physiographic province, which consists of the Adirondack Piedmont and Adirondack Mountain sections. The Piedmont consists of the foothills surrounding the higher interior mountains. The project lies wholly within the Fall Zone belt of the Piedmont. The Fall Zone belt is characterized by numerous waterfalls with relief ranging from 300 to 400 feet. The average drop in the river valley is 60 feet per mile.

The region was heavily glaciated during the Pleistocene epoch. Advances and retreats of the glaciers resulted in a thin veneer of till on the hills, stratified drift in the valleys, and formation of glacial lakes and deltas, characteristic of the region.

Wetlands in the study area, which are primarily associated with impoundment shorelines, are typically characterized as wooded wetlands and shrub wetlands. There are four NYSDEC-regulated wetlands located from the Soft Maple impoundment up to the Adirondack Park boundary. Upstream of the park boundary, there are 24 wetlands identified by the Adirondack Park Agency, most of which occur along the Beaver River and around Beaver Lake. Some wetlands, including the Moshier impoundment and part of the Soft Maple impoundment, are classified as lacustrine wetlands. The Eagle impoundment is classified as a riverine wetland.

The entire project area is rural. East of the Elmer Development, the vegetative cover is moderately to heavily forested, part of the Spruce-Fir-Northern Vegetation Zone dominated by hardwoods such as sugar maple, beech, and yellow birch, and conifer species such as eastern hemlock, white pine, and white cedar. Downstream (west) of the Elmer Development, land is agricultural along with a mixture of woodlands and brushlands, because of the more gentle topography and thicker soils. The region between Elmer and High Falls is a transitional area between the Adirondack Mountain Lowlands (Piedmont) and the Black River Valley.

Agricultural use is concentrated in the western portion of the area and includes areas around the High Falls, Belfort, Taylorville, and Elmer Developments, all located within the town of Croghan, Lewis County. Agricultural use of this area is typical of the balance of Lewis County, which is based on the production and sale of milk as the principal farm income. The climate favors forage crops such as hay and corn silage.

Forestland is concentrated in the eastern portion of the study area and includes the land areas surrounding the Effley, Soft Maple, Eagle, and Moshier Developments. Timber production is actively pursued in this area, and there are many sawmills in Lewis and Herkimer Counties. In the area of the project, a sawmill operates on the Beaver River near the village of Croghan just west of the study area boundary.

The upper reaches of the Beaver River Project in which the Moshier and Eagle Developments are situated are heavily wooded and very sparsely populated. This area lies in the town of Webb in Herkimer County and the town of Watson in Lewis County. This heavily forested area is fully within the Adirondack Park Boundary. Residential development consists primarily of summer homes and camps, which are concentrated on the southern portion of Beaver Lake and are accessible via County Route 26 and town roads.

The middle section of the project area that includes the Soft Maple, Effley, and Elmer Developments is also very sparsely populated, heavily wooded, and access is provided by only a

limited number of developed roadways, which are primarily owned and maintained by NMPC. Residential occupation is primarily seasonal, and it is tied to recreational opportunities.

The most downstream portion of the project area, including the Belfort and High Falls Developments, is more heavily populated than the rest of the area. Permanent homes are located in the vicinity of the Taylorville, Belfort, and High Falls Developments. Even with year-round residential occupation, there is still a very low population density. The landscape takes on a rural/agricultural character downstream of Belfort, in contrast to the heavily wooded and remote character of the upper reaches of the project area.

Commercial and industrial development is virtually nonexistent within the project area except for NMPC's hydro facilities.

The Moshier, Eagle, and the upper reservoir of the Soft Maple Development lie within the boundaries of the Adirondack Park. The land that lies north of the Beaver River from the Moshier powerhouse to Stillwater dam is almost entirely state owned and is classified by the Adirondack Park Agency as "wilderness area." The exceptions are parcels at the Moshier powerhouse and a parcel below Stillwater dam. These parcels are privately owned and are classified as resource management land (Adirondack Park Agency, 1989). Land adjacent to the Eagle Development is also classified as resource management.

B. Cumulative Impact Summary

An action may cause cumulative impacts on the environment if it overlaps in space and/or time with the impacts of other past, present, and reasonably foreseeable future actions. The individually minor impacts of multiple actions, when added together, may amount to collectively significant cumulative impacts. The existing environment shows the effects of past and present actions and provides the context for determining the cumulative impacts of future actions.

We reviewed the project's potential to cause adverse cumulative impacts. Given the project's location and design and the nature of the area's resources, we conclude that the project affects water quality and quantity, fish habitat, boating and other recreation. We consider cumulative impacts on these resources in individual resource sections (Section V.C).

C. Proposed Action

In each of the following resource sections, we describe the environmental setting, NMPC's proposed operating procedures and environmental or enhancement measures, and the recommendations of resource agencies and other entities. We then provide our

independent analysis and conclusions about the effects that the project may have on environmental resources, and we make recommendations to protect or enhance affected environmental resources.

Lastly, we discuss any unavoidable adverse impacts on each environmental resource as a consequence of relicensing the project with recommended protection or enhancement measures.

1. Geological Resources

a. Affected environment: The Beaver River Project lies entirely within the Adirondack physiographic province. The Adirondacks comprise the Adirondack Piedmont and Adirondack Mountains sections. The Adirondack Piedmont consists of the foothills surrounding the higher interior Adirondack Mountains, and it is further divided into the Grenville Lowlands, the Fall Zone, and the Childwold rock terrace. The project area lies entirely within Fall Zone, which is a belt in which waterfalls are sufficiently concentrated and common to characterize the topography. In this region, there is a close relationship between topography and the kind and structure of the underlying rocks. The foothills are low ridges of crystalline rock that are oriented in a northeast direction; consequently, the topography and drainage pattern of the region trends in this direction. The existing topography is the result of bedding planes, foliations, joint systems, and uneven erosion of bedrock with different resistances.

All bedrock in the project area consists of metamorphic and igneous rocks of the Precambrian age. The surficial geology of the project area originates mainly from the advance and retreat of glaciers. Abundant evidence indicates that this region was heavily glaciated during the Pleistocene epoch. Several ice advances occurred with intervening periods when the ice melted and retreated to the north, but only the effects of the last ice advance (i.e., Wisconsin Stage) have been identified. During glacial advances, hills were rounded off, soils were removed, valleys were eroded, and a thin veneer of bouldery drift (or till) was deposited on the hills and a stratified drift was deposited in the valleys. During the retreat of the ice, the rivers flowing north were dammed by the ice front, and a succession of temporary lakes was formed. Deltas were formed at the location where streams flowed into these lakes. These extensive sand and gravel deltaic plains are common throughout the Adirondack Peidmont and are located well above the present river beds. Portions of the project area, including the Soft Maple Development and all developments downstream, are covered by these deltaic sands. Minor amounts of alluvial sand and gravel of recent geological time can be observed in the present flood plains. Other glacial features such as outwash, recessional moraines, and kame deposits are distributed throughout the region on a small scale.

The Beaver River Project area has historically been influenced by two earthquake activity zones, the Adirondack Seismic Zone (last event was magnitude 5.1 within about 50 miles of the project area in 1983) and the Western Quebec Seismic Zone (last event was magnitude 6.0 within about 350 miles of the project area in 1988). This project is also in Zone 2 of the Seismic Zone Map of the Contiguous States and Puerto Rico which recommends that concrete structures be designed using a seismic acceleration coefficient of 0.10. The Beaver River Project facilities were designed to this standard; therefore, moderate earthquakes should have no effect on project operation.

Mineral resources within the project area are limited to scattered sand and gravel deposits that are used locally as fill or roadway material.

We describe the major soil associations at each development in the following section.

Moshier Development - The soils on the south side of the bypassed reach at this development are deep, well drained, and coarse textured. These are the Colton Association and occupy the gently sloping plains and sloping outwash terraces in valley bottoms above the flood plains. The soils on the south side of impoundment at this development are of the Potsdam Crary-Association and are deep, very bouldery silt and very fine sand over well to somewhat poorly drained glacial till. These soils are formed on sloping hill sides and are highly erodible. The Bryton-Dannemora soils are deep, poorly drained, stony soils developed in glacial till. These soils tend to have a perched high water table during wet seasons and have a medium erodibility. Soils on the north side of the impoundment and bypass consist primarily of the Becket-Canaan Association, which are shallow to deep, well-drained, moderately coarse textured soils developed in bouldery glacial till. These soils develop on sloping to moderately steep slopes and have a low to medium erodibility.

Eagle Development - The north side of the bypass and impoundment at this development is dominated by the Colton Association. The upland soils around this development tend to be stony and have rocky outcrops. These soils are unsuitable for crops, and forest vegetation dominates.

Soft Maple Development - This development is also dominated by the Colton Association. The soils contain on average 35 percent gravel in the top 3 feet providing a minor mineral resource.

Effley Development - This development is dominated by the Colton Association previously discussed.

Elmer Development - This development is dominated by the Colton Association previously discussed.

Taylorville Development - The soils on both the south and north shores of the impoundment and the south side of the bypassed reach belong to the Colton Association. The north side of the bypassed reach is also dominated by the Colton Association, however, it has minor soil components. These minor soils have a low erodibility and are not significantly different from the Colton Association.

Belfort Development - The soils in the vicinity of this development are dominated by the Colton Association, although the southeastern shore of the impoundment has steeper slopes than the rest of the development. Rock outcrops are distributed around the dam, throughout the upper two-thirds of the bypassed reach, and along the north central and southwestern banks of the impoundment.

High Falls Development - The soil in this area is extremely complex. Colton loamy fine sand, loamy sands, and cobbly loamy sands are still the most common soils; however, there are at least 15 additional minor soil types at this development.

b. Environmental impacts: The application identified several soils and environments (i.e., steep impoundment banks) susceptible or potentially susceptible to erosion and sedimentation. Neither NMPC nor the public, however, raised this issue. Operation of this project poses no immediate erosion or sedimentation threat and would not require any enhancements. In fact, increased stabilization of impoundment water levels would reduce the potential for future erosion or sedimentation.

c. Unavoidable adverse impacts: There may be a minor, short-term increase in erosion and sedimentation associated with construction of proposed enhancements. These would include boat launches, canoe portages, hiking and fishing trails, fishing decks, and camping and picnicking sites. A site-specific Erosion and Sedimentation Control Plan should be developed and approved by the Commission in consultation with other appropriate entities or agencies prior to construction.

2. Water Resources

a. Affected environment: Water quality and quantity resources could be impacted by the Beaver River Project and by other activities upstream of the project.

River Flow

The Beaver River is regulated by the Hudson River-Black River Regulating District (HRBRRD) at Stillwater Reservoir, which is operated primarily for flood control of the Black River.

Stillwater Reservoir controls 171 of the 291-square-mile Beaver River drainage basin. The reservoir is typically lowered in the fall and filled during the spring. During periods of high rainfall, when flooding is expected on the Black River, the HRBRRD curtails all releases except for the minimum flow release of 50 cfs required by FERC (Stillwater Reservoir, Project No. 6743).

The Beaver River Project is integrated into the overall operating scheme of the Beaver River. Except for Moshier and High Falls, all developments are situated such that they discharge directly into the impoundment of the downstream development. The Moshier Development discharges into the river which enters Beaver Lake. The High Falls Development discharges directly into the river.

The developments of the Beaver River Project operate in conjunction with the daily releases from Stillwater Reservoir. Normal releases from Stillwater Reservoir are governed in part by the elevation of the downstream reservoir, Moshier. The objective is to keep the water level in Moshier Reservoir at the top of the flashboards, 2 feet over the dam crest. This enables Moshier to operate at maximum head; maximum hydraulic capacity is about 542 cfs plus an 80 cfs (minimum flow plus leakage) constant release through the dam. Moshier is a peaking plant and operates at maximum capacity during peaking hours. This is possible due to a release at Stillwater of 50 cfs, on a 24-hour basis.

Streamflow data were collected for the Beaver River from USGS gages at Stillwater Reservoir and from below High Falls at Croghan. Both gages were used to formulate the monthly and annual flow duration curves provided by NMPC. The period of record used to calculate the annual flow duration curves (January 1931 through September 1988) was longer than the period of record used to calculate the monthly flow duration curves (January 1, 1960 through December 31, 1980). The following descriptions are based on the annual flow duration curves for the period of record of January 1931 through September 1985.

The Moshier Development has a drainage area of 182 square miles. Since 1991, a minimum bypass flow of 30 cfs has been released through a 30-inch-diameter outlet pipe tapped into the existing 10-foot-diameter penstock. The average inflow at the Moshier Development was estimated at 409 cfs. The minimum flow was 7 cfs, and the maximum flow was approximately 2,900 cfs. The median flow was approximately 395 cfs.

Beaver Lake is located between the Moshier and Eagle Developments. The main tributaries consist of Alder Creek, Beaver Meadow Brook, Slough Brook, Three Mile Creek, and Sunday Creek. During high rainfall when the HRBRRD curtails flows, the only flow entering Beaver Lake is from the unregulated portion of the basin and the minimum release and leakage at Moshier.

Since 1991, a minimum bypass flow of 30 cfs has been released into the Eagle bypass through a 5-foot-wide slide gate. Eagle Reservoir has a drainage area of 224 square miles. USGS gage data indicate that the average flow at the Eagle Development was 483 cfs. The minimum flow at the development was 15 cfs, and the maximum flow was approximately 3,600 cfs. The median flow was approximately 460 cfs.

The Soft Maple Development has a drainage area of approximately 240 square miles. Since 1991, a minimum bypass flow of 20 cfs has been released at the Soft Maple Development through a 10-foot-wide aluminum slide gate. A continuously recording streamflow gage has been installed in the bypass to measure minimum flows. The average flow at the Soft Maple Development was estimated to be approximately 511 cfs. The historical minimum flow at the development was 18 cfs, and the maximum flow was approximately 3,800 cfs. The median flow was approximately 490 cfs. The Soft Maple Development has the greatest hydraulic turbine capacity and operates with the shortest peaking duration.

The Effley Development has a drainage area of approximately 249 square miles. Average flow at the Effley Development was an estimated 527 cfs. The minimum flow was 20 cfs, and the maximum flow was approximately 4,000 cfs. The median flow was approximately 500 cfs. No minimum bypass flows are currently being released.

The Elmer Development has a drainage area of approximately 250 square miles. The average flow at the Elmer Development was an estimated 529 cfs. The minimum flow at the development was 20 cfs, and the maximum flow was approximately 4,000 cfs. The median flow was approximately 500 cfs. No minimum bypass flows are currently being released.

The Taylorville Development has a drainage area of approximately 251 square miles. Currently, there is a bypass flow of 30 cfs being released at the Taylorville Development through an aluminum slide gate. The average flow at the Taylorville Development was an estimated 531 cfs. The minimum flow was 20 cfs, and the maximum flow was approximately 4,000 cfs. The median flow was approximately 500 cfs.

The Belfort Development has a drainage area of approximately 252 square miles. The average flow at the Belfort Development was an estimated 533 cfs. The maximum flow was approximately 4,000 cfs, and the median flow was approximately 510 cfs. No minimum bypass flows are currently being released.

The High Falls Development has a drainage area of approximately 267 square miles. The average flow was an estimated 559 cfs. The minimum flow was 23 cfs, and the maximum flow was approximately 4,300 cfs. The median flow was

approximately 525 cfs. NMPC has an agreement with Missiquoi Associates, owner of the Beaver Falls Project (FERC No. 2593), to supply 250 cfs downstream of High Falls. The development is operated to maintain a base flow of 250 cfs downstream of the powerhouse so that adequate water is available in the town of Beaver Falls for mill processing, hydrogenerating, and sewage discharge requirements. This base flow requirement is not required by FERC. When the HRBRRD reduces flows from the Stillwater Reservoir, NMPC may rely on reservoir storage emergency reserves from the Moshier, Soft Maple, Effley, and High Falls Developments to satisfy its base flow requirements downstream of the High Falls powerhouse. No minimum bypass flows are currently released at High Falls.

Table 2 shows the percentage of time in each month that inflows at High Falls are less than 250 cfs. This corresponds to the percentage of time that the Moshier, Soft Maple, Effley, and High Falls reservoirs would be used to maintain flows.

Table 2. Average percent of time each month the flow at High Falls is less than 250 cfs (Source: NMPC, 1993 Monthly Flow Duration Curves) (Period of Record is January 1, 1960 through December 31, 1980)

January	6.5%
February	5.8%
March	10.8%
April	8.9%
May	20.0%
June	13.6%
July	12.7%
August	9.1%
September	12.7%
October	13.9%
November	17.4%
December	12.1%

The water quality management plan for the Black River Basin indicated that there were no consumptive uses of the Beaver River within the project area. At the time of the writing of the original application in 1991, NYSDEC indicated that no consumptive uses have been initiated since 1977.

The eight developments in the Beaver River Project are operated at efficient gate (approximately 85 percent of the hydraulic capacity of the turbine) or at full gate (at the hydraulic capacity of the turbine, 100 percent gate). Typically, when the available river flow exceeds the capacity of the units at efficient gate, the units will operate at full gate. Flows in excess of the combined full gate unit discharge, plus the required minimum flow, are spilled over the dam or released through the gates.

The peak load of the NMPC system usually occurs in December and consequently, December is a critical period of power supply. The dependable capacity for each development is defined as the 4-hour continuous power output developed from the usable storage capacity of the reservoir and the reservoir inflow that is equalled or exceeded 90 percent of the time.

Water Quality

NYSDEC classifies the waters of the Beaver River impoundments and their associated tributaries based on their designated best use. Water classifications for the project area include Class B (coldwater fishery), Class C(T) (coldwater fishery that supports trout), and Class D (warmwater fishery). The Beaver River water quality classification for the project area varies depending on location:

> from the Stillwater tailrace downstream to High Falls dam is Class C(T);
>
> the High Falls bypass is Class D; and
>
> from the High Falls tailrace to the hamlet of Beaver Falls is Class B.

NYSDEC Class B waters are defined as follows:

> The monthly median coliform value for one hundred milliliters (ml) of sample shall not exceed two thousand four hundred from a minimum of five examinations and provided that not more than twenty percent of the samples shall exceed a coliform value of five thousand for one hundred ml of sample and the monthly geometric mean fecal coliform value for one hundred ml of sample shall not exceed two hundred from a minimum of five examinations. This standard shall be met during all periods when disinfection is practiced.
>
> The pH shall be between 6.5 and 8.5.3/
>
> Total dissolved solids cannot be at concentrations which will be detrimental to the growth and propagation of aquatic life. Waters having present levels less than 500 milligrams per liter (mg/l) shall be kept below this limit.
>
> For cold waters suitable for trout spawning, the DO concentration shall not be less than 7.0 mg/l from

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3/ pH is measure of acidity with 7 being neutral. Measurements below 7 are increasingly acidic; measurements above 7 are increasingly basic.

other than natural conditions. For trout waters, the minimum daily average shall not be less than 6.0 mg/l. At no time shall the DO concentration be less than 5.0 mg/l. For non-trout waters, the minimum daily average shall not be less than 5.0 mg/l At no time shall the DO concentration be less than 4.0 mg/l.

Best usage of Class B waters is primary contact recreation and any other uses except as a source of water supply for drinking and culinary or food processing purposes.4/

NYSDEC Class C waters are defined as follows:

The monthly geometric mean total coliform value for one hundred ml sample shall not exceed ten thousand and the monthly geometric mean fecal coliform value for one hundred ml sample shall not exceed two thousand from a minimum of five examinations. This standard shall be met during all periods when disinfection is practiced.

The pH shall be between 6.5 and 8.5.

Total dissolved solids cannot be at concentrations which will be detrimental to the growth and propagation of aquatic life. Waters having present levels less than 500 milligrams per liter shall be kept below this limit.

For cold waters suitable for trout spawning, the DO concentration shall not be less than 7.0 mg/l from other than natural conditions. For trout waters, the minimum daily average shall not be less than 6.0 mg/l. At no time shall the DO concentration be less than 5.0 mg/l. For non-trout waters, the minimum daily average shall not be less than 5.0 mg/l At no time shall the DO concentration be less than 4.0 mg/l.

The best usage of Class C waters is fishing and all other uses except as a source of water supply for drinking, culinary or food processing purposes, and primary contact recreation.

NYSDEC Class D waters are defined as follows:

The pH shall be between 6.0 and 9.5.

Dissolved oxygen shall not be less than 3 milligrams per liter at any time.

4/ Primary contact recreation involves activities where you expect to get wet, e.g., swimming, wading, and water-skiing.

The best usage of Class D waters is secondary contact recreation.5/

The limited historical data for the Beaver River show that it is relatively unpolluted from point source discharges. NYSDEC, in its "Draft Water Quality Management Plan" for the Black River Basin stated that acid precipitation was likely the major nonpoint source for water quality problems in the basin. NMPC conducted extensive water quality monitoring at 12 locations along the Beaver River.

Results of water chemistry data collected in the Moshier, Eagle, Soft Maple, and Taylorville impoundments and tributaries indicate that pH for the Beaver River between Moshier and Taylorville ranged from 4.5 to 6.8 over the period of monitoring from 1987 through 1989. The water temperatures in the bypassed reaches ranged from 45°F to 75°F from May 1989 to October 1989. Water temperatures in the impoundments were approximately the same as the water temperatures in the bypassed reaches during the same time period. The dissolved aluminum concentrations ranged from 0.05 to 0.7 mg/l over the sampling period. The acid neutralizing capacity (ANC) of the Beaver River ranged from -30 to over 100 Ueq/l over the sampling period. The lowest pH and the lowest ANC occurred at the same time. DO levels were high and rarely fell below Class B standards.

