

**SUPPLEMENTAL FINAL ENVIRONMENTAL
IMPACT STATEMENT**

By the

**NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION**

As Lead Agency

**Concerning the
Application to Renew**

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

For the

**INDIAN POINT 2 & 3
STEAM ELECTRIC GENERATING STATIONS,
ORANGE, ROCKLAND AND WESTCHESTER COUNTIES
HUDSON RIVER POWER PLANTS FEIS**

Accepted:

Prepared by NYS Department of Environmental Conservation

EXECUTIVE SUMMARY

The action before the New York State Department of Environmental Conservation (“NYSDEC”) is the decision whether to renew the State Pollutant Discharge Elimination System (“SPDES”) permit and issue a Water Quality Certificate (“WQC”) for the Indian Point Energy Center Units 2 and 3 (“Indian Point”), a pair of nuclear powered steam electric generating stations located in Buchanan, Westchester County. Indian Point is owned and operated, respectively, by Entergy Nuclear Indian Point 2, LLC, Entergy Nuclear Indian Point 3, LLC, and Entergy Nuclear Operations, Inc., the owners and operator of Indian Point (collectively, “Entergy”). A SPDES permit and a WQC would allow Indian Point to discharge waste heat, a pollutant, to the waters of the Hudson River. A SPDES permit would also allow Indian Point to continue to withdraw water from the Hudson River for use as cooling water.

The SPDES permit was the subject of a Final Environmental Impact Statement dated June 25, 2003 (the “FEIS”).¹ The FEIS contemplated Supplemental EISs for each of the three Hudson River generation facilities addressed in the FEIS. Following issuance of the FEIS and a related draft SPDES permit for Indian Point, there ensued a more than 13-year long administrative adjudicatory proceeding with respect to the SPDES permit and NYSDEC Staff’s April 2010 notice of denial of Entergy’s WQC application, to which NYSDEC Staff, Entergy, and numerous intervenors and amici were parties. NYSDEC Staff and Entergy have now agreed to settle the dispute between them and to issuance of a final SPDES permit and a final WQC. This Supplemental Final Environmental Impact Statement (the “SFEIS”) provides, for purposes of public review and comment under the State Environmental Quality Review Act (“SEQR”), a summary of facts pertinent to the final SPDES permit and final WQC, including facts concerning the significant adverse environmental impacts of potential cooling water intake structure (“CWIS”) technologies for Indian Point considered during the adjudicatory proceeding.

This SFEIS does not repeat all of the information previously set forth in the FEIS or the December 1999 Draft Environmental Impact Statement (“DEIS”) that preceded the FEIS; rather, those earlier documents are appended hereto as Exhibits A and B. The purpose of this SFEIS is to supplement the earlier analysis to reflect material new information developed since the FEIS was published, and thereby to explain NYSDEC’s decision to issue the final SPDES permit, with the particular modifications found therein, and the final WQC.

The structure of this SFEIS is as follows. First, the SFEIS provides an overview of the history of the adjudicatory proceeding, particularly the history of this SPDES permit where the FEIS left off in 2003, and the WQC application. Second, it provides an overview of the Federal and New York law applicable to the proposed action. Third, it describes the evidence concerning the various CWIS alternatives considered during the adjudicatory proceeding, as NYSDEC sought to exercise its best professional judgment in selecting a “best technology available” (“BTA”) for Indian Point’s CWIS for purposes of Section 316(b) of the Federal Clean Water Act; 6 NYCRR § 704.5; and Commissioner Policy 52 (“CP-52”). This section of the SFEIS focuses on evidence concerning the feasibility of the BTA alternatives that were considered, as well as their significant adverse environmental impacts for purposes of SEQR. Lastly, the SFEIS explains Entergy’s commitment to retire Indian Point Units 2 and 3 in 2020

¹ The WQC Application was submitted to NYSDEC in April 2009 and thus post-dates the 2003 FEIS.

and 2021, respectively (subject to the terms and conditions of Entergy's commitment to do so, which are set forth herein) ("Early Retirement"), and the implications of that commitment on NYSDEC's BTA determination.

Ultimately, as explained herein and reflected in the final SPDES permit, NYSDEC has concluded that the following SPDES permit conditions represent BTA for Indian Point in light of Entergy's commitment to Early Retirement: an Early Retirement commitment (Condition 28), together with the scheduling of Indian Point's annual planned refueling and maintenance outages between February 23 and August 23 each year (Condition 26), flow limitations (Condition 6) and continued operation of Indian Point's existing suite of cooling water intake structure technologies (Condition 27), and continued intensive Hudson River monitoring (Condition 25). In reaching this determination, NYSDEC also took account of the adverse environmental impacts, and the significant social, economic, and other impacts, of alternative BTA proposals.

NYSDEC hereby solicits public comment on this SFEIS. Comments are due 45 days from the date of publication of the SFEIS (which shall be no later than February 2, 2017, or February 9, 2017 after a concurrence extension), which works out to March 20, 2017 (March 27, 2017, if the concurrence period is extended).

PROPOSED ACTION

The action before NYSDEC is the decision whether to renew Indian Point's SPDES permit and issue Indian Point a WQC, which would allow Indian Point to discharge pollutants, including waste heat, to the waters of the Hudson River. The SPDES permit would also allow Indian Point to continue to withdraw water from the Hudson River for use as cooling water. Based on the record of a 13-year long adjudicatory proceeding, and Entergy's commitment to Early Retirement, NYSDEC has decided to issue the final SPDES permit and the final WQC in the form accompanying this SFEIS as Exhibits C and D, respectively. A map showing Indian Point's location on the Hudson River appears below as Figure 1.



- **Figure 1: Location of Indian Point**

PROJECT HISTORY

A history of this project prior to the FEIS is set forth in the FEIS. This SFEIS repeats certain of that earlier history for context, but focuses on the post-FEIS history. The public is directed to the FEIS for a more fulsome description of the pre-FEIS history.

The predecessors in interest of Entergy applied in 1992 for renewal of the SPDES permit for Indian Point. Indian Point is located on the east side of the Hudson River in the Village of Buchanan, Westchester County, New York. The New York SPDES permit program is a federally-approved, state-administered program governing the discharge of pollutants (including, as relevant to the electric sector, thermal discharges) into state surface and ground waters. Conditions contained in a SPDES permit govern the discharges of permit holders. New York also uses its SPDES program to enforce the cooling water intake structure requirements of Section 316(b) of the Clean Water Act, 33 U.S.C. § 1365, and 6 NYCRR § 704.5. NYSDEC also issues WQCs pursuant to authority granted to states by §401 of the Federal Clean Water Act (33 U.S.C. §1341), employing the regulations promulgated at 6 NYCRR § 608.9 and Parts 700 – 704.

In 1999, for purposes of SEQR, Entergy’s predecessor (together with the then-owners of certain other Hudson River power plants, known as the “Hudson River Facilities”) produced a joint DEIS in support of their respective applications for SPDES permit renewals for the Hudson River Facilities.

On June 23, 2003, NYSDEC Staff accepted and noticed for public comment the FEIS for the Hudson River Facilities, including Indian Point.

On November 12, 2003, Department Staff proposed various modifications to the existing SPDES permit for Indian Point, including new conditions to implement closed cycle cooling as BTA to minimize adverse environmental impacts from the Indian Point’s CWIS. Department Staff’s BTA determination involved certain conditions related to Nuclear Regulatory Commission (“NRC”) issuance of license renewal determinations for the Stations, feasibility and SEQR assessments for the proposed BTA technology, as well as Entergy’s right to propose an alternative BTA. Various entities, including Entergy, challenged Department Staff’s proposed SPDES permit, and various third parties moved to intervene as parties or amici.

