

**FINAL ENVIRONMENTAL  
IMPACT STATEMENT**

**By the**

**NEW YORK STATE  
DEPARTMENT OF ENVIRONMENTAL CONSERVATION**

**As Lead Agency**

**Concerning the  
Applications to Renew**

**NEW YORK  
STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM  
(SPDES) PERMITS**

**For the**

**ROSETON 1 & 2, BOWLINE 1 & 2  
AND INDIAN POINT 2 & 3  
STEAM ELECTRIC GENERATING STATIONS,  
ORANGE, ROCKLAND AND WESTCHESTER COUNTIES**

**HUDSON RIVER POWER PLANTS FEIS**

**Accepted:  
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**Prepared by NYS Department of Environmental Conservation**

**Contact:**

**Betty Ann Hughes, NYS DEC, Division of Environmental Permits  
625 Broadway, Albany, NY 12233-1750  
(518) 402-9167; [bahughes@gw.dec.state.ny.us](mailto:bahughes@gw.dec.state.ny.us)**

**Final Environmental Impact Statement  
for SPDES Permit Renewals at  
Roseton 1 & 2, Bowline 1 & 2  
And Indian Point 2 & 3  
Steam Electric Generating Stations**

This Final Environmental Impact Statement (FEIS) consists of multiple sections:

- The fundamental underlying data and studies are contained in the 1999 DEIS, which is incorporated as part of this FEIS. The 1999 DEIS contains an extended description of the environmental setting, which is not duplicated in this FEIS.
- An Executive Summary immediately follows the Table of Contents.
- The first section following the Executive Summary of this FEIS is a discussion of the regulatory setting for and history of the proposed action which updates and augments the materials in the DEIS.
- The next section of this FEIS is a table in which all public comments received by the Department on the DEIS are excerpted and summarized. A list of all commentors is provided at the end of the table. The full texts of all comments received by the Department are included in Appendix F-I.
- The Department's responses to public comments complete the FEIS. In the interest of responding most effectively to the submitted comments, Department staff grouped the comments under related themes and responded to each theme.
- In addition to the public comments, other appendices provide background reports and reference materials that may not be readily available to readers.

**FINAL ENVIRONMENTAL IMPACT STATEMENT**

**NEW YORK  
STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMITS**

**For the ROSETON 1 & 2, BOWLINE 1 & 2, and INDIAN POINT 2 & 3  
STEAM ELECTRIC GENERATING STATIONS**

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Please note that appendices are not available on the website. However, you may request one or more of the appendices by contacting Betty Ann Hughes at [bahughes@gw.dec.state.ny.us](mailto:bahughes@gw.dec.state.ny.us).

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# EXECUTIVE SUMMARY

The action before the New York State Department of Environmental Conservation (Department) is the decision whether to renew State Pollutant Discharge Elimination System (SPDES) permits which would allow three steam electric generating stations to discharge waste heat, a pollutant, to the waters of the Hudson River; the permits would also allow the facilities to continue to withdraw water from the Hudson River for use as cooling water. The three facilities are:

- Bowline Point (Units 1 and 2), West Haverstraw, Rockland County;
- Indian Point (Units 2 and 3), Buchanan, Westchester County; and
- Roseton (Units 1 and 2), Newburgh, Orange County

(See Figure 1 in main text for general locations of all 3 facilities).

In December 1999, the owners and operators of the three facilities submitted a Draft Environmental Impact Statement (DEIS) to the Department which assessed the resources likely to be impacted by the facilities; evaluated alternative technologies and management strategies to mitigate impacts from each facility's operations; and proposed a preferred action intended to reduce the respective impacts. In March 2000, the Department accepted the DEIS for purposes of review and subsequently issued a Notice of Complete Application in the Environmental Notice Bulletin and in newspapers in the vicinity of each facility.

Department staff have further reviewed the DEIS and conclude that, while it was acceptable as an initial evaluation and assessment, it is not sufficient to stand as the final document, and additional information as to alternatives and evaluation of impacts must be considered. These considerations have been undertaken by Department staff to develop a final environmental impact assessment. This Final Environmental Impact Statement (FEIS) consists of the original DEIS submitted by the facilities' operators; comments received on the DEIS; the Department's responses to those comments, with similar comments grouped for response purposes; plus expanded discussions of the regulatory setting and alternatives for mitigation of impacts from the operation of the HRSA plants.

The Hudson River is rich with aquatic life, providing habitat for the early, sub-adult, and adult life stages of many aquatic species, including a number of game, commercial, and forage fish species. The Department's regulatory role includes limiting thermal discharges from each facility to ensure the survival of aquatic resources and also preventing aquatic organism mortality

resulting from impingement and entrainment at each facility’s cooling water intake structure (CWIS).<sup>1</sup>

To illustrate the magnitude of impacts of entrainment, Table 1 (below) uses data from the DEIS to calculate the average annual number of organisms of six of the fish species entrained by the three facilities.<sup>2</sup> If one assumes that all entrained fish die, as does the United States Environmental Protection Agency (USEPA) in its proposed rulemaking for cooling water intakes, then the total number of fish entrained is equal to total mortality from entrainment.<sup>3</sup>

**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.<sup>4</sup>**

<b>Plant Species</b>	<b>Roseton</b>	<b>Indian Point</b>	<b>Bowline</b>	<b>Total</b>
<b>American Shad</b>	3,128,571	13,380,000	346,667	16,855,238
<b>Bay Anchovy</b>	1,892,500	326,666,667	81,000,000	409,559,167
<b>River Herring<sup>5</sup></b>	345,714,286	466,666,667	13,814,286	826,195,238

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<sup>1</sup> Entrainment occurs when small aquatic life forms are carried into and through the cooling system as water is withdrawn for use in a plant’s cooling system; impingement occurs when larger aquatic life forms are caught against racks or screens at the intakes, where they may be trapped by the force of the water, suffocate or be otherwise injured.