These results led investigators to conclude that low pH, low ANC, and high aluminum concentrations were associated with high river flows. The temperature, aluminum concentration, and pH throughout the Beaver River reached levels reported to be lethal to brook trout. The impoundments did not appear to be a source of high quality water necessary to support a native brook trout fishery.

The pH levels for the Beaver River developments range from 4.5 to 6.2 from as deep as 9 meters below the surface to the surface. We discuss specific conditions in the following section.

The Moshier Development surface water pH levels are extremely low (4.5 to 5.0). These conditions typically occur beneath ice cover from February to April. During the warmer months, the pH levels tend to be higher at the surface and lower in the hypolimnion. The highest pH values recorded are only slightly above 6.0, while midcolumn pH values are generally between 5.5 and 6.0.

The Eagle Development does not exhibit significant stratification of pH within the impoundment. Data indicate a

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5/ Secondary contact recreation involves activities where getting wet is possible but not necessary, e.g., fishing and sailing.

The Eagle Development does not exhibit significant stratification of pH within the impoundment. Data indicate a late winter to spring depression in pH, with values falling below 5.0, while summer pH values can be slightly greater than 6.0.

Data collected for the Soft Maple Development indicate a pH range of less than 5.0 in the spring to a high of 6.2 in late summer. Data are insufficient to demonstrate a seasonal stratification of pH.

Data collected for the Effley Development were obtained by NYSDEC and indicated a pH of 6.0 at both the surface and at 9.1 meters below the surface.

Data collected for the Taylorville Development indicate a pH level of 6.16 at 1.5 meters below the surface.

Data collected for the Belfort Development indicate a pH of 5.96 at 1.5 meters below the surface.

Data collected for the High Falls Development by NYSDEC indicate that on July 31, 1972, the pH both at the surface and at 9.1 meters below the surface was 6.0. On June 30, 1977, a pH of 5.6 was recorded at an unspecified depth.

Thermal stratification is known to occur at the Moshier and Taylorville Developments for a short time in early and midsummer, respectively. Soft Maple probably also thermally stratifies, but data are incomplete. Eagle, Effley, and Belfort do not thermally stratify, and there are no temperature data for Elmer or High Falls.

Water quality data indicate that water temperatures for the impoundments and bypassed reaches for the months of July and August have reached the upper 70°F. Temperature, therefore, is a limiting factor for a healthy, coldwater trout fishery.

Data provided by NYSDEC and NMPC indicate that DO in the Beaver River developments range from 4.0 mg/l in the hypolimnion to 12 mg/l at the surface, averaging about 8.4 mg/l. DO standards are being met for Class B, C, and D waters.

Water quality conditions in the north channel of the bypassed reach at Soft Maple resulted in formation of a red flocculent. Small amounts were seen by staff during the site visit and the U.S. Fish and Wildlife Service, in its letter dated November 29, 1995, again noted the presence of the material. While the impact of the flocculent is unknown, NMPC will take measures to flush the material out of the bypassed reach during spring runoff.

Water quality data downstream of the High Falls Development is limited. Data collected in Murmur Creek by NYSDEC in August,

1971 indicates that the DO approximately 1.5 miles downstream of the High Falls dam measured 6.8 and 7.9 and alkalinity (CaCo3) was 21 mg/l.

b. Environmental impacts: Proposed maximum daily and seasonal fluctuations of the reservoirs are indicated in Table 3 as defined in the Settlement.

When the HRBRRD reduces releases from Stillwater Reservoir to collect spring runoff, the Moshier, Soft Maple, Effley and High Falls impoundments each may be drawn down a maximum of 3.0 feet to satisfy the 250 cfs baseflow below High Falls. These maximum fluctuations represent an enhancement in the stabilization of the reservoir capacities compared to previous operations. Previously licensed operations included an annual draw-down of 25 feet below the dam crest at Moshier in the early spring. At High Falls, the proposed 3 foot draw-down is 1 foot greater than current licensed conditions. Overall, the Settlement is an enhancement of current project operation.

Shoreline studies submitted as part of the application indicate that the location of existing shoreline erosion at or above the high water line is the result of forces such as waves and shoreline bank slope rather than reservoir fluctuations. There is no evidence that project operation has contributed to existing shoreline erosion.

Table 3. Beaver River maximum daily and maximum seasonal fluctuations of project reservoirs (Source: Settlement, 1995)

Reservoir	July 1 - April 30	May 1 - June 30	Maximum Seasonal
Moshier	1.5 feet	1.0 foot	3.0 feet
Eagle	1.0 foot		
Soft Maple	1.5 feet	1.0 foot	3.0 feet
Effley	1.5 feet	1.0 foot	3.0 feet
Elmer	1.0 foot		
Taylorville	1.0 foot	1.0 foot	
Belfort	1.0 foot		
High Falls	1.5 feet		3.0 feet

We reviewed the maximum daily and seasonal draw-downs proposed in the revised application and conclude that they would not contribute to additional shoreline erosion. The proposed draw-downs would be smaller than existing draw-downs, except at High Falls. Based upon the field studies, the shoreline appears to be in a state of equilibrium, and, therefore, proposed fluctuations would not accelerate shoreline erosion.

Water quality in the bypassed reaches may be modified by minimum flows. Minimum flows are currently released at four developments. FERC prescribed these interim flows on March 19, 1987:

Moshier	59 cfs
Eagle	59 cfs
Soft Maple	34 cfs
Taylorville	59 cfs

Subsequently, FERC issued an order amending the project license (December 5, 1991) and reducing these flows to 30, 30, 20, and 30 cfs, respectively. The flows were based on instream flow incremental methodology (IFIM) studies.

NMPC first proposed to maintain these minimum flows, but the revised application proposes the following minimum flows to the bypassed reaches:

Moshier	45 cfs
Eagle	45 cfs, possibly reduced to 30 cfs seasonally
Soft Maple	35 cfs
Effley	20 cfs
Elmer	20 cfs, possibly reduced to no less than 10 cfs
Taylorville	60 cfs, possibly reduced to 45 cfs
Belfort	20 cfs
High Falls	30 cfs

We considered the minimum flows proposed for the bypassed reaches and possible effects on water quality from these releases. Available information indicates that flows of the size proposed are large enough to control the pH in the bypassed reaches. That is, the pH of inflow from local tributaries entering the reaches is not a significant factor. In contrast, the pH in the impoundments is significant, and higher flows result in lower pH's. Thus, the Settlement proposes a water quality enhancement to previous interim flows by reducing the flows but will decrease pH compared to currently licensed minimum flows. The minimum flows proposed by NMPC in its original application would be more beneficial to pH, because the flows are lower than those in the Settlement. The proposed flows, however, represent an effective compromise between water quality concerns and other aspects of habitat in the bypassed reach. We agree, therefore, that the proposed bypassed reach flows in the revised

application are an enhancement to existing interim bypassed flows.

The assimilative capacity of the river downstream of High Falls appears to be challenged during the low flow season. This condition has prevailed under daily peaking operation, and the agreement between NMPC and Missiquoi Associates was reached to provide a continuous flow of 250 cfs to increase assimilative capacity. While water quality downstream of High Falls would not benefit under rare conditions if HRBRRD does not provide additional water during low flows, we conclude that providing the 250 cfs flow should be an enhancement when compared to historical water quality conditions.

c. Cumulative impacts: Water quality studies indicated that increased flows are associated with low pH. Increased flows to the bypassed reaches, therefore, could result in lower pH than would be found under normal, unaltered stream flows.

d. Unavoidable adverse impacts: Lower pH values would continue to be distributed throughout the project area.

3. Fisheries Resources

a. Affected environment: The Beaver River fishery historically was a coldwater Adirondack brook trout community, but it is now transformed to a mixed warmwater and coldwater fishery. The resource appears to be adversely affected by acid precipitation, and to a lesser extent, warm summer water temperatures. DO levels are not a problem for the fishery resource.

Based on fisheries investigations, dominant sport species that inhabit the impoundments of the Beaver River Project include yellow perch, rock bass, white sucker, brown bullhead, and pumpkinseed. Non-sport fish include the banded killifish, creek chub, lake chub, golden shiner, redbelly dace, and blacknose dace. Studies in the 1970's indicate that brook trout, chain pickerel, and lake and brown trout were also present in the impoundments. Poor water quality limits resident fish populations, resulting in a community that is low in diversity and abundance and composed primarily of acid tolerant and thermally tolerant species, except where there are small, isolated refugia. Stillwater Reservoir hosts populations of smallmouth bass and yellow perch.

Fish surveys have been conducted annually from 1985 through 1992 on the Beaver River in the bypassed reaches of the Moshier, Eagle, Soft Maple, and Taylorville Developments and in selected tributaries. Fourteen species of fish were collected, all of which have been previously reported in either the Black or Beaver Rivers, except for the northern redbelly dace. This species was first collected in 1988 (FWS, NYSDEC, 1994).

From 1985 to 1992, the most abundant sport species were brook trout and yellow perch. Wild brook trout dominated catches in the Beaver River tributaries, and yellow perch were most abundant in the bypassed reaches. Stocked brook trout were also collected in the bypassed reaches but in low numbers. Other species collected included white sucker, pumpkinseed, brown bullhead, rock bass, chain pickerel, and smallmouth bass.

Brook trout is the most popular game fish in the tributaries of the Beaver River. Yellow perch, white sucker, and brown bullhead are the dominant game species in the project area.

All species in the Beaver River, except brown bullhead, declined from 1988 to 1992. These declines are thought to be related to the increased bypass flows that decreased overall water quality in the project area. Although the minimum flows created additional habitat in the project area, the water was acidic during spring runoff and warm during late spring, summer, and early fall.

Prior to NMPC's entrainment and mortality study, rainbow smelt were not known to inhabit the project area. A large number of rainbow smelt were identified at Moshier during the study. Unconfirmed information indicates that the rainbow smelt were introduced when a consignment of smelt eggs, designated for stocking elsewhere by a private fish and game club, was released in the Moshier impoundment. It is not known to what extent smelt have colonized or will colonize the Beaver River. Lentic habitat and water temperature are factors likely to limit their distribution to localized impoundments within the basin.

NYSDEC manages the Beaver River as a coolwater/warmwater fishery with selected riverine reach segments targeted for coldwater management (Kleinschmidt Associates, 1995). In compliance with the FERC order issued March 19, 1987, NMPC initiated a brook trout stocking and monitoring plan for the Beaver River. About 8,000 brook trout were put into the river by Ichthyological Associates between fall 1987 and spring 1989. Stocking was limited to the bypassed reaches of Moshier, Eagle, Soft Maple and Taylorville Developments. All fish were marked at the hatchery by fin removal to distinguish stocking location and time. The brook trout stocking programs were conducted to provide survival information so that a brook trout fishery could be improved.

A creel census was conducted for the Beaver River bypassed reaches (Moshier, Eagle, Soft Maple, and Taylorville) and Sunday Creek, a tributary of the Beaver River, in 1988 and 1989. The objective of the creel census was to determine angler use (number and length of trips), success (catch rate and composition), origin of trout (wild versus hatchery) and location. Of the total brook trout caught, 22 were native, and 1,990 were of hatchery origin. Most wild trout were caught in the Soft Maple

bypassed reach, and most hatchery fish were caught in the Moshier bypassed reach.

On June 8, 1989, two bypassed reaches of the Beaver River (Moshier and Taylorville) were stocked with 2,000, low-pH tolerant brook trout. All fish were fin clipped to distinguish stocking locations. Stocked trout were recaptured during fish surveys in June, August, September and October of 1989. Clipped fish captured included 4 stocked in June 1988,, 28 stocked in October 1988 and 26 stocked in June 1989. No trout stocked in October 1987 were recaptured.

FWS, in their letter dated November 29, 1995, note that initial trout plantings probably died of thermal shock at the time of stocking. Also, it is noted that the poor recovery rate and establishment of the stocked trout in the bypassed reaches may be attributed to a number of factors in addition to water quality. As a result, any future trout stockings will use fish transplanted from local heritage streams.

The tiger muskellunge is not a native fish species but is an artificial, sterile, acid-tolerant hybrid stocked in the river for anglers. Tiger muskellunge collected during the entrainment and mortality study were 150 to 450 mm long. A nominal number of fish between 150 and 175 mm long were entrained at Moshier. Tiger muskellunge ranging from 150 to 450 mm long were also entrained at High Falls in late April and in June (Kleinschmidt Associates, 1995).

On January 10, 1995, NYSDEC indicated at the scoping meeting that a put and take stocking program of tiger muskellunge in the Moshier and Soft Maple impoundments had been implemented. The objective of this stocking program is mainly to establish a sport fishery and to control high populations of white suckers and yellow perch. No sampling or creel censuses have been conducted to date.

b. Environmental impacts:

Fish Passage

The revised application does not propose to provide upstream fish passage at any of the Beaver River developments. A fish screen is proposed at the Soft Maple Development at the upstream end of the diversion tunnel with no greater than 1/2-inch clear space openings. This screen is intended to prevent warmwater reservoir fish from passing into the coldwater bypassed reach habitat.

Interior (letter dated July 13, 1995) indicates that, at the Soft Maple Development, the desire to preclude the outmigration of warmwater fish into the coldwater-managed bypassed reach is an important objective of the Settlement. Interior lists this in

its recommended license conditions pursuant to Section 10(j) of the FPA. The proposed fish screen would prevent interspecific competition between the smallmouth bass inhabiting the impoundment and the brook trout inhabiting the bypassed reach. Interior indicates that the other seven developments would not significantly benefit from fishways. Because management objectives for the Beaver River are subject to change over the life of the project, Interior requests reserving its authority to prescribe fishways under Section 18 of the FPA.

We reviewed the needs for upstream fish passage for the Beaver River Project area. Presently, there are numerous natural barriers, primarily in the bypassed reaches, and hydropower barriers to upstream migration of fishes in the Beaver River. The natural barriers are vertical falls, chutes, and steep rapids over extensive areas of exposed bedrock. Such barriers would have precluded upstream migration from the Black River even without hydropower development. Many Beaver River Project dams are on the crest of steep drops that would act as natural barriers to upstream migration if the dams were not present. The staff does not recommend any further upstream fishways.

Fish entrainment and mortality studies were conducted at the request of FERC as part of the relicensing of the Beaver River Project. A study was conducted from October 11, 1993, through September 30, 1994, to estimate the fishery resources lost to turbine entrainment and mortality at the eight developments of the Beaver River Project. The need for downstream fish passage was also assessed from this study.

To effectively exclude adult fish from being entrained in the intakes, NMPC proposes, in its revised application, to install new trashracks at each development with 1-inch clear bar spacing. It does not propose any further fish passage enhancements to the developments.

We reviewed the proposed fish protection potential provided by the installation of the trashrack overlays. This method appears to be sufficient for the structure and composition of the present fishery. NMPC did not identify the specific type of fish screen proposed for the Soft Maple Development in its revised application. We recommend that NMPC identify a fish screen and submit plans to resource agencies for review and to FERC for approval and that NMPC develop plans for installing the Soft Maple screen and trashracks at all locations. The design would be reviewed by the agencies and approved by FERC prior to construction.

Whitewater Releases

In the Settlement Offer, whitewater releases are defined for the Moshier, Eagle, and Taylorville bypassed reaches. These may

have an adverse impact on fisheries resources. The flows are as follows:

Moshier - One 4-hour release of 400 cfs would be provided in September or October (prior to October 15) of each year, the exact timing of which is to be determined by NMPC and American Whitewater Affiliation (AWA), in consultation with the Beaver River Advisory Council (BRAC). Ramping flows would not exceed 200 cfs and will be made 2 hours before and after the boating flow release. The total volume of each release, including ramping flows, shall not exceed 2,400 cfs-hrs. The release at the Moshier Development would be coordinated, to the extent feasible, with the releases at the Eagle and Taylorville Developments.

Eagle - Five 4-hour releases of at least 200 cfs would be provided in September and October of each year, the exact timing of which is to be determined by NMPC and AWA, in consultation with BRAC. Ramping flows would not exceed 100 cfs and would be made for 1 hour before and after the boating flow releases. The total volume of each release, including ramping flows, shall not exceed 1,000 cfs-hrs. The releases at Eagle would be coordinated, to the extent feasible, with the releases at the Taylorville Development.

Taylorville - Five 4-hour releases not to exceed 400 cfs would be provided in September and October of each year, the exact timing of which is to be determined by NMPC and AWA, in consultation with BRAC. According to the Settlement, ramping flows would not exceed 200 cfs and will be made before and after boating flow releases for a total duration of time, not to exceed 3 hours. The total volume of each release, including ramping flows, shall not exceed 2,200 cfs-hrs. The releases at the Taylorville Development would be coordinated, to the extent feasible, with the releases at the Eagle Development.

NMPC's proposed whitewater releases (in its revised application) may have an adverse impact on fish refugia located within the Moshier bypassed reach. The high flows could adversely affect slow water current fish species by eliminating thermal or pH refugia or by sweeping resident species downstream of established habitats. Three game fish species were collected from 1987 through 1989 in the Moshier bypassed reach, smallmouth bass, brook trout, and chain pickerel. NYSDEC classifies the chain pickerel as a slow current fish and the smallmouth bass as a slow to moderate current fish. The periodic increased flow rates for boating and ramping (400 to 200 cfs), therefore, may impose high current stress on fish located in the refugia in the Moshier bypassed reach. The average water temperatures for the Moshier bypassed reach in September and October are approximately 55 and 47°F, respectively. Because the proposed whitewater releases are scheduled for September through October 14 when

water temperatures are already cooling, we conclude impacts should not result in warmwater inflows or loss of coldwater thermal refugia.

Aquatic habitat may be adversely affected at the Taylorville bypassed reach due to fluctuating water depths and juvenile fish may be stranded after whitewater releases end. The IFIM results indicate that a channel to the south of transects T12 and T13 contains a flow less than 1 cfs, except during whitewater releases and the spring runoff spill period. Fish displaced by the releases may be stranded in this section of the bypassed reach at the end of the boating and ramping flows. Another problem occurs at transect T11 where flows of 60 cfs and higher flood a large outcrop shelf area where displaced fish may become stranded and unable to return to the channel upon termination of the whitewater flows.

We reviewed the potential impacts on aquatic resources during whitewater releases. Given the limited resident community and the probability that fish would move downstream with high flows, significant losses are not expected.

Construction-related Impacts

NMPC proposes in its revised application to construct the following structures:

Moshier -
- Slide gate structure.
- New trashracks (or equivalent) with 1-inch clear bar spacing.

Eagle -
- Minor channel modifications below the release gate.
- New trashracks (or equivalent) with 1-inch clear bar spacing.

Soft Maple -
- Diversion tunnel and release device.
- New trashracks (or equivalent), 1-inch clear bar spacing.
- Fish screen (or equivalent), less than or equal to 0.5-inch clear space openings.

Effley -
- New gate structure; gated orifice through dam (2 square feet in area).
- Plunging pools, piping, etc
- New trashracks (or equivalent) with 1-inch clear bar spacing.

Elmer -
- New release structure, 2 square feet in area.

- Plunging pools, piping, etc
- New trashracks (or equivalent) with 1-inch clear bar spacing.

Taylorville -

- Minor channel modifications below the release gate.
- New trashracks (or equivalent) with 1-inch clear bar spacing.

Belfort -

- New gate structure; gated orifice through the dam (2 square feet in area).
- Plunging pools, piping, etc
- New trashracks (or equivalent) with 1-inch clear bar spacing.

High Falls -

- New gate structure at the north side of the spillway; a gated orifice through the dam (2 square feet in area).
- Plunging pools, piping, etc
- New trashracks (or equivalent) with 1-inch clear bar spacing.

Flow Monitoring

- Installation and maintenance of USGS gaging station at each of the bypassed reaches and one downstream in Croghan.
- Permanent staff gages of headpond and tailwater elevations at all eight facilities.

Based on our independent analysis, the staff determined that there would be minimal impacts related to construction activities for the installation of the new gate structures, trashracks, USGS gage stations, and for permanent staff gages. Neither coffer dams nor impoundment draw-downs would be required for these related construction activities. Construction-related impacts would be minimal. NMPC should develop a plan for the diversion tunnel at Soft Maple, for the modifications made for plunge pools, piping, and related construction activities after consultation with appropriate resource agencies, and then submit the plan to the Commission for approval.

Minimum Flows

In its revised application, NMPC proposes the following year-round minimum and "nominal" flows for the project's bypassed reaches:

Moshier - A year-round minimum flow of 45 cfs would be provided in the bypassed reach through the existing minimum

flow discharge pipe and orifice plate and through a new slide gate structure that would also accommodate whitewater releases and downstream fish passage.

Eagle - A year-round minimum flow of 45 cfs would be provided in the bypassed reach via the existing minimum flow slide gate. NMPC may seek to amend the minimum flow to as low as 30 cfs seasonally based on the results of bypassed reach site inspections and with the mutual agreement of NYSDEC and FWS after consultation with the BRAC. The seasonal minimum flow reduction would occur from October 1 to the end of spring runoff when uncontrolled spillage ceases or May 31, whichever comes first.