A public legislative hearing and issues conference were held with respect to the draft SPDES permit. An issues ruling, admitting intervening parties and setting certain issues for adjudication, was issued on February 3, 2006. In an interim decision, dated August 13, 2008 (the “Interim Decision”), the Deputy Commissioner ruled on interlocutory appeals and advanced various issues to adjudication in the SPDES permit proceeding. *See Matter of Entergy Indian Point 2, LLC*, Interim Decision of the Assistant Commissioner, 2008 N.Y. Env. LEXIS 52 (August 13, 2008). Among other things, the Interim Decision directed the parties to proceed to hearings on the issue of the site-specific BTA for the Stations.

On April 30, 2007, Entergy entities filed with NRC the federal license 20-year renewal applications for Indian Point. On April 6, 2009, Department Staff received a joint application for a federal Clean Water Act (“CWA”) Section 401 WQC on behalf of Entergy. Entergy submitted the joint application for a Section 401 WQC to NYSDEC as part of Entergy’s license renewal

application. Section 401 conditions federal licensing of an activity which causes a “discharge” into navigable waters on certification from the State in which the discharge might originate that the proposed activity would not violate federal or State water-protection laws. 33 U.S.C. Section 1341(a). In order to grant a WQC, NYSDEC must determine whether Indian Point’s continued operation meets State water quality standards pursuant to CWA Section 401 and Section 608.9 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (“6 NYCRR”), as well as 6 NYCRR Parts 700 – 704.

By letter dated April 2, 2010, NYSDEC Staff issued a Notice of Denial of the WQC application, precipitating a hearing on the grounds identified by various entities, including Entergy. A public comment hearing was held on July 20, 2010, and the issues conference took place the following day, on July 21, 2010. In an issues ruling dated December 13, 2010 (“WQC Issues Ruling”), the administrative law judges (“ALJs”) advanced additional issues to adjudication relating to the joint Section 401 WQC application. See *Matter of Entergy Nuclear Indian Point, LLC*, Ruling on Proposed Issues for Adjudication and Party Status, 2010 N.Y. Env. LEXIS 86 (December 13, 2010). The ALJs determined that the hearing on the SPDES and WQC issues would proceed on a consolidated basis and simultaneously, in order to develop a joint record.

The background and procedural history with respect to the renewal and modification of the SPDES permit are set forth in greater detail in the February 3, 2006 ruling on proposed issues for adjudication and petitions for party status, 2006 N.Y. Env. LEXIS 3; the Interim Decision, 2008 N.Y. Env. LEXIS 52 (August 13, 2008); the November 28, 2012 ruling of the Regional Director, 2012 N.Y. Env. LEXIS 80; and the February 3, 2015 issues ruling on permanent forced outages, 2015 N.Y. Env. LEXIS 4. The background and procedural history with respect to the Section 401 WQC proceeding are set forth in greater detail in the WQC Issues Ruling, 2010 N.Y. Env. LEXIS 86 (December 13, 2010).

Parties to the adjudicatory proceeding have included the mandatory parties Department Staff and Entergy; intervenors (Riverkeeper, Inc.; Scenic Hudson; Natural Resources Defense Council, Inc.; County of Westchester; Town of Cortland; African American Environmentalist Association; Richard Brodsky); and amici (City of New York; Independent Power Producers of New York; and Central Hudson Gas & Electric (“CHG&E”). By letter dated June 26, 2014, CHG&E withdrew from the proceeding.

Hearings have been held to consider Entergy’s proposed BTA (cylindrical wedge wire screens), NYSDEC Staff’s proposed BTA (closed cycle cooling and summertime outages of 42 and 62 days at each unit) and Riverkeeper’s proposed BTA (summertime outages of 118 days at each unit), as well as radiological issues and the issue of best usages, as advanced to adjudication in the issues ruling on the Section 401 WQC application. SEQR issues relating to each of the BTA alternatives were also the subject of hearings. The hearings on these topics began on October 17, 2011, and fifty-eight hearing days have since taken place. The transcript in the proceeding is 16,423 pages long, and 1,500 exhibits have been proposed to be admitted into evidence.

On January XX, 2017, NYSDEC Staff informed the ALJs that it and Entergy had agreed to a settlement, pursuant to which NYSDEC would issue the final SPDES permit and grant

Entergy a WQC for federal license renewal, in exchange for Entergy's commitment to, *inter alia*, Early Retirement.

REGULATORY SETTING

Federal Clean Water Act

NPDES Permitting

The basic federal law governing water pollution control in the United States is the federal Water Pollution Control Act (FWPCA), more commonly referred to as the Clean Water Act (CWA).² Although the FWPCA itself dates to 1948, the CWA as we now know it was largely shaped by comprehensive amendments in 1972 which completely overhauled the existing system.³ The 1972 CWA is properly viewed as the starting point for modern water pollution control law.

While the CWA has been amended several times since 1972, the heart of the Act which has remained intact is its system of regulating both direct and indirect discharges of pollutants into U.S. waters: the National Pollutant Discharge Elimination System (NPDES).⁴ The fundamental premise of the CWA, expressed in § 301, is not to regulate an otherwise lawful activity, but to make unlawful the discharge of *any* pollutant from a point source by any person.⁵ Thus, the discharge of pollutants is not a right and may only be allowed as specifically provided in the CWA. The bulk of the CWA may, therefore, be viewed as a detailed and highly regulated exception to the “no discharge” rule of § 301.

Pollution control standards under the Act are of two general types:

- (1) effluent standards which limit the quality and quantity of pollutants discharged from the source, also called “technology-based” standards; and
- (2) ambient standards which limit the concentration of pollutants in a defined water segment, also called “water quality-based” standards.

By establishing limits tailored to the nature of a discharge rather than its location, a uniform nationwide playing field was established that removed incentives for dischargers to relocate to other states to avoid treatment requirements.

The focus of an ambient standard is on the capacity of the receiving water to absorb or dilute a given pollutant. Thus, water quality-based standards vary according to

² 33 U.S.C. §§ 1251 - 1376.

³ FWPCA Amendments of 1972, Pub. L. No. 92-500, 86 Stat. 816.

⁴ See CWA § 402; 33 U.S.C. § 1342.

⁵ “Pollutant” is defined as including solid, industrial, agricultural and other wastes, sewage, sludge, heat, rock, sand, and biological and radioactive materials; CWA § 502(6), 33 U.S.C. § 1362(6). “Point source” is defined as any “discernable, confined, and discrete conveyance”; CWA § 502(14), 33 U.S.C. § 1362(14).

the use of the receiving water - for example, recreational, industrial, or public drinking water - and on local conditions, such as the size and flow of the receiving water, its turbidity, and other factors unique to the segment.

Technology-based effluent standards, on the other hand, do not focus on the qualities of the receiving water, but on the treatment a pollutant receives prior to its discharge. Technology-based standards define and mandate a level of effluent quality that is achievable using pollution control technology so that a pollutant's capacity to degrade the water segment into which it is discharged is lessened. Of the two, technology-based effluent standards dominate the CWA's regulatory system.

Both of these standards are implemented and enforced through the NPDES permit program, administered by the USEPA. Under § 402 of the CWA, a discharger must obtain an NPDES permit from EPA or from a state that has an EPA-approved program.⁶ The technology-based and water quality-based standards are written into the permits and are tailored to meet the particular permittee's situation, such as the pollutant-producing operation, the type and amount of pollutants to be discharged and the condition of the receiving water.

The CWA mandated development of water quality standards for water bodies and effluent limitations based on those standards, and it set forth the mechanism for incorporating water quality standards into NPDES permits. States were required to adopt classifications of water bodies according to their best uses. They were also required to develop standards for various pollutants that would establish maximum levels of pollutants in water bodies that would be allowable so that the water bodies could retain their best uses.⁷ These standards are then, in turn, incorporated into the NPDES permit as effluent limitations, along with any other relevant technology-based effluent limitations.

