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DOCKETED
USNRC

August 7, 2006 (4:07pm)

August 7, 2006

Office of the Secretary
Attn: Rulemaking and Adjudications Staff
Mail Stop O-16C1
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

OFFICE OF SECRETARY
RULEMAKINGS AND
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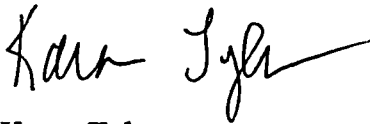
Re: In the Matter of Energy Nuclear Vermont Yankee, LLC and Entergy
Nuclear Operations, Inc. (Vermont Yankee Nuclear Power Station),
Docket No. 50-271-LR, ASLBP No. 06-849-03-LR

Dear Sir or Madam:

Please find enclosed for filing in the above stated matter New England Coalition, Inc.'s (NEC) Late Contention or, Alternatively, Request for Leave to Amend or File New Contentions.

Thank you for your attention to this matter.

Sincerely,



Karen Tyler
SHEMS DUNKIEL KASSEL & SAUNDERS PLLC

Cc: attached service list
Enclosures (3)

**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION**

Before the Atomic Safety and Licensing Board

In the Matter of)	
)	
Entergy Nuclear Vermont Yankee, LLC)	Docket No. 50-271-LR
and Entergy Nuclear Operations, Inc.)	ASLBP No. 06-849-03-LR
)	
(Vermont Yankee Nuclear Power Station))	

CERTIFICATE OF SERVICE

I, Ron Shems, hereby certify that copies of the NEW ENGLAND COALITION, INC'S
LATE CONTENTION OR, ALTERNATIVELY, REQUEST FOR LEAVE TO AMEND OR
FILE NEW CONTENTIONS in the above-captioned proceeding were served on the persons
listed below, by U.S. Mail, first class, postage prepaid; by Fed Ex overnight to Judge Elleman;
and, where indicated by an e-mail address below, by electronic mail, on the 7th day of August,
2006.

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UNITED STATES
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the matter of

ENTERGY NUCLEAR VERMONT YANKEE, LLC)
and ENTERGY NUCLEAR OPERATIONS, INC.)
Vermont Yankee Nuclear Power Station)
License Renewal Application)

Docket No. 50-271-LR
ASLB No.06-849-03-LR

**NEC'S LATE CONTENTION OR, ALTERNATIVELY, REQUEST FOR
LEAVE TO AMEND OR FILE A NEW CONTENTION**

Entergy amended its license renewal application in response to the New England Coalition's (NEC) Contentions 1 (thermal discharge) and 2 (metal fatigue).¹ However, the application amendments do not satisfy Entergy's NEPA obligations or its obligation to demonstrate plant safety. NEC, pursuant to 10 C.F.R. § 2.309(c) and (f)(2), respectfully requests admission of the following as a late contention, or alternatively, requests leave to amend Contention 1 or file the following as a new contention.

I. CONTENTION 1 – THERMAL DISCHARGE.

NEC incorporates by reference its already pending Contention 1 and its reply to Entergy's answer to Contention 1. In addition, NEC contends:

A. Late, Amended, or New Contention.

¹ At oral argument on August 1, 2006, the ASLB struck Entergy's amendments to its application for license renewal. Entergy has not filed a motion for leave to present the information in its license amendments to the ASLB. NEC is filing the attached in the event that the amendments are nonetheless posted on ADAMS and/or otherwise become part of this matter's record.

(1) NEC's Contention 1 is: Entergy's environmental report does not sufficiently assess the impacts of increased thermal discharges over the requested 20-year license extension. 10 C.F.R. § 2.309(f)(1)(i).

(2) The basis for this contention is Entergy's amendment of its environmental report (Amendment 6). The environmental report now references an amended (but expired) NPDES permit and claims that the NPDES permit amendment is a Clean Water Act (CWA) §316 variance or determination and fulfills Entergy's obligations under 10 C.F.R. § 51.53(c)(3)(A). However, the permit amendments, on their face, do not constitute a CWA § 316 determination. The amended permit has expired and remains only temporarily in effect. The amendments have been appealed and are being reviewed *de novo*. Moreover, the permit amendments require significant further study. Any new permit will be issued with different conditions based upon the studies required by the permit amendments Entergy now submits.

Further, an NPDES permit is not, by itself, a CWA § 316 variance or determination. Indeed, the Vermont Agency of Natural Resources (VANR) explicitly states that the amended permit is not a complete § 316 determination.² "The reviewers concluded that more information (i.e. actual field studies) was needed to make this determination, and therefore the

² The State of Vermont, through its Department of Public Service, has coordinated with the Vermont Agency of Natural Resources and has adopted NEC's Contention 1. The State of Vermont would not have adopted Contention 1 if the cumulative impacts of the thermal discharge over the requested 20-year license renewal had been assessed.

Agency has not granted this portion of the Applicant's amended request."

Attachment 1, Vermont Agency of Natural Resources Fact Sheet at 5.³

VANR found only that the "existing [pre-uprate] discharge under the existing [pre-uprate] permitted thermal limitations resulted in 'no appreciable harm' to the biota of the Connecticut River." *Id.* at 4. No findings were made regarding the cumulative impacts of the increased thermal discharge. To the contrary, the VANR explicitly stated that further study was needed before any such finding or determination could be made. *Id.* at 4-5.

Likewise, the U.S. Fish and Wildlife Service concluded that Entergy's CWA § 316 demonstration:

[L]acked information regarding the potential impact the thermal effluent may have on migrating Atlantic smolt behavior and physiology under either existing or proposed conditions. No studies specifically aimed at addressing these questions have been conducted since the current permit limits went into effect in 1990. Also, recent literature has shown a direct relationship between temperature and smolt physiology (McCormick et al. 1999) and temperature and smolt behavior (Barbin Zydlowski et al. 2005).

* * *

While the fisheries technical team was in general agreement with the demonstration results they brought to the attention of the ANR concerns regarding: (1) The robustness of the data used in the analyses; and (2) the need for future research to investigate potential thermal impacts on outmigrating juvenile shad.

Despite these concerns, the Service determined that it would not object to allowing a thermal

³ Entergy submitted this Fact Sheet as part of its License Renewal Application, Amendment 6.

increase from June 16 to October 14, *provided that* the amended permit contain conditions aimed at verifying the results of the predictive analyses and strengthening the monitoring program. As you are aware, the draft permit issued by the ANR does not include any new conditions related to American shad, and the only new condition related to the monitoring program is a requirement to perform an annual trend analysis.