Soft Maple - A year-round minimum flow of 35 cfs would be provided in the bypassed reach. Both existing slide gates located at the spillway would be used to release 15 cfs to the southern channel. The remaining 20 cfs would be provided through a diversion tunnel to the northern channel.

Effley - A year-round nominal flow of 20 cfs would be provided in the bypassed reach via a new gate structure located on the north side of the spillway.

Elmer - A year-round nominal flow of 20 cfs would be provided in the bypassed reach via a new release structure that would be designed in the existing needle beam structure located in the middle of the spillway. NMPC, upon agreement with FWS and after consultation with the BRAC, may seek to amend the minimum flow to no less than 10 cfs within 1 year of license issuance.

Taylorville - A year-round minimum flow of 60 cfs would be provided in the bypassed reach via the existing minimum flow slide gate. NMPC may seek to amend the minimum flow to between 45 and 60 cfs based on the results of a site inspection and with mutual agreement of NYSDEC and FWS after consultation with the BRAC, within 1 year of license issuance.

Belfort - A year-round nominal flow of 20 cfs would be provided in the bypassed reach via a new gate structure located on the south side of the spillway.

High Falls - A year-round nominal flow of 30 cfs +/- 3 cfs, depending on head, would be provided in the bypassed reach. Ten cfs (+/- 1 cfs, depending on head) would be provided through the existing low-level slide gate structure located in the middle of the spillway and 20 cfs (+/- 2 cfs, depending on head) would be provided through a new gate structure located at the north side of the spillway.

A year-round base flow of at least 250 cfs would be provided through the existing units and a new minimum flow release structure at the High Falls Development. The target baseflow would be measured and monitored by NMPC with a USGS streamflow gage in Croghan.

On July 13, 1995, Interior responded to the Notice of Application Ready for Environmental Assessment. It indicated that the revised application's proposals for instream flow releases would adequately maintain fish and wildlife resources and their habitats within the affected portions of the Beaver River.

We reviewed the proposed instream flows for the eight developments. All of the bypassed reaches, except for Soft Maple, would be managed for a mixed cold/coolwater fishery. The bypassed reach at Soft Maple would be managed for a coldwater fishery. The proposed flow releases for the developments are an overall enhancement of aquatic habitat to the existing instream flow releases. Table 4 presents the results of a review of the monthly flow duration curves (NMPC, 1992), which indicate the percentage of time that flows are projected to be less than 250 cfs for the months of May and June.

Table 4. Percentage of Time Flows Fall Below 250 cfs (Source: NMPC, 1992)

	May	June
Moshier	33	19.5
Soft Maple	24.2	14.8
Effley	23.5	15.5
High Falls	19.8	13.2

The HRBRRD has, in the past, supplemented water downstream during the low flow season. As long as the HRBRRD can ensure additional flow releases for the Beaver River Project during the low flow season to maintain a base flow of 250 cfs below High Falls, no significant impacts on fisheries would be expected. When sufficient flows are not available from HRBRRD, NMPC will be able to compensate, at least partially, by using storage capacity at Moshier, Soft Maple, Effley, and High Falls Developments. While there will be some times when flows will not be adequate to provide the base flow, the consequences of this rare occurrence should be acceptable, and we believe the public interest is not served by any further restrictions.

Flow Monitoring

NMPC proposes in its revised application to submit a streamflow monitoring plan to NYSDEC for approval within 3 months of FERC license issuance. This flow monitoring plan would provide for the installation and maintenance of a USGS gaging station, or equivalent. NMPC also proposes to monitor head pond elevations at each of the eight developments, which shall include all gages and/or equipment for the purposes of:

- determining the stage and/or flow of the stream on which the development is located;
- determining all other project flows including flow through the turbines and any other bypass/diversion flows; and
- determining project headpond and tailwater elevation.

NMPC proposes to have all gaging and ancillary equipment, including the headpond and tailwater gages, fully calibrated within 12 months of the license issuance. It also proposes a gage calibration plan to be submitted to NYSDEC for review and approval and permanent staff gages to be installed to allow for independent verification of headpond and tailwater elevations.

We reviewed NMPC's proposal for a monitoring plan and agree that the plan should be developed in consultation with appropriate agencies and submitted to the Commission for approval.

Reservoir Fluctuations

NMPC proposes in its revised application to fluctuate the reservoirs for each development as follows:

Moshier - From July 1 to April 30, the maximum daily reservoir fluctuation would be limited to 1.5 feet from the normal maximum headwater elevation. This corresponds to fluctuations between elevations 1,639.5 and 1,641.0 feet with flashboards and elevations 1,637.5 and 1,639.0 without.

From May 1 to June 30, the maximum daily reservoir fluctuation would be limited to 1.0 foot from the normal maximum headwater elevation. This corresponds to fluctuations between elevations 1,640.0 and 1,641.0 with flashboards and elevations 1,638.0 and 1,639.0 without flashboards. If flashboards are down or fail during this period, the flashboards would not be replaced until July 1 or later.

Maximum seasonal reservoir fluctuation would be limited to 3.0 feet from the normal maximum headwater elevation.

Further, during periods when the daily average inflow below High Falls is less than 250 cfs during the low flow season, additional storage at the Moshier Development may be used, in conjunction with storage at the downstream Soft Maple, Effley, and High Falls Developments. During low flow periods, the daily maximum reservoir fluctuation would be limited to 3.0 feet, corresponding to fluctuations between elevations 1,638.0 and 1,641.0 feet with flashboards. Flashboards are expected to remain in place during low flow conditions. Thus, no fluctuation without flashboards is specified. NMPC also proposes to contact the HRBRRD and seek its assistance in increasing flows, to address the low flow condition.

Eagle - The maximum daily and seasonal reservoir fluctuation would be limited to 1.0 foot from the normal maximum headwater elevation. This corresponds to fluctuations between elevations 1,425.2 and 1,426.2 feet with the flashboards and elevations 1,424.2 and 1,425.2 without flashboards. Flashboards would not be erected or replaced during the period May 1 to June 30 to protect nests of reservoir spawning fish and of waterfowl.

Soft Maple - The maximum daily reservoir fluctuation would be limited to 1.5 feet from the normal maximum headwater elevation. This corresponds to fluctuations between elevations 1,288.4 and 1,289.9 feet with flashboards and elevations 1,286.9 and 1,288.4 without flashboards.

From May 1 to June 30, the maximum daily reservoir fluctuation would be limited to 1.0 foot from the normal maximum headwater elevation. If flashboards are down or fail during this period, they would not be replaced until July 1 or later.

During periods when the daily average inflow at High Falls is less than 250 cfs during low flow periods, additional storage at the Soft Maple Development may be used to supplement base flow requirements below High Falls. During such low flow periods, the daily maximum reservoir fluctuation would be limited to 3.0 feet, corresponding to fluctuations between elevations 1,286.9 and 1,289.9 feet with flashboards. Flashboards are expected to remain in place during low flows.

Effley - The maximum daily reservoir fluctuation would be limited to 1.5 feet from the normal maximum headwater elevation. This corresponds to fluctuations between elevations 1,161.5 and 1,163.0 feet without flashboards, which are not present at Effley.

During the period from May 1 to June 30, fluctuations would be limited to 1.0 foot to protect reservoir spawning fish

and nesting birds. This 1.0 foot fluctuation corresponds to fluctuations between elevations 1,162.0 and 1,163.0.

During periods when the daily average inflow at High Falls is less than 250 cfs during low flow periods, additional storage at the Effley Development may be used to supplement the base flow requirements below High Falls. During low flow periods, the daily maximum reservoir fluctuations would be limited to 3 feet, corresponding to fluctuations between elevations 1,160.0 and 1,163.0 feet.

Elmer - The maximum daily reservoir fluctuations would be limited to 1.0 feet from the normal maximum headwater elevation. This corresponds to fluctuations between elevations 1,107.0 and 1,108.0 feet without flashboards, which are not present.

Taylorville - The maximum daily and seasonal reservoir fluctuations would be limited to 1.0 foot from the normal and maximum headwater elevation. This corresponds to fluctuations between elevations 1,069.6 and 1,070.6 feet with flashboards and elevation 1,068.8 and 1,069.8 without flashboards. Flashboards would not be replaced during the May 1 through June 30 period.

Belfort - The maximum daily reservoir fluctuation would be limited to 1.0 foot from the normal maximum headwater elevation. This corresponds to fluctuations between elevation 965.0 and 966.0 feet with flashboards and 964.0 and 965.0 without flashboards. Flashboards would not be replaced during the May 1 through June 30 period.

High Falls - The maximum daily reservoir fluctuation would be limited to 1.5 feet from the normal maximum headwater elevation. This corresponds to fluctuations between elevations 913.5 and 915.0 feet without flashboards, which are not present.

During periods when the daily average inflow at High Falls is less than 250 cfs during the low flow period, additional storage at the High Falls Development may be used to supplement the base flow requirements below. During low flow periods, the daily maximum reservoir fluctuations would be limited to 3 feet, corresponding to fluctuations between elevations 912.0 and 915.0 feet.

On July 13, 1995, Interior responded to the Notice of Application Ready for Environmental Assessment. It indicated that the need to provide an adequate base flow from the project while limiting reservoir fluctuations was discussed extensively during the settlement negotiations. Interior stated that the revised application adequately reduces the amount and duration of reservoir fluctuations within the Beaver River Project area.

We reviewed the maximum daily and seasonal draw-down proposed in the revised application and concluded that they represent an overall enhancement compared to the existing conditions. Impacts on spawning fish habitat in the project's impoundment will be more limited in extent, although they may occur more frequently in May and June. More significantly, the storage capacity available at the Moshier, Soft Maple, Effley, and High Falls Developments can be used to reduce downstream water quality and fish habitat impacts due to low flows. This capacity would only be used if HRBRRD could not provide relief. Because potential impacts downstream of the project are considered more significant than the project-related impacts, flow maintenance is a worthwhile use of the existing storage capacity. That the capacity to be used can be provided while limiting local impacts to acceptable levels is an added benefit.

c. Cumulative impacts: If the HRBRRD provides additional flows to the project developments during the period of May 1 through June 30, cumulative impacts on fisheries resources would be avoided.

d. Unavoidable adverse impacts: None.

4. Terrestrial Resources

a. Affected environment:

Vegetation

The constructed facilities are in the counties of Herkimer and Lewis. The upstream portion of the project is within the Adirondack Park, bounded primarily by state-owned, heavily wooded land. As described in Section V.A., the downstream part of the project becomes progressively more agricultural and developed, and the project area can be classified as rural with a distinctive change in cover type and land use just west of the Elmer Development. To the east, the cover is predominantly medium to heavy woods of spruce-fir-northern hardwoods association with a lack of agriculture. To the west of the Elmer Development, heavy woods transition to a mixture of woodlands, brushlands, and agriculture.

These vegetation differences reflect the underlying differences in soil characteristics, climate, and elevation. The eastern project area is at higher elevations, experiences colder temperatures, and in general has thinner soils. As a result, the higher elevations are dominated by spruce, fir, and birch, as well as white pine, hemlock, and northern white cedar. Northern hardwoods mixed with the spruce-fir forests are dominated by beech, sugar maple, with less frequent basswood, white ash, and black cherry. The northern hardwood forests are classified as mature in many portions of the project area and are likely to contain super-canopy trees.

Wetlands

Many wetlands in the project area are associated with impoundment shorelines. They are typically characterized as wooded wetlands and shrub wetlands. Within the wooded wetlands there are few dead, or dying trees with cavities. This could be due to the steep impoundment shorelines that limit the flooding of trees.

The Adirondack Park Agency maps wetlands down to less than 1 acre within the Adirondack Park, which extends west into the project area as far as the channel connecting the east and west portions of the Soft Maple impoundment. The park agency identifies 24 designated wetlands within the project boundaries. There are about 959 acres of wetland made up of the impoundments of Moshier, Soft Maple, and Eagle, with an additional 111 acres of smaller wetlands found around the impoundments (Costanza and Homa, 1990).

NYSDEC maps wetlands that are at least 12.4 acres in size. In the area outside of the Adirondack Park, there are four NYSDEC-regulated wetlands, all occurring in the areas southwest and northwest of the Soft Maple impoundment, between the Soft Maple powerhouse, and the Adirondack Park boundary.

There are no federal National Wetland Inventory maps for this area, because FWS has not yet mapped this area.

In response to our August 21, 1992, request for additional information, NMPC evaluated the effects of impoundment fluctuation on fish spawning and waterfowl nesting throughout the project area. Included in this study were more detailed descriptions of the location and size of wetlands within each impoundment. Seven percent of the Moshier shoreline is composed of 7 acres of wetland habitat, including palustrine emergent, scrub-shrub, and forested wetlands. The Eagle impoundment has about 34 acres of wetland covering 45 percent of the shoreline. The Soft Maple impoundment is largely devoid of wetlands with less than 1 percent of the shoreline providing 1.9 acres of primarily palustrine emergent habitat. At Effley, only about 1 percent of the shoreline is wetland with less than 1 acre of emergent and scrub-shrub habitat. The Elmer impoundment has about 1 acre of emergent and scrub-shrub wetlands representing about 4 percent of the shoreline. The Taylorville impoundment has about 2 acres of wetlands corresponding to 8 percent of the shoreline. At Belfort, approximately 1 acre of emergent and scrub-shrub wetlands cover about 9 percent of the shoreline. At High Falls, wetlands dominate the shoreline with 30 acres covering 40 percent of the shoreline.

Wildlife

The eastern portion of the project area contains several areas of important wildlife habitat. Deer-wintering yards are found in low-lying areas typically with dense coniferous cover and ponds or streams nearby. Moshier impoundment is likely to have the best deer-wintering yards. There are areas of low-lying grasses, shrubs, and other herbaceous vegetation that provide good habitat for waterfowl within marshy, wetland areas. Eagle impoundment, with its numerous wetlands and lower sloped shorelines has a relatively large amount of good waterfowl habitat. Species requiring dense expansive tracts of forest and minimal human disturbances, such as marten, bobcat, black backed woodpeckers, or gray jay, are more likely to occur in the eastern project area.

In the western portion of the project area, there is a greater diversity of habitat with a mixture of forest, brushland, open agricultural areas, and residences. The High Falls impoundment has abundant wetlands that provide habitat for waterfowl and other wildlife. The variety of habitats creates edge effect, which provides additional habitat for species that include deer, black bear, and small game.

NMPC's field crews observed wildlife during environmental studies. They found snowshoe hare, white-tailed deer, raccoon, beaver, and red squirrel, and signs of mink, otter, and muskrat. Green, wood, and mink frogs; the American toad; salamanders; and a snapping turtle were also observed.

Bird species of note found within the Beaver River Project area include numerous Canada geese and sightings of the common loon. The loon is currently a state species of concern and has been seen on Beaver Lake, Soft Maple, Effley, Eagle, Taylorville, and Moshier impoundments. FWS, in their letter dated November 29, 1995, report sightings in the High Falls impoundment, and that extensive nesting studies have been conducted at the Stillwater Project. Breeding pairs have been documented on Soft Maple and Moshier impoundments, and good potential habitat for nesting loons exists within most of the impoundments. The islands provide particularly good loon habitat because they are more removed from human disturbance and mammalian predators than shorelines. Wood ducks, common merganser, hooded merganser, and common goldeneye are cavity nesters that exist in the project area. Surf scoter, mallards, great blue heron, belted kingfisher, and gulls have also been observed. Upland species observed include the pileated woodpecker, ruffed grouse, scarlet tanager, black-capped chickadee, blue jay, white-throated sparrow, American robin, and thrushes. Broad-winged hawk and turkey vultures were the raptors observed. FWS, in their letter dated November 29, 1995, reported raven nesting in the Eagle Canyon area.

Threatened and Endangered Species

NYSDEC stated that no state-listed threatened or endangered fish, wildlife, or plants have been identified, or are known to exist within the project area (letter from L.J. Surprenant, NYSDEC, September 4, 1985). Additional correspondence stated that species of concern, especially raptors such as eagles and ospreys, follow river valleys during migration periods so that they could appear as transients.

NYSDEC also identified four locations as significant habitat. These include areas of the Soft Maple impoundment where a loon was reported nesting in 1985, and Beaver Lake where a loon was reported nesting in 1978 and an osprey nest was sighted in 1970. Other significant habitats are Moshier Flow where loons were reported to be nesting in 1978 and 1980, and the Beaver River Flow (Stillwater Reservoir) where an osprey was reported to be nesting 1 mile east of Moshier dam in 1970 (letter from J. Ozard, NYSDEC, Delmar, September 28, 1988).

During preparation of the application, NMPC consulted with FWS and was informed that there are no federally listed threatened or endangered species in the area, except for occasional transients (letter from Norman R. Chupp, FWS, Harrisburg Area Office, December 22, 1981 (Oswego River); and letter from Paul P. Hamilton, FWS, September 3, 1985 (Raquette River)). In response to our August 21, 1992, request for additional information, FWS confirmed that the status of federally listed threatened or endangered species within the project area has not changed since the initial consultation (letter from Leonard P. Corin, FWS, September 17, 1992).

b. Environmental impacts: The applicant's proposed actions may have several impacts on vegetation, wetlands, and wildlife.

The proposed recreational enhancements could result in an increase in human activities such as hiking, camping, picnicking, and whitewater and flatwater boating. These activities could increase the frequency and extent of disturbances adversely affecting habitats within bypassed reaches, along shorelines, and on impoundment islands. Disturbance of wildlife species may decrease foraging success, cause loss of habitat, and increase metabolic costs due to avoidance responses. As a result, growth and reproduction of waterfowl and furbearers who use these areas is diminished.

Impacts of Impoundment Fluctuations on Wetland and Wildlife Habitat

Impoundment fluctuations create an unstable environment for both plants and wildlife. Although the proposed impoundment fluctuations are, in general, improvements over previous levels,

there is still the potential for 3-foot fluctuations in four of the impoundments during low flow periods (when 250 cfs cannot be passed at High Falls with the normal fluctuation restrictions at project impoundments). Depending upon season when the low flow condition occurs, these fluctuations could result in the loss of aquatic furbearer denning sites, increased mortality of bottom hibernating reptiles and amphibians, reduced reproductive success of nesting waterfowl, and altered plant species composition, growth, and water regime of important shoreline wetland and wildlife habitats.

The revised proposal, as stated in the Settlement, is to limit fluctuations as described in Section V.C.2. These restrictions, however, could still result in large fluctuations. For example, at Moshier there is the potential to have seasonal or other short-term fluctuations between elevations 1,641 feet and 1,636 feet, resulting in a potential (albeit not highly probable) 5-foot fluctuation zone. Similarly, at Soft Maple the potential exists for fluctuations between elevations 1,289.9 and 1,285.4 feet, resulting in a 4.5-foot fluctuation zone. These numbers assume that flashboard failure extends the fluctuation. FWS (letter dated November 29, 1995) notes that flashboards on the Beaver River Project typically do not fail on an annual basis. Therefore, the frequency of extended reservoir fluctuations is expected to be small. The 5-foot fluctuation potential at Moshier is an improvement over past license conditions that allowed for up to a 24-foot fluctuation, and other additional improvements occur at the remaining project impoundments. Overall, nearly 40 acres of wetlands would be affected by the 3-foot fluctuation allowance, primarily at Moshier and High Falls.

Construction-related Impacts

NMPC does not propose any major construction involving land clearing or earth moving activities that would result in the removal of much vegetation. In some instances, small areas of vegetation may be removed for the construction, improvement, or maintenance of recreation facilities. For example, NMPC agreed in the Settlement to keep certain trails brushed. Mechanized brushing and trail clearing equipment can result in nonselective and excessive vegetation removal and increased erosion problems along trails.

Our Analysis

Our analysis of the flow duration curves shows that low flow periods occur frequently during the critical waterfowl nesting season of May 1 through June 30. Historical data show that, in May, the four impoundments slated for 3.0-foot fluctuations have been in low flow periods 33 percent of the time at Moshier, 24.2 percent at Soft Maple, 23.5 percent at Effley, and 19.8 percent at High Falls. In June, the low flow figures are 19.5 percent at

Moshier, 14.8 percent at Soft Maple, 15.5 percent at Effley, and 13.2 percent at High Falls. In addition, low flow periods occur at High Falls in all months of the year, ranging in monthly frequency from a low of 5.8 percent in January to the high of 20 percent in May, with a monthly average of 12 percent. These figures represent a significant number of days when the fluctuations in these impoundments could result in 3.0-foot draw-downs during the critical spring/early summer breeding season. During the waterfowl nesting season, fluctuations of this degree could have a severe impact on nesting success, especially at High Falls where there are numerous wetlands.

Based on the Settlement, the 3-foot fluctuation allowance under low flows has priority over the normal fluctuation restriction of 1 foot during May and June. This priority limits the value of the May 1 to June 30 1-foot fluctuation restriction. In addition, it is during this period that lost flashboards would not be replaced at projects with flashboards. To add a 3-foot draw-down on top of potential draw-down to the dam crest (flashboards out at Moshier and Soft Maple) could have an adverse impact on fisheries and wildlife habitats.

While the potential for impact exists, even the 3-foot draw-down represents an enhancement relative to present conditions. Furthermore, supplemental flow from Stillwater Reservoir sometimes can be used to compensate for low flows and to limit the extent or frequency of drawdowns. Since resulting conditions should be acceptable, we believe the public interest is not served by any further restrictions.