NPDES permits may also contain other conditions a permittee must meet, such as requirements for monitoring and reporting effluent discharges.⁸ Discharge without a permit or in violation of its conditions may subject the discharger to an enforcement action by the federal or state government, which in turn may result in civil and criminal penalties.⁹ A noncomplying discharger may also be subject to enforcement by private individuals or groups under the Act's citizen suit provision.¹⁰ In sum, the NPDES permit program is the focal point of the CWA's regulatory system, and compliance with an NPDES permit's conditions is deemed to be compliance with almost all of the Act's regulatory provisions.¹¹

⁶ CWA § 402(a) and (b), 33 U.S.C. § 1342(a) and (b).

⁷ CWA § 303, 33 U.S.C. § 1313.

⁸ 40 C.F.R. §§ 122.41 to 122.50 (permit conditions).

⁹ CWA § 309, 33 U.S.C. § 1319.

¹⁰ CWA § 505, 33 U.S.C. § 1365.

¹¹ CWA § 402(k), 33 U.S.C. § 1342(k).

CWA § 316(b) and Cooling Water Intake Structures

§ 316(b) of the CWA provides that any “point source” discharge standard established pursuant to §§ 301 or 306 of the CWA must require that the location, design, construction, and capacity of CWIS reflect the “best technology available” (BTA) for minimizing adverse environmental impacts.

EPA has defined a “cooling water intake structure” as the total physical structure and any associated constructed waterways used to withdraw water from waters of the U.S., extending from the point at which water is withdrawn from waters of the U.S. up to and including the intake pumps. EPA has defined “cooling water” as water used for contact or non-contact cooling, including water used for equipment cooling, evaporative cooling tower makeup, and dilution of effluent heat content.¹² The intended use of cooling water is to absorb waste heat from production processes or auxiliary operations.

CWA § 316(b) addresses the adverse environmental impact caused by the intake of cooling water, not discharges into water. Despite this special focus, the requirements of § 316(b) are closely linked to several of the core elements of the NPDES permit program established under § 402 of the CWA to control discharges of pollutants into navigable waters. For example, § 316(b) applies to point sources (facilities) that withdraw water from the waters of the U.S. for cooling through a CWIS and are subject to an NPDES permit. Conditions implementing § 316(b) are included in NPDES permits on a case-by-case, site-specific basis.

The majority of impacts to aquatic organisms and habitat associated with intake structures is closely linked to water withdrawals from the various waters in which the intakes are located. The withdrawal of substantial quantities of cooling water affects large numbers of aquatic organisms annually, including phytoplankton (tiny, free-floating photosynthetic organisms suspended in the water column), zooplankton (small aquatic animals, including fish eggs and larvae, that consume phytoplankton and other zooplankton), fish, crustaceans, shellfish, and many other forms of aquatic life.¹³ Aquatic organisms drawn into CWIS are either impinged on components of the CWIS or entrained in the cooling water system itself.

Impingement takes place when organisms are trapped against intake screens by the force of the water passing through the cooling water intake structure. This can result in starvation and exhaustion (organisms are trapped against an intake screen or other barrier at the entrance to the cooling water intake structure), asphyxiation (organisms are pressed against an intake screen or other barrier at the entrance to the cooling water intake structure by velocity forces which prevent proper gill movement, or organisms are

¹² National Pollutant Discharge Elimination System—Final Regulations To Establish Requirements for Cooling Water Intake Structures at Existing Facilities and Amend Requirements at Phase I Facilities, 79 Fed. Reg. 48300, 48431 (Aug. 15, 2014).

¹³ National Pollutant Discharge Elimination System—Proposed Regulations to Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities; Proposed Rule, 67 Fed. Reg. 17122, 1736 (Apr. 9, 2002) (“316(b) Proposed Rule”).

removed from the water for prolonged periods of time), descaling (fish lose scales when removed from an intake screen by a wash system), and other physical harms.¹⁴

Entrainment usually occurs when relatively small benthic, planktonic, and nektonic organisms, including early life stages of fish and shellfish, are drawn through the cooling water intake structure into the cooling system. In the normal water body ecosystem, many of these small organisms serve as prey for larger organisms that are found higher on the food chain. As entrained organisms pass through a plant's cooling system they are subject to mechanical, thermal, or toxic stress. Sources of such stress include physical impacts in the pumps and condenser tubing, pressure changes caused by diversion of the cooling water into the plant or by the hydraulic effects of the condensers, sheer stress, thermal shock, and chemical toxemia induced by antifouling agents such as chlorine.¹⁵

In addition to impingement and entrainment losses associated with the operation of CWIS, another concern is the cumulative degradation of the aquatic environment as a result of:

- (1) multiple intake structures operating in the same watershed or in the same or nearby reaches; and
- (2) intakes located within or adjacent to an impaired waterbody.

Historically, impacts related to CWIS have been evaluated pursuant to CWA § 316(b) on a facility-by-facility basis. While the potential cumulative effects of multiple intakes located within a specific waterbody or along a coastal segment are largely unknown, there is concern about the effects of multiple intakes on fishery stocks.¹⁶

New York State Laws

SPDES Permitting Program

Pursuant to authority granted by Congress in CWA § 402, USEPA has authority to allow states to carry out specified permitting functions, which would otherwise be performed by USEPA, for discharges into both interstate and intrastate waters. New York State received USEPA approval of such authority in the form of a Memorandum of Agreement between the state and USEPA in October 1975. The Memorandum established the basis for the SPDES permit program in New York State in lieu of a federally administered program.

Originally enacted in 1973, Article 17, Title 8 of the Environmental Conservation Law (ECL) authorizes NYSDEC to administer the SPDES permitting program that

¹⁴ *Id.*

¹⁵ *Id.*

¹⁶ *Id.*

governs the discharge of pollutants into the waters of the state at a given facility.¹⁷ The purpose of ECL Article 17, Title 8 is:

To create a state pollutant discharge elimination system (SPDES) to insure that the State of New York shall possess adequate authority to issue permits regulating the discharge of pollutants from new or existing outlets or point sources into the waters of the state, upon condition that such discharges will conform to and meet all applicable requirements of the [FWPCA] . . . and rules, regulations, guidelines, criteria, standards and limitations adopted pursuant thereto relating to effluent limitations, water quality related effluent limitations ...¹⁸

The discharge must also meet all applicable requirements of the ECL and the implementing regulations at 6 NYCRR Parts 700, et seq. and 750, et seq. The permitting objective is to prospectively control the discharge of point-source pollutants, including heat, by establishing chemical-specific limits and other requirements intended to assure that water quality standards in the receiving water body are achieved. Additional environmental objectives are to assure that aquatic communities are not unduly harmed by discharges, and to protect the public health and best usage of the water body.

Generally, thermal discharges to the waters of the State must meet water quality standards to assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water.¹⁹ In addition, thermal criteria apply to all waters of the State receiving thermal discharges.²⁰ These criteria may be modified upon application of a permittee to NYSDEC if NYSDEC finds them to be unnecessarily restrictive and that modification would still assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into which the discharge is to be made.²¹ The discharge of heat as a pollutant, a “thermal discharge,” is addressed in NYSDEC’s regulations at 6 NYCRR Part 704.

In making a modification to thermal criteria, NYSDEC typically imposes a “mixing zone” which limits the physical extent within which heated water can exceed specific applicable criteria.²² Outside of the mixing zone, thermal criteria must be met to assure compliance with water quality standards. Temperature limitations are established and imposed on a case-by-case basis for each facility subject to Part 704 jurisdiction. NYS has adopted the federal CWA § 316(b) BTA requirement for CWIS as part of NYSDEC’s thermal discharge criteria at 6 NYCRR § 704.5.

¹⁷ “Pollutant” is defined as any “dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand and industrial, municipal, and agricultural waste discharged into water.” ECL § 17-0105(17).

¹⁸ ECL § 17-0801.

