RESPONSE TO COMMENTS

NPDES Permit Modification NH0001473
GSP Schiller LLC
Schiller Station
Portsmouth, NH 03801

The U.S. Environmental Protection Agency's Region 1 (EPA) is issuing a Final National Pollutant Discharge Elimination System (NPDES) Permit Modification to GSP Schiller LLC ("GSP Schiller" or the Permittee) for GSP Schiller (the Facility) located in Portsmouth, New Hampshire. This permit modification is being issued under the Federal Clean Water Act (CWA), 33 U.S.C. §§ 1251 et. seq.

In accordance with the provisions of 40 CFR § 124.17, this document presents EPA's responses to comments received on the draft NPDES Permit Modification NH0001473 (the "Draft Permit Modification"). The Response to Comments explains and supports EPA's determinations that form the basis of the final permit modification (the "Final Permit Modification"). From October 4, 2022, through November 17, 2022, EPA solicited public comments on the Draft Permit Modification of NPDES permit NH0001473, issued on April 6, 2018, to discharge to, and withdraw cooling water from, the Piscataqua River.

EPA received comments from GSP Schiller (the Permittee) and joint comments from the Sierra Club and the Conservation Law Foundation on November 17, 2022.

Although EPA's decision-making process has benefited from the comments submitted, the information and arguments presented did not raise any substantial new questions concerning the permit modification that warrant EPA exercising its discretion to reopen the public comment period. EPA did, however, make certain changes in response to the public comments EPA received on the Draft Permit Modification, listed in Part I, below. The analyses underlying these changes are explained in the responses to individual comments in Part II, below, and are reflected in the Final Permit Modification. EPA maintains that the Final Permit Modification is a "logical outgrowth" of the Draft Permit Modification that was available for public comment.

A copy of the Final Permit and this response to comments document will be posted on the EPA Region 1 web site: https://www.epa.gov/npdes-permits/new-hampshire-final-individual-npdes-permits.

A copy of the Final Permit may be also obtained by writing or calling Danielle Gaito, U.S. EPA, 5 Post Office Square, Suite 100 (Mail Code: 06-4), Boston, MA 02109-3912; Telephone: (617) 918-1297; Email gaito.danielle@epa.gov.

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I. Summary and Changes to the Final Permit

The permit modification creates a new path to protect aquatic life from harm caused by impingement and entrainment at the facility's cooling water intake. The current permit attempts to provide such protection through the installation of wedgewire screens. However, as reflected in the record for the modification, the facility encountered operational and equipment issues during a pilot study of this technology, which resulted in lower-than-expected entrainment reductions. While the results of the pilot study do not definitively eliminate wedgewire screens as an available technology, the permit modification establishes an alternative path that would protect aquatic life with a high degree of certainty. This path includes a stringent cap on the intake flow, which in turn would limit operation of the facility. The cap would reduce the plant's allowable intake by 76%, which would be accomplished through a rolling, 12-month intake flow limit of 24%, along with monthly intake flow limits of 33% in the warmer months (which are of greater concern for aquatic life) and 66% in the winter. These flow limits ensure that impacts on aquatic life will be reduced, as they do not depend on the installation or operation of equipment and can be implemented immediately.

EPA is aware that the facility has not operated any of its generating units since June 2020 and that the nature of the New England power market may make future operation of this plant unlikely. The benefits of a stringent limit on operations—or, indeed, of any permit requirement—may therefore be only theoretical. However, EPA believes it is important to set a flow limit that would ensure effective protection of aquatic life in the event the facility does resume operations, regardless of the likelihood of such an event.

The following is a list of changes from the Draft to the Final Permit Modification.

1. The permittee name has been corrected on the permit to "GSP Schiller LLC" to match the legal name of the permitted entity.

2. The parameters modified under the Permit Modification have been included in a separate table under Part I.A.2 specific to the cooling water intake and designated as "SUM A" to facilitate coding and reporting these parameters in the Discharge Monitoring Report. SUM A is designated for the cumulative intake flows for the cooling water intake structures for Units 4, 5, and 6. This change is administrative and does not result in any substantive change in any of the modified parameters.

3. The parameter name "Total Flow" in Table I.A.2 has been changed to "Total Intake Flow." See Response to Comment A.1.

4. The sample type for Total Intake Flow in Table I.A.2 has been changed from "Recorder" to "Calculation." See Response to Comment A.4.

5. The maximum daily limit for Total Intake Flow for the period from April 1 through October 31 in Table I.A.2 has been changed from 41.8 MGD to 125.8 MGD. See Response to Comment A.1.

6. The Total Intake Flow period "February 1 – March 31" in Table I.A.2 has been extended to "November 1 – March 31" and the Total Intake Flow period "November 1 – December 31" has been deleted. See Response to Comment B.2.a.ii.

7. A "12-Month Average Total Intake Flow" limit of 30.19 MGD has been added to Table I.A.2. See Responses to Comments A.2 and B.2.b.

8. The requirement to complete an impingement technology performance study at Part I.A.11.a.2.i has been refined and the compliance deadline has been changed from 2 years from the effective date of the Modified Permit to after a period of 24 months in which at least one traveling screen is operating. See Responses to Comments A.2 and B.2.b.

9. The "Interim BTA" requirement at Part I.A.11.a.3 has been replaced with a 12-month impingement mortality BTA standard (reported as "percent screen efficiency") and the explanation of the calculation has been refined. See Responses to Comments A.2 and B.2.b.

II. Responses to Comments

Comments are reproduced below as received; they have not been edited.

A. Comments Submitted by GSP Schiller

Comment A.1 Entrainment

As explained in GSP Schiller's March 31, 2021 modification request and in other submittals to EPA, studies conducted pursuant to the Current Permit and changes in the operational profile of the units at the Schiller Station have demonstrated that limitations on the Station's intake flow, in lieu of the installation of a full scale wedgewire screen intake system, are the most effective method for addressing entrainment. The company therefore appreciates Region 1 including this compliance option in the Draft Permit and believes it is more stringent than the entrainment provisions included in the Current Permit (for reasons explained in GSP Schiller's March 31, 2021 modification request, May 20, 2021 email correspondence, and these comments). GSP Schiller does not object to the million gallons per day (MGD) intake flow limitations proposed in the Draft Permit except for the proposed "Maximum Daily" 41.8 MGD limitation applicable to the April 1 through October 31 annual period, which should be modified to 125.8 MGD consistent with the other periods.

GSP Schiller believes the inclusion of the 41.8 MGD Maximum Daily limitation in the Draft Permit is due to a misinterpretation of the company's March 31, 2021 modification request. In that correspondence, GSP Schiller proposed monthly average intake flow reductions of 41.8 MGD for April through October. The proposed reductions were not, however, intended to also limit the company's ability to operate all three units at the facility on any given day. Accordingly, GSP Schiller intended to request a Maximum Daily intake flow limitation of 125.8 MGD for the April 1 through October 31 annual period-not the 41.8 MGD Maximum Daily limitation included in the Draft Permit. GSP Schiller respectfully requests a revision of this 41.8 MGD Maximum Daily limitation to 125.8 MGD in the new final permit.

The Statement of Basis does not offer any explanation for the 41.8 MGD Maximum Daily limitation for the April 1 through October 31 annual period other than to assert that GSP Schiller requested such a limitation. Indeed, the Draft Permit does not include a similar limitation on the Maximum Daily flow for the November 1 through January 31 and February 1 through March 31 annual periods. Instead, for those other periods, Region 1 included the 125.8 MGD Maximum Daily limitation, which GSP Schiller also requests for the April 1 through October 31 annual period.

A 41.8 MGD Maximum Daily intake flow limitation in April through October is not required to satisfy CWA § 316(b)'s Best Technology Available (BTA) regulatory standard. The Current Permit's 37 percent reduction in entrainment of fish eggs and larvae satisfied the BTA standard, according to Region 1.[2] The monthly average flow reductions proposed in the Draft Permit will reduce fish egg and larvae entrainment by 63 percent,[3] which meaningfully exceeds the 37 percent Region 1 determined to be sufficient in 2018. There is therefore no reason to also place limitations on the daily operations of the Schiller Station units. Inclusion of an identical Maximum Daily and Monthly Average intake flow limitation for the April 1 through October 31

annual period means GSP Schiller will never actually approach the Monthly Average limitation throughout this annual period. To do so, GSP Schiller would have to operate one unit at Schiller Station each day from April 1 through October 31 (i.e., 213 consecutive days). As a "load following" facility that will operate sparingly and only in times of peak energy demand, it's unlikely a given unit will operate 10+ consecutive days (in all likelihood, a given unit will typically not operate more than three consecutive days). Consequently, the practical effect of a 41.8 MGD Maximum Daily intake flow limit is that: (1) the monthly average intake flow for the facility will be far less than 41.8 MGD; and (2) entrainment reductions will exceed levels Region 1 deemed necessary to satisfy§ 316(b)'s BTA standard due to unnecessary operational restrictions that do not reflect how the Schiller Station units will likely operate because of their role of providing electricity (and reliability) during limited, critical annual periods.

GSP Schiller has not agreed and does not agree to this "cap" or limitation on the daily operation of the Schiller Station units during this April through October annual period. The 41.8 MGD Maximum Daily intake flow limitation is not biologically necessary, is not needed to satisfy the CWA § 316(b) BTA standard, and, in effect, will unnecessarily inhibit GSP Schiller's ability to operate the units at Schiller Station and provide electricity to ISO-New England during critical annual periods when that energy is most needed. For all of these reasons, GSP Schiller requests that Region 1 revise the 41.8 MGD Maximum Daily limitation to 125.8 MGD in the modified final permit for Schiller Station.[4]

[1] GSP Schiller cites and refers to the Statement of Basis Region 1 issued with the Draft Permit as the "Statement of Basis" and to the agency's Response to Comments issued with the April 6, 2018 final NPDES permit for Schiller Station simply as "Response to Comments."
[2] Statement of Basis at 6. In the Statement of Basis for the Draft Permit, Region 1 also references anticipated reductions in entrainment of macrocrustaceans that were included in the agency's deliberations for the Current Permit. *See* Statement of Basis at 6-8. In its Response to Comments for the Current Permit, Region 1 provided that the macrocrustacean reductions are not "'critical' to its BTA determination because the determination focused on the reductions in entrainment of early life stages of fish …." *See, e.g.,* Response to Comments at 219.
[3] *See* Statement of Basis at 8.
[4] Should Region 1 reject GSP Schiller's request to change the Maximum Daily limitation from 41.8 MGD to 125.8 MGD, at a minimum, the agency should adjust 41.8 MGD to 42.2 MGD because 42.2 MGD is the design intake flow capacity of Unit 4 and GSP Schiller should be able to operate this unit on any given day. This 42.2 MGD capacity is already a part of Region 1's 125.8 MGD maximum capacity value for units 4-6 (42.2 + 41.8 + 41.8 = 125.8).

Response to Comment A.1

The Draft Permit Modification (Part I.A.2) proposed a seasonal monthly average and maximum daily total flow limits for cooling water discharges from Outfalls 002, 003, and 004. These limits were based on GSP's March 2021 modification request and EPA's analysis. GSP's March 2021 modification letter (at 3-4) requests permit provisions that limit the intake flow "in accordance with the following monthly schedule." EPA interpreted this request as a maximum daily intake flow across the three units and not, as the comment clarifies, an average monthly flow. EPA established both an average monthly and a maximum daily flow limit of 41.8 MGD for the period from April 1 through October 31 based on the table at p. 4. The comment requests that

EPA revise the flow limits for this period to reflect an average monthly flow of 41.8 MGD and maximum daily flow of 125.8 MGD.

The purpose of the April 1 through October 31 flow limit is to minimize adverse environmental impacts from entrainment during that period and is not intended to prescribe how the Facility operates the generating units on any given day. At a monthly average flow limit of 41.8 MGD, the facility can operate for 31 days at 41.8 MGD or 10 days at 125.8 MGD. In both cases the total monthly flow is 1,295.8 million gallons and the biological impact (number of organisms entrained), based on the EPA's calculation of entrainment as average monthly density times total flow, is the same. In other words, the *maximum daily* flow limit of 41.8 MGD is not necessary to achieve entrainment reductions commensurate with the entrainment BTA from the 2018 Permit as long as the average monthly flow limit is achieved. EPA revised the Final Permit Modification to reflect a maximum daily flow limit of 125.8 MGD and retained the averge monthly flow limit of 41.8 MGD.

Comment A.2: Impingement

In its March 31, 2021 permit modification request, GSP requested the "system of technologies" impingement mortality (IM) compliance standard *(see* 40 C.F.R. § 125.94(c)(6)) and the ability to conduct a two-year optimization study to evaluate an array of technologies, management practices, and operational measures to satisfy the regulatory standard. In follow-up correspondence to Region 1 dated June 27, 2022, GSP Schiller reaffirmed its request for this "system of technologies" IM compliance method and explained that the company would likely rely upon flow reductions "in whole or in part to satisfy this compliance option." Since that time, GSP Schiller has continued to evaluate its options for compliance under this "system of technologies" IM option, as well as the anticipated operational profile of the Schiller Station units, and has determined that its most prudent compliance path is relying exclusively on flow reductions to satisfy the "system of technologies" IM compliance standard. Consequently, GSP Schiller respectfully requests that the IM compliance requirements in the Draft Permit be revised to include the following requirements (and only these requirements):

- Continue to require compliance with the "system of technologies" IM compliance option. *See* 40 C.F.R. § 125.94(c)(6) (i.e., no change in the Draft Permit as to the selected IM compliance option)

- On the modified final permit's effective date, require reduction in the annual intake flows at Schiller Station to 24 percent of the design flow of the facility. In other words, establish an annual average "Total Flow" permit limitation of 30.19 MGD for the combined discharge of cooling water for Units 4, 5, and 6

    - Region 1 correctly states in its Statement of Basis that a facility may rely upon flow reductions in whole or in part to satisfy the "system of technologies" IM compliance option.[5] EPA explicitly stated as much in its 2014 final§ 316(b) rule:

        > EPA expects the reduction in impingement will be treated as an equivalent reduction in impingement mortality, and will therefore be

> considered by EPA or the State NPDES permitting authority in evaluating whether the chosen technologies and operational measures represent BTA performance under the site's conditions. *For example, an intake that operates infrequently due to the infrequent operation of the electric generating unit(s) it serves (such as* a *peaking unit) may use* a *relatively small amount of water on an annual basis when compared to the design capacity of the intake structure. This facility may choose to comply with the impingement mortality standard at§ 125.94(c)(6) by demonstrating to the Director that the facility operates at an annual intake flow that is less than or equal to 24 percent of its design intake flow on an annual basis.* This level of flow reduction could achieve a level of performance equivalent to or better than the impingement mortality performance standard in § 125.94(c)(7), and therefore could be considered to be compliant with the requirements of today's final rule.[6]

Relying exclusively on flow reductions also eliminates the need to complete an optimization study because there are no technologies, management practices, and/or operational measures to optimize. Region 1 knows the design intake flow of the intake structures at Schiller Station and has (or has access to) the facility's several years of historical operating data. Thus, the agency is aware GSP Schiller is capable of satisfying this IM compliance standard in this manner. This satisfies the demonstration required by EPA's 2014 final § 316(b) rule and eliminates the need for any biological monitoring.[7]

This flow reduction compliance path is more stringent than the requirements of the Draft Permit and requires compliance with one of EPA's seven pre-approved IM compliance options on the effective date of the permit.

- At the permittee's sole option at any time during the permit term (or in subsequent permit terms), allow for the completion of an "optimization study" in accordance with 40 C.F.R. § 122.21(r)(6)(ii) to develop a combination of technologies, management practices, and/or operational measures to minimize IM in accordance with 40 C.F.R. § 125.94(c)(6)
    - The purpose of the optimization study would be to allow GSP Schiller to develop an array of technologies, management practices, and/or operational measures to satisfy the regulatory standard that does not exclusively rely on flow reductions (and corresponding limitations on facility operations)
    - While completing this optimization study and until Region 1 issues a modified final permit to incorporate the selected combination of technologies, management practices, and/or operational measures following said study, the permittee shall continue to comply with the 24 percent annual intake flow reduction described above

- At the permittee's sole option at any time during the permit term (or in subsequent permit terms), allow for the installation and operation of modified traveling screens (i.e., IM compliance option 40 C.F.R. § 125.94(c)(5)) and completion of an "optimization study" in accordance with 40 C.F.R. § 122.21(r)(6)(i)

    - While completing this modified traveling screen and optimization study work, and until Region 1 issues a modified final permit to incorporate new conditions based on the results of the optimization study, the permittee shall continue to comply with the 24 percent annual intake flow reduction described above

GSP Schiller also requests that Region 1 remove: (1) Part 1.A.11.a.3. from the modified final permit because this "interim BTA' is no longer necessary; and (2) the wedgewire screen "0.5 fps through- screen velocity" compliance option, currently proposed in Part I.A.11.a.2.ii. of the Draft Permit.

As mentioned above, GSP Schiller's proposed IM compliance requirements are more stringent than what Region 1 proposed in the Draft Permit. First, the § 316(b)-compliant 24 percent annual IM standard (see 40 C.F.R. § 125.94(c)(7)) would be applicable on the effective date of the permit, as opposed to the more lenient "interim BTA" requirement Region 1 proposed in the Draft Permit. Second, GSP Schiller's proposal eliminates the 2+ year time period associated with completion of the 40 C.F.R. § 122.21(r)(6)(ii) optimization study.8 And, lastly, flow reductions provide a high degree of certainty as to the corresponding reduction in IM because Region 1 (and EPA, generally) assumes a 1:1 ratio in flow reductions and reductions in impingement.[9]

GSP Schiller's IM compliance proposal of annual reductions to 24 percent of design flow is also beneficial to overall reductions in entrainment at Schiller Station. Compliance with this 24 percent IM standard necessarily means GSP Schiller could not annually operate at or approaching the April- October and February-March monthly average flow limitations proposed by Region 1 for entrainment compliance. Monthly average operations at 41.8 MGD and 83.6 MGD, respectively, for these combined nine months of the year (even assuming 0.0 MGD flows in January, November and December) would result in an average annual total flow of approximately 38.3 MGD, which exceeds the 30.19 MGD average annual total flow limitation imposed due to the 24 percent of design flow IM compliance standard. This necessarily means realized entrainment reductions will exceed those relied upon by Region 1 in its Statement of Basis.

[5] *See* Statement of Basis at 10-11 (citing 79 Fed. Reg. 48,299, 48,347 (Aug. 15, 2014)).
[6] 79 Fed. Reg. at 48,347 (emphasis added).
[7] *See id.*
[8] GSP Schiller disagrees with Region 1's discussion about whether the company should have already completed this optimization study. A "system of technologies" IM compliance standard has never been included in Schiller Station's NPDES permit and/or officially "approved" by Region 1. Moreover, EPA recognized in promulgating its 2014 final § 316(b) rule that permit requirements to address entrainment can dictate or limit a facility's IM compliance options. See, *e.g.,* 79 Fed. Reg. at 48,327; 40 C.F.R. § 125.94(b)(1). Thus, until it was clear to GSP Schiller that wedgewire screens or some other specific technology would not be required to address entrainment at Schiller Station, completion of an IM "system of technologies" optimization study would have been speculative and could have been a waste of GSP Schiller resources.

[9] *See, e.g.*, Statement of Basis at 10; 79 Fed. Reg. at 48,331 ("Reduced volumes of cooling water produce a corresponding reduction in impingement and entrainment and, therefore, reduced impingement mortality and entrainment mortality."); *see also* Response to Comments at 272 (providing that Region 1 utilized this assumption in the Schiller and Merrimack Station NPDES permit renewal processes and acknowledging EPA's use of same in § 316(b) rulemakings).