NMPC proposes to brush all trails. To prevent excess loss of vegetation, we suggest that the trail brushing be conducted by hand tools only (including chainsaws), to minimize the loss of vegetation and displacement of wildlife.

c. Unavoidable and cumulative adverse impacts: Fluctuations in water levels, although more limited than before, cause a reduction in plant species diversity and/or robustness of wetland vegetation. Loss or reduction of important wildlife food species could reduce foraging opportunities, thereby decreasing growth or preventing successful reproduction. These fluctuations could also limit the nesting success of waterfowl due to increased exposure to predators and loss of nesting habitat.

In addition, increased human recreational use may result in increased frequency of disturbances of nesting, foraging, or resting wildlife. As human use of natural areas increases, the number of locations acting as refuges for disturbance-sensitive species may be reduced.

5. Cultural Resources

a. Affected environment: The Belfort Hydroelectric Plant was originally developed in 1898 by Lafayette Wetmore. The powerhouse was enlarged in 1915 by the New York Power Corporation, and it retains three early turbine/generators installed in 1903, 1915, and 1918.

The Belfort Hydroelectric Plant meets Criteria A and C of the National Register of Historic Places (NRHP) as one of the earliest operating facilities of its type and period in the Black River Basin. The stone and concrete block powerhouse, steel penstock, and ogee dam retain integrity of design and materials and contribute to an understanding of localized small hydroelectric generating industries in the early 20th century (J. Stokes, SHPO, April 11, 1991). No other prehistoric or historic archeological sites eligible for listing in the NRHP have been recorded within the Belfort Development boundaries.

No historic properties or prehistoric or historic sites eligible for listing in the NRHP have been recorded within the boundaries of the Moshier, Eagle, Soft Maple, Effley, Elmer, Taylorville, or High Falls Developments (letter from J. Stokes, SHPO, March 20, 1986.) The State Historic Preservation Office (SHPO) has requested that any changes in project operation or proposed construction activities at any development be submitted for review (letter from J. Stokes, March 20, 1986).

b. Environmental impacts: The general policy of the National Historic Preservation Act of 1966 (NHPA) is to encourage preservation of the nation's historic and cultural resources for future generations. NHPA Section 106 requires federal agencies to consider the effects of their actions on historic properties.

Historic and Architectural Resources

Inasmuch as the Belfort Hydroelectric Plant is a Historic Property, issuing a license for the continued operation and maintenance of the Belfort Development under the protection afforded by Section 106 of the NHPA, is generally to be considered a beneficial effect. Repairs or other activities to historic structures that are limited to in-kind replacement of historic fabric or features (i.e., replacement with new fabric that duplicates the old in terms of materials, design, size, color, and texture) would have no adverse effect upon the characteristics that qualify the Belfort Hydroelectric Plant for listing in the NRHP.

Activities requiring replacement other than in-kind, and activities involving new construction, partial demolition, or total demolition within the project boundaries could potentially have an adverse effect upon the characteristics that qualify the Belfort Hydroelectric Plant for listing in the NRHP. The

potential impact would depend upon the nature and scope of the activity.

Archeological Resources

For all eight developments, there are no recorded prehistoric or historic archeological sites eligible for listing in the NRHP within the project boundaries. Nevertheless, there is still the possibility that there could be undiscovered properties in the project area that could be adversely affected by project construction or operation. If properties are found during project construction or operation, or if NMPC undertakes ground-disturbing activities other than those approved in any license issued for the project, the licensee should consult with the SHPO; based on consultations with the SHPO, prepare a plan describing the appropriate course of action and schedule for carrying it out; file the plan for Commission approval; and take the necessary steps to protect the discovered properties from further impact until notified by the Commission that all of these requirements have been satisfied.

Our Analysis

NMPC retained Duncan Hay to evaluate the history of hydroelectric facilities in New York State and to develop a Cultural Resources Management Plan (CRMP) for the developments that are in or eligible for listing in the NRHP. The study produced a 13 volume inventory of hydroelectric facilities in New York State, a historical context for hydroelectric facilities in New York State, and included Level 3 Historic American Building Survey/ Historic Architectural and Engineering Record (HABS/HAER) documentation6/ of these facilities.

CRMPs are required to conserve the existing historic fabric and features of National Register eligible projects to the greatest extent practicable within the framework of continued "use", i.e., operation. NMPC submitted and the SHPO approved a draft CRMP for all of its projects in New York State.

Programmatic Agreement

To ensure that the provisions of the system-wide CRMP are reviewed, refined, and enacted, we recommend that the Commission; Advisory Council on Historic Preservation (ACHP); and the SHPO, with NMPC as a concurring party, execute a Programmatic Agreement (PA) before a license is issued for the Beaver River Project. The PA should stipulate further review and refinement of the CRMP and require that the revised CRMP be filed with the Commission for approval within 2 years of license issuance.

6/ Level 3 HABS/HAER documentation includes field notes and photographs.

NMPC prepared a draft PA in response to a request for additional information in August and September 1992 covering nine separate projects and the Moreau Manufacturing Company Feeder Dam Project in New York State currently undergoing relicensing. The draft PA was submitted on September 14, 1993, following review and approval by the SHPO (David Gillespie, SHPO, August 31, 1993). We modified the draft PA to conform with the general format and stipulations for hydroelectric projects approved by the ACHP in 1993. We are circulating the revised draft with this EA to NMPC, the SHPO and the ACHP for their review and approval.

c. Unavoidable adverse impacts: None.

6. Aesthetic Resources

a. Affected environment: In this section, we discuss the project's overall aesthetic character and summarize the various minimum flows that have been considered at the Beaver River Project developments.

Overall Aesthetic Character

We describe the regional landscape and the landscape immediately surrounding the project area in Section V.A. Although there are many similarities between the eight developments in landform, elevational changes, vegetative cover, and adjacent land uses, the project facilities themselves also influence the character of the aesthetic environment. For example, the existing penstocks are probably the biggest visual obtrusion for the Beaver River hydroelectric developments. They are large; usually divide access roads and public viewing from the bypassed reaches and river; and are painted bright, metallic, and with extremely noticeable colors. Each development has its own distinct visual features, and therefore, its own aesthetic issues and character. We discuss these in the following section by development.

Moshier - The landscape in the area of the Moshier Development has several aesthetic characters: a serene, tranquil, and relatively undeveloped impoundment; a rugged access road that is separated from the bypassed reach by the visually obtrusive penstock, which is buried on its upper end and is an exposed metallic, light blue steel pipe on its lower end; a bypassed reach that is naturally vegetated and follows the water through a series of plunge falls, small cascades, riffles and rapids; and a small, brick powerhouse and substation which, with the nearby parking area, overhead transmission lines, and surge tank, appears to have been cut into cleared areas in the woods.

Despite the man-made intrusions in the area, the overall landscape character is one of wilderness, especially in the bypassed reach and the impoundment. The bypassed reach and impoundment are of exceptional visual quality.

Eagle - The overriding character of the Eagle Development is of a remote area used for recreation: hiking, rock-climbing, boating, and cross-county skiing. Special scenic areas include the impoundment and the bypassed reach.

There are seasonal camps along the roads leading to the impoundment and along the southern side of the impoundment. Along the northern edge of the bypassed reach are cliffs that are used for rock-climbing. The above-ground penstock prevents views of the bypassed reach from the access road, which provides access to the Moshier impoundment, but it also prevents views of cars from the bypassed reach, thereby adding to the wilderness experience within the reach. The metallic light blue color of the penstock is visually intrusive within the rural character along the Eagle bypassed reach, where there are existing and proposed recreation activities. The concrete powerhouse and substation are located near the end of the portage route. Where it has not been cleared for hydroelectric facilities, access road, or seasonal camps, the Eagle Development is woodland.

Soft Maple - Because of the size and topography of the Soft Maple Development, there are many enclosed viewsheds. There are also many "subcharacters," although the overriding character is one of a large water body with gently rolling and wooded adjacent landforms, with a small amount of human activity visible in the seasonal camps, recreational areas, man-made landforms, fencing, and hydroelectric facilities. The bypassed reach seems remote and very rural, while the impoundment and its edges display the effects of human use. Conspicuous features include rather extensive fencing, gravel and sand pits, a large earthen embankment built to dam the impoundment (the terminal dam), and the brick powerhouse structure. It is a large and relatively accessible development, and there are formal and informal trails throughout the area.

The eastern part of the Soft Maple impoundment is within the Adirondack Park, and the park's southern limit is downstream of the spillway. The land on both sides of the river is privately owned, and it is classified by the APA as "Resource Management." There are many privately owned camps and summer homes along the shores, providing for recreational use of project lands and waters.

There are many recreational opportunities at this development because it is accessible by vehicle and there is a large amount of land between the impoundment and intake and the bypassed reach. Because of the changing landforms, vegetation, and water's edges, there is a great variety of views.

Effley - The land surrounding the Effley Development is heavily forested with a mixture of hardwoods and evergreens. Summer homes on the southern shore of the impoundment provide for recreational use, and the impoundment area is serene and wooded,

with a remote/rural character. When viewing the development from downstream, the concrete dam is overwhelming in its size and width, although the bypassed reach itself is an attractive, rolling, rock plain, with a small waterfall leading to the tailrace. The powerhouse is an attractive brick structure, nestled into the wooded slope adjacent to the dam. The character of this development is a rural, wooded waterway, with hydroelectric development and summer homes as evidence of human presence.

There is an area of erosion at the north end of the dam, and there are several small piles of construction and maintenance debris near the powerhouse and intake canal. Special scenic areas include the entire impoundment, and the bypassed reach to a small extent, although it is very small and relatively inaccessible to the public, even from the portage trail. The existing portage trail is on the north side of the bypassed reach, but it is not visually connected to it.

Elmer - The Elmer Development is surrounded by heavily forested land, and it has a character of remote/rural forest. The only access to the area is via a gravel road owned by NMPC. There is no current public or private use of the immediate area other than by NMPC.

The existing canoe portage traverses the northern side of the bypassed reach, opposite the powerhouse but well away from the water's edge, and it is not visually connected with the development except at the put-ins and take-outs. Downstream of the Elmer Development, land use, vegetation, and population density changes.

Taylorville - Taylorville and Belfort are the two developments most visible to the public, Taylorville because of its high level (relative to the other developments) of existing and proposed recreation, and Belfort because it is visible from an adjacent state road. Because of this public visibility, aesthetic issues at these two developments are significant.

Other than a few camps on the southern shore and one on the northern shore, there is very little development on the Taylorville impoundment. Most of the surrounding landscape remains heavily wooded. A small area located approximately 0.25 mile upstream of Taylorville dam along the north shore is presently being used for agricultural purposes, and cultivation of the soil occurs to within several feet of the water's edge. A parking and picnic area provides access to the impoundment and bypassed reach in conjunction with the canoe route. The parking area is among the trees, and it is of an appropriate character for a recreational site in a rural setting. There is an adjacent picnic area and another existing and proposed picnic area on a broad expanse of rocks at the upper end of the bypassed reach. The bypassed reach itself meanders for approximately 1 mile,

varying between rapids; riffles; small falls; a large pond area; and, at its lower end, a broad expanse of gently falling riffles. An existing swimming area is located one-third of the way down the reach, near the "falls" and pond. Although NMPC does not encourage public use of the lower bypassed reach, many visitors picnic, swim, and view the river here.

Hydroelectric structures affect the aesthetic resources of this development. The dam itself is unremarkable, except for graffiti and other indications of public use and abuse, on the dam and throughout the development. The picnic area in the bypassed reach is gated to prevent vehicular access. The penstock, which parallels the access road (which is the proposed portage trail at its upper end), is painted a metallic light blue-green and is visible through the vegetation from many areas of the development, detracting from its rural character. The powerhouse is an attractive stone structure, but it is overwhelmed by the adjacent wood surge tank and enormous transmission line substation. Several high and low transmission lines cross the river from the substation. Several residences owned by NMPC are located behind the substation, along the access road.

Special scenic areas and viewing areas include the picnic area overlooking the impoundment and the entire upper end of the bypassed reach, which is removed visually from the powerhouse, substation, and transmission lines.

Belfort - The Belfort impoundment and dam are visible from Erie Canal Road, which bisects the impoundment and dam on one side and the powerhouse on the other, crossing the intake canal. It is a state road, and traffic on it travels at about 40 mph. Although population density is relatively low in this area, because of its high visibility from the road, aesthetics at Belfort are of special concern.

The impoundment is primarily forested, with several islands and several permanent homes on its western end near the roads. A small parking area along the road near the dam allows public viewing of the impoundment, but it is somewhat separated from the impoundment by a low concrete wall and vegetation. The historic powerhouse is not readily visible from the public road or pedestrian areas. Although a substation and transmission line on Erie Canal Road, opposite the dam, appear utilitarian, they do not necessarily detract from the aesthetic environment, which displays many man-made structures.

The bypassed reach is particularly attractive, being cut into a steep gorge with vegetation on the southern side, and tall concrete and stone retaining walls on the northern side. The view of it is, however, not accessed by any designated public paths. Below the powerhouse, in the area designated for the

portage route, the steeply sloping hillside is forested with trees and underbrush.

The special scenic area at this development is the impoundment and dam, as viewed from the road and areas designated to receive pedestrian improvements.

High Falls - The area along the southern side of the High Falls impoundment is forestland. Along the northern side there is brushland from abandoned agricultural activities. There is very little development in the area around the impoundment. Public access to the area is limited to the northern shore where Old State Road crosses over the mouth of the Balsam Creek. There are several summer homes on the southern shore, near the dam and powerhouse.

The impoundment is very scenic, with the same rural (not wilderness) character that is seen at several of the other developments. Islands dot the impoundment, and NMPC proposes primitive campsites there. While the dam itself is an enormously tall and overwhelming structure when seen from below, in the bypassed reach, the reach itself is a winding and falling rocky stream bed with steeply sloped, vegetated banks on both sides. Because the proposed canoe portage route is distant from the bypassed reach, and not visually accessible to it, the public will see the dam and bypassed reach only if they choose to walk down the steep slope to it. A small number of people do use the reach for wading in the summer months. The brick powerhouse and substation are inaccessible to and not readily visible by the public. The blue-painted penstocks, while not in character with the rural landscape, do not necessarily detract from it because they are not easily seen by the law-abiding public.

This development is most frequently viewed from the public road at the northern edge of the impoundment mentioned above, a location from which the hydroelectric facilities are not apparent. The most scenic area of this development is the impoundment itself.

Minimum Flows

Under the existing license, minimum flows are provided at four of the eight developments: Moshier, Eagle, Soft Maple, and Taylorville. Table 5 summarizes the existing minimum flows. It also summarizes the study flows released by NMPC and viewed at the site visit or recorded on videotape on September 13, 14, and 15, 1993.

Table 5. Table of Minimum Flows in Bypassed Reaches (cfs).

Development	Existing Flow	Site Visit/ Videotape Flows	Settlement Flow
Moshier	30	30,90/35,58	45/12 mos
Eagle	30	150[2]/37,58	45/12 mos
Soft Maple (south channel)	20	30/26,44	35/12 mos
Effley	0	10,20,60,90	20/12 mos
Elmer	0	10,20,60,90	20/12 mos
Taylorville	30	90,120/30,65	60/12 mos
Belfort	0	10,20,60,90	20/12 mos
High Falls[1]	0	10,30,60	30/12 mos

[1] 250 cfs base flow required from powerhouse for downstream treatment plant.

[2] Uncontrolled flow at the time of the site visit.

b. Environmental impacts: Because NMPC does not propose any new structures that affect aesthetic resources, aesthetic assessment of the Settlement focuses on three areas: the visual impact of proposed recreational enhancements on the overall aesthetic character of the developments; minimum flows in the bypassed reaches; and reservoir fluctuations.

Overall Aesthetic Character

NMPC proposes recreation enhancements that include downriver boating, whitewater boating, camping, picnicking, and access to project bypassed reach and reservoirs for boating, fishing, hiking, swimming, and scenic viewing. The amount, size, and type of materials proposed for enhanced recreational resources would greatly affect the visual experience at each of the developments. New canoe portage trails and access trails for hiking and scenic viewing would involve new trail construction; new signage, kiosks, and trail markers proposed throughout the project boundaries would be very evident visual elements; picnic tables, grills, trash receptacles, and rest room facilities at the Soft Maple and Taylorville Developments would be new visual elements in the landscape; new parking facilities and parking barriers at Moshier and Soft Maple would have a visual impact; campsites, both primitive and tent/RV sites would affect the aesthetic character of the High Falls and Soft Maple Developments; and boat launches at Taylorville and Soft Maple would be visible from the impoundments.

NMPC exhibits describing the proposed recreation enhancements in response to a request for additional information from the Commission indicate design solutions for recreational enhancements made of those materials most appropriate for the environment of each development. The materials vary between the developments for added interest and appropriateness, but the design solutions maintain consistencies in path widths and signage typeface and logos, for example, so as to make the recreational system apparent.

Our Analysis

We generally concur with NMPC's proposed approaches to the design solutions for the recreational enhancements proposed and their overall effect on aesthetic resources. Implementation of the solutions proposed would satisfactorily blend with existing conditions to maintain current aesthetic character.

Because of whitewater boating releases, the project areas would receive significant and increasing visitation. Aesthetic issues relative to whitewater boating include both those for the days of the events, and those following the events. To maintain and promote a maximum aesthetic and overall experience, on the days of whitewater releases NMPC should control parking, vandalism, and safe use of the sites. Following the events, NMPC should clean the areas, repair any damage to structures and vegetation, and return the areas to their original condition.

Primitive campsites should be maintained by NMPC in a pristine condition. Picnic facilities should be supplied with an adequate number of acceptable-looking trash receptacles, which could be reduced in number during months of lower visitation to increase the wilderness experience. Grills and picnic tables should be maintained in an acceptable condition. Because of the potential for trash receptacles to attract bears, this provision should not be considered mandatory. If trash receptacles are not provided, the area should be regulatory policed for trash and litter.

Many aesthetics issues pertain to maintenance, which is an essential and critical component of the visual quality of all of these developments. The public should perceive that NMPC is generously opening these lands to the public, cares about the lands, and is willing to maintain them, despite their remoteness. It has been shown in other areas and parks that this attitude can be perceived by the public, and will be reciprocated by the majority of the people using the areas. Through maintenance, vandalism should be kept to a minimum, and each development's offered experience, be it wilderness, remote, or rural, would be maximized.

As described in the previous section, the existing penstocks are probably the biggest visual intrusion for the Beaver River

hydroelectric developments. While they cannot be hidden from view, they should be made as visually unobtrusive as possible. We recommend, therefore, that the colors of the penstocks should be revised during the next scheduled maintenance painting. Plans for repainting should be submitted to the Commission for approval.

Minimum Flows

The Settlement includes proposed minimum flows at all eight developments. We summarize these flows in Table 5 and present our assessment in the following section.

Moshier - The minimum flow offered in the Settlement is 45 cfs. At 30 cfs, the reach appears as a natural mountain stream with alternating riffles, rapids, open water, and waterfalls. The noise level is pleasant and mostly calm. At 56 cfs, the increased flow adds noise, covers more of the reach width, and adds excitement with increased rapids, riffles, and falls. Based on assessments of these flows, 45 cfs appears as a briskly moving mountain stream and would offer a pleasant noise level with a flow that highlights the rapids, riffles, and falls that are visible in this reach.

Eagle - The minimum flow offered in the Settlement is 45 cfs. At 37 cfs, the bypassed reach appears as a calm stream, with enough flow to maintain interest through the small falls, riffles, and rapids. Because of the very wide and deep channel in some areas, the flow provides only approximately 10 to 20 percent coverage of stream width with many exposed boulders and stones in the channel. Fifty-eight cfs adds interest, especially at the falls. Coverage increases only marginally in the wide channel areas. There is no significant increase in noise except at the falls. Based on the assessment of these flows, at the proposed 45 cfs the river in the bypassed reach would appear calm, with some visual and auditory interest generated at the falls.

Soft Maple - The minimum flow offered in the Settlement is 35 cfs. At 26 cfs, the bypassed reach appears as a meandering stream, with shallow pools, riffles, rapids, and two waterfalls. It is pleasant and calm, with an adequate noise level. At 44 cfs, the channel carries perceptibly more water, yet the character is mostly unchanged from 26 cfs, except at the waterfall, where volume, noise, and visual interest increased. Based on the assessment of these two flows, the character of the reach at 35 cfs would be a meandering stream with particular visual and auditory interest generated by the flow over the waterfalls.

Effley - The minimum flow offered in the Settlement is 20 cfs. Aesthetic assessment of minimum flows in the Effley bypassed reach must take into account several site-specific

factors: the reach is very short, it is very broad and rocky at its upper end and channelized into a small waterfall at its lower end, and it is not very visible to the public, even from the canoe portage route. At 10 cfs, the flow appears only as a trickle in the enormous channel. A small waterfall at the powerhouse is somewhat interesting. At the proposed flow of 20 cfs, there is perceptibly more water than at 10 cfs, but the character is unchanged.

