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Response to Comments from Public Service Company of New Hampshire

on

EPA's Revised Draft National Pollutant Discharge Elimination System

Permit No. NH 0001465

for

Merrimack Station

Public Service of New Hampshire

A Northeast Utilities Company

Submitted to the U.S. Environmental Protection Agency

October 22, 2014

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No. NH 0001465 for Merrimack Station

I. INTRODUCTION

Public Service Company of New Hampshire ("PSNH") submits the following response to the public comments received on or before August 18, 2014, pertaining to the United States Environmental Protection Agency-Region 1's ("EPA") April 18, 2014 revised draft National Pollutant Discharge Elimination System ("NPDES") permit for PSNH's Merrimack Station, Permit No. NH 0001465 ("draft permit"). The majority of comments submitted to the draft permit mirror and support comments PSNH made in its initial comments and therefore do not require any response. Specifically, the Utility Water Act Group ("UWAG"), Southern Company, and the Electric Power Research Institute ("EPRI") each submitted comments that agree with the following key points set out in PSNH's initial comments:

- EPA's determination that the softening, evaporation, and crystallization technology (*i.e.*, PSNH's secondary waste water treatment system ("SWWTS")), and corresponding zero liquid discharge limits, for the treatment of flue gas desulfurization ("FGD") waste water is "best available technology" ("BAT") is wrong;

- The SWWTS does not meet the legal definition of BAT, which means the SWWTS does not satisfy a finite set of well-established factors with precise definitions;

- EPA's associated zero liquid discharge effluent limit is not achievable at Merrimack Station and its inclusion in the draft permit is unfounded, arbitrary, and capricious;

- EPA rushed to judgment in issuing this latest draft permit based on incomplete and unreliable information. The agency's supposed "site-specific, case-by-case determination based on the facts at Merrimack Station," ignores the actual, undisputed facts concerning Merrimack Station;

- The draft permit relies on secondary sources, cursory research, and superficial interviews of the few companies in the world utilizing this cutting-edge technology whose plants

and systems differ greatly from Merrimack Station and its FGD waste water treatment system;

- The SWWTS, which PSNH was forced to install at Merrimack Station when EPA refused to identify an appropriate waste water treatment technology outside the multi-year renewal process of PSNH's NPDES permit, has consistently served its intended purpose as a volume reduction system that generates a manageable volume of effluent that can be transported to a facility with an NPDES discharge permit;

- The SWWTS does not and cannot eliminate all FGD waste waters and must have a purge stream in order to maintain stable treatment system operations;

- EPA's three proposed "compliance scenarios" do not save the agency's erroneous BAT determination. Operation as a "true ZLD system" is not possible at this time. Fly ash conditioning is also not a viable option because Merrimack Station does not generate enough ash to condition the volume of FGD waste water generated by the SWWTS. And, the only currently viable option—continued shipments to publicly owned treatment works ("POTWs")—cannot serve as the foundation of a legally permissible "best professional judgment" ("BPJ") BAT determination, provides nominal environmental benefit, and improperly subjects PSNH to the actions and/or discretions of third parties that could eliminate this compliance option at some point in the future.

- The physical/chemical treatment system with additional Enhanced Mercury and Arsenic Removal System (*i.e.*, the "PWWTS") at Merrimack Station is BAT. This treatment system removes approximately 90 percent of all toxic weighted pound equivalents ("TWPE") from FGD waste waters and satisfies water quality standards established by the New Hampshire Department of Environmental Services;

- Alternatively, EPA's decision to utilize its BPJ authority is unlawful and/or an abuse of discretion because national effluent guidelines already exist for FGD waste waters or will be promulgated within the year.

UWAG, Southern Company, and EPRI offered unique perspective and comments to the draft permit that critique EPA's determinations, as well. PSNH specifically addresses these comments in this submission.

Several environmental organizations (Earthjustice, Environmental Integrity Project, Sierra Club, and the Conservation Law Foundation) (collectively, the "Environmental Special Interest Groups" or "ESIGs"), submitted one set of comments that are contrary to those made by

PSNH and the other above-referenced entities.[1] Yet, the ESIGs' comments provide no value in this permit renewal proceeding. The ESIGs lack the necessary understanding of the operations and capabilities of evaporative technologies for the treatment of FGD waste waters. With no factual foundation, the comments lack legitimacy and are at best aspirational.

PSNH has responded to the isolated comments made by the ESIGs that are factually incorrect and/or based on false premises. However, the majority of the ESIGs' comments are so lacking in specifics or relevance it is difficult to formulate a meaningful response to them. PSNH believes the ESIGs' comments are adequately addressed and refuted already by PSNH's August 18, 2014 comments to the draft permit. In these comments, PSNH and its consultants also respond to each of the topical assertions set out in the ESIGs' comments.

II. PSNH'S RESPONSE TO COMMENTS ON EPA'S LATEST DRAFT PERMIT

A. PSNH Agrees with the Comments of Southern Company and UWAG Addressing EPA's Attempted Burden Shifting

In its Fact Sheet for the draft permit, EPA creates a "rebuttable presumption" that Merrimack Station's VCE and crystallizer system is "available . . . (*i.e.*, it is technologically and economically achievable for the Facility)" because PSNH has installed and operated its unique SWWTS for more than two years. *See* EPA Fact Sheet ("Fact Sheet") at 18-19. EPA provides that "[t]his presumption might possibly be overcome" by a showing that operational costs and/or technological issues may inhibit the long-term viability of this technological treatment option. *Id.* at 19. PSNH addressed this attempted burden-shifting in its August 18, 2014 comments and likewise agrees with Southern Company and UWAG's comments addressing this unlawful rebuttable presumption. *See* PSNH Comments on EPA's Revised Draft NPDES Permit No. NH 0001465 for Merrimack Station at 6-7 (Aug. 18, 2014) ("PSNH 2014 Comments"); Southern

[1] The Upper Merrimack River Local Advisory Committee also submitted a letter, but that letter specifically offered "no comment on th[e] revised draft NPDES permit" and therefore requires no response from PSNH.

Company Comments on EPA Region 1's Revised Draft NPDES Permit No. NH0001465 for Merrimack Station at 11-12 (Aug. 18, 2014) ("Southern Company 2014 Comments"); UWAG Comments on Revised NPDES Permit for the Merrimack Station at 21-22 (Aug. 18, 2014) ("UWAG 2014 Comments").

1. Southern Company's objection to EPA's rebuttable presumption

Southern Company, like PSNH, challenged EPA's ability to shift its statutorily-mandated burden to consider all required BAT factors before deciding what technological option constitutes BAT. *See* Southern Company 2014 Comments at 11. EPA is required to consider each BAT factor before making this determination and cannot side-step its regulatory requirements and simply presume the SWWTS is BAT. *See* 40 C.F.R. § 125.3(c) & (d). EPA's attempt to do so in this renewal proceeding is unlawful and "contravene[s] a long and continuous line of cases invalidating such presumptions. *See, e.g., Dir., Office of Workers' Comp. Programs v. Greenwich Collieries*, 512 U.S. 267, 281 (1994); *Chemical Mfrs. Ass'n v. DOT*, 105 F.3d 702, 705 (D.C. Cir. 1997)." Southern Company 2014 Comments at 11-12.

Furthermore, simply because PSNH installed the SWWTS at Merrimack Station does not support an inference that the SWWTS is technologically and economically "available" and/or viable under the CWA's BAT factors. Southern Company correctly recognized that "an agency may only establish a presumption if there is a sound and rational connection between the proved and inferred facts." *Id.* at 12. "[T]he fact that [PSNH's SWWTS] is installed proves nothing about whether all of the other required BAT factors support its selection as 'technologically and economically achievable' under the particular test that Congress laid out in the Clean Water Act." *Id.*

Determinations as to each BAT factor are required before establishing any treatment technology as BAT. EPA failed to complete this fundamental analysis. And, even if EPA's

burden-shift was legal, which it is not, PSNH has rebutted the presumption in its comments to the draft permit. *See, e.g.,* PSNH 2014 Comments at 9-30 (explaining in detail the reasons and purpose behind PSNH's installation of the SWWTS); PSNH Comments on EPA's Draft NPDES Permit No. NH 0001465 for Merrimack Station at 153-54 (Feb. 28, 2012) ("PSNH 2012 Comments") (same). It was EPA's refusal to work with NHDES and PSNH to identify the appropriate waste water treatment technology through any means other than the multi-year renewal process of the NPDES permit that left PSNH no choice but to minimize its FGD waste water so that it could meet the state statutory deadline to commence operation of the scrubber and continue operating Merrimack Station.[2] PSNH agrees with Southern Company that EPA's attempt to shift its burden and presume without proper analysis that the SWWTS at Merrimack Station is BAT is unlawful, arbitrary, and capricious. *See* Southern Company 2014 Comments at 12.

2. EPA also improperly relied on incomplete information about other facilities

Relying solely on EPA's unsupported statements in the Fact Sheet, the ESIGs argue that the VCE and crystallizer "is BAT for Merrimack Station" in part because they claim such systems are in use at other facilities abroad. *See* ESIGs' Comments on Revised NPDES Permit for the Merrimack Station, NPDES Permit No. NH0001465 at 5 (Aug. 18, 2014) ("ESIGs 2014 Comments"). Here, too, EPA seeks to shift its burden of persuasion to PSNH merely by mentioning that six other facilities in the world operate some form of this treatment technology. *See* Fact Sheet at 16-19. EPA provides no specifics about the water chemistry or operational details of any of these six facilities and does not attempt to compare them to the unique, complex, and evolving chemistry and SWWTS at Merrimack Station. EPA simply lists whether

[2] For this reason, UWAG's *fait accompli* comparison is an apt one. *See* UWAG 2014 Comments at 21.

or not these facilities utilize a VCE system, brine concentrator, and/or crystallizer. *See id.* Basing a BAT determination on such a cursory and incomplete examination, and effectively placing the burden on the permit holder to prove otherwise, is improper, bad science, and bad law.

EPA is tasked with thoroughly evaluating and understanding the details of waste water treatment technologies before making a BAT determination. It did not fulfill its obligations in this proceeding and has impermissibly attempted to shift its burden to PSNH. Despite the illegality of EPA's approach, PSNH provided extensive comments distinguishing the operations at Merrimack Station from those at the Iatan, Mayo, and the Italian facilities. PSNH also discussed in detail each of the facilities that abandoned the use of evaporative technologies due to operational and technical problems. *See generally* PSNH 2014 Comments at 96-119. PSNH's comments are uncontroverted.

PSNH has demonstrated that EPA failed to meet its statutory burden of rigorously evaluating whether the VCE/crystallizer technology and corresponding "no discharge" limit are legally "available" for the treatment of FGD waste waters. Further, PSNH has shown that EPA's reliance on other facilities to support the determination that the VCE/crystallizer technology and "no discharge" limit are legally "available" at Merrimack Station is improper, arbitrary, and capricious. The waste water chemistry generated, and the treatment technologies utilized, at the other facilities identified by EPA are unlike those at PSNH's Merrimack Station and a comparison of these facilities is therefore irrational.

While PSNH's August 18, 2014 comments address the Iatan, Mayo, and Italian facilities, very little information is known regarding the Chinese and Danish facilities mentioned in comments submitted by PSNH and UWAG. *See* PSNH 2014 Comments at 99; UWAG 2014

Comments at 24 (referencing the Chinese facility). With regard to the Chinese facility, there is no information in the record to which EPA can reasonably refer to support its assertion that the treatment system is capable of reliably and consistently eliminating all FGD waste waters or make a rational comparison of this facility to the SWWTS at Merrimack Station. In fact, what little, unverified information is included about the Chinese facility in EPA's fact sheet—*i.e.*, a treatment system supposedly has operated since 2009 without a brine concentrator and with a four-stage crystallizer—describes a technology and treatment process that is wholly distinct from that employed at PSNH's Merrimack Station. EPA's attempt to reference this Chinese facility in support of its BAT determination for Merrimack Station based on its incomplete and unsupported claims is therefore improper, arbitrary, and capricious.

