



RIVERKEEPER.

Fax

To: Secretary Annette Vietti-Cook From: Phillip Musegoos/Vichon Jafur

Fax: (301) 415-1672 Pages: 18

Phone: Date: 6/4/07

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• Comments:





RIVERKEEPER.

Mr. Bo Pham
Environmental Project Manager
Division of License Renewal
Mail Stop 0-7B1
301-415-8450
U.S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, Maryland 20852-2738
VIA FACSIMILE

June 4, 2007

Re: Acceptance Review for Entergy Nuclear Indian Point 2 and 3 License Renewal Application

Dear Mr. Pham:

After conducting an initial review of the License Renewal Application for Indian Point 2 and 3 submitted to the Nuclear Regulatory Commission (NRC) on April 30, 2007 by Entergy Nuclear Northeast (hereinafter "Entergy"), Riverkeeper hereby requests that the NRC reject Entergy's application as incomplete pursuant to 10 CFR 2.101(a)(4), due to numerous inaccuracies and omissions of material fact. Riverkeeper hereby reserves the right to raise these same issues as well as additional concerns in subsequent correspondence and future proceedings involving the NRC review of Entergy's license renewal application for Indian Point 2 and 3.

Pursuant to NRC's regulations implementing the Atomic Energy Act, information provided to the Commission by an applicant for a renewed license must be "complete and accurate in all material respects."¹ Additional regulations implementing the National Environmental Policy Act (NEPA) require the applicant's Environmental Report to address the impacts and any adverse effects of the proposed action on the environment, and the reasonable alternatives available.² The applicant's assessment of future environmental impacts must be objective, and include even "adverse information."³

Entergy's Indian Point application does not comply with these regulatory requirements in the following areas: impacts on aquatic ecology and the analysis of groundwater contamination under "New and Significant Information."

¹ 10 CFR 54.13(a). See also 50.30(b).

² 10 CFR 51.45(b).

³ 10 CFR 51.45(c).

1. Aquatic Ecology

With respect to aquatic ecology, it is patently clear that Entergy's Environmental Report (ER) fails to meet the requirements set forth in 10 CFR 51.45 and 10 CFR 51.53(c). There are three main flaws in the ER in this area: 1) Current specific information prepared by the New York State Department of Environmental Conservation (NYSDEC) has not been evaluated regarding aquatic ecology, in particular entrainment, impingement and thermal discharge impacts; 2) Important plant and animal habitats—except for endangered and threatened species—have not been evaluated; and 3) The analysis of available alternatives for reducing or avoiding adverse environmental effects on aquatic resources is grossly incomplete.

1.1 NRC Requirements for Assessing Aquatic Ecology

The ER must assess Category 2 issues related to aquatic ecology, including entrainment, impingement and thermal discharge. *See* 10 CFR 51.53(c). In general, NRC regulations require that the ER "contain sufficient data to aid the Commission in its development of an independent analysis." *See* 10 CFR 51.45 (c). Specifically, "the analyses for environmental reports shall, to the fullest extent practicable, quantify the various factors considered." *Id.* Moreover, the ER "should not be confined to information supporting the proposed action but should also include adverse information." *See* 10 CFR 51.45 (e).

The ER must also include a discussion of the status of compliance with water quality standards, in particular "thermal and other water pollution limitations or requirements which have been imposed by Federal, State, regional, and local agencies having responsibility for environmental protection." *See* 10 CFR 51.45 (d). Finally, the regulations require a complete analysis on available alternatives for reducing or avoiding adverse environmental effects and such analysis must "include a discussion of whether the alternatives will comply with such applicable environmental quality standards and requirements." *See* 10 CFR 51.45 (b), (c), (d).

As discussed further below, Entergy's "Entrainment Analysis," the "Impingement Analysis" and the "Heat Shock Analysis" fail to evaluate and to include significant adverse information contained in NYSDEC documents, which is necessary under 10 CFR 51.45(c), (e) and 10 CFR 51.53(c). In addition, the ER's discussion on the status of compliance with New York water quality standards, required under 10 CFR 51.45 (d), is completely at odds with the information contained in current specific information by the NYSDEC. Thus, the ER contains insufficient data and does not aid the Commission in its development of an independent analysis with regards to aquatic ecology.

1.2 Section 2.2: Aquatic and Riparian Ecological Communities

Relying on the 1999 Draft Environmental Impact Statement regarding the renewal of the SPDES permit for Indian Point (hereinafter 1999 DEIS)⁴—prepared by the prior owners of these stations—instead of consulting current information on this matter, such as the 2003 Final Environmental Impact Statement regarding the renewal of Indian Point's SPDES permit (hereinafter NYSDEC's FEIS)⁵—prepared by the NYSDEC—, the ER contains inaccurate and incomplete information. Below find two examples of such inaccuracies.