Elmer - The minimum flow offered in the Settlement is 20 cfs. As discussed at Effley, aesthetic assessment of minimum flows in the Elmer bypassed reach must take into account several site-specific factors: the reach is very short (shorter than Effley); it maintains a broad and rocky constant width for its entire length; it is straight (less visually interesting); and it is not very visible to the public, even from the canoe portage route. At 10 cfs, the flow appears only as a trickle, and it is not interesting. At the proposed 20 cfs, the flow is somewhat interesting, but provides very little coverage in the channel.

Taylorville - The minimum flow offered in the Settlement is 60 cfs. Relevant observations were made at 65 cfs and the difference between the flows is not considered significant. At 65 cfs the bypassed reach appears as a rushing stream, and in the rapids and falls areas there is an air of excitement due to whitewater, spray, and noise. The flow is visually appealing.

Belfort - The minimum flow offered in the Settlement is 20 cfs. The flow is released from the southern end of the dam and is visible primarily to south-traveling vehicles and pedestrians. The proposed flow of 20 cfs is interesting and provides some coverage of the dam and channel.

High Falls - The minimum flow offered in the Settlement is 30 cfs. There are several site-specific issues to consider when discussing minimum flows at High Falls: the size of the dam is visually overwhelming in the bypassed reach; the width of reach near the dam is very wide; visibility within the reach is poor due to extensive vegetation; and the public does not access the reach, except for an occasional wader (the canoe portage is well removed from the reach). The proposed flow of 30 cfs has marginally more water, interest, and noise, especially at the downstream end where the channel narrows, than 10 cfs, which is best described as a "trickle."

Our Analysis

Minimum flow levels in each of the bypassed reaches are largely responsible for defining the reach's character in terms of magnitude, sound, and spray. Variations in flow alter these characteristics. Lower flows may expose rock formations or vegetation that is submerged at higher flows. At higher flows, the character may be explosive and powerful, or there may be only

a negligible difference in character if the reach is very broad and flat, and it takes a great deal of water to change the percentage of the reach under water. Sound and spray levels can generally be expected to increase with flow level.

In general, all flows proposed in the Settlement would be acceptable for visual resources and enhancements over the minimum flows in the existing license. At Moshier, because of its wilderness designation and isolated location, the proposed flow of 45 cfs would be a level of water expected by the average visitor, and in conformance with its surroundings. The 45 cfs proposed for the Eagle Development is acceptable due to its relatively isolated location, and limited recreational interest (canoeing and rock-climbing).

At Soft Maple, the proposed 35 cfs would be between the two flow levels discussed, both of which show the Beaver River in this reach as a relatively calm stream. This level is acceptable, and would provide an enjoyable experience for visitors.

A particular consideration relative to the analysis of both the Effley and Elmer bypassed reaches is the private nature of the developments. At Effley, it would take very high flows to have any visual impact in this reach, and then it would be questionable as to how many people would see it. The higher flows studied at Elmer were aesthetically more appealing, but also would not be viewed by many people. We agree that the proposed 20 cfs at each development would be acceptable.

At Taylorville, we concur with the 60 cfs as the appropriate minimum flow. At Belfort, which is the most visible bypassed reach, the flow over the dam is visible primarily to south-traveling vehicles and pedestrians. Based on our assessment of the aesthetic values of minimum flows, 90 cfs is the best alternative, and even higher may be better. It provides greater coverage of dam, and therefore some visibility of dam for north-traveling vehicles. Given the development's size and the relatively low population density of the area, however, the proposed 20 cfs is acceptable. At High Falls, 30 cfs seems acceptable to allow the Beaver River to maintain a watered appearance with some visual interest.

In terms of visual resources, we support the creation of the BRAC proposed in the Settlement. Aesthetic issues that may arise during the 30-year license that are currently nonexistent may be addressed by the Committee. Increased population density and/or recreational visitation may have a great impact on the aesthetic resources within the eight developments.

Reservoir Fluctuations

The Settlement states that reservoir fluctuation would be limited to from 1 foot to a maximum of 3 feet, the fluctuation limits being defined for each development, and varying with low flow periods and nesting seasons.

Our Analysis

The reservoir fluctuation limitations as outlined in the Settlement attempt to minimize fluctuations. Minimizing fluctuation is also a goal for the protection of visual resources, as vegetation along the water's edge can remain stable. If the water requirements of the project are met during low flows, the benefits of the 1- to 1.5-foot fluctuation can be realized. If HRBRRD can not supply sufficient water, fewer benefits will result. However, even the 3-foot maximum drawdown represents an enhancement compared to present conditions, as discussed previously in Section V.C.2.

c. Unavoidable adverse impacts: There would not be any unavoidable adverse impacts on aesthetic resources. There would, however, be a cumulative beneficial impact as a result of implementation of the agreements in the Settlement.

7. Recreation Resources

a. Affected environment: We identified downriver boating, whitewater boating, camping, picnicking, and access to project reservoirs and bypassed reaches for fishing, boating, hiking, swimming, and scenic viewing as recreation resources that can be affected in a cumulative manner by the Beaver River Project. A sign-in log maintained by NMPC at Moshier Development for the years 1984 and 1986 through 1989 indicated that hiking was the most highly recorded activity. It was followed in descending order of use by camping, fishing, swimming, canoeing, and sight-seeing.

Downriver Boating - The Beaver River Canoe Route

The Beaver River Canoe Route extends along 12 miles of the Beaver River. The route begins at the head of the Moshier impoundment and ends at the western end of the Taylorville dam impoundment. The flatwater paddling route meanders through the series of five water impoundment areas created by the power development sites. There are four portages around dams and bypassed reaches at the Eagle, Soft Maple, Effley, and Elmer Developments. Canoe put-ins and portage routes are identified by brown signs with yellow letters. Portage routes are also blazed on trees with green paint.

Whitewater Boating

Currently, there is no whitewater boating within the boundaries of the Beaver River Project. In 1991, however, NMPC published the "System-wide Whitewater Recreation Plan" assessing the potential whitewater recreation at all the NMPC-owned hydroelectric projects. The plan was developed in consultation with representatives of organizations interested in whitewater recreation in New York. The Moshier and Taylorville Developments were identified as 2 of 16 sites with potential for whitewater recreation. For whitewater boating to occur in the bypassed reaches of these developments, NMPC would have to provide a scheduled release of sufficient flows.

Specific studies addressing whitewater recreation use were conducted on the bypassed reaches of the Taylorville and Moshier Developments to assess the feasibility of using these reaches for whitewater boating. A whitewater feasibility study for 0.8-mile in the Taylorville bypassed reach was conducted on October 14, 1989. Eleven paddlers of intermediate, advanced, and expert skills and two to sixteen years experience participated in the study. Whitewater features within the reach include four chutes and one 8- to 10-foot waterfall.

Study releases at Taylorville were provided at 230, 320, and 420 cfs. At 230 cfs, the participants rated the reach as Class III to IV for intermediate to advanced skill levels. They found this level to be a good intermediate training run, but tough on low volume boats and hazardous at many of the drops. At the 320 cfs level, the paddlers rated the whitewater as Class III to V for skill levels of intermediate, advanced, and expert. They found the run to be challenging for novice boaters, but the water levels were too shallow for low volume boats and there was a potential to cause injury in a flip. At 420 cfs, they rated the whitewater as Class IV to V for skill levels of intermediate, advanced, and expert. The consensus of the paddlers was that the 420 cfs flow creates the safest conditions. The overall evaluation of the reach was that it provides good quality, fun water for advanced paddlers and that the reach offers a unique combination of low risk and high drops with big pools for easy recovery in case of a swim (NMPC, 1991).

A paddling feasibility study for the 2.1-mile Moshier bypassed reach was done on June 11 through 12, 1993. The reach includes two 15-foot waterfalls, two 3-foot waterfalls, and three chutes through narrow gorges of 30-, 450-, and 500-foot-length. The average gradient of the reach is 54 feet per mile. Ten paddlers participated, and they concluded that at flows of 250 and 400 cfs the Moshier bypassed reach is rated Class III to V for intermediate to expert paddlers.

Camping

The Soft Maple Development provides the only camping sites within the Beaver River Project boundaries. Seven primitive campsites are located on a peninsula of land on the west shore with access from Eagle Falls Road, just south of the channel that diverts water to the lower reservoir. These sites are principally for canoeists paddling on the Beaver River Canoe Route, though there is easy access to the campsites by vehicle from Eagle Falls Road. Islands within the Soft Maple and High Falls impoundments are used informally as campsites, but NMPC does not maintain or manage them.

Picnicking

There are formal picnic areas located at the High Falls and Taylorville Developments. At High Falls, NMPC and Lewis County jointly operate a day-use area on the north end of the impoundment. There is parking for 10 cars and a stone dust path down to a car-top boat launch. There is also a picnic area with two picnic tables, grills, and trash receptacles. At Taylorville, there is a small picnic area adjacent to the north end of Taylorville, dam on the west shore of the impoundment with parking for 8 to 10 vehicles.

Informal picnicking at undeveloped areas occurs at several places within the project boundaries, especially in areas where there are scenic amenities, good trail or footpath access, and/or ease of access from local roads. The bypassed reach of the Soft Maple Development and an area adjacent to the Soft Maple canoe campsites are popular spots.

Access to Recreation Resources

In addition to downriver and whitewater boating, camping, and picnicking, there are several other recreation activities that we identified that use the project's recreation resources. These include fishing, swimming, hiking, and snowmobiling. These activities are affected by the access provided to project reservoirs and bypassed reach via parking areas, boat launches, and trails or footpaths.

At Moshier, facilities that support these recreational activities are centered near the powerhouse and the Sunday Creek parking lot. NMPC (which maintains a trail register) and NYSDEC jointly operate the lot. It provides parking for 15 to 20 vehicles, and anglers use the lot for access to Sunday Creek and the Beaver River. The lot also provides parking for hikers to access trail connections and footbridges over the Beaver River and Sunday Creek to access hiking trails in the Pepperbox Wilderness north of the site. There is also access to a hiking trail that originates at the lot and runs along 3/4 of the length of the south bank of the bypassed reach.

At Soft Maple Development, there are several trails that provide access to the 8,340-foot bypassed reach from Soft Maple Road for fishing, hiking, and scenic viewing. The bypass begins at a spillway at the west end of the upper reservoir adjacent to the head of the diversion canal and continues to the tailrace of the powerhouse. Minimum flow in the bypassed reach is 34 cfs. One trail to the bypass results from a heavily used snowmobile trail that passes through the area and crosses the bypassed reach on a crude log bridge. Other informal trails provide access to the bypassed reach for picnicking, swimming, fishing, and scenic viewing.

Fishing takes place in bypassed reaches and project reservoirs. Overall fishing in the bypassed reaches within the project boundaries is rated poor to fair. Creel censuses for the bypassed reaches indicate that the fish caught include yellow perch, brook trout, brown bullhead, chain pickerel, pumpkinseed, white suckers, and rock bass.

At the Taylorville Development, access to the impoundment reservoir for boating and fishing is provided by a car-top boat launch adjacent to the north end of Taylorville dam on the west shore of the impoundment. There is parking for 8 to 10 vehicles. Several trails also provide access to the bypassed reach from the north. Fishing occurs in both the impoundment and the bypassed reach. Smallmouth bass, bluegill, pickerel, and perch are caught in the impoundment. Brook trout are caught in the bypassed reach. Swimming in the bypassed reach takes place in pools below the dam.

At Belfort, the principal recreational use of the development is for boating and fishing. Access to the impoundment for boating and fishing is provided from Erie Canal Road at the south end of the dam. There is parking for 6 to 8 vehicles and a canoe launch at the bottom of a steep bank to the shore of the impoundment. The bottom drops off abruptly at the shore to a depth of 3 to 5 feet.

Access to the High Falls impoundment for boating and fishing is provided from the north shore via a car-top boat launch on Old State Road. The boat launch was cooperatively developed by NMPC, Iroquois pipeline, and Lewis County.

Access for Persons with Disabilities

Persons with disabilities have access to trails at High Falls and access to the water below the powerhouse at Soft Maple.

b. Environmental impacts: We identified opportunities for enhancing downriver and whitewater boating, camping, picnicking, and improving access to recreation resources at project facilities for fishing, hiking, swimming, and scenic viewing. NMPC has proposed several recreation enhancements.

These proposed enhancements were modified and supplemented by the Settlement.

Downriver Boating - Beaver River Canoe Route

NMPC proposes several enhancements to the Beaver River Canoe Route, including extension of the route beyond Taylorville to High Falls and thus encompassing the full 18-mile reach of the Beaver River Project. As part of the extension and enhancement of the canoe route, NMPC proposes new portage trails and associated access points for put-ins and take-outs at Taylorville, Belfort, and High Falls. New canoe access points are also proposed at Moshier, Soft Maple (with access to the upper impoundment at Effley), Taylorville, Belfort, and High Falls adjacent to Old State Road.

Our Analysis

The addition of new portages at Moshier, Taylorville, Belfort, and High Falls would allow extension of the route for the full 18-mile reach of the Beaver River within the project boundary and its further extension downriver and upriver to more of the Beaver River and beyond. Provision of benches and canoe rests along the longer portages at Taylorville and Eagle would enhance use of these portages. Creation of primitive campsites on islands and isolated peninsulas within the Soft Maple and High Falls impoundments would enhance the wilderness recreation experience some canoeist may seek by providing camping sites away from other human activity.

At the Belfort Development, the Erie Canal Road runs in a north and south direction through the site connecting Old State Road to the north with Belfort and Effley Falls Road to the south. It has a significant influence on recreational use of the development by improving access to the development and causing a significant obstacle to canoeists who portage downriver. Traffic in this area could be particularly hazardous to a person portaging a canoe across the road. We recommend that NMPC be required to consult with the appropriate highway safety officials to determine the proper road crossing precautions that should be installed in this location and that any recommended warning and safety measures be installed prior to any measures that would publicize the portage or encourage its use.

The expanded Beaver River Canoe Route probably would generate increased use by canoeists. Canoe put-ins and take-outs are particularly sensitive to erosion from increased traffic. NMPC should monitor the canoe put-ins and take-outs for signs of erosion and take corrective actions when necessary to prevent such erosion. Particular attention should be paid to the take-out at the Effley Development, where there is evidence of bank slumping in the vicinity of the canoe take-out.

Whitewater Boating

Based on the whitewater paddling feasibility studies, the Settlement includes proposed whitewater releases at the Moshier, Taylorville, and Eagle Developments (see NMPC's proposed flows in Section V.3.b). Releases would be coordinated among the three developments, and the release schedule could be altered after consultation with BRAC. The total of all releases, however the schedule is structured, would not exceed the equivalent of 96,600 kilowatt-hours (kWh).

In addition to the flows at these developments, at Moshier, to provide access to the upriver end of the bypassed reach for whitewater boaters, NMPC would develop a new car-top boat launch with a gravel parking lot for four vehicles below the impoundment. The gated, limited access road beginning adjacent to the Sunday Creek Brook parking lot would be opened to allow vehicle access to the upper reach.

Our Analysis

The proposed whitewater releases for the Moshier, Taylorville, and Eagle Developments open up a recreational resource previously not available within project boundaries. Both the Moshier and Taylorville sites were identified in NMPC's 1991 "System-wide Whitewater Recreation Plan" as having potential for whitewater boating. At Moshier, releases in September and October would provide water at a time of year when water was previously unavailable.

The feasibility studies showed that the reaches and flow levels are most appropriate for advanced to expert paddlers, which would preclude use of the resource by paddlers of lower skill level. Nearby releases downriver on the Black River at Watertown, however, are rated Class II and III and provide opportunities for beginning and intermediate paddlers.

A whitewater paddling feasibility study was not done for the Eagle bypassed reach, so it is difficult to assess whether the proposed release of 200 cfs is adequate. The bypassed reach is 3,855 feet long (0.7 mile). It includes an 8- to-10-foot waterfall. AWA and other representatives of whitewater interests familiar with the feasibility studies for both the Taylorville and Moshier bypassed reaches, however, based their recommendation of 200 cfs on first-hand observations of the reach and their experience of paddling similar flows in the other two reaches.

The Settlement does not give the exact timing of the releases at the three developments, but indicates that NMPC and AWA, in consultation with BRAC, would determine the schedule. This allows for flexibility in coordinating the releases, thus allowing adjustments to flow and changes in the release schedule to create optimum conditions and timing of releases. This is

important for new whitewater runs where there is no user history. The Settlement provides for consultation with BRAC to make any necessary adjustments.

Too much flexibility, especially at a new site, may also be detrimental if schedule changes are not publicized well in advance. Many paddlers probably would be traveling at least 1 to 2 hours to the site. We recommend that NMPC make public the release schedule (including dates, flows, and level of difficulty according to the International Scale of Difficulty) as early as possible in the paddling season and provide a mechanism for potential paddlers to check the schedule and make travel arrangements in advance of the scheduled releases.

Camping

NMPC proposes to enhance camping opportunities by adding new campsites at the Soft Maple and High Falls Developments. At Soft Maple, 10 new campsites would be developed on the peninsula of land presently used for primitive canoe camping. The new sites would have running water and accommodate tents, trailer campers, and recreational vehicles. A new 1,000 square foot caretaker's cabin and 500-square-foot garage would be built adjacent to the campsites. The canoe campsites presently in this area would be relocated to seven new primitive campsites on the islands and remote peninsulas of the upper reservoir. An 800-foot gravel road would provide vehicular access to the new sites. Five new primitive canoe campsites are also proposed for two of the islands in the High Falls impoundment.

Our Analysis

NMPC's proposal would increase the total number of campsites available within the project boundaries from 7 to 22, thus enhancing camping opportunities in the project area. The addition of tent camping and recreational vehicle sites creates camping opportunities not previously available at the Beaver River Project. The creation of primitive campsites on islands and isolated peninsulas in the Soft Maple and High Falls impoundment would enhance the quality of the wilderness recreation experience some canoeists may seek in paddling the Beaver River Canoe Route. The addition of sites in the High Falls reservoir complement the proposed extension of the Beaver River Canoe Route by creating campsites at what would become the furthest downriver location for camping within the Beaver River Project boundaries and anticipates use by canoeists who intend to continue downriver outside the project boundaries.

Picnicking

NMPC proposes new and improved picnic facilities for the Soft Maple and Taylorville Developments. NMPC proposes to develop a picnic area for Soft Maple with parking for about 20

cars and a 200-foot trail that would extend south of the parking lot to a picnic area with 15 picnic tables, grills, and trash receptacles. Four restrooms would also be built in the picnic area. At Taylorville, a new picnic area with four picnic tables, grills, trash receptacles, and two restrooms would be developed. Both facilities would be in areas adjacent to a proposed car-top boat launch facility.

Our Analysis

Proposed new facilities would encourage more day use of both areas and would provide site amenities that allow for better management of the areas. Human activity detrimental to the scenic quality of the natural environmental, such as vandalism and unsightly debris, is evident at both sites but should decrease with increased usage and the presence of a staffed caretaker's cottage at the Soft Maple Development. Construction of the new facilities would also probably include an overall cleanup of debris in the general area where the new facilities would be installed.

Access to Recreation Resources

NMPC proposed several new facilities that would enhance access to recreation resources within the project boundaries for fishing, hiking, swimming, and scenic viewing. These include new trails, parking areas, and boat launches at Moshier, Eagle, Soft Maple, Effley, Taylorville, Belfort and High Falls Developments. New signs identifying the facilities would also be provided at all sites, except at Effley and Elmer. New sign-in registers would be provided at Moshier and Belfort. An information kiosk would be constructed at Moshier that would describe the Beaver River Canoe Route and other foot trails in the area.

To enhance hiking conditions in the area, NMPC proposes to install a new footbridge to the Moshier bypass trail. The bridge would be constructed south of the powerhouse to avoid the penstock that blocks other routes.

At Eagle, a new scenic access trail to the bypassed reach for fishing and scenic viewing would be added by constructing a new 150-foot trail to the bypassed reach. The entrance would be midway along the reach under penstock pier #57, where a person can easily walk under the penstock. The area of the reach accessed would provide scenic views upstream to a gorge and "Eagle Canyon" and good fishing in a pool at the foot of the gorge. Signs would mark the access point. Minor road widening would accommodate a parking area for 2 to 4 vehicles.

NMPC proposes several enhancements for the Soft Maple Development that would improve access to the impoundment and the bypassed reach including a new car-top boat launch on the south shore of Soft Maple's upper reservoir. The new boat launch would

be in the same vicinity of the proposed new picnic area, campsites, and caretaker's cabin. There are 20 new parking spaces proposed for the area.

NMPC also proposes recreational enhancements for access to the Soft Maple bypassed reach for hiking, swimming, picnicking, and scenic viewing. A new parking lot for 10 to 14 cars is proposed in the location of an existing gravel pit off Soft Maple Road to provide parking for existing trails with access to the bypassed reach. It would be plowed in the winter to accommodate snowmobile trailers and other winter uses. The entrance to the parking lot from Soft Maple Road would be marked. Signs in the lot would direct people to trails that access the bypassed reach. Further east on Soft Maple Road, signage and roadside parking would be developed to provide access to a 150-foot trail to a scenic overlook of a fall on the bypassed reach. Extension of the formal trail would be limited to preserve the area's wild character.

Access to the Effley impoundment already has been provided by a new parking lot and car-top boat launch at the tailrace of the Soft Maple Development. This was constructed as a joint venture between Lewis County, NMPC, and the Iroquois Gas Transmission System.