On the other hand, more information has been obtained concerning the Vattenfall Nordjyllandsvaerket power station in Denmark. This information undercuts EPA's claims because the Denmark facility—like Merrimack Station—has been unable to eliminate its FGD purge stream. Instead, it is selling the "concentrated calcium chloride solution" or "brine" generated by normal FGD operations and the facility's evaporative treatment technology as a liquid de-icer that "will cover the market . . . within a distance of 25-50 km from" the plant.[3] Prior to discovering this beneficial reuse, the FGD purge had been "discharged in solution to a local water treatment plant."[4] Although identified as brine or as "calcium chloride liquor,"[5] the generated FGD purge contains the following constituents:

[3] N.O. Knudsen, *Production of a Liquid De-Icer by Evaporation of FGD Waste Water at Nordjyllandsvaerket, Unit 3*, VGB PowerTech J. 5/2006, at 1, 6 ("De-icer Paper").

[4] International Energy Agency, *Fossil Fuel-Fired Power Generation: Case Studies of Recently Constructed Coal- and Gas-Fired Power Plants*, at 48 (2007).

[5] *Id.* at 12, 46, 48.

Density	1,250 kg/m^3
Dry matter	25%
Freezing point	< 20 °C
Chloride	15 – 16%
Calcium	2 – 8%
Sodium, magnesium, potassium	<7%
Total nitrogen	<0.25%
Heavy metals: Cd, Hg, Cu, Ni, Zn, Cr, Pb	< 5 mg/liter

Table 4: Specification of the liquid de-icer [6]

There is no indication in literature reviewed that the Vattenfall facility has ever been able to eliminate all waste waters generated by its FGD system. Therefore, like the other facilities mentioned in EPA's Fact Sheet and heralded by the ESIGs, consideration of such facilities employing evaporative technologies as "zero discharge" facilities comes with the caveat that purges of waste water are required to keep the systems in balance and to avoid recurring maintenance, repair, and other operational issues. Merrimack Station is no different, and EPA's contrary conclusions are erroneous.

3. UWAG's related *fait accompli* comparison

PSNH agrees with UWAG's comment that EPA has circumvented its statutorily-required BAT analysis by assuming incorrectly that PSNH's SWWTS, as it currently exists, is capable of achieving zero liquid discharge. *See* UWAG 2014 Comments at 21. Specifically, EPA's only defense for its determination that PSNH's SWWTS is BAT for Merrimack Station, and the agency's corresponding "zero discharge" limit, would be that the agency believes it is requiring only that which already has been installed. *Id.* According to UWAG, then (and only then) could EPA's BAT determination potentially pass muster because "the decision causes no harm . . .

[6] De-icer Paper at 6.

because the money has been spent and the incremental cost of the requirement should be close to zero." *Id.*

But as UWAG points out:

> [T]he facts are different. The proposed permit does not accept the already-installed system as it is but demands that it be "zero discharge" without a purge stream. The permit ¶ 4 (p. 6) says simply that "the permittee is *not* authorized to discharge treated effluent from the Flue Gas Desulfurization System Waste Treatment Plant." But the assumption that the existing system is "zero discharge" is contrary to fact . . . . As a result, the zero discharge requirement imposes costs the Region has not even begun to consider. Those costs include ongoing expensive operations and maintenance costs and the continued cost of offsite disposal of the purge water.

Id. at 22. In its comments to the latest draft permit, PSNH explained why the SWWTS at Merrimack Station cannot achieve a zero discharge, must continue to generate a purge stream that has to be discharged, and requires flexibility due to periodic operational and maintenance issues. EPA failed to consider the unknown costs of modifying the existing SWWTS to attempt to achieve the draft permit's unattainable "no discharge" limit, and likewise ignored the perpetual costs associated with the aforementioned operation and maintenance occurrences. EPA simply presumes no additional costs exist. This determination is short-sighted and erroneous.

In sum, EPA cannot base its BAT determination on a presumption that the SWWTS can achieve zero discharge when, in fact, it cannot. EPA's attempt to reduce its statutorily-required BAT review to a presumption that BAT already exists is arbitrary and capricious. PSNH supports UWAG's comments concerning this gaping hole in EPA's BAT determination.

B. EPA Failed to Address a Mandatory BAT Factor

Southern Company correctly comments that EPA altogether failed to address one of the factors it is required to consider in establishing BPJ-based BAT effluent limits—namely,

analysis of the available control technologies for FGD waste streams within the electric power generation industry, followed by a review of treatment technologies at PSNH's Merrimack Station in particular. *See* Southern Company 2014 Comments at 12-16.

In developing BPJ-based BAT effluent limits, EPA is required to consider not just the factors in 40 C.F.R. § 125.3(d), but also the factors in § 125.3(c)(2), including "the appropriate technology for the category or class of point sources of which the applicant is a member, based upon all available information." *See* 40 CFR § 125.3(c)(2) and § 125.3(d); *see also* NPDES Permit Writers' Manual, EPA-833-k-10-001 (Sept. 2010), Chapter 5, Section 5.2.3.3 (confirming that case-by-case determinations must include a consideration of all of the factors in both § 125.3(c)(2) and § 125.3(d)). This factor mandates that EPA conduct a reasoned analysis of available control technologies for FGD waste streams within the electric power generation industry, followed by a review of treatment technologies at PSNH's Merrimack Station in particular. *See* Southern Company 2014 Comments at 15 (citing *See U.S. Steel Corp. v. Train*, 556 F.2d 822, 844 (7th Cir. 1977); *Alabama v. EPA*, 557 F.2d 1101, 1110 (5th Cir. 1977); *NRDC v. EPA*, 863 F.2d 863 F.2d 1420 (9th Cir. 1988)). EPA failed to consider this BAT factor or document its consideration of each BAT factor in the draft permit Fact Sheet. *See* NPDES Permit Writers' Manual at Section 5.2.3.6 ("Permit writers will need to document the development of case-by-case limitations in the NPDES permit fact sheet. . . . The information in the fact sheet should provide the NPDES permit applicant and the public a transparent, reproducible, and defensible description of how the BPJ limitations comply with the CWA and EPA regulations."). This failure renders EPA's BAT determination inadequate for PSNH's Merrimack Station.

Proper consideration of this BAT factor may have impacted EPA's analysis in this permit renewal proceeding because much of the analysis already was completed by EPA Headquarters in its Proposed Effluent Guidelines for the Steam Electric Power Generating Category. *See* 78 Fed. Reg. 34,432 (June 7, 2013) (hereinafter "NELGs"). In its rulemaking, EPA evaluated VCE/ZLD[7] technology and, following its analysis, did not select the treatment technology as one of its four preferred options for the treatment of FGD waste waters. This determination strongly suggests EPA will not mandate VCE/ZLD for the treatment of FGD waste streams in its final NELGs. EPA Region 1 failed to explain or document the basis for its departure from EPA Headquarters' determination that VCE/ZLD technologies are not a preferred treatment option for the treatment of FGD waste waters. EPA Region 1 must explain the basis for its divergence from EPA Headquarters' thorough analysis of this technological treatment option. Its failure to do so is arbitrary and capricious and warrants additional consideration—including public comment—prior to any final permit issuance for Merrimack Station.

C. PSNH Agrees that the Costs Associated with the Installation, Operation, and Maintenance of PSNH's SWWTS Exceed EPA's Established Cost-Benefit Threshold

PSNH, UWAG, EPRI, and Southern Company are the only entities that offered comments analyzing the cost and relative benefits associated with the operation of the SWWTS at Merrimack Station. Indeed, EPA did not even do so. In the respective comments of PSNH, UWAG, EPRI, and Southern Company, each determined the SWWTS at PSNH's Merrimack Station does not satisfy EPA's established $404/TWPE (1981 $) cost-effectiveness threshold, *even if one hypothetically were to assume PSNH could, within its current operational*

[7] PSNH explained in its original comments to the latest draft permit that the term "ZLD" is an improper one because "zero liquid discharge" is a discharge limitation and is not a technological treatment option for FGD waste waters. *See, e.g.*, PSNH 2014 Comments at 30-31. PSNH utilizes the "ZLD" term here only because that is how EPA referred to the evaporative technological option evaluated in the draft NELGs.

circumstances, comply with the "no discharge" effluent limit in EPA's draft permit and eliminate the remaining TWPE from the PWWTS effluent (which, for the reasons explained extensively in PSNH's original comments to this latest draft permit, it cannot). PSNH supports the comments and calculations included in EPRI's and UWAG's respective comments on the cost-effectiveness issue. *See* PSNH 2014 Comments at 135-38; UWAG 2014 Comments at 12-21, Attachment 1; EPRI Comments on the Revised Draft Determination of Technology-based Effluent Limits for the Flue Gas Desulfurization Wastewater at Merrimack Station in Bow, New Hampshire at 1-2, Appendix A (Aug. 18, 2014). PSNH likewise supports the comments and calculations included in Southern Company's comments to the draft permit. *See* Southern Company 2014 Comments at 17-19, Attachment 1.

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In both these and its original comments to the draft permit, PSNH has provided ample facts and analyses to inform EPA that the SWWTS at Merrimack Station: (1) is a volume reduction system installed at the facility to enable PSNH to handle manageable quantities of treated FGD effluent; (2) has consistently satisfied PSNH's volume reduction needs; and (3) was not designed or installed at Merrimack Station to function as a pollutant reduction system. EPA's consideration of the SWWTS as a pollutant reduction system is a false premise. And, its establishment of a zero discharge limit based on this false premise is improper.

Therefore, even if the SWWTS currently was capable of achieving the no discharge limit in the draft permit (and it is not), the costs and corresponding benefits under the above-described scenarios do not satisfy any cost-benefit test or threshold consistently used by EPA in the past for

determining BAT. In reality, no existing FGD treatment technology could satisfy EPA's standards because the simple fact is that very few constituents remain in Merrimack Station's FGD waste water following treatment by the PWWTS, the principal pollutant reduction system at Merrimack Station. For these reasons, EPA's designation of the SWWTS at Merrimack Station as BAT and as "ZLD," coupled with the agency's "no discharge" limit, are erroneous, arbitrary, and capricious.

D. The Environmental Special Interest Groups' Comments to the Draft Permit and to the NELGs are Superficial, Not Credible, and Reveal the Organizations' Unwavering Objective to Eliminate Coal-Fired Electric Generation

The ESIGs submitted comments supporting EPA's BAT determination and its zero-discharge limit for FGD waste water at Merrimack Station, while seeking to prohibit discharges of treated waste water to POTWs or the discharge of leachate containing waste water-conditioned fly ash. In other words, the ESIGs support the draft permit's zero limit and at the same time seek to eliminate the "compliance scenarios" the draft permit relies upon for achieving the zero limit.[10] The ESIGs' comments are superficial, unreliable, and demonstrate why an NPDES permit limit should not be made dependent on compliance scenarios already challenged by environmental groups.

1. The ESIGs Ignore the Operational Constraints of the SWWTS

The ESIGs dedicate about one page of their comments to asserting that PSNH's SWWTS at Merrimack Station and EPA's proposed "no discharge" limitation are technologically achievable. *See* ESIGs 2014 Comments at 4-5. Their trifling remarks offer no value to EPA in making its permitting determinations and, correspondingly, merit little response from PSNH.

[10] This is not surprising, considering Conservation Law Foundation's mission is "to shut down" coal-fired power plants "such as Merrimack Station in Bow." *See* www.clf.org. Similarly, Sierra Club's objective is to shut down all coal-fired electric generating facilities in America, regardless of the impact on or cost to the public. http://content.sierraclub.org/coal/.

