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April 29, 2013

VIA EMAIL AND FIRST CLASS MAIL

Pilar Patterson, Chief
Bureau of Surface Water Permitting
New Jersey Department of Environmental Protection
P.O. Box 420
Trenton, NJ 08625

Re: Comments of Sierra Club, American Littoral Society, New Jersey Environmental Federation, Clean Ocean Action, and Eastern Environmental Law Center Regarding the Draft New Jersey Pollutant Discharge Elimination System Permit for the B.L. England Generating Station (NJPDES Permit No. NJ0005444)

Dear Ms. Patterson:

Thank you for the opportunity to comment on the draft renewal New Jersey Pollutant Discharge Elimination System ("NJPDES") permit for R.C. Cape May Holdings LLC's B.L. England Generating Station ("B.L. England" or "the plant"). Please accept these comments submitted on behalf of the Sierra Club, American Littoral Society, New Jersey Environmental Federation, Clean Ocean Action, and Eastern Environmental Law Center ("Commenters").

While the planned repowering of B.L. England in 2016 from coal, oil, and tire-derived fuel to natural gas will significantly reduce air pollution, this does not entitle the plant to a free pass to continue polluting Great Egg Harbor Bay. The existing once-through cooling system that B.L. England plans to reuse for its new Unit 4 kills billions of organisms every year. This significant adverse impact would be minimized by installing a closed-cycle cooling system instead, like the one that cools the existing Unit 3. Further, Great Egg Harbor Bay's waters are impaired by a lack of dissolved oxygen. The heat and decaying organic matter discharged by B.L. England's once-through cooling system contributes to the Bay's failure to meet water quality standards and provide adequate habitat for wildlife, including more than a dozen rare and threatened species. Cooling towers would dramatically reduce these harms as well.

New Jersey Department of Environmental Protection ("NJDEP" or "the Department") is legally obligated to issue B.L. England a NJPDES permit that sets forth effluent limitations that adequately protect water quality in the bay. Further, NJDEP must address the plant as it exists today, not the plant as it may be configured in 2016. However, the Draft Permit does not contain the required water quality based effluent limits on certain metals that will be discharged until the repowering is complete; nor does it impose water quality based effluent limitations on the discharge of dissolved oxygen, nutrients, and heat either before or after the repowering. Instead, NJDEP plans to allow B.L. England to continue using an outdated once-through cooling system indefinitely, even though this system kills billions of organisms a year and causes or contributes to the ongoing water quality violations in Great Egg Harbor Bay. As proposed, the Draft Permit is patently illegal.

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The planned repowering, which entails a shutdown and significant engineering work, provides a perfect opportunity to finally address the lethal effect of B.L. England's cooling water system. Consistent with determinations by the United State Environmental Protection Agency ("EPA") and a number of other permitting authorities, the installation of closed-cycle cooling is necessary to minimize the harm that this system causes, and is technically feasible and cost-effective. The final NJPDES permit for the B.L. England Generating Station should require a conversion to closed-cycle cooling. This one step would address nearly all of the most glaring illegalities of the Draft Permit.

We hereby request a non-adversarial public hearing on the Draft Permit, as well as a meeting with you and your staff to discuss the issues raised in this letter.

SUMMARY OF COMMENTS AND OBJECTIONS

BACKGROUND

A. Great Egg Harbor Bay

Great Egg Harbor Bay is a shallow, biologically productive marine estuary dotted with many marsh islands. If adequately protected, the bay provides a rich and important breeding ground for hundreds of species of fish, amphibians, birds, invertebrates, and other animals on a stretch of the Atlantic coast that is continually losing such habitat. The bay is hydraulically connected to the Atlantic Ocean and receives freshwater inflows from four main surface sources: Middle River, Great Egg Harbor River, Patcong Creek, and the Tuckahoe River, which is just upstream of B.L. England. The three rivers drain the Pinelands Management Area and flow through the Lester G. MacNamara Wildlife Management Area.[1] Under New Jersey's water quality standards, the designated uses for a saline estuary like Great Egg Harbor Bay include: shellfish harvesting; maintenance, migration and propagation of the natural and established biota; primary and secondary contact recreation; and any other reasonable uses.[2]

The many plants and animals that rely on Great Egg Harbor Bay for food, habitat, and breeding include more than a dozen species that NJDEP recognizes as endangered, threatened, or of special concern. The marshes and waters near B.L. England are supposed to provide rich foraging habitat for bald eagles, black skimmers, black-crowned night herons, colonial waterbirds, and various tern species. The Bay also is meant to provide a permanent and sustainable home for carpenter frogs, eastern box turtles, Fowler's toads, northern diamondback terrapins, and spotted turtles – all of which are species of special concern – as well as barred owls and ospreys (threatened), and northern harriers and peregrine falcons (endangered),

[1] N.J. DEP'T OF ENVT'L PROTECTION, B.L. ENGLAND GENERATING STATION CONSOLIDATED RENEWAL PERMIT ACTION, NJPDES PERMIT NO. NJ005444, FACT SHEET p. 9 of 60 (March 28, 2013) ("Fact Sheet").
[2] *See id.* at 9; *see also* N.J. ADMIN. CODE § 7:9B-1.12(d) (water quality standards for SE1 waters).

ospreys.[3] In addition, four species of threatened or endangered turtles and the endangered Atlantic and shortnose sturgeon species inhabit Great Egg Harbor Bay.[4]

Unfortunately, Great Egg Harbor Bay is an impaired habitat for these and other species. The segment of Great Egg Harbor Bay to which B.L. England discharges is impaired by low levels of dissolved oxygen and fails to meet state and federal water quality standards.[5] NJDEP has not yet developed a Total Maximum Daily Load ("TMDL") for dissolved oxygen in Great Egg Harbor Bay, as required by federal and state law.[6]

Dissolved oxygen levels generally correlate negatively and strongly with air and water temperatures – as the temperature increases, the level of dissolved oxygen decreases. In addition, excess nutrients in an ecosystem also lower oxygen levels by stimulating excessive growth of single celled organisms and plankton that strip oxygen out of the water to fuel their own growth.

Low levels of dissolved oxygen put all forms of aquatic life under stress. In the extreme, low oxygen levels lead to massive fish die-offs and create a hypoxic "dead zone."

B. Water Pollution from B.L. England Generating Station Operations

B.L. England is located on Beesley's Point, along the southern shore of Great Egg Harbor Bay, between the mouth of the Tuckahoe River and the entrance to Peck Bay. Currently, the station consists of two frequently used coal fired electricity generating units – Units 1 and 2 – and a single, intermittently used oil burning Unit 3. Together, these three fossil fuelled units have an aggregate capacity of 447 Megawatts (MW).

Units 1 and 2 came on-line in 1961 and 1962, respectively.[7] Today they are subject to air pollution controls including a flue gas desulfurization system (FGD). FGD wastewater, which contains high concentrations of the toxic metals that are typically associated with coal combustion waste, is treated and then discharged to Great Egg Harbor Bay along with the plant's other wastes.

The coal and other material burned in the Unit 1 and 2 boilers is converted into toxic ash. The fly ash is mostly dry handled. Recently, B.L. England has upgraded its bottom ash handling

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[3] *See* Letter from Herbert A. Lord, NJDEP, to Matthew Nilsen, TRC Raviv Associates, Inc. (Aug. 14, 2007) (regarding rare species in the vicinity of B.L. England Generating Station); *see also* Letter from Herbert A. Lord, NJDEP, to Amy B. Jones, Water's Edge Environmental, LLC, (Nov. 19, 2007); Letter from Herbert A. Lord, NJDEP, to Jim Alderson, ENSR (Feb. 22, 2008) (regarding rare species in the vicinity of B.L. England Generating Station) (all three letters attached as Exhibit 1).

[4] *See* AKRF, *§316(b) Report NJPDES Permit Number NJ0005444 RC Cape May Holdings, LLC B.L. England Generating Station*, at III-7 (Feb. 2008) ("316(b) Report").

[5] *See* NJDEP, 2012 Draft 303(d) List, http://www.state.nj.us/dep/wms/bwqsa/2012_draft_303d_list.pdf (last visited Apr. 24, 2013); *see also* Fact Sheet p. 9 of 60.

[6] *See* 33 U.S.C. 1313(d); *see also* NJDEP, 2012 Draft 303(d) List (listing dissolved oxygen impairment and noting that TMDL development is not a high priority for NJDEP).

[7] *See* Fact Sheet p. 2 of 60.

system to recirculate bottom ash transport water, and is no longer using a bottom ash settling pond, instead sending that effluent to the same treatment system that handles FGD wastewater and other process wastes, which then discharges via DSN 013A.[8]

The wastewater treatment process at B.L. England is a basic oil separation and chemical precipitation system of the kind that has been standard at coal fired power plants since the 1970s. The treatment process includes oil coalescence, equalization, polymer addition, two stage pH adjustment, flocculation, clarification, filtration, and neutralization.[9]

C. Impacts of the Cooling Water Intake Technology Present at B.L. England

The two existing coal fired electricity generating units, Units 1 and 2, are cooled by an antiquated once-through cooling system, built in the 1960s, that draws 280 million gallons of water per day ("MGD") out of the shallow, biologically productive waters of Great Egg Harbor Bay. But along with the hundreds of millions of gallons of water that it draws in daily, the once-through cooling system also collects and kills billions of organisms. The system crushes larger fish and other animals against the intake structure (impingement) and sucks smaller organisms through the cooling water intake system (entrainment). According to B.L. England's own studies, the cumulative mortality adds up to 2 or 3 billion organisms a year, including members of more than 130 different species.

In contrast, the oil-fired Unit 3 is connected to a hyperbolic cooling tower (also known as a "natural draft" tower) that recycles cooling water in a closed-loop. Thus, although it is the same size as Unit 2, Unit 3 requires 90% less water to operate, drawing only 15 MGD.[10]

Cooling water for all three units is withdrawn from Great Egg Harbor Bay through an intake canal that extends approximately 220 feet offshore. The intakes are equipped with trash racks to remove large material, and vertical traveling screens that were installed in the 1960s and updated in the 1980s. The screens are not equipped with fish buckets; they are backwashed with a high pressure spray.[11] The high-pressure spray likely kills any impinged organisms.

After intake, cooling water is treated with bromine and other biocides, rapidly heated by approximately 16 degrees Celsius, and then returned to the shallows of Great Egg Harbor Bay. There it forms a large thermal plume, including a core "zone of initial dilution" that is so hot that it leaves a portion of the bay inimical to most indigenous forms of life.

The heated discharge is all the more problematic because the portion of Great Egg Harbor Bay to which B.L. England discharges is already impaired by very low levels of dissolved oxygen. The thermal discharge from B.L. England causes and contributes to this hypoxic zone by elevating water temperatures and thus lowering the saturation concentration of dissolved oxygen.

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[8] *See* Fact Sheet p. 5 of 60.
[9] *See* Fact Sheet p. 5 of 60.
[10] *See* Fact Sheet p. 4-5 of 60.
[11] *See* Fact Sheet p. 3 of 60.

On top of this, the tons of dead, rotting organisms that are killed by the cooling system, sprayed off the screens, and carried along in the plume also add to the problem. Essentially, B.L. England's cooling system collects billions of living organisms every year and minces them into a decomposing heap of nutrients and organic detritus. This also adversely affects dissolved oxygen levels – it is equivalent to dumping several tons of fertilizer into Great Egg Harbor Bay.

D. The Planned Repowering & Partial Reduction in Cooling Water Flows

For several years after NJDEP issues this permit, B.L. England will continue to operate as a coal-fired power plant. But under a settlement agreement between NJDEP and B.L. England's owners that resolved the facility's violations of various air pollution laws, R.C. Cape May must cease operating Unit 1 by Sept. 30, 2013; can only operate Unit 2 for approximately half the year (4,300 hours) between permit issuance and 2016, and must switch the fuel source at Unit 2 from coal/oil to natural gas by May 1, 2016. Unit 3, the oil burning unit, is unaffected by the settlement agreement.[12]

To comply with these requirements, R.C. Cape May has stated its intent to repower the entire facility – to shut down Unit 1, and switch the fuel source for both Units 2 and 3 to natural gas. As NJDEP describes it:

> Unit 1 will be retired and Unit 2 will cease operations as a coal-fired unit. Unit 3 which now runs on #6 oil will convert to natural gas. Unit 4 will consist of a new combined cycle combustion turbine which runs on natural gas with a Heat Recovery Steam Generation (HRSG) unit, but will utilize the existing steam turbine that was formerly associated with Unit 2. The former Unit 2 steam turbine is associated with the circulating cooling water.[13]

These changes mean that, in practice, the plant that exists after 2016 will, in every meaningful sense, be a new plant with an expected lifetime of many decades. The coal and oil fired boilers will be scrapped and replaced with new electricity generating equipment. The extent of the change is implicit in NJDEP's nomenclature: once the old Unit 2 steam turbine is incorporated into a new combined cycle unit, the combined unit will have a new name: "Unit 4."[14]

APPLICABLE LEGAL REQUIREMENTS

In enacting the Clean Water Act (the "Act"), Congress established as a national goal the elimination of all discharges of pollution into navigable waters.[15] In passing its own water pollution laws to implement the Act and its National Pollutant Discharge Elimination System (NPDES) program, the New Jersey Legislature declared that this ambitious federal program would be implemented over and above New Jersey's existing laws because "pollution of the

[12] *See* Fact Sheet p. 4 of 60.
[13] Fact Sheet p. 4 of 60.
[14] Fact Sheet p. 4 of 60.
[15] *See* 33 U.S.C. § 1251(a)(1).

ground and surface waters of this State continues to endanger public health; to threaten fish and aquatic life . . . even though a significant pollution abatement effort has been made in recent years."[16] By drawing on the Act to reinforce state law, the Legislature sought to advance

> the policy of this State to restore, enhance and maintain the chemical, physical, and biological integrity of its waters, to protect public health, to safeguard fish and aquatic life and scenic and ecological values, and to enhance the domestic, municipal, recreational, industrial and other uses of water.[17]

In furtherance of the goal of eliminating all pollution discharges into waters of the United States, the Clean Water Act provides that no pollutant may be discharged from any point source without a NPDES permit. Any failure to comply with a permit "constitutes a violation of the Clean Water Act."[18] The NPDES permit program is thus an integral part of the Act's plan to eliminate pollution discharges, and to restore and maintain the health and integrity of the nation's waters.[19] In New Jersey, the NPDES program is administered by NJDEP, which issues NJPDES permits.

