

UNITED STATES OF AMERICA 59 FERC□ 62,267
FEDERAL ENERGY REGULATORY COMMISSION

New England Power Company

Project No. 1904-008
Vermont

ORDER AMENDING LICENSE
AND REVISING ANNUAL CHARGES
(ISSUED JUNE 12, 1992)

On February 22, 1991, New England Power Company (NEP), licensee for the Vernon Project, filed an application for an amendment of license under Part I of the Federal Power Act (Act).

The licensee proposes to replace four existing 2-MW turbine/generator units (Units Nos. 5 through 8) with two 14-MW turbine/generator units (Unit Nos. 11 and 12). The proposed change would increase the project's total installed capacity from 24.4 MW to 44.4 MW and increase the total hydraulic capacity from 15,530 cubic feet per second (cfs) to 20,930 cfs. In addition, the licensee also proposes the following additional modifications to the project: (1) install two new outdoor 13.8-kV to 69-kV step-up transformers; (2) replace the existing interior 69-kV bare conductor overhead busses with an underground 13.8-kV interconnection to the new step-up transformers; (3) install two new draft tube extensions for the two 14 MW units; and (4) replace all interior electrical equipment for the turbine/generator units with a modern control system and a new control room.

The modifications would not greatly alter the operation of the project from its present condition since the amount of water available for daily generation would still be dependent on project inflow. The project would still operate to meet periods of high power demand and also operate in a more continuous base load mode when river flows are high enough to support continuous generation.

The Commission issued a public notice of the application. Comments received from the agencies have been fully considered in determining whether to issue this order. No agency objected to the issuance of this order.

The State of Vermont (Vermont) filed a motion to intervene, a Protest, and a Stay Request on June 26, 1991. Vermont withdrew its Protest and Stay Request by a settlement agreement filed on November 20, 1991. However, Vermont did not withdraw its motion to intervene to continue to be a party to this proceeding.

On June 27, 1991, Northeast Utilities Service Corporation (NUSCO) also filed a motion to intervene. NUSCO's concerns were that the proposed increased capacity at the Vernon Project would have negative effects on the operation of the downstream Turners Falls Project (FERC No. 1889) and Northfield Mountain Project (FERC No. 2485). Both projects are licensed to subsidiaries of NUSCO.

In response to NUSCO's comments, NEP stated that the proposed development could have the potential to beneficially affect the downstream projects by reducing fluctuations in the Turners Falls reservoir. Also, NEP stated that the operation of all three projects is coordinated through the New England Power Pool's regional central dispatching system (NEPEX). The present goal of NEPEX is to optimize generation from all the Connecticut Basin projects. NEP stated that if, at some time in the future, NEPEX stopped providing project coordination, NEP and NUSCO could enter into a coordination agreement. Article 304 has been added to the license to ensure continued coordinated operations of the affected projects.

On June 28, 1991, the Army Corps of Engineers (Corps), filed a letter with Commission concerning the application. The letter requested NEP to enter into an agreement with the Corps in order to coordinate flow releases from the Vernon Project with the upstream Corps flood control projects. The Commission will revise Article 32 of the license to specify that NEP and the Corps enter into a new agreement for the coordinated operation of the Vernon Project in the interests of flood control and navigation.

The staff considered the agency and public comments in its preparation of the Environmental Assessment (EA)¹. The attached EA also identifies environmental issues in relation to construction impacts on water quality and fish passage. Therefore, the Commission will include Articles 401 through 403 to address these issues.

Subsequent to preparation of the EA, the Vermont State Historic Preservation Officer (SHPO) raised concerns regarding impacts of the proposal on the eligibility of the Vernon Station for the National Registration of Historic Places. The proposed modifications would replace some of the original turbines, and mechanical and electric components, some of which date to 1909.

1 Environmental Assessment, Unit Replacement Project at Vernon Station, FERC Project No. 1904-008, New Hampshire and Vermont, Federal Energy Regulatory Commission, dated April 13, 1991. This document is available in the Commission's public files associated with this proceeding and is attached to this order.

In their letter dated May 15, 1992, the SHPO stated that the proposal would have an adverse effect on properties that are eligible for the National Register of Historic Places. The SHPO also stated that the effects of the modifications could be mitigated by preparing the registration form for the National Register of Historic Places for the Vernon Station, and documenting the components proposed for replacement to Historic American Engineering Records (HAER) standards.

The proposal's effects to the historic characteristics of the Vernon Station will be adequately mitigated by complying with Article 404. This article will require the licensee to prepare the registration form for the National Register of Historic Places and documentation of the components proposed for replacement to HAER standards.

Comprehensive Development

Section 4(e) of the Act states that in deciding whether to issue a license, the Commission, in addition to considering the power and development purposes of the project, shall give equal consideration to the purpose 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. These purposes are considered in the EA prepared for this project.

Section 10(a)(2)(A) of the Act, 16 U.S.C. §803(a)(2)(A), requires the Commission to consider the extent to which a project is consistent with federal and 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 have filed with the Commission eight comprehensive plans that address various resources in New Hampshire and seven comprehensive plans that address various resources in Vermont. Of these, the staff identified and reviewed five New Hampshire plans², four Vermont plans³, and one federal plan⁴ relevant to

2 Wild, Scenic, and Recreational Rivers for New Hampshire, 1977, New Hampshire Office of State Planning; Connecticut River Basin Fish Passage, Flow, and Habitat Alteration Considerations in Relation to Anadromous Fish Restoration, 1981, Technical Committee for Fisheries Management of the Connecticut River; A Strategic Plan for the Restoration of Atlantic Salmon to the Connecticut River Basin, 1982, Policy Committee for Fisheries Management of the Connecticut River; New Hampshire Rivers Management and Protection Program, 1988, State of New Hampshire; New Hampshire Wetlands Priority Conservation Plan, 1989, New Hampshire Office of State Planning.

this project. No conflicts were found.

Based upon a review of the agency and public comments filed on this project, and on the staff's independent analysis, the staff finds that the Vernon redevelopment is best adapted to a comprehensive plan for the proper use, conservation, and development of the Connecticut River and other project-related resources.