Specifically, the ESIGs do not attempt to address the actual operations of the SWWTS at Merrimack Station and/or why they believe the treatment system can achieve the "no discharge" limit proposed in the draft permit. Conversely, PSNH offered detailed comments about the SWWTS operations, the purpose for which it was installed at Merrimack Station, and why the treatment system cannot currently achieve a "no discharge" limit. *See, e.g.,* PSNH 2014 Comments at 79-96; 119-33. PSNH's August 18, 2014 comments explain why EPA's BAT determination, and corresponding "no discharge" limitation, are arbitrary, capricious, and unachievable for PSNH's Merrimack Station.

The ESIGs' comments regarding technological availability hinge on two basic propositions: (1) PSNH has installed and operated its SWWTS at Merrimack Station; and (2) other VCE and crystallizer systems are in use at other plants in the world. *See* ESIGs' 2014 Comments at 4-5. The ESIGs' restatement of the incomplete information in EPA's Fact Sheet does not support the draft permit's requirement that PSNH eliminate all FGD waste water discharges from Merrimack Station.

As to the first proposition, while it is true that the SWWTS is installed and operates successfully at Merrimack Station, it is not currently able to achieve a "no discharge" limitation. Because the ESIGs offer no support, evidence, or justification for their belief that PSNH's SWWTS can achieve this flawed permit condition, the ESIGs' comments do nothing to rebut the fact the SWWTS must generate a purge stream and requires certain operational flexibilities. *See, e.g.,* PSNH's 2014 Comments at 79-96; 119-33. Of course, the ESIGs seek to eliminate any operational flexibility in their comments. The ESIGs' unsubstantiated hyperbole is contradicted by PSNH's first-hand experience explained in its comments.

The ESIGs' second proposition also is devoid of any meaningful comparison of the few VCE and crystallizer technologies utilized in other parts of the world to the SWWTS at Merrimack Station.[11] The ESIGs do not address any site-specific factors or whether any such facility is consistently achieving a "no discharge" limit. They do not address whether these other facilities experience periodic technical and operational issues and/or need to generate and dispose of a discharge stream akin to the purge stream generated by the SWWTS at Merrimack Station. In its own comments, PSNH comprehensively reviewed these other facilities that employ some form of evaporative technology and explained that they, too, do not eliminate all FGD waste waters through their respective treatment processes. Further, many continue to experience episodic technical and operational issues that cause periodic disruptions in plant operations. *See* PSNH 2014 Comments at 96-119. The ESIGs' cursory comments on this topic must therefore be disregarded by EPA.

The relevant portions of the ESIGs' comments to EPA's NELGs are immaterial to this permit renewal proceeding. The ESIGs' NELG comments discuss waste streams and/or technological options (*e.g.*, cooling tower blowdown and cold crystallization) inapplicable to PSNH and its SWWTS, and suffer from the same deficiencies addressed above by PSNH. *See* ESIGs' Comments to NELGs at 19-21. These comments lack any substance.

The ESIGs' NELGs comments addressing the "process changes" BAT factor as it relates to mechanical evaporation technology are fatally flawed as well and signify an overall fundamental misunderstanding about the operational realities of this treatment technology. Those comments provide:

[11] The ESIGs claim that Duke Energy's Roxboro Station is in the process of installing a VCE system. *See* ESIGs 2014 Comments at 5. This is not true. There is no full or partial VCE installation planned or underway for FGD waste water treatment at Roxboro Station.

> The type of coal burned in a generating unit affects the concentrations of chlorides, dissolved solids, and metals in the FGD blowdown. However, the pre-treatment steps that EPA has evaluated as part of the mechanical evaporation technology option are designed to bring each of these components into the range suitable for the brine concentration system. Therefore, no upstream process changes are required for proper operation of the mechanical evaporation system.

Id. at 26 (emphasis added). The first sentence is correct inasmuch as it acknowledges that the type of coal utilized at a facility impacts the makeup and chemistry of the FGD waste water. The remainder is entirely wrong.

PSNH has made myriad operational changes to its PWWTS and other "upstream" processes in order to stabilize and optimize operation of its SWWTS at Merrimack Station. Changes of this kind likely have been required at all other facilities utilizing some form of evaporative technology, as well. PSNH's engineer, Mr. Richard R. Roy, has implemented so many changes in fact that he, along with Ms. Patricia Scroggin with Burns & McDonnell, drafted a paper summarizing the key process changes made at Merrimack Station in order to effectively operate the SWWTS. *See* R. Roy & P. Scroggin, "The Thermal Experience for FGD Wastewater at PSNH's Merrimack Station," IWC Paper 13-47 (2013) (referencing pH changes, softening steps, settling techniques, water balance impacts, etc. as process changes employed at Merrimack Station due to operation of the SWWTS). These ongoing process changes were described in great detail in PSNH's original comments to the latest draft permit, as well, and directly refute the ESIGs' contradictory claim. *See, e.g.*, PSNH 2014 Comments at 31-61.

The ESIGs' hollow assertion that "no upstream process changes are required for proper operation of the mechanical evaporation system" illustrates a fundamental lack of understanding of power plants, the operational sensitivities of evaporative treatment systems, and the manner in which this treatment technology is utilized at electric generating facilities. The ESIGs' cursory

and self-serving comments—both in this permit renewal proceeding and in the NELGs rulemaking—therefore offer no value and should be disregarded by EPA as it makes its final BAT determinations for Merrimack Station.

2. The ESIGs' Statement that PSNH's SWWTS and "No Discharge" Limitation are Economically Achievable is Self-Serving and Perfunctory

The ESIGs' assertion that PSNH's SWWTS, coupled with EPA's proposed "no discharge" limit, are economically achievable is unsupported and baseless. Like EPA, the ESIGs misunderstand the operational capacity of this treatment system technology and what it can reasonably and consistently achieve.

PSNH explained in its original comments that the SWWTS at Merrimack Station was not designed or installed to function as a pollutant reduction system and cannot achieve the impossible "no discharge" limit included in EPA's draft permit. *See, e.g.*, PSNH 2014 Comments at 17-20. The SWWTS was designed and installed at Merrimack Station as a volume reduction system and continues to serve this purpose for PSNH. *See id.* Any assertion or belief that the SWWTS has completely "eliminate[ed] the discharge of FGD wastewater at the Merrimack Station" is false, yet, it is the linchpin to the ESIGs' analysis in their comments. *See* ESIGs 2014 Comments at 6. Because the SWWTS cannot achieve the "no discharge" limit included in EPA's draft permit, it is not technologically achievable and, therefore, cannot be economically achievable at this time. The mere fact of installation of the SWWTS in 2012 does not make a zero discharge limit technologically or economically achievable. PSNH's thorough explanations about the capabilities, limitations, and purpose of the SWWTS, based on first-hand experience, render the ESIGs' conclusory comments unsupported and meaningless.[12]

[12] Aside from being factually flawed, the ESIGs' comments regarding economic achievability are misleading because they mischaracterize the appropriate legal standard for analyzing costs to establish BAT

3. The ESIGs' Comments and Justifications Seeking to Compel EPA to Prohibit Continued Shipments of FGD Waste Water to POTWs as a Compliance Option for Merrimack Station are Wrong

The ESIGs lack a basic understanding of POTW operations and the NPDES permits these facilities possess. The entirety of the ESIGs' comments suggest actions that either already have been undertaken by the various POTWs accepting waste water from PSNH or are outside the scope of EPA's regulatory authority. PSNH's consultant, GZA GeoEnvironmental, Inc. ("GZA"), addressed and responded to each of the ESIGs' POTW comments.[13] GZA's comments, along with the October 20, 2014 comments Lowell Regional Wastewater Utility ("LRWWU") filed with EPA, invalidate each of the ESIGs' comments on this topic and prove that the ESIGs' comments should be disregarded by EPA in this permit renewal proceeding.

4. The Drinking Water Concerns Raised by the ESIGs are Nonexistent

The ESIGs' generic discussion of trihalomethane ("THM") formation within drinking water systems due to the presence of bromide in source waters is irrelevant to the permit renewal process for Merrimack Station. *See* ESIGs 2014 Comments at 11-12. PSNH does not add any bromine- or bromide-containing materials in its plant operations and/or treatment processes and does not intend to do so within the foreseeable future to comply with EPA's new Mercury Air Toxics Standards ("MATS") or otherwise. Moreover, there are currently no water quality limits

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standards. The ESIGs contend that the CWA forbids EPA from using a cost-benefit analysis for a BAT determination. *See* ESIGs 2014 Comments at 11. This is neither accurate nor supported by the cases they cite. In fact, courts have concluded the opposite, finding "the agency *must* consider the benefits derived . . . *in relation to* the associated costs in order to determine whether, in fact, the resulting progress [from a limitation established under CWA § 301(b)(2)(A)] is 'economically achievable,' and whether the progress is 'reasonable.'" *Appalachian Power Co. v. Train*, 545 F.2d 1351, 1361 (4th Cir. 1975) (emphasis added); *see also BP Exploration & Oil v. US EPA*, 66 F.3d 784, 796 (6th Cir. 1995) (providing that it "is wrong to contend that EPA is not permitted to balance factors such as cost against effluent reduction benefits"); *Weyerhaeuser Co. v. Costle*, 590 F.2d 1011, 1045 (D.C. Cir. 1978) (noting that "[a]ll factors, including costs and benefits, are consideration factors" when making a BAT determination).

[13] GZA's comments, entitled "Response Comments to August 14, 2014 Letter from Conservation Law Foundation/Earthjustice/Environmental Integrity Project/Sierra Club to USEPA Region 1" (October 2014), are attached hereto as Exhibit 2.

for bromide because the constituent, in and of itself, does not constitute an environmental or health hazard.[14] Regardless, to the best of PSNH's knowledge, there is no evidence drinking water facilities located downstream of Merrimack Station have experienced excessive disinfection by-product ("DBP") formation issues. The ESIGs' interjection of this red herring in an attempt to support the "no discharge" limitation in the draft permit is therefore improper and must be disregarded by EPA.

Even if this were a material issue for Merrimack Station and the Merrimack River, which it is not, the comments offered by the ESIGs and in Dr. Jeanne VanBriesen's ("VanBriesen") report entitled "Potential Drinking Water Effects of Bromide Discharges from Coal-Fired Electric Power Plants" are incorrect and/or oversimplified. For instance, VanBriesen's report insinuates a direct, causal relationship with elevated bromide concentration and THM development, resulting in the adverse impact of treatment processes at drinking water treatment plants. This purportedly straightforward relationship between bromide and THM development is flawed. PSNH's consultant, Mr. William Kennedy ("Kennedy"), addresses VanBriesen's report and explains the host of factors that impact THM formation.[15] PSNH supports the comments offered by Kennedy.

In the end, and as explained above, the imposition of a technological treatment system at Merrimack Station due to this potential THM development issue is unjustified because no such THM formation issues currently exist. And, even if such issues were to arise in the future, there

[14] *See* World Health Organization, *Bromide in drinking-water" Background document for development of WHO Guidelines for Drinking-water Quality*, WHO/HSE/WSH/09.01/6, at 1 (2009) (identifying bromide as non-toxic to humans and further stating that because the "[b]romide ion has a low degree of toxicity . . . bromide is not of toxicological concern in nutrition" and may even be "nutritionally beneficial" on some level); EPA, *Environmental Assessment for the Proposed Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category*, EPA-821-R-13-003, at 3-10 (April 2013) (providing that "bromide is not of toxicological concern to humans").

[15] Kennedy's comments, entitled "Review of Comments to the Proposed NPDES Permit for Public Service of New Hampshire's Merrimack Station" (October 2014), are attached hereto as Exhibit 3.

is nothing to suggest that Merrimack Station's current operations impact this wholly distinct drinking water treatment issue.