New Jersey's water pollution laws and regulations cleave closely to the federal model. It is unlawful for any person to discharge pollution to waters of the state without a valid NJPDES permit.[20] And while the NJPDES regulatory scheme incorporates all of the stringent requirements of the federal NPDES program, it goes further by turning the federal standards into a floor, not a ceiling, for NJPDES permits.[21]

A. Technology Based Effluent Limits

The Clean Water Act requires that NPDES permits include effluent limits based on the performance achievable through the use of statutorily-prescribed levels of technology that "will result in reasonable further progress toward the national goal of eliminating the discharge of all pollutants."[22] Technology-based effluent limitations ("TBELs") constitute a minimum level of controls that must be included in a NPDES permit "regardless of a discharge's effect on water quality."[23]

For sources constructed prior to the passage of the Federal Water Pollution Control Act of 1972, discharges of pollutants must be eliminated or controlled through application of Best

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[16] N.J. STAT. ANN. § 58:10A-2.
[17] N.J. STAT. ANN. § 58:10A-2.
[18] 40 C.F.R. § 122.41(a).
[19] *See* 33 U.S.C. § 1342 (establishing permit program requirements).
[20] *See* N.J. STAT. ANN. § 7:14A-2.1(d).
[21] *See* N.J. STAT. ANN. § 7:14A-2.3(a),(d) ("Wherever the requirements of this chapter are more stringent than existing requirements of a Federal regulation, the requirements of this chapter shall apply.").
[22] 33 U.S.C. § 1311(b)(2)(A)(i); *see also* 33 U.S.C. § 1311(b)(1)(A); N.J. STAT. ANN. § 58:10A-6(f) ("A permit issued by the department . . . shall require the permittee . . . to achieve effluent limitations based upon guidelines or standards established pursuant to the Federal Act.").
[23] *Am. Petroleum Inst. v. EPA*, 661 F.2d 340, 344 (5th Cir. 1981).

Available Technology ("BAT").[24] In accordance with the Act's goal to eliminate all discharges of pollutants, BAT limits "shall require the elimination of discharges of all pollutants if the [EPA] Administrator finds, on the basis of information available to him . . . that such elimination is technologically and economically achievable . . . ."[25]

The requirement to meet the BAT standard is ongoing; it compels polluting industries to meet ever more stringent limitations on the path towards complete elimination of water pollution.[26] With each renewal of a NPDES permit, the permitting agency must reconsider whether further pollution reductions are attainable. The goal of the law is continuous, rapid improvement:

> The BAT standard reflects the intention of Congress to use the latest scientific research and technology in setting effluent limits, pushing industries toward the goal of zero discharge as quickly as possible. In setting BAT, EPA uses not the average plant, but the optimally operating plant, the pilot plant which acts as a beacon to show what is possible.[27]

EPA often codifies effluent limitation guidelines that reflect the BAT standards for particular discharges, pollutants, and activities found in a category of point sources. These guidelines become the floor—the minimum level of control that must be imposed in a NPDES permit. But where EPA has not set effluent limitation guidelines for a pollutant, or source, or particular activity, or where such guidelines are inadequate, a state-permitting agency must promulgate permit effluent limitations, in accordance with BAT, on a case-by-case basis.[28] In doing so, the state agency is bound by the same factors that EPA is required to apply in determining and applying BAT limits in a permit.[29] These factors are:

> (i) age of equipment and facilities involved,
> (ii) the process employed,
> (iii) the engineering aspects of the application of various types of control techniques,
> (iv) process changes,
> (v) the cost of achieving such effluent reduction,
> (vi) non-water quality environmental impact (including energy requirements).[30]

In applying these factors to seek out the best available technology that is economically achievable, the agency must consider the best state of the art practices in the industry and

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[24] *See* 33 U.S.C. § 1311(b)(2)(A).
[25] *Id.*
[26] *See Natural Res. Def. Council, Inc. v. U.S. Envt'l Protection Agency*, 822 F.2d 104, 123 (D.C. Cir. 1987).
[27] *Kennecott v. U.S. Envt'l Protection Agency*, 780 F.2d 445, 448 (4th Cir. 1985), *citing A Legislative History of the Federal Water Pollution Control Act of 1972*, 798 (Committee Print compiled for the Senate Committee on Public Works by the Library of Congress), Ser. No. 93-1 (1973).
[28] *See* 40 C.F.R. § 125.3(c)(2) & (3); *see also Texas Oil & Gas Ass'n v. U.S. Envt'l Protection Agency*, 161 F.3d 923, 928-29 (5th Cir. 1998).
[29] *See* 33 U.S.C. §§ 1311(b) & 1342(b); *see also Natural Res. Def. Council v. EPA*, 859 F.2d 156, 183 (D.C. Cir. 1988).
[30] 33 U.S.C. § 1314(b)(2)(B).

beyond. "Congress intended these [BAT] limitations to be based on the performance of the single best-performing plant in an industrial field."[31]

A technology is considered "available" where there is, has been, or could feasibly be use within an industry. Courts have explained that even where "no plant in a given industry has adopted a pollution control device which could be installed does not mean that the device is not 'available,'" thus ensuring that industry cannot game the system by all agreeing to not adopt the latest, best pollution control technology.[32] A discharger of pollutants may also be required to transfer a particular technology that has been used in another context where the transfer is practicable.

Likewise, a technology is "economically achievable" under the BAT standard if it is affordable for the best-run facility within an industry.[33] "BAT should represent a commitment of the maximum resources economically possible to the ultimate goal of eliminating all polluting discharges."[34]

B. Water Quality Based Effluent Limits

One of the most important functions that a state performs under the Clean Water Act is to promulgate water quality standards.[35] Water quality standards consist of both "designated 'uses' for a body of water (e.g., public water supply, recreation, agriculture) and a set of 'criteria' specifying the maximum concentration of pollutants that may be present in the water without impairing its suitability for designated uses."[36] As noted above, the designated uses of Great Egg Harbor Bay include: shellfish harvesting; maintenance, migration and propagation of the natural and established biota; primary and secondary contact recreation; and any other reasonable uses.[37]

After application of the most stringent treatment technologies available under the BAT standard, NJDEP must also include any limits in NJPDES permits necessary to ensure that water quality standards are maintained and not violated.[38] These are referred to as "water quality based effluent limits." Pursuant to N.J. ADMIN. CODE § 7:14A-13.5(a), water quality based effluent

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[31] *Chem. Mfrs. Ass'n v. U.S. Envt'l Protection Agency*, 870 F.2d 177, 226 (5th Cir. 1989).
[32] *Hooker Chems. & Plastics Corp. v. Train*, 537 F.2d 620, 636 (2d Cir. 1976).
[33] *See, e.g.*, *Reynolds Metals Co. v. U.S. Envt'l Protection Agency*, 760 F.2d 549, 562 (4th Cir. 1985); *Tanner's Council of Am. v. Train*, 540 F.2d 1188, 1191-92 (4th Cir. 1976).
[34] *Natural Res. Def. Council v. U.S. Envt'l Protection Agency*, 863 F.2d 1420, 1426 (9th Cir. 1988) (quotations omitted); *see also U.S. Envt'l Protection Agency v. Nat'l Crushed Stone Ass'n*, 449 U.S. 64, 74-75 (1980) (if a discharger of pollutants can afford the best available technology, then it must meet, and should not be allowed a variance from, stringent BAT limits).
[35] *See* 33 U.S.C. §§ 1313(a)-(c) (requiring states to adopt water quality standards and requiring EPA to set water quality standards when states fail to do so).
[36] *American Paper Inst. v. EPA*, 996 F.2d 346, 349 (D.C. Cir. 1993); *see* 33 U.S.C. § 1313(c)(2)(A).
[37] *See* Fact Sheet p. 9 of 60; *see also* N. J. ADMIN. CODE § 7:9B-1.12(d) (water quality standards for SE1 waters).
[38] 40 C.F.R. § 122.44(d); *see also Am. Paper Inst. v. U.S. Envt'l Protection Agency*, 996 F.2d 346, 350 (D.C. Cir. 1993); *Waterkeeper Alliance, Inc. v. U.S. Envt'l Protection Agency*, 399 F.3d 486, 502 (2d. Cir. 2005). New Jersey has incorporated this federal requirement into state law. *See* N.J. STAT. ANN. § 58:10A-6(f) ("A permit issued by the department . . . shall require the permittee . . . such further discharge restrictions and safeguards against unauthorized discharge as may be necessary to meet water quality standards. . . .").

limitations are required when a pollutant or pollutants "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above the SWQS [State Water Quality Standards]."[39] This obligation includes compliance with both narrative and numeric water quality standards.[40]

C. Antidegradation

To maintain the integrity of the nation's waters, the Act and implementing regulations require states to implement an "antidegradation policy."[41] The policy must ensure that, even after requiring application of the best treatment technologies and any additional measures necessary to ensure compliance with applicable water quality standards, water quality is not further degraded to the level of minimal compliance by virtue of incremental changes over time. The antidegradation requirement is an ongoing requirement, which must be examined, considered, and complied with each time NJDEP renews a permit or issues a new permit.[42]

New Jersey's antidegradation policy states, "existing uses [of a waterbody] shall be maintained and protected. Designated uses shall be maintained or, as soon as technically and economically feasible, be attained wherever these uses are not precluded by natural conditions."[43] Further, at a minimum, even the state's most polluted waters "shall be protected from any measurable changes (including calculable or predicted changes) to the existing water quality."[44] And under no circumstances can "water quality-based effluent limitations established to implement the water quality standards (which includes the antidegradation policies)" ever provide for effluent limits less stringent than "those required pursuant to sections 301, 306, and 307 of the Federal Clean Water Act."[45]

D. Use of the Best Technology Available for Cooling Water Systems

Section 316(b) of the Act requires that the "location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact."[46] As with all technology-based standards, dischargers must comply with Section 316(b)'s technology-based effluent limitations immediately, meaning that B.L. England

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[39] *See also* 40 C.F.R. § 122.44(d)(1)(iii) ("[T]he permit must contain effluent limits for any pollutant for which the state determines there is a reasonable potential for the pollutant to cause or contribute to a violation.").
[40] 40 C.F.R. § 122.44(d)(1).
[41] *See* 40 C.F.R. § 131.12.
[42] All NJPDES permits must include water quality based effluent limitations - "restrictions and safeguards against unauthorized discharge as may be necessary to meet water quality standards." N.J. STAT. ANN. § 58:10A-6(f). These effluent limitations "shall not interfere with the attainment of the Surface Water Quality Standards, including the antidegradation policies." N.J. ADMIN. CODE § 7:9B-1.5 (e)(3). More broadly, both federal and state law require that all NJPDES permits assure compliance with all applicable state water quality standards. New Jersey's regulations make clear that the state's antidegradation policies are included in those water quality standards. *See, e.g.*, N.J. ADMIN. CODE § 7:9B-1.5 (e)(2) (noting that New Jersey's State Water Quality Standards include the antidegradation policies).
[43] N.J. ADMIN. CODE § 7:9B-1.5(d)(1).
[44] N.J. ADMIN. CODE § 7:9B-1.5 (d)(2)(iii).
[45] N.J. ADMIN. CODE § 7:9B-1.5(e)(2).
[46] 33 U.S.C. § 1326(b).

should have been brought into compliance long ago. It must now be brought into compliance with Section 316(b) "as soon as possible," and, in the interim, must be subject to "interim requirements and dates for their achievement."[47]

In 2004, EPA published regulations designed to implement Section 316(b) at existing power plants. Following legal challenges, however, the Second Circuit remanded numerous aspects of the rule to the EPA.[48] The U.S. Supreme Court reviewed the Second Circuit's decision on the limited issue of whether Section 316(b) authorizes EPA to balance costs and benefits.[49] Other aspects of the *Riverkeeper II* decision were not addressed by the Supreme Court's review. In response to the Second Circuit's remand of extensive portions of the rule, EPA suspended the entire regulation for existing facilities so that it could revise the rule to be consistent with the Act.[50] To date, EPA has not yet finalized new rules for existing facilities, although it has published a draft regulation. But EPA has clearly prohibited state agencies from delaying permit renewals and decisions under 316(b) of the Act while they wait for EPA to complete its rulemaking. Rather, in the absence of a final federal rule, states must exercise their best professional judgment to issue permits that comply with the Clean Water Act.[51]

In addition to the express technological requirements contained in Section 316(b), "permits issued under [] section 316(b) . . . must go beyond th[e BTA] standard when technology alone is insufficient to meet state water quality standards[].Thus, in certain cases, even if the technology standard does not require closed-cycle cooling, a state's [water quality standards] may."[52] As discussed below, water quality standards that protect ecosystems from thermal pollution can also require a closed-cycle cooling retrofit.

E. Control of Thermal Pollution

The U.S. EPA acknowledges that "thermal pollution has long been recognized to cause harm to the structure and function of aquatic ecosystems."[53] Accordingly, both the Act and New Jersey law define heat as a pollutant subject to BAT limits.[54]

In addition, the Department is required to identify water bodies for which technology-based thermal controls are insufficient "to assure protection and propagation of a balanced

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[47] 40 C.F.R. § 122.47(a); *see also* 33 U.S.C. § 1311(b).
[48] *See Riverkeeper Inc. v. U.S. Envt'l Protection Agency*, 475 F.3d 83 (2d Cir. 2007) (hereinafter "*Riverkeeper II"*).
[49] *Entergy Corp. v. Riverkeeper, Inc.*, 556 U.S. 208 (2009).
[50] *See* U.S. EPA, National Pollutant Discharge Elimination System—Suspension of Regulations Establishing Requirements for Cooling Water Intake Structures at Phase II Existing Facilities, 72 Fed. Reg. 37,107 (codified at 40 C.F.R. §§ 122, 125) (July 9, 2007).
[51] *See id*.
[52] *In re Dominion Energy Brayton Point, L.L.C.*, Case No. NPDES 03-12, 12 E.A.D. 490, 496 (E.A.B. Feb. 1, 2006).
[53] U.S. EPA, National Pollutant Discharge Elimination System – Cooling Water Intake Structures at Existing Facilities and Phase I Facilities, 76 Fed. Reg. 22,246 (codified at 40 C.F.R. §§ 122, 125) (April 20, 2011) ("Proposed Rule").
[54] *See* 33 U.S.C. §§ 1311(b)(2)(F) (requiring that BAT effluent limitations be established for all non-toxic pollutants by 1989), 1362(6) (defining "pollutant" to include heat); *see also* N.J. STAT. ANN. § 58:10A-3(n) (defining "pollutant" to include "thermal waste").

indigenous population of shellfish, fish, and wildlife" and impose more stringent "total maximum daily thermal loads" and water quality-based effluent limitations for heat in order to ensure that the receiving water meets water quality criteria.[55]

The Act authorizes NJDEP to deviate from otherwise applicable requirements and set less stringent thermal discharge limits in NJPDES permits, but only if the owner or operator of a source is able to demonstrate that the proposed technology-based thermal effluent limitation is more stringent than necessary to protect a "balanced, indigenous population of shellfish, fish, and wildlife."[56]

A "balanced, indigenous population" is defined by EPA to mean, essentially, a healthy and sustainable native ecosystem: "a biotic community typically characterized by diversity, the capacity to sustain itself through cyclic seasonal changes, presence of necessary food chain species and by a lack of domination by pollution tolerant species."[57] To determine what a balanced indigenous population looks like, the permitting authority must consider what species would inhabit the receiving water body if it were not degraded by thermal discharges.[58]

DISCUSSION

The following discussion sets forth the Commenter's objections to and concerns regarding the Draft Permit, in detail.