Recommendations of Federal and State Fish and Wildlife Agencies

Section 10 (j) of the Act, 16 U.S.C. §803(j), requires the Commission to include license conditions, based on recommendations submitted by federal and state fish and wildlife agencies pursuant to the Fish and Wildlife Coordination Act, for protection, mitigation, and enhancement of fish and wildlife. The attached EA for the amendment proposal addresses the concerns of the federal and state fish and wildlife agencies and makes recommendations consistent with those of the agencies.

Summary of Findings

After considering the environmental information in the application for amendment of license, the staff's independent environmental assessment, and other agency and public comments, the staff finds that issuance of this amendment is not a major federal action significantly affecting the quality of the human environment. The EA contains background information, analysis of impacts, support for related license articles, and the basis for a finding of no significant impact on the environment.

The Vernon Project, as amended by this order, is best adapted to the comprehensive development of the waterway for beneficial public uses. The increase in the authorized generating capacity from 24.4 MW to 44.4 MW (59,200 horsepower equivalent) is in the interest of maximizing the project's

3 Connecticut River Basin Fish Passage, Flow, and Habitat Alteration Considerations in Relation to Anadromous Fish Restoration, 1981, Technical Committee for Fisheries Management of the Connecticut River; A Strategic Plan for the Restoration of Atlantic Salmon to the Connecticut River Basin, 1982, Policy Committee for Fisheries Management of the Connecticut River; Vermont State Comprehensive Outdoor Recreation Plan, 1983-1988, 1983, Vermont Agency of Environmental Conservation; Vermont Rivers Study, 1986, Vermont Agency of Environmental Conservation.

4 Restoration of Atlantic Salmon to New England Rivers: Final Environmental Impact Statement, 1989, U.S. Fish and Wildlife Service.

electrical generating potential. The licensee will pay the United States the revised annual charges effective the first day of the month in which this order is issued.

The Director orders:

(A) The license for the Vernon Project, FERC No. 1904, is amended as proposed in the application filed on February 22, 1991, effective the first day of the month in which this order is issued.

(B) The following exhibits conform to the Commission's rules and regulations. They are approved and made part of the license, superseding the existing exhibits:

Exhibit A - Pages A-1 through A-4 of the exhibit A entitled "Exhibit A - Project Description", filed on February 22, 1991.

Exhibit	FERC No.	Title	Superseding
F-1	1904-93	General Layout of Plant	1904-87
F-2	1904-94	Details of Spillway	1904-88
F-3	1904-95	Powerhouse & Switchyard	1904-89
F-4	1904-96	Section of Powerhouse, Unit Nos. 1-4	1904-90
F-5	1904-97	Section of Powerhouse, Unit Nos. 11-12	1904-91
F-6	1904-98	Section of Powerhouse, Unit Nos. 9-10	1904-92

(C) The superseded exhibit F drawings are eliminated from the license.

(D) The exhibit M of the license, filed on June 23, 1969, is superseded and eliminated from the license.

(E) The project description in ordering paragraph (B)(2) of the license is revised to read as follows:

(2) Project works consisting of: (a) a concrete gravity dam comprising of a 500-foot-long overflow spillway with 8-foot-high flashboards, a 100-foot-long gated sill block with two

20-foot-high by 50-foot-long tainter gates, and a 353-foot-long non-overflow section; (b) Vernon Reservoir with a water surface area of 2,550 acres at normal pool elevation 220.13 (NGVD) extending about 27 miles upstream; (c) a powerhouse

containing four 2,000-kW, two 14,000-kW, and two 4,200-kW generating units for a total installed capacity of 44,400-kW; (d) transmission facilities consisting of: (i) generating leads; (ii) four 66/2.3-kV and two 72/2.3-kV step-up transformers located within the powerhouse; (iii) an underground 13.8-kV interconnection to two outdoor 13.8 to 69-kV step-up transformers; and (e) appurtenant facilities.

(F) Article 30 of the license is revised to read as follows:

Article 30. The licensee shall pay the United States the following annual charge, effective the first day of the month in which this order is issued:

- ù For the purpose of reimbursing the United States for the cost of administration of Part I of the Act, a reasonable annual charge as determined by the Commission in accordance with the provisions of its regulations in effect from time to time. The authorized installed capacity for that purpose is 59,200 horsepower.

(G) Article 32 of the license is revised to read as follows:

Article 32. The licensee shall enter into an agreement with the Department of Army, Corps of Engineers (Corps), providing for the coordinated operation of the project, in the interest of flood control and navigation, on the Connecticut River in accordance with the rules and regulations prescribed by the Secretary of the Army. A copy of the agreement shall be filed with the Commission within one year of the date of this order. If the licensee and the Corps fail to reach an agreement, then the licensee shall file its proposals for coordinated operation of the project with other water resource projects on the Connecticut River, together with a copy of the Corp's objections to the licensee's proposals. The Commission reserves the right to impose conditions on the licensee for coordinated operation of the project.

(H) The following articles are added to and made part of the license for the Vernon Project:

Article 301. The licensee shall commence construction of the revised project works within two years from the issuance date of this order and shall complete construction of the project within four years from the issuance date of this order.

Article 302. The licensee shall, at least 60 days prior to the start of construction, submit one copy to the Commission's Regional Director and two copies to the Commission (one of these shall be a courtesy copy to the Director, Division of Dam Safety and Inspections), of the final contract drawings and specifications for pertinent features of the revised project works, such as water retention structures, powerhouse, and water conveyance structures. The Commission may require changes in the plans and specifications to assure a safe and adequate project. If the licensee plans substantial changes to location, size, type, or purpose of the water retention structures, powerhouse, or water conveyance structures, the plans and specifications must be accompanied by revised Exhibit F and G drawings, as necessary.

Article 303. Within 90 days after constructing the revised project works, the licensee must file for Commission approval revised exhibits A, F, and G to describe and show the project as built.

Article 304. The licensee shall continue to allow the New England Power Pool's regional central dispatching system (NEPEX) to coordinate the operation of the Vernon Project with the Northfield Mountain Project (FERC No. 2485) and Turners Falls Project (FERC No. 1889) for generation output. Both the Northfield Mountain and Turners Falls Projects are immediately downstream of the Vernon Project and owned by subsidiaries of Northeast Utilities Service Company (NUSCO). In the event that NEPEX will no longer continue to adequately coordinate the projects' operation, the licensee shall enter into a reasonable agreement with NUSCO to coordinate the operation of the three projects. If the licensee must enter into an agreement with NUSCO, then the licensee shall submit a copy of this agreement to the Commission. The Commission reserves the right to impose conditions on the licensee for coordinated operation of the project.