5. The ESIGs' Comments on Leachate Discharges Associated with Mixing FGD Waste Water with Fly Ash are Factually Flawed

Further compounding their misunderstanding of how VCE/crystallizer technologies function (and, more importantly, how PSNH's SWWTS operates at Merrimack Station), the ESIGs direct EPA to eliminate any purported circumvention of the erroneous "no discharge" limit the agency has set out in the draft permit by: (1) expressly prohibiting the application of brine concentrate to fly ash destined for a landfill; and (2) setting effluent limits for landfill leachate based on the characteristics of that leachate when the fly ash is not conditioned with brine concentrate. *See* ESIGs 2014 Comments at 10. As justification for this requested action, the ESIGs provide that allowing PSNH to mix brine concentrate from the "first phase" of its SWWTS does not force the company to operate the "second phase" of the SWWTS, which is the crystallizer that, according to the ESIGs, eliminates the brine concentrate and produces only a salt cake and distillate that can be reused in the FGD system. *Id.* The comments and demands of the ESIGs are erroneous for the reasons that follow.[16]

[16] The ESIGs' comments about ash conditioning also are inconsistent with those made by the organizations in response to EPA's draft NELGs, which also were submitted to EPA Region 1 in response to the Merrimack Station draft permit despite having little to no relevance in this permit renewal process. As background, EPA "reject[ed]" mechanical evaporation (i.e. VCE/crystallizer) technologies as BAT for the treatment of FGD waste waters in the draft NELGs "because the total industry cost . . . [was] too high." ESIGs' Comments to NELGs at 24. The ESIGs disagreed with EPA's affordability determination and argued that EPA's industry cost estimates were too high. In doing so, the ESIGs specifically referenced ash conditioning with brine concentrate as a viable alternative to operating the more costly forced-circulation crystallizers for the elimination of brine concentrate. *Id.* at 23.

Ash conditioning is either an acceptable treatment option for FGD waste waters or it is not. The ESIGs cannot argue that ash conditioning is a viable treatment/disposal option in an attempt to lower cost estimates associated with operating the technology and yet, on the other hand, argue that EPA should expressly prohibit the ash conditioning process because it purportedly allows regulated entities to circumvent a "no discharge" limit for FGD waste waters. The ESIGs cannot have it both ways, and their inconsistent positions discredit their overall arguments regarding this treatment technology.

As a threshold matter, PSNH thoroughly explained in its original comments to the latest draft permit that EPA's proposed compliance "scenario" of using "treated FGD waste water for ash conditioning prior to landfilling" is not, in and of itself, a viable compliance option for the elimination of all FGD waste waters due to insufficient quantities of fly-ash at Merrimack Station.[17] *See* PSNH 2014 Comments at 88-90. This fact alone renders the ESIGs' comments and suggested actions regarding fly ash conditioning superfluous and unnecessary.

The ESIGs' comments also depend on facts that are untrue. First, the ESIGs are incorrect that operation of "both phases" of the SWWTS at Merrimack Station results in only a salt cake and a distillate that can be reused in the FGD system. PSNH's SWWTS must also generate a purge stream for reasons the company explained in detail in its original comments to the latest draft permit. *See, e.g.*, PSNH 2014 Comments at 80-88. Running the "second phase" of the SWWTS therefore does not eliminate all FGD waste water, as the ESIGs assert in their comments. The unavoidable purge stream must be disposed of in some manner regardless of the components of the SWWTS utilized at Merrimack Station.

Second, contrary to the ESIGs' belief, PSNH does not mix any waste water that is directly from the brine concentrator with fly ash generated at Merrimack Station. The ESIGs' requested prohibition on the application of waste water from the brine concentrator to fly ash destined for a landfill is therefore irrelevant.

Lastly, the ESIGs erroneously assume that a landfill exists at Merrimack Station within which PSNH disposes of FGD purge-conditioned fly ash. This is not the case. Any discussion of, or request for, regulation of landfill leachate due to ash conditioning in any final renewal permit for Merrimack Station is therefore misplaced.

[17] UWAG submitted similar comments on the viability of this ash conditioning compliance scenario, which PSNH concurs with and supports. *See* UWAG 2014 Comments at 10-11.

The underlying factual errors in the ESIGs' comments on ash conditioning, coupled with PSNH's declaration that fly-ash conditioning is not a viable compliance option due to insufficient quantities of fly-ash at Merrimack Station, necessitate that EPA disregard the ESIGs' comments on this regulatory compliance option.

6. The ESIGs' Attack on EPA's Compliance Scenarios Demonstrates the Necessity of a Permit to Discharge Waste Water to the Merrimack River Following Treatment with the PWWTS

Parts II and III to the ESIGs' comments challenge two of the draft permit's "compliance scenarios"—discharging treated waste water to POTWs (Part II) and mixing treated FGD waste water with fly ash (Part III). Notwithstanding the lack of merit to their comments, the ESIGs' comments demonstrate another reason why EPA's "no discharge" limit BAT determination is unlawful. Permit compliance cannot be made dependent on the actions and permits of third-parties, as illustrated by the ESIGs' attacks on the various "compliance scenarios." *See* PSNH 2014 Comments at 88-96. In effect, the ESIGs seek a zero limit and no means for PSNH to comply with it. This is absurd and demonstrates why PSNH should be allowed to discharge FGD effluent treated by the PWWTS directly to the Merrimack River.

7. The Report of John H. Koon submitted with Conservation Law Foundation's 2012 Comments to EPA's Draft Permit for Merrimack Station is Superficial and of No Value or Relevance

EPA has requested comments on its determination that the evaporative technology implemented at PSNH's Merrimack Station is BAT. EPA has moved beyond water quality standards and discharge loadings to request a discussion on BAT for the treatment of FGD waste waters. Dr. John H. Koon's ("Koon") February 24, 2012 report offers nothing of relevance to that discussion. There is no technology discussion in his report. He has no experience with physical-chemical treatment, biological treatment, brine concentrators, crystallizers, or salt presses, much less any of these individual components utilized in series as a combined system

that he has articulated in his report. His report provides no input into the technological discussion of these or alternate technologies competing to best treat PSNH's FGD wastewater. Instead, Koon's report recites publicly available information with no technology-specific analysis. While it relates waste water treatment capital expenditures to project capital expenditures or plant worth, there is no comparison to other technologies as would be expected to determine the best technology. While he has related parasitic load for the wastewater treatment system to the overall station service or nation-wide electrical load, there is no comparison of parasitic load with other technologies as would be expected to determine the best technology. The words "brine concentrator" and "crystallizer" only appear as a quote from a document prepared for PSNH. There are no meaningful comments to his report as it provides no relevant information to comment upon.

Kennedy, PSNH's consultant, responds to and critiques Koon's cursory report.[18] PSNH supports the comments offered by Kennedy.

III. PSNH AGREES WITH UWAG'S COMMENT THAT EPA MUST REVISIT ITS CWA SECTION 316(b) DETERMINATIONS IN LIGHT OF THE NEW FINAL RULE AND REFRAIN FROM ANY BPJ-BASED BTA DETERMINATION DUE TO THE FINAL RULEMAKING

On May 19, 2014, EPA released its final rule on cooling water intake structures ("CWISs") for existing power plants, pursuant to Section 316(b) of the CWA (hereinafter the "316(b) Rule"). The rule was published in the Federal Register on August 15, 2014, and became effective on October 14, 2014. *See* 79 Fed. Reg. 48,300 (Aug. 15, 2014). The issuance of this rule eliminates EPA's ability to issue a final NPDES permit regulating the CWIS at Merrimack Station utilizing the agency's outmoded BPJ regulatory authority. UWAG correctly noted this fact in its August 18, 2014 comments to EPA's latest draft permit. *See* UWAG 2014 Comments

[18] *See* Exhibit 3, at 5-8.

at 33. ("The Merrimack Station draft permit must now be revised to comply with the [316(b) Rule], and the revisions should be made available for comment."). PSNH agrees with UWAG's comments and has retained consultants to evaluate how the requirements of the new rule apply to Merrimack Station and its CWISs, as well as how best to tailor and/or improve upon analytical evaluations the company previously submitted to EPA to conform with the scientific studies required by the 316(b) Rule. EPA is legally obligated to revisit its 316(b) determination in the draft permit for Merrimack Station and must allow the public to review and comment on the revisions to the draft permit mandated by the final 316(b) Rule.

A. Any Attempt by EPA to Finalize a BPJ-Based BTA Determination is Unlawful, Arbitrary, and Capricious in Light of EPA's 316(b) Rule

BPJ-based case-by-case Section 316(b) best technology available ("BTA") determinations are only proper when national regulations have not been set. Because EPA has finalized a national rulemaking, EPA's authority to issue a case-by-case determination for the CWISs at Merrimack Station ceases to exist. *See* 40 C.F.R. § 125.3(c)(2) (providing that the imposition of case-by-case technology-based treatment requirements in NPDES permits is acceptable only if EPA-promulgated effluent limitations developed under section 304 of the CWA are inapplicable). Any attempt by EPA to issue a final permit at this time using its BPJ therefore would be unlawful and would amount to an attempt to impose limits on Merrimack Station that simply will not be required at other facilities in the industry.

The Ninth Circuit has recognized the absurdity of proceeding with establishing BPJ case-specific effluent limits when NELGs are almost complete, much less when final NELGs have been issued. *See Nat. Res. Defense Council, Inc. v. EPA*, 863 F.2d 1420 (9th Cir. 1988) ("*NRDC*"). It was EPA that defended its refusal to utilize its BPJ authority to set effluent limits because national standards for the offshore oil industry would soon be promulgated to set a

nationwide, uniform requirement on this issue and EPA did not want to conflict with the forthcoming national effluent limits. *Id.* at 1427. The court agreed with EPA's decision and provided the following apt statement:

> The recent "anti-backsliding" amendment to the Act is designed to prevent "backsliding" from limitations in BPJ permits to less stringent limitations which may be established under the forthcoming national effluent limitation guidelines. . . . If the EPA were to require as BAT the retrofitting of all drilling sources for reinjection of produced water in the Gulf of Mexico, and, the *eventual* national standards were less stringent in any respect, there would be an inconsistency between BAT for Gulf drilling and BAT for the rest of the nation's off-shore drilling. This inconsistency would lack any apparent scientific or equitable basis. If, on the other hand, the eventual national standards embody more stringent standards that this permit requires, this permit can be reopened and its standards made more stringent. Given the large commitment of resources that would be necessary to begin retrofitting, the values of certainty and uniformity inherent in the congressional scheme [of the CWA] take on added significance. There is a justification for some delay in this situation in order to ensure that the produced water limitation in the Gulf conforms with the national standard.

Id. (emphasis added) (internal citation and quotation marks omitted); *see also Delaware Riverkeeper Network v. Delaware*, No. N13M-10-009 DCS, at 6, 9-10 (Del. Sup. Ct. Jan. 2, 2014) (holding that a permit writer was justified in delaying the issuance of a renewed NPDES permit for 11 years due to, *inter alia*, EPA's repeatedly advising that the final 316(b) Rule was forthcoming); 49 Fed. Reg. 37,998, 38,020 (Sept. 26, 1984) (in addressing concerns about EPA's proposed anti-backsliding standard and the expectation that more permits issued based on a permit writer's BPJ would be challenged as a result, EPA provided its policy would be that "if

promulgation of a [national effluent limitation] guideline is expected, [it] will generally defer permit issuance rather than issue a BPJ permit").[19]

Guidelines and/or technology standards should be applied equally to all permittees and not penalize or create a competitive disadvantage for regulated entities subjected to case-by-case permit determinations—especially when those case-by-case determinations are unlawfully rendered after a national rule has been promulgated. *See NRDC v. Costle*, 568 F.2d 1369, 1378 (D.C. Cir. 1977) ("the primary purpose of the effluent limitations and guidelines was to provide uniformity" and minimize pressure to "compete for industry and developments"). Requiring installation of closed-cycle cooling technologies at Merrimack Station will forever deprive PSNH the opportunity to pursue the more reasonable compliance options afforded by the new national regulations due to anti-backsliding rules that prevent EPA from changing, renewing, or reissuing an NPDES permit with technology limits that are less strict than the limits in the previous permit. *See* 33 U.S.C. § 1342(o). It is therefore not only proper, rather mandatory, for EPA to abandon its BPJ-based BTA determinations and apply the national standards included in the final 316(b) Rule to the CWISs at Merrimack Station. Otherwise, the BPJ-based permit could lead to the absurd result of forcing PSNH to go through timely, costly, and unnecessary efforts to comply with the case-specific BTA limits that will never be applied to any other source. For these reasons, the determination also deprives PSNH equal protection under the law.