A. Closed-Cycle Cooling Is Required at B.L. England to Comply With Section 316(b) of the Clean Water Act.

Both the technology-based analysis of Section 316(b) of the Clean Water Act and the water quality analysis required under Sections 301[59] and 316(a) of the Act lead independently to the conclusion that a closed-cycle cooling retrofit must be part of B.L. England's upcoming repowering. Commenters address Section 316(b) first.

1. NJDEP has not performed the analysis required under Section 316(b) of the Clean Water Act.

Section 316(b) of the Clean Water Act requires that the "location, design, construction, and capacity of cooling water intake structures reflect the best technology available for

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[55] 33 U.S.C. § 1313(d) (requiring states to identify bodies of water for which technology-based thermal controls are insufficiently stringent and to impose "total maximum daily thermal loads" to protect these waters); *see also* 33 U.S.C. § 1312 (requiring imposition of water quality-based effluent limitations on the discharge of pollutants when necessary to meet water quality standards);

[56] 33 U.S.C. § 1326(a).

[57] 33 U.S.C. § 1326(a); *see also* 40 C.F.R. §§ 125.58(f), 125.71(c) (both defining a balanced indigenous population in similar terms).

[58] *In re Dominion Energy Brayton Point, L.L.C.*, 12 E.A.D. at 555-58.

[59] Section 301(b)(1)(C), 33 U.S.C. § 1311(b)(1)(C), requires the inclusion of water quality based effluent limitations in NPDES permits.

minimizing adverse environmental impact."[60] The adverse environmental impacts of B.L. England's once-through cooling system are significant and include killing millions of fish and billions of other organisms every year. The Act requires that these impacts be minimized through this NJPDES permit renewal, not at some indefinite future point. Yet NJDEP avoids making any real decisions or requiring any serious improvements to the cooling water system by asking B.L. England to submit a feasibility study that explores minimal improvements to the existing and inadequate once-through cooling system.

In the Draft Permit the NJDEP concludes that, in its best professional judgment, B.L. England will minimize the adverse environmental impact of its cooling water system by submitting a feasibility study that analyzes the feasibility of reducing impingement mortality through improved screens with fish buckets and an improved fish return system.[61] This is very far from the kind of determination about the best technology available (referred to as a "BTA determination") required by federal law. This "BTA Determination" does not discuss or address entrainment at all, nor does it require B.L. England to take any action that might actually reduce the number of fish killed. The Department should have considered a range of options that address both impingement and entrainment, and determined which technology is the best available for minimizing the adverse environmental impacts of B.L. England's cooling water system. Then, NJDEP should require that this technology be installed as soon as reasonably possible – likely during the upcoming repowering and concomitant shutdown of most of the cooling system.

As the Department is already aware, the best technology to address B.L. England's fish kills and thermal pollution is a closed-cycle cooling system like the one that is already in use at Unit 3. Using the upcoming repowering as a chance to install a closed-cycle cooling system for the balance of the plant will reduce B.L. England's water withdrawals and the environmental impacts they entail by 90%, at an affordable cost, which is not wholly disproportionate to the benefits, and without disrupting B.L. England's electricity generating operations. Hence, it is also an available technology.

2. NJDEP's BTA determination process was compromised by the Department's failure since 2005 to demand information about cooling towers.

The deficiencies in the process leading up to NJDEP's unlawful and incomplete BTA BAT determination began soon after the last renewal of the B.L. England permit in 2005. In 2005, NJDEP determined that if B.L. England continued to operate, it must submit a Proposal for Information Collection (PIC) in 2005 and a Comprehensive Demonstration Study (also called a "316(b) Report") in 2008, as required by the federal "Phase 2" rules governing existing cooling water intake structures that were in effect in 2005.[62] The PIC was due on September 9, 2005, the 316(b) Report by January 7, 2008.

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[60] 33 U.S.C. § 1326(b).
[61] *See* Fact Sheet p. 21 of 60.
[62] *See* N.J. DEP'T OF ENVT'L PROTECTION, B.L. ENGLAND GENERATING STATEMENT, NJPDES PERMIT NO. NJ005444, Fact Sheet p. 24 of 33 (2005) ("2005 Fact Sheet"), attached as Exhibit 2; *see also* N.J. DEP'T OF ENVT'L

Later in 2005, B.L. England submitted the PIC as required by their permit. But AKRF, the consulting firm hired to produce the PIC, excluded all consideration of cooling towers from the analysis.[63] Instead, the consultants examined a set of ten technology options that all involved various modifications to the existing screens, the fish return system, relocation of the intake, or addition of a net barrier.[64] None of these technologies approach the impingement and entrainment reductions achievable through the use of closed-cycle cooling. Despite the glaring omission of cooling towers from the proposed scope of analysis, the NJDEP accepted this obviously deficient PIC and awaited submission of a 316(b) Report in 2008.

Between 2005 and the proposed submission of a 316(b) Report in 2008, EPA withdrew its Phase 2 regulations in light of a ruling from the Second Circuit Court of Appeals' decision that struck down many parts of these rules as unlawful.[65] Given the change in regulatory background, NJDEP sent a letter to R.C. Cape May Holdings in December 2007. NJDEP explained that

> until a new rule is issued, EPA has directed states and permitting authorities to issue permits using Best Professional Judgment (BPJ). *In order to make this determination, any renewal application must contain a complete analysis of the suite of intake protection technologies that are available to address impingement and entrainment.*[66]

In the Fact Sheet accompanying the Draft Permit, NJDEP has again acknowledged that, after the *Riverkeeper II* decision, "the Department determined that any renewal application must contain a complete analysis of the suite of intake protection technologies that are available to address impingement and entrainment. The Department specified a due date of June 30, 2008 for this 316(b) study information."[67] Given that B.L. England already operates one natural draft cooling tower, it is indisputable that closed-cycle cooling is one of the intake protection technologies available to address impingement and entrainment at B.L. England, and that cooling towers must be considered as part of a complete analysis. And NJDEP was aware that, in the 2005 PIC, the plant owners had excluded any consideration of cooling towers. But NJDEP made no effort to correct this gap in the record before it. Instead, in its 2007 letter, NJDEP actually *waived* a requirement that the forthcoming CDS should include "technology and compliance assessment information" and "information to support site-specific determination of best technology available for minimizing adverse environmental impact."[68]

PROTECTION, B.L. ENGLAND GENERATING STATEMENT, NJPDES PERMIT NO. NJ005444, p. 11 of 19 (2005) ("2005 Permit"), attached as Exhibit 3.

[63] *See* AKRF, *316(b) Proposal for Information Collection Prepared in Compliance with 40 CFR 125.95(b)(1) for B.L. England Generating Station, Beesley's Point, NJ*, at 8 (June 13, 2005); Attachment 2 to 316(b) Report.

[64] *See Id*. at 8.

[65] *See Riverkeeper II*, 475 F.3d 83.

[66] Letter from Pilar Patterson, Chief, Bureau of Point Source Permitting Region 2, NJDEP, to Andrew Shawl, Environmental Engineer, R.C. Cape May Holdings LLC, p. 2 (Dec. 20, 2007) ("Patterson Letter"); Attachment 1 to 316(b) Report (emphasis added).

[67] Fact Sheet p. 15 of 60.

[68] Patterson Letter at 2.

In February 2008, B.L. England's consultants submitted the 316(b) Report on its behalf.[69] Predictably, the 316(b) Report did not include any analysis of closed-cycle cooling, nor did R.C. Cape May's subsequent permit renewal application, submitted to NJDEP in 2009. Although the application included a request for renewal of B.L. England's Section 316(a) variance, it made no reference to Section 316(b) at all.[70]

After receiving the 316(b) Report in 2008 and the renewal permit application in 2009, NJDEP took another four years to issue this Draft Permit. This extended delay provided NJDEP ample time to correct the deficient record in its possession. But instead, for several years NJDEP sat on the information submitted by R.C. Cape May Holdings – a submission that NJDEP had known since 2005 would lack any consideration of closed-cycle cooling – and then issued this inadequate draft BTA determination without any information about or consideration of closed-cycle cooling.

3. B.L. England's once-through cooling system causes significant adverse environmental impact that must be minimized.

NJDEP's failure to even consider closed-cycle cooling is all the more galling considering the significant harm caused by once-through cooling at B.L. England. B.L. England's cooling water intakes have significant adverse impacts that include killing billions of organisms per year and returning these billions of living organisms into the water as several tons of decomposing organic waste. B.L. England then discharges hundreds of millions of gallons of hot water daily in an extremely high temperature plume that exacerbates dissolved oxygen impairment in Great Egg Harbor Bay.

To quantify impingement and entrainment, B.L. England's owners conducted impingement and entrainment mortality studies in 1998-1999 and again in 2005-06, using similar methodologies each time.[71] These studies indicate that, for decades, B.L. England has killed between 2 and 3 billion organisms per year.

On a volumetric basis, the results across time are consistent. In 1988-89, sampling found 80 species impinged and 134 species entrained.[72] In 2005-06, at least 60 species were impinged and 132 species entrained.[73] The mean annual density of organisms impinged and entrained was nearly constant across time: 19,264 organisms per $100m^3$ of water withdrawn in 1988-89; 19,157 organisms per $100m^3$ in 2005-06. The total number of organisms killed dropped by about a third, however, from around 3 billion organisms in 1988-89 (3.05 billion), down to around 2 billion organisms (1.92 billion) in 2005-06.[74] But since the density of entrained organisms did

[69] Fact Sheet p. 15 of 60.
[70] *See* AKRF, *NJPDES-DSW Permit Renewal Application NJPDES Permit No. NJ0005444* (Aug. 2009) ("2009 Renewal Application").
[71] *See* Fact Sheet p. 15 of 60.
[72] *See* Fact Sheet p. 17-18 of 60.
[73] *See* Fact Sheet p. 17-18 of 60.
[74] *See* Fact Sheet p. 17-18 of 60.

not change more than a fraction of a percent, the difference in the number of organisms killed can only be attributable to a reduced intake flow used in extrapolating the 2005-06 sampling out to annual numbers as compared to the flow used in the 1988-89 estimates. The 2005-06 annual mortality estimates are based on B.L. England's actual cooling water intake from 2002-2006.[75] The baseline flow used to estimate annual mortality in 1988-89 is not explicitly discussed in B.L. England's submission.

For the next few years, the plant's design intake flow will remain 294.3 MGD. After repowering, B.L. England will continue to withdraw 167.6 MGD of cooling water unless NJDEP requires a move to closed-cycle cooling.[76] Since there are no enforceable flow or generating capacity limitations written into the Draft Permit, NJDEP's best technology available determination must be based on avoiding the harm that would occur at these design flows.[77] Even at a flow of 167.6 MGD, B.L. England will withdraw 600,000 cubic meters of water from Great Egg Harbor Bay daily, or more than 231 million cubic meters of water every year. At a density of 19,000 organisms per 100 cubic meters, B.L. England will assuredly continue to kill billions of organisms a year.

4. **The BTA determination is unacceptably flawed because NJDEP never even considered the possibility of closed-cycle cooling.**

NJDEP's failure to even consider the use of cooling towers at B.L. England is completely inexcusable. For a number of reasons, it is arbitrary, capricious, and unreasonable, and violates the express requirement of Section 316(b) that NJDEP minimize the adverse environmental impact of B.L. England's cooling water intake structure.[78]

First, the absence of any cooling tower analysis is inconsistent with NJDEP's recent BTA determination process at other power plants. For example, in 2010, NJDEP published a draft NJPDES permit for the Oyster Creek Nuclear Generating Station in which NJDEP determined

[75] 316(b) Report at III-12 (Feb. 2008).
[76] *See* Fact Sheet p. 5 of 60.
[77] The Administrative Consent Order, which does require a shutdown of Unit 1 by September 2013 and only half-time operation of Unit 2, is not an enforceable part of the NJPDES permit and in any case it does not directly regulate the withdrawal of cooling water. Moreover, this is not the first time that NJDEP has thought it might have a solid agreement with B.L. England to shut down. A similar agreement was reached ten years ago, under which B.L. England was to shut down by 2007. Plainly, that date has long since passed, yet B.L. England is still operating. This NJPDES permit must set adequate effluent limits to control the discharge that the NJPDES permit itself permits. NJDEP cannot rely on a side agreement outside the bounds of the permit to do the work that a NJPDES permit must by law do itself, particularly where that agreement is not enforceable by citizens. This violates the rights to citizen participation and enforcement provisions of the Clean Water Act.
[78] *See In re Failure by the Dep't of Banking and Ins. to Transmit a Proposed Dental Fee Schedule to the OAL for Publication in the New Jersey Register*, 336 N.J. Super. 253, 263 (App. Div. 2001) (setting forth standard for judicial review of administrative action); *see also Campbell v. Dep't of Civil Serv.*, 39 N.J. 556, 562 (1963) (Appellate court can overturn agency decisions that violate the legislative policies expressed or implied in a statute); *Pub. Serv. Elec. & Gas Co. v. N.J. Dep't of Envt'l Protection*, 101 N.J. 95, 103 (N.J. 1985) (One question "sometimes subsumed in the search for arbitrary or unreasonable agency action" is "whether the agency action violates the enabling act's express or implied legislative policies.").

on a BPJ-basis that closed-cycle cooling was BTA under § 316(b) for Oyster Creek.[79] Closed-cycle cooling systems have been evaluated at other power plants in New Jersey as well.[80] Yet at B.L. England, NJDEP changed its practice without explanation and never looked at whether cooling towers are technically or economically feasible. Again, considering that there is already one unit at B.L. England that is cooled by a closed-cycle system, this complete omission is utterly baffling.