Article 401. The licensee shall, in consultation with the New Hampshire Water Supply and Pollution Control Division (NHWSPC) and the Vermont Agency of Natural Resources (VANR), and at least 90 days before commencing any project-related land clearing or land disturbing activities, prepare and file for Commission approval a final plan and schedule to control erosion, slope stability, and fugitive dust, and to minimize the quantity of sediment resulting from project construction and operation.

The erosion control plan shall be based on the actual geological, soil, and groundwater conditions and final project design. The erosion control plan shall contain, as a minimum, the following measures: 1) cofferdams, perimeter control measures, measures to divert runoff around disturbed land surfaces and to collect and filter runoff, provisions for energy dissipation, rip-rap, and permanent drainage where necessary; 2)

a revegetation plan; and 3) disposal of excavated materials above the high water mark and storage of fuel and chemicals used in construction in a manner to prevent releases to water bodies. In addition, the licensee shall take every reasonable precaution during construction to prevent the discharge of petrochemicals, wet concrete, or other materials and debris into the river. Debris generated shall be disposed of properly and in a non-wetland location.

The licensee shall also include in the plan documentation of consultation with, and recommendations of, the NHWSPC and the VANR. Specific descriptions of how all of the agency comments and recommendations are accommodated by the plan should be included in the filing. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons for rejection, based on project-specific information. The licensee shall allow a minimum of 30 days for the agencies to comment on the plan prior to filing the plan with the Commission. The licensee shall not commence any land clearing or land disturbing activities until the licensee is notified in writing that the Commission approves the plan. The licensee shall give prior written notice to the NHWSPC and the VANR at least 48 hours prior to the commencement of land clearing or land disturbing activities.

The Commission reserves the right to require changes to the plan. Upon notification of Commission approval, the licensee shall begin implementing the erosion control plan, including any changes required by the Commission.

Article 402. At least 90 days before commencing any project-related construction activities, the licensee shall file a plan for Commission approval to ensure the safe and efficient upstream passage of Atlantic salmon, American shad, and other anadromous fishes during the construction and operation of the new units. The upstream passage plan shall include, but not be limited to, the following: 1) provisions for constructing the new units to avoid the driving of sheet pilings in the tailrace during the upstream migration of anadromous fishes at the project; 2) the results of the licensee's hydraulic modelling study showing the effects of the new units' discharges on the hydraulic conditions in the project tailrace; 3) recommendations, based on the results of the modelling study, for any changes to the project's structures or operation needed to ensure the safe and efficient upstream passage of anadromous fishes; 4) a proposed plan and schedule for monitoring the effectiveness of the fish ladder during operation of the new units; and 5) a schedule for filing with the Commission the results of the monitoring and, for approval, any additional recommended changes to the project's structures or operation, based on the monitoring results, to ensure the safe and efficient upstream passage of anadromous fishes.

The licensee shall prepare the plan following consultation with the Connecticut River Atlantic Salmon Commission (CRASC), the U.S. Fish and Wildlife Service (FWS), the Vermont Department of Fish and Wildlife (VDFW), and the New Hampshire Fish and Game Department (NHFGD). The licensee shall include with the plan documentation of consultation and copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the comments of the agencies are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations prior to filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing should include the licensee's reasons for not doing so, based on project-specific information.

The results of the studies shall be filed with the Commission according to the approved schedule. If the results indicate that modifications are needed to improve upstream fish passage, the licensee shall also file recommendations for these changes to with the Commission for approval. The licensee shall consult with CRASC and the other fishery agencies on the study results and on the proposed modifications. The Commission reserves the right to require any changes to the plan to improve the effectiveness of upstream passage of anadromous fishes at the project.

Article 403. At least 90 days before commencing any project-related construction activities, the licensee shall file with the Commission for approval a plan to provide safe and efficient downstream passage for Atlantic salmon smolts, American shad, and blueback herring during the construction and operation of the new units. The downstream passage plan shall include, but not be limited to, the following: 1) provisions for alternate interim downstream fish passage, in the event that construction activities interfere with the operation or effectiveness of the existing interim downstream passage facility; 2) functional design drawings of permanent downstream passage facilities and a schedule for constructing these facilities so that the facilities are operational prior to the start of operation of the new units; 3) provisions to monitor the effectiveness of the downstream passage facilities in minimizing the entrainment of anadromous fishes; and 4) provisions to operate the downstream fish passage system in accordance with the annual notification letter issued by the CRASC.

The licensee shall prepare the plan following consultation with the CRASC and the other fishery agencies. The licensee shall include with the plan documentation of consultation and copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the comments of the agencies are accommodated by the plan. The licensee shall allow a minimum of

30 days for the agencies to comment and to make recommendations, prior to filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing should include the licensee's reasons for not doing so, based on project-specific information.

The Commission reserves the right to require changes to the plan. Operation of the new units shall not begin 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 404. The licensee shall, prior to commencing any project-related construction activities, that will affect the characteristics of the Vernon Station that make it eligible for the National Register of Historic Places, (1) prepare the National Register of Historic Places registration form consistent with the Secretary of the Interior's Standards and Guidelines for Historic Preservation for the Vernon Station, and (2) document the components proposed for replacement according to the standards of the Historic American Engineering Records (HAER) of the National Park Service (NPS). The HAER documentation shall be based on the recommendations of the Vermont and New Hampshire State Historic Preservation Officers (SHPO) and the HAER staff of the NPS. The licensee shall file with the Commission copies of letters from the Vermont and New Hampshire SHPO's commenting on the registration form for the Vernon Station for the National Register of Historic Places. The licensee shall also file a copy of a letter from the NPS accepting the HAER documentation. The Commission may require changes to the documentation based on this filing. No construction activities that will effect the characteristics of the Vernon Station that make it eligible for the National Register of Historic Places shall begin until the licensee is notified by the Commission that the documentation complies with requirements of the article.