Ultimately, any attempt to issue a final permit for Merrimack Station including BPJ-based BTA requirements would be patently unreasonable and unlawful due to the issuance of the final 316(b) Rule. The CWA obligates EPA to abandon its case-specific BTA determinations for

[19] Notably, this argument applies to FGD waste water effluent guidelines, as well. EPA has issued proposed NELGs for the steam electric power generating category and is obligated to finalize the regulatory rulemaking in or before September 2015.

Merrimack Station's CWISs and formulate new permit conditions in accordance with the final 316(b) Rule.

B. PSNH Must Revise its Scientific Studies to Conform with the Requirements of the Final 316(b) Rule

The new 316(b) Rule offers a number of compliance options and, with limited exceptions, requires a regulated entity to conduct and submit myriad scientific studies to their respective permit writer in order to evaluate permissible impingement and entrainment compliance scenarios. PSNH has submitted numerous 316(b)-related studies to EPA over the years. However, none of its scientific studies include the precise comprehensive analyses now required by the 316(b) Rule. EPA must allow PSNH an opportunity to complete the mandatory studies and compliance evaluations enumerated in the 316(b) Rule before the agency makes a final decision regarding the regulation of CWISs at Merrimack Station. The compliance options and studies required by the 316(b) Rule are described in detail below.

A general overview of the 316(b) Rule is obligatory in order to properly put into context the scope and purpose of the mandatory scientific studies. As background, Section 316(b) of the CWA requires the location, design, construction, and capacity of CWISs to reflect BTA for minimizing adverse environmental impacts, primarily by reducing the amount of fish and shellfish that are impinged or entrained at a CWIS. Because the 316(b) Rule impacts 544 power plants within the United States, including PSNH's Merrimack Station, EPA determined it best to "ensure flexibility" for compliance with the final rule. The agency therefore specifically stopped short of requiring closed-cycle cooling to be implemented nationwide at all existing facilities, citing several reasons including reliability of energy delivery and prohibitive costs for some facilities. Instead, the agency offered regulated entities the following seven options for meeting the BTA requirements for reducing impingement:

- Operate a closed-cycle recirculating system (i.e. cooling tower);
- Operate a CWIS that has a maximum through-screen design intake velocity of 0.5 foot per second (fps);
- Operate a CWIS that has a maximum through-screen intake velocity of 0.5 fps;
- Operate an offshore velocity cap, an open intake designed to change the direction of water withdrawal from vertical to horizontal and located a minimum of 800 feet from the shoreline;
- Operate a modified traveling screen that the EPA determines meets the 316(b) Rule standard and is the BTA for impingement reduction;
- Implement another combination of technologies, management practices and operational measures that the EPA determines is BTA for impingement reduction; or
- Achieve a 12-month impingement mortality performance of 24 percent mortality or less, including latent mortality (18 to 96 hours), for all nonfragile species.

See 40 C.F.R. § 125.94(c). Few, if any, power plants in the United States are expected to elect to operate a closed-cycle recirculating system (Option 1) or adhere to the 12-month impingement mortality performance of 24 percent mortality or less (Option 7) to comply with the impingement mortality requirements of the 316(b) Rule. Options 1, 2 and 4 are preapproved technologies requiring little or no demonstration of flow reduction. Options 3, 5 and 6 require additional information to be submitted to the permitting agency, including an impingement technology performance optimization study that includes two years of at least monthly impingement mortality monitoring, before the technology may be accepted as BTA to control impingement mortality. For compliance alternatives 5 and 6, this additional information includes site-specific impingement studies supported by two years of biological sampling data.

In addition to the seven impingement compliance options, the 316(b) Rule offers a *de minimis* rate of impingement option where facilities can assert that rates of impingement are so low that additional impingement controls are not justified. *See* 40 C.F.R. § 125.94(c)(11). The standard is not precisely defined. Instead, permitting authorities, based on a review of site-

specific data provided by the facility, could conclude that the documented rate of impingement at the cooling water intake is so low that no additional controls are warranted. *Id.* Separately, the 316(b) Rule authorizes a facility with a low average annual capacity utilization factor (less than 8 percent averaged over a 24-month period) to obtain less stringent requirements for impingement mortality for its intake structure. *See* 40 C.F.R. § 125.94(c)(12).

Regardless of the chosen compliance option, each regulated facility must complete a battery of analyses as part of the impingement mortality assessment, including the following:

- Source Waterbody Physical Data: Requires a description and scaled drawings showing the physical configuration of the water body, including areal dimensions, depths, and temperature ranges, identification and characterization of the source waterbody's hydrological and geomorphological features, estimates of the intake's area of influence within the waterbody, and locational maps;

- CWIS Data: Requires information on the design of the intake structure and its location in the water column, including design intake flows, daily hours of operation, number of days of the year in operation and seasonal changes, if applicable, a flow distribution and water balance diagram that includes all sources of water to the facility, recirculating flows, and discharges, and engineering drawings of the cooling water intake structure;

- Source Waterbody Baseline Biological Characterization Data: Characterization of the biological community in the vicinity of the CWIS;

- Cooling Water System Data: Information on the operation of the cooling water system, including descriptions of reductions in water withdrawals, recycled water, and proportion of the source waterbody withdrawn;

- Impingement Compliance Method Plan: A description of the chosen compliance method for impingement mortality, including any requests for BTA determinations under the alternative standards for *de minimis* rates of impingement or low capacity utilization power generation units;

- Performance Data: Summary of biological survival studies conducted at the facility and a summary of any conclusions or results, including site-specific studies addressing technology efficacy, entrainment survival, and other impingement and entrainment mortality studies; and

- Operational Status Information: Descriptions of each unit's operating status, including the age of the unit, capacity utilization for the previous five years, and any major upgrades completed within the last 15 years.

See 40 C.F.R. § 122.21(r)(ii)(1)-(8).

The 316(b) Rule does not establish a national BTA entrainment standard. Instead, the permitting agency will determine BTA entrainment requirements for a facility on a case-by-case basis utilizing the following mandatory factors: the numbers and types of organisms entrained, including threatened and endangered species; the impact of changes in particulate emissions or other pollutants; land availability relating to the feasibility of entrainment technology; remaining useful plant life; the quantified and qualitative social benefits and costs of available technologies; entrainment impacts on the source waterbody; and impacts on the reliability of energy delivery within the immediate area. *See* 40 C.F.R. § 125.94(d).

Existing facilities with an actual intake flow ("AIF") of more than 125 million gallons per day ("MGD") of cooling water are required to conduct comprehensive peer-reviewed studies to help determine whether and what site-specific controls, if any, are required to reduce entrainment mortality caused by the operation of CWISs. *See* 40 C.F.R. § 122.21(r)(ii)(9)-(13) The required entrainment studies include the following:

- Entrainment Characterization Study: Requires the regulated entity to develop and submit an entrainment mortality data collection plan; requires that the entrainment mortality data collection plan be peer-reviewed within 1 year; and requires the entrainment mortality data collection plan to be implemented within 6 months after submission of the entrainment mortality data collection plan to the permitting authority;

- Comprehensive Technical Feasibility and Cost Evaluation Study: Requires a description of all technologies and operational measures considered, including documentation of factors that make a technology impractical for further evaluation. The cost evaluation is based on least-cost approaches to implementing each technology while meeting all regulatory and operational requirements of the facility. The study must be peer-reviewed;

- Benefits Valuation Study: Requires a detailed discussion of the magnitude of water quality benefits, both monetized and non-monetized, of the entrainment mortality reduction technologies evaluated in the Comprehensive Technical Feasibility and Cost Study, including incremental changes in the impingement mortality and entrainment mortality of fish and shellfish; and monetization of these changes to the

extent appropriate and feasible using the best available scientific, engineering, and economic information. Benefits that cannot be monetized will be quantified where feasible and discussed qualitatively. The study would also include discussion of recent mitigation efforts already completed and how these have affected fish abundance and ecosystem viability in the intake structure's area of influence. Finally, the report would identify other benefits to the environment and the community; and

- Non-water Quality and Other Environmental Impacts Study: Requires a detailed discussion of the changes in non-water quality factors attributed to technologies and/or operational measures considered. These changes could include increases or decreases in the following, as examples, energy consumption, thermal discharges including an estimate of increased facility capacity, operations, and reliability due to relaxed permitting constraints related to thermal discharges; air pollutant emissions and their health and environmental impacts, noise, safety such as the potential for plumes, icing, and availability of emergency cooling water, grid reliability including an estimate of changes to facility capacity, operations, and reliability due to cooling water availability, consumptive water use, and facility reliability. This assessment also must be peer-reviewed.

See id. Facilities with per day AIF of 125 MGD or less are not required to submit any of the aforementioned studies.

As stated above, PSNH has over the years submitted to EPA scientific information, evaluations, and studies pertaining to its CWISs that are of some relevance to the new 316(b) Rule and the evaluations necessary under this regulatory regime. This documentation needs to be updated and adjusted to better address the requirements of the new final rule. PSNH's consultants, Enercon Services, Inc. ("Enercon") and Normandeau Associates, Inc. ("Normandeau"), prepared reports outlining PSNH's potential compliance options under the new rule, along with what information, evaluations, and/or studies PSNH would need to compile or complete and submit to EPA in the foreseeable future to assess potential technological compliance options at Merrimack Station.[20] PSNH supports the reports provided by Enercon and Normandeau.

[20] Normandeau's report is "Attachment 1" to Enercon's report, which is entitled "Assessment of 2007 Response to United States Environmental Protection Agency CWA § 308 Letter, PSNH Merrimack Station Units 1

In their respective reports, Enercon and Normandeau both evaluate existing impingement data for Merrimack Station and conclude that the facility should qualify for the *de minimis* exception due to the documented low rate of impingement, especially compared to the rates of impingement at other existing facilities in the country. As for entrainment, Enercon notes that flow data from 2011 through 2013 demonstrate that current AIF for Merrimack Station is approximately 113.8 MGD, which falls below the 125 MGD threshold triggering the need to carry out peer-reviewed scientific studies, according to the 316(b) Rule. Because flow rates will likely increase in the future at Merrimack Station, however, Enercon preemptively includes in its report an assessment of what information, evaluations, and/or scientific studies, as well as what potential technologies, need to be further evaluated to determine the most effective technological option for reducing entrainment abundance. PSNH intends to submit to EPA the information, evaluations, and/or scientific studies outlined in the Enercon and Normandeau reports as soon as reasonably possible. EPA is legally obligated to consider this documentation to make a BTA determination for the CWISs at Merrimack Station, in accordance with the requirements of the 316(b) Rule. In sum, EPA cannot legally impose requirements on PSNH that equate to in excess of $100 million in costs to implement technologies that are unnecessary and not required of any other source in the country.