Second, the failure to consider closed-cycle cooling also contradicts the approach laid out in the EPA guidance documents that NJDEP claims to rely upon in making BTA determinations. In the last permit renewal for B.L. England, in 2005, NJDEP explained that in the absence of federal rules, the draft 1977 EPA guidance "has served as applicable guidance for Section 316(B) determinations."[81]

In that 1977 guidance, EPA noted that closed-cycle cooling achieves a "dramatic reduction in rates of water used."[82] While EPA also stated that closed-cycle cooling is not the inevitable outcome of every BPJ-based BTA determination, rather "the appropriate technology is best determined after a careful evaluation of the specific aspects at each site," EPA then suggested that cooling towers must be considered in situations like that at B.L. England, where entrainment kills between one and three billion organisms every year:

> Where environmental impact from entrainment must be minimized *reliance must be placed primarily on flow reduction* and intake relocation as remedial measures: Reducing cooling water flow is generally an effective means for minimizing potential entrainment impact. In fact, *this may be the only feasible means to reduce impact of entrainment* . . . Reduction of flow is accomplished primarily by an increase in condenser temperature rise or through recirculating cooling systems."[83]

NJDEP has previously characterized the B.L. England intake as being "located in a shallow estuarine environment downstream of the Tuckahoe Wildlife Management Area"[84] and explained that "intakes in coastal waters, estuaries, and tidal rivers tend to have greater ecological impacts than those in freshwater lakes and offshore ocean intakes, since these areas are usually more

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[79] N.J. DEP'T OF ENVT'L PROTECTION, OYSTER CREEK GENERATING STATION DRAFT NJPDES PERMIT NO. NJ0005550 (Jan. 7, 2010) ("Oyster Creek Draft Permit"), attached as Exhibit 4. This requirement was modified in the December 21, 2011 final NPDES permit following a December 9, 2010 administrative consent order requiring shutdown of the plant by December 31, 2019.

[80] *See, e.g.*, N.J. DEP'T OF ENVT'L PROTECTION, HUDSON GENERATING STATION DRAFT NJDPES PERMIT NO. NJ0000647 (Jan. 12, 2011) (considering natural draft cooling towers, mechanical draft wet cooling towers, and wet/dry cooling towers as potential BTA options) ("Hudson Draft Permit"), attached as Exhibit 5; N.J. DEP'T OF ENVT'L PROTECTION, MERCER GENERATING STATION DRAFT NJPDES PERMIT NO. NJ0004995 (July 21, 2006) (considering closed-cycle cooling as a potential BTA option) ("Mercer Draft Permit"), attached as Exhibit 6.

[81] Fact Sheet p. 21 of 33.

[82] Environmental Protection Agency, DRAFT GUIDANCE FOR EVALUATING THE ADVERSE IMPACT OF COOLING WATER INTAKE STRUCTURES ON THE AQUATIC ENVIRONMENT, 12 (1977).

[83] *Id.* at 13 (emphasis added).

[84] 2005 Fact Sheet p. 22 of 33.

biologically productive and have more aquatic organisms in early life stages."[85] That is precisely the kind of scenario in which entrainment must be minimized and cooling towers must be considered. Further, the need to evaluate the use of cooling towers in connection with this repowering is all the more obvious at a site like B.L. England, where "a careful evaluation of the specific aspects" of the site reveals that one natural draft cooling tower has already been in use for decades, thus proving that cooling tower technology is available and feasible at this site.

Finally, NJDEP's failure to consider the use of a cooling tower for the new Unit 4 also contradicts EPA's latest guidance on BTA Determinations. In 2011, EPA proposed new regulations to replace the regulations that were largely invalidated in 2007 by the Second Circuit. Although these are only proposed regulations and some aspects of them are problematic, NJDEP refers to these draft regulations in the process of reaching its BPJ-based BTA Determination at B.L. England.[86] Yet NJDEP missed the fact that, under these draft regulations, it would be required to evaluate the use of cooling towers at every existing facility in the state, including at B.L. England. EPA's proposed text for 40 C.F.R. § 122.21(r)(10)(i)(A) reads:

> The owner or operator of the facility must submit an engineering study of the technical feasibility and incremental costs of candidate entrainment mortality control technologies. . . . At a minimum, the owner or operator of the facility must conduct a study to evaluate the technical feasibility of closed-cycle recirculating systems (cooling towers). . . [87]

EPA believes that every existing facility should consider the use of cooling towers because "the effectiveness of closed-cycle cooling technology is widely demonstrated and the number of existing facilities initiating retrofits to closed-cycle cooling is increasing."[88] In many cases, these retrofits have occurred "after significant periods of operation utilizing the once-through system."[89]

Thus, the absence of any analysis as to whether cooling towers are the best technology available at B.L. England is inconsistent with NJDEP's past permitting practice, with the draft 1977 EPA Guidance that NJDEP claims to rely upon, with EPA's latest draft regulations, and it flies in the face of common sense given that a cooling tower has been successfully used at this site for decades with no adverse consequences. A BTA Determination that does not include consideration of cooling towers for B.L. England is irrational and legally deficient.

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[85] 2005 Fact Sheet p. 22 of 33.
[86] *See* Fact Sheet p. 20-21 of 60.
[87] Proposed Rule, 76 Fed. Reg. at 22,278.
[88] ENVT'L PROTECTION AGENCY, TECHNICAL DEVELOPMENT DOCUMENT FOR THE PROPOSED SECTION 316(B) PHASE II EXISTING FACILITIES RULE, EPA-821-R-11-001, at 7-3 (March 28, 2011) ("TDD"), attached as Exhibit 7.
[89] TDD at 6-11.

5. A proper BPJ analysis of closed-cycle cooling towers would have found it to be the best technology available.

Had NJDEP conducted a proper BPJ-based BTA analysis that included examining the use of cooling towers, the Department would have been forced to conclude that closed-cycle cooling is the best technology available to minimize the adverse environmental impact of B.L. England's water withdrawals. In 2006, while drafting a NJPDES permit for the Mercer power plant, NJDEP concluded that "closed cycle cooling is considered by the Department to be the best technology" for protecting fish at intakes, and the question remaining for the Department henceforth would be whether the technology is "available" at a particular site.[90] Cooling towers are unquestionably available at B.L. England – one has already operated there for decades.

No other technology even approaches the environmental effectiveness of closed-cycle cooling. EPA has looked at every known technology from strobe lights and bubble curtains to wedgewire screens, but found many of them to be of questionable effectiveness and feasibility.[91] Of those technologies that EPA selected for further study, it found that the next most effective technologies to closed-cycle cooling only reduce mortality from impingement, but can do little or nothing to reduce entrainment of early life stage organisms such as free floating larvae and eggs.[92] Without reducing intake volume, EPA estimates that, on average, the next best alternatives to closed-cycle cooling can only reduce fish kills by about 31%.[93]

NJDEP argues that a 43% reduction in cooling water intake caused by the shutdown of Unit 1 is a significant gain. But this is not a replacement for a proper BTA Determination. And in light of the fact that closed-cycle cooling would reduce intake by 90% or more, a 43% reduction does not minimize impingement and entrainment; it is literally a half-measure. Even with a 43% reduction in cooling water intake, B.L. England will still kill billions of organisms every year. NJDEP has not explained why a 43% reduction is acceptable and consistent with use of the best technology available when a 90% reduction is readily achievable.

NJDEP has already determined that closed-cycle cooling was the best technology available at the Oyster Creek power station.[94] Although Oyster Creek is a larger power station

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[90] Mercer Draft Permit, Fact Sheet p. 11 of 42.

[91] *See, e.g.*, TDD at ch. 6 (March 28, 2011) (reviewing and dismissing from further consideration technologies including louvers, aquatic filter barriers, and certain screen designs).

[92] *See, e.g.*, Proposed Rule, 76 Fed. Reg. at 22,203 (proposed April 20, 2011) (suggesting use of modified traveling screens or velocity reduction techniques to meet an impingement mortality standard, but then noting that "[t]his technology does not minimize adverse environmental impacts associated with entrainment.").

[93] *See* Proposed Rule, 76 Fed. Reg. at 22,205 ("BTA impingement mortality controls . . . would achieve up to a 31 percent reduction [in mortality]."); *see also id.* at 22,202-203 (comparing various technologies). EPA also discusses other flow reduction technologies such as variable speed pumps and timed seasonal outages, but these are not applicable to a newly repowered natural gas plant like B.L. England that seeks authority to operate at maximum capacity.

[94] *See* Oyster Creek Draft Permit (concluding that closed-cycle cooling was BTA under § 316(b) for Oyster Creek) (Note that this requirement was modified in the December 21, 2011 final NPDES permit following a December 9, 2010 administrative consent order requiring shutdown of the plant by December 31, 2019).

(645 MW) than B.L. England and withdraws almost twice as much cooling water,[95] it too is located in an estuary on the New Jersey Shore. And based on sampling conducted from 2005 to 2007, entrainment at Oyster Creek appears to be *lower* than at B.L. England: between 600 million and 1.35 billion aquatic organisms at Oyster Creek,[96] as compared to two to three billion organisms at B.L. England. Thus, B.L. England's cooling water intakes are far more destructive than those at Oyster Creek, the plant impinges and entrains at least twice as many organisms per gallon of cooling water.

At Oyster Creek, NJDEP evaluated a wide array of alternative control technologies and determined that BTA for the facility was closed-cycle cooling.[97] NJDEP focused on the fact that closed-cycle cooling reduces water intake usage significantly, thereby decreasing impingement and entrainment effects; and is one of the few technologies able to do so.[98] The Department should follow its own precedent and determine that closed-cycle cooling is the best technology available to minimize entrainment at B.L. England.

Since the Oyster Creek draft permit was issued, EPA and other regulators have joined NJDEP in concluding that no other technology approaches the effectiveness of closed-cycle cooling. For example, the Environmental Appeals Board ("EAB") has upheld a permit provision for the Brayton Point power plant in Massachusetts that "would essentially require closed-cycle cooling for the entire station" as BTA.[99] And a number of state and federal permitting authorities – including EPA's Region 1 and the n state of New York – have concluded that closed-cycle cooling constituted the appropriate performance standard for compliance with Clean Water Act-mandated reductions in impingement and entrainment.[100]

B.L. England is substantially similar to other facilities for which permitting agencies have required installation of closed-cycle cooling to reduce impingement and entrainment mortality. Like the Brayton Point power plant in Fall River, Massachusetts, for which U.S. EPA Region 1

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[95] *See* Oyster Creek Draft Permit, Fact Sheet p. 5 of 42 (Station withdraws 662.4 MGD for use as non-contact cooling water; station also withdraws water from a separate intake which is mixed with the cooling water to mitigate thermal discharge issues).
[96] *See id.* at 17 of 42(summing entrainment estimates in table).
[97] *See id.* at 10 of 42.
[98] *See id.* at 25 of 42.
[99] *See In re Dominion Energy Brayton Point*, 12 E.A.D. at 504, 597-618.
[100] NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NOTICE OF DENIAL: JOINT APPLICATION FOR CWA § 401 WATER QUALITY CERTIFICATION; NRC LICENSE RENEWAL – ENTERGY NUCLEAR INDIAN POINT UNITS 2 AND 3, NYS DEC Nos.: 3-5522-00011/00030 (IP2) & 3-5522-00105/00031 (IP3) (Apr. 2, 2010) (denying water quality certification on grounds that implementation of closed-cycle cooling was necessary to comply with Section 316(b)), attached as Exhibit 8; NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION, E.F. BARRETT POWER STATION SPDES PERMIT NO. NY0005908, Fact Sheet (Oct. 2009) (setting forth determination that closed-cycle cooling is BTA for E.F. Barrett Power Station), attached as Exhibit 9 ("E.F. Barrett Fact Sheet"); *see also* ENVT'L PROTECTION AGENCY, MERRIMACK STATION NPDES DRAFT PERMIT NO. NH0001465, draft permit and fact sheet with "Attachment D" related to cooling water intake and thermal discharge limits (proposing requirement of closed-cycle cooling as BTA under § 316(b)), available at http://www.epa.gov/region1/npdes/merrimackstation/ and attached as Exhibits 10, 11, and 12 ("Merrimack Draft Permit"); ENVT'L PROTECTION AGENCY, AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM, MIRANT CANAL STATION PERMIT NO. MA0004928 at p. 16 of 21 (issued by EPA Region 1 on Aug. 1, 2008) (requiring reductions in entrainment to levels commensurate with closed-cycle cooling), attached as Exhibit 13.

required installation of cooling towers pursuant to 316(b), B.L. England is located on a shallow estuarine bay.[101] Both Brayton Point and B.L. England use copious amounts of cooling water (on the order of hundreds of millions of gallons per day) and, absent closed-cycle cooling, result in billions of entrained, and thousands of impinged aquatic organisms. EPA determined closed-cycle cooling to be BTA at Brayton Point, and it is likewise BTA here.

The New York Department of Environmental Conservation ("NY DEC") recently deemed closed-cycle cooling to be BTA for the E.F. Barrett power station in New York, another facility that is comparable to B.L. England. E.F. Barrett is a two-unit facility with a total output of 362 MW, slightly *smaller* than B.L. England.[102] The receiving water, Barnum's Channel in the Town of Hempstead on the southern shore of Long Island, supports a finfish community—including bay anchovy, Atlantic menhaden, cunner, gobies, scup, pipefish, tautog, windowpane flounder and winter flounder—that is similar to that in Great Egg Harbor Bay.[103] Levels of entrainment are likewise comparable, and indeed are slightly *lower* at E.F. Barrett: 1.2 billion eggs and larvae, as compared to two to three billion for B.L. England.[104] In arriving at the conclusion that closed-cycle cooling was BTA, NY DEC evaluated a wide array of alternative control technologies. DEC based its determination that cooling towers were BTA on several factors, noting among other things that the technology would significantly reduce the number of eggs and larvae entrained and impinged "more than any other technology or operational measure available to reduce aquatic impacts."[105] NY DEC also noted the ancillary benefits in abating thermal discharge issues at E.F. Barrett,[106] which as described below, are even more significant at B.L. England because the once-through cooling system discharges both heat and nutrients into a water body that is impaired for dissolved oxygen.

Although it has no legal obligation to do so, in conducting a BTA determination NJDEP typically compares the costs and benefits of different technologies to ensure that the costs of the technology selected as the best available are not wholly disproportionate to the benefits gained by its implementation.[107] As NJDEP knows, there is a great deal of evidence indicating that the benefits of saving billions of fish and other organisms every year are substantial; they are not wholly disproportionate to the costs of a cooling tower.

In 2010, NJDEP received an economic analysis of the benefits of reducing impingement and entrainment from Professor Robert Johnston, a leading environmental economist who has advised various government agencies on the costs and benefits of cooling towers.[108] Prof.