(I) Within 90 days of the date of issuance of this order, the licensee shall file an original of the approved exhibit F drawings reproduced on silver or gelatin 35 mm microfilm mounted on Type D (3 1/4" x 7 3/8") aperture cards for each drawing. In addition, the licensee shall file two Diazo-type duplicate aperture cards. The original set and one duplicate set of aperture cards should be filed with the Secretary of the Commission. The remaining duplicate set of aperture cards should be filed with the Commission's New York Regional Office. The FERC drawing number (1904-93 through 1904-98) shall be shown in the margin below the title block of the microfilmed drawing and also in the upper right corner of each aperture card. The top line of the aperture card shall show the FERC exhibit (i.e., F-1 through F-6), Project Number, Drawing Title, and date of this order.

(J) This order constitutes final agency action. Requests for rehearing by the Commission may be filed within 30 days of the date of issuance of this order, pursuant to 18 C.F.R. §385.713.

J. Mark Robinson
Director, Division of Project
Compliance and Administration

ENVIRONMENTAL ASSESSMENT
FOR HYDROPOWER LICENSE AMENDMENT

Unit Replacement Project at Vernon Station

FERC Project No. 1904-008

New Hampshire and Vermont

Federal Energy Regulatory Commission
Office of Hydropower Licensing
Division of Project Compliance and Administration
825 N. Capitol Street, NE
Washington, D.C. 20426

April 13, 1992

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ENVIRONMENTAL ASSESSMENT

FEDERAL ENERGY REGULATORY COMMISSION
OFFICE OF HYDROPOWER LICENSING
DIVISION OF PROJECT COMPLIANCE AND ADMINISTRATION

Date: April 13, 1992

Project Name: Vernon FERC Project No. 1904-008

A. APPLICATION

1. Application type: Amendment of License
2. Date filed with the Commission: February 22, 1991
3. Applicant: New England Power Company (NEP)
4. Water body: Connecticut River
5. Nearest city or town: Hinsdale, NH
6. County: Cheshire, NH; Windham, VT State: NH/VT

B. PURPOSE AND NEED FOR ACTION

NEP proposes to redevelop the Vernon Project by replacing four existing 2.0 megawatt (MW) turbine/generator units (Units No. 5 through 8) with two new 14-MW units and replacing old electrical equipment and controls. The proposed change would increase the project's total installed capacity from the authorized 24.4 MW to 44.4 MW.

The proposed redevelopment of the Vernon Project would result in more efficient use of water passing through the project and increase average annual generation from 124,470 megawatt hours (MWh) to about 180,500 MWh.

C. PROPOSED PROJECT AND ALTERNATIVES

1. Description of the proposed action.

NEP proposes to replace four eighty-year-old existing 2.0-MW turbine/generator units (Units No. 5 through 8) with two new 14-MW units. The proposed changes would increase the maximum hydraulic capacity of the project from 15,530 cubic feet per second (cfs) to 20,930 cfs. All interior electrical equipment connecting the remaining generating units (Units No. 1 through 4, 9 and 10) will be replaced with new modern control systems and a

new control room.

NEP also proposes to install two new outdoor 13.8 to 69-kilovolt (kV) step-up transformers located at the south end of the 69-kV switchyard, replace the existing interior 69-kV bare conductor overhead busses with an underground 13.8-kV interconnection to the new step-up transformers, and install two new draft tube extensions for the two new 14-MW units. These extensions would project downstream of the fish ladder's collection channel.

The operation of the Vernon Project following the proposed unit replacements would not be greatly altered from the present condition, since the amount of water available for daily generation would still be dependent on project inflow. The Vernon Station would still operate to meet periods of high power demand during periods of low river flows, and it would operate in a more continuous base load mode when river flows are high enough to support continuous generation, primarily during high runoff periods (e.g., spring freshets, storm events).

NEP estimates that, as a result of the larger Station discharge capacity, gate spillage would be reduced from about 14 percent to about 10.5 percent on a yearly basis. The time that the Station would be at the minimum flow discharge of 1,250 cfs would increase from about 32 percent to about 36 percent on a yearly basis.

The current minimum flow release of 1,250 cfs would be maintained during and following construction.

2. Alternatives to the proposed action.

Alternatives to the proposed action include the no-action alternative and the installation of a greater or lesser amount of capacity at the project.

The no-action alternative would not result in the development of the unused hydraulic capacity at the site and not result in the more efficient use of the water that now passes through the project. Further, because of the deteriorating condition of the four eighty-year-old 2.0 MW units, NEP has estimated that approximately \$8.5 million worth of repairs would be needed to restore the existing units.

Other alternatives exist with respect to the number and sizes of new units to install as replacements for the old units. NEP considered the installation of one or two new units, and based on physical constraints, commercial availability, available river flows, and a cost/benefit analysis, decided that the two proposed 14-MW units represented the best choice under the existing alternatives.

3. Applicant's proposed mitigative measures.

a. Construction.

The proposed unit replacements would not disturb areas outside of the existing powerhouse and adjacent switchyard. The powerhouse area would be isolated from the Connecticut River through the use of upstream and downstream structurally supported sheet pile cofferdams. To avoid sedimentation problems, all work would take place within the area behind the cofferdams. Dewatering discharge would be clarified to meet downstream water quality standards prior to being returned to the river.

Further, to avoid potential disruptive effects on usage of the adjacent fish ladder, NEP has agreed not to drive sheet piling into the tailrace while the fish ladder is being operated for upstream fish passage.

b. Operation.

NEP proposes to conduct fish behavior studies in the forebay and tailrace of the project following operation of the new units to determine whether the proposed changes adversely affect upstream or downstream fish passage at the project. NEP proposes to make changes to project structures or operation if the studies show that fish passage has been adversely affected.

D. CONSULTATION AND COMPLIANCE

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

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

2. Section 7 consultation (Endangered Species Act).

- a. Listed species: XX None. Present:
- b. Consultation: XX Not required.
 Required; completed: / / .

3. Section 401 certification (Clean Water Act).

Not required.

XX Required; applicant requested certification on 02/22/91.

Status : XX Granted by the certifying agency¹ on 12/09/91.

XX Waived by the certifying agency² on 11/18/91³.