Access to the Taylorville impoundment would be improved by the construction of a new car-top boat launch north of the impoundment dam. A 250-foot gravel access road would be extended to the site with roadside parking. New trails to the bypassed reach are also proposed, including 2,800 feet of barrier-free cement and stonedust trails. These would enhance access along the north bank of the bypassed reach.

Access to the Belfort impoundment would be enhanced by a 600-square-foot barrier-free fishing deck proposed for the west shore north of the dam. There would be parking for six cars in a parking lot between the impoundment and Erie Canal Road. Trash receptacles, signs marking the site, and a sign-in register would also be provided.

Access to the High Falls impoundment already has been provided as a joint venture of Lewis County, NMPC and the Iroquois Gas Transmission System.

Our Analysis

NMPC's proposal enhances access to recreation resources. New and improved parking facilities at Moshier, Taylorville, High Falls, and Soft Maple would better accommodate anglers, hikers, swimmers, scenic viewers, and other recreational users of facilities within or abutting the project boundaries. New and improved footpaths and hiking trails would provide better access

to the bypassed reaches at Moshier, Eagle, Soft Maple, and Taylorville Developments for hiking, fishing, and scenic viewing.

NMPC also proposes information kiosks at the Moshier and Taylorville Developments that would be used to provide information about the Beaver River Canoe Route. These would be helpful at developments where recreation opportunities would be expanded.

Access for Persons with Disabilities

In addition to specific enhancements described above for the Belfort and Taylorville Development to provide barrier-free access for persons with disabilities, NMPC proposes to address access for persons with disabilities project-wide. This includes designating reserved parking spaces for persons with disabilities at all parking lots, designing all accessible foot paths to be 5 feet wide to allow passage of two wheelchairs, surfacing paths with rolled crushed stone/stone dust to provide stable, firm, and slip-resistance surfaces, maintaining trail slopes at a maximum grade of 8.3 percent, and providing level rest areas every 200 feet. Paths and trailheads would be posted to indicate the level of difficulty for users with disabilities. Picnic areas would include picnic tables and grills that are designed for use by persons with disabilities. NMPC also proposes to publish brochures that indicate which facilities in the project boundaries are accessible or have special features, such as braille signage, barrier-free tables, or barrier-free rest rooms.

Our Analysis

NMPC's proposal includes specific facilities that would enhance access to recreation resources for persons with disabilities. The descriptions of the proposed new restroom facilities, however, do not specifically state that they would be barrier-free. NMPC has stated that it would enhance access for persons with disabilities. Therefore, we assume that it intends to make the new restrooms accessible for persons with disabilities and will require it in the project license. In addition, NMPC should include as a component of its recreation plan a description of barrier-free facilities within the project boundaries. We recommend that this plan include input from groups representing persons with disabilities.

The Beaver River Fund

The Settlement establishes the Beaver River Fund and Advisory Council. The fund would be administratively managed by NMPC, and used according to the recommendation of the Council. The Council will be chaired by NYSDEC. The membership will include representatives of several federal, state, and local agencies and nongovernmental organizations with interests in the river basin.

NMPC's initial contribution of $80,000 to the Fund would be used exclusively to purchase a 25-foot-wide conservation easement around the Moshier Impoundment, reserve sand and gravel rights along the Moshier bypassed reach and fee title to the abutting acreage to the south, and to obtain fee title to "Eagle Canyon." Subsequent contributions by NMPC to the fund, which may vary depending on events during the term of the license, would be used within the Beaver River basin for as yet unidentified...

> projects and services designated by majority vote of the Council for purposes or ecosystem protection, natural resource stewardship, public education, facility maintenance, and applied research necessary to accomplish these projects and provide these services and additional public access to outdoor recreational resources...

The Settlement states that the fund is not intended for any of the parties [presumably to the Settlement] to carry out any obligations under the license or amendments thereto.

Our Analysis

We do not recommend that the provisions of the Settlement establishing the Beaver River Fund and Advisory Council be included in the license. As discussed elsewhere in this document, we find that other terms of NMPC's proposal and the Settlement provide appropriate enhancement of identified project impacts and, as appropriate, will require NMPC to submit for Commission approval all necessary plans to implement the Settlement, apart from this provision. We are able to discern no direct link between enhancement pertaining to the Beaver River Project and the broadly defined projects and services that would be supported by the Fund, with the possible exception of the specifically identified enhancements related to the initial contribution. Moreover, it would be impractical for the Commission to attempt to oversee NMPC's participation in a fund carrying out future projects and services that may or may not relate to the project and, therefore, may or may not be within our jurisdiction. Thus, we will recommend that the Commission exclude the fund entirely from the license. We note as well that Settlement specifically states that it is not intended to be viewed as a license obligation.

While we will not recommend these provisions of the Settlement be adopted, we recognize that they will provide a benefit to the public and for that reason commend NMPC for its agreement to provide funds and administrative services.

c. Unavoidable adverse impacts: There would be no unavoidable adverse impacts on recreation resources. There would, however, be a cumulative beneficial effect from providing whitewater boaters with improved access to the bypassed reaches

at the Moshier, Eagle, and Taylorville Developments and enhanced recreational flows on a scheduled basis at all three developments. Cumulative beneficial effects would also accrue to downriver boaters by extending the Beaver River Canoe Route 6 miles with improved portages at the Moshier, Taylorville, Belfort, and High Falls Developments.

D. No-action Alternative

Under the no-action alternative the project would continue to operate under the current mode of operation, and no new environmental protection, mitigation, or enhancement measures would be implemented.

VI. DEVELOPMENTAL ANALYSIS

In this section, we analyze the project's use of the Beaver River's water resources to generate hydropower, estimate the economic benefits of the project as defined by the Settlement, and address the economic effects on the project of various measures considered in the EA for the protection or enhancement of environmental and recreational resources.

We base our independent economic studies on current electric power conditions. We do not consider future inflation or escalation of prices. For our economic analysis of the alternatives, we used a total annual operation and maintenance (O&M) expense of $1,102,658 as provided by NMPC in its license application. We include a cost of $1,000,000 for NMPC to prepare the application. NMPC's net investment of $9,450,614 was included in our analysis, as were its recent miscellaneous repair costs of $6,080,000.

We based our estimate of the cost of alternative capacity on an assumed capacity value of $109/kW-year (at a fixed charge rate of 14 percent), which is based on a combined-cycle combustion turbine plant fueled by natural gas (the cheapest, most reasonable capacity addition available). The cost of alternative energy generation is based on natural gas-fueled electric plants in the Middle Atlantic Division of the country. We base our estimate of the amount of fuel that would be displaced on fuel consumption at a heat rate of 6,200 Btu/kWh. We estimated the 1995 cost of fuel based on the Energy Information Administration's 1995 publication: Supplemental to the Annual Energy Outlook, End-Use Energy Prices: Reference Case, Source: Electric Utilities - Natural Gas Combined-Cycle, page 124, Table 12. Using these assumptions, we estimate the annual cost of alternative power would be about $8,196,300 (42 mills/kWh).

A. No-action Alternative

This alternative represents the existing project. Under this alternative, there would be no change in current operation

or facilities. The project would continue to operate in conformance with the requirements of the original license. No enhancement measures would be provided, and the existing environment would not change.

Because there are no enhancements under this alternative, there are no associated construction costs. The annual cost of the existing project, including carrying charges on the net investment, would be about $3,505,600 (18 mills/kWh) for the existing generation of about 197 GWh of energy annually. Therefore, the existing project produces power at an annual cost of about $4,690,700 (24 mills/kWh) less than currently available alternative power.

B. Project as Proposed in the Settlement

This alternative is based on the Settlement between NMPC, agencies, and others, dated February 7, 1995, and amended March 8, 1995. It consists of the continued operation of the Beaver River Project, but with numerous enhancements as agreed upon in the Settlement. Based on current electric power conditions, the net annual benefit of the proposed project would be $4,116,200 in 1995 dollars. In Table 6, we present a summary of the proposed enhancements and of the cost and impact of these enhancements on project benefits.

Table 6. Summary of Project Enhancements as Proposed in Settlement and Related Costs (Source: Staff)

Enhancement	Generation (GWh)	Capital Cost of Enhancements (1995 $)	Current Net Annual Benefit (1995 $)
Existing Project	197.285		$4,690,700
Down River Boating		$32,900	-$4,800
Whitewater Boating	-.097		-$1,700
Camping		$140,700	-$20,500
Picnicking		$44,900	-$6,500
Access to Recreational Resources		$78,200	-$11,400
Access for Persons with Disabilities		$47,800	-$7,000
Reservoir Fluctuation Limits*			-$60,100
Minimum flows in Bypassed Reach	-7.943		-$142,400
New Gate Structures		$295,000	-$42,900

Table 6. Summary of Project Enhancements as Proposed in Settlement and Related Costs (Source: Staff)

Enhancement	Generation (GWh)	Capital Cost of Enhancements (1995 $)	Current Net Annual Benefit (1995 $)
Fish Protection and Conveyance Measures		$235,000	-$34,200
Replacement of Trashracks		$688,000	-$100,000
Minor Channel Modifications		$12,000	-$1,700
Native Brook Trout Transplant Program		$10,000	-$1,500
Streamflow Monitoring			-$111,300
Capital cost:		$160,000	
Annual O&M cost:		$88,000	
Beaver River Fund*			-$28,600
Capital cost:		$80,000	
Annual O&M cost:		$17,000	
TOTALS	189.245		$4,116,200
Capital cost:		$1,824,500	
Annual O&M cost:		$105,000	

* Results in an estimated loss of dependable capacity of 0.55 MW.

* Not part of the project license but included to provide more complete cost information.

C. Comparison of Alternatives to Existing Project

In Table 7, we present a summary of the annual costs for the various alternatives.

The project would be economically beneficial so long as its projected levelized cost is less than the levelized cost of alternative energy and capacity. Based on a 30-year license term, our estimate shows that power from the Beaver River Project would cost about $4,116,200 less than the probable cost of alternative power. While cost estimates over a 30-year license term are necessarily uncertain, we think it reasonable to conclude that the economic benefit to NMPC and the public of issuing a new license would be substantial.

Table 7. Comparison of Economic Analyses of Beaver River Project Alternatives

	Existing Project	NMPC's Proposal (Settlement)
Installed capacity (MW)	45.122	45.122
Annual generation (GWh)	197.285	189.245
Annual power value:		
(thousands $)	$8,196.3	$7,992.0
(mills/kWh)	41.5	42.2
Annual cost		
(thousands $)	$3,505.6	$3,875.8
(mills/kWh)	17.7	20.4
Net annual benefit		
(thousands $)	$4,690.7	$4,116.2
(mills/kWh)	23.8	21.8

In our view, continued operation of the project consistent with the terms of the Settlement would allow NMPC to continue to provide a reasonably priced source of power from a renewable energy resource while also providing substantial benefits for nondevelopmental resources. For this reason, we find the Settlement [other than the Beaver River Fund and Advisory Council provisions, which we do not recommend be included in the license] fair, equitable, and not inconsistent with the public interest. We further find that the project, if operated under a license consistent with the terms of the Settlement, would be best adapted to a comprehensive plan for the Beaver River Basin.

VII. COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE

Sections 4(e) and 10 (a)(1) of the FPA require the Commission to give equal consideration to all uses of the waterway on which a project is located. When the Commission reviews a hydropower project, the recreation, fish and wildlife, and other nondevelopmental values of the waterway are considered equally with its electric energy and other developmental values. In deciding whether and under what conditions, to issue a hydropower license, the Commission must weigh the various economic and environmental tradeoffs involved in the decision.

A. Recommended Action

We evaluated in detail the Settlement and the no-action alternative. As a result, we selected issuance of a new license consistent with the terms of the Settlement [other than the Beaver River Fund and Advisory Council provisions, which we do not recommend be included in the license] as the preferred

option. We recommend this option because the public interest is best served by adoption of the Settlement.

The issuance of a new license for the Beaver River Project with the enhancement measures provided in the Settlement would allow NMPC to continue to operate the project as an economically beneficial, dependable, and inexpensive source of electric energy for its customers. The associated environmental benefits that would occur with this relicensing would also benefit the existing natural resource values in the vicinity of the project (aquatic and terrestrial resources), and other aspects of the existing human environment, including soil conservation, cultural resources, recreation, and aesthetics.

The beneficial effects on the environment associated with relicensing the Beaver River Project would result from the enhancement measures proposed in the Settlement and summarized in Section III.A. The nondevelopment benefits of these measures include the following:

- improved habitat and production conditions for resident fish;
- improved wildlife habitat in the basin;
- improved recreational facilities;
- higher visual quality and lower erosion potential in project impoundments;
- increased knowledge, protection, and educational value of archaeologic and historic resources; and
- improved fish protection at intakes.

Our analysis of the proposed Settlement indicates that NMPC and the resource agencies and other parties have formulated a plan for relicensing that strikes a generally reasonable balance between the developmental values of the project and the associated nondevelopmental resource values. In addition to the benefits of continued hydroelectric generation (Section VI), the provisions of the Settlement would provide the major environmental enhancements described in Section III.A.3. Thus, we conclude that the benefits of the measures proposed in the Settlement justify the costs outlined in Section VI.

We also evaluated the no-action alternative, defined as the continued operation of the project under the terms and conditions of the existing license without implementing any new environmental protection or enhancement measures. This option would provide the same developmental benefits as the recommended option, would provide lower or no minimum flows at all eight developments, and would eliminate numerous nondevelopmental

benefits. Costs of the measures proposed in the Settlement for nonflow enhancement of fisheries, and for enhancement of wildlife, recreation, aesthetics, and cultural resources, would be foregone. Although this option has not been proposed, its comparison with the Settlement assists in making our evaluation of the extent of the changes that would occur with relicensing the project as proposed in the Settlement. Consideration of this alternative is also prescribed by the Council on Environmental Quality.

B. Developmental and Nondevelopmental Uses of the Waterway

We analyzed the economic effects of providing the various environmental enhancements included in the provisions of the Settlement (Section VI). We conclude that the project remains economically beneficial with the recommended enhancement measures and that significant beneficial environmental effects would result from their implementation. Although continued operation of the project would result in some minor unavoidable adverse environmental impacts (e.g., shoreline erosion), these impacts would be offset by the level of other developmental and nondevelopmental benefits that would accrue with relicensing the project as recommended.

Based on a review of the agency comments filed in this proceeding and on our independent analysis, pursuant to Sections 4(e), 10(a)(1), and 10(a)(2) of the FPA, we conclude that issuing a new license for the Beaver River Project consistent with the terms of the Settlement, other than the above noted exception concerning the Beaver River Fund and Advisory Council, would permit the best comprehensive development of the Beaver River.

VIII. RECOMMENDATIONS OF FISH AND WILDLIFE AGENCIES

Under the provisions of the FPA, as amended by the Electric Consumers Protection Act of 1986, each hydroelectric license issued by the Commission must include conditions based on recommendations of federal and state fish and wildlife agencies for the protection and enhancement of fish and wildlife and their habitat affected by the project.

Section 10(j) of the FPA states that whenever the Commission believes that any fish and wildlife agency recommendation is inconsistent with the purposes and the requirements of the FPA or other applicable law, the Commission and the agency shall attempt to resolve any such inconsistency, giving due weight to the recommendations, expertise, and statutory responsibilities of each agency.

The recommendations of the fish and wildlife agencies (outlined in Section III.A.3 herein) were finalized, after a period of negotiation with NMPC, in the Settlement; therefore, the option recommended in this EA, to relicense the Beaver River

Project with the provisions of the Settlement, is consistent with recommendations of federal and state fish and wildlife agencies.7/ This determination is based on the fact that the FWS and NYSDEC are parties to the Settlement.

IX. CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2) of the FPA 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 a total of 27 qualifying comprehensive plans of which we identified 7 New York and 3 United States comprehensive plans to be applicable. We did not find any conflicts. We list comprehensive plans relevant to this project in Section XI.

X. FINDING OF NO SIGNIFICANT IMPACT

We conclude that none of the resources that we studied - including geologic, water quantity and quality, fisheries, terrestrial, aesthetic, cultural, and recreation resources - would experience significant adverse effects under the proposed action.

On the basis of the record and this EA, issuing a new license for the project as proposed by NMPC, and documented in the Settlement, would not constitute a major federal action significantly affecting the quality of the human environment. For this reason and pursuant to Commission regulations, no Environmental Impact Statement is required.

XI. LITERATURE CITED

Costanza, R.T. and J. Homa, Jr. 1990. Additional Investigations of Wetland Habitat within the Beaver River Hydroelectric Project, FERC No. 2645, Herkimer & Lewis Counties, New York. Prepared for the Niagara Mohawk Power Corporation by Ichthyological Associates, Inc. Lansing, New York. 75 pp.

Federal Energy Regulatory Commission (FERC). 1994a. Policy statement: Use of reserved authority in hydropower licenses to ameliorate cumulative impacts. Docket No. RM93-25-000, Issued December 14, 1994.

7/ The provisions of the Settlement pertaining to the Beaver River Fund cannot be properly characterized as direct measures to protect fish and wildlife resources and consequently are outside the scope of Section 10(j). Therefore, we have considered the River Fund pursuant to FPA Section 10(a).

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(10) New York State Parks, Recreation, and Historic Preservation. State Comprehensive Outdoor Recreation Plan. 1994.

XII. LIST OF PREPARERS

FERC

Tom Camp – Task Monitor – M.S., Landscape Architecture - 31 years experience

Stone & Webster

Tom Biffar – Deputy Project Manager – Purpose and Need, EA Coordinator (Ph.D. Biology – 23 years experience)

John Downing – Water Quality and Fisheries (Fisheries Biologist; M.S. Biometrics – 18 years experience)

Bryce Mochrie – Project Description and Economics (Civil Engineer; M.S. Civil Engineering, 23 years experience)

Paul Martin – Terrestrial Ecology (Terrestrial Biologist; M.S. Zoology – 10 years experience)

Steve Conant – Recreation Resources (Recreation Planer; M.A. Urban and Environmental Policy - 12 years experience)

Patricia Weslowski - Cultural Resources (Preservation Planner; M.P.A. Public Administration - 15 years experience)

Pamela Shadley - Aesthetic Resources (Landscape Architect; Masters in Landscape Architecture - 10 years experience)

Adirondack ADK Mountain Club
Headquarters
RR 3, Box 3065
Lake George, NY 12845-9522
(518) 668-4447 FAX (518) 668-3746

November 21, 1995

95 NOV 22 PM 3:11

Betty Lou Bailey
4078 Georgetown Square
Schenectady, NY
12303-6306
Office (518) 355-0604

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
888 First Street NE
Washington, DC 20426

Re: FERC #2645-029 Beaver River Project

ADK-1 The draft Environmental Assessment for the Beaver River Project (FERC 2645) has been reviewed and a number of small comments and suggestions are now being reported to FERC. None of them are a major matter, which is not surprising since the draft EA is based on the Settlement, which covered all basic issues. Our comments follow, predominantly in page sequence.

ADK-2 By providing portages at all eight dams, the existing canoe route will be extended both upstream and downstream for trips beyond the Beaver Project in either direction. When New York State bought extensive property in the upper reaches of the Bog River in the 1980's, this was publicized as a step in restoring the historic Beaver-Bog River canoe route, which via Tupper Lake leads to the Raquette River, dominated by another series of mainly Niagara Mohawk Power Corporation impoundments. Lake Lila on the upper Beaver River was acquired by New York State in about the same time period. The missing link between the two watersheds is 1-2 miles, depending on route chosen. Canoe travel downstream of the Beaver Project through the villages of Croghan and Beaver Falls into the Black River and downstream on the Black is a more obvious continuation of the Beaver Project canoe route.

ADK-3 Page iv, par. 1: Add an item to the action summary, such as "provide portage paths at all 8 dams, so that canoe travel upstream, through and downstream is unimpeded".

ADK-4 Page 3, last line: While it isn't wrong to describe Stillwater Reservoir as "upstream of the High Falls development", it would be more meaningful to say "upstream of the Moshier development" since Moshier is immediately downstream of Stillwater.

ADK-5 Page 5, Fig. 2: Delete "(Canoe Route Origin)" at canoe launch shown below Moshier powerhouse. This conflicts with the portage path coming from the Moshier impoundment. Note that outside the scope of the draft EA and Settlement, there is to be a portage around the Stillwater dam onto the upper end of the Moshier impoundment, so it would be inappropriate to use "canoe route origin" anywhere in Fig. 2.

Comments of the Adirondack Mountain Club on the Beaver River DEA Dated November 21, 1995

ADK-1 No response required.

ADK-2 The comment has been noted.

ADK-3 The EA, in the summary section, has been revised to reflect this enhancement.

ADK-4 The EA, in Section III.A.1, has been revised to reflect the location of Moshier as the next development downstream of Stillwater.

ADK-5 Figure 2 in the EA has been revised as suggested to reflect the continuous nature of the canoe route.

Adirondack Mountain Club — FERC 2645, Beaver River

ADK-6 Page 6, Fig. 3: The already existing portage path for the Eagle development, using the less busy road, should be indicated. Take out and put in are shown already. A new portage around the spillway for whitewater in the bypass reach should be added.

ADK-7 Page 8, Fig. 4: The diagram for Soft Maple does not designate that there is both a north and south bypass channel for an initial distance of roughly 1500 feet. See comments for pages 46 and 66 which are related to this.