Response to Comment A.2

The Draft Permit Modification proposed a requirement to operate a system of technologies, management practices, and operational measures to minimize impingement mortality consistent with the BTA standard at 40 CFR § 125.94(c)(6). It proposed to require the Permittee to demonstrate optimization of the system of technologies by completing an impingement technology performance optimization study consistent with 40 CFR § 122.21(r)(6). In addition, the Draft Permit Modification proposed an interim BTA requirement to maintain a 12-month impingement mortality standard of no more than 30 percent. EPA drafted these requirements in this way because, at the time of the Draft Modification, GSP Schiller informed EPA that it intended to comply with the impingement mortality BTA standard through the use of a system of technologies, management practices, and operational measures (40 CFR § 125.94(c)(6)) but had not completed an optimization study to demonstrate performance of this option nor had it proposed permit conditions that would ensure optimal operation of the technology and operational measures. EPA proposed requirements that it believed would bring GSP Schiller into compliance with 40 CFR § 125.94(c)(6) as soon as practicable and would impose an enforceable limit on impingement mortality in the interim.

In its comment, GSP Schiller has, for the first time, identified a plan to satisfy the systems of technologies BTA standard by additional limits on intake flow at its CWISs to meet an annual average flow no greater than 24 percent of the Facility's design flow. An intake flow limit that will achieve a level of performance equivalent to or better than the impingement mortality performance standard in 40 CFR § 125.94(c)(7) could be considered to be compliant with the 2014 Final Rule. *See* 79 Fed. Reg. 48,347. EPA agrees that a level of performance that achieves a 24% impingement mortality standard or better is obviously more stringent than the *interim* standard of 30% mortality that EPA proposed in the Draft Permit Modification.

The comment proposes an "annual average" total flow limit of 30.19 MGD, which is equivalent to 24 percent of the cumulative design intake flow of Units 4, 5, and 6 [125.8 MGD * 0.24 = 30.19 MGD]. EPA clarifies, however, that the referenced impingement mortality performance standard is a 12-month average, not an annual average. 40 CFR § 125.94(c)(7) ("Each month, you must use all of the monitoring data collected during the previous 12 months to calculate the 12-month survival percentage."). The calculations for demonstrating compliance with a 12-month performance standard are therefore different than those used for annual average limitations, and the Final Rule specifies a 12-month standard to avoid confusion. *See* 2014 Final Rule RTC at 125. If the Permittee is to rely on flow to satisfy the "systems of technologies" option by meeting the performance standard, the flow limit must also be a 12-month average. The Final Permit Modification requires the Permittee to maintain a 12-month average flow limit no greater than 30.19 MGD.

In its comment, GSP Schiller suggests that the proposed average flow limit "eliminates the need to complete an optimization study because there are no technologies, management practices, and/or operational measures to optimize." EPA acknowledges that sufficient operating data are available to support that the Facility has met this flow limit in the past and is capable of meeting it in the future. However, EPA disagrees that the proposed flow limit alone necessarily satisfies 40 CFR § 125.94(c)(6) and eliminates the need for any biological monitoring. The systems of technologies compliance alternative considers both impingement reductions achieved through flow and any additional reductions that the Facility achieves by optimizing operation of existing technologies. In this case, GSP Schiller has existing traveling screens that will be rotated when the CWISs are operating and the operation of these screens can be optimized to reasonably provide a higher level of impingement survival (e.g., optimizing the pressure of the spray wash and rotation frequency and/or speed of the screens). In combination, the 12-month flow limit and optimization of the traveling screens will address the impingement mortality BTA standard for a system of technologies at 40 CFR § 125.94(c)(6).

EPA does not agree with the comment that the permit should include a provision allowing for the completion of the optimization study at the permittee's "sole option." First, such a provision would be contrary to EPA regulations. Permittees must satisfy the application requirements for NPDES permits at 40 CFR § 122.21, including, for facilities that operate a CWIS, the requirements at § 122.21(r). All existing facilities must submit the information required under 40 CFR § 122.21(r)(2) and (3) and the applicable provisions of (r)(4), (5), (6), and (7). 40 CFR § 122.21(r)(1)(ii)(A). In its NPDES application, operators of existing facilities must identify the chosen method(s) of compliance with the impingement mortality standard. 40 CFR § 122.21(r)(6). Pursuant to the regulations, if a Permittee elects to comply with the impingement mortality standard at § 125.94(c)(6), it "**must** . . . submit an *impingement technology performance optimization study*." 40 CFR § 122.21(r)(6)(ii) (bolded emphasis added); *see also* 79 Fed. Reg. at 48,347, 48,361, 48,362 (Ex. VIII-2), 48,365 ("[F]acilities choosing to comply with § 125.94(c) by operating a system of technologies (under § 125.94(c)(6)) that will achieve the impingement mortality standard *must* submit a[n] impingement technology performance optimization study under § 122.21(r)(6)(ii).") (emphasis added); 2018 RTC at 34 ("If a facility chooses Options 5 or 6 to comply with the rule, it must undertake an 'impingement technology performance optimization study.'"), 41 ("[B]oth the modified traveling screens and system of technologies options require submission of an impingement technology performance optimization study for the permitting authority to review before either technology may be determined to be the best technology available for impingement mortality"). The regulations do not specify any exception. GSP Schiller's request to retain the "sole option" during the permit term or in subsequent permit terms to complete an optimization study would violate the requirement in 40 CFR § 122.21(r)(6)(ii) that a Permittee who has chosen to comply with the impingement mortality BTA standard at § 125.94(c)(6) must submit an optimization study for future reissuance of its NPDES permit.

Second, as suggested earlier in this response, the systems of technologies performance standard is based on the lowest level of impingement mortality the facility is reasonably capable of achieving at its cooling water intake structures. *See* AR-369 at 116. The optimization study must include biological data measuring the reduction in impingement mortality achieved by operation of the system of technologies, operational measures, and best management practices and

"demonstrate that the system of technologies has been *optimized* to minimize impingement mortality." 79 Fed. Reg. at 48,365 (emphasis added); *see also id.* ("EPA envisions the study will function to *optimize* performance, which is not the same as requiring a study merely demonstrating a specific numeric level of performance for impingement mortality has been or can be achieved.") (emphasis added). The demonstration must document and describe the percent impingement mortality reflecting optimized operation of the total system of technologies, operational measures, and best management practices. 40 CFR § 122.21(r)(6)(D). The Permittee may *identify* § 125.94(c)(6) as its chosen method of compliance with the BTA standard for impingement mortality, *id.* § 122.21(r)(6), but the *Director* (here, the EPA) determines the system of technologies, management practices, and operational measures that is the impingement BTA at the facility's cooling water intake structures, *id.* § 125.94(c)(6); *see also* 79 Fed. Reg. at 48,358 (noting that the permitting authority determines whether the proposed impingement controls are consistent with § 125.94(c)), 48,365. Moreover, the Director's determination is made *after* review of the optimization study. *Id.* § 125.94(c)(6). That decision is *informed* by comparing the data from the optimization study to the performance standard under 125.94(c)(7) but the performance of each system is site-specific and simply matching the 24-percent mortality standard in (c)(7) based on a flow reduction may not necessarily "minimize" impingement mortality to the greatest degree reasonably possible at a particular facility. *See* 40 CFR § 125.92. Verifiable and enforceable conditions are established in the next permit to ensure the optimized system performs as demonstrated. Thus, while GSP may identify § 125.94(c)(6) as its chosen method of complying with the impingement mortality standard, EPA determines the impingement BTA for Schiller Station's cooling water intake structures and does so only after reviewing the optimization study.

Moreover, while reduced volumes of cooling water can produce a corresponding reduction in impingement, impingement can also be affected by other factors, such as intake velocity and location on a site-specific basis. 79 Fed. Reg. at 48,331. The 1:1 relationship between flow and entrainment across all units is based on a simple calculation of density of early life stages (assumed to be uniformly distributed throughout the source water) times flow. *See* 79 Fed. Reg. at 48,331. When the flow decreases, entrainment decreases by the same proportion at all units. On the other hand, the 2006-2007 impingement study demonstrated that there is not a consistent or observable relationship between simultaneous impingement densities at each of GSP Schiller's generating units. *See* AR-136 at 104, 106, 112, 123. Given this variability, biological monitoring over a sufficient time period to capture a representative sample is necessary to estimate the impingement rate when the CWISs are operating. For this reason, EPA revised the requirements of the impingement performance optimization study to specify representative monitoring effort based on operation of the CWIS. Daily flow information will be used in combination with this impingement data to demonstrate that the 12-month average percent impingement mortality is no greater than 24 percent until such time that site-specific requirements for the optimization of the screens are available. *See* 40 CFR § 122.21(r)(6)(ii)(D); *see also* 79 Fed. Reg. at 48,366; Responses to Comments A.4, B.2.b. The optimization study serves to evaluate the flow limits and the additional practices and measures the facility could reasonably use to minimize impingement mortality and that would inform EPA's decision as to the best technology available for impingement reduction at Schiller Station's cooling water intake structures.

The 2014 Final Rule provides an example of how a facility would calculate the impingement mortality rate based on the individual performance of multiple technologies. In the example, a hypothetical facility operating three different technologies (an offshore location, an acoustical deterrent, and variable frequency drives) calculates the cumulative impingement mortality reduction for all three technologies. In this example, the combined effective percent impingement mortality is calculated to be 19%. *See* 79 Fed. Reg. 48,375-6. The facility does not stop once it reaches a percentage equal to or less than 24 percent. This percent mortality is the best the facility can achieve by operating the suite of technologies and the permit would establish conditions to ensure that the technologies are operated to achieve this performance. *See also id.* at 48,347 (envisaging that a facility that chooses to comply with § 125.94(c)(6) by operating at or below 24% of DIF must still submit an impingement technology performance optimization study), 48,365 (Again, "the study will function to optimize performance, which is not the same as requiring a study merely demonstrating a specific numeric level of performance for impingement mortality has been or can be achieved."). The number of fish excluded from impingement via flow is calculated as the volume multiplied by the impingement rate. *See id*. at 48,376. Monitoring impingement at the traveling screens for the optimization study will provide a value for monthly impingement rate at each unit, which will be used to calculate a site-specific reduction based on flow when the CWISs operate. When the CWISs do not operate, the average monthly percent impingement mortality is zero and no monitoring is required.

EPA applied statistical methods to develop the 12-month percent impingement mortality from a set of facility impingement data. *See* 2014 TDD at 11-8. Generally, the 12-month standard of 24 percent impingement mortality represents the average performance of traveling screens based on site-specific data from a suite of facilities. The actual, site-specific averge percent impingement mortality ranged from 1.6 to 48.8%, which reflects that mortality rates are subject to a certain amount of uncertainty. *See* Exhibit 11-5 of the 2014 TDD at 11-9. The performance standard of 24 percent is reasonable based on the design and expected operation of traveling screens and site conditions but is not meant to be a biological threshold for impacts from impingement. In the preamble to the 2014 Final Rule, EPA notes that the optimization study "will function to optimize performance, which is not the same as requiring a study merely demonstrating a specific numeric level of performance for impingement mortality has been or can be achieved. For the majority of facilities, EPA expects annual performance using modified traveling screens will exceed the Agency's calculated average annual performance standards for impingement mortality." 79 Fed. Reg. at 48,366. A facility that can optimize its technologies to achieve a lower percent impingement mortality is expected to do so.

The impingement mortality BTA compliance alternative in Part I.A.11.a.3 will combine flow limits with optimized use of the traveling screens Schiller Station already has. While they do not meet all the requirements for "modified traveling screens" under the 2014 Rule, they can still serve to minimize impingement mortality; optimizing their operating conditions to be as protective as reasonably possible will result in better performance than would be achieved through flow limits alone. EPA is not requiring GSP Schiller to install new technologies to comply with 40 CFR § 125.94(c)(6) but the Permittee must optimize its current technologies (i.e., the existing traveling screens and the proposed flow reduction) to "minimize" impingement mortality. 40 CFR §§ 125.92 ("***Minimize*** means to reduce to the smallest amount, extent, or degree reasonably possible."), 125.94(c)(6). Optimized use of the existing traveling screens has

the potential to provide reasonable additional impingement mortality reduction, and the study is necessary to analyze and determine that reduction.

GSP Schiller also requests that it retain the "sole option" during the permit term or in subsequent permit terms to install and operate modified traveling screens and complete an optimization study in compliance with 40 CFR § 125.94(c)(5). EPA explained, in response to comments for issuance of the 2018 Permit, that modified traveling screens will not minimize adverse environmental impacts from entrainment—additional technology to minimize entrainment will be necessary. *See* 2018 Response to PSNH Comment V.B.3. EPA also indicated that modified traveling screens alone would not minimize impingement mortality because additional measures are necessary to protect fragile species consistent with 40 CFR § 125.94(c)(9). *See id*. The data available at the time of the 2018 Permit issuance indicated that GSP Schiller impinged a number of species that typically do not experience high levels of impingement survival, including alewife, Atlantic herring, Atlantic menhaden, and rainbow smelt. *See* 2014 Fact Sheet at 152. In the Statement of Basis, EPA indicated that it was not "revisiting its determination that the existing traveling screens at Schiller Station are not adequately protective to satisfy the requirements of CWA § 316(b) and do not meet the BTA for impingement mortality at 40 CFR § 125.94(c)(5)." AR-508 at 9. GSP Schiller has not offered any new information or new data to demonstrate that modified traveling screens alone would effectively minimize impingement mortality at this Facility, including for fragile species. At this time, the record does not support the use of modified traveling screens alone as the BTA for impingement mortality, and additional technology or measures would still be necessary to minimize entrainment.[1] The Permittee may, in accordance with the regulations, propose to use modified traveling screens to meet the impingement mortality BTA standard in future permitting cycles, but it would be necessary for EPA to review any GSP Schiller submissions, including new biological data, and determine whether this technology would be BTA.

GSP Schiller also requests that Region 1 remove: (1) Part 1.A.11.a.3. from the modified final permit because this "interim BTA' is no longer necessary; and (2) the wedgewire screen "0.5 fps through- screen velocity" compliance option, currently proposed in Part I.A.11.a.2.ii. of the Draft Permit. EPA does not agree that the addition of a 12-month intake flow limit obviates the need for a permit provision setting a maximum impingement mortality percentage. While adding the 12-month intake flow limit will further serve to limit the potential number of organisms exposed to the intake—and hence subject to impingement mortality—over this period, impingement is affected by more than just intake flow. As noted earlier in this response, other site-specific factors impact impingement, as shown in the 2006-2007 impingement study at Schiller Station. Further EPA has said that a 12-month intake flow that is less than or equal to 24% of a facility's design intake flow *could* achieve a level of performance that is equivalent to or better than the 24% impingement mortality performance standard in § 125.94(c)(7), and therefore *could* be considered to be compliant with the requirements of the 2014 Existing Facilities Rule. 79 Fed. Reg. at 48,347. But biological data measuring the reduction in impingement mortality achieved by the flow limits is still necessary to determine the impact. 40 CFR § 122.21(r)(6)(ii). The impingement technology performance optimization study would document how and to what

[1] The flow limits in the Final Modified Permit, on the other hand, will exclude fish from being impinged and will act equally on fragile and non-fragile species. For this reason, the flow limits provide additional protection for fragile species compared to traveling screens.

extent the flow limits actually result in reduced impingement and would be used by EPA to determine whether the facility satisfies the impingement BTA. *Id.* Moreover, EPA regulations provide that, "[a]fter issuance of a final permit that establishes the entrainment requirements under § 125.94(d), the owner or operator of an existing facility must comply with the impingement mortality standard in § 125.94(c) as soon as practicable." *Id.* § 125.94(b)(1). EPA issued a final permit for Schiller Station in 2018 that established the entrainment requirements for the facility. Those entrainment requirements would have simultaneously brought the facility into compliance with the regulations' impingement requirements, but this modification now allows GSP an alternative to installing wedgewire screens. In addition, the optimization study—which will measure and document the impact of the combination of flow limits and the traveling screens on impingement mortality at the facility—is still, at a minimum, two years away (if not longer[2]), creating an overall timeline in tension with the "as soon as practicable" requirement. *See also* 79 Fed. Reg. at 48,360 (envisioning that the Existing Facilities Rule "will generally result in compliance" with the impingement mortality standards within eight years of 2014, that is, by 2022). While the combination of intake flow limits and the existing traveling screens may be sufficient to meet the impingement mortality BTA standard, EPA cannot be certain until the study is completed and submitted. Further, the applicable regulations provide that EPA may establish interim BTA requirements for impingement. *Id.* § 125.94(h). For these reasons, EPA is including an interim permit provision that establishes a maximum impingement mortality percentage. EPA has established a 12-month average impingement mortality at 24% because a permitting authority's decision under § 125.94(c)(6) is to be informed by comparing a facility's performance to the numeric standard that would otherwise apply at § 125.94(c)(7), which is 24%. Both the 12-month intake flow limit and the 12-month averge impingement mortality become effective during the first full calendar month following the effective date of the Modified Permit and are calculated as a rolling average using the current reporting month and the preceding 11 months. EPA anticipates that, once the optimization study is completed and the technologies and measures it identifies are incorporated into the permit, this interim BTA requirement could potentially be removed.

EPA also does not agree that the 0.5 fps through screen velocity option at Part I.A.11.a.2.ii associated with wedgewire screens should be removed from the permit. First, the comment does not provide any reason for doing so. Second, EPA did not revisit the 2018 entrainment BTA determination in the Draft Modification and did not remove the entrainment compliance alternative at Part I.A.11.a.1.ii to install and operate wedgewire screens. AR-509 at 4; *see also* Response to Comment A.4. Thus, if the permittee chooses to comply with the entrainment BTA by installing and operating wedgewire screens, Part I.A.11.a.2.ii is necessary to establish the maximum through-screen velocity, which is an important design element to limit entrainment using wedgewire screens. *See id.* at 48,334-35 & n.60. In such a case, Part I.A.11.a.2.ii will also enable the permittee to comply with the impingement standard at § 125.94(c) and to do so using a pre-approved technology (i.e., 0.5 fps through-screen design velocity—§ 125.94(c)(2)) that does not require an optimization study or biological monitoring. *See* 79 Fed. Reg. at 48,344. EPA has noted that a permit for the § 125.94(c)(2) compliance alternative for impingement mortality "will *necessarily* include criteria, design standards, and operational conditions specific to the pre-

[2] The overall length of time required to complete the optimization study will depend on whether the Facility operates in consecutive months. *See* Final Modification at Part I.A.11.a.2.i.

approved technology." *Id.* (emphasis added). For these reasons, the Final Modification retains Part. I.A.11.a.2.ii.

Comment A.3: Future Permits/Backsliding

GSP Schiller has stated that it is willing to accept limitations on its operations at Schiller Station in the form of intake flow reductions and has specifically proposed such flow reductions in its March 31, 2021 permit modification request and other communications with Region 1. Intake flow reductions provide certainty for the agency and are also consistent with the company's anticipated future operations of Schiller Station. The intake flow reductions GSP Schiller proposed for entrainment exceed the percent reductions Region 1 deemed necessary to satisfy CWA § 316(b) when it issued the April 6, 2018 final permit for the facility. The addition or "overlay" of the 24 percent IM annual total flow limitation further restricts Schiller Station's operations in key entrainment periods, meaning actual reductions in entrainment will exceed the metrics Region 1 evaluated in its Statement of Basis. Again, these intake flow reductions are presently acceptable to GSP Schiller because they represent the reasonable projection of the operation of the Schiller Station units for the foreseeable future. Nevertheless, the company hereby reserves its (and any subsequent owner's) right to request: (1) adjustments to these percent reductions, including but not limited to changes in the overall percent reduction and adjustments in the monthly distributions of the percent reduction, in the future if circumstances change; and/or (2) a change in the applicable IM compliance standard (i.e., 40 C.F.R. § 125.94(c)(1)-(7), (11), or (12)) and/or the manner in which the permittee elects to comply with any such IM compliance standard; and, in each instance, neither CWA § 402(o) nor 40 C.F.R. § 122.44(l) (including any current case law, administrative decision, and/or agency guidance interpreting same) would prohibit any such adjustment. ***To the extent Region 1 disagrees with any aspect of GSP Schiller's position on this matter, the company respectfully requests that the agency communicate that fact to the undersigned prior to issuing a final permit so that GSP Schiller may reconsider some or all of the intake flow limitations it has proposed***.