IV. EPA SHOULD ALLOW SUPPLEMENTAL COMMENTS ON ITS CWA 316(a) AND 316(b) DETERMINATIONS DUE TO THE PASSAGE OF TIME, NEW EVIDENCE, AND THE AGENCY'S INABILITY TO TIMELY RESPOND TO INFORMATION REQUESTS CRITICAL TO THIS NPDES PERMIT PROCEEDING

Given the length of time that has passed since 2011, PSNH requests the opportunity to submit new information concerning the CWA Section 316(a) and (b) determinations contained in

& 2, Bow, New Hampshire" (October 2014) (contains Confidential Business Information pursuant to 40 C.F.R Part 2). Both reports are attached hereto as Exhibit 4.

the September 30, 2011 permit. PSNH's comments on the 2011 draft permit were the last substantive submission PSNH provided to the agency addressing these issues. Within the past three years, EPA has not requested or accepted any such information from PSNH. The agency also has not communicated with PSNH regarding the status of its 316(a) or (b) determinations in light of comments submitted by interested stakeholders, including PSNH. Given the import and potential substantial consequences of EPA's 316(a) and (b) permit determinations, it is critical that PSNH be allowed to update this information before EPA issues a final permit. Additionally, because any alteration to existing cooling water processes or infrastructure has the potential to affect FGD operations and, correspondingly, the reliability and efficiency of the FGD waste water treatment systems at Merrimack Station, EPA should allow submission of updated comments generally addressing 316(a) and (b) issues. All plant processes are interconnected, as explained in PSNH's August 18, 2014 comments. EPA cannot evaluate technological treatment options for one waste stream in isolation. For all of these reasons, PSNH requests that the comment period be reopened with respect to EPA's 316(a) and (b) determinations, and otherwise reserves the right to submit any new information PSNH has developed since 2011 concerning the determinations in the September 30, 2011 draft permit.

Further, EPA should reopen the administrative record for this permit renewal proceeding with respect to both 316(a) and (b) to the extent EPA intends to rely on any new information to support its September 30, 2011, permit determinations. Since 2011, PSNH has issued Freedom of Information Act ("FOIA") requests to EPA seeking its documentation and support for the standards and limitations in the draft permit issued in 2011 and the revised draft permit. PSNH first issued a FOIA request on October 12, 2011, to which EPA failed to adequately respond. *See* PSNH 2012 Comments at 199-201. More recently, on March 24, 2014, PSNH issued a

FOIA request[21] seeking documents from the prior two years concerning the draft permit and communications and work papers of EPA officials involved in this proceeding. EPA advised in July 2014 that it was unable to complete its response to this latest FOIA request until October 17, 2014, only a week before completion of this comment period. Last week, EPA delayed its deadline again to October 22nd, and produced an additional 626 records on October 17th. PSNH has not had an adequate opportunity to consider this information. Moreover, some of the information produced in response to PSNH's March 24, 2014, FOIA request to date appears to be related to 316(a) and (b) issues, although it is impossible to know for sure whether it has any relevance to this permit proceeding. EPA must allow PSNH and the public an opportunity to comment on EPA's prior 316(a) and 316(b) permit determinations to the extent EPA intends to base them on any new information developed since 2011.

V. CONCLUSION

The current draft permit is unrealistic and unachievable. EPA must reconsider its determination in the revised draft permit that the SWWTS at Merrimack Station is BAT and its erroneous conclusion that this SWWTS can achieve a ZLD limit. It is not based on sound science, ignores technological realities and limitations, and lacks a defensible cost analysis. No comments from other stakeholders alter this conclusion originally set out in PSNH's August 14, 2014 comments to the draft permit.

EPA must also reassess its preliminary Section 316 determinations due to changed circumstances and new scientific information. Since 2011, PSNH has collected new information pertaining to the balanced indigenous population within the Hooksett Pool that EPA has a duty to consider prior to issuing any final 316(a) thermal discharge determination for Merrimack Station.

[21] See PSNH's March 24, 2014 FOIA request, available at https://foiaonline.regulations.gov/foia/action/public/view/request?objectId=090004d2802099d5.

Distinctly, the new 316(b) Rule significantly impacts EPA's ability to render a BPJ-based BTA determination for Merrimack Station's CWISs and requires the agency to modify its technological conclusions to conform to the tenets of the final rulemaking. PSNH intends to submit information, evaluations, and scientific studies to EPA as soon as possible to inform the agency's Section 316 technological decision-making. PSNH respectfully requests that EPA delay issuing any final permit for Merrimack Station until the agency evaluates this new information.

Exhibit 1

Redacted

CONFIDENTIAL BUSINESS INFORMATION

Exhibit 2

RESPONSE COMMENTS TO

August 18, 2014 Letter from
Conservation Law Foundation / Earthjustice / Environmental Integrity Project /
Sierra Club to USEPA Region 1

Re: Revised Draft Permit for Merrimack Station
NPDES Permit No. NH0001465

Ronald A. Breton, P.E.

October 2014

GZA GeoEnvironmental, Inc.
5 Commerce Park North, Suite 201
Bedford, New Hampshire 03110-6984

RESPONSES PERTAIN TO YELLOW HIGHLIGHTED TEXT

Page 7, First Paragraph

II. **EPA SHOULD USE ITS AUTHORITY TO PREVENT NEGATIVE WATER QUALITY IMPACTS FROM MERRIMACK DISCHARGING ITS FGD WASTEWATER TO POTWS THAT ARE NOT EQUIPPED TO HANDLE SUCH WASTEWATER.**

> EPA's fact sheet states that PSNH could circumvent a zero-liquid discharge standard for its FGD wastewater by not operating the VCE and crystallizer system but instead sending the FGD wastewater to a local publicly owned treatment works. Fact Sheet at 49. PSNH itself acknowledges that POTWs are not designed to remove the toxic pollutants present in FGD wastewater from Merrimack, such as mercury and selenium. 2011 Draft Permit, Attachment E at 14. Moreover, EPA notes that a number of toxic pollutants, including persistent, bioaccumulative toxins, are present in FGD wastewater and will not be treated effectively in a POTW. Fact Sheet at 49 ("It is unclear whether these pollutants receive any treatment at the POTWs. These constituents are generally expected to pass through a typical municipal sewage treatment plant."). EPA has proposed to address this regulatory gap in the proposed ELG rule, but in the meantime there are currently no pretreatment standards for many of the pollutants present in the FGD wastewater from Merrimack. *See* 78 Fed. Reg. at 34,477 (noting that "all of the pollutants proposed for regulation under BAT/NSPS pass through," including arsenic, mercury, and selenium).

Merrimack Station's treated FGD wastewater contains concentrations of certain pollutants of concern (POCs) (e.g., arsenic, mercury, and selenium) at levels in the parts per billion and parts per trillion range. These levels are one and two orders of magnitude less than typical concentrations of pollutants common to treated wastewater from significant industrials users (SIUs), such as metal finishers, medical laboratories, hospitals, textiles, electronics, industrial launderers, etc. POTWs have the ability to remove a variety of pollutants including non-conservative (e.g., BOD, TSS, oil & grease) and conservative (e.g., metals) pollutants. Common biological and physical processes employed by POTWs have the ability to remove most pollutants, in particular arsenic, mercury, and selenium. Based on published removal rates (EPA Guidance for Local Limits Development Document – July 2004), removal rates for these three metals typically range from 45% to 60% in POTWs. Biological treatment processes tend to assimilate metals in the biomass and/or convert dissolved metals to insoluble chemical forms that are subsequently removed through physical gravity settling processes inherent to all municipal treatment facilities.

These removal capabilities represent one critical input in a POTW's approach to determining the Maximum Allowable Headworks Loading (MAHL) for its particular treatment process. It is a fundamentally and universally accepted fact that all POTWs remove a significant percentage of pollutants contributed by non-domestic sources. In particular, all toxic metals of concern are removed generally in a range of 30% to 70% at POTWs.

In October 2010, PSNH provided comments to EPA setting out a BAT analysis for the treatment of FGD wastewaters at Merrimack Station. A comment suggesting that publicly owned treatment works (POTWs) are not designed to remove toxic pollutants present in FGD wastewater from Merrimack Station was included in the record. This assertion was included to highlight the fact that the primary wastewater treatment system designed specifically for the treatment of FGD wastewaters would achieve better pollutant removals than POTWs. POTWs do provide incremental removal of already very low levels of metals. Merrimack Station's primary treatment system provides a higher removal rate of pollutants, but PSNH acknowledges that additional treatment is provided through the POTW treatment process despite the fact that the effluent from the primary wastewater treatment system already complies with water quality standards in the Merrimack River at Merrimack Station.

Page 8, First Paragraph

> To prevent Merrimack Station from sending FGD wastewater to POTWs that cannot treat the toxic pollutants in the FGD wastewater, EPA should take actions regarding both Merrimack Station's NPDES permit and the POTWs' NPDES permits. EPA should include a clause in the final Merrimack Station NPDES permit providing that EPA will reopen the permit to include the new pretreatment standards for FGD wastewater established by the forthcoming ELG rule. EPA should then reopen and revise Merrimack Station's NPDES permit as soon as the new pretreatment standards for FGD wastewater are finalized. In addition, EPA should require PSNH to submit to EPA Region 1 a report at the end of each month providing detailed information on any FGD wastewater sent to a POTW for treatment, including the name and location of the receiving POTW, the amount and pollutant characteristics of the wastewater, and such other information as is necessary.

Action on the part of EPA, such as amending the NPDES permits of Merrimack Station and/or the various POTWs, to prevent treated FGD wastewater from being managed at local POTWs is unwarranted and would lead to further incongruent standards for the steam electric generating industry compared to other industrial dischargers. The concentrations and mass of POCs in Merrimack Station's treated FGD wastewater are extremely miniscule and insignificant. A comparison of wastewaters received from other typical, non-domestic and domestic sources further illustrates this fact. For example, the average concentration of common metals in domestic septage is similar or greater than treated FGD wastewater generated at Merrimack Station. The average concentration of arsenic is typically in the range of 0.17 mg/l in septage[1] compared to values typically below 0.03 mg/l in treated FGD wastewater. Considering the removal efficiencies typically achieved at POTWs, the resulting mass of pollutants in the POTW's effluent attributable to Merrimack Station's treated discharge is insignificant.

[1] Septage data from Allenstown NH POTW (9/24/13) provided by NHDES

The following sections address and disprove the purported "actions" the Environmental Organizations assert EPA should carry out to further regulate PSNH's FGD waste stream.

Page 8, Second Paragraph

In addition, EPA should also take actions relating to the POTWs' NPDES permits to address this problem. First, EPA should determine whether the POTWs receiving FGD wastewater from the Merrimack Station are violating their NPDES permits by doing so (and should immediately inform the POTW operators of its intent to undertake this determination). Between 2012 and 2014, Merrimack Station sent FGD wastewater to 5 POTWs: S. Portland, Attleboro, Lowell, Hooksett, and Franklin. Fact Sheet at 24-25. As the table below indicates, it is our understanding that EPA Region 1 is the permitting authority for all of these facilities except the S. Portland POTW.[7]

Table 1. POTWs that Receive FGD Wastewater from Merrimack Station and Have NPDES Permits Issued by EPA Region 1

POTW	NPDES Permit Date	Permit Number	Expired?
Attleboro	6/9/2008	MA0100595	Yes
Franklin	6/19/2009	NH0100960	Yes
Hooksett	8/5/2013	NH0100129	No
Lowell	9/1/2005	MA0100633	Yes

As the agency that issued the NPDES permits for these facilities, EPA should determine whether receiving Merrimack Station's FGD wastewater results in a violation of any permit terms, such as terms prohibiting the pass through of pollutants[8] and/or prohibitions on the discharge of toxic amounts of pollutants or toxic components that will result in demonstrable harm to aquatic life.[9] EPA should also investigate whether the POTWs are complying with any reporting requirements that may be triggered by the receipt of FGD wastewater from Merrimack Station, such as requirements to inform EPA Region 1 when new pollutants are introduced from an indirect discharger or when there is a substantial change in the pollutants introduced to the POTW.[10]

Contrary to the tone of, and requests for action within, the Environmental Organizations' comments, PSNH did not carelessly decide to transport FGD wastewater to POTWs, nor did the POTWs unsystematically accept the wastewater from Merrimack Station. Instead, PSNH and the various POTWs accepting FGD wastewater from Merrimack Station collaborated extensively to determine the best and most reasonable concept of transporting and managing treated FGD wastewater to ensure that no environmental criteria was being or would be exceeded. This analysis specifically included evaluations to verify that pass-through, inhibition, and/or interference violations would not likely occur. There is no legitimate challenge that can be advanced with respect to this issue.