ADK-8 Same page: There are already four arrows to the primary area for day use and camping, but without mention of the caretaker cabin and garage. Perhaps fewer arrows and a more complete description could be used and minimize clutter.

ADK-9 Same page: A trail should be added between the scenic overlook on the south bypass channel and the nearest parking area.

ADK-10 Page 9, Fig. 5: The bypass reach at Effley should be labelled and the portage path added and labelled. (The canoe landing area and launch area are already shown.)

ADK-11 Page 11, Fig. 6: Add Elmer bypass reach. Show canoe portage trail between canoe landing area and launch area.

ADK-12 Page 12, Fig. 7: To differentiate it from other linear features, label the road to the Taylorville picnic area.

ADK-13 Page 13, Fig. 8: The indicated Belfort canoe portage uses Erie Canal Road, described on page 62 as a road with 40 mph traffic and we share FERC concerns on page 73 for its use in the canoe portage. We also note that the canoe landing area is described on page 72 as "at the bottom of a steep bank" where the impoundment "bottom drops off abruptly at the shore to a depth of 3 to 5 feet", not an inviting prospect. A far more suitable canoe access to the impoundment is apparently feasible to the north of the intake structure, but south of the general store. Niagara Mohawk would likely need an easement to use this land which appears unsuited for a house site because of terrain. The grade at the shore is modest. Then going west it gets steeper, then levels out to an informal parking area next to Erie Canal Road. Use of this property should enable persons portaging canoes to simply cross Erie Canal Road onto Niagara Mohawk property to the west. This is why the Settlement says to "consult with the ADK" on the Belfort canoe portage.

ADK-14 Page 15, Fig. 9: For High Falls, add the portage trail from the canoe landing area to the canoe launch and label it.

ADK-15 Page 23, par. 2, line 4: "Lila" probably should be "Lila".

ADK-6 Figure 3 in the EA has been revised as suggested to show the existing portage path. Access for whitewater boating has not yet been designated.

ADK-7 Figure 4 in the EA has been revised to designate the north and south channels of the bypassed reach at Soft Maple.

ADK-8 Figure 4 in the EA has been revised to note the caretaker's cabin and reduce clutter.

ADK-9 Figure 4 in the EA has been revised to show the trail between the scenic overlook and the parking lot nearby.

ADK-10 Figure 5 in the EA has been revised to show the bypassed reach and portage path.

ADK-11 Figure 6 in the EA has been revised to show the Effley and Elmer canoe portages and the bypassed reach at Elmer.

ADK-12 Figure 7 in the EA has been revised to designate the access road to the picnic area.

ADK-13 The alternative portage route you describe is certainly shorter and may be safer as you suggest. Figure 8 in the EA shows the route presently proposed, but we assume that the actual route will be subject to consultation as provided in the Settlement.

ADK-14 Figure 9 in the EA has been revised to show the canoe portage route at High Falls.

ADK-15 The EA, in Section V.A.1, has been revised to correct the spelling of "Lila".

ADK-16 Page 25, Table 1: Oroghan isn't listed. According to an article in Adironsack Life, July/August 1994, pp. 26-29, this should be an active license application.

ADK-17 Page 46, Minimum Flow, Soft Maple: The 15 and 20 cfs flows are intended for the two initially separate bypass channels, which then converge after 1500 feet or so. This reads as if both flows go into a conventional single bypass. See comment on Fig. 4.

ADK-18 Page 51, par. 3: Some additional description is needed to explain when unavoidable low flows (less than 250 cfs) come into the High Falls impoundment unless *other* impoundments are drawn down. A suggested summary of how this occurs would be:

> While there may be some additional times when the HRBHnD could provide more flow to help maintain the 250 cfs base flow below High Falls, in times of flood or near flood, they will not. Since tributaries will subside in flow before major rivers, there are times when the Black River in the Carthage-Watertown area is still in a flood condition but the tributaries between Stillwater Reservoir and the High Falls dam have already subsided and provide less than 200 cfs. Thus for a few days, when Stillwater is only releasing the minimum 50 cfs, water from inside Beaver Project storage will be needed to maintain 250 cfs outflow. This situation inherently lasts only a few days until the Black River also subsides, thus limiting the drawdowns within the Beaver Project.

ADK-19 Page 54, par.1: Analysis should only deal with when High Falls can't provide 250 cfs. Naturally the upstream impoundments have less inflow, but this is irrelevant since they are not required to release 250 cfs.

ADK-20 Page 56, par. 3: Change to read ".....Stillwater Reservoir can sometimes be used to compensate for low flows....". Note deletion of "natural" since low flows are often part of a flood scenario.

ADK-21 Page 56, par. 4: Hand tools are recommended to include a grass whip (costing under $20) which cuts stems to 1/4 inch when sharp and is highly efficient when swung.

ADK-22 Page 65, par. 4: Trash receptacles should not be mandatory. Adirondack locations seldom provide these any more since they attract bears. If the local bear joins a picnic lunch, it is very disruptive.

ADK-23 Page 66, Soft Maple: This does not say whether north channel, south channel, or lower bypass (after junction) is being observed.

ADK-16 Table 1 in the EA lists existing facilities and does not include those that are being proposed.

ADK-17 The EA, in Section V.C.3, has been revised to indicate the distribution of flow in the two channels.

ADK-18 The EA, in Section V.C.3, has been revised to incorporate ADK's text on the relationship between low flows and flood events at High Falls.

ADK-19 The analysis is relevant to the consideration if impacts in the impoundments. While it is true that 250 cfs is not required at the upstream developments, it is satisfactory and much easier to use 250 cfs for assessment instead of trying to develop specific values for each development.

ADK-20 The EA, in Section V.C.4, has been revised as suggested although we would suggest that flood flows are as natural as other flow levels.

ADK-21 The comment is noted.

ADK-22 The EA, in Section V.C.6, has been revised to make the receptacles optional.

ADK-23 The observations were made in the south channel as noted in Table 5 of the EA.

Adirondack Mountain Club

FERC 2645
Beaver River

ADK-24 Page 70: There is no description of whitewater in the Eagle bypass and this should be added.

ADK-25 Page 73, par. 2: Moshier was omitted from the enumeration of new portages.

ADK-26 Page 73, par. 2, line 4: Change to read ".....extension downriver and upriver to more of the Beaver River and beyond."

ADK-27 Page 74, par. 5: The Eagle bypass release of 200 cfs should not be described as the optimum level. The Settlement says "at least 200cfs" and that is a guess since there has been no whitewater test. It would be desirable to have a whitewater test before inviting the public to a whitewater release and perhaps discovering it isn't enough.

ADK-28 Page 74, par. 4: Delete the sentence about releases on the Black River in Watertown since these are Class IV, not II and III, and definitely not suitable for beginner and intermediate paddlers. See Appalachian Whitewater Vol. III The Northern Mountains by John Connelly and John Porterfield, pp. 54-56.

ADK-29 Page 75, last par.: Trash receptacles. OK if bears don't get attracted.

ADK-30 Page 77, par. 2: The "new access to Effley" already exists.

ADK-31 Page 77, par. 6: Delete entire paragraph, "Changes in access.....parking facilities." This paragraph conflicts with the Settlement (see III D 3 & 4) for Eagle recreation features which fine tunes existing facilities and deletes none.

ADK-32 There seemed to be no derogatory comment about the overly frequent fluorescent green blazes on the existing portage paths. In the future, Niagara Mohawk will be using adequate but smaller blazes or markers more appropriate to woodland portage trails.

ADK-33 Except for the one paragraph on page 77, which is likely a glitch, the draft Environmental Assessment nicely supports the Settlement.

Betty Lou Bailey

Betty Lou Bailey, Chrm.
Canoe Route Subcommittee
Conservation Committee

cc: Service List
T. Camp, FERC
J. Caffry, ADK
R. Ringlee, ADK
B. Wood, ADK
A. Velto, ADK
L. Borland, ADK
R. Wendell, ADK
J. Freeman, ADK
T. Matias, TU
R. Coonrad, NYSCC

ADK-24 A whitewater paddling feasibility study was not done for the Eagle bypass. Nevertheless, we believe the record is adequate on the whitewater recreation issue. The whitewater enhancements licensed here are based on our analysis of NMPC's "System-wide Whitewater Recreation Plan," the whitewater studies conducted at the Taylorville and Moshier Developments, and the whitewater proposals in the Settlement.

ADK-25 The EA, in Section V.C.7, has been revised to reflect the new portage at Moshier.

ADK-26 The EA, in Section V.C.7, has been revised to reflect the more extensive options for canoeing beyond the Beaver Project.

ADK-27 We did not describe 200 cfs as optimal and did not intend to do so. As we state in the EA, the Settlement allows for adjustments to flow based on consultation with the Advisory Council. We expect AWA and NMPC to use the flexibility built into the Settlement to establish an "optimal level" for the Eagle bypass.

ADK-28 Your comment is noted. The rating of II and III comes from the final Environmental Assessment for the Watertown Hydroelectric Project (FERC Project No. 2442; June 9, 1995). The EA also states that the water is suitable for beginning and intermediate paddlers. Clearly such ratings have a degree of subjectivity and will vary with flows being maintained.

ADK-29 Your comment is noted.

ADK-30 The EA, in Section V.C.7, has been revised to reflect existing access to the Effley impoundment.

ADK-31 The EA, in Section V.C.7, has been revised by deleting the conflicting paragraph.

ADK-32 Your comment is noted. You have raised and resolved the issue.

ADK-33 No response is required.

Service List
FERC #2645 - Beaver River

Bernard Malewski	Adirondack Council
Betty Lou Bailey	Adirondack Mountain Club
Neil Woodworth	Adirondack Mountain Club
Barbara A. Mottier	Adirondack Park Agency
George V. Outcalt, Jr.	Adirondack Park Agency
Margaret Bowman	American Rivers
Richard J. Bowers	American Whitewater Affiliation
Bruce Carpenter	New York Rivers United
David M. Gibson	Assoc. for the Protection of the Adirondacks
Peter Henner	City of Cohoes
Edward Grumert	Town of Croghan
Supervisor	Town of Croghan
Wesley K. Eisenhauer	Jefferson County
Mayor	Village of Lowville
Michael W. Murphy	Niagara Mohawk Power Corp.
Jerry L. Sabattis	Niagara Mohawk Power Corp.
Sam S. Hirschey	Niagara Mohawk Power Corp.
Gregg Carrington	Niagara Mohawk Power Corp.
David J. Miller	National Audubon Society
Robert W. Gift	National Park Service
Richard Moos-Collins	Natural Heritage Institute
Bruce Zeisel	NYS Dept. of Environmental Cons.
Keith G. Silliman	NYS Dept. of Environmental Cons.
Jeffrey J. Sama	NYS Dept. of Environmental Cons.
Chairman	NY Public Service Commission
Secretary	NY Public Service Commission
Walter Kiang	NY Office of Parks, Recreation & Historic Preservation
Barbara J. Raymond	Niagara Mohawk Power Corp.
Brian K Billinson	Niagara Mohawk Power Corp.
Betty H. Bradley	St. Lawrence County
Mona Janopaul	Trout Unlimited
Anthony R. Conte	US Dept. of Interior
Sherry W. Morgan	US Fish & Wildlife Service
Kevin Mendick	National Park Service
Karl R. Amylon	City of Watertown
Frances S. Francis	Spiegel & McDiarmid
Virgil Taylor	Town of Watson
Town Clerk	Town of Webb

NIAGARA MOHAWK

NIAGARA MOHAWK POWER CORPORATION/300 ERIE BOULEVARD WEST, SYRACUSE, N.Y. 13202/TELEPHONE (315) 474-1511

November 21, 1995

Honorable Lois D. Cashell
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Dear Secretary Cashell:

The Niagara Mohawk Power Corporation (NMPC) has reviewed the Federal Energy Regulatory Commission (FERC) Draft Environmental Assessment (DEA) for the Beaver River Hydroelectric Project (FERC Project No. 2645) dated October 23, 1995 and has the following comments:

NMPC-1 Page IV, first paragraph, states that NMPC "(6) plan and implement fish protection and conveyance measures at Moshier, Soft Maple, Effley, Elmer, Belfort and High Falls". Conveyance is not to be provided at Soft Maple; actually the settlement parties are attempting to prevent or exclude downstream fish movement at this development. On the other hand, the Eagle and Taylorville developments are to provide conveyance measures as per the Settlement Offer. Therefore, this section of the DEA should read "(6) plan and implement fish protection and conveyance measures at Moshier, Eagle, Effley, Elmer, Taylorville, Belfort and High Falls."

NMPC-2 Page IV, first paragraph, states that NMPC construct the diversion tunnel at Soft Maple. For clarification purposes, the diversion tunnel is an existing structure. NMPC is proposing a fish screen at the entrance of the diversion tunnel, but no major modification or construction of the diversion tunnel.

NMPC-3 Page iv, first paragraph, states that NMPC implement a trout transplanting program at Soft Maple. As per the Settlement Offer, NMPC will provide two fisheries biologists for three days in each year of the transplant program and equipment necessary for the safe transport of the fish during this effort. The New York State Department of Environmental Conservation (NYSDEC) will conduct all fisheries investigations on brook trout and if the investigation reveals the need to supplement the existing brook trout population, then the NYSDEC will commence a four year program of transplanting native brook trout from local heritage streams to enhance prospects for a sustainable brook trout fishery. See page 7, section IV.C. of the Beaver River Settlement Offer for specifics.

[illegible]

Comments of Niagara Mohawk Power Corporation on the Beaver River DEA Dated November 21, 1995

NMPC-1 The EA, in the summary, has been revised to reflect use of fish protection screening and trash racks at Soft Maple and fish protection trash racks and fish conveyance measures at Moshier, Eagle, Effley, Elmer, Taylorville, Belfort and High Falls.

NMPC-2 The EA, in the summary, has been revised to reflect the existing diversion tunnel.

NMPC-3 The EA, in the summary, has been revised to reflect NMPC's participation in NYSDEC's trout transplanting program at Soft Maple.

NMPC-4 | Page 43, second paragraph, first sentence, states "In its revised application, NMPC proposes *whitewater releases* for the Mosher, Eagle and Taylorville bypassed reaches that may have an adverse impact on fisheries resources." This section of the DEA should read, "In its revised *Settlement Offer*, NMPC proposes whitewater releases....".

NMPC-5 | Page 43, last paragraph, states "The total volume of each release, including ramping flows, shall not exceed 200 cfs-hrs". This section of the DEA should read "The total volume of each release, including ramping flows, shall not exceed 2200 cfs-hrs". See page 10, section VII.D.1 of the Beaver River Settlement Offer.

NMPC-6 | Page 48, second paragraph, states "This flow monitoring plan would provide for the installation and maintenance of a USGS gaging station, or equivalent, at each development and below High Falls at Croghan". As per the Settlement Offer, NMPC is proposing to provide for the installation and maintenance of a *USGS gaging station, or an approved* alternate system, at one location only and not at each development. See page 13-14, section X. E. of the Beaver River Settlement Offer for specifics.

NMPC-7 | Throughout the entire DEA, Appendix A is referenced as the *Beaver River* Settlement Offer. However, the actual appendix is labeled "Appendix 1". For consistency, this should be corrected to read "Appendix A".

If you have any questions regarding these comments or need further information, please contact me at (315) 428-5042.

Sincerely,

John F. Kuhn

John P. Kuhn
Project Designer

JPK:kmq

cc: Attached Service List

TJPK1335A.MQ

NMPC-4 As noted on page 1 in Section I of the EA, NMPC's filing of the Settlement Offer is considered a revision to the application. For clarification, however, the EA in Section V.C.3, has been revised to reflect the proposal of the releases in the Settlement Offer.

NMPC-5 The EA, in Section V.C.3, has been revised to reflect the correct volume.

NMPC-6 Based on the clarification of Section X.E. in the Settlement, the EA, in Section V.C.3, has been revised to reflect installation of a single USGS gaging station.

NMPC-7 The label of the first appendix in the EA has been revised to Appendix A for consistency with citations in text.

DISTRIBUTION LIST

Mr. Robert Glenson
Executive Director
Adirondack Park Agency
P. O. Box 99
Ray Brook, NY 12977

Anton Sidoti, Regional Director
Federal Energy Regulatory Commission
19 West 34th Street, Suite 400
New York, NY 10001

James Baca, Director
Bureau of Land Management, DOI
1849 C Street N.W.
Washington, D.C. 20240

Neil Woodworth, Counsel
Adirondack Mountain Club
RR3, Box 3055
Lake George, NY 12845-9523

Richard Bowers, Director
American Whitewater Affiliation
1430 Fenwick Lane
Silver Spring, Maryland 20910-3328

Richard Roos-Collins
Natural Heritage Institute
114 Sansome Street, Suite 1200
San Francisco, CA 94104

Matthew Huntington, Director of Hydro
American Rivers, Inc.
801 Pennsylvania Ave, SE, Suite 400
Washington, DC 20003

David Gibson, Executive Director
The Assoc for Protection of Adirondacks
P. O. Box 951
Schenectady, NY 12301-0951

Anthony Conte
US Department of the Interior
Office of the Solicitor
One Gateway Center, Suite 612
Newton Corner, MA 02158-2868

Bruce Babbitt, Secretary
U.S. Department of the Interior
1849 C. Street N.W.
Washington, DC 20240

Betty Lou Bailey
Adirondack Mountain Club
4029 Georgetown Square
Schenectady, NY 12303

Paul Maclejewski, Chair NY
Trout Unlimited
2711 Girdle Rd.
Elma, NY 14059

Bruce Carpenter, Executive Director
New York Rivers United
199 Liberty Plaza, Marine Midland
Rome, NY 13440

David Miller, Regional VP
National Audubon Society
1789 Western Ave.
Albany, NY 12203

Charles Gauvin, President and CEO
Trout Unlimited
800 Follin Lane, SE, Suite 250
Vienna, VA 22180-4959

Bernard Melewski, Counsel
The Adirondack Council
353 Hamilton Street
Albany, NY 12210

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

NOV 2 2 1995

Lois D. Cashell, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

ATTN: Tom Camp

Dear Ms. Cashell:

EPA-1 The Environmental Protection Agency (EPA) has conducted a preliminary review of the October 31, 1995 environmental assessment (EA) for the proposed relicensing of Beaver River Project (Project No. 2645). The Niagara Mohawk Power Corporation proposes to include new operational procedures and enhancement measures, and develop additional recreational facilities. No new capacity is proposed at the project. The project would affect eight existing developments on the Beaver River between 11 and 29 miles upstream of the confluence with the Black River in Herkimer and Lewis Counties, east of Carthage, New York.

EPA-2 We understand that the project as currently proposed is the result of a settlement reached among numerous parties, including state and local entities, and various environmental groups. In our February 24, 1995 scoping letter (copy enclosed), EPA expressed concern about the impacts of this project on wetlands, fishery habitats, and riffle/pool complexes. We are disappointed that, despite our concerns, we were not participants in the discussions that led to the present proposal. Our preliminary review of the EA does not indicate that our concerns have been adequately addressed.

EPA-3 Due to the recent furlough of federal employees, we requested by telephone an extension to the comment period; Mr. Camp of your staff indicated that an extension was not possible. Nevertheless, we will continue to review the project and expect to provide additional, more detailed input regarding our concerns during the Section 404 permit review process.

Should you have any questions concerning this letter, please contact Ms. Maeve Arthare of my staff at (212) 637-3515.

Sincerely yours,

Laura Livingston

Laura J. Livingston, Assistant Chief
Environmental Impacts Branch

Enclosure

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Comments of the US Environmental Protection Agency on the Beaver River DEA Dated November 22, 1995

EPA-1 No response required.

EPA-2 The settlement talks on the Beaver River Project evolved from legal proceedings concerning the issuance of a water quality certificate and attendance was at the invitation of the New York State Department of Environmental Conservation. All of the issues noted were considered in the Settlement and the EA. In the latter, we conclude that proposed measures represent enhancements, particularly of fishery habitat and wetlands (see Sections V.C.3 and 4).

EPA-3 The comment is noted.

With regard to water quality, the evaluation of potential environmental impacts associated with the proposed project should include a thorough analysis of impacts to surface water quality. At a minimum, the impacts assessment should address discharge from sewage treatment plants and CWA National Pollutant Discharge Elimination System permitted outfalls in the area. Data on water quality, including pH, dissolved oxygen, and thermal gradients, should also be provided in the documentation.

Finally, we recommend that the comprehensive environmental evaluation include not only cumulative, but also indirect impacts; the indirect impacts analysis should address the potential for unplanned growth and subsequent development in the project area.

Please be reminded that if the environmental document determines that adverse impacts to environmental resources are unavoidable, measures to mitigate these impacts must be developed and discussed in the document.

Thank you for the opportunity to comment. Should you have any questions concerning this letter, please contact Daisy Mather of my staff at (213) 264-6720.

Sincerely yours,

Laura J. Livingston, Assistant Chief
Environmental Impacts Branch

2PM-EI:MATHER:X6720/2/23/95 LAN: HYDRO: BEAVER.ECO

FEB 2 4 1995

Thomas Camp, Task Monitor
Office of Hydropower Licensing
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

Dear Mr. Camp:

The Environmental Protection Agency (EPA) has reviewed the scoping document for the proposed Beaver River Hydroelectric Project, which consists of eight hydroelectric developments, in the counties of Herkimer and Lewis, New York, Federal Energy Regulatory Commission (FERC) project number 2645. The proposed project involves refurbishment of seven of the developments, the redevelopment of the Belfort site, and the addition of 1.3 MW of capacity to the existing 45.1 MW through the addition of a minimum flow unit at the Eagle Development.