First, the ER, in its section on "Physical and Chemical Environment" (section 2.2.1), only mentions the existence of "once-through" cooling plants on the Hudson River—not a single closed-cycle cooling plant is mentioned—and includes the Bethlehem facility among the various once-through cooling facilities on the Hudson River.⁶ However, since 1999, Bethlehem has been repowered and converted into a closed-cycle cooling facility, and other facilities—including Athens and Bowline 3 on the Hudson River and others on the East River in New York City—have been permitted to operate with closed-cycle cooling systems. Indeed, as stated in NYSDEC's FEIS:

For the Athens project, a new plant employing combined-cycle technology, potential impacts on aquatic resources were found to be a very compelling concern, and a dry cooling system was determined to be BTA [Best Technology Available]. At Bethlehem, a repowering incorporating combined-cycle technology, third parties voiced strong concerns over potential visibility of the taller structures required for a full dry cooling system as opposed to wet or hybrid cooling tower systems, but significant numbers of species and life stages susceptible to both entrainment and impingement were present at the site. Thus, for that project, a plan was developed and approved to construct hybrid cooling towers, install a wedgewire structure over the intake, and seasonally deploy an MLES™ to further screen the intake during peak periods of potential entrainment. The MLES™ installation at Bethlehem will be flat panels generally paralleling the shoreline.

Bowline 3, a new combined-cycle plant, will use a combination of technologies similar to that at Bethlehem. In addition, Bowline 3's sponsors propose to use discharge water from Bowline 1 and 2, when available, instead of Hudson River water for its cooling water source. This

⁴ Entergy has referenced this document in the ER, as follows: CHGEC (Central Hudson Gas and Electric Corporation). 1999. Consolidated Edison Company of New York, Inc., New York Power Authority, and Southern Energy New York. Draft Environmental Impact Statement for State Pollutant Discharge Elimination System Permits for Bowline Point, Indian Point 2 and 3, and Roseton Steam Electric Generating Stations. *See e.g.*, sections 2.14 & 4.24

⁵ Entergy has referenced this document in the ER, as follows: NYSDEC (New York State Department of Environmental Conservation). 2003. Final Environmental Impact Statement Concerning the Applications to Renew SPDES Permits for the Roseton 1 and 2, Bowline 1 and 2 and Indian Point 2 and 3 Electric Generating Stations, Orange, Rockland and Westchester Counties, Hudson River Power Plants FEIS. Accepted: June 25, 2003. *See e.g.*, sections 2.14 & 4.24

⁶ Environmental Report (ER), p. 2-7.

management strategy could further reduce the amount of fresh river water required for the new generating plant. At the Reliant/Astoria facility, a repowering project on the Queens side of the East River, combined-cycle generation with hybrid towers plus intake protection will be provided; the towers will use a reverse osmosis treatment system to minimize salt drift impacts. The SCS/Astoria and NYPA/Astoria projects, both new plants employing combined-cycle generation, will use dry cooling.⁷

Second, the ER, in the section on "Fish Communities" (Section 2.2.5), states that "[t]he NYSDEC's FEIS noted a decline in bay anchovy abundance and suggested it was linked to power generation plant water intakes on the Hudson River [NYSDEC 2003]."⁸ But Entergy omits to say that the NYSDEC's FEIS also considers that "[s]everal species of fish in the Hudson River estuary, such as American shad, white perch, Atlantic tomcod and rainbow smelt, have shown trends of declining abundance."⁹

In fact, Entergy's reference to NYSDEC's FEIS statement on the decline in bay anchovy is the only reference to NYSDEC's FEIS in the 5-page section of Fish Communities (pp. 2-13 to 2-17). In contrast, the 1999 DEIS, which is an earlier document prepared by the prior owners of the stations—not by the NYSDEC—is referenced at least 11 times in the same section. Moreover, NYSDEC's FEIS actually criticizes the 1999 DEIS' information regarding white perch. The complete quote from the FEIS on this point is, as follows:

However, juvenile and age-1 abundance indices suggest that white perch numbers in the Hudson River are declining. This contrasts with the DEIS conclusion that the population appears resilient enough to sustain its population in the future under similar levels of power plant mortality.¹⁰

1.3 Sections 4.2, 4.3 and 4.4: Entrainment, Impingement and Heat Shock

Entergy's "Entrainment Analysis," "Impingement Analysis" and "Heat Shock Analysis" (Sections 4.2.5.2 & 4.2.6 (at 4-12 and 4-13); 4.3.5.2 & 4.3.6 (at 4-17 to 4-19); 4.4.5.2 & 4.4.6, respectively) also fail to evaluate the conclusions and recommendations provided in NYSDEC's FEIS. Similarly, Entergy deliberately neglects to consider the conclusion provided in the NYSDEC's Fact Sheet regarding the renewal of Indian Point's SPDES permit (hereinafter NYSDEC's Fact Sheet).¹¹

Although both documents (NYSDEC's FEIS and NYSDEC Fact Sheet) have been included in the "References" section and considered in other sections of the ER, Entergy has purposely avoided an evaluation of these key NYSDEC documents in the sections

⁷ NYSDEC's FEIS, p. 36.

⁸ ER p. 2-17

⁹ NYSDEC's FEIS, p. 57.

¹⁰ *Id.* p. 62.

¹¹ Entergy has reference this document in the ER, as follows: NYSDEC (New York State Department of Environmental Conservation). 2003c. Fact Sheet, New York State Pollutant Discharge Elimination System (SPDES) Draft Permit Renewal with Modification Indian Point Electric Generating Station, Buchanan, NY. November 2003 Indian Point Units 1, 2, and 3, SPDES #NY-0004472. See e.g., Section 4.26, p. 4-90.

that purport to develop the entrainment, impingement and thermal analyses. Furthermore, Entergy's Entrainment Analysis, Impingement Analysis, and Heat Shock Analysis fail to include significant adverse information contained in the conclusions and recommendations provided in NYSDEC's FEIS and NYSDEC's Fact Sheet, and to quantify the adverse factors, which is necessary under 10-CFR 51.45 (e), (c).