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[101] *See In re Dominion Energy Brayton Point*, 12 E.A.D. at 502.
[102] *See* E.F. Barrett Fact Sheet at 1 of 8.
[103] *See id*.
[104] *See id.* at 1-2 of 8.
[105] *Id.* at 4 of 8.
[106] *Id*.
[107] *See, e.g.*, NJDEP, *Fact Sheet for a Draft NJPDES Permit Including Section 316(a) Variance Determination and Section 316(b) Decision, Permit No. NJ0005622*, p. 65 of 83 (issued Dec. 8, 2000) (analyzing whether the costs and benefits of closed-cycle cooling would be wholly disproportionate at Salem).
[108] Memorandum from Prof. Robert J. Johnston, Clark University, regarding Economic Benefits Associated with Reductions of Entrainment and Impingement Losses in Cooling Water Intake Structures and Implications for Oyster Creek Generating Station (March 10, 2010), attached as Exhibit 22 ("Johnston Memo").

Johnston explained that "[a]ll evidence indicates that economic benefits from I&E reductions are significant."[109] But he also warned NJDEP that the evidence can be difficult to collect simply by looking at conventional economic data. The problem is that many of the economic benefits of saving fish and other organisms "are non-market economic benefits that are (1) unrelated to the direct use of affected species in markets, and (2) only measurable using non-market valuation methods capable of estimating both use and nonuse values. As a result, reliance on market data alone to estimate benefits of I&E reductions will lead to gross underestimates of total benefits."[110] Similarly, the U.S. EPA estimates that less than 3 percent of the fish saved by closed-cycle cooling systems have commercial or sportfishing value.[111] To look only at these values is to ignore nearly all of the benefits of saving fish and protecting habitat.

In the past, at power plants such as the Mercer Generating Station, NJDEP has based its wholly disproportionate analysis on deeply flawed cost-benefit studies provided by power plant owners that looked at market data for commercially fished species and zeroed-out the value of all non-commercial species of fish.[112] Thus, NJDEP has grossly underestimated the total benefits of reducing impingement and entrainment.

This problem is not unique to New Jersey. For many years, EPA had recognized that the benefits of protecting fish, shellfish and other aquatic organisms from destruction by cooling water intake structures were very significant, but had no way to quantify these benefits. So in late 2011, U.S. EPA conducted a national stated-preference study in order to correct some of the worst shortcomings of cost-benefit analyses for cooling water intake regulation. The initial results were released in the summer of 2012.[113] As EPA explains:

> Stated preference surveys are an attempt to determine the economic value of goods or services outside of the context of the marketplace. Simply described, a stated preference survey attempts to gauge the value of an item through questions designed to mimic consumer decision-making in actual markets . . . When there is no behavioral trail (Larson, 1993), that is, no observable behaviors (such as recreational trips) that can be analyzed to infer value, stated preference methods are the only way

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[109] *Id*. at 1.
[110] *Id*.
[111] *See* EPA, *Environmental and Economic Benefits Analysis of the Proposed Section 316(b) Existing Facilities Regulation*, at 4-6 (2011), available at: http://water.epa.gov/lawsregs/lawsguidance/cwa/316b/upload/environbenefits.pdf
[112] For example, PSEG, the owner of the Mercer Generating Station, submitted a regulatory study in 2008 arguing that non-use benefits should be monetized only when there is substantial harm to threatened and endangered species or other major ecological impacts, and that therefore it could avoid monetizing non-use benefits and could submit a monetized cost-benefit analysis that set the value of these benefits at zero. *See* PSEG Services Corporation, *Comprehensive Demonstration Study for Mercer Generating Station, NJPDES Permit No. NJ0004995*, page 44 (June 30, 2008).
[113] *See* EPA, National Pollutant Discharge Elimination System—Proposed Regulations To Establish Requirements for Cooling Water Intake Structures at Existing Facilities; Notice of Data Availability Related to EPA's Stated Preference Survey, 77 Fed. Reg. 34927 (June 12, 2012), attached as Exhibit 23; see also Memorandum from Erik Helm, EPA, to Section 316(b) Existing Facilities Rule Record, regarding 316(b) Stated Preference (SP) Survey – Survey Methods and Model Results (June 5, 2012), attached as Exhibit 24.

> to measure values, especially non-use values (U.S. EPA 2010 Guidelines for Preparing Economic Analyses).[114]

EPA's study still excludes many non-use values and imperfectly measures others, but it provides a defensible low-end estimate of the value of protecting fish from impingement and entrainment.

The results of EPA's study were clear and overwhelming: the monetized benefits of closed-cycle cooling greatly exceed its costs by a large margin across the United States. EPA estimated the net present cost of different technologies for reducing impingement and entrainment of fish and compared them to the net present value that Americans are willing to pay for the environmental benefits of these technologies. The results of the comparison indicate that the net environmental benefits from modernized cooling systems will be at least $5 - $7 billion annually, even under a series of highly conservative and unrealistic assumptions.[115] Frank Ackerman, a noted environmental economist, concluded that the benefits are more likely in the range of $13 to $18 billion.[116]

EPA's survey design was methodologically rigorous and vetted by outside experts and government economists. After carefully surveying the economic literature on stated preference studies, EPA used a series of focus groups to design and test a survey that asks respondents to price a basket of four separate "attributes," or environmental goods, related to saving fish. EPA carefully staggered the survey options so that different respondents priced different combinations of these four goods. NJDEP should look to EPA's research and conclude that the benefits of a closed cycle cooling system are substantial and are not wholly disproportionate to the costs; thus a closed cycle cooling system is the best technology available at B.L. England.

6. **Unit 4 is effectively a new unit and should be regulated as such.**

As discussed above, a proper BPJ analysis of the best technology available for B.L. England's cooling water intake structures would have found closed-cycle cooling to be BTA. Such analysis assumes, as NJDEP did, that B.L. England is categorized as an existing facility and not a "new facility" under EPA's Phase I regulations for cooling water intake structures[117] or a "new unit at an existing facility" under EPA's proposed regulations for existing facilities.[118] The facilities for which NJDEP and other permitting agencies have required installation of closed-cycle cooling described above – Oyster Creek, Brayton Point, Indian Point, Merrimack

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[114] EPA, *Survey Support Document, In Support of Section 316(b) Stated Preference Survey Notice of Data Availability* at 1-2 (2012), attached as Exhibit 25.
[115] *See* Comments on EPA's Section 316(b) Stated Preference Survey**,** Dr. Frank Ackerman, Stockholm Environment Institute-US Center, Tufts University, July 10, 2012 , available at http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OW-2008-0667-3021 and attached as Exhibit 26.
[116] *Id*.
[117] *See generally* 40 C.F.R. Part 125, Subpart I – Requirements Applicable to Cooling Water Intake Structures for New Facilities Under Section 316(b) of the Act, §§ 125.80-89; see also 40 C.F.R. § 125.83 (definition of new facility).
[118] *See* Proposed Rule, 76 Fed. Reg. at 22,283 (proposed 40 CFR § 125.94(d) ("BTA standards for entrainment mortality for new units as existing facilities")).

and Mirant Canal – are all existing facilities. In addition, there are two further reasons supporting closed-cycle cooling at B.L. England that were not present at those other plants.

First, regardless of how it may be categorized under the federal regulations, Unit 4 is effectively a new unit and NJDEP should regulate it as such. In every way that matters, the repowering project will create a new electricity-generating unit at B.L. England that NJDEP has already labeled "Unit 4." Unit 4 will come into existence in 2016, after a significant engineering and construction effort that provides the ideal opportunity to upgrade the balance of the plant surrounding Unit 4. Unit 4 will generate 425 MW of electricity, nearly as much as the entire power station generates today, and almost three times more power than the Unit 2 steam turbine.[119] The primary source of this power increase is a new natural gas turbine that will also provide heat to power the Unit 2 steam turbine. Finally, Unit 4's operating life will extend out for many more decades, meaning that investments in environmental protection that are associated with Unit 4 can be amortized over a considerable lifespan – and will continue to protect Great Egg Harbor Bay for decades too.

In the federal rulemaking docket, EPA's technical staff explained why projects like B.L. England's repowering are akin to the construction of a new unit and/or a new facility than the continuation of an existing facility and should be regulated as such. EPA originally wrote a draft regulation that would have treated a repowered facility like B.L. England as a new unit, meaning it would be required to reduce impingement and entrainment to levels commensurate with a closed-cycle cooling system. A few months before proposal, EPA submitted a draft of its proposed rule to OMB for interagency review.[120] Pursuant to Executive Order 12,866, once the draft rule was published in the Federal Register EPA also released a "redlined" version of its proposed rule, revealing amendments made to the original proposal, which reflected OMB's suggestions and recommendations.[121] With respect to repowering projects, the draft regulations EPA submitted to the White House stated as follows:

> In summary, EPA proposes that, because repowering, replacement, and additional unit installation decisions can be accomplished feasibly and with lower costs than retrofitting an entire existing facility, it is appropriate to require the same entrainment mortality controls at new units as are applicable to new facilities per the Phase I rule. New units are similar to new facilities, regardless of whether that unit is a green field construction, an additional unit, a replacement unit, or a repowered unit. Further, EPA considered that new units would be similar to new facilities in terms of the useful expected plant life and therefore found in general

[119] *See* Fact Sheet p. 4 of 60 (Unit 2 output is currently 155 MW).
[120] *See Documentation of Changes Made During Executive Order 12866 OMB Review – Cooling Water Intakes 2040-AE95 NPRM*, Document ID: EPA-HQ-OW-2008-0667-1295 (Attached as Exhibit 14) ("Document 1295"); *see also Document Submitted to Initiate EO 12866 Review - Cooling Water Intakes 2040-AE95 NPRM FRN* [DCN 10-6625A], Document ID: EPAHQ-OW-2008-0667-1295.1 (attached to Document 1295).
[121] *See* untitled document numbered EPA-HQ-OW-2008-0667-1295 2 with markup showing [DCN 10-6625B], EPA-HQ-OW-2008-0667-1407 [DCN 10-6625B], (Redline-strikeout documenting changes made during EO 12866 review) ("Redlined Version of Proposed Rule"), attached as Exhibit 15.

> this would mean that closed-cycle cooling would reduce entrainment mortality for a longer time than for existing facilities as a whole.[122]

EPA explained its reasoning for deciding that repowered units should be treated like any other new unit. Repowerings provide "the ideal opportunity to design and construct the new units without many of the additional expenses associated with retrofitting an existing unit to closed-cycle. Thus, for example, the timing of retirement and replacement is within the control of the facility," meaning that "incremental downtime that may be associated with installing closed-cycle cooling may be avoided or minimized."[123]

For all of the reasons given by EPA in that version of the proposed rule, NJDEP should recognize that the B.L. England repowering is "the ideal opportunity to design and construct" Unit 4 without the having to retrofit an existing unit to closed-cycle or consider issues such as limited remaining useful life. Accordingly, the case for closed-cycle cooling at BTA is even stronger at B.L. England than it was at Oyster Creek, Brayton Point, Indian Point, Merrimack and Mirant Canal, all of which must be retrofit after being in operation for many years.

Second, the Proposed Rule's definition of "new unit at existing facility," if adopted by EPA as part of the final rule, may not hold up in court. EPA's rationale for why repowerings are akin to new units and new facilities was deleted from the proposed regulation at the insistence of the Office of Management and Budget ("OMB"). But OMB does not have technical expertise relevant to evaluating the similarity of repowerings, retrofits and new construction, and the ease with which closed-cycle cooling systems can be incorporated into these projects. Therefore, its technical decisions about repowerings merit no deference. That provision of EPA's rule is very likely to be challenged as being irrational, arbitrary and capricious, and not supported by the administrative record. If EPA's proposed definition of "new unit at exiting facility" is restored to the definition originally developed by EPA in 2011, B.L. England's repowering will be categorized as a "new unit at an existing facility," which would require application of a categorical standard requiring closed-cycle cooling.

B. B.L. England's Cooling Water Discharges are Unlawful.

In some cases, a closed-cycle cooling system is needed in order to comply with state water quality standards, irrespective of whether the Act's technology-based provisions also require use of the technology.[124] At least four power plants – the McDonough and Yates plants in Georgia, and the Canadys and Wateree plants in South Carolina have converted to closed-cycle cooling primarily to reduce thermal discharges that ran afoul of state water quality standards.[125] As at those plants, the thermal pollution and the nutrients discharged by B.L. England's once-through cooling system cause sufficient environmental harm to warrant a conversion to closed-cycle cooling.

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[122] Redlined Version of Proposed Rule at 147-148.
[123] Redlined Version of Proposed Rule at 92-93.
[124] *See In re Dominion Energy Brayton Point,*12 E.A.D. at 496 (noting that either technology or water quality based elements of the NPDES permitting process can independently require the use of a closed-cycle cooling system).
[125] *See* TDD at 2-14.

1. The discharge of once-through cooling water at B.L. England causes or contributes to violations of dissolved oxygen and nutrient water quality standards.

The segment of the Great Egg Harbor Bay into which B.L. England dumps its waste heat is impaired by very low levels of dissolved oxygen.[126] The water quality standard for dissolved oxygen in Great Egg Harbor is 5 mg/L averaged over 24 hours, and no less than 4.0 mg/L at any time.[127] Most summers, the portion of the Harbor nearest to B.L. England fails to meet this standard.