Based on the information you have provided, we anticipate that all relevant topics will be included in the environmental documentation for these projects. However, in addition to the standard range of topics covered by environmental documentation developed pursuant to the National Environmental Policy Act, we recommend that you include detailed information on the effects of any changes in water level of the dam impoundments on existing wetlands within the project area, including what effects the changes may have on the frequency, duration and depth of flooding and/or saturation in those wetlands, as well as discuss the effects on fishery habitats and riffle/pool complexes.

In addition, the environmental documentation should include a discussion of all potential permits, including Section 10 and/or Section 404 permits from the U.S. Army Corps of Engineers, that may be required for this project. As you may know, riffle/pool complexes are "special aquatic sites" along with wetlands under Section 404 of the Clean Water Act (CWA). Impacts, as well as opportunities for enhancement of such areas, would be specially considered in any review of Section 404 permit applications for modifications to these projects, if Section 404 permits are necessary.

United States Department of the Interior

NATIONAL PARK SERVICE
New England System Support Office
15 State Street
Boston, Massachusetts 02109-3572

IN REPLY REFER TO:

November 27, 1995

L-7619 NESO(SPE)
FERC 2645

Mr. John H. Clements
Director, Division of Project Review
Federal Energy Regulatory Commission
Office of Hydropower Licensing
888 First Street, N.W.
Washington, DC 20426

Dear Mr. Clements:

NPS-1 This is in response to the Federal Energy Regulatory Commission (FERC) Notice of Availability of a draft environmental assessment (DEA) for review and comment concerning the Beaver River Hydro Project, FERC No. 2645, Herkimer and Lewis Counties, New York. We regret the tardiness of this response. We were stalled by the interruption of the Federal employee furlough period.

NPS-2 The National Park Service (NPS) is pleased that the FERC has chosen to adopt the Settlement Offer as its preferred alternative, however, the NPS objects to the omission of the Beaver River Fund from that alternative as stated at pages 78-79 of the DEA. The initial concern of the parties to the agreement, and the reason they commenced negotiations, was that the applicant's proposal did not provide adequate mitigation for project impacts. This concern was remedied by the elements contained in the settlement.

The NPS believes that the fund and any actual expenditures will be directly linked to project impacts, and is within the FERC's jurisdiction. FERC staff's rational for not incorporating the Beaver River Fund and Advisory Council into the license appears to be based on procedural, not substantive concerns relating to FERC's ability to oversee implementation of the fund and the possibility that as yet undetermined fund expenditures may be for items outside FERC's jurisdiction. These are understandable concerns, and it was for this reason that the severability clause was included in the agreement.

NPS-3 The NPS is pleased that the FERC staff acknowledged at page 79 that the fund will provide a public benefit and commended the applicant's commitment to abide by the terms of the fund.

Comments of the National Park Service on the Beaver River DEA Dated November 27, 1995

NPS-1 No response is needed.

NPS-2 The Beaver River Fund is one result of settlement talks at which FERC was a frequent observer. While the Commission may support the concept of the Beaver River Fund and endorse its establishment, the Commission will not regulate the fund unless it includes a requirement for the fund in a license for the Beaver River Project. As set forth in the FEA, staff believes that the fund is an inappropriate licensing remedy for project impacts and therefore recommends against including such a license requirement.

NPS-3 No response is needed.

NPS-4

Given that several settlement negotiations are ongoing, it would be of great assistance to all parties involved in these processes to have some written guidance from the FERC as to what is and what is not likely to be acceptable to FERC staff and the Commissioners in terms of settlement conditions and the type of enhancement funds included in this and other settlement agreements.

Thank you for the opportunity to comment on this DEA. If you have any questions or need any additional information, please feel free to contact Mr. Kevin Mendik of my staff at (617) 223-5299.

Sincerely,

Terry W. Savage
Superintendent

NPS-4 FERC staff members have attended numerous settlement meetings with the stated purpose of providing insight into what might or might not be acceptable to the Commission. As frequently noted, each project is subject to independent evaluations. These evaluations are not standardized and, at the request of the participants in the talks, are taking place after the settlement talks are completed or abandoned. This effectively precludes written guidance of the type you request.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 Luker Road
Cortland, New York 13045

November 29, 1995

Ms. Lois A. Cashell, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, NE
Washington, DC 20426

Dear Ms. Cashell:

FWS-1 The U.S. Fish and Wildlife Service (Service) has received and reviewed the Federal Energy Regulatory Commission's (FERC) Draft Environmental Assessment (DEA) for the proposed relicensing of Niagara Mohawk Power Corporation's (NMPC) Beaver River Project (FERC No. 2645). The Department of the Interior (Department) submitted a "MOTION TO INTERVENE IN OPPOSITION" to the proposed Beaver River Project and later commented that, "If the requirements of a new license are consistent with those agreements reached in the executed Settlement Offer, the Department will not oppose project relicensing."[1] Unfortunately, the DEA did not include draft license articles for our review of consistency.

FWS-2 Enclosed are Service comments on the DEA. We identified a significant error which incorrectly references the existing minimum instream flow release requirements. This error is found throughout the document and requires portions of the DEA to be rewritten. The Service appreciates the opportunity to provide the FERC with our comments and recommendations. If you have further questions, please contact David Bryson of my staff at (607) 753-9334.

Sincerely,

Sherry W. Morgan
Field Supervisor

Enclosure

cc: Service List

[1] See letter to Lois D. Cashell, FERC from Willie R. Taylor, Director, Office of Environmental Policy and Compliance dated July 13, 1995.

Comments of the Fish and Wildlife Service on the Beaver River DEA Dated November 29, 1995

FWS-1 Conclusions and recommendations are clearly stated in the DEA, and these recommendations, in final form, are reflected in the articles of the license order. The order is prepared just after the final EA, since the recommendations might change based on comments received. License articles generally are not made available for external review; an exception might be a "cooperating agency".

FWS-2 The EA has been revised in pertinent sections, as required, to reflect the current minimum flows based on the amending order.

U.S. FISH AND WILDLIFE SERVICE
COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT OF THE BEAVER RIVER HYDROELECTRIC PROJECT
FERC NO. 2645
HERKIMER AND LEWIS COUNTIES, NEW YORK

FWS-3 | **Page iv. Summary.** The license should...(6) plan and implement fish protection and conveyance measures at...[add in Eagle and Taylorville].

FWS-4 | **Page 8. Figure 4. Soft Maple Development.** The diagram should identify that there are two branches to the upper portion of the bypassed reach (i.e. a north and south channel).

FWS-5 | **Page 9. Figure 5. Effley Development.** The bypassed portion of the Beaver River should be depicted.

FWS-6 | **Page 11. Figure 6. Elmer Development.** The bypassed portion of the Beaver River should be depicted.

FWS-7 | **Page 13. Figure 8. Belfort Development.** The bypassed portion of the Beaver River should be identified.

FWS-8 | **Page 15. Figure 9. High Falls Development.** The bypass segment of the Beaver River downstream of the development's dam has three channels, not one single channel as depicted.

FWS-9 | **Page 16. 2. Project Operation.** The Moshier, Eagle, Soft Maple, and Taylorville developments are currently required to release 30, 30, 20, and 30 cubic feet per second (cfs) of water to their respective bypassed river reaches [not the referenced 59, 59, 34, 59 cfs, respectively].

FWS-10 | **Page 16. 3. Proposed Environmental Measures.** The proposal to plan and implement fish protection and conveyance measures should also include the Eagle and Taylorville developments. The U.S. Fish and Wildlife Service (Service) has provided additional comments on the minimum flow release mechanisms in our October 18, 1995, letter to Niagara Mohawk Power Corporation (NMPC).

FWS-11 | **Page 17. 3. Proposed Environmental Measures.** The proposal to construct the diversion tunnel at Soft Maple is misleading. The diversion tunnel leading to the north channel of the bypassed reach is existing. Additional measures are planned to screen this release pipe and deter warmwater fish from exiting the reservoir and entering the bypassed reach.

FWS-12 | **C. No-action Alternative.** The Draft Environmental Assessment (DEA) suggests that the "status quo" represents the "baseline environmental conditions." The Service disagrees with the assertion that present circumstances represent baseline conditions. We note that issuing a new license for an existing project is "substantially equivalent to issuing an original license, including a consideration of all relevant harms and benefits to public

FWS-3 The EA, in the summary, has been revised to reflect use of fish protection screening and trash racks at Soft Maple and fish protection trash racks and fish conveyance measures at Moshier, Eagle, Effley, Elmer, Taylorville, Belfort, and High Falls.

FWS-4 Figure 4, in the EA, has been revised to reflect the two channels of the bypassed reach at Soft Maple.

FWS-5 Figure 5, in the EA, has been revised to show the bypassed reach at Effley.

FWS-6 Figure 6, in the EA, has been revised to show the bypassed reach at Elmer.

FWS-7 Figure 8, in the EA, has been revised to identify the bypassed reach at Belfort.

FWS-8 Figure 9, in the EA, has been revised to reflect the three channels of the bypassed reach at High Falls.

FWS-9 The EA, in Section III.A.2, has been revised to reflect the current minimum flows based on the amending order issued December 5, 1991.

FWS-10 The EA, in Section III.A.3, has been revised to reflect use of fish protection screening and trash racks at Soft Maple and fish protection trash racks and fish conveyance measures at Moshier, Eagle, Effley, Elmer, Taylorville, Belfort, and High Falls.

FWS-11 The EA, in Section III.A.3, has been revised to reflect screening of the existing diversion tunnel.

FWS-12 The use of current conditions as baseline conditions for environmental assessments is consistent with current FERC policy and practice. To consider pre-project and current conditions substantially equivalent ignores changes in the environment that have occurred over the life of the previous license. To use a pre-project baseline for assessments also introduces an unnecessary area of uncertainty inherent in trying to estimate prior conditions without supporting evidence. It is far more realistic and less problematic to use the current baseline, and it is also the only way to effectively consider project retirement or dam removal, in cases where this is warranted.

uses related to the project." Confederated Tribes and Bands of the Yakima Indian Nation, 746 F.2d 466, 476 (9th Cir. 1984), cert. denied, 471 U.S. 1116 (1985). Thus, the decision whether to issue a new license to an existing project must be made after fully assessing the environmental conditions that would exist if there were no project.

FWS-13 Page 31-33. Water Resources. The DEA incorrectly identified existing minimum instream flow releases for the Moshier, Eagle, Soft Maple, and Taylorville bypassed reaches as 59 cfs, 59 cfs, 34 cfs, and 59 cfs, respectively. This error is found in many other sections of the DEA. On December 5, 1991, the Director, Division of Project Compliance and Administration, issued the "ORDER MODIFYING MINIMUM FLOW RELEASES" requiring a continuous minimum flow of 20 cfs in the Soft Maple bypass, and 30 cfs in the Moshier, Eagle, and Taylorville bypassed reaches, respectively. The Department of the Interior (Department) filed a request for rehearing and motion for stay of this order, which was denied by the Federal Energy Regulatory Commission (FERC). However, the FERC suggested that it would consider minimum instream flow releases in its relicensing decisions.

FWS-14 Page 33. Table 2. The period of record for the monthly flow duration curves should be identified.

FWS-15 Page 35-37. Water Quality The DEA does not identify a water quality problem occurring in the north channel of the Soft Maple bypass. To explain, the Soft Maple Reservoir was drawn down while the terminal dam was being repaired. As a consequence, minimum instream flows could not be released from the existing slide gate into the south channel. However, minimum flows were temporarily released from a tunnel in the diversion dam into the north channel. After the impoundment was refilled, flow releases were again provided to the south channel by the slide gate. When the flows to the north channel had ceased, inspections of the channel revealed that leachate from the toe of the diversion dam had caused a mass of red/orange flocculent (likely some form of iron and/or magnesium oxides) to settle out and be deposited throughout this segment of the bypassed reach. We understand that measures will be taken by NMPC to flush this flocculent out during periods of spring runoff. This condition should not prevail once the agreed upon minimum flows are continuously released into the north channel.

FWS-16 Page 37. b. Environmental Impacts. The Service does not concur with the statement that, "Based on the field studies, the shoreline appears to be in a state of equilibrium ..." Along the shorelines of several impoundments there are visible signs of mass wasting where large sections of land have sloughed into the reservoirs.

FWS-17 Page 39. The statements, "We have no current data on downstream water quality to indicate the need for flows for assimilative capacity. We conclude, therefore, that the 250 cfs should be an enhancement when compared to historical water quality conditions.", contradict the report from page 32 which indicates that, "NMPC has an agreement with Missisquoi Associates, owner of the Beaver Falls Project (FERC No. 2593), to supply 250 cfs downstream of High Falls. The development is operated to maintain a base flow of 250 cfs downstream of the powerhouse so that adequate water is

FWS-13 The EA, in Section V.C.2, has been revised to reflect current minimum flows based on the amending order, issued December 5, 1991.

FWS-14 Table 2 of the EA has been revised to specify the period of record for the data.

FWS-15 The EA, in Section V.C.2, has been revised to reflect the presence of the flocculent in the north channel of the bypassed reach at Soft Maple. During the site visit, trace amounts of a red/orange flocculent were observed at the base of the terminal dam. The channel recently had been lined with weathered rocks. Some rocks contain large quantities of iron and magnesium which reduces to iron and magnesium oxide during the weathering process. These oxides can produce a reddish/orange flocculent. Therefore, this observation was not considered a significant water quality problem. The refill occurred after the site visit and may have modified the condition. We agree that the proposed flushing should be effective.

FWS-16 The Shoreline Erosion Study (December 1993) by Northrop, Devine & Tarbell, Inc., indicates that erosion occurring on the reservoir shorelines is not related to the Beaver River Project operations. In fact, erosion has been attributed to (1) sloughing - occurring on the north to northwest shores due to soil softening/loosening and frost heave during freeze-thaw cycles; and undercutting - partially attributed to the steepness of slopes around the reservoirs and to fetch distance. The reservoirs with bank soils that were predominantly sand or gravelly sand erode more than the coarser grained gravelly sands/till and glacial till reservoir banks. Undercutting also can be attributed to boat waves on high traffic reservoirs including Soft Maple and Effley.

They concluded that the operating fluctuations of the project reservoirs do not have a significant impact on increasing the rate of shoreline erosion, and that the erosion appears to be occurring at a very flow rate because of the vegetative root mat.

The mass wasting at Effley was noted in the study. This small area (3 foot undercut) is the only area described where mass wasting is occurring, and the rate of erosion is apparently so slow that water quality should not be adversely affected by sediments entering the reservoir and causing turbid conditions. Therefore, the shoreline is considered to be in a relative state of equilibrium.

FWS-17 The EA, in Section V.C.2, has been revised to clarify the statement concerning flows and assimilative capacity. We know that 250 cfs has been agreed upon and presumably supplies sufficient assimilative capacity. We do not have data to define the relationship between flow and assimilative capacity.

available in the town of Beaver Falls for mill processing, hydrogenerating, and sewage discharge requirements."

FWS-18 Page 40. 3. Fisheries Resources a. Affected environment: The statements that, "All species in the Beaver River, except brown bullhead, declined from 1985 to 1992. These declines are thought to be related to the increased bypass flows that decreased overall water quality in the project area.", are unsubstantiated. To accurately document a "decline" in the fisheries (which may be interpreted as a reduction in the number of species, the number of individuals within a species, the species biomass, etc.), a scientifically developed study, with statistically valid parameters for testing should be undertaken. These types of studies have not been conducted. Consequently, the suggestion of fisheries decline and the postulated relationship to increased flows is unfounded.

FWS-19 Page 41. The initial trout plantings probably succumbed to thermal shock at the time of stocking; there was a substantial difference between the temperatures of the hauling water and the river-water at the time of stocking. The poor recovery and establishment of the stocked trout within the bypassed reaches may be attributed to a number of factors, not just water quality. For example, domestically raised trout tend to move downstream leaving the initial stocking area. Thus, the ability to recapture these fish may be limited. Further, the ability to establish self-reproducing populations with fish of non-native origin often meets with very limited success. Consequently, if supplemental trout stockings become warranted in the future, fish will be transplanted from local heritage streams to enhance the fishery.

FWS-20 Page 44. Whitewater Releases. The text suggests that, "The IFIM studies indicate that optimum flows for smallmouth bass and brook trout are between 10 and 20 cfs." The term "optimum" is dependent on model interpretation not model output. Physical habitat simulation models (PHABSIM) typically portray the amount of habitat over the range of modelled flows per a given life history stage. The referenced statement does not indicate which life history stage(s), or if any time of year considerations were evaluated.

FWS-21 Page 46. Minimum Flows Eagle. The referenced 1995 field evaluations have not been scheduled. Such evaluations may have to be undertaken during 1996.

FWS-22 Page 53. Wildlife. The Service's staff have observed loons in the High Falls impoundment. In addition, extensive loon nesting studies were conducted at the attempted Stillwater Project.

FWS-23 Page 54. In addition to the avian species listed, raven (*Corvus corax*) nesting provides an interesting feature within the Eagle Canyon area.

FWS-24 Page 57. Impacts of Impoundment Fluctuations on Wetland and Wildlife Habitat. It should be noted that the flashboards on the Beaver River Project do not typically fail on an annual basis. Thus, the frequency of reservoir fluctuations due to board loss and replacement is expected to be minimal.

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FWS-18 The statements referenced are based on the surveys conducted from 1985 through 1992 and reported in the relicensing application. Such surveys are conducted to provide information on annual variations. Species present and relative numbers provide useful information. The role of increased flows is clearly speculative. More quantitative experimentation does not appear to be available so we have reported the information that is available.

FWS-19 The EA, in Section V.C.3, has been revised to incorporate the information provided.

FWS-20 IFIM studies by Homer & Conners (1987) used habitat typing methods and combined this information with the flow alternative and species-life stage curves to evaluate optimum flows in the bypass reaches of Moshier, Eagle and Taylorville. When evaluating whitewater releases flows of 30, 60, and 90 cfs were considered to determine habitat effects on fry, juvenile adult and spawning brook trout, and adult and spawning stages of smallmouth bass.

The DEA, in Section V.C.3, has been revised by deleting the reference to optimum flows for smallmouth and brook trout and replaced the statement with NYSDEC's current. Velocity classifications for chain pickeral and smallmouth bass.

FWS-21 The EA, in Section V.C.3, has been revised to eliminate the reference to studies in 1995.

FWS-22 The EA, in Section V.C.4, has been revised to reflect the additional information on loons.

FWS-23 The EA, in Section V.C.4, has been revised to reflect the additional information on raven.

FWS-24 The EA, in Section V.C.4, has been revised to reflect the low rate of flashboard failure.

FWS-25 Page 64. Table 5. The cited "existing flow" is incorrect. Further, we have no knowledge that "0" flow was released in the Eagle bypass. This would represent a violation of the existing license conditions. Please identify specifically when "0" flow was released and/or authorized for the Eagle bypass.

FWS-26 Page 66. Minimum Flows Soft Maple. This section fails to reference the unsightly red flocculent within the north channel of the bypass.

FWS-27 Page 69. Downriver Boating - The Beaver River Canoe Route. The "beginning" of the canoe route does not start at the tailwater of the Moshier development but at the head of the Moshier impoundment immediately downstream of the Stillwater dam. In addition, a take-out and portage is to be located at the Moshier dam.

FWS-28 Page 77. Access to Recreation Resources. The referenced "new" access to the Effley impoundment has already been constructed as part of a joint venture between Lewis County, NMPC, and the Iroquois Gas Transmission System. The access to the High Falls impoundment was also developed as a joint venture among these same parties.

FWS-29 Page 80. VI. Development Analysis. Although we will not provide a rigorous critique of the economic analysis we note that the profit generated during the annual license terms was not considered and the cost of the referenced "existing" bypass flows may be incorrect.

FWS-30 Page 85. B. Development and Nondevelopment Uses of the Waterway. We believe that the Beaver River Fund and the Advisory Council represents an important component of the "comprehensive development" of the waterway.

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FWS-25 Table 5, in Section V.C.6, has been revised to reflect minimum flows specified in the amending order. The "O" flow at Eagle denotes no observations as flows were uncontrolled and estimated as 150 cfs. The table has been revised for clarification. Similarly no observations were made at Soft Maple where flows were about 30 cfs during the site visit.

FWS-26 Observations were made in the south channel and dealt with varying flow conditions. The red flocculent, reported elsewhere, was not considered a significant visual impact.

FWS-27 The EA, in Section V.C.7, has been revised to reflect continuity in the Canoe Route at the Moshier Development.

FWS-28 The EA, in Section V.C.7, has been revised to reflect prior joint venture activities at Effley and High Falls.

FWS-29 The economic analysis was done following FERC's standard practice which compares the cost of the project to generate energy to the cost of generating an equivalent amount of energy by an alternative (least cost) source. Profits are not included. Also, the EA, in Section VI and VII has been revised to reflect the results of the economic analysis of current conditions modified to use minimum flows based on the amending order.

FWS-30 As noted in the EA, FERC staff recognizes the value of the Fund and the Advisory Council, but we have no control or legal responsibility for either. Therefore, related conditions will not become part of any license order issued for this project.

Document Content(s)

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