Since 1975, NYSDEC has delegated authority from the Federal government to administer the SPDES program under the Clean Water Act (CWA). Accordingly, the NYSDEC evaluates and regulates the impact of the applicant's cooling system under the CWA. *See* CWA § 316(b). In addition, New York has established criteria governing thermal discharges. *See* 6 NYCRR Part 704. NYSDEC's FEIS and NYSDEC's Fact Sheet contain the most current information by the NYSDEC regarding the applicant's environmental impacts due to entrainment, impingement, and thermal discharges. Thus, these documents must be considered in the ER pursuant to the NRC regulations at 10 CFR 51.45 (a), (c) and 10 CFR 51.53 (c).

The NRC staff has consistently reviewed current specific documentation prepared by the states' environmental agencies in connection with entrainment, impingement and heat shock. For instance, in NUREG-1437, Supplement 28 (January 2007), regarding the renewal license of the Oyster Creek facility in New Jersey (OCNGS), NRC staff expressly noted that to evaluate the impact of entrainment losses it had reviewed NJDEP's "conclusion and recommendations provided in the NJDEP fact sheet (NJDEP 2005) regarding the renewal of the OCNGS NJPDES permit."¹² Moreover, NRC staff relied on NJDEP's assessment to quantify entrainment and impingement at OCNGS.¹³

In sum, Entergy's failure to discuss the findings and conclusion in NYSDEC's FEIS and NYSDEC's Fact Sheet amounts to a fatal flaw, since these documents are the latest document analyzing and quantifying the adverse environmental impacts of the station's cooling system and the potential alternatives to minimize such impact.

1.3.1 Section 4.2: Entrainment of Fish and Shellfish in Early Life Stages; Section 4.3 Impingement of Fish and Shellfish in Early Life Stages

Pursuant to 10 CFR 51.53(c), Entergy is required to analyze the environmental impact of the proposed action as a result of the entrainment and impingement of fish and shellfish in early life stages from its cooling system. Entergy's "Entrainment Analysis," in sections 4.2.5.2 and 4.2.6 (at 4-12 and 4-13), and the "Impingement Analysis," in section 4.3.5.2 and 4.3.6 (at 4-17 to 4-19), however, are fatally incomplete and must be rejected due to the applicant's failure to evaluate vitally important NYSDEC documents.

To begin, Entergy's "Entrainment Analysis" and the "Impingement Analysis" are incomplete because it has considered entrainment and impingement impacts relying solely on the 1999 DEIS and other two reports prepared by Entergy's consultants, while

¹² *See* NUREG-1437, Supplement 28 (January 2007), p. 4-13. *See also* pp. 4-11, 4-12, 4-17 to 4-27.

¹³ *Id.* Table 4-3 (p. 4-14) & Table 4-5 (p. 4-12).

entirely ignoring NYSDEC's FEIS. There is no mention or consideration of the FEIS in Entergy's analyses of entrainment and impingement.

Indeed, the "Entrainment Analysis" and the "Impingement Analysis" lack any discussion or consideration of two basic documents prepared by the NYSDEC: NYSDEC's Fact Sheet and NYSDEC's FEIS. Astutely, Entergy has included both documents in the pertinent "References" section (section 4.26) and also mentions these document in the "Background" discussions (and other sections of the EF). But Entergy has failed to consider these key NYSDEC documents in the required analyses pursuant to 10 CFR 51.45 and 10 CFR 51.53(c).

Significantly, the NYSDEC's FEIS provides not just recommendations and conclusions regarding entrainment impacts and alternatives to minimize such impacts, but quantifies entrainment impacts that have been ignored by Entergy. According to the NYSDEC's FEIS, the station's cumulative entrainment impact is, as follows:¹⁴

<u>Plant Species</u>	<u>Indian Point</u>
American Shad	13,380,000
Bay Anchovy	326,666,667
River Herring	466,666,667
Striped Bass	158,000,000
White Perch	243,333,333
Total	1,207,713,334

NYSDEC's FEIS concludes that the billions of fish that are killed by the stations each year represent a significant mortality and are yet another stress on the River's fish community.¹⁵ The FEIS also notes, contrary to Entergy's assertions, that although the primary cause of these population changes cannot conclusively be attributed entirely to the operation of these stations, the mortality that they cause must be taken into account when assessing these population declines.¹⁶ The NYSDEC also states,

What is clear from the data and analyses presented in the DEIS is that entrainment and impingement, primarily the former, are eliminating a significant portion of the above-listed species in their egg and larval forms, as well as many more species which spawn or spend part of their life stages in the lower Hudson River.¹⁷

Furthermore, the NYSDEC has determined not to rely on the fish population models presented in the 1999 DEIS to make conclusions for the FEIS or for the SPDES permits

¹⁴ See NYSDEC's FEIS, Table 1. Estimated Average Numbers of Selected Fish Species Entrained Annually at Roseton, Indian Point, and Bowline Stations. Based on In-plant Abundance Sampling, 1981-1987.