Response to Comment A.3

GSP comments that, while the intake limits proposed in the permit and the additional 24% annual limit proposed by GSP in its comments are presently acceptable to GSP, it believes it should be able to request, in future permit cycles, unspecified adjustments to these limits or a change in the manner of complying with the impingement mortality standard at 40 CFR § 125.94(c) or both. The comment then asserts that "neither CWA § 402(o) nor 40 C.F.R. § 122.44(l) (including any current case law, administrative decision, and/or agency guidance interpreting same) would prohibit any such adjustment." The comment, however, does not explain how GSP arrived at this conclusion.

CWA § 402(o) and 40 CFR § 122.44(*l*) are references to Clean Water Act anti-backsliding requirements. In general, these provisions prohibit EPA from renewing, reissuing, or modifying an existing NPDES permit to contain effluent limitations, permit conditions, or standards less stringent than those established in the previous permit, unless one of the statutory or regulatory exceptions to anti-backsliding applies. *See* CWA §§ 303(d)(4), 402(o); 40 CFR § 122.44(*l*). EPA's anti-backsliding regulation pre-dates the Water Quality Act of 1987, which amended the

CWA by adding the anti-backsliding provisions now in CWA § 402(o). 54 Fed. Reg. 246, 251 (Jan. 4, 1989). The D.C. Circuit upheld EPA's authority to issue its anti-backsliding regulation prior to enactment of CWA § 402(o). *See Nat. Resources Def. Council v. EPA*, 859 F.2d 156 (D.C. Cir. 1988). Further, EPA has noted that 40 CFR § 122.44(*l*) remains effective even in light of, and is broader than, CWA § 402(o). *In re Star-Kist Caribe*, 2 E.A.D. 758 (CJO 1989) ("When Congress elevates a portion of a rule from regulatory status to statutory status to protect it from modification by agency action, it does not implicitly repeal or modify other portions of the rule itself."); 54 Fed. Reg. at 252 ("EPA's regulation at § 122.44(l)(1) restricts backsliding in cases not covered by the WQA amendments.").

GSP's comment is conclusory; it does not provide any factual or legal basis for the assertion that a potential request GSP might make in a future permit proceeding would not be prevented by the CWA's anti-backsliding provisions. It is also vague and indeterminate because it does not provide detail on the specific changes that GSP might request. Further, it is hypothetical in that it envisions that GSP could submit such requests but does not indicate that GSP has plans to do so at this point. Anti-backsliding is an important concept in NPDES permitting. If presented with a request from GSP in the future to alter the intake limits or impingement mortality compliance provisions of the permit, EPA would evaluate, among other things, whether CWA § 402(o) and 40 CFR § 122.44(*l*) are implicated and, if so, whether one or more statutory or regulatory exceptions would allow GSP's requested change(s).[3] Without more specific information at this time, however, EPA cannot fully evaluate the issue. Moreover, EPA has not been presented with a request that is applicable to the current permit proceeding, since the comment speculates about changes that might be requested and considered in a future permit reissuance proceeding (i.e., not the current modification proceeding).

The comment requests that EPA tell GSP if the agency disagrees "with any aspect" of GSP's position on this matter before EPA finalizes the modification. EPA understands the request, given that GSP asked for this permit modification based on intake limits it proposed and that anti-backsliding can prevent future loosening of permit provisions in some situations. Moreover, an anti-backsliding analysis is generally required any time a permit is reissued with limits or conditions less stringent than comparable limits or conditions in the previous permit and therefore may be appropriate, if GSP later requests, for example, changes to the intake flow limits. Consequently, EPA contacted GSP and informed GSP that anti-backsliding could be applicable to the type of intake limit changes GSP loosely described and that some exceptions might be applicable to allow it, but that it is difficult, if not impossible, to determine the outcome of any such analysis at this point and without more details. AR-507. EPA informed GSP, therefore, that, at this stage, EPA could not agree with the comment that any such changes would not be prevented by CWA § 402(o) or 40 CFR § 122.44(*l*). *Id.* In addition, the comment is not about applying an anti-backsliding analysis to the limits and conditions in the current permit proceeding but rather to vague, uncertain permit conditions potentially at issue in a future

[3] EPA would also have to evaluate whether the requested changes satisfied 316(b)'s substantive standard that the CWIS reflect the best technology available for minimizing adverse environmental impact. For instance, depending on the specific compliance option requested, an alteration may require the permittee to submit an optimization study, which EPA would then use to determine the impingement BTA for the facility. *See* 40 CFR § 122.21(r)(6), 125.94(c). EPA does not have enough information at this time to determine whether anti-backsliding would prevent such a request.

proceeding. *Id.* In essence, the comment requests an advisory opinion, asking EPA to evaluate the outcome of a hypothetical based on few, if any, details of the changed permit conditions GSP might seek in the future. EPA cannot reasonably assess such a scenario. Furthermore, any future change to the limits would need to be subject to public participation; EPA does not want to short circuit potential public comments that could be submitted on such topics if relevant to a future permit proceeding.

GSP later informed EPA that GSP is willing to accept the uncertainty surrounding the backsliding issue and did not wish to withdraw its modification request. *Id.* Consequently, EPA has proceeded with the modification. If, and when, GSP requests permit changes related to cooling water use in a future permit reissuance, EPA will evaluate such a request in the context of that permit proceeding, including analyzing whether and how the concept of anti-backsliding may impact such requests.

Comment A.4: Additional Comments on Permit

Part. I.A.2.: GSP Schiller respectfully requests that Region 1 change the "Sample Type" for all flow measurements from "Recorder" to "Calculate," as this term more appropriately defines how the company generates the flow numbers it reports. Specifically, GSP Schiller utilizes established pump curves and run times to calculate the volume of water withdrawn. It should be noted that the reported values are likely conservative as the discharge of the pumps will decrease over time due to wear, fouling and other factors that impact performance.

Part. l.A.11.: In its March 31, 2021 permit modification request, GSP Schiller requested the removal of the wedgewire screen compliance requirements and associated compliance schedule from Part I.A.11 in the modified NPDES permit. Region 1 acknowledges that removal request in its Statement of Basis.10 Nevertheless, without explanation, the agency has proposed to modify Part I.A.11. and include alternative wedgewire screen compliance requirements and its associated compliance schedule (see generally Part I.A.11., including revisions to subparts a. and b.) in the new permit for the facility, and thus proposes to deny GSP Schiller's request to remove wedgewire screens as a compliance option based on new information. GSP Schiller's pilot study and design reports demonstrate the impracticability of wedgewire screens at Schiller Station. Accordingly, including this compliance alternative in the modified permit as BTA could create confusion and is technologically incompatible with compliance with other conditions in the permit. GSP Schiller therefore respectfully reasserts its request that the wedgewire screen compliance requirements and associated compliance schedule be removed from the modified final permit.

"Interim BTA" for Impingement: GSP Schiller requests the removal of the interim BTA compliance requirement. Should Region 1 nonetheless elect to include this interim BTA requirement in the modified final permit, GSP Schiller requests clarity on the following:

- The definition of "number of fish impinged," the term used in the denominator of the 12-month mortality percentage equation, requires clarification. Region 1 has proposed to define that term to mean "the sum of total impingement at all three units over 12 months *calculated for each month* based on the impingement rate (fish impinged per gallon from

impingement monitoring) times the design flow of the cooling water intake pumps (e.g., the number of fish that would have been impinged if all pumps operate at design flow)." (emphasis added). GSP Schiller does not understand how to interpret the "calculated for each month" phrase in that definition and believes it has the potential to cause confusion as to how the compliance calculation should be completed. The phrase should perhaps be deleted as unnecessary or Region 1 could potentially clarify the overall calculation methodology by including a hypothetical example, including the agency's expectations on what, where, and for how long it expects the company to conduct biological monitoring in a given month.

- The Draft Permit (p. 13) states that GSP Schiller "must meet [this] interim BTA for the period beginning 3 months from the effective date of the Permit Modification." This is also a vague statement potentially capable of different interpretations and should be revised. Because the proposed "interim BTA" compliance requirement is a 12-month standard and Region 1 has proposed to provide GSP Schiller three months from the effective date before the 12 month period commences, compliance with that requirement cannot be evaluated until 15 months after the effective date of the modified final permit. This should be explicitly stated in the modified final permit.

- If GSP Schiller elected to prospectively ensure its combined total discharge of cooling water for Units 4, 5, and 6 would not be greater than 30 percent of the design flow of the two intake structures, it appears that the company could forgo the work associated with analyzing the number of impinged fish that are killed (i.e., assume all such fish die) and the associated rate of impingement. The Statement of Basis suggests that this could be acceptable.[11] GSP Schiller requests that Region 1 explicitly reference this compliance option in the modified final permit, if it is acceptable.

[10] Statement of Basis at 2.
[11] *Id.* at 13-14.

Response to Comment A.4

The comment requests that the sample type for flow Part I.A.2 of the Modified Permit be changed from “Recorder” to “Calculate” to align with the method the Permittee uses to report effluent flow. As the comment states, GSP Schiller uses established pump curves and run times to calculate the volume of water withdrawn rather than a meter. See 2015 Fact Sheet at 20 (“Flows are based upon pump run times.”). In addition, this sample type is commonly used by the industry to calculate effluent flow and is used for reporting effluent flow at multiple facilities in Region 1. *See*, *e.g.*, Merrimack Station NPDES Permit No. NH0001465, GenOn Kendall NPDES Permit No. MA0004898, Wheelabrator Saugus NPDES Permit No. MA0028193. The Final Permit Modification lists “Calculation” as the sample type for the intake flow limitations in Part I.A.2.

The comment also requests that EPA remove the interim BTA requirement at Part I.A.11.a.3 from the Permit Modification. EPA addressed the impingement mortality BTA standard in Response to Comment A.2. Based on the revisions to impingement requirements in response to

that comment, EPA revised the interim BTA requirement in the Final Permit Modification. As explained in Responses to Comments A.2 and B.2.b.i, the Final Permit Modification requires the Permittee to meet a 12-month impingement mortality standard of no more than 24 percent until the optimization study is complete and conditions resulting in optimal screen operation can be implemented.

The comment also suggests that the language of Part I.A.11.a.3 is unclear and requests clarification on the calculation of impingement mortality. Compliance with the impingement mortality requirements of 40 CFR § 125.94(c)(6) requires calculation of impingement mortality reflecting each component of the system of technologies. The calculation is a combination of the reduction in rate of impingement, the reduction in impingement mortality (from operation of traveling screens), and the reduction in flow. *See* 40 CFR § 122.21(r)(6)(ii)(D). *See also* AR-369 at 279. Hypothetical examples of how to calculate impingement mortality for a system of technologies are provided in the preamble to the 2014 Final Rule, *see* 79 Fed. Reg. at 48,375, and the Technical Development Document for the 2014 Final Rule, *see* AR-182 at 11-15. In these examples, percent impingement mortality is adjusted for flow reductions by calculating the volume of reduced flow multiplied by the density of fish near the intake. *See id*. This value reflects the number of fish that would be impinged if not for the flow reduction. This value is added to the number of fish impinged at the traveling screens observed during monitoring to estimate the total number of fish impinged for the purpose of calculating percent mortality. At this time, recent data sufficient to estimate the density of fish near the intakes are not available, both because the Permittee has not completed its performance optimization study and because it has not operated the generating units (and thus the traveling screens) since 2020. EPA considered relying on data from prior impingement monitoring or the relative abundance of species in the vicinity of the CWIS collected for prior source water characterization studies (40 CFR § 122.21(r)(4)) but ultimately determined that either method would incorporate substantial uncertainty.

Under Part I.A.11.a.3, the Final Permit Modification requires the Permittee to calculate the 12-month rolling average percent impingement mortality as the average of the monthly percent impingement mortality for the reporting month and preceding 11 months. Impingement monitoring is not required for any month that the CWIS and associated seawater pumps are not operating. *See* AR-369 at 278. Under these circumstances, the observed monthly percent impingement mortality would be zero. In the event that the CWISs operate, the monthly percent impingement mortality would be calculated as the number of fish killed at the traveling screens (based on impingement monitoring and including latent mortality) divided by the total number of fish impinged. Consistent with the examples provided in the 2014 Final Rule for systems of technologies, the total number of fish impinged should be adjusted to account for flow reductions. In this case, total impingement is the impingement rate (fish per million gallons based on impingement monitoring when the CWISs are operating) times the design flow of the units. This value represents the number of fish that would have been impinged had the flow limits not been in place and reflects the reduction in impingement mortality achieved from exposing fewer fish to impingement.

The comment suggests that an impingement standard cannot be evaluated until 15 months from the effective date. However, because the percent impingement mortality is zero when the Station

does not operate and GSP Schiller has not operated since June 2020, this permit condition can become effective immediately because the Facility's impingement mortality for the 11 months preceding the effective date of the permit is known. The Facility may cease biological monitoring and reporting of impingement mortality after the recommended operational measures and conditions from the demonstration of system optimization are incorporated as verifiable and enforceable permit conditions.[4]

Finally, the comment requests that EPA remove the wedgewire screen requirements from Part I.A.11.a.1.ii. and the compliance schedule in Part I.A.11.a.5. GSP Schiller asserts that EPA "without explanation" has included alternative wedgewire screen compliance requirements and its associated compliance schedule and, as such, denied the Permittee's request to remove wedgewire screens as a compliance option based on new information. In fact, the Statement of Basis (AR-508) plainly addresses the 2018 BTA requirements, stating (at 6):

> EPA is not revisiting the BTA determination from the Draft or Final Permits. The BTA determination for the Final Permit was based on consideration of the relative costs of the two available and potentially effective technologies in light of the quantitative and qualitative benefits of reducing entrainment. See Response to Sierra Club Comment IV.A.2.a. This determination and the requirements of the Final Permit were not challenged. In addition, this Statement of Basis is not intended to serve as EPA's assessment of GSP's conclusions from its 2018 pilot study. EPA acknowledges that GSP experienced operational and equipment issues with the technology, which resulted in lower-than-expected entrainment reductions when compared to the estimated values for the draft and final permit determinations. The results of the study suggest that full implementation of wedgewire screens at Schiller Station may be more complex than anticipated, and changes to the design and/or number of screens, mechanical repairs, and more frequent cleaning will likely result in increased costs compared to the values evaluated for the Final Permit. However, the performance of the technology during the pilot study is not central to this modification.

EPA explained that it was not revisiting its BTA determination from 2018, because the performance of the technology during the pilot study is not critical to EPA's justification for the modification. *See also* Response to Comment B.2.c. In addition, the results of the pilot study do not definitively eliminate wedgewire screens as an available technology at Schiller Station.[5] Rather than re-examine the entire BTA determination during the permit term, EPA elected to focus on whether the Permittee's proposed approach of intake flows provides comparable entrainment protection to the BTA from the 2018 Permit. GSP does not explain that such an approach is improper. In fact, GSP's modification request takes a similar approach, comparing entrainment impacts under intake flow limits to entrainment with wedgewire screens in place. AR-491 at 4-5, Att. at 4. GSP comments that retaining the wedgewire screen compliance option

[4] Biological characterization and optimization data gathering may still be required as part of any subsequent permit applications. *See* 2014 Rule RTC (AR-369) at 277.

[5] In June 2021, GSP provided a report that it characterized as providing "a design of what a wedgewire screen arrangement at Schiller Station would consist of in light of the results of the wedgewire screen pilot study." AR-509 (Letter from E. Tillotson, GSP, to D. Houlihan, EPA (June 21, 2021)) at 1.

in the permit "could create confusion and is technologically incompatible with compliance with other conditions in the permit." The comment is speculative (i.e., "could"), vague, and conclusory. GSP fails to explain how a permit that authorizes a permittee to choose between two methods of compliance "could create confusion." The Modified Permit offers the Permittee flexibility to meet the BTA through either intake flows or wedgewire screens and makes clear that the Permittee may comply with the permit by implementing either alternative.[6] GSP also fails to specify what "other conditions in the permit" are purportedly technologically incompatible with the wedgewire screen compliance option and why GSP thinks they are technologically incompatible. For these reasons, the comment fails to support removal of the wedgewire screen compliance option or schedule from the permit.

B. Comments from Sierra Club and Conservation Law Foundation

Comment B.1: Background

Factual and Procedural Background

Schiller Station is a 163 megawatt (MW) facility that consists of two 48 MW coal-fired units, Units 4 and 6, which use oil as a back-up fuel; one 48 MW wood-fired unit, Unit 5; and one 19 MW combustion turbine. Units 4, 5, and 6 began commercial operation in the 1950s. These three units employ once-through cooling systems drawing through two cooling water intakes with a total maximum design intake flow of 125.8 million gallons of water per day ("MGD"). Draft Permit Modification at 3. This water is withdrawn from and discharged back into the Piscataqua River. In the process, aquatic life from the River is impinged and entrained by the cooling water intake system ("CWIS") and suffers mortality thereby. As EPA notes, "the losses from impingement mortality and entrainment at Schiller Station constitute an adverse environmental impact on the Piscataqua River and additional controls are necessary and warranted to minimize that impact consistent with" Clean Water Act requirements. Draft Statement of Basis at 4.

In September of 1990, EPA Region 1 issued NPDES Permit No. NH0001473 to Public Service Company of New Hampshire ("PSNH"), the then-owner and operator of Schiller Station.[1] This 1990 Permit superseded the permit issued on December 31, 1984, and authorized the continued operation of Schiller's once-through cooling system. The Region modified the permit on May

[6] To the extent GSP is confused about how the compliance schedule at Part I.A.11.b applies if GSP later decides to comply with the wedgewire screens alternative, EPA notes that the Draft Modification specified that the milestones in the permit's compliance schedule for wedgewire screens "are based on the effective date of the 2018 Final Permit and are not being modified in this Permit Modification." Draft Modification at Part I.A.11.b n.2. In other words, while EPA proposed an alternative compliance option that would allow GSP to forgo installing and operating wedgewire screens (i.e., intake flow limits and other associated provisions), EPA did not propose to modify the schedule to provide GSP any additional time to install and operate wedgewire screens should it decide to comply with the wedgewire screens alternative. Thus, if GSP wishes to comply with the wedgewire screens alternative, GSP must adhere to the intake flow limits alternative requirements (e.g., seasonal and 12-month avg. intake flow limits in Part I.A.2) until such time as the wedgewire screens are installed and fully operational. *See* Modified Permit at Part I.A.2 n.8, Part I.11.a.1, 2.

31, 1991, and the permit expired on September 30, 1995, but was administratively continued for over twenty years thereafter.

In September of 2015, EPA noticed for public comment a draft NPDES permit for Schiller Station.[2] As part of this permitting process, EPA considered the Best Technology Available ("BTA") for entrainment and impingement at Schiller. The Sierra Club and CLF submitted comments arguing that closed-cycle cooling represented BTA for Schiller.[3] Finally, on April 6, 2018, EPA released a final NPDES permit for Schiller Station, to go into effect on the first day of the calendar month following 60 days after signature, to expire on June 30, 2023.

The April 2018 NPDES permit for Schiller Station included BTA determinations for entrainment and impingement under section 316(b) of the Clean Water Act and its implementing regulations. Specifically, the permit set a requirement that Schiller "install and operate a fine mesh wedgewire screen intake system for the [cooling water intake systems] of Units 4, 5, and 6" with a "slot or mesh size no greater than 0.8 mm" to satisfy entrainment requirements, and that, in addition to the screens, "[t]o minimize impingement mortality, the permittee shall maintain a through-screen velocity at the wedgewire screens no greater than 0.5 fps." 2015 NPDES Permit at 11-12.