E. COMMENTS

1. The following agencies and entities provided comments on the application or filed a motion to intervene in response to the public notice dated 05/10/91.

Commenting agencies and other entities	Date of letter
U.S. Fish and Wildlife Service	07/11/91
Vermont Agency of Natural Resources	06/26/91 ⁴
New Hampshire Fish and Game Department	09/13/91
U.S. Army Corps of Engineers	06/24/91
Connecticut River Atlantic Salmon Commission	10/04/91

Motions to intervene	Date of motion
State of Vermont	06/25/91 ⁵
Northeast Utilities Service Company	06/26/91

2. XX The applicant responded to the comments or motion(s) to intervene by letter(s) dated 06/11/91 and 06/12/91.

¹New Hampshire

²Vermont

³Vermont had originally claimed jurisdiction under § 401, which NEP disputed. In a Settlement Agreement entered into with NEP, dated November 18, 1991, the State of Vermont waived § 401 Certification, to the extent that it may have been required.

⁴This comment letter was withdrawn in a Settlement Agreement between the State of Vermont and NEP dated November 18, 1991.

⁵On June 26, 1991, The State of Vermont also filed a Protest and Stay Request with the Commission. The Protest and Stay Request was withdrawn by the Settlement Agreement dated November 18, 1991. The motion to intervene, however, was not withdrawn.

F. AFFECTED ENVIRONMENT

The mainstem Connecticut River in the area of the Vernon Project is a critical component of the Connecticut River Anadromous Fish Restoration Program. As an example, over 780,000 Atlantic salmon fry and 24,000 smolts were stocked into tributaries upstream of the Vernon Project in 1991, and fry stockings are slated to be increased substantially in the next few years. In addition, one out of every ten returning adult salmon is not captured at downstream fishways, but allowed to continue upstream to spawn naturally. These fish should provide additional smolt production upstream from Vernon.

Because of the use of the mainstem Connecticut River and upstream tributaries by salmon, shad, and herring, both upstream and downstream fish passage are critical issues at the Vernon Project.

Upstream passage for anadromous fishes at the Vernon Project is provided by a combination modified Ice Harbor and vertical slot design fish ladder located on the Vermont shore. The fish ladder was constructed and became operational in 1981. A fish collection gallery with a series of entrance weirs lies over the project's draft tubes. The Vernon ladder is designed to pass 40,000 adult Atlantic salmon and 750,000 adult American shad annually. Usage of the fish ladder by these species has generally increased since its completion. During 1991, five salmon and over 37,000 American shad passed upstream of the project via the fish ladder, testimony to the fact that while successes have been achieved, restoration is far from complete.

No permanent facilities currently exist for the downstream passage of anadromous fishes at the Vernon Project. Downstream fish passage is needed during the spring (Atlantic salmon smolts), summer (adult shad), and fall (juvenile shad). Prior to 1991, the log and ice sluice at Vernon was operated during the spring to provide downstream passage for salmon smolts. Studies conducted during 1988 (Saunders and Mudre 1988) indicated that the sluice was not effective for passing Atlantic salmon smolts when operated at a gate opening of 1-2 feet. The sluice was more effective in tests conducted during 1990, passing up to 36 percent (mean = 21%) of the smolts when the gate opening was 3.5 feet (Royer et al. 1991).

By order dated July 26, 1990, the Director, Division of Project Compliance and Administration (in FERC's Office of Hydropower Licensing), issued an order approving an interim downstream fish passage facility at the project. This interim facility consists of a bypass conduit that was constructed inside an unused exciter bay in the powerhouse. This facility became

operational on April 1, 1991. Testing of the effectiveness of the interim facility was conducted during 1991, however the results of the studies are not currently complete. It is anticipated that the fish bypass conduit will be a component of the permanent downstream fish passage system implemented at the project.

Downstream passage for anadromous fishes at Vernon is also provided by spillage over the dam. Spillage typically occurs only in the spring, during high flows. Consequently, spillage would typically be expected to benefit only smolt migrations, and would not be significant for the downstream passage of juvenile or adult clupeids.

G. ENVIRONMENTAL IMPACTS AND RECOMMENDATIONS

Redevelopment of the Vernon Project has the potential for minor short-term impacts on downstream water quality during construction. Short and/or long-term impacts are possible on fisheries resources through an increase in entrainment or a reduction in fish passage efficiency. Long-term impacts are possible on the river flow regime, due to the increase in the hydraulic capacity of the project. There would be no adverse impacts on vegetation, wildlife resources, aesthetics, cultural resources, land use, or recreation associated with the implementation of the amendment proposal.

The following four environmental impact issues have been identified in relation to the proposed license amendment: 1) construction impacts on water quality and fish passage; 2) upstream fish passage; 3) downstream fish passage; and 4) changes in water flow regime.

1. Construction Impacts on Water Quality and Fish Passage

The proposed construction has the potential to cause short-term impacts on water quality, including turbidity, sedimentation, and discharge of construction pollutants (e.g., fuel, lubricating oil, or debris). However, standard construction precautions should minimize the probability that these impacts will occur. The licensee proposes to isolate the work area from the river by sheet-pile cofferdams, and to use settling basins to clarify water before it is returned to the river.

Minimal disturbance of land would occur during the proposed redevelopment. Nonetheless, the licensee should ensure that appropriate erosion and sediment controls are employed to prevent suspended sediments from entering the Connecticut River. The licensee should also ensure that construction-related pollutants and debris do not enter the Connecticut River. Consequently, the

licensee should prepare an erosion, sediment, and construction debris control plan prior to beginning any land disturbing activities. The plan should be developed in consultation with the New Hampshire Fish and Game Department (NHFGD) and the Vermont Agency of Natural Resources (VANR) and filed for Commission approval at least one month prior to the start of any land disturbing activities.

The resource agencies raised the concern that construction activities might also disrupt fish passage at the project. The agencies stated that the driving of sheet-pile cofferdams in the tailrace may frighten upstream migrant fish away from the fish ladder entrance. To avoid this potentiality, NEP has agreed to not drive sheet piling into the tailrace while the fish ladder is being operated for upstream fish passage. Staff finds that this proposal is satisfactory, and the licensee should refrain from driving sheet piling into the tailrace during the upstream migration of anadromous fishes.