¹⁵ *Id.* p. 58.

¹⁶ *Id.*

¹⁷ *Id.* p. 59.

to be issued for the stations.¹⁸ Instead, NYSDEC has concluded that "the impacts associated with power plants are more comparable to habitat degradation; the entire natural community is impacted."¹⁹ NYSDEC's analysis is summarized, as follows:

These "once-through cooling" power plants do not selectively harvest individual species. Rather, impingement and entrainment and warming of the water impact the entire community of organisms that inhabit the water column. For example, these impacts diminish a portion of the forage base for each species that consumes plankton (drifting organisms in the water column) or nekton (mobile organisms swimming through the water column) so there is less food available for the survivors. In an intact ecosystem, these organisms serve as compact packets of nutrients and energy, with each trophic (food chain) level serving to capture a diffuse resource and make it more concentrated. Ichthyoplankton (fish eggs, larvae and very small fish which drift in the water column) and small fish feed on a base of zooplankton (drifting animal life) and phytoplankton (drifting plant life). The loss of these small organisms in the natural community may be a factor that leads to harmful algal blooms. The small fish themselves serve as forage for the young of larger species, which serve as forage for larger individuals, and so on up the food chain, more correctly understood as a "trophic pyramid".

Once-through cooling mortality "short-circuits" the trophic pyramid and compromises the health of the natural community. For example, while an individual bay anchovy might ordinarily serve as food for a juvenile striped bass or even for a common tern, entrainment and passage through a power plant's cooling system would render it useful only as food to lower trophic level organisms. It could no longer provide its other ecosystem functions of consuming phytoplankton, digesting and concentrating it into its tissues, and ranging over a wide area, distributing other nutrients as manure. This is just a single example from a very complex natural system, where the same basic impact is multiplied millions of times over more than one hundred fish species.²⁰

NYSDEC's Fact Sheet, among other important findings, provides the following conclusion regarding entrainment and impingement at Indian Point that has been totally ignored by Entergy:

Each year Indian Point Units 2 and 3 (collectively "Indian Point") cause the mortality of more than a billion fish from entrainment of various life stages of fishes through the plant and impingement of fishes on intake screens. ... Losses at Indian Point are distributed primarily among 7 species of fish, including bay anchovy, striped bass, white perch, blueback

¹⁸ *Id.* p. 60.

¹⁹ *Id.* p. 53.

²⁰ *Id.* pp. 53-54.

herring, Atlantic tomcod, alewife, and American shad. Of these, Atlantic tomcod, American shad, and white perch numbers are known to be declining in the Hudson River ... *Thus, current losses of various life stages of fishes are substantial.*²¹

1.3.2 Section 4.4: Heat Shock

Pursuant to 10 CFR 51.53(c), Entergy is also required to analyze the environmental impact of heat shock from its once-through cooling system. Entergy's Analysis of Environmental Impact in connection with heat shock, however, is incomplete and must be rejected. As with the entrainment and impingement analyses, the "Thermal Discharge Analysis," in sections 4.4.5.2 & 4.4.6, lacks any discussion or consideration of NYSDEC's FEIS or NYSDEC's Fact Sheet.

Some of NYSDEC's findings, recommendations and conclusion in the FEIS regarding thermals impacts that have been entirely dismissed by Entergy are:

Indian Point: As of the 1987 - 1992 SPDES permit term, thermal discharges from Indian Point did not meet applicable thermal criteria. ... These provisions alone [in the SPDES permit based on the Hudson River Settlement Agreement and those in subsequent Consent Orders], however, are not sufficient for Indian Point to meet thermal criteria. Thermal modeling indicates that the thermal discharge from Indian Point causes water temperatures to rise more than allowed, which is four degrees (F.) over the temperature that existed before the addition of heat, or a maximum of 83oF, whichever is less, in the estuary cross sections specified in 6 NYCRR §704.2(b)(5). A mixing zone was not specified in the previous SPDES permit for the Indian Point facility.²²

Thermal discharges were inadequately addressed in the DEIS. The DEIS asserts, with no supporting evidence, that "... [t]he surface water orientation of the plume allows a zone of passage in the lower portions of the water column, the preferred habitat of the indigenous species." Other data and analyses cast doubt on this assertion.²³

Given the extent of warming shown in the HydroQual graphs, combined with the recent dramatic declines in tomcod and rainbow smelt as discussed previously, the Department believes it prudent to seek additional thermal discharge data for each facility, including a mixing zone analysis, and anticipates requiring triaxial thermal studies as conditions to each of the SPDES renewals. Depending on the results of those analyses, additional controls may be required to minimize thermal discharges.²⁴

²¹ See NYSDEC's Fact Sheet, Attachment B, p. 1 of 8.

²² See NYSDEC 2003c, p. 19 (footnote omitted).

²³ *Id.* p. 71.

²⁴ *Id.* p. 72.

NYSDEC's Fact Sheet also provides critical facts and analysis regarding the stations' thermal impacts that have been deliberately ignored by Entergy, such as:

Under Section 316(a) of the Clean Water Act (CWA), a permittee may submit a demonstration that its thermal discharge does not threaten the survival of indigenous aquatic populations even if it does not meet state water quality criteria. Such a study was prepared in 1978 by the prior owners of the Indian Point units, but it was superseded by provisions of the 1981 - 1991 Hudson River Settlement Agreement and subsequent Consent Orders effective 1992 - 1998. Based on that older "316(a) demonstration", the former operators of the Indian Point units asserted that the facility complied with the NYS thermal standard (6 NYCRR Part 704).