¹⁹ 6 NYCRR § 704.1(a).

²⁰ NYCRR § 704.2.

²¹ 6 NYCRR § 704.4.

²² 6 NYCRR § 704.3.

New York has adopted the appropriate regulations for the operation of the SPDES permit program, including standards for the development and issuance of permits as well as for the types of effluent limitations to be imposed in these permits.²³ In addition to the federally developed categorical effluent limitations, NYSDEC has developed numerous water quality standards for various pollutants in its regulations and less formal “guidance” values for many more pollutants.²⁴ NYSDEC has also categorized through regulation all significant water bodies in the State, based upon the best use of each water body.²⁵

NYSDEC’s overall SPDES permitting activity is intended to implement the declared public policy of the State of New York that water resources not be wasted or degraded and “shall be adequate to meet the present and future needs for domestic, municipal, agricultural, commercial, industrial, power, recreational and other public, beneficial purposes.”²⁶

Goals for water discharge permitting are also articulated in the ECL:

Reasonable standards of purity and quality of the waters of the state be maintained consistent with public health, safety and welfare and the public enjoyment thereof, the propagation and protection of fish and wildlife, including birds, mammals and other terrestrial and aquatic life, and the industrial development of the state, and to that end, to require the use of all known available and reasonable methods to prevent and control pollution, wastage and unreasonable disturbance and defilement of the waters of the state.²⁷

Any source proposing to discharge pollutants requiring a SPDES permit must file an application with NYSDEC at least 180 days before the proposed commencement of the discharge²⁸ or, if renewing an existing SPDES permit, at least 180 days before the expiration of the existing permit.²⁹ Submission of a timely renewal application continues the terms of the existing SPDES permit until the renewal permit is issued by NYSDEC.³⁰ If NYSDEC determines to issue the permit, it prepares a draft permit, including proposed effluent limitations and other conditions.³¹

NYSDEC is required to provide public notice of every draft SPDES permit which gives a description of the discharge and the terms of the draft permit, and sets forth a

²³ See 6 NYCRR Part 750.1

²⁴ 6 NYCRR Part 703; Department Technical and Operational Guidance Series (TOGS) § 1.1.1.

²⁵ See 6 NYCRR Parts 701 and 800 to 941.

²⁶ ECL § 15-0105(3).

²⁷ ECL § 15-0105(7); *see also*, ECL § 17-0101.

²⁸ 6 NYCRR § 750-1.6

²⁹ 6 NYCRR § 750-1.16

³⁰ SAPA § 401(2).

³¹ 6 NYCRR § 750-1.9

public comment period of no less than 30 days during which interested parties may submit written comments concerning the application.³² During the public comment period any person, including the applicant, may submit written comments or request a hearing. NYSDEC is required to hold a legislative hearing to receive unsworn public comments if it determines that there is significant public interest and sufficient reason for such a hearing.³³ If no hearing is held, only the written comment period occurs, and NYSDEC will issue a final SPDES permit following the close of the public comment period.

In certain instances, an adjudicatory hearing may also be held, where evidence and sworn testimony is presented before an Administrative Law Judge (“ALJ”). Any interested party, as well as the applicant, may request an adjudicatory hearing with respect to any aspect of a draft SPDES permit so long as the request is made during the public comment period.³⁴ At such a hearing, parties have an opportunity to contest issues the ALJ has determined to be adjudicable.³⁵

NYSDEC is required to determine the existence of the following facts in a SPDES permit renewal context:

1. That the permittee is in compliance with or has substantially complied with all the terms, conditions, requirements, and schedules of compliance of the expiring SPDES permit;
2. That NYSDEC has up-to-date information on the permittee’s production levels, waste treatment practices, and the nature, contents, and frequency of the permittee’s discharge, pursuant to new forms and applications or monitoring records and reports; and
3. That the discharge is consistent with currently applicable effluent and water quality standards and limitations, and other legally applicable requirements.³⁶

Upon a determination of the existence of these facts, NYSDEC may issue a renewal permit.

NYSDEC also has authority to modify SPDES permits for a number of reasons, including significant changes in a discharger’s operations or new information, such as the promulgation of new standards by either the State or USEPA.³⁷ Permits can also be

³² 6 NYCRR § 750-1.9

³³ 6 NYCRR § 750-1.9

³⁴ 6 NYCRR § 750-1.1(d)

³⁵ 6 NYCRR § 624.4(b)(5), (c)

³⁶ 6 NYCRR § 750-1.16

³⁷ 6 NYCRR § 750-1.18

modified or revoked in response to violations of permit conditions, misrepresentations by the permittee, or changes in conditions.³⁸

Water Quality Certification Program

NYSDEC issues WQCs pursuant to authority granted directly to states by Section 401 of the Federal Clean Water Act (33 U.S.C. § 1341), employing the regulations promulgated at 6 NYCRR § 608.9 and Parts 700 – 704. Section 401 conditions federal licensing of an activity which causes a “discharge” into navigable waters on certification from the State in which the discharge might originate that the proposed activity would not violate federal or State water-protection laws. 33 U.S.C. Section 1341(a). In order to grant a WQC, the Department must determine whether IPEC’s continued operation meets State water quality standards pursuant to CWA Section 401 and Section 608.9 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York (“6 NYCRR”).

NYSDEC may provide public notice of a draft WQC and set forth a public comment period of no less than 30 days pursuant to 6 NYCRR §621.7(b)((ii), during which interested parties may submit written comments concerning the application. During the public comment period any person, including the applicant, may submit written comments or request a hearing. NYSDEC may hold a legislative hearing to receive unsworn public comments if it determines that there is significant public interest and sufficient reason for such a hearing. *See* 6 NYCRR §621.8(c)(1) and (2). If no hearing is held, only the written comment period occurs, and NYSDEC will issue a final WQC following the close of the public comment period.

In certain instances, an adjudicatory hearing may also be held, where evidence and sworn testimony is presented before an Administrative Law Judge (“ALJ”). Any interested party, as well as the applicant, may request an adjudicatory hearing with respect to any aspect of a draft SPDES permit so long as the request is made during the public comment period. At such a hearing, parties have an opportunity to contest issues the ALJ has determined to be adjudicable. *See* 6 NYCRR § 621.8(b) and (d).

Legislative Findings and Commissioner’s Powers

In enacting legislation to preserve and protect the water resources and wildlife of the State of New York, the NYS Legislature made findings of fact and vested the Commissioner of Environmental Conservation with broad powers and authority germane to the regulation of electricity generating facility operations that use and impact such resources.

The Legislature has found:

The State of New York owns all fish, game, wildlife, shellfish, crustacea and protected insects in the state, except those legally acquired and held in private

³⁸ 6 NYCRR § 750-1.20

ownership. Any person who kills, takes or possesses such fish, game, wildlife, shellfish, crustacea or protected insects thereby consents that title thereto shall remain in the state for the purpose of regulating and controlling their use and disposition.³⁹

The general purpose of powers affecting fish and wildlife, granted to the department by the Fish and Wildlife Law, is to vest in the department, to the extent of the powers so granted, the efficient management of the fish and wildlife resources of the state. Such resources shall be deemed to include all animal and vegetable life and the soil, water and atmospheric environment thereof, owned by the state or of which it may obtain management, to the extent they constitute the habitat of fish and wildlife as defined in § 11-0103⁴⁰

New York State has been generously endowed with water resources which have contributed and continued to contribute greatly to the position of preeminence attained by New York in population, agriculture, commerce, trade, industry and outdoor recreation.⁴¹

All fish, game, wildlife, shellfish, crustacea and protected insects in the state, except those legally acquired and held in private ownership, are owned by the state and held for the use and enjoyment of the people of the state, and the state has a responsibility to preserve, protect and conserve such terrestrial and aquatic resources from destruction and damage and to promote their natural propagation.⁴²

It is in the best interests of this state that provision be made for the regulation and supervision of activities that deplete, defile, damage or otherwise adversely affect the waters of the state and land resources associated therewith.⁴³

The NYSDEC Commissioner has the power to:

Promote and coordinate management of water, land, fish, wildlife and air resources to assure their protection, enhancement, provision, allocation, and balanced utilization consistent with the environmental policy of the state and take into account the cumulative impact upon all such resources in making any determination in connection with any license, order, permit, certification or other similar action or promulgating any rule, regulation, standard or criterion.⁴⁴

³⁹ ECL § 11-0105.