In view of the above, the Service requests that the ANR revise the draft amended permit to contain the new conditions. If it is not possible to incorporate our recommendations into the amended permit, we ask that the ANR provide us with assurance that the conditions will be included in any renewed permit issued for the project (the current project permit expires on March 31, 2006).

Attachment 2, U.S. Fish and Wildlife Service Letter to Vermont Agency of Natural Resources (Mar. 17, 2006) (emphases added). Not all of the U.S. Fish and Wildlife Service's recommendations were incorporated into the March 30, 2006 permit amendments (that expired on 3/31/06, but remain in temporary effect pending issuance of a new permit). As requested by the Service, any new permit will contain different conditions than the expired permit. Hence, the expired permit cannot serve as a CWA § 316 determination for the cumulative impacts of Entergy's requested additional 20-year license term.

Further basis demonstrating the inadequacy of Entergy's amended environmental report is the absence of a CWA § 401 Water Quality Certification. Entergy is on notice that its requested license extension cannot

issue without a § 401 Certification. Yet, Entergy's amended environmental report makes no mention of any effort to seek and obtain § 401 Certification.

(3) This contention is within the scope of the proceeding. 10 C.F.R. § 2.309(f)(1)(iii). The impacts at issue are Category 2 and arise directly from Entergy's environmental report. It is thus within this proceeding's scope.

(4) The issue raised in this contention is material to findings the NRC must make in this matter. 10 C.F.R. § 2.309(f)(1)(iv). The NRC must take a "hard look" at the cumulative impacts of Entergy's increased thermal discharge over the additional requested 20-year license renewal. Commencement of this "hard look" requires Entergy to provide an assessment of these impacts, starting with a § 316 determination. 10 C.F.R. § 54.53(c)(3)(B).

(5) The attached Vermont Agency of Natural Resources Fact Sheet (Attachment 1), U.S. Fish and Wildlife Service letter (Attachment 2), and declaration of Dr. Ross Jones (Attachment 3) constitute concise statements of fact, law, and expert opinion that Entergy has not assessed the cumulative impacts of its additional thermal discharge. 10 C.F.R. § 2.309(f)(1)(v). Dr. Jones's declarations, and the U.S. Fish and Wildlife Service letter cite recent studies that create a framework for adequate assessment of the impacts. The expired permit amendment, on its face, is not

a CWA § 316 variance or determination. Entergy thus fails to meet the requirements of 10 C.F.R. § 54.53(c)(3)(B).

(6) The information here, presented at hearing, and in NEC's original Contention 1, provides ample information showing a genuine dispute with the Applicant. 10 C.F.R. § 2.309(f)(1)(vi). Simply put, Entergy claims to have assessed the cumulative impacts of its increased thermal discharge over the next 20 years. NEC provides fact, law, and expert opinion that the assessment is woefully inadequate. Entergy seeks to escape the need to assess its impacts by providing a CWA § 316 variance. However, no such variance has issued. The expired permit amendment, on its face, is not such a determination. Entergy's amendment of its application to characterize the permit amendment as a CWA § 316 determination shows a genuine dispute.

B. NEC Satisfies Requirements for a Late-Filed Contention.

A contention in response to Entergy's amendment of its environmental reports is appropriate under 10 C.F.R. § 2.309(c).

This contention arises under NEPA and "shall [be] based on the applicant's environmental report." 10 C.F.R. § 2.309(f)(2). By letter dated July 28, 2006, Entergy amended its environmental report to include amendments to its NPDES permit. Entergy characterizes the amended NPDES permit as a Clean Water Act § 316 variance or determination. However, as demonstrated below, the NPDES permit amendments are not a CWA § 316 variance or determination, and do not assess the cumulative

impacts of Entergy's thermal discharges over the requested 20-year license term.

This new information, upon which NEC's amended or late-filed contention is based, was not previously available. 10 C.F.R. §2.309(f)(2)(i). Because an environmental contention "shall" be based upon the applicant's environmental report, 10 C.F.R. § 2.309(f)(2), a contention taking issue with Entergy's reliance on its amended NPDES permit to meet NEPA obligations could not have been filed until Entergy amended its environmental report, demonstrating such reliance. Entergy's amendment of its environmental report now puts the NPDES amendments into play.

Further, the fact that Entergy is characterizing the NPDES permit amendments as a CWA §316 variance or determination is new information. The Vermont Agency of Natural Resources Fact Sheet issued with the permit specifically states that the permit amendments *do not* constitute a CWA § 316 variance, but only "partially" meet § 316's requirements. See Attachment 1, VANR Fact Sheet at 4-5. The Fact Sheet goes on to explain that significant further study is needed before a CWA § 316 variance or determination may issue. *Id.* Likewise, the U.S. Fish and Wildlife Service raised significant concerns and requested further study. Attachment 2, U.S. Fish and Wildlife Service Letter (Mar. 17, 2006). Therefore, the fact that Entergy has now formally amended its environmental report to characterize

the permit as a CWA § 316 variance is new, and could not have been reasonably anticipated.

This amendment to Entergy's environmental report, incorporating new information, constitutes good cause for a late-filed contention. 10 C.F.R. § 2.309(c)(1)(i). It is undisputed that NEC and its members have standing, a right to be made party to this proceeding, and a concrete interest in this proceeding. 10 C.F.R. § 2.309(c)(1)(ii)-(iii).

The possible effect of any order that may be entered here is no different from the effect of an order on NEC's existing Contention 1. 10 C.F.R. § 2.309(c)(1)(iv). This late or amended/new contention simply responds to information only now in Entergy's environmental report. NEC continues to contend that Entergy has not adequately assessed the cumulative impacts of its increased thermal discharge over the requested additional 20-year term of any renewed license.

NEC's interests cannot be protected in any other way because no other parties are raising this same contention. NEC's interests will not be represented by any other party.⁴ Nor will this late-filed or amended contention delay the proceeding. Further, delay, if any, is solely attributable to Entergy because, assuming that the amended permit is a CWA § 316 determination, Entergy could have amended its environmental report any time after the March 30, 2006 issuance of these permit amendments.

⁴ The State of Vermont has adopted NEC's environmental contention, but NEC remains as the sponsor and representative for this contention. 10 C.F.R. § 2.309(f)(3).

Entergy only now chooses to amend its environmental report. Delay, if any, is not prejudicial to Entergy. 10 C.F.R. § 2.309(c)(1)(v)-(vii).