The April 2018 NPDES permit also set forth a compliance schedule for installation of these BTA screens that "shall be completed as soon as practicable but no later than the schedule of milestones," including:

- Pilot design testing design and installation of all pilot testing equipment within 6 months of the effective date of the permit (i.e., by December 1, 2018)
- Completion of pilot testing of wedgewire screens no later than 18 months after the effective date of the permit (i.e., by December 1, 2019)
- Submission to EPA of a demonstration report within 21 months of the effective date of the permit (i.e., by March 1, 2020), including
- Proposed screen slot size,
- Proposed material choice for the equipment, and
- Proposed optimal screen orientation
- Completion of data collection, including topographic and bathymetric surveys, no later than 22 months after the effective date of the permit (i.e., by April 1, 2020)
- Submission of a final design for the wedgewire screens within 26 months of the effective date of the permit (i.e., by August 1, 2020).

Id. at 13. Within 8 months after submission of the final design, Schiller was to complete submission of all necessary permit applications, complete the permitting process within another 12 months and/or report to EPA on the progress of that permitting process, and finally complete, within 20 months of obtaining permits and approvals, complete installation, testing, startup, and commissioning of the wedgewire screens. *Id.* at 14. Accordingly, the 2018 permit contemplated at the most a timetable of somewhere between 54 and 66 months from the effective date of the permit for screens to be in place and operational, or in other words, completion by late 2022 or 2023.

However, GSP sought, and received, from EPA an extension of this timeline. In March 2020, EPA extended the deadline for the demonstration report another five months from March 1, 2020 to July 30, 2020, the data collection deadline another five months to August 29, 2020, and the deadline for final design submission another five months to December 30, 2020. *See* Letter from K. Moraff to E. Tillotson (March 25, 2020).

Notwithstanding the permit requirement and the extra time EPA afforded to GSP to comply, it does not appear that GSP ever submitted a final wedgewire screen design to EPA. Instead, on March 31, 2021 GSP requested relief from the BTA wedgewire screen requirement and proposed in its place lowered limits on CWIS flows during certain months that would offer nominal "reductions" in system flow levels. However, these proposed limits were significantly in excess of the plant's operations at the time. *See* Letter from E. Tillotson to D. Houlihan (March 31, 2021) at 3-4 (requesting relief from screen requirements and instead proposing monthly CWIS flow reductions April-October), 3 (noting the Schiller units were currently "in a long-term outage status").

Applicable Legal Requirements

Section 316(b) of the CWA requires that the "location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact."[4] As with all technology-based standards, dischargers must comply with Section 316(b)'s technology-based effluent limitations immediately, meaning that Schiller should have been brought into compliance long ago. The plant now must be brought into compliance with Section 316(b) "as soon as possible," and, in the interim, must be subject to "interim requirements and dates for their achievement."[5]

In 2004, EPA published regulations designed to implement Section 316(b) at existing power plants like Schiller. Following legal challenges, however, the Second Circuit remanded numerous aspects of the rule to the EPA.[6] The U.S. Supreme Court reviewed the Second Circuit's decision on the limited issue of whether Section 316(b) authorizes EPA to consider costs in relation to benefits.[7] Other aspects of the Riverkeeper II decision were not addressed by the Supreme court's review. In response to the Second Circuit's remand of extensive portions of the rule, EPA withdrew the entire regulation for existing facilities so that it could revise the rule to be consistent with the Clean Water Act.[8]

EPA's subsequent CWA § 316(b) regulations became effective on October 14, 2014, setting national requirements under Section 316(b) for cooling water intake structures at existing facilities. For entrainment control, these regulations are not a significant departure from the site-specific Best Professional Judgement process that controlled BTA determinations in prior decades. The regulations still require the permit writers to engage in case-by-case BTA selections, but the new rule specifies five factors that the permit writer must consider in establishing the site-specific entrainment standard:

> (i) Numbers and types of organisms entrained... (ii) Impact of changes in [air] emissions ... associated with entrainment technologies; (iii) Land availability

> inasmuch as it relates to the feasibility of entrainment technology; (iv) Remaining [facility] useful plant life; and (v) Quantified and qualitative social benefits and costs of available entrainment technologies when such information on both benefits and costs is of sufficient rigor to make a decision.[9]

To control impingement, the regulations designate a set of "pre-approved" technologies that a facility can implement to satisfy the BTA standard. The regulations also allow a facility to use other technologies to meet the BTA standard if it can show that they will perform sufficiently.[10] Approval of such an alternative technology would require the permit writer to make a site-specific decision.

On October 4, 2022, EPA released its 2022 Draft Permit Modification and noticed it for public comment. Subsequently, EPA extended the original public comment period from November 2 to November 17; accordingly, these comments are timely.

[1] *See* AR-002, Schiller Authorization to Discharge Under the National Pollutant Discharge Elimination System NH0001473 (Sept. 11, 1990) (the "1990 Permit").
[2] *See* AR-258.
[3] *See, e.g.*, AR-312, Comments of Sierra Club (Jan. 27, 2016) (hereinafter "Comments of Sierra Club"); AR-311, CLF Comment on NPDES Permit No. NH0001743 (Jan. 27, 2016). Although these comments are already part of the permitting record for Schiller Station, Commenters incorporate those comments and their supporting materials herein by reference.
[4] 33 U.S.C. § 1326(b).
[5] 40 C.F.R. § 122.47(a); *see also* 33 U.S.C. § 1311(b).
[6] *See Riverkeeper Inc. v. U.S. Envtl. Prot. Agency ("Riverkeeper II")*, 475 F.3d 83 (2d Cir. 2007).
[7] *Entergy Corp. v. Riverkeeper, Inc.*, 556 U.S. 208 (2009).
[8] *See* EPA, National Pollutant Discharge Elimination System—Suspension of Regulations Establishing Requirements for Cooling Water Intake Structures at Phase II Existing Facilities; Suspension of Final Rule, 72 Fed. Reg. 37,107 (July 9, 2007).
[9] 40 C.F.R. § 125.98(f)(2).
[10] 33 U.S.C. § 1313(d) (requiring states to identify bodies of water for which technology-based thermal controls are insufficiently stringent and to impose "total maximum daily thermal loads" to protect these waters); *see also id.* § 1312 (requiring imposition of water quality-based effluent limitations on the discharge of pollutants when necessary to meet water quality standards).

Response to Comment B.1

The Sierra Club and the Conservation Law Foundation (collectively, "Sierra Club") begin their comments with a characterization of "Factual and Procedural Background" information and do not include any claim therein that any condition of the draft permit modification is inappropriate or request any specific change. Thus, no response is necessary here. EPA relies on, and reiterates, the relevant background information provided in the Statement of Basis for the Draft Modification.[7]

[7] In this part of the comment, Sierra Club also states that it incorporates by reference its comments (including supporting materials) on the 2015 Draft Permit. EPA previously responded to Sierra Club's comments on the 2015 Draft Permit in the Response to Comments document included with the 2018 Final Permit. Furthermore, to the extent Sierra Club's previous comments addressed other topics not raised by this modification, they are outside the scope of the modification.

EPA does note, however, that Sierra Club correctly observes that the 2018 Final Permit included a BTA determination for minimizing entrainment. In particular, EPA determined that wedgewire screens—notably, without any volumetric intake flow limits—are the best technology available at Schiller Station. 2018 Permit at Part I.A.2. Part I.A.11.a. In the Draft Modification, EPA did not propose to rescind or remove this BTA determination. *See* Draft Mod. at Part I.A.11.a. Nor has EPA done so in the Final Modification. *See* Final Permit at Part I.A.11.a. While EPA agrees with the comment that the proposed intake flow limits in the Draft Modification are "significantly in excess of the plant's operations at the time [of GSP's 2021 modification request]"—in fact, the facility had not been running at all and was in the midst of an outage that began in 2020, Statement of Basis at 6—the proposed intake limits nonetheless represent a significant drop in the intake flows allowed under the 2018 Final Permit. The Final Modification further decreases those intake limits. Final Modified Permit at Part I.A.2, I.A.11.a.3.

Next, the commenters provide their understanding of "Applicable Legal Requirements" and rulemaking history for national standards for Section 316(b) of the CWA. In the Statement of Basis for the proposed modification and the Fact Sheet for the 2015 Draft Permit, EPA summarized the legal requirements applicable to cooling water intake structures, *see* AR-508 at 3-5; 2015 Fact Sheet at 78-88, and reiterates and incorporates those discussions by reference here. EPA need not respond to the comments addressing the Phase II Rule, because that rule is no longer in effect and did not apply to the Final Permit or Final Modification, making it immaterial to the current permit proceeding. As to the currently applicable § 316(b) regulations promulgated in 2014, the comment for the most part (and similar to the "Factual and Procedural Background" section) neither presents an interpretation of how the regulations should be applied specifically to the Schiller Station permit modification nor requests that EPA change the Draft Modification in any way. Thus, this part of the background comment likewise requires no additional response.[8] To the extent the organization's later substantive comments echo one or more of the comments above and suggest that certain permit conditions are inappropriate or request changes to permit conditions, EPA will respond to those later comments in appropriate detail.[9]

[8] Furthermore, the commenters characterize their later comments as their "substantive comments," Comment B.2, further supporting the conclusion that detailed responses to these background comments are not necessary here.
[9] EPA notes that the comment could give an incorrect impression of the applicable deadline for complying with the § 316(b) standard. In particular, the comment states that, "[a]s with all technology-based standards, dischargers must comply with Section 316(b)'s technology-based effluent limitations immediately" and that "[t]he plant now must be brought into compliance with Section 316(b) 'as soon as possible.'" (citing CWA § 301(b)). If, by citing CWA § 301(b), Sierra Club means to suggest that the statutory deadline for meeting § 316(b) requirements has passed, EPA notes that the deadlines in § 301(b) for other standards do not apply to § 316(b) standards. 79 Fed. Reg. 48,300 at 48,359 (Aug. 15, 2014). Rather, the agency has said that permittees must comply with the entrainment and impingement standards "as soon as practicable." 40 CFR § 125.94(b).

Comment B.2: Substantive Comments

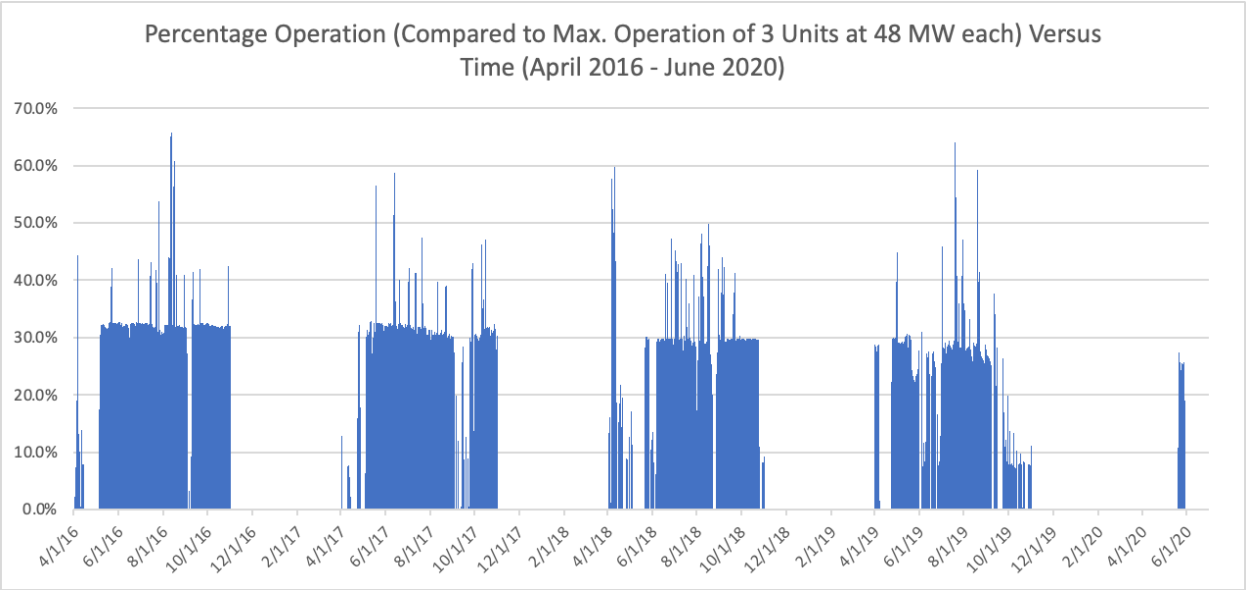
Comment B.2.a: Entrainment

Comment B.2.a.i: Unlike the installation of wedgewire screens, the proposed CWIS flow limits in the draft Modification would not actually reduce Schiller's entrainment of aquatic life

EPA's draft Modification's proposed reductions in permitted limits on CWIS flows for certain months would not result in significant changes in CWIS flows at Schiller Station–or in almost all cases, any changes at all–and accordingly would not provide any "reduction" in entrainment at Schiller.

As was apparent to EPA before it finalized the 2018 NPDES permit, the overall capacity factor at Schiller Station is relatively low (even in the years preceding summer of 2020, when Schiller ceased operating at all). Indeed, Schiller's capacity factor in both 2016 and 2017 was well-below a third of overall capacity, with the two-year average for that period being just 29.8%. Nor does annual capacity factor at Schiller during this period mask particularly higher seasonal or even *daily* plant operations–during the months of April through October from 2016 through 2020, Schiller's generation was consistent with no more than just one unit operating on the vast majority of days it actually operated. As the data in Exhibit 1 - Schiller Operations Data 2016-2020 shows, very rarely during those months has Schiller historically operated at levels above 33% of capacity (and only rarely did days involve operations significantly above 33% capacity), meaning that Schiller's daily CWIS flows almost never exceed the limit EPA proposes in the draft Modification for April-October operations.

Figure 1: Schiller Daily Percentage Operation (Spring-Fall, April 2016-June 2020)[11]



Indeed, daily operations above 33% capacity only amount to roughly 5% of overall days, meaning that the proposed 66% reduction in CWIS flows in the draft Modification would, at the very best, only reduce CWIS actual flows by 5% spread out over *five years*. Moreover, during the period examined there were hundreds of days involving much less than 33% capacity, meaning that EPA's proposed CWIS flow limits would allow *increases* in flow levels–and concomitant entrainment–on those days.

The February-March proposed monthly CWIS flow limits are even less likely to amount to any actual change in Schiller's behavior. Operations data from 2016 through 2020 for February and March, even assessing a rolling 30-day average, shows that Schiller never once, in *five years' worth of operations*, exceeded 66% operations. *See* Exhibit 1, Tab 3, Column G (comparing 30-day rolling average megawatt hours reported in EPA's Air Markets Program Database to potential megawatt-hours generated by two out of three 48-MW units operating); *id.* at Column I (comparing percentage of actual megawatt-hours generated to potential generation of all three 48-MW units operating). Accordingly, Schiller's CWIS flows during these periods likewise never exceeded the flow limits EPA contemplates here in the proposed Modification. Indeed, Schiller appears to have only rarely exceeded 40% operations/CWIS flows in the historical data, and to have topped out at 42% back in 2017. The CWIS flow limits in the draft Modification are thus exceedingly unlikely to result in any actual reduction in entrainment at Schiller.

Nonetheless, EPA's proposed justification for these CWIS flow limits is that they would result in hypothetical reductions of flow compared to theoretical 100% capacity factor operations and thus would reduce abstract fish entrainment at greater rates than would the wedgewire screens EPA had previously determined to be BTA. Draft Statement of Basis at 7.[12] However, EPA makes a fundamental error in its assessment: while CWIS flow limits will only reduce entrainment if they actually reduce real-world CWIS flows, wedgewire screens will reduce entrainment *under all CWIS flow scenarios*.

Exhibit 1 illustrates this. Assuming for ease of calculation that each 48 MW unit at Schiller, for the months of April through October, is capable of entraining and killing 100 units of fish per day at full operation/full CWIS flow, Tab 1 Column W sums the maximum entrainment mortality allowed under EPA's proposed CWIS flow limit for 2016-2020. Assuming (as EPA does–*see* draft Statement of Basis at 7, n.6; 79 Fed. Reg. 48,331) that entrainment is proportional to flow, the actual operations at Schiller can be used to scale and calculate by the same ratio the entrainment mortality from April-October for 2016-2020; the resulting total figure is in Column T. The figure in Column T is actually only 67% of the figure in Column W–underscoring that EPA's proposed CWIS flow limits are set significantly higher than Schiller's historical behavior. More importantly, however, Column U scales entrainment mortality by the 37% reduction figured for wedgewire screens that EPA relies on (*see* draft Statement of Basis at 7). The resulting figure is less than half the entrainment mortality EPA's proposed limits would achieve. A similar exercise is undertaken in Tab 2, as regards macrocrustacean impingement, again showing that screens would reduce entrainment due to actual operations more than EPA's theoretical reductions in CWIS flow from an imaginary 100% capacity factor.

Put another way, EPA has wrongly compared the efficacy of screens at Schiller at 100% capacity factor to Schiller without screens at a 33% capacity factor and thus erroneously concluded that its proposed 33% April-October CWIS flow limits are more protective. An apples-to-apples comparison for the purposes of determining BTA should instead compare the impact of screens versus flow restrictions *as compared to actual operations*.[13]

Finally, EPA does not, in the proposed Modification, conduct the same sort of analysis that led it to conclude, just four years ago, that BTA for Schiller Station was "a fine mesh wedgewire screen intake system" for Schiller's cooling water intake system, and to mandate the installation of such a system in the 2018 NPDES permit. There, EPA conducted benefit-cost analysis to conclude that, while closed-cycle cooling would be far more protective of aquatic life (by virtually eliminating cooling water withdrawals and accordant entrainment and impingement), fine mesh wedgewire screens would be much cheaper. *See* EPA 2018 Response to Comments at 216 ("The closed-cycle cooling option, however, is estimated to cost nearly 40 times more than any of the wedgewire screen options . . . ***wedgewire screen options will also achieve substantial entrainment mortality reductions and will do so at far lower costs***") (quoting 2015 Draft Fact Sheet at 155, emphasis added). EPA thus "based its determination of the BTA for entrainment at Schiller Station on the relative biological effectiveness and costs of wedgewire screens as compared to closed-cycle cooling." *Id.*[14]

However, EPA here never assesses the "cost" of its proposed cooling water discharge "limitations." As noted above, EPA uses theoretical maximal cooling water discharges characteristic of a 100% capacity factor for Schiller Station in determining that "limiting" those theoretical flows by 66% April-October and by 33% February-March would result in fewer entrained fish and macrocrustaceans. This annual roughly 4/9 reduction in operations would (if we are to maintain the fiction that Schiller ever has or ever would operate continuously at full capacity) cost tens of millions of dollars per year in foregone revenue. As the average real-time power price in ISO-NE in 2021 was $44.88 per megawatt-hour,[15] Schiller at EPA's imagined 100% capacity factor would garner some $56.6 million in revenue (48 MW x 3 units x 24 hours/day x 365 days/year x $44.88 per megawatt-hour); reducing that by 4/9 would therefore "cost" over $25 million per year. Such an annual cost would be, of course, far in excess of the comparatively trivial capital and operations cost of wedgewire screens[16] or even cooling towers.

To the extent that EPA considers such foregone revenue "costs" to be phantom–since Schiller's operations have been, as demonstrated above, below *both* a theoretical 100% capacity factor *and* the CWIS flow "limits" EPA now proposes–EPA should likewise concede that the "benefits" of its proposed flow limits are similarly illusory.[17]

[11] *See* Exhibit 1, Tab 1. Data taken from U.S. EPA, Clean Air Markets Program Data, *available at* https://campd.epa.gov/data/custom-data-download.

[12] As EPA notes, the proposed CWIS flow limits would lead to an *increase* in macrocrustacean entrainment. *Id.* at 7. The fact that the proposed flow limits would, even under EPA's flawed baseline assessment, lead to a tradeoff in macrocrustacean life for fish life is yet another reason why the proposed limits fail to be BTA.