It is not customary, nor is it necessary, for EPA to determine whether POTWs receiving treated FGD wastewater are violating their permits. NPDES permits issued by POTWs include a general condition that requires POTWs to determine what types and quantities of pollutants they can accept without causing environmental impact (i.e., pass-through, inhibition, and interference). POTWs with SIUs are required to develop scientifically-derived and legally-defensive local limits using EPA-approved protocols (i.e., modeling pollutant impacts to a variety of performance, sludge management, and pass-through criteria). The fundamental principle associated with this approach dictates that the local limits derived from this process ensure that the POTW's discharge has no significant impact on the environment. The process for establishing local limits is described with greater specificity in the next section.

Page 9, First Paragraph

> Second, if EPA concludes that the current NPDES permits for these POTWs do not include terms that adequately address the receipt and discharge of FGD wastewater, then EPA Region 1 should modify the permits for these 4 POTWs and include new permit conditions to prohibit or adequately treat FGD wastewater from Merrimack Station. 40 C.F.R. § 122.63(a)(2) authorizes EPA to modify a NPDES permit under the following circumstances:

No such action on the part of EPA is necessary. All NPDES permits (individual and general) issued to the POTWs contain conditions that ensure that each POTW evaluate its ability to control all sources of wastewater contributed to their system. There is a prescribed and uniform methodology for POTWs to follow to determine the need and extent of controls for non-domestic (i.e., industrial) wastewater sources. The approach involves the development of an Industrial Pretreatment Program, including local limits. The permits issued to POTWs do not include specific terms that address the receipt of certain non-domestic wastewater sources. Rather, the NPDES permits mandate that the POTW assess their ability to accept non-domestic wastewater based on a prescribed methodology, as generally described below:

- EPA recommends that POTWs base their local limits on the maximum allowable headworks loading (MAHL)[2] calculated for each POC. A pollutant's MAHL is determined by first calculating its allowable headworks loading (AHL)[3] for each environmental criterion; the most stringent AHL would be the MAHL.

[2] A MAHL is the estimated maximum loading of a pollutant that can be received at a POTW's headworks without causing pass through or interference. It is the most protective (lowest) of AHLs (see definition) estimated for an individual pollutant.

[3] An AHL is the estimated maximum loading of a pollutant that can be received at a POTW's headworks that should not cause a POTW to violate a particular treatment plant or environmental criterion. AHLs are developed to prevent interference or pass through.

- The MAHL approach enables POTWs to calculate local limits taking into account the portion of the MAHL that is readily controllable (i.e., from industrial users (IUs)) and the portion that is not as easy to control (i.e., from domestic sources and background concentrations). The maximum allowable industrial loading (MAIL) is the portion of the MAHL available to IUs. It is based on sampling data from the collection system and at the POTW. Local limits are based on the allocation of MAILs as uniform concentrations that apply to all IUs, as mass allocations provided individually to each IU, or some combination of the two options.

- Calculating MAHLs is not the appropriate method to evaluate all pollutants. Pollutants may create collection system conditions that can be harmful to workers such as fires, explosions, corrosion, flow obstructions, high temperature, and toxic fumes. To address these issues, EPA recommends that POTWs consider various options. Developing and implementing local limits with the MAHL approach requires the following five basic steps:

    1. Determine the POCs[4]
    2. Collect and analyze data
    3. Calculate MAHLs for each POC
    4. Designate and implement the local limits
    5. Address collection system concerns

It is evident from some comments that there is a poor understanding of the Industrial Pretreatment Program mechanics. The local limits established by the POTW based on system-specific criteria apply to all discharges. That is, separate local limits cannot be established for individual users.

The POTWs that have evaluated the acceptance of treated FGD wastewater have completed analysis that demonstrates compliance with all environmental criteria including protection of water quality standards.

[4] A POC is any pollutant that might reasonably be expected to be discharged to the POTW in sufficient amounts to pass through or interfere with the works, contaminate its sludge, cause problems in its collection system, or jeopardize its workers.

Page 9, Third Paragraph

> The NPDES permits for the Attleboro, Franklin, and Lowell POTWs were issued prior to 2012, when the Merrimack scrubber came online and began generating scrubber wastewater, and when Merrimack began sending this wastewater to POTWs. All of the information in the record regarding shipments of FGD wastewater from Merrimack to these 3 POTWs constitutes information "not available at the time of permit issuance." 40 C.F.R. § 122.63(a)(2), since the POTW permits were issued before the scrubber wastewater was generated and shipped to the POTWs. Additionally, EPA states in the Fact Sheet that it believes that limits may be needed because the POTWs are not designed to adequately treat the toxic metals in the FGD wastewater, and thus the information "would have justified the application of different permit conditions." *id.*, namely, limits on receiving FGD wastewater.

Treated FGD wastewater from Merrimack Station contains extremely low levels of POCs, specifically arsenic, mercury, and selenium. Typical industrial users contribute POCs in the milligram per liter (parts per million) range while treated Merrimack Station FGD wastewater typically exhibits pollutants in the microgram per liter (parts per billion) and nanograms per liter (parts per trillion) range. POCs at these concentrations and associated low masses (pounds per day) contribute insignificantly to the MAIL of a typical POTW.

For example, Merrimack Station has an agreement in place with the Lowell Regional Wastewater Utility (LRWWU) to accept treated FGD wastewater. Working cooperatively with LRWWU, PSNH determined (i.e., self-certified) that the POCs in its hauled waste stream did include arsenic and mercury.[5] Lowell conducts extensive monitoring to determine all of its POCs and its ability to accept the maximum quantities of these pollutants on a daily basis. These monitoring data are then input into a model that calculates MAHLs and MAILs. Subtracting out the "uncontrolled" domestic contribution, it results in an allowable loading rate for all other non-domestic wastewater source. To illustrate the relatively low levels of POCs contributed by PSNH's treated waste stream, contributions to the LRWWU of hauled waste from Merrimack Station was generally less than 1% of capacity for arsenic and mercury. Specifically, arsenic and mercury have been less than 0.6% and 0.08% of the MAIL, respectively, as conservatively calculated for these two POCs. Merrimack Station's impact to the LRWWU is insignificant with respect to the facility's capacity and ability to manage treated FGD wastewater and ensure that pass-through, inhibition, and interference does not occur.

Persons knowledgeable with the Industrial Pretreatment Program process recognize that introducing a different waste stream does not constitute "new knowledge," but simply requires a revised assessment to determine impacts (if any) to the system and to determine if revised local

[5] Selenium is not a POC in the LRWWU wastewater system because selenium is not introduced to the Lowell POTW in a mass quantity (or concentration) that meets the criteria of a POC. Selenium is typically measured at below detection limits at various points at the POTW including the headworks. Receipt of FGD wastewaters from Merrimack Station has not impacted this reality.

limits are necessary. To complete this assessment, Lowell has established a comprehensive internal monitoring program that has produced a representative and statistically valid database that determines the significance or insignificance of industrial wastewater contributions. In the case of Merrimack Station and its FGD wastewater, impacts to POTW operations and local limits were determined to be negligible.

Page 9, Fourth Paragraph

> Third, EPA should insist that each POTW that has received FGD wastewater from Merrimack Station revise its local pretreatment standards to prohibit Merrimack Station from sending FGD wastewater to the POTW. POTWs must adopt local pretreatment requirements to address local conditions and submit the plan for approval by the relevant permitting authority. *See* 40 C.F.R. § 403.8. The POTW is required to issue a permit, or the equivalent of a permit, to each industrial source discharging to the POTW. EPA should follow through on its suggestion, Fact Sheet at 49, of using local pretreatment standards to address the indirect discharge of FGD wastewater, which contains dangerous toxic pollutants that cannot be adequately treated by POTWs. As noted above, EPA has already found, in the proposed ELG rule, that toxic pollutants in FGD wastewater (including arsenic, mercury, and selenium) pass through POTWs in the absence of effective pretreatment, *see* 78 Fed. Reg. at 34,477, and EPA must not allow POTWs to continue to discharge Merrimack's FGD wastewater without adequate treatment or in a manner that causes or contributes to a violation of state water quality standards. EPA should make it clear in the Fact Sheet for this permitting action that the measures relating to POTWs

Based upon the determinations and analyses described above, there is definitely no legal requirement, nor is there any material reason, for any POTW to revise its Industrial Pretreatment Program to accommodate treated industrial wastewater from Merrimack Station, or for that matter, from another IU. As requested by the Environmental Organizations, and in accordance with applicable regulations and the requirements of their respective NPDES permits, each POTW has already: (1) established any local limits necessary for POCs; (2) issued a permit (or equivalent) to Merrimack Station after evaluating its proposed FGD waste stream; and (3) determined the quality of the treated wastewater from Merrimack Station to be in full compliance with all applicable rules and regulations.

From 40 CFR 403.03, "(T)he term *Pass Through* means a Discharge which exits the POTW into waters of the United States in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation)." Analyses performed by the POTWs demonstrate that the concentrations and mass of pollutants in treated FGD wastewater will not result in pass through where permits have been issued referencing EPA's definition and standard practices.

Page 10, First Paragraph

> Finally, EPA should urge the State of Maine to take similar actions regarding the S. Portland POTW, namely: investigate whether receiving FGD wastewater from Merrimack Station violated any terms of the existing NPDES permit; revise the NPDES permit to include permit terms to prohibit receiving FGD wastewater if such terms do not exist in the current permit; require the S. Portland POTW to revise its local pretreatment standards, and include such revised conditions in any permit or similar document that the POTW has issued to PSNH. EPA should also ensure that Maine, and other states in New England, take these actions regarding any POTWs that receive FGD wastewater from Merrimack Station in the future.

Similar to the State of New Hampshire and Commonwealth of Massachusetts, EPA and the State of Maine likely see no reasonable basis for deviating from EPA's established guidance regarding the development of an Industrial Pretreatment Program and Local Limits for the reasons stated herein. As explained above, the agency's guidance and regulations already require POTWs to evaluate their ability to control all sources of wastewater contributed to their system through the calculation and utilization of MAHLs and MAILs. The actions proposed by the Environmental Organizations are superfluous.

Exhibit 3

Review of Comments to the Proposed NPDES Permit for Public Service of New Hampshire's Merrimack Station

William Kennedy, P.E.

October 2014

10716 Carmel Commons Blvd., Suite 140
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On April 18th, 2014, Region I of the United States Environmental Protections Agency (EPA) issued a revised draft National Pollution Discharge Elimination System (NPDES) permit for Public Service of New Hampshire's (PSNH) Merrimack Station. This revision follows the initial draft released on September 30th, 2011. Comments to the revised and original draft were entered into the record by various groups. The following is a discussion of selected comments as titled on the EPA Region 1 website (www.epa.gov/region1/npdes/merrimackstation/).

Merrimack NPDES Comments, August 18, 2014

These comments were submitted on behalf of the Conservation Law Foundation, Earthjustice, Environmental Integrity Project and Sierra Club.