The agencies also stated that cofferdams or construction activities on the upstream face of the powerhouse might, depending on time of year, interfere with the operation of the interim downstream passage facility. Because of the potential impact on downstream migrant fishes, in the event that activities associated with the construction of the new units interfere with the operation or effectiveness of the interim downstream passage facilities, the licensee should, following consultation with the Connecticut River Atlantic Salmon Commission (CRASC) and the other fishery agencies, file for Commission approval, a plan to provide an alternate interim downstream passage system.

2. Upstream Fish Passage

The proposed new turbine/generator units will discharge a greater flow volume than the present units and at an upturned angle. This new configuration may create a boil at the head of the tailrace below the powerhouse, and near the upstream fishway entrance gallery. This boil may interfere with the effectiveness of the existing fishladder for upstream fish passage.

NEP has developed a scale physical model of the facility to model plant outflows in order to determine the potential effects of the new units on fishway guidance and attraction flows. Preliminary results of the modelling indicate that there would be no changes in tailrace hydraulic conditions at flows exceeding 10,290 cfs. However, the model showed that, at lower flows, a slight back eddy would be present near the fish ladder entrance when only the two new units (Units 11 and 12) were running. The condition was found to be corrected by dividing the load between the new units and existing Units 9 and 10. Based on these preliminary results, NEP proposes to run a portion of the load through either or both Units 9 or 10 to eliminate the eddy at

flows below about 10,000 cfs.

The licensee should complete the modelling analyses and consult with CRASC and the other fishery agencies regarding the modelling results, and any proposed measures to correct problems identified. The licensee should file the modelling results showing the effects of the new unit discharges on the operation of the existing fish ladder and recommendations, based on the results of the modelling study, for any changes to the project's structures or operation needed to ensure the safe and efficient upstream passage of anadromous fishes. This filing should be part of an upstream fish passage plan that the licensee should develop and file with the Commission for approval.

To gain additional insight into the effects, if any, of the proposed redevelopment on fish passage, NEP proposes to conduct fish behavior studies in the tailrace after the new units begin operation, in order to determine if the back eddy predicted by the model tests, or other flow changes, would actually deter fish from using the main entrance of the fish ladder. The results of these studies would indicate whether any changes in project structures or operation are warranted.

Staff further finds that these proposed behavioral studies should be conducted. Consequently, following operation of the new units with any proposed modifications, the licensee should consult with CRASC and the other fishery agencies to develop a study plan and conduct a study to evaluate the effectiveness of the fish ladder under the new hydraulic regime. The licensee shall file with the Commission a post-operational report describing the passage system effectiveness, and, for approval, any proposed measures or further studies.

3. Downstream Fish Passage

Because the proposed redevelopment at the Vernon Project would increase the total hydraulic capacity of the plant, the potential exists for a reduction in the frequency and magnitude of spillage at the project. Under normal efficient maximum operation, the project currently uses about 11,000 cfs of river flow. Following the proposed unit replacements, normal efficient maximum discharge would increase to about 17,800 cfs.

The reduction of spill would increase the likelihood of fish entrainment at the project, and thus the potential for turbine-related mortality. A study conducted at Vernon during 1990 showed that 44 to 86 percent of salmon smolts passed downstream via spillage during those times when spill was occurring (Royer et al. 1991).

NEP estimates that the proposed redevelopment would decrease spillage about 4 percent on an annual basis, from about 14

percent to about 10 percent. However, it is more appropriate to consider spill reductions as they relate to specific downstream migrations. Under existing conditions, spillage is important only for the Atlantic salmon smolt outmigration, since river flows during summer and fall (when adult shad and juvenile clupeids outmigrate) are typically insufficient to allow spillage.

Staff studied flow data for the Connecticut River at the Vernon Project to determine the expected magnitude of spill reduction during the period of time when Atlantic salmon smolts outmigrate. For purposes of this analysis, the smolt migration was considered to occur during the month of May. Based on 19 years of water temperature data, Saunders (1987) determined that the likely period of smolt migration at the Bellows Falls Project (FERC No. 1855), approximately 33 miles upstream from Vernon, was from April 27 to June 14, annually, with the great majority of the migration occurring during the month of May.

Analysis of the flow duration curve for the month of May (based on data from 1915 to 1987) indicates that the proposed change in maximum normal efficient discharge from 11,000 cfs to 17,800 cfs would reduce the percent of time that spillage occurred during May from about 70 percent of the time to about 37 percent of the time, a reduction in spillage of about 45 percent.

Staff also analyzed the average daily flow at the Vernon Project over the period 1981 to 1990 (Figure 1). Over this period, flow in excess of 11,000 cfs occurred an average of 22 days (range 7 to 31 days) during the month of May. Over the same period, flows in excess of 17,800 cfs occurred an average of 12 days (range 0 to 26 days). This corresponds to a reduction in the average number of days that spillage would have occurred of about 46 percent. Based on the average daily flow data, the proposed redevelopment would tend to restrict spillage to the first half of May.

The reduction in spillage during the latter half of May could differentially impact wild, as opposed to hatchery smolts. Saunders and Mudre (1988) studied smolt passage at the Bellows Falls Project and found that peak migration of hatchery smolts occurred about 10 days prior to the peak migration for wild smolts in 1987 (i.e., May 10 versus May 20). If this finding represents a general trend, the proposed redevelopment could have a more serious impact on wild smolts.

Because of the potential for increased adverse impacts on Atlantic salmon smolts resulting from operation of the proposed new units, it is imperative that effective downstream passage facilities are installed and operated at the Vernon Project.

Downstream fish passage at Vernon is the subject of a

Figure 1. Average River Flows at the Vernon Project: May 1981-1990.
 Horizontal Lines Indicate Current and Proposed Normal
 Efficient Maximum Discharge (H.C.).

July 26, 1990 Memorandum of Agreement (MOA) between NEP and the resource agencies. This agreement establishes a mechanism and a schedule to provide downstream passage systems at NEP projects on the Connecticut River. Under this agreement, NEP has agreed to the installation of permanent downstream fish passage facilities at the Vernon Project by 1994. The licensee should continue to cooperate with the fishery agencies on downstream fish passage issues, and remedy any adverse impacts associated with the proposed redevelopment.