The two nearest water quality monitoring stations in NJDEP's Marine Water Monitoring Program are Station 2902A, located at the confluence of the Tuckahoe River and Great Egg Harbor Bay, and Station 2720B, located in the Bay north of and near to B.L. England.[128] Together, these stations give a good indication of the water quality in Great Egg Harbor Bay near B.L. England. Between 1998 and 2007, station 2902A reported a total of 35 dissolved oxygen samples at an average annual concentration of 7.0 mg/L and a minimum summertime concentration of 2.6 mg/L. Over the same period of time, station 2720B reported a total of 46 dissolved oxygen samples at an average annual concentration of 7.2 mg/L and a minimum summertime concentration of 3.7 mg/L.[129] At Station 2902A, dissolved oxygen measurements were below the state water quality standard of 5 mg/L in at least eleven samples taken during ten different summers.[130] At Station 2720B, dissolved oxygen measurements were below the state water quality standard of 5 mg/L in at least six samples taken during six different summers, and 12 other samples taken in 7 other years had less than 6 mg/L of dissolved oxygen, very close to the limit.[131] Further, water quality monitoring conducted at Station 2720B shows that this portion of Great Egg Harbor Bay has experienced algal blooms and brown tides in the past, most recently an algal bloom in July 2012.[132]

The discharge of heat from B.L. England's once through cooling system unquestionably contributes to these recurrent water quality violations. As NJDEP acknowledges, "[t]he station's

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[126] *See* Fact Sheet p.9 of 60.
[127] *See* N.J. ADMIN. CODE § 7:9B-1.14(d).
[128] *See* NJDEP, Marine Water Monitoring Program website, http://www.nj.gov/dep/bmw/atlantic3.htm (last visited April 20, 2013).
[129] See NJDEP, Marine Water Monitoring Program, summary data for monitoring stations 2720B and 2902A, http://www.state.nj.us/cgi-bin/dep/bmw/station.pl?2720B; http://www.state.nj.us/cgi-bin/dep/bmw/station.pl?2902A (last visited April 20, 2013).
[130] Calculated based on raw data downloaded from NJDEP Water Monitoring Program. Dissolved oxygen recorded below the 5.0 mg/L standard in 1993, 1998-2001, 2003, 2004, 2008, 2009, and 2011. No data available in 1994, 1995, 2005-2007, or 2012. Data is attached as Exhibit 16.
[131] Calculated based on raw data downloaded from NJDEP Water Monitoring Program. Dissolved oxygen recorded below the 5.0 mg/L standard at 2720B in 1994, 1997, 2001, 2003, 2004, and 2009. Readings between 5 and 6 mg/L in 1990, 1993, 1998, 1999, 2000, 2010, and 2011. No data available in 1992, 1995, 2005-2007, or 2012. Data is attached as Exhibit 16.
[132] *See* NJDEP, Marine Water Monitoring Program, phytoplankton data for station 2720B, http://www.state.nj.us/dep/wms/bmw/phyto_2720B.htm (last visited Apr. 23, 2013).

once-through cooling water discharge increases water temperatures in the bay."[133] Dissolved oxygen concentrations in water are inversely correlated to temperature – hotter water contains less oxygen; colder water holds more oxygen. By raising the water temperature, B.L. England reduces its dissolved oxygen concentration.

In summertime, average water temperatures in Great Egg Harbor Bay typically range from 20-27 degrees Celsius.[134] The average summer water temperature recorded at the monitoring stations (average of samples taken in June, July, and August) between 1989 and 2010 was 23.6 degrees Celsius at 2902A and 21.9 degrees Celsius at 2720B.[135] During summer, when dissolved oxygen concentrations are lowest, B.L. England is authorized to discharge water from Great Egg Harbor Bay up to a maximum temperature of 38.3 degrees Celsius.[136] Even under ideal conditions, this marked temperature increase reduces the maximum oxygen concentration in the discharged water by a quarter, before accounting for oxygen demanding substances.[137] This is an obvious contribution to the water quality exceedances observed near B.L. England every summer.

In addition, B.L. England's cooling system encounters billions of living organisms every year and minces them into a decomposing heap of nutrients and organic detritus. The tons of dead, rotting organisms that are entrained and killed by the cooling system and discharged at DSNs 009A and 010A contribute to the dissolved oxygen impairments in Great Egg Harbor Bay. So do the dead fish sprayed off the screens and discharged at DSN 008A. Killing and then dumping all of these dead organisms into the water adversely effects dissolved oxygen levels – it is equivalent to dumping several tons of fertilizer into Great Egg Harbor Bay every year.

New Jersey's State Water Quality Standard for the discharge of nutrients states that:

> Except as due to natural conditions, nutrients shall not be allowed in concentrations that render the waters unsuitable for the existing or designated uses due to objectionable algal densities, nuisance aquatic vegetation, diurnal fluctuations in dissolved oxygen or pH indicative of excessive photosynthetic activity, detrimental changes to the composition of aquatic ecosystems, or other indicators of use impairment caused by nutrients.[138]

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[133] Fact Sheet p.29 of 60.
[134] *See* 316(b) Report at II-3 (describing water temperatures in the low 70s to the mid 80s Fahrenheit).
[135] Calculated based on data downloaded from NJDEP Water Monitoring Program. Average of 17 samples taken between August 1989 and June 2010 at 2720B and 10 samples taken between August 1993 and June 2010 at 2902A.
[136] *See* 2005 Permit, Part III, p.14-15.
[137] *See* Missouri Department of Natural Resources, Maximum Dissolved Oxygen Concentration Saturation Table, http://www.dnr.mo.gov/env/esp/wqm/DOSaturationTable.htm (last visited April 20, 2013). Under ideal lab conditions, the maximum dissolved oxygen concentration of water in the 22-24 degree range is around 8.6 mg/L. Raising the temperature to 38.3 degrees reduces the maximum concentration to approximately 6.6 mg/L, a decrease of around 25%. With the addition of nutrients and other oxygen demanding substances in the water, the dissolved oxygen concentration is far lower.
[138] N.J. ADMIN. CODE § 7:9B-1.14(d).

As explained above, the area of Great Egg Harbor Bay adjacent to B.L. England has experienced algal blooms and is unsuitable for its designated uses due to dissolved oxygen levels. NJDEP has identified "agriculture" – i.e. nutrient runoff – as one cause of this impairment.[139] Therefore the uncontrolled discharge of nutrients from DSNs 008A, 009A, and 010A causes or contributes to violation of both the dissolved oxygen and nutrient water quality standards and must be subject to effluent limits.

Under N.J. ADMIN. CODE § 7:14A-13.5(a), the Department must establish water quality based effluent limits for heat and nutrients/organic matter (dead organisms) that protect water quality, particularly dissolved oxygen levels, in Great Egg Harbor Bay. But NJDEP has not set any limits on the dissolved oxygen content of the cooling water, on the organic matter released at DSNs 008A, 009A, and 010a, or on any other parameter that might serve as an effective proxy to address the discharge of heat and nutrients from these outfalls.

The absence of water quality based effluent limits is particularly surprising (and unreasonable) given that NJDEP has recognized that it is legally obligated to set dissolved oxygen limits at DSN 013A, the outfall for treated wastewater, in order to protect water quality in Great Egg Harbor Bay.[140] NJDEP believes that a 24-hour average limitation of 5.0 mg/L and an instantaneous minimum limitation of 4.0 mg/L on dissolved oxygen at DSN 013A are needed to adequately protect water quality.[141] These effluent limits are set precisely at the water quality criteria for dissolved oxygen that apply to saline estuaries pursuant to N.J. ADMIN. CODE § 7:9B-1.14(d). Presumably, NJDEP has set this limit because there is no assimilative capacity for oxygen demanding or low-dissolved oxygen discharges in Great Egg Harbor Bay. By requiring that the discharge meets the in-stream water quality criteria at the point of discharge, NJDEP ensures that the discharge from DSN 013A does not cause or contribute to a violation of water quality standards.

Yet the discharge from DSN 013A is presently 0.69 MGD, and will drop to just 0.22 MGD after repowering.[142] At 294 MGD now, or even at 167 MGD later, the heated, nutrient-laden discharge from the cooling water system is hundreds of times larger and likely to have a far more significant impact on dissolved oxygen levels in Great Egg Harbor Bay than the wastewater treatment system. With summertime dissolved oxygen levels in the bay already at or below the thresholds set for DSN 013A, effluent limits are unquestionably needed for the heated discharge from the cooling water system. At a minimum, NJDEP must establish heat and dissolved oxygen effluent limits for DSN009A and DSN010A that, effective immediately, require the discharge to meet a 24-hour average limitation of 5.0 mg/L and an instantaneous minimum limitation of 4.0 mg/L; and must establish quantitative limits on the nutrient and organic matter released from Outfalls 008A, 009A, and 010A.

In the Fact Sheet, NJDEP places substantial emphasis on the possibility that "the repowered operating conditions and closure of Unit 1 will result in a significant [cooling

[139] *See* NJDEP, 2012 Draft 303(d) List.
[140] *See* Fact Sheet p. 9 of 60.
[141] *See* Fact Sheet p.39 of 60.
[142] *See* Fact Sheet p. 7 of 60.

water] discharge flow reduction."[143] But the anticipated changes to the discharge from the planned repowering are legally irrelevant to NJDEP's renewal of this NJPDES permit today because they take place in the future. While NJDEP considers them to be likely, its legal obligation is to write a permit that adequately controls the discharge that exists today. As NJDEP acknowledged in 2005, while responding to comments submitted by B.L. England's former owners on the draft NJPDES permit:

> In accordance with N.J.A.C. 7:14A-13.5(a), WQBELs are required when a pollutant or pollutants, '. . . are of may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above the SWQS.' This requirement applies regardless of a possibility that the facility will close and cease discharging.[144]

The law also applies regardless of a possibility that the facility will repower in several years.

In determining whether the thermal pollution discharge from B.L. England is allowable and whether a 316(a) variance should be granted, NJDEP should have consulted with the U.S. Fish and Wildlife Service and with the National Oceanic and Atmospheric Administration. Both federal agencies have voiced concern in the past about the discharge of thermal pollution in marine estuaries generally. And both agencies have a strong interest in and a deep understanding of the ecological health of Great Egg Harbor Bay and have supported NJDEP's conservation and research efforts in the past and have consulted with NJDEP on other NJDPES permitting processes. If NJDEP has not already done so, it should now consult with US. Fish and Wildlife Service and with the National Oceanic and Atmospheric Administration prior to issuance of the final permit to learn more about the short and long term impact of permitting B.L. England to develop a new, long-lived generating unit with a once-through cooling system.

2. DEP unlawfully proposes to renew a 316(a) variance to otherwise applicable heat limits for a thermal discharge that causes or contributes to violations of water quality standards.

Instead of establishing water quality based effluent limits, NJDEP is moving in the opposite direction: it proposes to renew B.L. England's alternative heat limits, set under a Clean Water Act section 316(a) variance to the technology based standards of the Act and statewide water quality standards for heat.[145] Because the thermal discharge from B.L. England causes or contributes to ongoing exceedances of water quality standards, granting this variance is illegal on its face.

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[143] Fact Sheet p.30 of 60.
[144] 2005 Permit, Response to Comments, p.5 of 13.
[145] New Jersey's State Water Quality Standard for heat in saline estuaries is 29.4 degrees Celsius, measured at the edge of a heat dissipation area. *See* N.J. ADMIN. CODE § 7:9B-1.14(d) (setting 29.4 degree limit); *see also id.* § 7:9B-1.5(c) and (h) (providing for the use of heat dissipation areas and for variances from heat limits under Section 316(a) of the Clean Water Act). NJDEP has not attempted to define a heat dissipation area or to prove that the discharge from B.L. England complies with effluent limits that assure attainment of this water quality standard.

NJDEP has acknowledged that Great Egg Harbor Bay is impaired by low levels of dissolved oxygen and that dissolved oxygen effluent limits are required on at least one outfall. How can NJDEP also conclude that Great Egg Harbor Bay supports a balanced, indigenous population of fish, shellfish and wildlife, and that the thermal discharge that impairs the harbor also assures the protection and propagation of that balanced indigenous population?

The proposed 316(a) variance determination is not supported by the evidence. NJDEP explained that its intent to renew the variance is based primarily on the fact that the overall discharge of heat from B.L. England is decreasing:

> One of the factors that the Department considered regarding this request is whether or not operating characteristics have changed. . . . [T]he Department has determined that a variance under Section 316(a) is warranted . . . based on the Department's findings that: (1) the operating conditions for years 2008 through 2010 are below the bounds of the operating conditions at the time of the last 2005 variance; (2) the repowered operating conditions and closure of Unit 1will result in a significant discharge flow reduction; and (3) the overall heat loading limits from the station have been retained. As a result, the Department has determined that a thermal discharge at the Station, in accordance with the proposed temperature and heat limitations, is expected to assure the protection and propagation of the balanced indigenous population.[146]

This analysis is flawed in several ways. First, it is unreasonable for NJDEP to rely directly on the fact that there is less heat discharged presently than was discharged when the 316(a) variance was last renewed in 2005 because, in 2005, Great Egg Harbor Bay was not yet listed as impaired for dissolved oxygen.[147] While operating conditions have improved, the status of Great Egg Harbor Bay has deteriorated. The relevant question is not whether there is less heat going into the Harbor today; it is whether the alternative heat limit proposed for the period before and after the repowering is acceptable in light of the impairment. An alternative heat limit that would cause or contribute to exceedances of water quality standards is not acceptable.[148]

Second, the proposed 316(a) variance determination places significant emphasis on the fact that with Unit 1 going out of operation, the plant's total heat load will drop and therefore the impact on Great Egg Harbor Bay should generally be positive. But at the same time, NJDEP is allowing B.L. England to increase the temperature of the discharge in summertime by several degrees in order to run supplementary burners (duct burners).[149] NJDEP believes that the reduced overall heat load will shrink the outer zone of the thermal plume, the 1.5 degree isotherm, by around 30%.[150] But because the remaining discharge will now come out of the

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[146] Fact Sheet p.29-30 of 60.
[147] *See* 2012 Draft 303(d) List (Great Egg Harbor Bay first listed for dissolved oxygen impairment in 2006).
[148] Unless established pursuant to a wasteload allocation in a TMDL. NJDEP has not developed a TMDL for Great Egg Harbor Bay.
[149] *See* Fact Sheet p.4 of 60.
[150] *See* Fact Sheet p.29 of 60.

plant hotter than ever the "zone of initial dilution" – an area so hot that it is totally uninhabitable to indigenous fish and other organisms – will increase in both size and temperature.[151] Thus, the repowered plant will actually expand the area of Great Egg Harbor Bay that is completely unfit for aquatic life.[152]

Finally, the proposed variance is unlawful because B.L. England has not carried its burden of proof: it has not submitted a cumulative impacts analysis that evaluates the impact of the proposed alternative heat limits in light of other significant impacts on Great Egg Harbor Bay, including the anticipated impacts of climate change. In seeking a 316(a) variance, whether for the first time or upon renewal, the permittee's burden of proof is to demonstrate that the alternative limit it seeks will assure protection of a balanced indigenous population of shellfish, fish and wildlife considering the "cumulative impact of its thermal discharge together with all other significant impacts on the species affected."[153] Neither B.L. England's request for a variance nor NJDEP's proposed variance determination discuss the cumulative impact of increased heat, nutrients, and low dissolved oxygen levels on the health of Great Egg Harbor Bay and its denizens.

Most significantly, however, the variance request and variance determination are silent with respect to climate change. With a major repowering proposed, whatever cooling system is built now will operate for at least another 40 or 50 years. The failure to consider climate change in setting the heat limits that establish the design parameters of this long-lived cooling system is arbitrary and capricious. As a shallow estuarine environment connected to a warming Atlantic Ocean and warming rivers, Great Egg Harbor Bay plainly will be affected by climate change.