⁴⁰ ECL § 11-0303(1); *see also*, ECL §§ 11-0303(2) and 11-0305.

⁴¹ ECL § 15-0103(2).

⁴² ECL § 15-0103(8).

⁴³ ECL § 15-0103(13).

⁴⁴ ECL § 3-0301(1)(b).

Provide for the propagation, protection, and management of fish and other aquatic life and wildlife and the preservation of endangered species.⁴⁵

Provide for the protection and management of marine and coastal resources and of wetlands, estuaries and shorelines.⁴⁶

New York State Coastal Management Program

The NYS Coastal Management Program was developed under authority of New York State Executive Law 910-22 and 19 NYCRR Part 600. The operative sections of the Executive Law provide 11 points of policy that have been detailed in a single set of 44 decision-making criteria in the Coastal Management Program and final environmental impact statement. NYSDEC, as a state agency, must find that all direct and funding actions, and any permitting actions that are the subject of an EIS under SEQR, are consistent with the Coastal Management Program.⁴⁷ In addition, SEQR regulations provide that, for any state agency action in a coastal area, a draft EIS must contain an identification of the applicable coastal resources/waterfront revitalization policies and a discussion of the effects of the proposed action on such policies.⁴⁸ Renewal of Indian Point's SPDES permit will not result in any new effects on coastal zone policies.

State law also requires that state agencies provide timely notice to local governments whenever an identified action will occur within an area covered by an approved local waterfront revitalization program (LWRP). The NYS Secretary of State is required to confer with state agencies and local governments when notified by a local government that a proposed state agency action may conflict with the policies and purposes of its approved LWRP, and may modify the proposed action to be consistent with the local plan.⁴⁹

The consistency provisions of the New York State Coastal Management Program enable NYSDEC to consider the full range of coastal policies prior to undertaking and approving a specific action, including completion of a coastal assessment form as in this case.

Hudson River Estuary Management Program

In 1987, ECL § 11-0306 was amended in order to establish a Hudson River estuarine district including “the tidal waters of the Hudson River, including the tidal waters of its tributaries and wetlands from the federal lock and dam at Troy to the Verrazano-Narrows.”⁵⁰ This section also directed NYSDEC to establish a Hudson River

⁴⁵ ECL § 3-0301(1)(c).

⁴⁶ ECL § 3-0301(1)(e).

⁴⁷ 6 NYCRR 617.9(e); 19 NYCRR 600.4(a)

⁴⁸ 6 NYCRR 617.14(d)(10).

⁴⁹ Executive Law 915-a.

⁵⁰ ECL § 11-0306(1).

estuary management program “in order to protect, preserve and, where possible, restore and enhance the Hudson River estuarine district.”⁵¹ The district was also to consider the remainder of the Hudson River, New York Bight, and the waters around Long Island, as they impact the Hudson River estuary.

A Hudson River estuary management advisory committee, consisting of representatives of commercial fishing, sportsmen, research, conservation, and recreation, as well as a Hudson River estuary coordinator, was created within NYSDEC to manage the Hudson River estuary management program and assist in the development and implementation of the program.⁵²

A Hudson River estuarine sanctuary was also established “for the purpose of protecting areas of special ecological significance within the Hudson River estuarine district and associated shorelands ...”.⁵³ The sanctuary also serves as a “long-term estuarine field laboratory for research and education concerning the Hudson River ecosystem.”

NYSDEC and the advisory committee were directed to develop a continuing estuary management program “for the preservation, protection, restoration and enhancement of the Hudson River estuarine district and associated shorelands including but not limited to its natural resources, its fish and wildlife and the habitats within it.”⁵⁴ The strategy was required to include, among other things, the following:

- a. Evaluation of the impact of the uses of water on the Hudson River estuarine district including present and future demands for water and their impact on the balance of fresh and salt water in the estuary.
- b. Identification of areas of potential ecological significance which may require rehabilitation.
- c. A status report on the levels of toxicants in and their effects on important estuarine indicator species and for species that have potential or existing recreational or commercial value.
- d. Identification of the anthropogenic activities and the conservation and management problems that pose an existing or potential threat to the resources and the functioning of the estuary.⁵⁵

⁵¹ ECL §11-0306(2).

⁵² ECL §11-0306(4).

⁵³ ECL §11-0306(5).

⁵⁴ ECL §11-0306(6).

⁵⁵ See ECL §11-0306(6)(e)-(h).

In enacting ECL § 11-0306, the Legislature made the following findings and declarations:

The legislature further finds that the Hudson River estuary is of statewide and national importance as a habitat for marine, anadromous, catadromous, riverine and freshwater fish species and that it is the only major estuary on the east coast to still retain strong populations of its historical spawning stocks. Such species are of vital importance to the ecology and the economy of the state and to the recreational and commercial needs of the people of the New York state and neighboring states. A lack of sufficient and reliable research and documentation has resulted in recurring disputes on the movements, life cycles and habitats of these species.

The legislature further finds that the Hudson River estuary possesses a fishery of outstanding commercial and recreational value, and the economic potential of the Hudson River estuary's fishery is at present underdeveloped. Improper management and use of the Hudson River estuary will deprive present and future generations of the benefit and enjoyment of this valuable resource.

The legislature further finds that the protection of estuarine species throughout their life history; the protection of their spawning habitat, nursery habitat, wintering habitat and feeding and foraging habitat; and the protection, enhancement and restoration of the state's natural resources upon which these species and their habitat depend requires a specific program for the proper management of the Hudson River estuary.

It is hereby declared to be the policy of the state to preserve, protect and, where possible, restore and enhance the natural resources, the species, the habitat and the commercial and recreational values of the Hudson River estuary.

Hudson River Valley Greenway Program

Article 44 of the ECL was amended in 1991 to establish a Hudson River Valley Greenway Communities Council (Greenway Council) to assist Hudson River Valley communities in the 10 counties of Westchester, Putnam, Dutchess, Columbia, Rennselaer, Albany, Green, Ulster, Orange, and Rockland in their plans for development. Article 44 was enacted as companion legislation to the Hudson River estuary management program discussed earlier.⁵⁶ The statute authorizes the Greenway Council to provide and support cooperative planning to establish a voluntary regional compact among Hudson Valley localities to protect the valley's natural and cultural resources and promote regional planning. The ECL also provides that, upon compact effectiveness, state agency actions for which an EIS is being prepared under SEQR, including Department actions, must be assessed in light of the Greenway compact and applicable rules and regulations, and that the Greenway Council should review and comment in

⁵⁶ ECL §11-0306

writing on the DEIS.⁵⁷ As of early 2003, six counties and several localities were actively engaged in Greenway Compact planning and programs.

Endangered Species Act

For purposes of the federal Endangered Species Act (“ESA”), Indian Point has obtained a biological opinion and incidental take statement from the National Marine Fisheries Service (“NMFS”), and is in the process of finalizing a biological monitoring program with NMFS. Under the authority of ECL § 11-0535 and 6 NYCRR Part 182, NYSDEC will be issuing a conforming state ESA permit to Indian Point in contemporaneously with the final SPDES permit.