Allowing this late contention also helps assure a sound record. 10 C.F.R. § 2.309(c)(1)(viii). Entergy has characterized the NPDES permit amendment as "final on its face." Entergy answer at 16. It is not. The permit amendments have been appealed, are subject to de novo review, and may be stayed. They are not final. Likewise, Entergy's characterization of the amendments as a CWA § 316 determination or variance is not correct. The VANR fact sheet states that this is not the case. Likewise, Entergy implies that the U. S. Fish and Wildlife Service independently reviewed and endorsed the expired permit amendments. Entergy Answer at 15. As demonstrated above, the Service has significant concerns and has asked for more study. Therefore, NEC's participation may be reasonably expected to assist in developing a sound record.

C. NEC Satisfies Requirements for Contention Amendment or New Contention.

In the alternative, Entergy's amendment of its environmental report also warrants leave for an amended or new contention pursuant to 10 C.F.R. § 2.309(f)(2). As demonstrated above, the new information upon which this amended or new contention is based was not previously available. 10 C.F.R. § 2.309(f)(2)(i). An environmental contention must be based on the applicant's environmental report. 10 C.F.R. § 2.309(f)(2). This information was not in the environmental report prior to Entergy's Amendment 6.

Entergy's amendment to its environmental report represents a material change in both its legal theory concerning compliance with NEPA, and the facts it submits as alleged proof of compliance. NEC's initial contention did not rely on a permit and was not based on 10 C.F.R. § 51.53(c)(3)(B)'s reference to a CWA § 316 determination. The information in this amended or new contention is materially different. 10 C.F.R. § 2.309(f)(2)(ii).

This amended or new contention is also timely. 10 C.F.R. 2.309(f)(2)(iii). NEC received notice of Amendment 6 only on Friday afternoon, July 28, 2006.

II. CONTENTION 2 – ENVIRONMENTALLY ASSISTED METAL FATIGUE.

NEC incorporates by reference its already pending Contention 2 and its reply to Entergy's answer to Contention 2. NEC has considered Entergy's application amendment 5, and finds it unnecessary to amend Contention 2. NEC notes that the application amendment 5 does not satisfy NEC's Contention 2 in that it does not describe: how CUFs were calculated, why CUFs are "conservative", how Entergy proposes to refine its analysis to lower CUFs, or how components with CUFs greater than 1 will be monitored.

III. NEC HAS CONSULTED OTHER PARTIES.

To the extent that the above constitutes a motion, NEC hereby certifies that it has made a good faith effort to consult with the parties, pursuant to 10 C.F.R. § 2.323(b). The State of Vermont and the Town of Marlboro do not

object. The NRC Staff does not object, provided NEC satisfies all relevant requirements of 10 C.F.R. §§ 2.309, 2.323. Entergy objects. Counsel for the State of Massachusetts was out of the office Monday, August 7, 2006, and has not yet responded to NEC's e-mail request for consent, sent at 10:25 a.m. on that date.

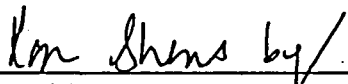

IV. CONCLUSION.

NEC's revised Contention 1 should be admitted as a late contention. Alternatively, NEC's motion for leave to amend Contention 1 should be granted.

August 7, 2006

New England Coalition

by:

 by 
Ronald A. Shems
Karen Tyler (on the brief)
SHEMS DUNKIEL KASSEL & SAUNDERS PLLC
For the firm

Attorneys for NEC

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DEPARTMENT OF ENVIRONMENTAL CONSERVATION
WASTEWATER MANAGEMENT DIVISION
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FACT SHEET
(October 2005, revised March 2006)

AMENDED NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
PERMIT TO DISCHARGE TO WATERS OF THE UNITED STATES

NPDES NO: VT0000264
FILE NO: 13-17
PERMIT NO: 3-1199
PROJECT ID NO: NS75-0006

Received

MAR 31 2006

By

Lynn Seewald

NAME AND ADDRESS OF APPLICANT:

Entergy Nuclear Vermont Yankee
320 Governor Hunt Road
Vernon, VT 05302

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

Entergy Nuclear Vermont Yankee
320 Governor Hunt Road
Vernon, Vermont

RECEIVING WATER: Connecticut River

CLASSIFICATION: Class B. Class B waters are suitable for bathing and recreation, irrigation and agricultural uses; good fish habitat; good aesthetic value; acceptable for public water supply with filtration and disinfection.

I. Proposed Action, Type of Facility, and Discharge Location

The above named applicant (Applicant) applied on February 20, 2003 to the Vermont Department of Environmental Conservation (Department) for an amendment of their permit to discharge into the designated receiving water. The Applicant is engaged in the operation of a nuclear electrical generating station. The discharge is from the outfall of the facility to the Connecticut River. The Department has made a decision to amend the discharge permit. The amendment approves a 1° F increase in the thermal discharge from the facility (S/N 001) at the compliance point downstream during the period of June 16 through October 14. The Applicant's request for increased thermal limitations during the period of May 16 through June 15 is denied as discussed below.

II. Description of Discharge

A quantitative description of the discharge in terms of significant effluent parameters is based on state and federal laws and regulations, the discharge permit application, and the recent self-monitoring data.

III. Limitations and Conditions

The effluent limitations of the S/N 001 discharge and the monitoring requirements may be found on the following pages of the permit:

Effluent Limitations:	Pages 2, 4, and 5 of 25
Monitoring Requirements:	Pages 2, 4, and 5 of 25

IV. Permit Basis and Explanation of Effluent Limitation Derivation for S/N 001**Facility Description and Background:**

The Applicant owns and operates a nuclear power station in Vernon, Vermont. The facility is located on the west shore of Vernon Pool, an impoundment of the Connecticut River created by Vernon Dam. The dam and Vernon Station, a hydroelectric facility, are located approximately 0.75 miles downstream from the Vermont Yankee Nuclear Power Station (Facility). The Facility, which began operation in 1972, is classified as a Boiling Water Reactor (BWR) with a rated core thermal power level of 1593 MW, providing a gross electrical output of 537 MW. The remainder of the energy, 1056 MW, is removed as heat by the circulating water system as it passes by the condenser and discharges to the Connecticut River (S/N 001), or to the atmosphere via mechanical draft cooling towers.

The S/N 001 discharge is made up of the main condenser cooling water and service water. Open/Hybrid cycle flow is permitted at 543 MGD, daily maximum, and closed cycle flow is permitted at 12.1 MGD. This amendment does not propose a change in the flow limitations or any other limitations with the exception of temperature.