The licensee should install downstream fish passage facilities or implement other measures to provide safe and efficient downstream passage for Atlantic salmon, American shad, and herring, concurrent with the planning and construction of the new units. These facilities should be operational prior to the start of operation of the new units. The design of permanent downstream fishways should be developed in consultation with CRASC and other fishery agencies and should be filed for Commission approval at least 30 days prior to their proposed construction.

Downstream fish passage facilities should be operated in accordance with the annual notification letter issued by the

CRASC, in conjunction with the U.S. Fish and Wildlife Service (FWS), the Vermont Department of Fish and Wildlife (VDFW), and the New Hampshire Fish and Game Department (NHFGD).

Once operational, the approved downstream fish passage system should be monitored to determine the effectiveness of the system in minimizing the entrainment of anadromous fishes. Study plans, including schedules for conducting the monitoring and submitting reports, should be developed in consultation with the CRASC and the other fishery agencies and filed for Commission approval along with the downstream fish passage designs.

The results of the monitoring should be filed with the Commission according to the approved schedule. If the results indicate that modifications to the downstream passage measures are needed, the licensee should also file recommendations for these changes with the Commission for approval. The licensee should consult with CRASC and the other fishery agencies on the monitoring results and on the proposed modifications.

4. Changes in Water Flow Regime

In their Motion to Intervene and Comments, Northeast Utilities (NU) expressed concern that the increased hydraulic capacity resulting from the redevelopment of the Vernon Project may negatively affect the operation of two NU projects located downstream from Vernon: Northfield Mountain (FERC No. 2485) and Turners Falls (FERC No. 1889). NU states that because Vernon would have a hydraulic capacity greater than Turners Falls, it could be operated in a manner that would decrease generation from the Turners Falls Project, the next hydroelectric station downstream from the Vernon Project. With respect to Northfield Mountain, a pumped-storage project that utilizes the Connecticut River between the Vernon Project and the Turners Falls Project as its lower reservoir, NU claims that the Vernon redevelopment could adversely affect that project's generation and operating and reserve capacity.

NEP's response to NU's Motion to Intervene and Comments was that they already have the potential to adversely affect both projects, and that the proposed development could potentially beneficially affect the two projects, since they would be able to regulate project discharge over a wider range of flows.

From a practical standpoint, the key factor that would determine whether affects were adverse, beneficial, or benign, is coordination of operation among the projects. At present, and for the foreseeable future, the operation of all three projects is coordinated through the New England Power Pool's regional central dispatching system ("NEPEX"). The present goal of NEPEX is to optimize generation from all the Connecticut Basin projects. NEP stated that if, at some time in the future, NEPEX

stopped providing project coordination, then NEP and NU could enter into a coordination agreement.

NU also claimed that the proposed redevelopment would allow NEP to cause greater fluctuations in the elevation of the Turners Falls' pool, hence exacerbating shoreline erosion, or negatively affecting fish passage at the Turners Falls Project.

NEP responded that their ability to regulate a wider range of river flows could actually reduce pool level fluctuations. They further responded that their ability to fluctuate the pond would be small, on the order of one foot, and that any fluctuations would be gradual, as opposed to those caused by the operation of the Northfield Mountain Project, which can cause pond elevation changes of six feet. NEP further states that the redevelopment may actually result in decreased shoreline erosion, since water surface elevation could be better regulated.

With respect to NU's statement that the proposed redevelopment could negatively affect fish passage at the Turners Falls Project, NEP stated that NU produced no evidence to support this claim, and pointed out that none of the resource agencies voiced this concern.

The erosion issue was considered when the Vernon Project was relicensed in 1979. At that time, the Commission concluded that standard article 19 of the Vernon Project's license provides that the operation of the Vernon Project shall not result in shoreline erosion, and provides remedies for any erosion problems that may arise. Since relicensing, no evidence has arisen that demonstrates that operation of the Vernon Project has resulted in shoreline erosion. Further, NU has presented no evidence that the proposed amendment would result in water level fluctuations greater than those that currently occur, or other evidence that the proposed amendment would cause shoreline erosion. Because standard article 19 provides a mechanism for the correction of erosion problems, should they be demonstrated to occur, no additional safeguards are needed at this time.

Staff concludes that NU has not demonstrated that the redevelopment of the Vernon Project would affect the operation of fish passage facilities at the Turners Falls Project. Further, staff finds that adequate measures are already in place, or provided for, to ensure the development and operation of effective fish passage facilities at the Turners Falls Project.

H. CONCLUSION

NEP should be authorized to proceed with the redevelopment of the Vernon Project, under the conditions delineated above. Approval of the proposed amendment would not constitute a major

federal action significantly affecting the quality of the human environment; therefore, an environmental impact statement (EIS) will not be prepared.

I. LITERATURE CITED

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- Saunders, W.P. 1987. Assessment of the frequency of worst-case flow conditions during downstream migration of salmon smolts at Bellows Falls Dam. International Science & Technology, Inc., Reston, Virginia. Final Task 2 Report prepared for New England Power Service Company.
- Saunders, W.P. and J.M. Mudre. 1988. An evaluation of the effectiveness of fish bypass modifications of the log and ice sluiceway at Bellows Falls Station. International Science & Technology, Inc., Reston, Virginia. Report prepared for New England Power Service Company.

J. LIST OF PREPARERS

Name	Position title
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400-SERIES ARTICLES

Article 401. The licensee shall, in consultation with the New Hampshire Water Supply and Pollution Control Division (NHWSPC) and the Vermont Agency of Natural Resources (VANR), and at least 30 days before commencing any project-related land clearing or land disturbing activities, prepare and file for Commission approval a final plan and schedule to control erosion, slope stability, and fugitive dust, and to minimize the quantity of sediment resulting from project construction and operation.

The erosion control plan shall be based on the actual geological, soil, and groundwater conditions and final project design. The erosion control plan shall contain, as a minimum, the following measures: 1) cofferdams, perimeter control measures, measures to divert runoff around disturbed land surfaces and to collect and filter runoff, provisions for energy dissipation, rip-rap, and permanent drainage where necessary; 2) a revegetation plan; and 3) disposal of excavated materials above the high water mark and storage of fuel and chemicals used in construction in a manner to prevent releases to water bodies. In addition, the licensee shall take every reasonable precaution during construction to prevent the discharge of petrochemicals, wet concrete, or other materials and debris into the river. Debris generated shall be disposed of properly and in a non-wetland location.