[13] EPA's approach would also set a perverse precedent. If BTA screens reduce entrainment by 37%, EPA's analysis here could conclude that flow levels consistent with a 63% capacity factor "reduce" entrainment by just as much, and that since Schiller hasn't operated above a 61% capacity factor since 2009, no screens or other technology need be installed. EPA did not employ such illogic in 2018, and it should not employ it here.

[14] Sierra Club and CLF disagreed with EPA's methodology during the comments process leading to the 2018 permit, and Commenters continue to disagree with it now. *See, e.g.*, AR-312, Comments of Sierra Club.
[15] ISO New England, About Us > Key Grid and Market Stats Fast Stats, *available at* https://www.iso-ne.com/about/key-stats/markets#:~:text=The%20average%20real%2Dtime%20price,was%20%244 4.84%20per%20megawatt%2Dhour.
[16] During the permitting process that resulted in the 2018 Permit, EPA did not make public the actual cost figures that it relied on for its analysis, claiming that they were confidential business information; however, Sierra Club analysis, submitted in our comments at the time, assessed that screens would cost $700,000 to $850,000. Comments of the Sierra Club Exhibit 2, Synapse Energy Economics Report at 2. For its part, EPA indicated that wedgewire screens at Schiller could be installed for "a low seven-figure cost." 2015 Fact Sheet at 158.
[17] It is also worth considering that GSP would be unlikely to have "proposed an alternative to minimize entrainment in which the Permittee would limit operation of Schiller Station to a single unit from April through October (a 66.8% reduction in flow during this period)" (Draft Statement of Basis at 5) in order to avoid the "low seven-figure cost" (2015 Fact Sheet at 158) of screens if it really meant giving up on many millions of dollars worth of revenue through foregone operations.

Response to Comment B.2.a.i

The comment opposes the Draft Modification on the basis that the proposed alternative for complying with the entrainment BTA will not result in significant changes in actual flows at Schiller Station and will not provide any reduction in entrainment. The comment supports its claim with a spreadsheet analysis[10] comparing entrainment under the proposed flow limits to estimated entrainment if the Facility were to use wedgewire screens under recent operational flows (2016-2020). The comment essentially boils down to a claim that EPA errs in its estimation of comparably effective flow limits by considering the entrainment impacts of Schiller's cooling water intake structures at design flow and should instead base its decision solely on entrainment impacts at recent operational flows. The comment therefore mistakenly focusses on comparing entrainment estimated to occur at the proposed flow limits only to entrainment estimated to occur with wedgewire screens at recent operating levels. The comment, however, never explains the basis for its flawed premise and overlooks two critical facts—first, that, in the 2018 Final Permit, EPA grounded its decision establishing wedgewire screens as the entrainment BTA for Schiller Station's cooling water intake structures on estimates of entrainment *at design flow*, *see* Fact Sheet at 93-97, 105; 2018 Response to Comment at 293-94, and second, that the 2018 Final Permit authorizes the facility to operate *at design flow*, 2018 Final Permit Part I.A.2. For these reasons, EPA, in the Draft Modification, reasonably compared entrainment estimates under the flow limits to entrainment estimates with wedgewire screens *at design flow*.

For the 2018 Final Permit, EPA evaluated impacts at design flow because the erstwhile owner (PSNH) said it wanted a permit that would allow it to operate Schiller Station at 100% capacity utilization, even though the facility generally ran far below that. AR-044; AR-139; AR-508 at 4. While EPA also qualitatively considered in the BTA determination that Schiller Station's recent

[10] EPA has not reproduced the spreadsheet in this Response to Comments but has included it in the Administrative Record. EPA notes that Sierra Club's analysis is not representative of the effectiveness of wedgewire screens as EPA assessed in the Fact Sheet. Sierra Club assumed the screens would result in a uniform 37% reduction in entrainment, but this value misrepresents EPA's calculation of entrainment reductions based on life stage, exclusion, and survival. *See* Fact Sheet (AR-510) at 117-118. Actual entrainment reductions may be higher (in the case of eggs) or lower (for larvae) in any given month than Sierra Club's analysis projects.

actual flows were well below its design flow and would likely remain so, the weight of EPA's analysis is primarily borne by an evaluation of entrainment impacts at design flow because there was no certainty that the facility's operations would not increase and because the facility sought the ability to run at 100% capacity utilization. S*ee* AR-510 (2018 Response to Comment) at 294, 308-309. Notably, Sierra Club agreed with EPA's decision at that time to use entrainment impacts *at design flow* instead of recent flows. *See id*. at 266 ("Sierra Club agrees with EPA's decision to estimate entrainment losses based on the plant's *design flow* of 124.4 mgd, rather than the plant's 5-year average operating flow Schiller used in its estimates.") (emphasis added). Moreover, Sierra Club supported its own arguments for closed-cycle cooling as the BTA on the entrainment impacts of the facility at 100% capacity utilization. *See id*. at 233 ("Sierra Club agrees with EPA's upward adjustment [of entrainment estimates] to align with Schiller's *design* intake flow.") (emphasis added). Sierra Club took the same position in the Merrimack Station NPDES Permit proceeding, commenting that EPA cannot set permit provisions "based on what level of operation [one] suspects [a power plant] *might* engage in, but only on what level of operation it is *allowed*." AR-511 at 25 (underlining added). Sierra Club also advocated that permit limits should be "based on the facility's *potential* pollution, *not historical performance*" and that "EPA must not consider *any* drop in output at" a power plant. *Id.* (emphases added). Without explanation (or even acknowledgement of its previous position), Sierra Club now reverses course.

The result of EPA's entrainment BTA determination in 2018 was that the Final Permit required GSP Schiller to install wedgewire screens but authorized the facility to operate year-round *at design flow* (125.8 MGD). The CWIS requirements at Part I.A.2 and I.A.11.a represent EPA's determination of the maximum entrainment reduction warranted considering the factors at 40 CFR § 125.98(f)(2) and (3) based on the permitted flow of the Facility (i.e., design flow). 40 CFR § 125.98(f). Sierra Club and others submitted comments on this BTA determination in 2015—to which EPA responded—but no one challenged the Final Permit. Despite Sierra Club's comment to the contrary, *see* Comment B.2.c, EPA has not revisited or changed this determination in this Permit Modification, *see* Statement of Basis (AR-508) at 4. For the modification, EPA evaluated an alternate entrainment compliance option to determine whether and how it would be as effective or more effective to minimize entrainment compared to the BTA requirements of the 2018 Permit,[11] which is wedgewire screens without flow limits—that is, *at design flow*. AR-508 at 4.

[11] Incidentally, Sierra Club's comments do not dispute EPA's authority to establish an alternative compliance option or include any argument that the CWA or its implementing regulations prohibit EPA from doing so. Sierra Club comments only on the reasonableness of EPA's basis for the proposed intake limits. A permitting authority may determine that a particular technology is the "best technology available for minimizing adverse environmental impact" but include permit conditions that do not require its installation. For instance, a permitting authority may determine that closed-cycle cooling is the BTA for entrainment at a particular facility but include permit conditions that only require the facility to limit its intake flows to a level commensurate with closed-cycle cooling technology. *See, e.g.*, 40 CFR § 125.94(d) (authorizing a permitting authority to determine "that the site-specific BTA standard for entrainment under [§ 125.94(d)] requires performance *equivalent to* a closed-cycle recirculating system") (emphasis added). Further, EPA has determined that the best technology available for minimizing impingement mortality at Existing Facilities is modified traveling screens with a fish-friendly return, but EPA's regulations do not require Existing Facilities to install that technology—instead allowing them to choose that option or one of six others that EPA determined to be equally, or more, effective. 40 CFR § 125.94(c).

Without explanation, Sierra Club's comment shifts the baseline for determining the maximum reduction in entrainment warranted from design flow to actual operating flows based on a period from 2016-2020. By changing the baseline flows that underlay EPA's entrainment BTA determination, Sierra Club is, in effect, assuming a combination of wedgewire screens *and* flow reductions is the existing BTA, which EPA rejected in 2018.[12] Sierra Club comments that a comparison of entrainment with and without wedgewire screens under actual operating flows is an "apples-to-apples comparison for the purposes of determining BTA." EPA's purpose in this modification, however, is *not* to determine BTA, because EPA *already* determined the BTA in 2018 and did not reconsider that determination. AR-508 at 4. Instead, EPA is comparing the reduction that it previously determined represented the maximum entrainment reduction warranted in 2018 (which Sierra Club did not appeal) to the reduction that can be achieved with an alternative technology (i.e., intake flow limits). For the modification, an "apples to apples" comparison of the effectiveness of each technology to control entrainment is, therefore, one that compares entrainment estimates with wedgewire screens at design flow because the 2018 permit was grounded in, and allows the Facility to operate at, design flow. Several times in its comment Sierra Club criticizes EPA's analysis of the flow limits on the basis that the 100% capacity flow is "imaginary" or "theoretical." Not only do these criticisms conflict with Sierra Club's own past analyses, *see*, *supra*, they ignore that the Permittee's decision to seek a permit that would allow it to operate at full capacity fundamentally impacted the entrainment BTA analysis EPA undertook, and they seek to penalize the Permittee for not operating Schiller Station at full capacity in recent years. EPA is well aware that the facility has operated far below its 100% capacity, Statement of Basis (AR-508) at 5, and the flow limits would lock a significant share of those reductions in place, thereby providing greater certainty of survival of organisms than wedgewire screens would. AR-508 at 8. Sierra Club also opposes the modification on the basis that "EPA's proposed CWIS flow limits would allow *increases* in flow levels–and concomitant entrainment." This comment, however, ignores that the *existing* (unmodified) permit *already allows* increases in flow levels and, even with wedgewire screens in place, would allow increases in entrainment over recent operating levels. Since EPA is establishing an alternative compliance option in the Permit Modification and not revisiting the BTA determination, EPA reasonably used the same premise that it used to arrive at the BTA determination, which was that the facility was authorized to operate at full capacity and would have certain estimated impacts at that capacity. EPA does not agree that it is unreasonable for EPA to compare the effectiveness of flow limits to the effectiveness of the 2018 permit's requirements—that is, wedgewire screens but without flow limits.

[12] In so doing, the comment partially rehashes comments Sierra Club submitted on the 2015 Draft Permit. As noted earlier, in that proceeding, Sierra Club argued for closed-cycle cooling (and against wedgewire screens) as the entrainment BTA, focusing on the numbers of organisms entrained at design flow—in other words, on the impacts when the facility runs at full capacity. *See, e.g.*, 2018 Response to Comment (AR-510) at 233, 287 ("Schiller kills about 1.596 billion organisms annually . . ."). Sierra Club also commented that, in the event EPA disagreed and determined wedgewire screens to be the BTA, EPA should also include flow limits. *See id*. at 291-292. But even Sierra Club's argument for wedgewire screens plus flow limits in that proceeding assumes that closed-cycle cooling is actually the correct BTA determination and justifies wedgewire screens plus flow limits on the basis that together they would be comparable to closed-cycle cooling. *See id*. Thus, even Sierra Club's 2015 comment for wedgewire screens plus flow limits starts from the premise that entrainment must be estimated *at design flow*. Sierra Club's new position in this modification proceeding is therefore inconsistent with its previous comments arguing for wedgewire screens plus flow limits.

EPA acknowledged that operation of Schiller Station at the time of the 2018 Permit had changed since the 2007 Entrainment and Impingement Studies (AR-136) were completed, largely due to the reduced operating capacity at Units 4 and 6. *See* Response to Sierra Club Comment IV.B.3 (AR-510) at 293. But EPA explained that it did not factor any change in operation into its assessment of the adverse environmental impacts from entrainment. *See id.*at 293-94. EPA explained that it used design flow to evaluate impacts because PSNH was not proposing to maintain a low capacity in the future and because "there is no way to predict with certainty the seasonal or annual capacity factor for each unit." 2018 Fact Sheet (AR-510) at 149. While EPA considered the likely continued reduced capacity of the facility as one of many qualitative factors in the context of evaluating the relative costs and benefits of wedgewire screens versus closed-cycle cooling, it noted that the entrainment reductions achieved with wedgewire screens "are based on operating at the design flow" and that "[a]ny reductions that result from a reduction in generating capacity, and thus cooling water flow, at Units 4 and 6 will be additional benefits that EPA does not rely on in calculating entrainment reductions." 2018 RTC at 295. EPA recognized that additional—but unenforceable—entrainment reductions would likely be achieved based on the difference between design and actual intake flow. EPA also expects, however, and has considered in this modification, that the intake flow limits in the modified permit—which are enforceable—will on balance yield entrainment reductions in excess of 37% as compared to design flow. Indeed, from April through October (which encompasses the period of highest densities of eggs and larvae), the modification establishes maximum average monthly intake flow limits of 33%, an entrainment reduction from design flow of 67%. Moreover, the Final Modification includes a 12-month average flow limit of 24% design capacity and, in response to Sierra Club's comments, extends the flow limit at 66% of DIF from November through March.[13] Establishing enforceable flow limits in the modified permit allows EPA to calculate with certainty the seasonal capacity for each unit and, as a result, the estimated entrainment reduction.

The appropriate baseline for the comparison of the BTA (wedgewire screens) and flow limits is the design flow because that is the flow allowed under the 2018 Permit and that is the flow that formed the basis for EPA's evaluation of adverse environmental impacts and its determination of the maximum entrainment reduction warranted. 40 CFR § 125.98(f)(2) and (3).[14] The Statement of Basis (AR-508 at 7-9) explains that the flow limits will achieve a level of entrainment that is at least as effective as the estimated entrainment control of the BTA in the 2018 Permit. EPA's

[13] As the comment observes (in footnote 12), the flow limits in the Modified Permit could result in higher entrainment of macrocrustaceans as compared to EPA's estimate of their entrainment with wedgewire screens in place. The comment asserts, without explanation, that this is a "reason why the proposed limits fail to be BTA," but the comment never grapples with EPA's explanation that the decrease in anticipated effectiveness for macrocrustaceans is tempered by other considerations. Statement of Basis at 8. EPA balanced the potential estimated impacts to macrocrustaceans against the certainty of entrainment control provided by enforceable flow limits, the expected increased benefits for early life stages of fish (particularly fish larvae), and the timeline for compliance in the Final Permit Modification. *Id.*

[14] Sierra Club points out that EPA did not conduct an analysis of the factors at 40 CFR § 125.98(f)(2) and (3) for the modification, but Sierra Club does not assert that such an analysis is required at this time. EPA did not repeat the analysis because, as explained in this response and in Response to Comment A.4, EPA has not revisited its determination that wedgewire screens are the BTA for Schiller Station. Statement of Basis (AR-508) at 4. At this time, EPA is modifying the permit to allow an alternative compliance option that EPA has determined will control entrainment as effectively, if not more effectively, than the technology that EPA selected as the BTA. In a future permit issuance, EPA may reconsider the BTA and reassess the site-specific entrainment requirements, including the factors under the 2014 Final Rule.

regulations do not necessarily require the technology that achieves the lowest possible entrainment but the technology which achieves the "maximum reduction warranted" after consideration of the adverse environmental impacts and the framework set out in 40 CFR § 125.98(f).[15] At this time, the appropriate comparison is based on EPA's determination of the maximum reduction warranted in the 2018 Permit, which was based on, and allowed, operation of the Facility at design flow. Compared to the 2018 Permit limits, the intake flow limits in the Permit Modification provide comparable entrainment protection. For these reasons, the flow limits in the Final Permit Modification are a reasonable alternative.

Comment B.2.a.ii: Even if proposed flow restrictions were to actually reduce CWIS flows at Schiller, the proposed seasonal limits are unlikely to provide necessary protection against entrainment

EPA claims that the majority of entrainment is expected to occur between April and October, and so focuses its proposed CWIS flow limits during those months. However, for a variety of reasons, such calendar-based limits are unlikely to provide protection against entrainment consistent with the requirements of BTA.

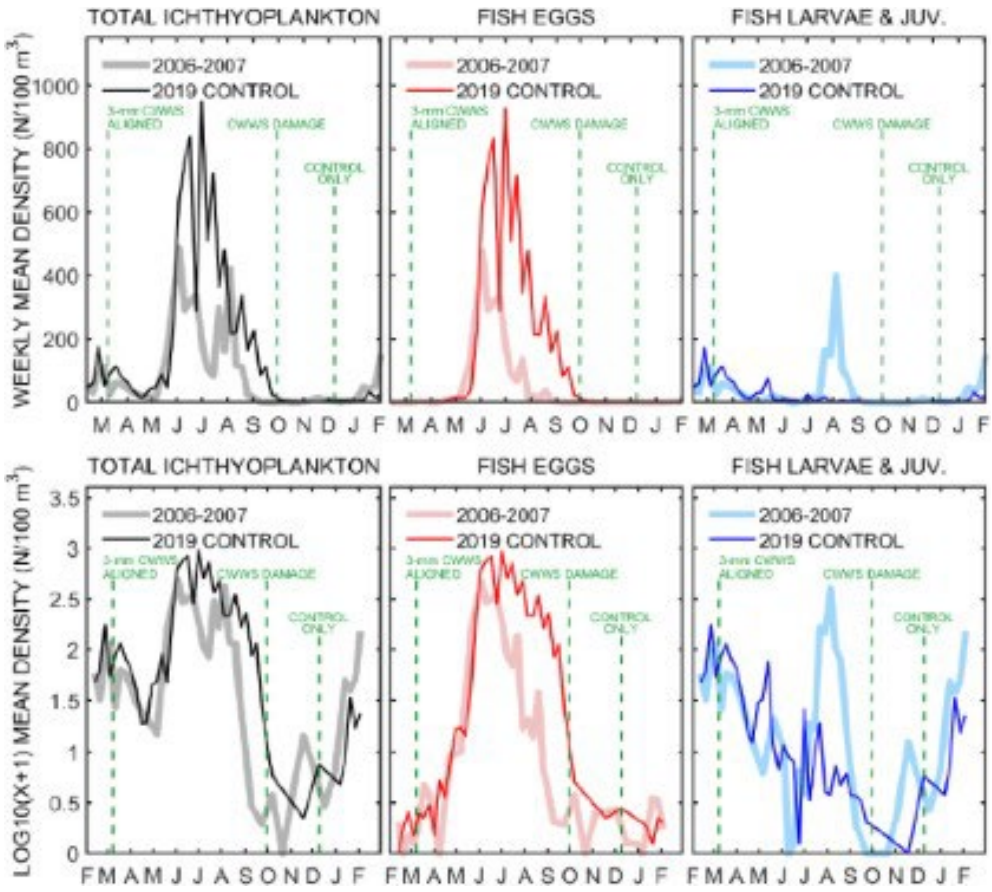
For example, bimodal peaks in cod spawning activity in the Gulf of Maine include both spring (April-July) and winter (October-February) subpopulations. *See* Berrien and Sibunka, (1999), attached hereto as Exhibit 2. As such, the absence of winter CWIS flow restrictions would leave spawning activity vulnerable to harm from Schiller's CWIS that would be, nonetheless, protected to some degree by the screen requirements in the 2018 permit.

Similarly, EPA appears to rely on entrainment data from 2006-2007 (*see* AR-136) in determining that most entrainment occurs between April 1 and October 31. However, a single-year snapshot (particularly one, such as that study, that relied on periodic sampling instead of continuous sampling) from the 2006-2007 season is an unreliable predictor of entrainment density or temporal distribution from year to year, let alone decades later. *See* Staudinger et al. (2019), attached hereto as Exhibit 3 (concerning the Gulf of Maine ecosystem, concluding that the "timing of recurring biological and seasonal environmental events is changing on a global scale relative to temperature and other climate drivers," and citing "direct evidence for shifts in timing").

As an example of climate change and varying annual conditions shifting spawning timelines, Figure 11 of the 2020 Normandeau Report plots data from 2006-2007 as well as "2019 control" data. 2019 was a warmer year than 2006 and 2007, and there is a marked temporal shift in most of the plotted peaks in 2019 towards later months as compared to the earlier, cooler years.