Description of Entergy's Permit Amendment Request:

The Applicant's February 20, 2003 application requested an amendment to the existing thermal effluent limitations which would allow it to increase the temperature of the Connecticut River by 1°F as determined at Station 3 (located 0.65 miles downstream from Vernon Dam) relative to upstream river temperatures (Station 7, approximately 4 miles upstream). This request was for the period May 16 through October 14 (summer period) only and does not affect the so-called winter period (October 15 through May 15).

The existing and requested thermal effluent limitations are listed below.

Existing Thermal Effluent Limitations:

<u>Station 7 Temperature:</u>	<u>Increase in Temperature Above Ambient at Station 3:</u>
Above 63° F	2° F
>59° F, ≤63° F	3° F
≥55° F, ≤59° F	4° F
Below 55° F	5° F

Requested Thermal Effluent Limitations:

<u>Station 7 Temperature:</u>	<u>Increase in Temperature Above Ambient at Station 3:</u>
Above 78°F	2°F
>63°F, ≤ 78°F	3°F
>59°F, ≤ 63°F	4°F
≤ 59°F	5°F

In support of its application, the Applicant submitted the following principle documents at the time of application as well as additional follow-up documentation to the Agency of Natural Resources' (Agency) requests for further information.

1. "§316(a) Demonstration In Support of a Request for Increased Discharge Temperature Limits at Vermont Yankee Nuclear Power Station During May Through October", dated April 2004, Normandeau Associates.
2. "Hydrothermal Modeling of the Cooling Water Discharge from the Vermont Yankee Power Plant to the Connecticut River", April 2004, Applied Science Associates, Inc.
3. Water temperature data pertaining to thermal conditions below the Vernon Dam during the period May 16 through October 14, 2004, Normandeau Associates (electronic copy).
4. "Adult American Shad Hourly Count Data and the Corresponding Hourly Water Temperature Data for the Vernon Dam Fishway on the Connecticut River, 1991-2001", January 2004 and March 2004, Normandeau Associates.

Legal and Regulatory Basis for ANR's Review:

The Agency's review of thermal discharges is governed by §316(a) of the Clean Water Act (CWA) and relevant portions of the Vermont Water Quality Standards, effective July 2, 2000 (VWQS). CWA §316(a) provides for the establishment of alternative thermal effluent limitations. EPA has adopted regulations pursuant to §316(a) at 40 CFR §125.70 through 125.73. 40 CFR §125.73 includes the "Criteria and standards for the determination of alternative effluent limitations under 316(a)" and §125.73(a) states that:

"Thermal discharge effluent limitations or standards established in permits may be less stringent than those required by applicable standards and limitations if the discharger demonstrates to the satisfaction of the director that such effluent limitations are more stringent than necessary to assure the protection and propagation of a balanced, indigenous community of shellfish, fish and wildlife on the body of water into which the discharge is made."

For existing discharges, such as Entergy's, EPA's §316(a) regulations also provide for a retrospective analysis of the existing discharge. Specifically, 40 CFR §125.73(c)(1)(i) requires that any such retrospective analysis show:

"That no appreciable harm has resulted from the normal component of the discharge (taking into account the interaction of such thermal component with other pollutants and the additive effect of other thermal sources to a balanced, indigenous community

of shellfish, fish, and wildlife in and on the body of water into which the discharge is being made);"

Section 3-01 B.1. of the VWQS establishes temperature criteria for all state waters and establishes conditions for the assimilation of thermal wastes. Specifically, Section 3-01 B.1.d. Assimilation of Thermal Wastes states:

"The Secretary may, by permit condition, specify temperature limits that exceed the values specified above in order to authorize discharges of thermal wastes when it is shown that:

- (1) The discharge will comply with all other applicable provisions of these rules;
- (2) A mixing zone of 200 feet in length is not adequate to provide for assimilation of thermal waste; and
- (3) After taking into account the interaction of thermal effects and other wastes, that the change or rate of change in temperature will not result in thermal shock or prevent the full support of uses or the receiving waters."

The Agency has also determined that Section 1-03 Anti-Degradation Policy is applicable to this application (see below for further discussion).

Findings of ANR's Review Process

The proposed changes to the thermal effluent limitations reflected in the draft permit are the result of the Agency's partial approval of the Applicant's 2004 §316(a) demonstration request. The Agency found that during the period from June 16 through October 14 the limits will "assure the protection and propagation of a balanced indigenous population of shellfish, fish and wildlife". However the Agency could not make the same finding for the period May 16 through June 15 based on existing data.

The Agency's review of the application consisted of two parts consistent with the Applicant's submittals. First, the hydrothermal modeling was reviewed. The modeling was designed to predict the spatial and temporal changes in the Connecticut River as a result of requested increases in the thermal effluent limitations. Second, the Agency reviewed the §316(a) Demonstration Report which evaluated the impacts of the proposed temperature increases on the Connecticut River biota (Demonstration). Reviewers of the Applicant's submittals and application materials included staff from the Vermont Department of Fish and Wildlife and the Vermont Department of Environmental Conservation (Reviewers). In addition the Agency solicited and received substantive input from the New Hampshire Fish and Game Department and the US Fish and Wildlife Service throughout the course of the review. The Agency also selected Versar, a Maryland based third-party consultant to assist the Agency with its review. Due to their extensive experience in the review of §316(a) demonstration studies, Versar conducted an analysis and provided a report to the Agency on the hydrothermal modeling portion of the Demonstration.

The Reviewers concurred with the Applicant's retrospective analysis that the existing discharge, under the existing permitted thermal effluent limitations, resulted in "no appreciable harm" to the aquatic biota of the Connecticut River within the area influenced by the Applicant's thermal discharge during the period May 16 through October 14. However, in order to approve the requested increase in temperature a *predictive* determination also needed to be made that the proposed limits would "assure the protection

and propagation of a balanced indigenous population of shellfish, fish, and wildlife". The Reviewers agreed that the temperature increase would assure this balanced indigenous population during the period of June 16 through October 14 but concluded there was limited information regarding whether migrating salmon smolt would be impacted by the increased thermal effluent limitations during the period of May 16 through June 15, the later part of the smolt outmigration period. The Reviewers concluded that more information (i.e. actual field studies) was needed to make this determination and therefore the Agency has not granted this portion of the Applicant's amended request.