In the long run, the failure to consider climate change is not in B.L. England's interests either, because if the plant is reliant on a once-through cooling system, increasing temperatures in Great Egg Harbor Bay may limit the repowered plant's ability to run when intake water temperatures are hot. During recent heat waves, some U.S. power plants have already had to reduce or curtail operations to comply with thermal discharge regulations.[154] These problems are not confined to southern, drought-prone states. In August 2012, the Millstone nuclear plant in Connecticut had to shut down two reactors due to temperatures in Long Island Sound that exceeded the permitted maximum. This is the first time the plant has had to curtail operations

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[151] *See* Fact Sheet p.29 of 60.

[152] This draft NJPDES permit is also unlawful in that the alternative heat limits in the proposed 316(a) variance rely upon a thermal mixing zone (including the zone of initial dilution), but the size, location, and dimensions of that mixing zone are not specified in the Fact Sheet or the permit itself. While NJDEP asserts that the zone of initial dilution will increase in size, it is unclear to what extent. Without knowing the dimensions of this mixing zone, it is impossible to verify or follow NJDEP's reasoning for concluding that the loss of this zone is not significant.

[153] 40 C.F.R. § 125.73(a); *see also* Memorandum from James A. Hanlon, US EPA, to Directors of EPA Regional Water Divisions, regarding Implementation of Clean Water Act Section 316(a) Thermal Variances in NPDES Permits (Review of Existing Requirements) (Oct. 28, 2008), available at: http://www.epa.gov/region1/npdes/merrimackstation/pdfs/ar/AR-338.pdf (emphasizing that polluters have the burden of proof and must support a variance request with cumulative impact analysis), attached as Exhibit 17.

[154] Michelle T. H. van Vliet, John R. Yearsley, Fulco Ludwig, Stefan Vögele, Dennis P. Lettenmaier and Pavel Kabat, "Vulnerability of US and European electricity supply to climate change," 2 *Nature Climate Change* 676 (June 3, 2012), Digital Object Identifier (available at): 10.1038/nclimate1546.

due to the temperature of Long Island Sound.[155] Higher global temperatures will only increase the frequency with which such compliance issues will arise in northern states. For example, in 2012, the scientific journal Nature Climate Change published a study by a global team of researchers concluding that, by the 2040s, power plants with once-through cooling systems could be faced with summertime intake temperatures exceeding 27 degrees Celsius due to an increased frequency of low flows, higher overall river temperatures, and higher peak summer temperatures, and will need to adapt their cooling systems or risk decreases of average summer usable capacity of 12 - 16%.[156]

3. DEC's proposal to raise the thermal limits at DSN 010A also violates the anti-backsliding provisions of state and federal law.

Currently, the cooling water system discharge is subject to a temperature differential limit of 8.8 degrees Celsius as a daily maximum in the summertime (June-August) and an effluent temperature limit of 38.3 degrees Celsius as a daily maximum.[157] In this permit renewal, however, NJDEP plans to weaken these heat limits to accommodate R.C. Cape May's desire to install duct burners at B.L. England in order to avoid a dropoff in summertime generating capacity without having to pay to upgrade the condenser cooling system. The fact sheet accompanying the Draft Permit explains that

> Combined cycle plants with combustion turbines typically experience a significant drop in capacity between summer and winter months as compared to the existing simple cycle boiler steam plant design. However, the use of duct burners, which recovers a large portion of this loss in capacity, results in increases in the maximum temperature and temperature difference characteristics of the discharge. Similarly, use of the new steam turbine bypass will elevate temperatures in the discharge for limited periods of time.[158]

In order to accommodate the duct burners and a related steam turbine bypass at DSN 010A after the repowering, the Department will raise the summertime (June to August) temperature differential limit from 8.8 to11 degrees Celsius as a daily maximum and the maximum temperature effluent limit from 38.3 to 40.5 degrees Celsius.[159]

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[155] *See* Stephen Singer, "Warm seawater forces Conn. nuclear plant shutdown," *SeaCoast Online* (Aug. 13, 2012), available at http://www.seacoastonline.com/apps/pbcs.dll/article?AID=/20120813/NEWS/120819916/-1/NEWSMAP.

[156] Michelle T. H. van Vliet, John R. Yearsley, Fulco Ludwig, Stefan Vögele, Dennis P. Lettenmaier and Pavel Kabat, "Vulnerability of US and European electricity supply to climate change," 2 Nature Climate Change 676 (June 3, 2012), Digital Object Identifier (available at): 10.1038/nclimate1546.

[157] *See* 2005 Permit, Part III, p.14-17.

[158] Fact Sheet p.4 of 60.

[159] *See* Fact Sheet p.30 of 60; *see also* Draft Permit p.26-27 of 63.

Relaxation of this heat effluent limit clearly violates New Jersey's anti-backsliding rules. N.J. ADMIN. CODE § 7:14A-13.19 states that

> Except as provided for under Section 402(o) of the Federal Act (33 U.S.C. §1342(o)), when a permit is modified, renewed or reissued, all effluent limitations or standards shall be at least as stringent as the final and effective effluent limitations or standards in the previous permit.

Thus, the increase in the temperature of the discharge is illegal unless an exemption under Section 402(o) applies. None of those exceptions apply at B.L. England. NJDEP claims that it can apply the first listed exception, but this is clearly incorrect.

The provision NJDEP cites to allows for a less stringent effluent limitation only if "material and substantial alterations or additions to the permitted facility *occurred after permit issuance which justify* the application of a less stringent effluent limitation."[160] There are two important conditions: the material and substantial alterations must already have occurred, and those alterations must justify application of a less stringent effluent limitation. Neither condition is met here. First, although a repowering is contemplated by 2016, no material or substantial alterations have occurred at B.L. England yet. Until the repowering is completed, in 2016, the exception cited by NJDEP cannot possibly apply. Second, even if the proposed repowering occurs as planned, NJDEP has not explained why a less stringent effluent limitation for the discharge of heat would be justified. As explained above, although the reduced volume of the discharge will shrink the overall size of the thermal plume, the increased heat of the discharge will expand the zone at the core of the plume that is totally uninhabitable, thus destroying more habitat than the current plume. NJDEP has not explained why a greater loss of habitat is justified. Further, less stringent effluent limitations are clearly unjustifiable for the same reasons that a Section 316(a) variance is inapplicable: the discharge of heat into the oxygen-starved summer waters of Great Egg Harbor Bay causes or contributes to ongoing violations of water quality standards.

Finally, even if the exception cited by NJDEP did apply, Section 402(o) also provides that "in no event may such a permit to discharge into waters be renewed, reissued, or modified to contain a less stringent effluent limitation if the implementation of such limitation would result in a violation of water quality standard . . . ." 33 U.S.C. § 1342(o)(3). Since the less stringent effluent limitation contemplated by NJDEP would result in violation of the dissolved oxygen water quality standard in Great Egg Harbor Bay, there is simply no way that NJDEP can authorize B.L. England to backslide by discharging water at a higher temperature than at present.

C. The Draft Permit Lacks Water Quality Based Effluent Limits

The B.L. England permitting process exemplifies a longstanding, illegal practice at NJDEP. For many years, NJDEP failed to gather adequate effluent data to support a numeric "reasonable potential analysis" based on existing effluent characteristics at B.L. England. The

[160] 33 U.S.C. § 1342(o)(2)(A); *see also* Fact Sheet p.36-37 of 60.

Department then uses its own failure as an excuse for not conducting any kind of reasonable potential analysis before issuing the NJPDES permit. In addition, NJDEP then proposes lax schedules for gathering the missing data and does not include reopener provisions in the permit specifying that the permit shall be reopened immediately once the missing data are collected. Commenters have observed this disturbing pattern of illegal permit writing in both the Mercer Generating Station and Hudson Generating Station NJPDES permits as well, and believe that it likely occurs at other facilities as well.[161]

The Department must ensure that every NJPDES permit contains effluent limitations for all pollutants that have the reasonable potential to cause or contribute to violations of water quality standards.[162] To discharge this duty, NJDEP must decide whether a discharge has the "reasonable potential" to cause environmental harm by using "procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant or pollutant parameter in the effluent, the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity), and where appropriate, the dilution of the effluent in the receiving water."[163] A permit writer's determination based on these federally mandated procedures is commonly called a "reasonable potential analysis."

The Department claims that it cannot determine whether an existing discharge has the reasonable potential to cause or contribute to a violation of water quality standards unless it has ten water quality samples: "Acceptable data sets [for reasonable potential analysis] generally consist of, at a minimum, 10 data values including the most recent 2½ years of data collection."[164] Thus, DEC concluded that it lacks sufficient data to conduct a reasonable potential analysis:

- at DSN 001A (cooling tower blowdown), including for copper, even though in the four existing water quality samples from this outfall copper was detected in three samples and the highest measurement was 15 times greater than the state water quality standard.[165]

- at DSN 003 (stormwater outfall), because the Department has only four water quality samples. To remedy this deficiency, NJDEP is ordering once-annual sampling.[166] But this means that in five years, when the Draft Permit is finalized and expires, NJDEP still will not have the ten samples it needs to issue a lawful renewal permit; and the oldest of its nine samples will be more than six years out of date.

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[161] *See, e.g.*, Hudson Draft Permit, Fact Sheet p. 35 of 44 ("At this time, the Department is aware of only one current data point for each outfall for priority pollutants as included in the 2008 renewal application. This data set is insufficient to determine the need for WQBELs."); *see also* Mercer Draft Permit, Fact Sheet p. 34 of 43.
[162] *See* 40 C.F.R. § 122.44(d) ("[e]ach NPDES permit shall include . . . limitations [that] control all pollutants . . . which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard, including State narrative criteria for water quality.").
[163] 40 C.F.R. § 122.44(d)(1)(ii).
[164] Fact Sheet p.37 of 60.
[165] *See* Fact Sheet p.34 of 60.
[166] *See* Fact Sheet p.36 of 60.

- at DSNs 009A and 010A (once-through cooling water). Although arsenic and the toxic plasticizer BPA have been detected at values exceeding state water quality standards, "at this time, insufficient data exist to determine the need for WQBELs."[167]

- at DSN 013A (wastewater treatment plant), because there are only five samples, including the data submitted with B.L. England's Permit Renewal application. DEC is not conducting a reasonable potential analysis or setting water quality based effluent limits even though it detected arsenic and selenium in four of five samples, *with at least one arsenic sample at concentrations nearly 300 times higher than the state water quality standard*.[168]

- at DSN 014A (FGD wastewater), where DEP not only concluded that, "at this time, insufficient data exist for most of these parameters to determine the need for WQBELs," but that it need not even collect such data because the FGD scrubber likely will shut down in 2016, when the repowering is completed.[169]

DEP has acted arbitrarily and unlawfully, and is abusing its limited discretion, by failing to conduct a reasonable potential analysis and failing to set water quality based effluent limits.

DEP ignored available information indicating that these discharges have the reasonable potential to cause or contribute to violations of water quality standards, and failed to take reasonable steps to gather the effluent data it wanted. DEP had numerous options for handling this situation, all of which are preferable to writing an unlawful permit that lacks water quality based effluent limits. For example, DEP could rely on the four or five samples it has for each outfall, particularly where a sample has presented pollutant concentrations many times above state water quality standards.

Alternatively, DEP can characterize the effluents from these outfalls using data from similar discharges at other power plants. For example, with respect to DSNs 013A and 014A, which receive effluents contaminated with coal combustion waste, DEP can rely on recent guidance sent from EPA to NPDES permit writers. After reviewing data from numerous plants, EPA concluded that "metals in [coal combustion waste] effluent are variable and have the potential to exist in relatively high concentrations" and that

> the following pollutants may be expected to be found in CCR effluent at concentrations that are greater than water quality criteria: Aluminum, Arsenic, Cadmium, Chromium, Copper, Iron, Manganese, Nickel, Selenium, Thallium, Chloride, and Nitrate/Nitrite. Barium, Lead, Mercury, and Silver also can exceed water quality criteria as measured at internal outfalls . . . Total Dissolved Solids

[167] Fact Sheet p.38 of 60.
[168] *See* Fact Sheet p.40 of 60.
[169] *See* Fact Sheet p.43-44 of 60. NJDEP's position is not only illegal, it also marks an arbitrary reversal of the agency's position. Just a few years ago, NJDEP explained to B.L. England's then owners that the obligation to establish water quality based effluent limits "applies regardless of a possibility that the facility will close and cease discharging." 2005 Permit, Response to Comments, p.5 of 13.

> and Sulfate are present in concentrations which could potentially cause or contribute to water quality impacts.[170]

Therefore, EPA concluded that permit writers must conduct a reasonable potential analysis and establish water quality-based effluent limits for these metals.[171]

Or DEP could have sought the data it required during the four years that lapsed between B.L. England's submission of a permit renewal application and DEP's issuance of this NJPDES permit. NJDEP has authority under state and federal law to require permittees to conduct monitoring to provide the data that the agency needs in order to write a legal permit.[172] NJDEP refers to the paucity of data sets "made available to the Department,"[173] but it is NJDEP's responsibility to gather the data it needs to issue NJPDES permits. If adequate data has not "been made available," the fault lies with NJDEP. NJDEP cannot now use the lack of water quality data as an excuse to issue an illegal permit.

Finally, DEP could simply have rejected B.L. England's permit renewal application as incomplete and insufficient and demanded more data when it was filed in 2009. But DEP did none of these things. Instead, it proposes to issue a blatantly illegal permit.

Presumably, DEP's insistence on gathering ten data points before conducting a reasonable potential analysis is based on N.J. ADMIN. CODE § 7:14A-13.8(a)(2), which states that in calculating water quality based effluent limitations based on existing effluent quality, "if fewer than 10 data points are available, the permit shall require monitoring and include a reopener clause to include existing effluent quality limitations based on 10 or more data points." But relying on existing effluent quality, though preferable to other methods, is not the only way to conduct a reasonable potential analysis.

And NJDEP has not followed its own rules. The state regulations clearly require that a permit developed without adequate effluent samples "*shall include a reopener clause*."[174] The requirement to collect sampling data and improve upon a deficient reasonable potential analysis is one of DEP's basic water quality policies:

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[170] *See* Memorandum from James A. Hanlon, Director, EPA Office of Wastewater Management to Water Division Directors, EPA Regions 1-10 regarding National Pollutant Discharge Elimination System (SPDES) Permitting of Wastewater Discharges from Flue Gas Desulfurization (FGD) and Coal Combustion Residuals (CCR) Impoundments at Steam Electric Power Plants (June 7, 2010), Attachment B, p.3. ("Hanlon Memo") The memorandum and attachments are available at http://www.epa.gov/SPDES/pubs/hanlonccrmemo.pdf and are attached as Exhibits 18-20.