[15] Similarly, the purpose of the permit requirements established under CWA § 316(b) is ensure that the location, design, construction, and capacity of the CWIS reflect the best technology available for minimizing adverse environmental impact. These conditions are not necessarily required to change the "behavior" of a facility. The 2014 Final Rule recognizes that, in certain cases, the outcome of a site-specific BTA determination could be that no additional entrainment controls are warranted. *See* 79 Fed. Reg. at 48,303.

Figure 2: Weekly Mean Entrainment Density (2020 Normandeau Report)[18]



Indeed, the 2020 Normandeau Report also does not support EPA's proposed unconstrained CWIS flow limits and lack of BTA screens in December and January. As Figures 17 and 18 in that Report indicate, entrainment densities of eggs and larval and juvenile fish actually increased significantly in those months significantly with the preceding November and December. *See* 2020 Normandeau Report at 79-80. As such, reliance on seasonal CWIS flow limits to reduce harm commensurate with continuously-in-place screens is unsupported and inconsistent with the requirements of BTA.

[18] Taken from Normandeau Associates, Inc., Evaluation of the Entrainment Reduction Performance of 0.8-mm and 3.0-mm Cylindrical Wedgewire Screens at Schiller Station ("2020 Normandeau Report") at 37, Fig. 11.

Response to Comment B.2.a.ii

In its comment, Sierra Club asserts that the proposed seasonal flow limits will not provide protection against entrainment consistent with the requirements of BTA. Sierra Club argues that EPA relied on a single year of data (2006-2007) when it set seasonal limitations and offers several reasons why setting seasonal limits based on a single year of data is improper.

EPA concurs that entrainment controls during winter months are necessary to provide comparable protection for early life stages of species, such as Atlantic cod, which spawn in winter (October-February). Zemeckis et al. 2019 observed the greatest number of adult Atlantic cod spawning in Massachusetts Bay from early November through late January. *See* AR-501. In the Statement of Basis (AR-508 at 7-8), EPA explains that flow limits are necessary during winter months to provide comparable protection for commercially, recreationally, and/or ecologically important species with early life stages present during late winter and early spring, including Atlantic cod, winter flounder, and American sand lance. The Draft Modification proposed flow limits during February and March to provide such protection during winter months when early life stages are most likely to be present. In response to the comment, EPA reviewed additional data, including ichthyoplankton data collected at the Northeast Gateway Deepwater Port in Massachusetts Bay, and observed that densities of early life stages of several species, including Atlantic cod, American sand lance, and pollock tend to increase in December and peaked in January in several years. As explained in more detail below, EPA concludes that flow limits should be extended throughout the winter (November through March) to provide comparable protection for winter spawning populations of resident fish as wedgewire screens at design flow would.

EPA does not agree, however, with Sierra Club's assertion that EPA improperly relied only on entrainment data from 2006-2007 in setting the period of the most stringent seasonal intake flow limits. GSP Schiller proposed limiting flows commensurate with operation of a single unit from the period from April 1 to October 31, which EPA concluded coincides with the peak period of entrainment. *See* Statement of Basis (AR-508) at 7. EPA did not rely solely on the 2006-2007 data for this conclusion but also considered other information, including the 2019 data. EPA considers the entrainment data to be the best available site-specific information on which to evaluate seasonal presence of the highest densities of eggs and larvae in the Piscataqua River.[16] During 2006-2007, 83% of entrainment occurred during April through October; 89% of entrainment occurred during this period in 2019. Entrainment densities were an order of magnitude higher during this period than during the winter months. In responding to GSP's request for a modification EPA also drew on knowledge of the life history of fish in the Gulf of Maine and its experience reviewing and evaluating entrainment data for other coastal facilities in Massachusetts and New Hampshire. EPA maintains that the site-specific data from two years of entrainment monitoring support the period originally selected by GSP Schiller, and determined by EPA to be appropriate, for single unit operation and thus, that a flow limit equal to a 33% of capacity captures the period when eggs and larvae are present in the highest densities. As a result, the proposed flow limits for April through October offer similar or better entrainment control than the BTA under the 2018 Permit (i.e., wedgewire screens at design flow).

[16] Sierra Club implies that the 2006-2007 data are unreliable because the study used periodic sampling "instead of continuous sampling." EPA has never seen an entrainment sampling design based on continuous sampling. On any given sampling day, each entrainment sample requires 2 to 3 hours of pumping over four diel periods (between 25,000 and 28,000 gallons per sample). Normandeau collected 684 samples for the wedgewire screen pilot study and processed 240 samples. In each sample, live larvae, live juvenile fish, and live, fertilized eggs are sorted using microscopic examination and each organism is identified to the lowest practical taxon and enumerated. Continuous entrainment sampling would result in so many samples it would not be practical to accurately sort, identify, and count ichthyoplankton. The sampling frequency used in 2007-2007 and 2019 was generally consistent with § 316(b) monitoring requirements established for new facilities that operate a CWIS. *See* 40 CFR § 125.87(a)(2).

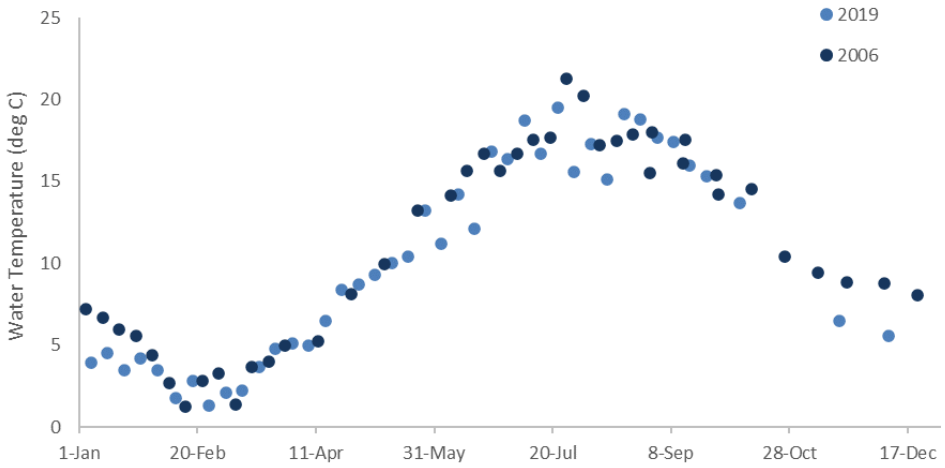
Sierra Club references Figure 11 from the 2020 Normandeau Report (AR-499) to suggest that there is a "marked temporal shift in most of the plotted peaks in 2019 towards later months as compared to the earlier, cooler years." The top three panels in Figure 11 (untransformed weekly mean densities) demonstrate that the interannual variability between sampling years is more pronounced than any seasonal shift. This variability is influenced by a number of factors including temperature. *See* AR-500, AR-502. Incubation time of fish eggs and larval growth rates are linked to temperature, and temperature changes during seasonal spawning periods can result in temporal shifts in ichthyoplankton densities. *See* AR-512; AR-513. While Sierra Club focusses on the untransformed data, EPA concludes that the log-transformed data in the bottom three panels in Figure 11 provide the more useful characterization because log transformation reduces influence of extreme values and, in this comparison, interannual variability.[17] Sierra Club does not point to a specific example of temporal shifts in the figure, but EPA's view of the information in Figure 11 is that the three bottom panels generally demonstrate fairly consistent patterns over the two periods for both eggs and for fish larvae and juveniles (with the exception of the August-September peak larval densities in 2006 which was not observed in 2019).[18] Sierra Club also indicates that 2019 was a warmer year and suggests that temperature is the cause of the supposed temporal shifts "towards later months as compared to the earlier, cooler years." However, temperature data collected during each of the entrainment studies (Figure B.2-1) demonstrate that temperatures between the two years were generally consistent and, where differences are observed (e.g., January and fall), that 2006 was warmer than 2019. EPA does not see evidence in the two studies that the 2019 study period was warmer than the 2006 study period or that there is a "marked temporal shift in most of the plotted peaks in 2019 towards later months as compared to the earlier, cooler years."

As explained above, temperature impacts the timing of spawning and the duration of incubation. If, as Sierra Club suggests, 2019 was a warmer year than 2006, densities of early life stages in winter and spring would be expected to shift earlier in the year, not later, because warmer temperatures would shift spawning earlier and result in shorter incubation times. One change in egg density observed in Figure 11 is shift in peak egg density from late May and early June in 2006 to July in 2019. Regardless of whether the shift in egg density was related to later spawning or longer incubation periods during the cooler winter, the proposed flow limit in the Draft Modification for the period from April through October would be in effect and provide entrainment protection for both peaks. Another possible change in larval density in Figure 11 is a shift in the presence of eggs and larvae during fall from November in 2006 to December in 2007. Fall spawning is often triggered by a drop in temperature and a warmer fall could shift the timing of fall spawning later in the year; however, the temperature in Fall 2019 was cooler than in 2006. If temperature was related to the shift in early life stages in 2019, EPA would expect that the presence would increase earlier, not later in the season. The data in Figure 11 of the 2020 Normandeau Report (AR-499) do not provide sufficient support for Sierra Club's argument that there are "marked temporal shift in most of the plotted peaks in 2019 towards later months as compared to the earlier, cooler years."

[17] Log transformation is a common transformation for biological data to convert data exhibiting asymmetrical or skewed distribution to a more normal distribution for statistical analysis. In this case, the log transformed data are also useful for comparing entrainment counts that vary widely on a relative scale. See AR-506.

[18] This August-September period is, of course, already encompassed by the more stringent limits proposed for April-October.

Figure B.2-1. Water temperature (deg C) at the cooling water intake structure during the entrainment study in 2006 – 2007 and 2019. (Temperature data from AR-136; AR-499).



The Draft Modification proposed an average monthly flow limit at 66% of capacity for the months of February and March to provide comparable protection as wedgewire screens for early life stages of commercially, recreationally, and/or ecologically important species present in late winter and early spring, including Atlantic cod and American sand lance. The comment asserts that the lack of seasonal CWIS flow limits in December and January would not provide entrainment protection commensurate with continuously-in-place screens and references for support Figures 17 and 18 of the 2020 Normandeau Report (AR-499 at 79-80), which it claims demonstrate that densities of early life stages increased in December and January as compared to November. EPA agrees in part. Figure 17 demonstrates that in 2019, weekly mean *egg* density (and Log_{10} weekly mean density) decreased in October (as compared to the previous month) and remained relatively low for the rest of the year.[19] Figure 18, however, demonstrates that in 2019, weekly mean density of *larvae and juveniles* began increasing in December (as compared to the previous month) and continued increasing into February and March. In addition, Figure 22 of the 2020 Normandeau Report (AR-499 at 84) illustrates that three of the top four larvae and juvenile species at the existing CWIS are winter spawners (American sand lance, grubby, and rock gunnel). While the Report does not include species-specific data for the months of November through February, Figure 22 does reveal relatively high weekly mean densities in March, suggesting that larvae are likely also abundant in the preceding months. Furthermore, Figure 11 of the 2020 Normandeau Report (AR-499 at 37), which Sierra Club references earlier in its comment, also indicates that the presence of larval and juvenile fish began increasing in December into January in both 2006-2007 and 2019. Taken together, Figures 11, 18, and 22 in the 2020 Normandeau Report (reproduced below as Figures B.2-2 and B.2-3) support Sierra

[19] The 2020 Normandeau Report includes tabular data for the "performance period" from March 1 to October 31 but does not provide tabular data for the months at issue in this comment. EPA relied on the data in the figures for this response.

Club's argument, and convince EPA, that densities of fish larvae increase in November and are likely abundant in December and January as well as February and March.

Figure B.2-2. Weekly mean entrainment density and Log_{10} (x + 1) transformed weekly mean entrainment density of eggs and larvae and juveniles at the existing cooling water intake structure (CWIS) for Units 5 and 6 ("Existing CWIS (Control)"). AR-499 Figures 17 and 18.

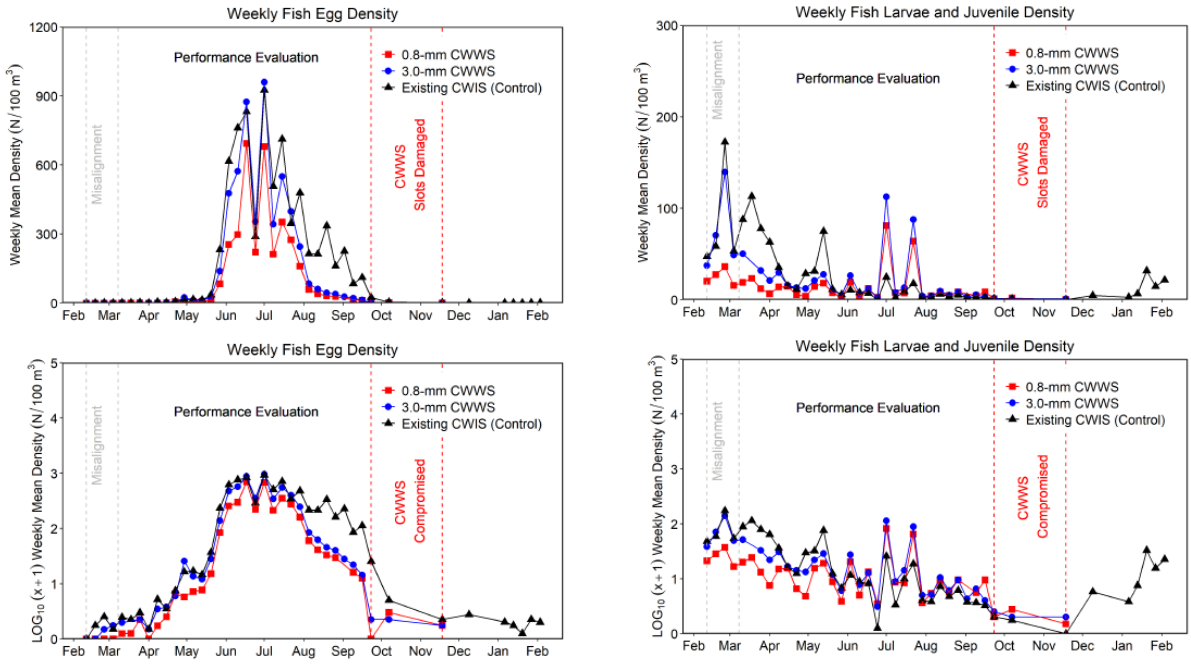
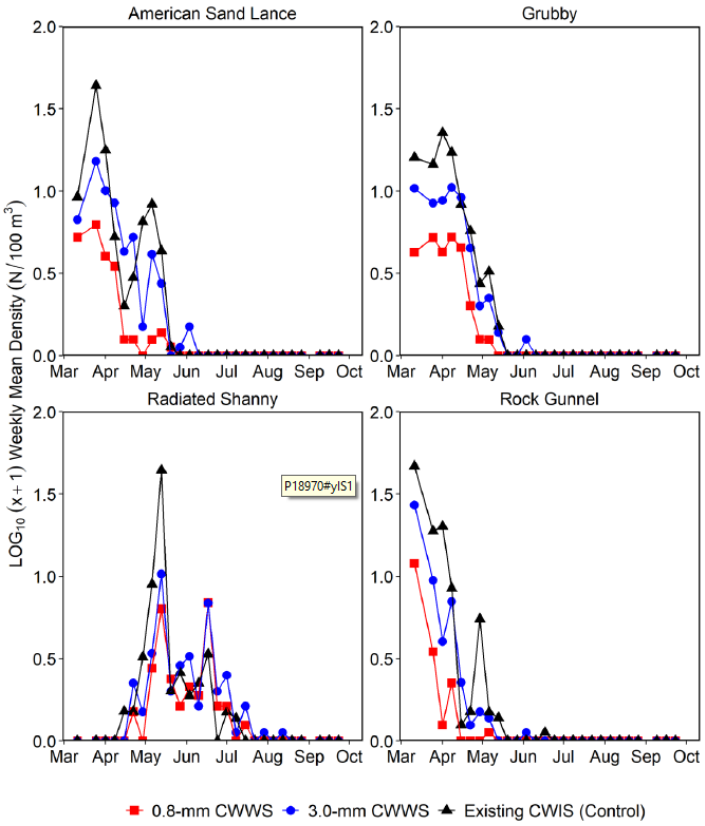


Figure B.2-3. Log_{10} (x + 1) transformed weekly mean entrainment density of larvae and juveniles of the top four species at the existing cooling water intake structure (CWIS) for Units 5 and 6 ("Existing CWIS (Control)"). AR-499 Figure 22.



EPA also reviewed annual entrainment monitoring data collected at the Northeast Gateway deepwater liquified natural gas port in Massachusetts Bay (NPDES Permit No. MA0040240) from 2008 through 2020. While the port is located offshore, the fish communities in Massachusetts Bay and the Piscataqua River are similar and the data are useful for providing additional information about the timing of spawning and presence of early life stages in recent years. Early life stages of Atlantic cod, pollock, and American sand lance are consistently observed in December and January at densities as high or higher than in February and March throughout the years. *See* AR-503. Based on review of entrainment data at GSP Schiller and in Massachusetts Bay, EPA agrees that entrainment controls are necessary to provide comparable protections as wedgewire screens would for early life stages of important winter spawning species, particularly Atlantic cod, in December and January. In support of its comment, Sierra Club includes a 2019 review by Staudinger et al. (AR-495), which concludes that the timing of biological and seasonal environmental events is shifting relative to temperature and other climate drivers. One of the studies referenced in that review, Walsh et al. (2015) (AR-500, AR-502), observed changes in seasonal timing of larval occurrence in the Northeast Shelf Ecosystem (from Cape Hatteras, North Carolina to Cape Sable, Nova Scotia), between the periods from 1977-1987 and 1999-2008. Changes in larval occurrence were detected for 49% of taxa with the highest frequency among winter taxa, the majority of which presented as a change in relative abundance earlier in the season. Warming ambient average ocean temperatures and shifts in the timing of

larval abundance observed over decades further support establishing flow limits to provide comparable entrainment control for winter spawners from November through January as wedgewire screens would.

In response to this comment, EPA revised Part I.A.2 of the Final Permit Modification to extend the average monthly flow limit of 83.6 MGD to cover late fall and early winter, making the total period covered by this limit November 1 through March 31. This flow limit represents an average monthly flow of 66% of design flow or, put another way, reduces entrainment by 34% as compared to unconstrained intake at design flow. By comparison, EPA estimated that wedgewire screens would provide a 37% reduction in entrainment as compared to the existing traveling screen technology. A reduction of 34% during the winter is less than 37%, however, the 37% estimate is based on the cumulative reduction considering physical exclusion and the likelihood of survival for both eggs and larvae. EPA estimated that wedgewire screens would reduce entrainment of larvae by 12%. *See* Fact Sheet (AR-510) at 116-117. Because larvae are present at higher densities than eggs in January through March (demonstrated in Figures 17 and 18 of the 2020 Normandeau Report (AR-499)), the overall effectiveness of wedgewire screens in these months is therefore likely to be less than 37%. Based on the number of eggs and larvae entrained during December through March in the 2006-2007 and 2019 studies and the estimated effectiveness of wedgewire screens, EPA estimates that wedgewire screens would result in entrainment reductions ranging from 9% - 19% per month. Limiting flow to 66% of the design flow, and extending the limit to additional winter months, will result in entrainment reductions as effective or more effective than the BTA requirements of the 2018 Permit.

Comment B.2.b: Impingement

Comment B.2.b.i: Further delay in achieving compliance with the impingement mortality standard is incompatible with the requirement that compliance be accomplished "as soon as practicable"

As per 40 C.F.R. § 125.94(b)(1), "[a]fter issuance of a permit that establishes the entrainment requirements under § 125.94(d), the owner or operator of an existing facility must comply with the impingement mortality standard in § 125.94(c) as soon as practicable." (emphasis added). Here, EPA issued a permit in 2018 that established entrainment requirements for Schiller Station, and yet Schiller appears, far from complying with impingement mortality standards "as soon as practicable," to have taken no concrete steps to address impingement at all. This is improper.