In addition, in response to comments received during the public notice period, the Agency has included a 85° F upper temperature limit at downstream Station 3 (the downstream monitoring station) during the period of June 16 through October 14. The condition will require that the permittee reduce the thermal output of the discharge to the extent that the average hourly temperature at Station 3 does not exceed 85° F.

In accordance with the VWQS, Section 1-01 B.1.d. the discharge must also not prevent the 'full support of uses' which is defined as "the achievement of the level of water quality necessary to consistently maintain and protect existing and designated uses." Designated uses are described in the Management Objectives for each class of water. For Class B waters, Section 3-04 A. Management Objectives of the VWQS includes the following designated uses: Aquatic Biota, Wildlife, and Aquatic Habitat; Aesthetics; Public water supply; Irrigation of crops and other agricultural uses; Swimming and other primary contact recreation; and Boating, fishing, and other recreational uses. The §316(a) Demonstration specifically documents that the use Aquatic Biota, Wildlife, and Aquatic Habitat is fully supported by the increase in thermal effluent limits. The Demonstration also indirectly addresses recreational fishing in that there will continue to be a balanced indigenous population of fish available for the angler. Based on the information provided to the Agency, it has made a determination that the proposed increase in thermal effluent limits will maintain a level of quality that fully supports all designated uses. In addition, at this time, the Secretary has not identified any uses in the area affected by the project that require designation as an existing use. All aquatic biota, aquatic habitat, wildlife, and recreational uses in the affected area will be maintained and protected. There are no uses such as recognized swimming holes or other unique recreational activities nor rare, threatened or endangered species that will be affected by the project that would warrant further consideration by the Secretary for designation as an existing use.

Anti-Backsliding: §402(o) of the Clean Water Act requires that a permit cannot be amended to contain effluent limitations that are less stringent than the comparable effluent limitations in the prior permit. §402(o)(2)(D) makes an exception from the general prohibition for less stringent effluent limitations when the permittee has received a modification pursuant to §316(a) of the Act.

As noted above, the Agency has reached a tentative decision to amend the Applicant's permit and made a finding that the Applicant's request meets the requirements for thermal discharges pursuant to §316(a) and Section 3-01 B.1.d of the VWQS and therefore the exception to the anti-backsliding requirements apply to this proposed discharge.

Antidegradation:**Section 1-03.B. Existing Uses**

Section 1-03.B. of the Vermont Water Quality Standards requires that existing uses of waters and the level of water quality necessary to protect those existing uses shall be maintained and protected regardless of the water's classification. Determinations of what constitutes an existing use are made during the basin planning process or on a case-by-case basis during consideration of an application. Based on the information provided by the Applicant and further outlined below, the Agency has concluded that the proposed discharge meets the Policy established in Section 1-03.B. of the VWQS.

For purposes of the analysis, the area of the proposed discharge is defined as an approximately 1.5-mile segment of the Connecticut River that spans from the lower Vernon Pool to the Vernon Dam Tailwaters. The thermal discharge is located approximately 0.75 miles upriver from the Vernon Dam. The affected area spans to Station 3 (0.65 miles downstream from Vernon Dam).

Although the Applicant believes that an Anti-Degradation analysis is not required for the requested increase in thermal limits, at the Agency's request the Applicant presented an Anti-Degradation Policy Analysis. The Applicant's analysis considers each of the five factors that the Secretary must consider in the evaluation of existing uses and concludes that all existing uses will be maintained and protected. In doing so, the Applicant has assumed that all aquatic biota, wildlife, plant life, and recreational uses of the area affected by the discharge are existing uses. The Agency does not explicitly find herein that the mere presence of aquatic biota, wildlife, plant life, or incidental recreational use of a waterbody automatically constitutes an existing use. There are no uses such as recognized swimming holes or other unique recreational activities nor rare, threatened or endangered species that will be affected by the project that would warrant further consideration by the Secretary for designation as an existing use. However, the Agency does agree with the Applicant that all uses of the affected area whether designated as existing uses or recognized as designated uses for Class B waters will be maintained and protected for the summer period for which the Agency is granting amended thermal limits.

a. *Aquatic biota that utilize or are present in the waters;*

In support of this amendment, the Applicant examined the aquatic biota through the use of a retrospective and predictive demonstration project for the proposed discharge. In the development of this §316(a) Demonstration Project, the Applicant targeted representative important species (RIS) that were indicative of the overall ecological health of the aquatic biota and then analyzed the proposed discharge's affect on those RIS. The Applicant focused upon macroinvertebrate and fish communities in its demonstration and then drew inferences to the potential impacts to the wildlife and plankton communities. The Applicant's Demonstration provides a sound basis for the conclusion that there have been no adverse impacts from the existing thermal discharge on benthic macroinvertebrates or RIS. Most population levels and compositions have remained unchanged from 1991 to 2002 in the affected area and upstream in the unaffected area. Those fish species that have experienced a decline (juvenile American shad and White suckers) have experienced declines consistent with overall declines noted for the adjacent upstream Connecticut River and not in the waters only affected by the existing discharge. The Applicant's predictive

analysis for the Demonstration indicates that the approved temperature increase will create insignificant changes in the thermal structure of the receiving waters affected by the project's discharge and that as a result the use of the waters by all species present will be maintained and protected.

The Departments of Environmental Conservation and Fish and Wildlife from the State of Vermont, Department of Fish and Game from the State of New Hampshire, the United States Fish and Wildlife Service and a third party consultant with expertise in thermal and aquatic biota modeling from power plant discharges (Versar) reviewed the Demonstration. The Agency has concluded that the predictive Demonstration provided by the applicant reasonably assures a balanced aquatic community of fish and benthic macroinvertebrates.

The Agency has concluded that there will be no significant impact from the proposed discharge on the aquatic biota that are present in the area affected by the proposed discharge. The Agency therefore agrees with the Applicant's analysis that the use of the waters by all species present will be maintained and protected.

b. *Habitat that supports existing aquatic biota, wildlife, or plant life.*

An analysis of the waters has shown that biological growth in the area affected by the proposed discharge is generally limited by food and nutrients (as well as habitat considerations such as substrate) supplied more than by temperature and therefore there will be no significant enhancement of biological productivity.

Although some biota may be displaced temporarily from the area affected by the proposed temperature increase, these species are mobile and there is sufficient habitat available for use by the species so that the habitat required for these species is adequately available. The data provided by the Applicant on the retrospective use of the waters affected by the proposed discharge shows that the discharge has not significantly limited the habitat used by the aquatic biota, wildlife or plant life in the affected area.