Use and Conservation of Energy

The administrative and adjudicatory record, including insofar as it incorporates studies and reports of the New York Independent System Operator (“NYISO”) and New York Public Service Commission (“NYPSC”), including but not limited to iterations of the NYISO Reliability Needs Assessment and Comprehensive Reliability Plan, and documents from the NYPSC Indian Point Reliability Contingency Plan docket (such as the order establishing that docket, and the NYPSC environmental impact statement for that docket), as well as documents from NYSDEC and other governmental documents pertaining to the Regional Greenhouse Gas Initiative, document the contribution of Indian Point to New York State’s bulk electric system, particularly in the short-to-medium term. This contribution is measured in terms of electric system reliability, wholesale and capacity market pricing, and reductions in emissions of criteria air pollutants and greenhouse gases. The record also identifies that any potential impacts to reliability and capacity in the medium-to-long term are expected to be avoided or mitigated given responsive measures taken on the basis of planning on the part of the NYISO and the NYPSC, and the SPDES Permit’s and WQC’s recognition of the need for temporary continued operation of Indian Point in order to preserve system reliability and capacity if necessary mitigation is not forthcoming. For these reasons, the record demonstrates that Early Retirement will satisfy electric generating capacity needs and other electric system needs in a manner consistent with the State Energy Plan.

MITIGATION AND ALTERNATIVES

Available Mitigation Technologies

At present, Indian Point’s existing CWIS employs a “once-through” cooling system, *i.e.*, Hudson River water is withdrawn by the CWIS, circulated past the condenser coils to absorb waste heat from the operation of Indian Point’s two operating reactor units, and discharged back to the Hudson River at a higher temperature than at the intake.

The current design of the CWIS incorporates certain features designed to reduce mortality to aquatic organisms as a result of impingement against the CWIS’s intake screens or entrainment within the circulating cooling water itself. Specifically, Indian Point’s CWIS employs a system

⁵⁷ ECL §44-0115(3).

of Ristroph modified traveling screens with a low pressure spray wash system that washes impinged fish and other larger aquatic organisms off the screens separately from debris that is removed using a high pressure spray; a fish handling and return system that conveys the fish and other organisms washed off the screens back into the Hudson River; and variable-speed pumps that allow Indian Point to more precisely adjust the volume of water withdrawn from the Hudson River, as compared to single-speed pumps, which allows for a reduction in the volume of cooling water withdrawn and corresponding reductions in impingement and entrainment. Despite these features, the operation of Indian Point's CWIS results in smaller aquatic organisms (eggs and larvae) being entrained within the circulating cooling water, while some larger organisms are impinged on intake screens.

Based on information in the 1999 DEIS, the 2003 FEIS, and the other information obtained and analyses conducted since those documents were prepared, including in connection with adjudicatory proceeding, NYSDEC has considered three primary potential technologies or operational measures as alternatives to once-through cooling, to mitigate the adverse environmental impact of Indian Point's CWIS for purposes of CWA § 316(b) and 6 NYCRR § 704.5. Specifically, these mitigation measures are: (1) closed-cycle cooling ("CCC"); (2) cylindrical wedgewire screens ("CWS"); and (3) flow reductions achieved via annual fish-protection outages ("FPO"). Each of these alternatives is discussed and evaluated separately below. Alternatives discussed in the 2003 FEIS, but that were not the subject of extensive consideration during the adjudicatory proceeding because they were readily determined to be infeasible or ineffective at Indian Point are not discussed herein; the public is directed to the FEIS, and to the fact sheet for the final SPDES permit, for a discussion of such alternatives.

Instead of these mitigation alternatives, as the next section of the SFEIS discusses, given the specific and unique facts of this action, NYSDEC has determined that the BTA for Indian Point, as reflected in the final SPDES permit, is as follows: an Early Retirement commitment (Condition 28), together with the scheduling of Indian Point's annual planned refueling and maintenance outages between February 23 and August 23 each year (Condition 26), flow limitations (Condition 6) and continued operation of Indian Point's existing suite of cooling water intake structure technologies (Condition 27), and continued intensive Hudson River monitoring (Condition 25). This determination includes finding that Early Retirement will allow Indian Point Units 2 and 3 to operate in compliance with State water quality standards, allowing NYSDEC to issue a final WQC.

Alternatives Assessment

This assessment is based on all of the information gathered and proceedings described in the Project History, above. In addition, and pursuant to 6 NYCRR § 617.15(a), this assessment is based in relevant part on the NRC's December 2010 Final "Supplement 38 Regarding Indian Point Generating Units 2 and 3" to NRC's Generic Environmental Impact Statement for License Renewal of Nuclear Plants, which goes by the reference NUREG 1437, Supplement 38, Volumes 1-3, as it has been supplemented through this date (collectively, the "2010 NRC FSEIS"). The multi-volume 2010 NRC FSEIS contemplates continued operation of Indian Point through and beyond the 2020, employing the cooling water intake structure technologies and related measures required in the renewed SPDES permit. *See* 6 NYCRR § 617.15(a) ("When a draft and final EIS for an action has been duly prepared under the National Environmental Policy Act of

1969, an agency has no obligation to prepare an additional EIS under this Part, provided that the Federal EIS is sufficient to make findings under section 617.11 of this Part.”). The 2010 NRC FSEIS is available online from the NRC.

Closed-Cycle Cooling

Closed-cycle cooling recirculates cooling water in a closed system that substantially reduces the need for withdrawing cooling water from the River. By reducing the amount of River water that IPEC needs to withdraw in order to operate, CCC in turn would result in reductions in the number of impinged or entrained aquatic organisms at Indian Point. The benefit of hybrid cooling towers for minimizing environmental impacts is substantial, if such towers can be operated throughout the entrainment season, with a 97% reduction in fish mortality in that instance (ASA Analysis and Communication 2003).

Analysis showed that the construction of hybrid cooling towers is generally feasible (Enercon Services 2003), but faces substantial site-specific challenges (Enercon Services 2010; Tetra Tech 2013) and would require prior review and approval from the Nuclear Regulatory Commission (“NRC”), which issues Entergy’s operating licenses. More specifically, the evidence in the record suggests that there may not be sufficient space within the Indian Point site boundary in which to locate cooling towers of a sufficient size given the volume of Indian Point’s circulating water flow (Enercon Services 2010; Tetra Tech 2013). Additionally, siting conflicts exist between the current configuration of the Indian Point station and the most likely proposed location for cooling towers, such that cooling tower construction would require relocating numerous existing structures including: the Algonquin natural gas pipeline owned by Spectra Energy; overhead transmission lines; the utility tunnel and monitoring house; the primary water storage tank area, boric acid storage tanks, and the Unit 3 waste storage tank; the radioactive machine shop; the Unit 3 outage support building; numerous layers of security fencing; and the independent spent fuel storage installation (“ISFSI”) (Tetra Tech 2013). Cooling tower construction also would require at least four years of blasting in proximity to operating nuclear reactor units, which is uncertain to be permitted by NRC and/or local municipal authorities (Tetra Tech 2013; Enercon Services 2010). Even if these construction-related feasibility challenges could be overcome, evidence suggests that, due to increased pressure and water temperatures, operation of CCC at Indian Point would exceed the operational limits of the facility’s condenser, causing operational problems at the Stations (Enercon Services 2013).

The length of time required to design, permit and construct closed-cycle cooling technology at the facility would likely be at least 9.5 years and would involve costs potentially in excess of \$1 billion (Enercon 2010; Tetra Tech 2013). The construction and operation of cooling towers on the Indian Point site potentially would result in adverse environmental and other SEQR impacts. Construction and operation of cooling towers has the potential to create nuclear safety for the Indian Point site, including as a result of salt deposition, fogging, and icing, which may result in electrical arcing and/or compromise perimeter security (Enercon Services 2013). The construction and/or operation cooling towers potentially may result in exceedances of local noise restrictions, adverse impacts on visual or scenic resources in the Lower Hudson Valley region (TRC 2013), and adverse impacts to the habitat of threatened or endangered species located in the vicinity of the Indian Point site, including the bald eagle and the Indiana bat (TRC 2013). The nearly year-long construction outage necessary to construct cooling towers at Indian Point,

and the resulting increase in demand for electricity that likely will be filled by existing fossil-fueled generators, also is expected to cause increases in emissions of criteria air pollutants, greenhouse gas emissions, and wholesale energy and installed capacity market prices (NYSDPS 2013), as would subsequent operation of the cooling towers. The construction outage also may have adverse implications for the reliability of New York State's electric system (NYSDPS 2013).