Instead, GSP proposed (three years after the 2018 permit was issued) to address impingement through "a system of technologies, management practices, and operational measures." Draft Statement of Basis at 10. However, GSP has apparently failed to propose just what that system of technologies might be, what management practices would be involved, or what operational measures it will employ. Under 40 C.F.R. § 125.949(c)(6), an applicant seeking approval for such a "system of technologies" to meet its impingement reduction obligations must complete and submit the "impingement technology performance optimization study" discussed in 40 C.F.R. § 122.21(r)(6)(ii). GSP has not done that, either. As EPA notes:

> GSP has not yet completed the two-year optimization study, has not proposed any permit conditions that specify optimal operation of the technology or operational measures, and has not identified which combination of technologies and operational measures it has selected to comply with the impingement mortality standard.

Draft Statement of Basis at 10; *see also id.* at 11 ("GSP has not yet completed ***the required*** evaluation nor has it provided a demonstration of the expected impingement reductions consistent with optimization of a system of technologies.") (emphasis added). On this basis of no information, no required study, and no proposed limits, technologies, management practices, or operational measures, GSP nonetheless requests that the Schiller NPDES permit be modified to relieve it of the impingement obligations it has been well-aware of for the better part of five years. On such a non-record, EPA has no grounds for granting GSP's requested modification.

Nor is further delay in addressing impingement as per the requirements of the 2018 NPDES permit supportable. As the relevant regulations require, the impingement mortality standard must be complied with "as soon as practicable, " 40 C.F.R. § 125.94(b)(1), and as even EPA notes, giving GSP additional time to conduct a two-year study in advance of a presumed additional permit modification request (one that might include an actual proposal to meet the impingement mortality standard) "may create tension with the requirement to achieve compliance 'as soon as practicable.'" Draft Statement of Basis at 12. GSP has operated Schiller Station for nearly five years, and stepped into the shoes of Schiller's prior operator during the permitting process that resulted in the 2018 permit. If GSP wanted to pursue compliance under 40 C.F.R. § 125.949(c)(6), it has had ample opportunity to do so during the past half-decade, and has already requested and received one extension already. GSP's dilatory approach to impingement compliance and its hollow impingement mortality standard proposal should not be rewarded with further multi-year delays.

Response to Comment B.2.b.i

GSP Schiller's 2018 Permit required installation and year-round operation of wedgewire screens with a design through-screen velocity no greater than 0.5 fps, which would satisfy one of the impingement mortality BTA compliance options in the 2014 Final Rule, namely, 40 CFR § 125.94(c)(2). The Statement of Basis (AR-508 at 9) explains that the modification of the 2018 Permit would allow the Permittee to rely on enforceable limits on intake flows as an alternative method of complying with the entrainment BTA. However, the flow limits will not achieve a through-screen velocity of no greater than 0.5 fps. Because EPA had already determined that the existing traveling screens, independent of any other operational measure or technology, do not alone satisfy one of the impingement mortality standards at 40 CFR § 125.94(c), the Draft Modification also had to consider an alternative compliance option to meet the impingement mortality BTA standard. Sierra Club comments that EPA "has no grounds" to modify the permit to allow GSP to comply with § 125.94(c) by using the systems of technologies option at § 125.94(c)(6) because GSP has not described which technologies in particular it will rely on and has not yet completed the required optimization study. The comment further asserts that the

proposed alternative compliance option for the impingement mortality standard in the Draft Permit Modification further delays compliance and is, therefore, incompatible with the regulatory requirement in § 125.94(b)(1) to comply with the impingement mortality standard "as soon as practicable."

In the 2018 Permit, EPA addressed how the 2014 Final Rule aligns the compliance deadlines for impingement mortality and entrainment requirements in Response to PSNH Comment V.B.3. AR-510 at 75. In the 2014 Final Rule, EPA recognized that the BTA determination for entrainment may drive or otherwise impact the choice of impingement compliance method. *See* 79 Fed. Reg. at 48,327, 48,358-60. The 2014 Final Rule sequences the entrainment and impingement mortality controls so that facilities select and implement the controls for impingement mortality as soon as practicable after the entrainment controls have been determined and put in place. 40 CFR § 125.94(b)(1). In this way, the 2014 Final Rule sought to avoid situations where investments in impingement mortality controls would later be rendered obsolete by entrainment control requirements. *See* 79 Fed. Reg. 48,356. In this case, EPA's determination of the BTA for entrainment would have required GSP Schiller to install wedgewire screens according to the schedule provided in Part I.A.11.b of the 2018 Permit. The Facility would achieve compliance with the impingement mortality BTA standard at 40 CFR § 125.94(c)(2) only after the screens were operational.

The comment asserts that GSP Schiller has taken no "concrete steps" to control impingement mortality even though EPA issued a permit with impingement requirements in 2018. The 2018 Permit, however, did not require GSP Schiller to take additional action to control impingement before the wedgewire screens were operational beyond operating the existing traveling screens. Thus, GSP Schiller would comply with the impingement mortality requirements in the 2018 Permit "as soon as practicable" only after the installation of wedgewire screens. Even under the most aggressive schedule, EPA would not expect screens to be operational until Fall 2023, which means that GSP Schiller would not have met the impingement mortality BTA in the 2018 Permit until Fall 2023 at the earliest.

GSP Schiller's request for a modification of the CWIS requirements for minimizing entrainment necessarily affects its ability to meet requirements to control impingement. GSP Schiller proposed to minimize impingement mortality based on a system of technologies, management practices, and operational measures. 40 CFR § 125.94(c)(6); *see* Statement of Basis (AR-508) at 10. However, as EPA explained in the Statement of Basis (at 10) and as Sierra Club notes in its comment, GSP Schiller did not specify before the issuance of the Draft Modification the combination of technologies, practices, and operational measures it would use to bring it into full compliance with the impingement mortality BTA compliance alterative at 40 CFR § 125.94(c)(6), though EPA expected that the requested intake flow limits would play a role. During the public notice period, however, GSP Schiller identified a plan aimed at satisfying the systems of technologies BTA standard through additional limits on intake flow at its CWISs that equate to an annual average flow no greater than 24 percent of the facility's design flow. In other words, GSP Schiller has, in its comments, identified additional operational measures it will implement to comply with the impingement mortality BTA alternative at 40 CFR § 125.94(c)(6). As EPA recognized in the 2014 Final Rule, a "facility may choose to comply with the impingement mortality standard at § 125.94(c)(6) by demonstrating to the Director that the

facility operates at an annual intake flow that is less than or equal to 24 percent of its design intake flow on an annual basis." 79 Fed. Reg. at 48,347. An intake flow limit that will achieve a level of performance equivalent to or better than the impingement mortality performance standard in 40 CFR § 125.94(c)(7) could be considered to be compliant with the 2014 Final Rule. *See id*. The Final Permit Modification establishes a 12-month average flow limit no greater than 30.19 MGD and requires the Permittee to meet a 24 percent impingement mortality standard rather than the proposed 30 percent interim performance standard. The revisions will require GSP Schiller to begin to monitor and report impingement mortality on the effective date of the Modified Permit and provide a reasonable basis for modifying the permit to allow GSP to comply with § 125.94(c) by using the system of technologies option at § 125.94(c)(6).

The comment also asserts that EPA should not modify the permit to allow compliance pursuant to § 125.94(c)(6) because GSP has not yet completed the required optimization study. While there would have been *time* for the Facility to perform the required two-year optimization study since the 2018 Permit was issued, the 2018 Permit did not require an optimization study.[20] Thus, there was no reason for GSP to begin an optimization study upon receiving the 2018 Permit. Further, while GSP could have conceivably begun an optimization study once it decided to request to comply with § 125.94(c) by operating a system of technologies, EPA recognizes that GSP could not be certain of the outcome of its modification request, including whether it would be authorized to pursue the alternative compliance methods for minimizing entrainment and impingement. More importantly, the Facility (and therefore, the cooling water intake structures and the traveling screens) has not operated since June 2020 (which predates the modification request). Operating the cooling water intake structures and the traveling screens solely for the purpose of conducting an optimization study while the Facility was in long-term shutdown would have caused impingement mortality that would otherwise not have occurred. *See* Statement of Basis (AR-508 at 12-13). For these reasons, and in this site-specific situation, EPA finds the Modified Permit's timing of the impingement technology performance optimization study requirement to be reasonable. The Final Permit Modification retains the requirement to complete the impingement technology performance optimization study. The study must include 24 months of impingement monitoring during periods when at least one of the generating units is operating (monitoring is not required when the units are not generating power and the seawater pumps are not operating). The Final Permit Modification requires the Permittee to calculate and report impingement mortality (reported as "screen efficiency") based on reductions in flow and monitoring of the traveling screens and demonstrate that it achieves an impingement mortality performance standard no greater than 24 percent consistent with the alternative compliance method at 40 CFR § 125.94(c)(7) as soon as practicable (i.e., the 12-month average flow limit and impingement mortality percent value become effective on the effective date of the Modified Permit. The first reported value will include the first calendar month following the effective date of the Modified Permit and the preceding 11 months) and even before the optimization study is complete.

[20] An optimization study is only required if a permittee complies with the impingement mortality standard by using either § 125.94(c)(5) or (6). 40 CFR § 122.21(r)(6). Since, under the 2018 Permit, the permittee would comply with the impingement mortality standard by using the option at § 125.94(c)(2) (0.5 fps through-screen design velocity), the 2018 Permit did not include a requirement to conduct an optimization study.

The modification therefore does not "relieve" the Permittee of its obligation to minimize impingement mortality or delay compliance with that obligation. Rather, the modification establishes immediate flow limits to control impingement mortality, requires the Permittee to complete the impingement technology performance optimization study, and, in the interim, prohibits the Permittee from exceeding a 24% impingement mortality standard. Together these requirements require GSP Schiller to reduce impingement mortality as compared to the baseline evaluated for the 2018 BTA determination and come into compliance with the BTA standard at 40 CFR § 125.94(c)(6). Accordingly, the Final Permit Modification is consistent with the regulatory requirement to satisfy the BTA for impingement mortality as soon as practicable.

Comment B.2.b.ii: EPA's proposed interim impingement performance standard is unsupported

EPA's proposed "interim 12-month performance standard . . . of no more than 30 percent mortality" is likewise wholly unsupported. Initially, EPA errs in suggesting that its 30% impingement mortality standard is appropriate because it is only "slightly higher than" the 24% mortality performance standard in 40 C.F.R. § 125.94(c)(7). Draft Statement of Basis at 13. However, 30 is *125%* of 24, not "slightly higher."

Whether or not 30 is nominally "slightly higher" than 24, the proposed Modification contemplates calculating impingement mortality dramatically differently than how the performance standard in 40 C.F.R. § 125.94(c)(7) is calculated. Under the regulatory performance standard,

> The 12-month impingement mortality performance standard is the total number of fish killed divided by the total number of fish impinged over the course of the entire 12 months.

40 C.F.R. § 125.94(c)(7). In other words, the 24% standard is the ratio of [dead impinged organisms] to [all impinged organisms]. By contrast, the proposed Modification would calculate its 30% ratio by "the total number of fish killed by the total number of fish that *would have been impinged at design flow* over the course of 12 months." Draft Modification Statement of Basis at 14, n.14 (emphasis added). The two standards are accordingly wholly incompatible, and EPA's reliance on the 125.97(c)(7) performance standard to support its proposed interim standard as such fails.[19] Indeed, particularly given that EPA assumes "100% mortality of impinged fish," (Draft Modification Statement of Basis at 13), and that the 2006-2007 biological monitoring data that EPA relies on found an impingement mortality rate for fish of *82%*,[20] EPA's proposal here is unsupported by the 24% regulatory impingement mortality standard.

[19] This is made even more apparent by EPA's direction that the "number of fish that would have been impinged" for purposes of evaluating the proposed 30% mortality standard "can be calculated using the actual monthly impingement rate times the monthly design flow of the pumps," which presumably turns the entire exercise into a simple ratio of actual pump flow to the pump design flow. Draft Modification Statement of Basis at 14, n.14.

Actual levels of impingement mortality are, under EPA's proposal, apparently irrelevant as long as Schiller stays below a 30% capacity factor, a feat it has readily accomplished since 2017 and thus for the entire life of the 2018 permit.

[20] *See* AR-136, Normandeau Associates, Inc., Entrainment and Impingement Studies Performed at Schiller Generating Station from September 2006 through September 2007 (April 2008) at 139, Table 4-22.

Response to Comment B.2.b.ii

The comment asserts that EPA's interim 30% standard proposed in Part I.A.11.a.3 of the Draft Permit Modification is unsupported because it is too far above the 24% mortality performance standard in 40 C.F.R. § 125.94(c)(7). As explained earlier, EPA has revised Part I.A.11.a.3 to 24% in the Final Permit Modification. *See* Responses to Comments A.2, B.2.b.i. Therefore, no further response to this aspect of the comment is required.

The method EPA proposed for calculating an impingement mortality performance standard is supported by the 2014 Final Rule. Sierra Club suggests that the method, which accounts for both the operation of the traveling screens and the reduction achieved through flow reductions, is improper. EPA disagrees.

The comment errs by equating the method of compliance for systems of technologies with the performance standard at 40 CFR § 125.94(c)(7). For the purposes of complying with the BTA standard at 40 CFR § 125.94(c)(7), the average impingement mortality is the ratio of the total number of fish killed to the total number of fish impinged. *See* AR-182 at 11-8. However, as explained above and in Responses to Comments A.2, A.4, and B.2.b.i., EPA has revised the Final Modified Permit to require GSP Schiller to demonstrate that it will be able to comply with the impingement mortality BTA standard at 40 CFR § 125.94(c)(6) by operating a system of technologies, including the existing traveling screens and flow limits, which result in a percent impingement mortality no greater than 24 percent. Under this compliance method, facilities may operate a system of technologies, management practices, and operational measures that the Director determines is the best technology available for impingement reduction at the CWIS. The Director's decision that the system of technologies is the BTA is *informed by* comparing the performance data of the system of technologies to the performance standard at 40 CFR § 125.94(c)(7) but the method of compliance for 40 CFR § 125.94(c)(6) is independent from § 125.94(c)(7). The optimization study will provide site- and species-specific data on impingement survival, and operating conditions that improve survival, at the existing traveling screens. EPA conservatively assumed 100% impingement mortality when calculating the interim standard of 30% for the Draft Modified Permit and the Statement of Basis but, as the comment recognizes, Normandeau (AR-136) observed that some organisms (e.g., non-fragile species) survive impingement. The traveling screens will provide for some level of survival, resulting in a reduction in impingement mortality, particularly after incorporating additional operating conditions such as more frequent rotation and low-pressure spray.

Further, EPA recognizes that reducing exposure to impingement reduces impingement mortality. *See* 79 Fed. Reg. 48,347 ("By virtue of reducing the actual impingement, mortality caused by impingement is no longer a consideration—an organism that is never impinged cannot be killed by the intake structure."). GSP Schiller operates its generating units intermittently and, when not generating electricity, the units do not withdraw cooling water. When no cooling water is

withdrawn, no impingement (and thus, no impingement mortality) occurs. Adhering strictly to the calculation of impingement mortality in 40 CFR § 125.94(c)(7), as Sierra Club suggests, would ignore entirely the impingement mortality that is avoided by not withdrawing cooling water and would be inconsistent with EPA's position in the 2014 Final Rule that a permittee may choose to comply with § 125.94(c)(6) by demonstrating that the facility operates at an annual intake flow less than or equal to 24 percent of its design intake flow and performing an optimization study. *Id*.

The Technical Development Document for the 2014 Final Rule ("Alternative Provision Calculations") (AR-182 at 11-14) explains how facilities might use a system of technologies or operational measures to achieve the BTA standard for impingement mortality, including, for example, screening technologies which can be directly monitored and operational measures for which indirect methods of estimating impingement reduction may be used. EPA states (AR-182 at 11-14):

> If the technology reduces impingement, the alternative provisions calculations would increase the number of the observed impinged fish by the estimated number that would have been impinged without the technology. The facility would then compare the observed number of killed fish to the larger total number of impinged fish (i.e., the sum of observed and estimated number reduced by technology). This comparison would result in a lower impingement mortality rate than the unadjusted, observed value.

In other words, permittees can receive credit for, and the calculation of mortality should be adjusted to account for, reductions in impingement mortality achieved with operational measures, including flow reductions, by estimating the number of fish that would have been impinged absent that technology. Part I.A.11.a.3 estimates the reduction in impingement mortality based on impingement monitoring (when the traveling screens operate) and the reduction in flow in compliance with flow limits. This method is consistent with EPA's explanation of how to calculate impingement mortality under 40 CFR § 125.94(c)(6) in the TDD. In this case, the Final Permit directs the Permittee to calculate a rolling, 12-month average impingement mortality based on the average monthly impingement mortality for the reporting month and the preceding 11 months. Any month in which the CWISs do not operate (i.e., no cooling water is withdrawn) results in an average monthly impingement mortality rate of zero for that month. *See* Response to Comment A.4.

Comment B.2.c: EPA improperly withheld record materials upon which it relies from public review

In its draft Statement of Basis for the proposed permit modification, EPA repeatedly cites the "Wedgewire Screen Site-Specific Study Engineering Evaluation GSP Schiller LLC-Schiller Station, Enercon 2020." EPA asserts that the study results "suggest that full implementation of wedgewire screens at Schiller Station may be more complex than anticipated," and accordingly claims that this will "likely result in increased costs compared to the values evaluated" for the 2018 Permit. Draft Modification Statement of Basis at 4. However, despite this 2020 Enercon report being cited by EPA in support of its proposed Modification, and despite the document

being included in the administrative record, EPA has withheld the Enercon report from the public, stating that it is claimed as Confidential Business Information ("CBI") by GSP. In correspondence with Sierra Club, EPA stated that the 2020 report summarizes the results of a 2019 pilot study, which is also not included in the administrative record. *See* Email from Danielle Gato to Zachary Fabish (Nov. 3, 2022).

Certain information submitted to the EPA may, in certain situations, be claimed as CBI by the submitter. 40 C.F.R. § 122.7(a). However, EPA's own guidance provides that the administrative record should nonetheless include CBI "if that information was considered during the decision-making process." In addition, "*as much of the CBI material as possible* should be made available through redaction or some other technique that shields the confidential information. This approach protects the CBI information while making the general information available to the public and the courts."[21] Indeed, multiple circuit courts have held that withholding information from the public that the agency relies on in its decision making is not allowed because it prevents adequate judicial review of agency action.[22] If CBI is withheld, it can only be omitted in "narrow situations," for example by using limited redaction or providing detailed summaries of the underlying information to "disclose[] as much information publicly as [the agency] can."[23]

Here, neither the 2020 report, nor the 2019 pilot study that the report summarizes, are publicly available, whether in full, redacted, or summary form. While the 2020 report is included in the administrative record, the 2019 pilot study is not. Although EPA claims that the report "is not central to this modification," the cost and feasibility of implementing wedgewire screens are the primary basis for GSP's permit modification request. Draft Statement of Basis at 4. Further, the modification to the permit solely concerns a proposed alternative to the wedgewire screen requirement. Withholding the entire 2020 report therefore goes against EPA's own guidance and judicial decisions on the appropriate use of CBI. Without access to the report or the underlying study, the public and the courts are unable to assess EPA's proposed determination that wedgewire screens are no longer BTA to minimize adverse environmental impacts from impingement and entrainment at Schiller Station. Accordingly, EPA should either abandon the proposed Modification or make the Entercon Report and its underlying data public, and reopen the public comment period to allow the public an opportunity to review and comment on these withheld record materials.