The Agency has concluded that the affected area will continue to provide habitat that supports existing aquatic biota, wildlife, and plant life.

c. *The use of the waters for recreation or fishing*

Class B waters are designated to achieve and maintain the following uses: swimming and other primary contact recreational activities and boating, fishing and other recreational uses. VWQS Section 3-04.A.5. and 6.

The Agency has concluded that the proposed increase in thermal discharge will permit the waters to achieve and maintain their uses for swimming and other primary contact recreational activities to the extent that such activities are occurring. The Agency has also concluded that the proposed discharge will maintain and achieve the boating uses of the affected waters.

As described in paragraphs (a) and (b) above, based on the Agency's review of the Applicant's Demonstration, we have concluded that the receiving water will achieve and maintain its uses for fishing as a result of maintaining and protecting the uses for aquatic biota.

- d. *The use of the waters for water supply, or commercial activity that depends directly on the preservation of an existing high level of water quality.*

The waters in the area of the proposed discharge are not used for water supply purposes and there is no commercial activity that directly depends on the preservation of an existing high level of water quality, therefore this subsection is not applicable to the proposed discharge.

- e. *With regard to the factors considered under (a) and (b), evidence of the use's ecological significance in the functioning of the ecosystem or evidence of the use's rarity.*

The area affected by the proposed discharge serves as a transit corridor for migratory fishes, namely Atlantic salmon and American shad. The affected area is a transit corridor for Atlantic salmon, and the area is used by American shad as a spawning and nursery area during part of the first year of life until they emigrate downstream in the fall. Studies provided by the Applicant show that the population of American shad, while declining, is declining at a rate consistent with the decline above and below the discharge.

The receiving water does not contain any state or federally listed threatened or endangered species based on surveys from 1967 to 2000 and a recent specific search in 1997 for listed mussels. Although two listed species of mussels (the dwarf wedge mussel and the brook floater) occur in the Connecticut River, they do not occur in the area affected by the project. The triangle floater mussel, which is not threatened or endangered, does occur both upstream and downstream as well as in the affected area and has been subject to extensive monitoring by the Applicant.

A pair of nesting bald eagles was found in 1999 on Stebbins Island (located in New Hampshire) approximately 1.4 miles downstream from the Vermont Yankee facility. The bald eagle is federally listed as threatened and listed as endangered in Vermont. The bald eagle will not be impacted by the proposed thermal increase.

Based on the information provided by the Applicant and the information contained within the Demonstration, the Agency has concluded that the proposed discharge will not significantly affect the water's ecological significance or the rarity of this water and will not impact any use of the waters by rare, threatened or endangered species.

Section 1-03.C. High Quality Waters.

Waters whose existing ambient water quality exceeds the minimum water quality criteria are "high quality" and are therefore required to meet the standards contained in Section 1-03.C of the VWQS unless the discharge is determined to be insignificant. In determining whether a socioeconomic analysis is required for a discharge, the Agency examines whether the discharge will degrade a high quality water. In making the assessment for this proposed discharge, the Agency examined the following:

The proposed discharge will affect a nearly 1.5 mile span from the discharge to approximately Station 3. In the applicant's Demonstration, when examining the average operating condition (conditions occurring at least 50 percent of the time) the Applicant's Demonstration showed that approximately three percent of the Vernon Pool volume and approximately three percent of the bottom area will see a one degree F rise in temperature.

The Applicant's proposed discharge will be 81 degrees F for less than 14 hours between the June 16 and October 14 summer period.

The Agency has concluded that the magnitude, duration, and spatial extent of the proposed thermal discharge on the receiving waters and the expected impact on the aquatic biota as described above is insignificant and therefore does not require a socioeconomic analysis.

In examining the potential for the thermal discharge to increase pollutants or otherwise degrade the water quality of the segment, the Agency has determined that the proposed discharge will not have an effect on the amount of phosphorus in the River; the proposed increase will not have an effect on the levels of nitrates in the River; the proposed discharge will not have an effect on sludge deposits or solid refuse; the proposed discharge will not impact water taste, odor, or color; the proposed discharge will not affect toxic substances; the proposed discharge will not affect radioactive substances; the proposed discharge will not have an impact on turbidity in the waters; and the proposed discharge will not have an effect on the levels of *Escherichia coli*.

The Agency has concluded that the proposed discharge may result in slight but insignificant increases of plant, plankton and bacteria communities. These slight increases will have commensurately slight effects on the levels of settleable solids, floating or total suspended solids. The slight rise in biological activity may also have a slight or negligible effect on the alkalinity of the waters and the waters pH.

The increase in thermal levels in the waters affected by the proposed discharge will also have a slight effect on dissolved oxygen. Since there is an inverse relationship between temperature and the levels of dissolved oxygen that water is capable of holding, there will be a slight decrease in the levels of dissolved oxygen in the waters. The decrease, however, will be immeasurable.

The possible additive or synergistic effects of the pollutants associated with the activity in combination with other previously approved activities or the potential of the thermal discharge to stress sensitive biological resources such as indigenous species, rare species, and threatened and endangered species are insignificant.

While the Agency has concluded that the socio-economic balancing test is not necessary for this discharge because the discharge will not have significant impact on the water quality of the receiving waters, the Applicant has nevertheless provided information in support of that test. The Applicant asserts that its facility provides baseload unit of power in the Vermont market. In addition, this power source prevents Vermont from turning to the "spot market" during peak summer periods thereby preventing power purchases at a premium. Also, the Applicant asserts that it employs 495 permanent workers and 125 contractors at the Vermont facility. In addition to these permanent workers, every 18 months during refueling, the Applicant brings in between 600 to 1000 contractors to the area to refuel the reactors.

Most significantly for this analysis, this amendment allows less frequent operation of the Applicant's cooling towers. The operation of the cooling towers diverts 12 megawatts of power for transmission during the peak summer season. Reduced cooling tower use allows the facility's equipment to operate more efficiently and reduces wear on equipment.

When comparing the socioeconomic benefits of the Applicant's proposed discharge with the

insignificant effects that the proposed discharge will have on water quality and uses in the area, the Agency concludes that the requirements of Section 1-03.C.2. would be met if such an analysis was required.

V. Procedures for Formulation of Final Determinations

The public comment period for receiving comments on this draft amended permit was from October 24 through December 7, 2005. During the comment period interested persons submitted their written views on the draft permit. All written comments received by 4:30 PM on December 7, 2005 were retained by the Department and considered in the formulation of the final determination to issue, deny or modify the draft permit.