Based on modeling submitted with the 1999 DEIS by the prior owners of Indian Point (along with owners of two other Hudson River generating stations), *the thermal criteria outlined in 6 NYCRR Part 704.2 are not being consistently maintained under the present operation of the facility. Appendix VI Chapter 6 of the 1999 DEIS, "Near-field Temperature Modeling", concludes that newer analyses of the discharge from Indian Point "... indicate that it is highly likely that the exceedance of the top-width criterion, and possible the cross-sectional area criterion, would occur under slack conditions. Top-width exceedances occur under all flood scenarios" In more general terms, this means that temperatures measured at the water surface along a line running from the outfall across the river to the far shore, and measured at varying depths along the cross-section below that line from outfall to far shore, likely exceed the thermal criteria in the Department's regulations during periods with lowest river flow velocities, that is, during the transition between tidal cycles. Furthermore, temperatures at the water surface along that same line from outfall to far shore appear to exceed the thermal criteria at all flow levels classified as "flood", that is, during high tides.*

The permit therefore requires the permittee to conduct additional thermal studies to verify actual in-stream conditions of the thermal component of the discharge. The in-stream tri-axial study mandated by Special Condition 7 will require actual measurement of river and outfall temperatures at multiple points on the surface and at depth, along the surface and in cross-section running from the outfall and across the river to the far shore, as well as temperature measurements on the surface and at various depths at specified points running parallel to the course of the river. *Using this additional data plus existing sources, the Department will be able to determine if the Indian Point facility complies with the thermal standard and whether to grant Indian Point a variance from NYS thermal criteria.*²⁵

²⁵ NYSDEC 2003b, Attachment A, pp. 6 of 8 and 7 of 8.

1.4 Section 4.23.1: Cumulative Impacts on Aquatic Resources

Entergy's analysis of Cumulative Impacts on Aquatic Resources is also incomplete. As with the entrainment, impingement and thermal discharge analyses, section 4.43.1 (pp. 4-80 to 4-83) lacks any discussion or consideration of NYSEC's FEIS, which has ample discussion on cumulative impacts of the various "once-through" cooling facilities on the Hudson River.

1.5 Important Plant and Animal Habitats

While the ER considered impacts on "threatened" or "endangered" species, it falls short of evaluating the impact on "threatened" or "endangered" species and other species from the ongoing groundwater contamination from the stations. (See Section 2, Below). Indeed, the ER states "tritium, Strontium-90, Cesium-137, and Nickel-63 have been detected in low concentrations in some onsite groundwater monitoring well samples,"²⁶ and confirms that "[b]ased on the results of the preliminary hydrogeologic characterization of the site, Entergy has concluded that some contaminated groundwater has likely migrated to the Hudson River."²⁷

Further, the ER lacks consideration of "Important Plant and Animal Habitats", which are not considered "threatened" or "endangered" under Federal law, and that is necessary under 10 CFR 51.53(c)(3)(ii)(E). Entergy's ER simply states that "[t]he Hudson Highlands just north of the Indian Point site (RM 44 through RM 56) is classified as a Significant Coastal Fish and Wildlife Habitat," citing to the 1999 DEIS (Section IV.B.2.2.a), and mentions Haverstraw Bay as a "nursery area".²⁸ But there is no mention of Haverstraw Bay as a Significant Coastal Fish and Wildlife Habitat just south of the stations.

Important plant and animal habitats that have not been evaluated are described in Sections 1.5.1 and 1.5.2 below.

1.5.1 Essential Fish Habitats (EFH)

The Hudson River estuary has Essential Fish Habitat (EFH) designations for the following species: Atlantic sea herring, Atlantic butterfish, Black Sea Bass, Bluefish, Red hake, Summer flounder, Winter flounder, and Windowpane flounder.²⁹ As Entergy's ER notes, Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the National Marine Fisheries Service Sustainable Fisheries Act of 1996, provides that Federal agencies must consult with the Secretary of Commerce on all actions or proposed actions authorized, funded, or undertaken by the agency that may adversely affect essential fish habitat. "Therefore, the NRC staff will also initiate an

²⁶ See ER p. 5-4.

²⁷ *Id.*

²⁸ See ER p. 2-7.

²⁹ See Summary of EFH Designations - Estuaries: Hudson River available at www.ncro.noaa.gov

Although Entergy submits that "substantial feasibility concerns exist" regarding closed-cycle cooling at this site, the ER offers no other alternatives to substantially reduce impacts to a level equivalent to that which can be achieved by closed-cycle cooling at this site. Indeed, the level of protectiveness for aquatic ecology has already been established by the State of New York, which is a level equivalent to that which can be achieved by closed-cycle cooling at this site.

Entergy fails to disclose that NYSDEC would require Indian Point to install and operate a closed-cycle cooling system or to provide "an alternative technology(s) that can minimize adverse environmental impact to a level equivalent to that which can be achieved by closed-cycle cooling at this site."³³ Therefore, Entergy's analysis lacks a complete evaluation on available alternatives for reducing or avoiding adverse environmental effects and fails to "include a discussion of whether the alternatives will comply with such applicable environmental quality standards and requirements." See 10 CFR 51.45 (b), (c), (d).