[21] EPA's Action Development Process, Administrative Records Guidance, at 9 (Sept. 2011), https://www3.epa.gov/ogc/adminrecordsguidance09-00-11.pdf (emphasis added).
[22] *See, e.g.*, *Flyers Rts. Educ. Fund, Inc. v. Fed. Aviation Admin.*, 864 F.3d 738, 745-46 (D.C. Cir. 2017); *United States Lines, Inc. v. Federal Maritime Comm'n*, 584 F.2d 519, 535 (D.C. Cir. 1978); *Riverkeeper, Inc. v. U.S. E.P.A.*, 475 F.3d 83, 112 (2d Cir. 2007); *Nat. Res. Def. Council v. Thomas*, 805 F.2d 410, 418 n.13 (D.C. Cir. 1986).
[23] *Flyers Rts. Educ. Fund*, 864 F.3d at 745-46.

Response to Comment B.2.c

The comment asserts that EPA improperly withheld a July 2020 report entitled "Wedgewire Screen Site-Specific Study Engineering Evaluation," produced by GSP's consultant, Enercon (hereafter referred to as the "2020 Enercon Report"), which GSP labelled as Confidential Business Information ("CBI"). Sierra Club comments that EPA should release the 2020 Enercon

Report and re-open the comment period. The comment also reflects some confusion about the 2019 pilot study and the 2020 Enercon Report. For instance, the comment twice recognizes that the 2020 Enercon Report is "included in the administrative record," while also suggesting that it is not. ("[T]he 2020 [Enercon] report summarizes the results of a 2019 pilot study, which is *also* not included in the administrative record.") (emphasis added). In addition, the comment incorrectly indicates more than once that the results of the 2019 pilot study are not "publicly available."

In the Statement of Basis (AR-508), EPA referenced both the 2020 Enercon Report and a report on the 2019 pilot study produced on or around the same time by another GSP consultant, Normandeau Associates, Inc., entitled "Evaluation of the Entrainment Reduction Performance of 0.8-mm and 3.0-mm Cylindrical Wedgewire Screens at Schiller Station" (hereafter referred to as the "2020 Normandeau Report"). As the titles suggest, the reports present the results of the year-long pilot study, with the 2020 Enercon Report focusing on an engineering evaluation of the two wedgewire screens used in the study—including the study design and actual operation—and the 2020 Normandeau Report providing data and analysis of the actual performance of screens with different slot widths—0.8mm and 3.0mm—at reducing entrainment of eggs and larvae. The 2020 Normandeau Report also depicts and describes the extent of biofouling and damage to the screens during the 2019 pilot study. *See, e.g.*, AR-499 at 24-25. GSP submitted both reports to EPA on July 30, 2020, along with a cover letter, in which GSP asserted that the reports show that "the 0.8 mm and 3.0 mm wedgewire screens (WWS) did not perform as predicted during the pilot testing." AR-514 (July 30, 2020, cover letter) at 1. GSP's cover letter summarized the results of the pilot study by saying:

> Myriad operational/equipment issues arose, unanticipated screen degradation (*e.g.*, fouling, clogging, biogrowth, damage) occurred due to the uniquely harsh conditions in the Piscataqua River, and percent reductions in entrainment were significantly less than expected (including prior to the aforementioned equipment and screen degradation issues), meaning reductions in associated entrainment mortality were also not realized. Consequently, implementation of full-scale WWS at Schiller Station would be imprudent.

Id. at 1-2. GSP also stated in the cover letter its intention to pursue a modification to Schiller Station's NPDES Permit. *Id.* at 2. To be clear, the cover letter, the 2020 Enercon Report, and the 2020 Normandeau Report are all in the administrative record for the permit modification. Also in the administrative record is GSP's permit modification request, which also provides a summary of the entrainment performance of the screens during the pilot study as well as the extent of biofouling and surface damage GSP's consultants observed at the screens. AR-491, Normandeau Att. at 2. Based on GSP's CBI claim, EPA withheld the contents of the 2020 Enercon Report, but the cover letter, the 2020 Normandeau Report, [21] and the permit modification request were fully available to Sierra Club before, and during, the comment period.

Sierra Club comments that withholding the 2020 Enercon Report was improper and that EPA should have provided Sierra Club with as much of it as possible when EPA issued the Draft

[21] Sierra Club's comments make clear that it reviewed the 2020 Normandeau Report. *See* Comment B.2.a.ii.

Modification. EPA does not agree. Issuing the Draft Modification without releasing the report was reasonable for several reasons, including principally that Sierra Club had previously informed EPA that Sierra Club was not interested in reviewing any portion of the 2020 Enercon Report, as discussed below. In addition, EPA is required by regulation to keep confidential certain documents it receives that have been claimed as CBI. Applicable EPA regulations at 40 CFR part 2 provide that a business "may assert a business confidentiality claim" covering certain information submitted to EPA. 40 CFR § 2.203(b); *see also id.* § 122.7(a). When a business asserts a claim, the regulations require EPA to safeguard the material, *see, e.g.*, *id.* § 2.211(a), including penalties applicable to EPA employees for wrongful disclosure, *id.* § 2.211(c). Additional reasons are discussed later in this response.

As noted above, Sierra Club previously indicated to EPA that it was uninterested in the 2020 Enercon Report. In response to an informal request from Sierra Club, EPA sent GSP's July 30, 2020, cover letter and the 2020 Normandeau Report to Sierra Club in September 2020, AR-515, meaning that Sierra Club had information about the results of the pilot study in its possession for more than two years before EPA issued the Draft Modification and that Sierra Club knew GSP intended to seek a permit modification. As noted above, the 2020 Normandeau Report presents the details of the performance of the screens in reducing entrainment during the pilot study. As also noted previously, both the cover letter and 2020 Normandeau Report reference and summarize GSP's engineering evaluation of the pilot study, with the 2020 Normandeau Report including several photographs of screen fouling and damage from the pilot study. AR-499 at 24-25. Furthermore, when EPA sent Sierra Club these documents, EPA specifically informed Sierra Club of the 2020 Enercon Report, noting that GSP had labelled the 2020 Enercon Report as CBI and that, consequently, EPA could not provide the report outside the FOIA process. AR-515. EPA advised that, if Sierra Club wanted the report, it should submit a FOIA request to EPA. *Id.* In late November 2020, Sierra Club submitted such a FOIA request, describing records that encompassed the 2020 Enercon Report.[22] AR-516 (Nov. 23, 2020, FOIA request) at 1. In response to that request, EPA released documents to the requester on December 21, 2020, AR-517, and again on January 13, 2021, AR-518, but not the 2020 Enercon Report. In a letter accompanying the January 2021 release, EPA informed the requester that, consistent with EPA's FOIA regulations at 40 CFR part 2, EPA was initially denying the request as to four documents in full based on a claim of CBI by GSP. AR-518. EPA stated that it was fully prepared to provide a confidentiality determination as to these records but would "delay beginning the process of making a final CBI determination until and unless you inform us that you have decided to request the claimed-CBI." *Id.* at 1. Consequently, EPA specified, "[i]f you do not indicate to us by **January 27, 2021**, that you would like us to begin the final CBI determination process, we will consider your FOIA request as to the potential CBI withdrawn." *Id*. Not only did Sierra Club fail to indicate to EPA by that date that it wanted EPA to begin the final CBI determination, Sierra Club subsequently confirmed its withdrawal of the FOIA request as to the potential CBI. AR-520; *see also* AR-521. In addition, on March 31, 2021, GSP submitted a permit modification request to EPA that again included specific reference to the 2020 Enercon Report as well as a summary of its results. AR-491 at 2-3, Normandeau Att. at 1-4. EPA provided GSP's modification request to Sierra Club on September 10, 2021. AR-522. In short, Sierra Club had

[22] Sierra Club has submitted multiple FOIA requests to EPA regarding Schiller Station in recent years, including another dated June 3, 2020, AR-526, and another dated October 14, 2022, AR-523.

biological results of the pilot study and summaries of the engineering evaluation in its possession long before EPA issued the Draft Modification, and Sierra Club, by withdrawing its request for the 2020 Enercon Report, indicated that it did not wish to review any version of the report. In reasonable reliance on these events and in light of the regulations pertaining to safeguarding claimed-CBI and other factors discussed in more detail below, EPA reasonably issued the Draft Modification without releasing the CBI-labelled report.[23]

Sierra Club now comments that EPA should provide the 2020 Enercon Report and re-open the comment period to allow Sierra Club to "assess EPA's proposed determination that wedgewire screens are no longer BTA to minimize adverse environmental impacts from impingement and entrainment at Schiller Station" and provide comments on the report. EPA concludes that Sierra Club's comment fails to make a persuasive case for EPA to exercise its discretion to re-open the comment period and that review of the releasable details of the 2020 Enercon Report is not necessary for Sierra Club to provide meaningful comment on the proposed modification.

Under the NPDES regulations, EPA "may" re-open a comment period "[i]f any data[,] information[,] or arguments submitted during the public comment period . . . appear to raise substantial new questions concerning a permit." 40 CFR § 124.14(b). As EPA's Environmental Appeals Board has noted, the "critical elements" of § 124.14(b) are that any new questions raised must be "substantial" and that the Regional Administrator's decision to re-open the comment period is discretionary. *In re NE Hub Partners, LP*, 7 E.A.D. 561, 585 (EAB 1998), *review denied sub nom. Penn Fuel Gas, Inc. v. EPA*, 185 F.3d 862 (3d Cir. 1999); *accord In re Dominion Energy Brayton Point, LLC*, 13 E.A.D. 407, 416 (EAB 2007); *see also In re Cape Wind Assocs., LLC*, 15 E.A.D. 327, 335 (EAB 2011). The Board traditionally affords a Region "substantial deference" in the decision whether to re-open a comment period. *Dominion Energy*, 13 E.A.D. at 416. For several reasons, EPA concludes that Sierra Club's comments do not raise substantial new questions that would justify re-opening the comment period. First, the 2020 Enercon Report is ancillary to the decisions EPA made in this permit modification proceeding. Second, Sierra Club advocates for a re-opened comment period based on a false premise. Third, while Sierra Club fails to acknowledge it, other record documents in its possession prior to the comment period already provided it with detailed results from the 2019 pilot study and general information about the engineering evaluation, which provided Sierra Club with ample basis to formulate comments on this matter. Fourth, additional factors weigh against re-opening the comment period.

First, the 2020 Enercon Report addresses an issue that EPA need not decide—i.e., an engineering evaluation of the two wedgewire screens used in the 2019 pilot study, including the study design and actual operation—making comments on the details of that report immaterial to the outcome

[23] Sierra Club has since indicated a newfound desire to review the report. Following Sierra Club's change of heart, EPA asked GSP to provide EPA with a releasable version of the 2020 Enercon Report. In late February 2023, GSP provided EPA with a redacted version, AR-524, which EPA added to the administrative record and sent to the commenter, AR-525. Shortly after receiving the redacted version, EPA also asked GSP to substantiate its claim of confidentiality as to the redacted portions, AR-527, which GSP did, AR-529 (3/24/23 Letter from L. Tillotson, GSP Schiller, to M. Smart, EPA). After careful review of the information provided by GSP Schiller, EPA determined that the redactions qualify as CBI and are therefore exempt from disclosure. AR-530.

of the modification proceeding. As clearly noted in the Statement of Basis, EPA has not revisited or rescinded the BTA determination in the 2018 Final Permit. AR-508 at 4. Rather, based on further decreases in Schiller Station's capacity utilization since issuance of the permit in 2018, coupled with the permittee's new interest in operational limits, EPA proposed intake flow limits in the draft modification as an *alternate* means for GSP to comply with the BTA determination in Schiller Station's 2018 Final Permit. *Id.* Accordingly, EPA proposed to retain the option for GSP to comply with the BTA determination and CWA § 316(b) by installing wedgewire screens. *See, e.g.*, Draft Permit Mod. at Part I.A.11.a.1.ii. EPA analyzed whether, and determined that, the proposed intake limits would minimize entrainment to a comparable degree as the provisions of the 2018 Final Permit, which required installation of wedgewire screens without any volumetric[24] limit on intake flows. *Id.* at 4-14. As a result, EPA did not have to evaluate in this permit modification proceeding GSP's engineering conclusions about the pilot study and expressly noted that it was not assessing them. *Id.* at 4. While Sierra Club highlights EPA's observation that the pilot study results "suggest" that changes in the design and maintenance of wedgewire screens "will likely result in increased costs" relative to those evaluated for the Final Permit, EPA notably did not conclude that wedgewire screens are technologically or economically infeasible. *Id.* at 4. Sierra Club also asserts that EPA should re-open the comment period because "the cost and feasibility of implementing wedgewire screens are the primary basis *for GSP's* permit modification request." (emphasis added). But the comment does not explain why future comments aimed at assessing GSP's motivation for requesting the modification would be relevant, where EPA did not revisit its past conclusions about wedgewire screens' cost and feasibility and retained the permit's wedgewire screen requirements as an alternative means of compliance. Moreover, the comment does not allege that cost and feasibility are *EPA's* "primary basis" for the modification. In other words, Sierra Club does not undermine EPA's assertion in the Statement of Basis that "the performance of the technology during the pilot study is not central to the modification" by commenting that cost and feasibility were *GSP's* primary motivator in seeking the modification. The 2020 Enercon Report, as a presentation of GSP's evaluation of the engineering methodology for conducting, and the performance of, the 2019 pilot study, predictably does not include an assessment of the principal issue at hand in the modification—whether intake flow limits would minimize entrainment to a comparable degree as the BTA requirements of the 2018 Final Permit. That issue is addressed in the Statement of Basis and, from GSP's perspective, in the 2021 Modification Request, both of which documents Sierra Club possessed in full. Sierra Club has already ably commented on the entrainment comparability issue and has not alleged that its ability to do so was impaired by not having access to the 2020 Enercon Report. *See* Comments B.2.a, .c., *supra*. Reviewing and commenting on the 2020 Enercon Report is unnecessary for probing the issue of whether the proposed intake flow limits comparably minimize entrainment. A new desire to review and comment on the details of a report potentially relevant to cost or feasibility of wedgewire screens does not raise "substantial new questions" where EPA does not need to evaluate such cost or feasibility issues.

[24] EPA specifies "volumetric" here only to differentiate the intake flow limits in the Draft Modification from a different type of intake flow limit included in the 2018 Final Permit —namely, a through-screen velocity limit, which, as the name implies, sets a maximum velocity at which cooling water may be withdrawn from the source waterbody, measured at the surface of the wedgewire screens. The through-screen velocity limits in the 2018 Final Permit would not impact GSP's ability to operate the cooling water intake structures up to their volumetric design intake flows.

Second, Sierra Club's given reason why EPA must re-open the comment period is based on a fictional "determination"—that is, one that EPA neither proposed in the Draft Modification nor made in the Final Modification. Sierra Club asserts that it now needs access to the 2020 Enercon Report "to assess EPA's proposed determination that wedgewire screens are no longer BTA to minimize adverse environmental impacts from impingement and entrainment at Schiller Station." Contrary to Sierra Club's claim, however, EPA never said in the Statement of Basis or proposed in the draft modification that wedgewire screens "are no longer" the BTA at Schiller Station. As noted above, EPA specified that it was not revisiting or rescinding the BTA determination in the 2018 Final Permit and was not making a determination as to the feasibility of wedgewire screens at Schiller Station. *See* AR-508 at 4. Consistent with these statements, EPA proposed in the draft modification to retain the wedgewire screen provisions of the 2018 Final Permit. *See, e.g.*, Draft Mod. at Part I.A.11.a.1, .2, .5. The final modification likewise retains those provisions. *See, e.g.*, Final Mod. at Part I.A.11.a.1, .2, .5; *see also* Response to Comment A.4 (rejecting GSP's request to remove them from the permit). Sierra Club's request to re-open the comment period hangs entirely on an imagined determination, and comments opposing a determination that EPA did not make would be irrelevant to the permit modification proceeding. Consequently, Sierra Club's request to re-open the comment period does not raise substantial new questions about the permit.

Third, notwithstanding the intimation in Sierra Club's comments that the results of the pilot study are not available, other record documents fully available to Sierra Club long before EPA issued the Draft Modification provide information about the results of the 2019 pilot study and present GSP's reasons for seeking another compliance option. As referenced earlier in this response, these documents include the 2020 Normandeau Report, GSP's July 30, 2020, cover letter, and GSP's 2021 permit modification request. Yet, Sierra Club does not comment on the discussions of the pilot study in these documents. Instead, Sierra Club takes issue with EPA's statement that the pilot study results "suggest that full implementation of wedgewire screens at Schiller Station may be more complex than anticipated, and changes to the design and/or number of screens, mechanical repairs, and more frequent cleaning will likely result in increased costs compared to the values evaluated for the Final Permit." AR-508 at 4. As a preliminary matter, the comment overlooks the context in which EPA included these statements. That is, EPA referred to GSP's conclusions about the pilot study to acknowledge them but also to make clear that EPA need not assess them because they are not critical to EPA's justification for the modification. *Id.* The modification does not depend on the 2020 Enercon Report's conclusions, but, in any event, other record documents to which Sierra Club has long had access include specific and general information about the pilot study's results that provided Sierra Club sufficient basis to formulate comments. For instance, the 2020 Normandeau Report includes the biological data and results from the pilot study, describes reduced entrainment performance of the screens (relative to the performance indicated in the 2018 Final Permit), and includes several conclusions attempting to explain the reasons for reduced performance. AR-499 at xv-xvi, 89, 95-96, 118-21. The report also depicts and summarizes biofouling and screen damage observed in October-December 2019, as well as other equipment issues. *Id*. at 23-25. In addition, GSP's modification request includes a summary of the pilot study that includes a description of the "engineering, biological, and physical factors" GSP's consultants concluded contributed to the lower-than-expected performance of the test screens. AR-499 at 1-3. Sierra Club does not explain why the comment period must now be re-opened to solicit its comments on a pilot study

it largely ignored in its initial comments.[25] For this additional reason, Sierra Club's comments regarding the 2020 Enercon Report do not raise substantial new questions about the modification that would justify re-opening the comment period.

Fourth, additional factors weigh against re-opening the comment period. In particular, EPA did not significantly change the permit terms between the draft and final modification. *In re Springfield Water & Sewer Comm'n*, 18 E.A.D. 430, 451 (EAB 2021); *In re Dominion Energy Brayton Point, LLC*, 13 E.A.D. 407, 416 n.10 (EAB 2007); *see also In re Indeck-Elwood, LLC*, 13 E.A.D. 126, 147 (EAB 2006) (explaining that the significance of a change in permit terms between draft and final permit is a consideration in determining whether to re-open the comment period). Nor has EPA changed its rationale for the modification. While EPA has made several adjustments to the permit provisions, these revisions are all unrelated to the 2020 Enercon Report and are logical outgrowths of the draft modification made in response to public comments. Moreover, these adjustments are minor or administrative in nature or make the final modification more stringent consistent with adjustments Sierra Club sought. See Part I. of this Response to Comments. In addition, the only new provision to the permit is a 12-month average total flow limit restricting the facility to 24% of its design flow, which also increases the stringency of the permit. *See* Springfield, 18 E.A.D. at 451. Lastly, the publicly available record, including the Statement of Basis and the Response to Comments document, adequately explains the Region's reasoning so that a dissatisfied party can develop a permit appeal. *Id.* As explained earlier, the modification does not depend on the 2020 Enercon Report. While EPA considered the Enercon Report relative to GSP's request to remove the wedgewire screens provisions from the permit, EPA did not have to assess GSP's claims in the report. Because the modification does not depend on the 2020 Enercon Report, the report is not necessary for Sierra Club to develop an appeal. Moreover, Sierra Club had access to other record documents reporting on the pilot study and, since the filing of the comment, has received the releasable version of the 2020 Enercon Report.

For all these reasons, EPA concludes that Sierra Club's comments do not raise any "substantial new questions" and declines to exercise its discretion to re-open the comment period. 40 CFR § 124.14(b).

[25] The only references to the 2020 Normandeau Report in Sierra Club's comments are favorable citations to the control data Normandeau collected. *See* Comment B.2.a.ii. In other words, Sierra Club uses the control data to bolster its own arguments and does not criticize the 2020 Normandeau Report or the report's evaluation of the pilot study or the performance of the wedgewire screen technology. *Id.*