The Department also held a hearing on November 30, 2005 at the Brattleboro Middle School (All Purpose Room), 109 Sunny Acres Drive, Brattleboro, Vermont at 6:00 P.M. All statements, comments, and data presented at the public hearing were retained by the Department and considered in the formulation of the final determination to issue, deny, or modify the draft amended permit.

Comments received during the public notice period are responded to in the attached Responsiveness Summary.



United States Department of the Interior

FISH AND WILDLIFE SERVICE

300 Westgate Center Drive
Hadley, MA 01035-9589



In Reply Refer To:
FWS/Region 5/ES

MAY 17 2006

Jeffrey Wennberg, Commissioner
Vermont Agency of Natural Resources
Department of Environmental Conservation
103 South Main Street
Waterbury, Vermont 05671-0401

Dear Mr. Wennberg,

Thank you for your letter dated January 18, 2006, also sent to Lee Perry, New Hampshire Fish and Game Department (NHFGD), requesting clarification on the position of the U.S. Fish and Wildlife Service (Service) regarding a proposed increase of thermal discharge to the Connecticut River associated with the Entergy Nuclear Vermont Yankee Power Station (Entergy), located in Vernon, Vermont.

The State of Vermont Agency of Natural Resources (ANR) has issued a draft National Pollutant Discharge Elimination System (NPDES) amended permit that retains existing discharge limits from May 16 to June 15, but allows an increase in the thermal discharge to the Connecticut River from June 16 to October 14.

As part of the amendment request, Entergy performed a 316(a) Demonstration, comprised of both a retrospective analysis and a predictive determination. The former is needed to conclude that the project has caused no prior appreciable harm to the aquatic biota, and the latter is necessary to "assure the protection and propagation of a balanced indigenous population of shellfish, fish, and wildlife."

A representative from the Service participated (in an advisory capacity) on a Fisheries technical team that reviewed the Demonstration and provided comments and recommendations to the ANR through the Vermont Department of Fish and Wildlife. While the Service's trust resources include all interjurisdictional fish, including species resident to the project area, our efforts in assisting the ANR were focused primarily on migratory species. Based on our review of the Demonstration, the Service determined the following:

Retain the existing limits from May 16 to June 15

The Service found that the Demonstration lacked information regarding the potential impact the thermal effluent may have on migrating Atlantic salmon smolt behavior and physiology under either existing or proposed conditions. No studies specifically aimed at addressing these questions have been conducted since the current permit limits went into effect in 1990. Also, recent literature has shown a direct relationship between temperature and smolt physiology (McCormick et al. 1999) and temperature and smolt behavior (Darbin, Zydlewski et al. 2005).

The Service supports denial of the requested increase during the smolt migration season until further information is gathered. We are pleased the ANR recently has requested that Entergy conduct smolt studies, and that Entergy already has initiated consultation on study design.

Allow an increase in thermal limits from June 16 to October 14

Monitoring of juvenile and adult American shad occurs annually as a condition of the current NPDES permit. The Demonstration retrospectively analyzed the long-term data set and concluded that the project had caused no prior appreciable harm to American shad. Further, Entergy's predictive analysis showed little or no change in available habitat over existing conditions, and that no survival thermal thresholds would be exceeded.

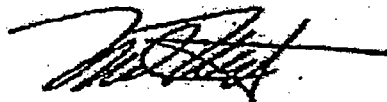
While the fisheries technical team was in general agreement with the Demonstration results, they brought to the attention of the ANR concerns regarding: (1) The robustness of the data used in the analyses; and (2) the need for future research to investigate potential thermal impacts on outmigrating juvenile shad.

Despite these concerns, the Service determined that it would not object to allowing a thermal increase from June 16 to October 14, provided that the amended permit contain conditions aimed at verifying the results of the predictive analyses and strengthening the monitoring program. As you are aware, the draft permit issued by the ANR does not include any new conditions related to American shad, and the only new condition related to the monitoring program is a requirement to perform an annual trend analysis.

In view of the above, the Service requests that the ANR revise the draft amended permit to contain the new conditions. If it is not possible to incorporate our recommendations into the amended permit, we ask that the ANR provide us with assurance that the conditions will be included in any renewed permit issued for the project since current permit expires on March 31, 2006).

We look forward to working cooperatively with your agency and others to assure protection of anadromous fishery resources in the Connecticut River.

Sincerely,



Marvin E. Moriarty
Regional Director

Enclosure

cc: New England Field Office, Mike Bartlett
Connecticut River Coordinator, Sunderland Office of Fisheries Assistance, Jan Rowan
Connecticut River Watershed Council
NHFGI, Lee Perry
NHFGI, Gabe Gries
Vermont Department of Fish and Wildlife, Ken Cox

STATE OF VERMONT

ENVIRONMENTAL COURT
DOCKET NO. 89-4-06 VtecIn Re: Entergy Nuclear Vermont Yankee
Discharge Permit
Permit Number: 3-1199

Motion for Stay

AFFIDAVIT OF ROSS T. JONES IN SUPPORT OF MOTION FOR STAY

I, ROSS T. JONES, being duly sworn, deposes and says:

1. I received a Ph.D. in ecology/evolutionary biology from Northwestern University (Evanston, IL.) in 1990. My doctoral research focused on how changes in environmental factors (e.g., water temperature, flow rate, predation, etc) affect the short-term biological acclimation and long-term evolution of some aquatic invertebrates in streams and rivers. Much of my doctoral research was published in the peer-reviewed journal, *EVOLUTION*, the leading journal of evolutionary biology. After completing my doctoral research, I spent six years working as a Research Fellow in the Department of Biology and the Marine Science Research Laboratory at Memorial University of Newfoundland (St. John's, Newfoundland, Canada). Much of my research during this period was published in the peer-reviewed journal, *MARINE BIOLOGY*, a leading journal in this field. As with my doctoral research, this research is directly applicable to understanding and analyzing the potential effects of thermal discharge on short-term and long-term biological changes in the aquatic species found near the Vermont Yankee nuclear power plant. My curriculum vitae is attached. (Attachment 1.)

2. This affidavit specifically addresses the negative effects of Vermont Yankee's thermal discharge on American shad populations in the Connecticut River.