Page 1, paragraph 1, states, "The record reflects that Public Service of New Hampshire ("PSNH") has operated a vapor compression and evaporation ("VCE") and crystallizer system since 2012 that can eliminate the discharge of flue gas desulfurization ("FGD" or "scrubber") wastewater." This is an inaccurate statement in so much as the elimination of a discharge stream has not been demonstrated by PSNH, or for that matter any other VCE/crystallizer system in FGD wastewater treatment service. Aquatech's system operating manual specifically identifies the need to periodically purge the Crystallizer Concentrate Tank to remove highly soluble salts that cycle up in concentration within the system. The documented periodic shipment of purge to local POTW's is indicative that elimination has not been demonstrated. Further, the expectation of a zero discharge from the FGD wastewater treatment system is counter to the design intent of the system, which has little to no redundancy of equipment and unit operations to maintain treatment system and generating station reliability.

Paragraph 1 further states, "Based on PSNH's installation and successful operation of the VCE and crystallizer system, EPA properly concluded that eliminating the discharge of Merrimack's FGD wastewater is technologically and economically achievable." This too is an inaccurate statement. As explained above, the elimination of FGD wastewater at Merrimack Station is not possible and therefore cannot be technologically achievable. Further, Region 1 did not meet its obligation to do a comprehensive economic evaluation of cost per toxic weighted pollutant equivalent (TWPE) removed. Casting aside the Region's erroneous approach that since the

system was installed there was no added cost, EPA failed to consider the cost of redundant operations required for system reliability. In addition, had EPA accurately evaluated the capital and operations cost per TWPE removed, it would have shown that they far exceed any prior treatment cost in 1981 dollars for any industry.

In the section titled, "Factual Background," (page 2) there are several errors. Region 1 did not "issue" a permit in 2011. A draft was released for comment. Had an NPDES permit actually been issued in the many years since the expiration of the 1992 permit, PSNH would have been in a position to apply for a permit modification and have not been forced into the position to install the VCE system. Further, the Region did not appropriately consider the industry wide applicability of VCE, nor evaluate the cost effectiveness of the technology based on TWPE removed.

References and considerations of a proposed rule, i.e. the Steam Electric Power Generating effluent guidelines and standards (40 CFR Part 423), 78 Fed. Reg. 34,432 (June 7, 2013)(SEEG), is not reasonable as the anticipated rule has yet to be promulgated, consideration and response to comments are still on going and agency internal reviews are still underway. In so much as the proposed SEEG presented a multitude of BAT options under review, it is disingenuous to reference a single section of one option. The 1982 SEEGs continue to be in force until such time as they have been properly revised.

In so much as VCE/crystallization has not been demonstrated, at Merrimack Station or elsewhere, to achieve a zero liquid discharge in FGD service over a reasonable operational period, the inclusion of this technology in a BPJ determination of BAT is far from reasonable. Had PSNH demonstrated "successful operation of a zero-liquid discharge system" the discharge of a purge stream to POTWs would not be necessary. This is obviously in contradiction of empirical data. While PSNH has indeed been successful in operating and tuning the VCE/crystallizer system to reduce the volume of discharge, as designed, "no discharge" operations have not been demonstrated. The use of the term "ZLD" is problematic and confusing in the context of a BAT discussion, as it is not a technology.

Page 5, paragraph 3, makes reference to a VCE installation at Duke Energy's Roxboro Station. There is no installation underway or current plan to proceed with a VCE system in FGD wastewater treatment service at Roxboro Station.

Page 6, paragraph 1, refers to PSNH and Burns & McDonnell's commendable efforts to adjust and tune the VCE/crystallizer system to optimize performance. While it is agreed that this optimization has taken place and continues, the goal is to improve reliability and further reduce the required rate of purge from the system. In no way has a zero, meaning no, liquid discharge been demonstrated over a reasonable operational period.

Page 7, paragraph 3, mentions that there are municipal drinking water intakes downstream of the facility. The proposed concentration based limits of the constituents of concern identified in the 2011 draft permit for the FGD wastewater stream, without accounting for any assimilation or attenuation by the receiving body, are well below drink water standards.

Page 12, paragraph 1, also discusses the impact of bromide on THM formation. There are no surface water limits specific to bromide. The variables influencing THM formation, which are well documented in the literature, are:

1. Water temperature;
2. System residence time;
3. Chlorine dosing used to maintain minimum system sanitizer concentrations;
4. Total Organic Carbon (TOC) concentrations;

To a lesser degree, the availability of bromides in the source water and exposure to sunlight/UV radiation are seen to impact THM formation. EPA identified over chlorination of TOC laden waters by municipal drinking water systems as a concern for THM formation in the 1970's, long before the introduction of wet FGD scrubbers. In later rule makings on THMs in drinking water, EPA identified smaller municipalities as being challenged to meet the ever more stringent requirements of THM reduction. Bromides in the source water contribute to increased THM concentrations in systems that are already challenged primarily due to bromoform having nearly twice the molecular weight of chloroform. THMs are regulated on a mass based concentration rather than on a molar basis. Be that as it may, the presence of bromide in the source water, is

not a root cause for municipalities being challenge with the recent changes in THM limits in drinking water. Many municipalities when challenged with high TOC concentrations in the source water and low capacity factors, resulting in extended system residence times, have followed EPA's recommendation, going back nearly 40 years, to discontinue the use of chlorine as a residual disinfection agent in drinking water.

CLF Comments on NPDES Permit NH0001465; Exhibit 02, 24 February 2012

These comments were submitted on behalf of the Conservation Law Foundation by J. Koon. It appears that the author has no direct experience and little more than a cursory knowledge-base grounded in a patchwork of limited publically available information that ignore the details and complexities associated with the FGD water matrix and the application of VCE technology to the same in a power plant setting.

There are several conclusions, summarized on page 1 of the report, that need to be challenged.

1. TWPE reduction is not the factor used in BPJ-BAT determination, but rather the cost per TWPE. EPA has never determined a technology for any industry to be cost effective that had a cost greater than $404 per TWPE removed.
2. While VCE is an available technology for certain, limited power plant applications, it has not been successfully utilized in FGD service to achieve a reliable zero liquid discharge.
3. A comparison of the cost of treatment to site operating revenue is not germane as the economically reasonable evaluation benchmark is cost per TWPE removed. From an accounting perspective, costs, as they relate to affordability, are typically compared to net income rather than gross operating revenue.
4. Since 1982, and certainly since 2005, EPA has been unable to determine what in fact is BAT for FGD wastewater treatment. Over these many years, EPA has offered up several alternatives for consideration, but has yet to propose a BAT that has met EPA internal review criteria.

5. The evaluation of adverse implications does not include the lack of redundancy of the system design. The system design intent was for volume reduction rather than zero discharge.
6. The evaluation of parasitic load as being "very small" is not quantified. Further discussion of parasitic load as a percentage of generation is not germane. The impact of parasitic load should be evaluated on a basis of cost of energy and the impact of additional fuel requirements.
7. The evaluation of air emissions and solid waste generation is not quantified. A comparison of VCE solids generation to weight of ash and gypsum is not relevant. Land fill space is based on volume not mass. Ash and gypsum have potential beneficial uses.
8. The design of the VCE system was based on the concept of volume reduction, without being a requisite operation for generation reliability. The design does not include the redundancy of equipment and unit operations necessary to achieve consistent, reliable zero discharge operations, assuming that operation without a minor purge stream can even be demonstrated.
9. The sampling and monitoring limits proposed by the author indicate a lack of background and familiarity with the FGD water matrix and EPA's study efforts over the past several years. The October 2009, Steam Electric Power Generating Point Source Category: Final Detailed Study Report (EPA 821-R-09-008) ("Study Report") clearly shows in Tables 4-8 through 4-10, that reduction of specific characteristics of the water, i.e. TSS, arsenic, mercury and selenium, are effective surrogates for any number of additional constituents. Yttrium for example, which the author included in the lengthy list of proposed analytes, was eventually removed from EPA's study list when it was shown that there did not exist a reasonable expectation that the element would be found in detectable concentrations in the water matrix. EPA's *Technical Development Document for the Proposed Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category* (2013 TDD), EPA-821-R-13-002, EPA-HQ-OW-2009-0819-2257 (April 2013) discusses the use of surrogate constituents, and how sufficient reduction of one constituent indicates a reduction of another using the treatment systems under review.

The comparison of systems related to TWPE reduction is flawed. It does not exclusively use site specific values, but rather industry average concentrations to determine TWPE removal for a given flow rate. This is certainly contrary to a site specific BPJ determination. The removal for physical/chemical plus biological is not representative of optimized operation of a physical/chemical treatment system as detailed in Figure 4-6 of EPA's Study Report The calculation also does not take into consideration the advanced design and operation of the Merrimack physical/chemical treatment system which includes soda ash softening, elevated pH precipitation of boron along with a host of additional metals and the enhanced mercury arsenic removal system (EMARS).

Section 4-2 of Koon's report discusses the availability of VCE technology. The history of VCE usage within the power industry for other applications is not relevant as the chemistry and operational issues are very different than that of FGD waters. The operational experience of the Italian VCE sites in FGD service is dated. Those systems do not operated continuously in a zero discharge configuration and do have reliability issue with fouling of the heat exchange surfaces.

Table-3 of Koon's report lists Capital Cost of various installations. These appear to be equipment costs rather than the more appropriate values of total installed cost (TIC). Industry experience and EPRI's FGD WWTS costing model show TIC to typically be three to five times equipment cost.

The energy impacts of operating a VCE system in FGD service failed to note energy consumption per volume of water treated, i.e. MW per 1000 gallons of water. This energy and its related cost is a significant fraction of the station's net operating margin. Coal fired stations operate in a manner to maximize net electric generation per thermal unit of fuel consumed. Fractional improvements in this ratio are key factors in maintaining operational viability and a competitive advantage in the market. Koon's attempt to marginalize any energy impacts associated with operating a VCE system are therefore improper.

Koon's discussion of the disposal of solid wastes from a treatment system references Wylie 2008. This paper specifically discusses solids generated from an FGD waste water solids

removal system, which are primarily gypsum fines. Nowhere in the Wylie paper is the characterization of solids resulting from a VCE operation presented or discussed.

It is of interesting note that the Koon references Jacobs 2011a pg 67, for the proposition that a reduced discharge, i.e., zero to five gpm, is expected and then argues that BAT, thus configured, should be VCE. This somewhat describes the system installed by PSNH.

In Section 5 of Koon's report, periodic monitoring of untreated FGD wastewater is discussed. It is suggested that this monitoring of an in-process stream be included in the NPDES permit. Such monitoring is outside the purview of the permitting authority, as are arguably the setting of limits at internal outfalls. *See Iowa League of Cities v. EPA*, 711 F.3d 844, 877–88 (8th Cir. 2013) (citing *Am. Iron & Steel Ins. v. EPA*, 115 F.3d 979, 996 (D.C. Cir. 1997)) (both holding that EPA lacks statutory authority to set internal limits, as distinguished from limits at the point of discharge to "waters of the United States").

The proposed discharge limits are indicative a lack of familiarity of how NPDES permits are written, the sampling techniques, and analytical methods required to obtain reliable data. The following points are representative of this fundamental lack of understanding:

1. If there is a zero discharge then there are no limits.
2. BPT for pH is 6-9 not 7-9.
3. Composite sampling is not used for low level mercury.
4. VOC's would not be in the FGD matrix.
5. EPA has acknowledged, June 2010 Hanlon memo, that published methods, as written, may not be sufficiently sensitive to accurately and consistently measure low level metals in the FGD matrix.

Conclusion:

The term Zero Liquid Discharge has been inappropriately used to describe the vapor compression evaporation and crystallization system installed at Merrimack Station. The installed VCE system is designed to reduce the volume of treated water generated by the enhanced physical chemical treatment system. It is this same enhanced physical chemical

treatment that should be considered as BAT, based on the available analytical data, the degree of TWPE removal, and the fact that FGD wastewater is currently classified as a low volume waste.

Exhibit 4

Redacted

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