1.7 Status of Compliance

The ER fails to present a complete analysis of compliance. Contrary to the findings and conclusions in NYSDEC's FEIS and NYSDEC's Fact Sheet discussed above in 1.3, Entergy submits that:

Compliance with the SPDES Permits over previous years has been excellent. For example, there has never even been an exceedance relative to thermal discharge limits as identified in the Station's SPDES permit.³⁴

As noted above, in sections 1.3 and 1.5, NYSDEC has determined to modify Entergy's SPDES permit to require closed-cycle cooling at this site or other alternatives to substantially reduce impacts to a level equivalent to that which can be achieved by closed-cycle cooling at this site, and that there may be exceedances relative to thermal discharge limits as identified in the Station's SPDES permit. Thus, the ER has failed to completely discuss the status of compliance with water quality standards, in particular thermal and other water pollution limitations or requirements which have been imposed by New York State.

Finally, there is no mention that in 2002, certain petitioners, including the Hon. Richard L. Brodsky, an assemblyman in the New York State Legislature, commenced a proceeding in Albany County Supreme Court, pursuant to Article 78 of the New York Civil Practice Law and Rules ("CPLR"), to mandate action by NYSDEC on the Indian Point SPDES permit renewal applications. See *Matter of Brodsky v. Crotty*, Sup. Ct., Albany County, Keegan, J., Index No. 7136-02. On April 8, 2003, upon review of the renewal application, NYSDEC staff proposed to modify the SPDES permit to require

³³ See NYSDEC, Fact Sheet p.4. Note that Riverkeeper Inc. (and other Environmental Petitioners) objects to this permit condition.

³⁴ ER p. 9-2.

essential fish habitat consultation with the NMFS.”³⁰ However, under 10 CFR 51.53(c)(3)(ii)(E), Entergy is required to include an analysis on “Important Plant and Animal Habitats.” Thus, in addition to the NRC-NMFS consultation, Entergy should be required to prepare an EFH analysis—species by species—and include it in the ER.

1.5.2 Significant Coastal Fish and Wildlife Habitats

Haverstraw Bay, just south of the Indian Point site, is a designated Significant Coastal Fish and Wildlife Habitat by the State of New York. According to the Designation document:

Haverstraw Bay is a major nursery and feeding area for certain marine species, most notably bay anchovy, Atlantic menhaden, and blue claw crab. Depending on location of the salt front, a majority of the spawning and wintering populations of Atlantic sturgeon in the Hudson may reside in Haverstraw Bay. Shortnose sturgeon (E) usually winter in this area as well.

... Haverstraw Bay is a critical habitat for most estuarine-dependent fisheries originating from the Hudson River. This area contributes directly to the production of in-river and ocean populations of food, game, and forage fish species. Consequently, commercial and recreational fisheries throughout the North Atlantic depend on, or benefit from, these biological inputs from the Hudson River estuary.³¹

The Haverstraw Bay Designation document also states:

A habitat impairment test must be met for any activity that is subject to consistency review under federal and State laws, or under applicable local laws contained in an approved local waterfront revitalization program. If the proposed action is subject to consistency review, then the habitat protection policy applies, whether the proposed action is to occur within or outside the designated area.

The specific habitat impairment test that must be met is as follows. In order to protect and preserve a significant habitat, land and water uses or development shall not be undertaken if such actions would: destroy the habitat; or, significantly impair the viability of a habitat.³²

Since the proposed action is subject to consistency review, then the Haverstraw Bay habitat protection policy applies and must be assessed in the ER.

1.6 Alternatives to Closed-Cycle Cooling

³⁰ ER pp. 9-5 & 9.6.

³¹ See NYS, Significant Coastal Fish and Wildlife Habitat Program, Designated Habitat Haverstraw Bay.

³² *Id.*

reduction of impacts to aquatic organisms and completion of a water quality review that would result in adjustments to certain limits in the existing SPDES permit.

On May 14, 2003, the court issued an order that set a schedule requiring, among other things that NYSDEC complete the FEIS for the stations by July 1, 2003, and issue a draft SPDES permit for the stations by November 14, 2003. The court's order also granted a motion by Riverkeeper, Inc. to intervene. By February 4, 2006, the NYSDEC Administrative Law Judge had issued a Ruling on Issues on Adjudication, which has been appealed by all parties. A decision of the NYSDEC Commissioner is imminent. Thus, it is reasonable that Entergy will be required to install and operate a closed-cycle cooling system under the renewed SPDES permit, or to provide an alternative technology(s) that can minimize adverse environmental impacts to a level equivalent to that which can be achieved by closed-cycle cooling at this site, in order to comply with the CWA and NYS water quality standards.