3. My review of the potential threats to American shad of Vermont Yankee's past, current, and future thermal discharge include Entergy's 1978, 1990, and 2004 316(a) Demonstration Reports and related reports and data prepared or collected by Entergy and its predecessors, as well as and scientific reports and data from various state and federal environmental agencies responsible for the management of Connecticut River species and ecosystems. I have also studied peer-reviewed material dealing with the effects of temperature on fish species commonly found in or near the Vernon Pool area of the Connecticut River.

4. The American shad is an anadromous species native to the Connecticut River. American shad are free spawners, meaning that they do not build "redds" (gravel nests), as do the Atlantic salmon. Instead, female shad discharge eggs into the water column, and these eggs are fertilized by males who swim alongside.

5. In the Connecticut River, American shad currently range as far north as Bellows Falls Dam. Adults migrate to and spawn in the Vernon Pool from approximately mid-May to early-July. Juvenile shad remain in the lower Vernon Pool until late summer to mid-fall when they begin their downstream migration to the Atlantic Ocean.

(Attachment 2, Map of the Vernon Pool and surrounding area.)

6. Under the amended permit, Entergy is required to measure the temperature at Station 7, located approximately 3.5 miles upriver from the discharge point. (Map, Attachment 2.) From June 16 to October 14, the permit authorizes Entergy to increase the temperature of the river as measured at Station 3, 1.4 miles downstream from the

discharge point. The permit allows Vermont Yankee's thermal discharge to raise the river temperature as measured at Station 3 by 2°F to 5°F, depending on the temperature at Station 7. For example, if the temperature at Station 7 is above 78°F, Vermont Yankee may only raise the river temperature, as measured at Station 3, by 2°F. However, if the temperature at Station 7 is 66°F, Vermont Yankee may raise the river temperature, as measured at Station 3, by 3°F. Finally, the amended permit states that, if the river temperature at Station three "equals or exceeds" 85°F, Vermont Yankee is required to reduce its thermal discharge temperature "as soon as possible" because the permit imposes a thermal limit of 85°F. (Amended Permit, Attachment 3.)

7. An examination of peer-reviewed scientific literature demonstrates clearly that water temperature is a limiting factor in all life cycle phases of the American shad.¹

8. An episodic increase in water temperature from 68°F to 77°F over forty-eight hours reduces survival of yolk sac and feeding stage shad larvae.²

9. The temperature shock resulting from a temperature increase from 68°F to 86°F kills all larval shad, under laboratory conditions.³

10. As a threshold of approximately 66°F is reached, the behavioral tendency of juveniles to maintain position against the current in low light or at night is decreased and they begin to drift downstream.⁴

¹ Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (South Atlantic): American Shad. D.E. Facey & M.J. Van Den Avyle. Biological Report 82(11.45) U.S. Fish & Wildlife Service (April 1986).

² Effects of environmental factors on survival, growth, and production of American shad larvae, S.D. Leach and E.D. Houde, *Journal of Fish Biology*, 54:767-786, 1999.

³ *Id.*

11. Delays in downstream migration of juvenile shad resulting from physical and thermal barriers adversely affect the shad's ability to make the physiological adaptations required for life in salt water, resulting in increased mortality.⁵
12. Late migration and seawater entry dramatically increase mortality of juvenile American shad.⁶
13. Increased water temperature is more stressful for adult shad because they expend more energy than other migratory fish species in the Connecticut River.⁷
14. There has been a statistically significant decline in the Connecticut River's shad population in the lower Vernon Pool between 1991 and 2002. Entergy acknowledged this decline in their 2004 Section 316(a) Demonstration Report. (Tables 5-09 to 5-14, pp. 155-157, Attachment 4.) Data collected by third party; public and private agencies, illustrates that, approximately one American shad generation after Vermont Yankee began discharging thermal effluent, there has been a significant decline in the number of American shad reaching the immediate downstream vicinity of the lower Vernon Pool.
15. Entergy's 2004 Section 316(a) Demonstration Report illustrates that Vermont Yankee's thermal discharge exceeds 66°F during the summer and fall, which

⁴ John A. O'Leary and Boyd Kynard, Behavior, Length, and Sex Ratio of Seaward-Migrating Juvenile American Shad and Blueback Herring in the Connecticut River, Transactions of the American Fisheries Society, 115:529-536, 1986.

⁵ The loss of hyperosmoregulatory ability in migrating juvenile shad, *Alosa sapidissima*, Joseph Zydlewski and Stephen D. McCormick, *Can. J. Fish. Aquat. Sci.*, 54: 2377-2387, 1997.

⁶ Late migration and seawater entry is physiologically disadvantageous for American shad juveniles, J. Zydlewski, S.D. McCormick, and J.G. Kunkel, *Journal of Fish Biology*, 63: 1521-1537, 2003).

⁷ Metabolic rates in an anadromous clupeid, the American shad (*Alosa sapidissima*), J.B.K. Leonard, J.F. Norieka, B. Kynard, S.D. McCormick, *J. Comp Physiol B* 169: 287-295, 1999.

may impair the downstream migration, of those juvenile shad exposed to the thermal effects of the discharge, during late summer through mid-fall. (Table 3-3, Attachment 5.)

16. Based upon the above information and in my professional opinion, rapid increases in water temperature, as occur during Vermont Yankee's thermal discharges, can reduce the survival of larval and juvenile shad, and reduce numbers of spawning adults shad returning to the lower Vernon Pool.

17. Entergy's Demonstration Report documents a significant decline in the American shad population near Vermont Yankee. However, in my professional opinion, and as noted by the U.S. Fish & Wildlife Service, Entergy needs to conduct studies similar to those cited in paragraphs 7-13 on the actual effects of their thermal discharge on the physiology and behavior of all life stages of the American shad.

18. In my professional opinion, if these studies confirm that Vermont Yankee's past thermal discharge is a cause of the dramatic decline in American shad populations, then increasing the thermal discharge limits will accelerate the decline of the shad population, leading to the probable local extinction of the American shad from this part of the Connecticut River.

19. In my professional opinion, allowing the amended permit to take effect on June 16, 2006 poses an imminent, perhaps irreversible, threat to the American shad population in the Connecticut River. This conclusion is based on evidence that Vermont Yankee's past thermal discharge may be a cause of the current dramatic decline in American shad populations.

ROSS T. JONES

STATE OF VERMONT

COUNTY OF WINDSOR, SS

On June 15, 2006 personally appeared the above-named Ross T. Jones and acknowledged the foregoing to be his free act and deed.

Monica Litzelman
Notary Public
My Commission Expires: 02-10-07