<sup>2</sup> DEIS Appendix VI-1-D-2, “Estimated Total Number of Fish Entrained”, and DEIS Appendix VI-1-D-1, “Estimated Number of Fish Killed Due to Entrainment”, (both utilizing generator estimates of through-plant survival), and calculating the mean mortality over the years presented for each species at each facility.

<sup>3</sup> National Pollutant Discharge Elimination System - Proposed Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities. USEPA Docket No. OW-2002-0049; see 67 FR 17122.

<sup>4</sup> Figures are absolute numbers of entrainable life stages, including eggs, yolk-sac larvae, post-yolk-sac larvae, and some juveniles, of the species studied.

<sup>5</sup> “River Herring” includes both Blueback Herring and Alewife, which are difficult to differentiate in their early life stages. It does not include other herring species like shad.

<b>Striped Bass</b>	129,857,143	158,000,000	15,571,429	303,428,571
<b>White Perch</b>	211,428,571	243,333,333	13,257,143	468,019,048
<b>Atlantic Tomcod<sup>6</sup></b>	No Data This Study	No Data This Study	No Data This Study	No Data This Study
<b>Total</b>	692,021,071	1,208,046,667	123,989,524	2,024,057,262

The generators attempted to estimate through-plant survival, and using those adjustments, the calculations result in a slightly lower number of fish killed by entrainment mortality, as shown in Table 2 (below).

**Table 2. Estimated Annual Entrainment Mortality of Six Fish Species at Roseton, Indian Point, and Bowline Stations, Using Generator Estimates of Through-plant Survival.**

<b>Plant Species</b>	<b>Roseton</b>	<b>Indian Point</b>	<b>Bowline</b>	<b>Total</b>
<b>American Shad</b>	2,500,000	10,640,000	281,667	13,421,667
<b>Bay Anchovy</b>	1,892,500	326,666,667	78,285,714	406,844,881
<b>River Herring</b>	277,142,857	371,666,667	11,085,714	659,895,238
<b>Striped Bass</b>	40,428,571	46,500,000	4,671,429	91,600,000
<b>White Perch</b>	130,000,000	138,666,667	8,071,429	276,738,095
<b>Atlantic Tomcod</b>	No Data This Study	No Data This Study	No Data This Study	No Data This Study
<b>Total</b>	451,963,929	894,140,000	102,395,952	1,448,499,881

<sup>6</sup> No numbers are available for Atlantic tomcod because, for the source study, no collections were made during the early part of the season when Atlantic tomcod entrainment and mortality would be a serious issue.

Based on data presented in the DEIS and analyses in that and in this FEIS, Department staff conclude that the generators' estimates represent the lower boundary of the actual mortality range, that is, the actual mortality lies somewhere between the generators' number (low end) and 100% (upper end, all entrained organisms die). Later sections of this FEIS discuss the significance of entrainment mortality; other impacts of continued operation of the HRSA generating stations, including thermal impacts; and potential control or mitigation measures.

As a result of the Department's further review of the DEIS plus the additional information and analysis provided by staff, a draft permit can be developed for each facility. Each draft permit will be based on this FEIS together with a detailed, site-specific application for that station and will contain a decision on the "best technology available" (BTA) to minimize entrainment and impingement mortality at that station. These BTA decisions are required by §316(b) of the federal Clean Water Act.<sup>7</sup> Supplemental application materials relating to existing facilities and system designs are still necessary for each site. An individual draft permit will be issued for each site, but in general terms, each permit will require the covered facility to meet BTA by designating, as SPDES permit conditions, a compliance schedule to implement one or more of the technologies now available to substantially reduce entrainment and impingement mortalities from the cooling water intake at that station.

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<sup>7</sup> 33 U.S.C. §§ 1251 - 1376

## **PROPOSED ACTION**

The action before the New York State (NYS) Department of Environmental Conservation (Department) is the decision whether to renew State Pollutant Discharge Elimination System (SPDES) permits which would allow three steam electric generating stations to discharge pollutants, including waste heat, to the waters of the Hudson River. The permits, if renewed, would also allow the continued withdrawal of water from the Hudson River to be used as cooling water. The three facilities are:

- Bowline Point (Units 1 and 2), West Haverstraw, Rockland County;
- Indian Point (Units 2 and 3), Buchanan, Westchester County; and
- Roseton (Units 1 and 2), Newburgh, Orange County.

Figure 1, on the following page, shows the location of the three generating stations