[171] *See id.*

[172] For example, pursuant to N.J. ADMIN. CODE § 7:14A-2.12(b), "[w]here the data necessary to make a determination of effluent limitations . . . do not exist and/or are incomplete, the Department may require the permittee or the applicant to undertake any and all studies that it determines necessary to determine permit limits and conditions."

[173] *See, e.g.*, Fact Sheet p.43 of 60 (before concluding that there is insufficient data, NJDEP "analyzed all effluent data sets made available to the Department.").

[174] N.J. ADMIN. CODE § 7:14A-13.8(a)(2).

> When the Department is unable to determine for one or more pollutants or pollutant parameters of interest whether the discharge from a particular facility will cause, have the reasonable potential to cause, or contribute to an excursion above a Surface Water Quality Standard, the permit for that facility *shall include effluent monitoring requirements* for each pollutant or pollutant parameter where such a determination cannot be made. The discharge permit *shall be reopened and modified to include water quality based effluent limitations* if subsequent monitoring demonstrates that the discharge causes, contributes, or has the reasonable potential to cause or contribute to an excursion above the Surface Water Quality Standards.[175]

But this Draft Permit does not contain a reopener provision that would allow NJDEP to include the missing effluent limits as soon as possible, although it does contain specific provisions related to the BTA determination, petroleum hydrocarbons in cooling tower blowdown, and new biocides.[176]

Further, even if some form of administrative necessity could justify issuing a legally deficient permit now, DEP cannot justify setting a sampling schedule that will take five or more years to provide ten data points, instead of correcting the permit's shortcomings as soon as possible. The Act requires compliance with water quality standards at all times. Delaying compliance for a permit cycle or longer by setting an unreasonably long sampling schedule is a clear abuse of DEP's discretion.

Therefore, NJDEP must conduct reasonable potential analyses and include water quality based effluent limits in the final permit. From the material in the Fact Sheet, it is evident that, at a bare minimum, NJDEP should include:

- a copper effluent limit at DSN 001A, where copper was detected in three samples and the highest measurement was 15 times greater than the state water quality standard;
- an effluent limit at DSN 008A that relates to a parameter such as total organic carbon or biological oxygen demand and addresses the impact that pressure-spraying dead and decomposing fish off the plant's intake screens has on dissolved oxygen concentrations;
- arsenic, heat, dissolved oxygen, and nutrient effluent limits at DSNs 009A and 010A; and
- an arsenic effluent limit at DSN 013A (wastewater treatment plant).

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[175] N.J. ADMIN. CODE § 7:14A-13.5(l) (emphasis added).

[176] *See*, Draft Permit Part IV, Industrial Wastewater, subsection (G)(2)(d) (reopener for BTA determination), Fact Sheet p.33 (reserving right to reopen to address petroleum hydrocarbons in cooling tower blowdown) and p.46-47 (reopener for new biocides). In Part I of the permit there is a reference to the general reopener provision in N.J. ADMIN. CODE § 7:14A-6.2(a)(10). But there is no explicit commitment to reopen this permit and add the missing WQBELs and the Department has set the data gathering schedule here in a manner that ensures that the 10 needed data points will not be gathered for most outfalls until after the renewal permit expires.

NJDEP should conduct (or require B.L. England to conduct) a program of rapid testing over the next few months to adequately characterize all of the discharges at B.L. England for which it claims to lack sufficient data, and should then issue a final permit that includes water quality based effluent limits.[177]

D. The Technology Based Effluent Limits at DSN 013A and 014A Are Inadequate

The Draft Permit sets inadequate technology based effluent limits at DSN013, the discharge from the wastewater treatment plant, and at DSN 014, the discharge from the FGD scrubber. DSN 014A is an internal monitoring point that routes to the treatment system, which also handles other contaminated wastestreams such as bottom ash transport water. The effluents passing through these two outfalls contain a number of highly toxic metals including arsenic, selenium, and chromium. DEP must use its best professional judgment to set stringent effluent limitations that can control B.L. England's discharge of toxic heavy metals. The current effluent limits are far from reflecting the best available technology for coal plants.

EPA has not yet established effluent limitation guidelines ("ELG"s) for steam electric power generators that address the metals and other toxic pollutants found in coal combustion waste ("CCW"). The agency has announced its intention to revise the existing ELGs for power plants to include metals and other CCW pollutants, but this will take several more years.[178] In the meantime, the Clean Water Act requires NJDEP to stand in the shoes of EPA and use its best professional judgment to set case-by-case technology based effluent limitations (TBELs) for these pollutants in NJPDES permits.[179]

EPA last promulgated ELGs for the steam electric power generation industry in 1982[180] – more than 30 years ago – before the agency was fully cognizant of threats posed by waste waters from coal ash handling, coal combustion equipment cleaning, and air pollution control systems. Since then, EPA has learned that the power sector is the second largest discharger of toxic pollutants, and the toxicity of these discharges is primarily driven by metals associated with CCW.[181] EPA has also made clear that the existing ELGs fail to control metals in CCW discharges.[182] Thus, in 2009, EPA issued guidance for permit writers addressing CCW effluents from power plants, in which EPA restated its position that "in the absence of an effluent

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[177] NJDEP should collect samples in a matter of months and issue a final permit in a timely manner. A renewal of the B.L. England NPDES permit is already three years overdue.
[178] U.S. EPA, News Release, *EPA Proposes to Reduce Toxic Pollutants Discharged into Waterways by Power Plants* (Apr. 19, 2013) (announcing that draft regulations will be formally published in the Federal Register shortly), available at http://yosemite.epa.gov/opa/admpress.nsf/0/8F5EF6C6955F6D2085257B52006DD32F.
[179] *See* 33 U.S.C. §§ 1311(b)(2)(A), 1342 (a)(1)(B) (requirement to include technology based effluent limitations even in the absence of ELGs); 40 C.F.R. § 125.3(c),(d) (procedures for using best professional judgment); *see also NRDC v. EPA*, 863 F.2d 1420, 1425 (9th Cir. 1988).
[180] *See* U.S. EPA, Steam Electric Power Generating Point Source Category: Effluent Limitations Guidelines, Pretreatment Standards and New Source Performance Standards, Final Rule, 47 Fed. Reg. 52,290 (Nov. 19, 1982).
[181] *See* U.S. EPA, Notice of Availability of Preliminary 2008 Effluent Guidelines Program Plan, 72 Fed. Reg. 61,335, 61,342 (Oct. 30, 2007).
[182] *See, e.g.* U.S. EPA, Notice of Availability of Preliminary 2010 Effluent Guidelines Program Plan, 74 Fed. Reg. 68,599, 68,606 (Dec. 28, 2009).

guideline for those pollutants, the CWA [Clean Water Act] requires permitting authorities to conduct the "BPJ" analysis discussed above on a case-by-case basis for those pollutants in each permit.[183]

In setting BAT effluent limits, at a minimum, NJDEP should look to the performance of other plants in the industry. The recently permitted Merrimack power plant in New Hampshire, for example, uses a considerably more effective treatment system that begins with a conventional chemical precipitation system like the one used at B.L. England, but then adds on an advanced biological treatment system specifically to treat dissolved CCW metals like selenium. The difference is evident:

Comparison of FGD Wastewater Effluent Limits at Merrimack and B.L. England[184]

Pollutant (µg/l)	Merrimack		B.L. England		
	Monthly Average	Daily Maximum	Effluent Data (mthly avg/daily max)	Monthly Average	Daily Maximum
Arsenic	8	15	169	Report	Report
Cadmium	Report	50	not sampled	no limit	no limit
Chromium	Report	10	4/10	Report	200
Copper	8	16	5,300/48,000	Report	8,700
Lead	Report	100	not sampled	no limit	no limit
Selenium	10	19	40	Report	Report
Zinc	12	15	30/130	Report	1000

Generally, the effluent limits at Merrimack are orders of magnitude lower than at B.L. England. The fact that plants like Merrimack are meeting these limits means that they are achievable and the technology leading to them is "available" at B.L. England. And EPA has learned that other plants are surpassing even this level of achievement and eliminating all FGD wastewater discharge either through the use of vapor-compression evaporation systems or by fully recycling wastewater.[185]

DEP cannot simply dismiss improved treatment technologies as not "available" for DSNs 013A and 014A because some of the discharges routed through these outfalls will cease if the repowering is completed. As DEP has itself previously noted, its obligation under the Clean Water Act to impose effluent limitations applies "regardless of a possibility that the facility [or

[183] *See* Hanlon Memo, Attachment A, p.2.
[184] *See* Merrimack Draft Permit p.6 of 29 (outfall 003C, FGD wastewater only) compared against DSN013A proposed limits, Fact Sheet p.54 of 60. This comparison is actually biased in favor of B.L. England because the concentrated FGD wastewater stream from Merrimack, which should be harder to treat, is compared to the diluted effluent at B.L. England.
[185] *See* EPA, *Steam Electric Power Generating Point Source Category: Final Detailed Study Report*, at 4-33, 4-36, EPA 821-R-09-008 (Oct. 2009) ("Detailed Study Report"). Available at http://water.epa.gov/lawsregs/guidance/cwa/304m/archive/upload/2009_10_26_guide_steam_finalreport.pdf. and attached as Exhibit 21.

an outfall] will close and cease discharging."[186] Moreover, the wastewater treatment plant will not shut down – it will continue to operate even if the FGD scrubber is disconnected upon repowering. If DEP is concerned about the remaining life of the treatment plant in light of the repowering, the Department can set a compliance schedule for meeting the more stringent effluent limits that concludes in 2016, on the planned date of the repowering. Thus, B.L. England can choose to meet the effluent limit by repowering and eliminating the discharge, or in the alternative, by installing more advanced pollution controls.

Thus, the Draft Permit should be revised to set BAT effluent limits at DSNs 013A and014A. The attainment of zero discharge at some plants suggests that the BAT standards is in fact zero – the complete elimination of all discharge. At a minimum, however, the Merrimack effluent limits are far closer to BAT than the current effluent limits at B.L. England.

E. The Draft Permit Violates New Jersey's Antidegradation Policy

New Jersey's antidegradation policy states that "existing uses [of a waterbody] shall be maintained and protected. Designated uses shall be maintained or, as soon as technically and economically feasible, be attained wherever these uses are not precluded by natural conditions."[187] Further, at a minimum, even the most polluted waterbodies "shall be protected from any measurable changes (including calculable or predicted changes) to the existing water quality."[188] And under no circumstances can "water quality-based effluent limitations established to implement the water quality standards (which includes the antidegradation policies)" ever provide for effluent limits less stringent than required by federal law.[189]

The Draft Permit violates the antidegradation policy in several ways. First, the failure to set water quality based effluent limits violates the state's antidegradation policy because NJDEP has not analyzed whether the permit renewal will cause any measurable changes to the existing water quality. Increasing the temperature of the discharge at DSN010A in a manner that makes a larger portion of Great Egg Harbor Bay inimical to indigenous species violates the antidegradation policy for the same reasons.

Most of all, the Draft Permit's failure to require closed cycle cooling and the unlawful proposed 316(a) variance together allow B.L. England to continue discharging high volumes of heat and nutrients into an oxygen-impaired waterbody, and this also violates the antidegradation policy. New Jersey's antidegradation rules state that "designated uses shall be maintained or, as soon as technically and economically feasible, be attained."[190] The designated uses of Great Egg Harbor Bay are not being attained – the harbor does not fully support aquatic life as it should because of low dissolved oxygen levels. It is technically and economically feasible to bring the Harbor closer to attainment through use of a closed-cycle cooling system at B.L. England.

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[186] 2005 Permit, Response to Comments, p.5 of 13.
[187] N.J. ADMIN. CODE § 7:9B-1.5(d)(1).
[188] N.J. ADMIN. CODE § 7:9B-1.5 (d)(2)(iii).
[189] *See* N.J. ADMIN. CODE § 7:9B-1.5(e)(2).
[190] N.J. ADMIN. CODE § 7:9B-1.15(d).

Before issuing a final permit, NJDEP must conduct an antidegradation review and include in the administrative record a determination that "indicate[s] clearly how the permit comport[s] with New Jersey's antidegradation policy."[191] Failure to do so is grounds for remanding the permit to the agency.[192] The antidegradation review of the Draft Permit should require the use of a closed-cycle cooling system.

CONCLUSION

For the foregoing reasons, NJDEP should issue a final NJPDES permit for B.L. England that resolves the issues identified above and fully complies with all requirements of the Clean Water Act. Primarily, this requires that NJDEP set effluent limits and make a final BTA determination that require a reduction of cooling water intake flows and thermal discharges to a level consistent with the use of a closed-cycle cooling system. The Commenters request an opportunity to meet with NJDEP to discuss the terms for the permit renewal.

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[191] *Borough of Lavalette v. NJDEP*, 120 N.J. 168, 180 (1990).
[192] *See id.* at 181 (absence of antidegradation review renders administrative record inadequate to support issuance of NPDES permits).

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Exhibits:

1. Species of Concern Letters
2. B.L. England 2005 Fact Sheet
3. B.L. England 2005 Final Permit (including response to comments)
4. NJ DEP, Oyster Creek Draft Permit and Fact Sheet
5. NJ DEP, Hudson Draft Permit and Fact Sheet
6. NJ DEP, Mercer Draft Permit and Fact Sheet
7. EPA, Technical Development Document
8. NY DEC, Denial of CWA § 401 Water Quality Certification to Entergy Nuclear Indian Point
9. NY DEC, E.F. Barrett Fact Sheet
10. EPA, Merrimack Draft Permit
11. EPA, Merrimack Fact Sheet
12. EPA, Merrimack Attachment D
13. EPA, Mirant Canal Permit
14. EPA, Original Draft of Proposed Rule
15. EPA, Redlined Version of Proposed Rule
16. NJDEP, Marine Water Monitoring Program Data
17. Hanlon Memo 2008 re 316(a) Variances
18. Hanlon Memo 2009
19. Hanlon Memo 2009, Attachment A
20. Hanlon Memo 2009, Attachment B
21. EPA, Detailed Study Report
22. Johnston Memo
23. EPA, Notice of Data Availability June 12, 2012.
24. Erik Helm, EPA, Memo to Record re Stated Preference Study
25. EPA, 316(b) Stated Preference Study Survey Supporting Document
26. Comments of Prof. Frank Ackerman regarding EPA Stated Preference Study