2. Groundwater Contamination Analysis

Section 5.1 of the Environmental Report contains Entergy's analysis of groundwater contamination at Indian Point under the rubric of "New and Significant Information."³⁵ In the ER, Entergy classifies Groundwater Contamination as "new information, but not necessarily significant."³⁶ The ER relies on the Council on Environmental Quality (CEQ) definition of "significant," which requires consideration of the context in which the proposed action is situated, and the intensity of the impacts.³⁷ The regulations list ten different factors to be used in evaluating intensity.³⁸ Factor 3 requires evaluation of "Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or *ecologically critical areas* (emphasis added)."³⁹ Despite this requirement, Entergy fails to evaluate the potential impacts of the groundwater contamination on either Essential Fish Habitat or Significant Coastal Fish and Wildlife Habitat, particularly Haverstraw Bay. (See Section 1.5, Above). These are clearly within the scope of "ecologically critical areas" described in the CEQ regulations. As such, the groundwater contamination must be assessed as both "New" and "Significant" under NEPA. Entergy's conclusions in the ER regarding the sources and potential environmental impacts of the Indian Point groundwater contamination are unsupported by the facts and at odds with the publicly stated opinions of both NRC and New York State DEC staff involved in the ongoing groundwater leak investigation. As such, Section 5.1 of the ER is incomplete for purposes of the NRC's acceptancy review.

2.1 Indian Point 2 Spent Fuel Pool Leak

³⁵ *Id.* at 5-2.

³⁶ *Id.*

³⁷ See 40 CFR 1508, 27.

³⁸ *Id.*

³⁹ *Id.*

Entergy claims the tritium contamination found in numerous onsite monitoring wells is “the result of historical pool leakage in the 1990s which has since been repaired,” based on the assertion that Entergy has not been able to identify leaks in the IP2 pool liner, and the contamination is not consistent with active leakage.⁴⁰ However, Entergy failed to note that only about 60% of the IP2 pool liner has actually been examined for leaks, due to the high density of the spent fuel storage racks and the minimal clearance between the bottom of the racks and the floor of the pool.⁴¹ Entergy has failed to provide any explanation in the Environmental Report as to the feasibility of examining the remainder of the pool liner for leaks. Nor does the Environmental Report address what other steps Entergy could take to find the source of the IP2 leak, if in fact it is not feasible to examine the remaining 40% of the pool liner. On the contrary, the Report suggests that because Entergy has looked for the leak and not found it, the pool must not be leaking. This is an arbitrary and illogical conclusion without adequate factual support.

In addition, the claim that the contamination is not consistent with active leakage is not correct. Analysis of soil samples taken in the vicinity of the cracks in the IP2 pool wall in September 2005 indicate high levels of Cobalt-60, Cesium-134 and Cesium-137 consistent with the activity of these radionuclides in the spent fuel pool water.⁴²

Another apparent contradiction between the ER and the NRC’s inspection results can be found in the March 16, 2006 NRC Special Inspection Report assessing the groundwater contamination at Indian Point. Page 1 of the report states that “Entergy sampled existing “Due Diligence” wells that were developed in 2000. One of these wells, MW-111 (last sampled for tritium in 2000 with no activity detected) was sampled on September 29, 2005. The analytical result, reported on October 5, 2005, indicated 211,000 pCi/l, tritium.”⁴³ MW-111 is located in the IP2 transformer yard, near the IP2 fuel storage building. If the tritium in the groundwater is indeed from “historical pool leakage in the 1990s” as Entergy claims in the Environmental Report, why was it not detected in MW-111 in 2000? These results clearly indicate that a tritium leak occurred at IP2 between 2000 and 2005. Neither NRC nor Entergy has suggested that there could be another source of tritium leakage at IP2 besides the IP2 spent fuel pool. These facts simply do not support Entergy’s assertion that the IP2 pool is no longer leaking or has not leaked since the 1990s. NRC staff involved in the Indian Point groundwater investigation indicated their disagreement with Entergy on this issue, at the NRC Annual Assessment Meeting for Indian Point held on April 26, 2007.⁴⁴

⁴⁰ *Id.* at 5-6.

⁴¹ Entergy’s description of the groundwater investigation can be found on the New York State Emergency Management website at <http://jic.semo.state.ny.us/PlantStatus/PlantStatusMain.aspx>, last accessed May 30, 2007. See also NRC’s website on the Indian Point leaks at <http://www.nrc.gov/reactors/plant-specific-items/indian-point/on-going-activities05.html>, last accessed May 30, 2007.

⁴² Information obtained by Riverkeeper through a Freedom of Information Act requests, FOIA/PA 2005-0369, FOIA/PA 2006-0019. Entergy “FSB Sample Log” was attached to an e-mail dated November 22, 2005 from Donald Croulet at Entergy to Jim Noggle of NRC, entitled “FW: Information requested by Mr. Noggle NRC.”

⁴³ *Indian Point Nuclear Generating Unit 2-Special Inspection Report No. 05000247/2005011*, March 16, 2006.

⁴⁴ Based on conversation between Jim Noggle of NRC and Phillip Muscgaas of Riverkeeper during the NRC public meeting, held at Colonial Terrace in Cortlandt, New York on April 26, 2007.

The issue of whether this leak is ongoing is critical to the license renewal review, since the spent fuel pools qualify as "systems, structures and components" that fall within the scope of aging management review for license renewal.⁴⁵ The omission of these soil sample results and the above-referenced section of the NRC Special Inspection Report render this section of the ER incomplete.