Cylindrical Wedgewire Screens

CWWS are a passive intake technology that work by preventing some early life stage aquatic organisms from being carried into the intake structure. More specifically, CWWS have an internal cylindrical framework around which a wire is tightly wound to form the screening surface, which consists of V-shaped wedgewire bars that are welded and formed to maintain a uniform screen opening with the narrower end internal to the screen. CWWS reduce impingement and entrainment by discouraging debris accumulation on the screen surface and evenly distributing intake flow across and throughout the screen surface, resulting in a slower "through-screen" velocity.

Entergy proposed to install 144 2.0 mm screens in the vicinity of the existing CWIS to effectively eliminate impingement mortality and reduce entrainment mortality. Although CWWS would be even more effective at reducing impingement at Indian Point than would CCC, achieving impingement reductions of up to 99.3% of the regulatory baseline, CWWS would be less effective than CCC at reducing entrainment. A CWWS installation of this size also would be larger than any previous deployment in New York. Design and installation of the screens is expected to take an estimated five to six years and to cost approximately \$300 million.

In terms of adverse environmental or other impacts, CWWS would avoid many of the adverse impacts discussed above associated with CCC, including impacts to visual resources, increased noise, impacts to air quality, impacts to Indian Point's operations and nuclear safety and security, and impacts to electric-system prices and/or reliability.

CWWS potentially would give rise to other adverse impacts, however, that NYSDEC has considered as part of its analysis. These adverse impacts include the potential for the construction and/or operation of CWWS to result in a long-term loss of more than five acres of Hudson River benthic habitat, and the potential that construction and/or operation of CWWS may negatively impact threatened or endangered species, such as Hudson River shortnose and Atlantic sturgeon.

Annual Fish Protection Outages

Annual FPOs are another means of reducing cooling water withdrawals, and therefore achieving reductions in entrainment and impingement of aquatic organisms. For example, the 2003 draft SPDES permit called for seasonal outages of 42 unit-days on an interim basis between February 23 and August 23 based on evidence that peak entrainment occurs during those months. During the adjudicatory proceeding relating to renewal of Indian Point's SPDES permit, proposals for dual-unit FPOs of 42, 62, and 118 days per year (mainly in the summer period between May 10

and August 10) also were evaluated, as well as proposals that would combine a single-unit CCC retrofit with FPOs of 42 or 62 days per year at the non-retrofitted unit.

The effectiveness of FPOs in achieving entrainment reductions may be highly variable, and depends primarily on whether the dates on which the FPOs occur coincide with annual entrainment peaks, with the result that longer FPOs tend to have greater efficacy at reducing entrainment than shorter FPOs (Nieder 2015). The time of year in which entrainment peaks occur may vary substantially from year to year, and may also differ for certain species of fish. The record evidence indicates that the entrainment reduction efficacy of dual-unit FPOs is less than the efficacy of CCC, and may be less effective than CWWS depending on when the FPOs are scheduled in comparison to entrainment peaks (Nieder 2015).

Dual-unit annual FPOs are subject to a number of feasibility challenges that may preclude their implementation at Indian Point. Nuclear facilities like Indian Point are operated on a schedule that NRC developed specifically for the purpose of reducing nuclear-safety risks, whereby each reactor unit generates electricity for 23 months followed by a 1-month refueling and maintenance outage. Annual, dual-unit FPOs are inconsistent with that NRC-approved refueling schedule, and are not employed at any comparable, currently operating nuclear facility in the United States. A transition to FPOs likely would require NRC approval through the license-amendment process. Approval of dual-unit annual FPOs is likely to take a number of years.

Annual FPOs also may result in adverse environmental, social, economic, and other impacts. The summer period corresponds to the typical period during which peak summertime demand for electricity occurs (NYS DPS 2015). Annual summertime FPOs have the potential to result in violations of applicable New York State electric system reliability criteria, or in additional costs to maintain the reliability of the electric system (NYS DPS 2015). Indian Point's absence during FPOs is likely to result in increased demand for electricity produced by existing fossil-fueled generators, which could cause increases in greenhouse gases and emissions of criteria air pollutants (NYS DPS 2015).

To the extent that annual FPOs are combined with a single-unit CCC retrofit, most of the same potential adverse impacts associated with a CCC retrofit project, as discussed above, are likely to be present as well.

THE FINAL SPDES PERMIT

Based upon all of the available information, including with respect to environmental impacts, and in light of Entergy's commitment to Early Retirement, NYSDEC has determined that CCC, CWWS, and FPOs are not BTA for IPEC; rather, the final SPDES permit reflects Entergy's commitment to Early Retirement, together with the other fish protection conditions set forth in the final SPDES permit, as BTA.

Specifically, the final SPDES permit contains the following biological conditions:

25. Within 3 months of the Effective Date of the Permit (EDP+ 3), the permittee must submit to the Department an approvable plan for continuation of a Hudson River Biological Monitoring Program (HRBMP) consisting of the Long

River Survey, Beach Seine Survey and Fall Shoals Survey performed at current (2015) levels in the tidal Hudson River (River miles 0-152). This plan will also contain a commitment and plan by the permittee to work with the Department to determine a reduced monitoring effort that would provide the data necessary to continue collecting the long-term record of or data to identify status and trends reasonably attributable to Indian Point's continued operations in the Hudson River fish community sampled. Upon receipt of Department approval, the permittee must conduct the HRBMP in accordance with the approved plan until Units 2 and 3 are retired pursuant to Entergy's commitment to do so as set forth in Condition 28. The approved HRBMP plan will become an enforceable interim condition of this SPDES permit. Upon the completion of the reduced monitoring effort study, the Department will require the implementation of the agreed upon recommendations contained in the final report. Within 6 months of the Effective Date of the Permit (EDP+6), the permittee must submit to the Department all of the data that has been collected to date but has yet to be provided to the Department for the "Hudson River Striped Bass and Atlantic Tomcod Surveys" in an agreed upon electronic format.

26. Unless otherwise excused by the New York State Public Service Commission or the New York State Independent System Operator, the permittee must schedule and take its annual planned refueling and maintenance outage at one IPEC unit, which in recent years have averaged approximately 30 unit days per year, between February 23 and August 23 each year during the remaining operating life of the facility.

Reporting: The permittee must give the NYSDEC's Steam Electric Unit Leader an annual report that provides: (a) a list of unit-day outages for each calendar year and (b) the running average of unit-day outages.

27. The Ristroph modified traveling screens number 21 through 26 and 31 through 36 must continue to be operated on continuous wash when the corresponding cooling water circulation pump is running. The low pressure wash nozzles installed at each of these screens must be operated at 4 to 15 PSI so that the fish and invertebrates are removed from the traveling screens, washed into the existing fish return sluiceway, and returned to the Hudson River. The operation of the screens and fish return system must be inspected daily and the screen wash pressures recorded in the wash operator's log. The traveling screens and the fish return and handling system must minimize the mortality of fish to the maximum extent practicable.