The licensee shall also include in the plan documentation of consultation with, and recommendations of, the NHWSPC and the VANR. Specific descriptions of how all of the agency comments and recommendations are accommodated by the plan should be included in the filing. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons for rejection, based on project-specific information. The licensee shall allow a minimum of 30 days for the agencies to comment on the plan prior to filing the plan with the Commission. The licensee shall not commence any land clearing or land disturbing activities until the licensee is notified in writing that the Commission approves the plan. The licensee shall give prior written notice to the NHWSPC and the VANR at least 48 hours prior to the commencement of land clearing or land disturbing activities.

The Commission reserves the right to require changes to the plan. Upon notification of Commission approval, the licensee shall begin implementing the erosion control plan, including any changes required by the Commission.

Article 402. At least 30 days prior to the start of installation of the new units, the licensee shall for Commission approval a plan to ensure the safe and efficient upstream passage of Atlantic salmon, American shad, and other anadromous fishes during the construction and operation of the new units. The upstream passage plan shall include, but not be limited to, the following: 1) provisions for constructing the new units to avoid the driving of sheet pilings in the tailrace during the upstream migration of anadromous fishes at the project; 2) the results of the licensee's hydraulic modelling study showing the effects of the new units' discharges on the hydraulic conditions in the project tailrace; 3) recommendations, based on the results of the modelling study, for any changes to the project's structures or operation needed to ensure the safe and efficient upstream passage of anadromous fishes; 4) a proposed plan and schedule for monitoring the effectiveness of the fish ladder during operation of the new units; and 5) a schedule for filing with the Commission the results of the monitoring and, for approval, any additional recommended changes to the project's structures or operation, based on the monitoring results, to ensure the safe and efficient upstream passage of anadromous fishes.

The licensee shall prepare the plan following consultation with the Connecticut River Atlantic Salmon Commission (CRASC), the U.S. Fish and Wildlife Service (FWS), the Vermont Department of Fish and Wildlife (VDFW), and the New Hampshire Fish and Game Department (NHFGD). The licensee shall include with the plan documentation of consultation and copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the comments of the agencies are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations prior to filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing should include the licensee's reasons for not doing so, based on project-specific information.

The results of the studies shall be filed with the Commission according to the approved schedule. If the results indicate that modifications are needed to improve upstream fish passage, the licensee shall also file recommendations for these changes to with the Commission for approval. The licensee shall consult with CRASC and the other fishery agencies on the study results and on the proposed modifications. The Commission reserves the right to require any changes to the plan to improve the effectiveness of upstream passage of anadromous fishes at the project.

Article 403. At least 30 days before the start of installation of the new units, the licensee shall file with the Commission for approval a plan to provide safe and efficient downstream passage for Atlantic salmon smolts, American shad, and blueback herring during the construction and operation of the new units. The downstream passage plan shall include, but not be limited to, the following: 1) provisions for alternate interim downstream fish passage, in the event that construction activities interfere with the operation or effectiveness of the existing interim downstream passage facility; 2) functional design drawings of permanent downstream passage facilities and a schedule for constructing these facilities so that the facilities are operational prior to the start of operation of the new units; 3) provisions to monitor the effectiveness of the downstream passage facilities in minimizing the entrainment of anadromous fishes; and 4) provisions to operate the downstream fish passage system in accordance with the annual notification letter issued by the CRASC.

The licensee shall prepare the plan following consultation with the CRASC and the other fishery agencies. The licensee shall include with the plan documentation of consultation and copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the comments of the agencies are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations, prior to filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing should include the licensee's reasons for not doing so, based on project-specific information.

The Commission reserves the right to require changes to the plan. Operation of the new units shall not begin 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.

Comprehensive Development

Section 4(e) of the Act states that in deciding whether to issue a license, the Commission, in addition to considering the power and development purposes of the project, shall give equal consideration to the purpose 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. These purposes are considered in the environmental assessment prepared for this project.

Section 10(a)(2)(A) of the Federal Power Act (FPA), 16 U.S.C. §803(a)(2)(A), requires the Commission to consider the extent to which a project is consistent with federal and 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 have filed with the Commission eight comprehensive plans that address various resources in New Hampshire and seven comprehensive plans that address various resources in Vermont. Of these, the staff identified and reviewed five New Hampshire plans⁶, four Vermont plans⁷, and one federal plan⁸ relevant to this project. No conflicts were found.

⁶Wild, Scenic, and Recreational Rivers for New Hampshire, 1977, New Hampshire Office of State Planning; Connecticut River Basin Fish Passage, Flow, and Habitat Alteration Considerations in Relation to Anadromous Fish Restoration, 1981, Technical Committee for Fisheries Management of the Connecticut River; A Strategic Plan for the Restoration of Atlantic Salmon to the Connecticut River Basin, 1982, Policy Committee for Fisheries Management of the Connecticut River; New Hampshire Rivers Management and Protection Program, 1988, State of New Hampshire; New Hampshire Wetlands Priority Conservation Plan, 1989, New Hampshire Office of State Planning.

⁷Connecticut River Basin Fish Passage, Flow, and Habitat Alteration Considerations in Relation to Anadromous Fish Restoration, 1981, Technical Committee for Fisheries Management of the Connecticut River; A Strategic Plan for the Restoration of Atlantic Salmon to the Connecticut River Basin, 1982, Policy Committee for Fisheries Management of the Connecticut River; Vermont State Comprehensive Outdoor Recreation Plan, 1983-1988, 1983, Vermont Agency of Environmental Conservation; Vermont Rivers Study, 1986, Vermont Agency of Environmental Conservation.

⁸Restoration of Atlantic Salmon to New England Rivers: Final Environmental Impact Statement, 1989, U.S. Fish and Wildlife Service.

Based upon a review of the agency and public comments filed on this project, and on the staff's independent analysis, the staff finds that the Vernon redevelopment is best adapted to a comprehensive plan for the proper use, conservation, and development of the Connecticut River and other project-related resources.