2.2 Strontium-90 Uptake in Hudson River Fish

The ER does not contain any analysis regarding the potential contamination of Hudson River fish and shellfish with strontium-90 as a result of the unmonitored leak from the Indian Point 1 spent fuel pool. On January 16, 2007 the *Westchester County Journal News* reported that fish samples taken by Entergy in Fall of 2006 showed slightly elevated levels of strontium-90 in their flesh, raising concerns that this radionuclide could potentially bioaccumulate in the Hudson River ecosystem.⁴⁶ Out of twelve individual fish and shellfish collected for analysis, four showed detectable levels of strontium-90. The bones of the fish were not sampled for strontium-90, despite the fact that this type of radionuclide mimics calcium and concentrates in bones and teeth.

Entergy launched its own internal investigation in response to these findings which specifically suggests that further studies of Hudson River fish are warranted. In a January 2007 internal Entergy memorandum discussing preliminary dose assessments from Sr-90 in Hudson River fish and invertebrates, the author concludes that following a conservative analysis of fish consumption based on the 24.5 pCi/kg of Sr-90 in the white perch sample from Roseton, the maximum individual annual dose would equal 44% of the annual allowable bone dose to an Adult male.⁴⁷ The memorandum concludes by suggesting that "While we should not discount the value originally determined by AREVA, this evaluation indicates that we must perform additional investigation in an attempt to validate and understand the 25 pCi/L recently identified at our control location in Roseton."⁴⁸ Despite this recommendation, no mention of the dose assessment or need for further studies is included in the ER. Given the fact that much of the Hudson River habitat in which these fish exist is designated as significant or essential under state and federal law, the omission of this data from the ER renders it incomplete.

In response to concerns raised over the adequacy of Entergy's offsite sampling program under Indian Point's Radiological Environmental Monitoring Plan (REMP), the New York State Department of Environmental Conservation (DEC) publicly committed to an expanded radiological sampling plan in conjunction with New York's Department of

⁴⁵ See 10 CFR 54.21. See also NUREG-1801, Rev. 1, *Generic Aging Lessons Learned (GALL) Report*, Nuclear Regulatory Commission, September 2005.

⁴⁶ "Hudson River Fish Found to Contain Radioactive Isotope," Greg Clary, January 16, 2007 *Westchester County Journal News*.

⁴⁷ Memorandum from S. Sandike, Sr. Chemistry Specialist to T. Burns, NEM Supervisor, "Dose Assessments from Sr-90 in the Hudson River for Fish and Invertebrates-January 2007 Results," January 17, 2007, IPEC-CHM-07-002.

⁴⁸ *Id.* at pg. 2.

Health.⁴⁹ At a March 2, 2007 Roundtable Meeting on the Indian Point leaks, a representative of New York DEC's Bureau of Radiation Protection stated that Entergy's current sampling program under the REMP was not adequate to determine whether the groundwater leaks were affecting the Hudson River environment.⁵⁰

In sum, the ER is incomplete because it fails to address the potential environmental impacts of the Indian Point 1 strontium-90 leak on Hudson River fish and shellfish. The ER states that "[T]he radionuclide release is not anticipated to change environmental considerations, such as water usage, land usage, terrestrial or aquatic ecological conditions, or air quality...as a result of license renewal activities."⁵¹ This conclusion is based on an incomplete ER that fails to include the most recent results of Entergy' fish sampling under the REMP, any mention of the NYSDEC expanded fish sampling plans, or any analysis of potential dosage pathways to man from ingesting contaminated Hudson River fish.

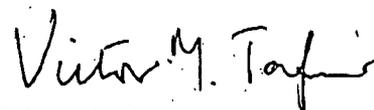
Conclusion

For the foregoing reasons, Riverkeeper reiterates its request to NRC to reject Entergy's Indian Point license renewal application as incomplete. We look forward to your timely response to this request.

Sincerely,



Phillip Musegaas
Riverkeeper Staff Attorney



Victor Tafur
Riverkeeper Staff Attorney

⁴⁹ Representatives of New York's DEC publicly announced their plans to expand radiological fish sampling at a March 2, 2007 Roundtable Meeting on the Indian Point leaks held at Pace University in Pleasantville, New York, and at the NRC Annual Assessment Meeting for Indian Point held at Colonial Terrace in Cortlandt, New York on April 26, 2007.

⁵⁰ *Id.*

⁵¹ *Supra* Note 6, pg. 5-6.

cc:

Annette Vietti-Cook, Secretary U.S. Nuclear Regulatory Commission
Dale E. Klein, Chairman, U.S. NRC
Edward McGaffigan, Jr., Commissioner
Jeffrey S. Merrifield, Commissioner
Gregory B. Jaczko, Commissioner
Peter B. Lyons, Commissioner
Samuel Collins, NRC Region 1 Administrator
Mary A. Colligan, Assistant Regional Administrator, NMFS
Senator Hillary Rodham Clinton
Senator Charles Schumer
Congressman Eliot Engel
Congressman John Hall
Congressman Maurice Hinchey
Congresswoman Nita Lowey
Congressman Christopher Shays
Eliot Spitzer, Governor of New York
Andrew Cuomo, Attorney General of New York
Pete Grannis, Commissioner, NY DEC
William Little, DEC
Paul Eddy, NY Department of Public Service
A. Spano, Westchester County Executive
R. Bondi, Putnam County Executive
C. Vanderhoef, Rockland County Executive
E.A. Diana, Orange County Executive
Michael R. Kansler, President, Entergy Nuclear Operations
Fred R. Dacimo, Site Vice President, Entergy Nuclear Operations