28. In reliance upon Entergy's commitment to retire Indian Point Units 2 and 3 no later than 2020 and 2021, respectively (subject to the terms and conditions of that commitment, which include electric system reliability considerations, as set forth in the January 5, 2017 Indian Point Agreement between and among Entergy and NYSDEC, the outage and reporting requirements reflected in Condition 26, the traveling screens and fish return and handling system reflected in Condition 27, and the flow conditions reflected in

Condition 6 (which employ multi-speed pumps), constitute the continuing measures for best technology until termination of operations at Units 2 and 3. Based on its consideration of these and other unique and specific factors, and the record established in the combined SPDES permit and WQC proceedings, and Entergy's commitment to retire Indian Point Units 2 and 3, as set forth above in this Condition, in its best professional judgment NYSDEC has determined that the measures as set forth in this SPDES permit represent the best technology available for the cooling water intakes for Indian Point Units 2 and 3.

The terms and conditions of Entergy's commitment to Early Retirement, as referenced herein, are as follows:

- “IP2 shall permanently cease operations no later than April 30, 2020, and IP3 shall permanently cease operations no later than April 30, 2021 (collectively the two dates, with such extensions as are provided for in this Agreement, are referred to as the “Retirement Dates”); provided, however, that if NYS determines that an emergency exists by reason of war, terrorism, a sudden increase in the demand for electric energy, or a sudden shortage of electric energy or of facilities for the generation or transmission of electric energy, the operation of IP2 may be extended upon the mutual agreement of NYS and Entergy, but in no event beyond April 30, 2024, and the operation of IP3 may be extended upon the mutual agreement of NYS and Entergy, but in no event beyond April 30, 2025, in accordance with applicable law and regulatory requirements. Nothing in this Paragraph 1 affects Entergy's rights and obligations under tariffs of the New York Independent System Operator, Inc. (“NYISO”) governing large generator retirements.”
- “No extension to address a condition or circumstance described in Subparagraph 1.a shall exceed two years in duration.

Further, there shall be no extensions to address a condition or circumstance described in Subparagraph 1.a which exceed a total of four years for each of IP2 and IP3, meaning, for the avoidance of doubt, that no such extensions shall be granted beyond April 30, 2024 for IP2 and beyond April 30, 2025 for IP3.

(a) NYS and the AG shall each have the right under this Agreement and (b) Riverkeeper shall have the right pursuant to this Agreement and Appendix I, respectively, to seek enforcement of the provisions of Subparagraphs (b)(i) and (b)(ii) of this Paragraph 1.

Notwithstanding the foregoing provisions of this Subparagraph 1.b, the restrictions in Subparagraphs (b)(i) and (b)(ii) and the rights conferred in Subparagraph (b)(iii) are expressly subject to any order issued by the

United States Secretary of Energy pursuant to Section 202(c) of the Federal Power Act.”

THE FINAL WQC

The Final WQC requires compliance by Entergy with the terms of the Final SPDES Permit, including Early Retirement. In particular, in addition to WQC general conditions, the Final WQC contains the following specific conditions:

1. **Water Quality Certification.** The Department of Environmental Conservation (the “Department”) hereby certifies that the subject license renewals for the Indian Point Nuclear Plant will not contravene effluent limitations or other limitations or standards under Sections 301, 302, 303, 306 and 307 of the Clean Water Act of 1977 (PL 95-217), provided that all of the conditions listed herein are met. This WQC supersedes the Department’s April 10, 2010 Notice of Denial.

2. **Operating in Accordance with SPDES Permit.** The WQC holder is authorized to operate its cooling water intake structure and to discharge in accordance with effluent limitations, monitoring and reporting requirements, other provisions and conditions set forth in this WQC, which expressly incorporates, among other permits, the SPDES permit issued with this WQC, including Early Retirement, and any subsequent, conforming SPDES permit for the Indian Point Nuclear Power Plant issued during the term of this WQC in compliance with Title 8 of Article 17 of the Environmental Conservation Law of New York State and the Clean Water Act, as amended, (33 U.S.C. § 1251 et seq.), pursuant to NYCRR Title 6, Chapter X, State Pollutant Discharge Elimination System (“SPDES”) Permits Part 750-1.2(a) and 750-2.

Major Supporting Documents.

The primary analyses supporting these findings are summarized in the following publicly available environmental impact statements and rely on the references therein:

- June 2003 Final Environmental Impact Statement.
- December 2010 Final “Supplement 38 Regarding Indian Point Generating Units 2 and 3,” to NRC’s Generic Environmental Impact Statement for License Renewal of Nuclear Plants, and goes by the reference NUREG 1437, Supplement 38, Volumes 1-3.

In addition, these SEQR Findings rely on the record, including all testimony and exhibits, developed in the SPDES and WQC administrative proceedings, with specific reference to the following documents:

Barnthouse, et al. 2008. Entrainment and Impingement at IP2 and IP3: A Biological Impact Assessment. January 2008.

Charles River Associates. 2011. Indian Point Energy Center Retirement Analysis. August 2011.

Enercon Services, Inc. 2010. Evaluation of Alternative Intake Technologies at Indian Point Units 2 and 3. February 2010.

Enercon Services, Inc. 2010. Engineering Feasibility and Costs of Conversion of Indian Point Units 2 and 3 to a Closed-Loop Condenser Cooling Water System. February 2010.

Enercon Services, Inc. 2012. Technical Design Report for Indian Point Units 2 and 3: Implementation of Cylindrical Wedge Wire Screens. April 2012.

Hoffman, F.O. 2015. Estimate of Health Impacts Attributable to Permanent Mandatory Summertime Outages for Personnel at Indian Point Unit 2 and Indian Point Unit 3. June 2015.

Hoover & Keith, Inc. 2014. Acoustic Assessment of the Proposed Cooling Towers for Closed Cycle Cooling. February 2014.

NERA Economic Consulting. 2013A. Benefits and Costs of Cylindrical Wedgewire Screens at Indian Point Energy Center (NERA Environmental Consulting. March 2013.

NERA Economic Consulting. 2013B. “Wholly Disproportionate” Assessments of Cylindrical Wedgewire Screens and Cooling Towers at IPEC. December 2013.

NERA Economic Consulting 2015. Economic Analysis of Permanent Mandatory Summertime Outages at IPEC. June 2015.

New York Department of Environmental Conservation Staff. 2013. Offer of Proof on Permanent Forced Outages/Seasonal Protective Outages. November 2013.

New York Independent System Operator. 2014. NYISO 2014 Reliability Needs Assessment. September 2014.

New York Independent System Operator. 2015. NYISO 2015 Comprehensive Reliability Plan. July 2015.

Nieder, William. 2015. Indian Point Energy Center Unit 2 and Unit 3 BTA Analysis Step Four of the BTA Procedure: The Wholly Disproportionate Test. Amended Wholly Disproportionate Test Report With Outages. June 2015.

Saratoga Associates. 2009. Indian Point Energy Center Closed-Cycle Cooling Conversion Feasibility Study: Visual Assessment. June 2009.

Talisman International. 2015. Evaluation of Regulatory Implications of Permanent Mandatory Summertime Outages at Indian Point 2 and Indian Point 3. June 2015.

Tetra Tech. 2013. Indian Point Closed-Cycle Cooling System Retrofit Evaluation. June 2013.

Tetra Tech. 2014. IPEC ClearSky Retrofit: Planning Schedule. March 2014.

TRC Environmental Corp. 2009. Cooling Tower Impact Analysis for the Indian Point Energy Center. September 2009.

TRC Environmental Corp. 2013A. Environmental Report, New York State Environmental Quality Review Act, in Support of the Draft SEIS for a State Pollutant Discharge Elimination System (SPDES) Permit (No. NY-0004472). March 2013.

TRC Environmental Corp., et al. 2013B. New York State Environmental Quality Review Act: Entergy Response Document To the Tetra Tech Report and the Powers Engineering Report In Support of the Draft SEIS for a State Pollutant Discharge Elimination System (SPDES) Permit (No. NY-0004472). December 2013.

TRC Environmental Corp. 2015. Entergy Supplemental Environmental Report: Permanent Mandatory Summertime Outages. August 2015.