BEFORE THE ENVIRONMENTAL APPEALS BOARD
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C.

In re: Dominion Energy Brayton Point, L.L.C. (Formerly USGen New England, Inc.) Brayton Point Station NPDES Permit No. MA 0003654	NPDES Appeal No. 07-01

EPA REGION 1 RESPONSE TO PETITION FOR REVIEW

Respectfully submitted by EPA Region 1,

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In compliance with an order issued by the Environmental Appeals Board (the "EAB" or the "Board") of the United States Environmental Protection Agency ("EPA" or the "Agency"), EPA's Region 1 office ("Region 1" or the "Region") hereby files this Response to Petition for Review in the above-captioned appeal (the "Response"). This Response demonstrates that Petitioner fails to identify any clear error of fact or law, or any exercise of discretion or important policy consideration, that warrants review or further remand of the permit by the Board.

Through its Petition for Review, Dominion Energy Brayton Point, L.L.C. ("Dominion" or the "Petitioner"), appeals Region 1's November 30, 2006, decision on issues remanded by the Board's decision in *In re Dominion Energy Brayton Point, L.L.C. (Formerly USGen New England, Inc.) Brayton Point Station*, NPDES Appeal No. 03-12 (EAB, Feb. 1, 2006) (the "Remand Order"). Attached to its Petition, Petitioner also submits "Table 1," which contains additional allegations of error and a number of Exhibits, some of which also include additional arguments. Therefore, this Response by Region 1 includes Appendix A entitled, "Response by Region 1 to Additional Arguments Presented in Petitioner's Table 1 and Exhibits," which provides additional responses to the material filed by Petitioner. Finally, Petitioner also files three

motions in connection with its Petition. Region 1 also files separate responses to each of these motions.

I. Procedural Background and Description of Region 1's Determination on Remand

On July 22, 2002, after several years of study and discussion with Dominion's predecessors in interest and other interested parties, Region 1 issued a new draft National Pollutant Discharge Elimination System ("NPDES") permit to the Brayton Point Station power plant ("BPS") (the "Draft Permit"). Ex. 3.[1] *See also Dominion* at 18. The Draft Permit was issued in connection with proceedings to renew a prior NPDES permit issued by Region 1 to BPS in June 1993 (NPDES Permit No. MA0003654) (the "1993 Permit"). Ex. 9.[2] In support of the Draft Permit, the Region also issued a Draft Permit Determinations Document (the "DPDD") (Ex.4), which included a volume of expert consultant reports on certain relevant technical and scientific issues. Following public information meetings, public hearings and a public comment period, Region 1 issued a new Final NPDES permit to BPS on October 6, 2003 (the "Final Permit" or the "Permit"). Ex. 1. *See also Dominion* at 20. In support of the Final Permit, Region 1 also issued a Responses to Comments document, which included an additional volume of expert consultant reports (the "RTC"). Ex. 2 (Vols. I and II).

The key, and most controversial, environmental protection provisions in the Permit are its stringent limits on BPS's thermal discharges to, and cooling water withdrawals from, the Mount

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[1] Region 1 cites herein to documents previously submitted to the EAB and interested parties as Exhibits in prior related proceedings by their existing Exhibit Numbers. For new Exhibits, Region 1 is filing a "List of New Exhibits for Remand Proceeding." The Exhibits on this list will be numbered "R1, R2, *etc.*" The Region is also filing a Certified Index of Documents Added to the Administrative Record on Remand.

[2] By its terms, the 1993 Permit "expired" in July 1998. *Id.* at 1. It was administratively continued, however, because the facility timely applied for permit renewal in January 1998. *See Dominion* at 17. *See also* 40 C.F.R. § 122.6(a) and (b).

Hope Bay estuary. These limits were appealed to the EAB on November 5, 2003, by the then owners of BPS, USGen New England ("USGen"), a subsidiary of PG&E Corporation. *See Dominion* at 20. BPS was later acquired from USGen by Dominion Energy Brayton Point, LLC, a subsidiary of Dominion, which has continued the permit appeal. *See id.* at 4, n. 1.

Under 40 C.F.R. § 124.16, the Permit's new thermal discharge and cooling water intake limits were stayed as "contested conditions" due to Petitioner's original appeal, while a small number of "uncontested" permit conditions went into effect. *See* Ex. R1 (AR 4000). For the stayed conditions, the corresponding provisions of the 1993 Permit, including its far less stringent thermal discharge and cooling water intake limits, remain in effect. *Id. See also* 40 C.F.R. § 124.16(c)(2).

On February 1, 2006, following briefing and oral argument, the EAB issued the Remand Order addressing the merits of Dominion's permit appeal. The Board's decision ruled in favor of the Region on most issues related to the Permit and its supporting analyses, but nevertheless remanded the Permit to the Region so that it could further address two substantive technical issues and two administrative matters. *See, e.g., id.* at 293-94. The EAB also directed the Region to determine under 40 C.F.R. § 124.14 whether or not additional public comment should be sought with respect to either or both of the remanded substantive issues. *Id.* at 135, 288.

On November 30, 2006, Region 1 issued its "Determination on Remand from the EPA Environmental Appeals Board, Brayton Point Station, NPDES Permit No. MA0003654" (the "Determination on Remand" or "DOR"). Ex. R2 (AR 4066). *See also* Ex. R3 (AR 4065). The Region's Determination on Remand addresses each of the issues remanded by the Board.

The first substantive issue remanded called for the Region to reconsider its selection of a

five-day threshold per summer month for exceedances above the critical temperature, which was an element in the formula the Region used to develop summer thermal discharge limits under CWA § 316(a). *Dominion* at 133-35, 293-94. The Board instructed Region 1 to either reaffirm or modify the five-day threshold and adequately explain the reasons for its decision. *Id.* at 135, 293. In response, the Region decided that the five-day threshold should be reaffirmed and that no changes to the Permit limits would be necessary or appropriate. Region 1 provided a detailed rationale for its decision. Ex. R2 (DOR) at 2, 21-30. It also determined that it would not be necessary to reopen the record for additional public comment on this issue and explained the reasoning behind its decision. *Id.* at 30-32.

The second substantive issue remanded by the Board required Region 1 to reconsider whether sound emissions from converting BPS from open-cycle to closed-cycle cooling would likely be able to comply with Massachusetts noise control regulations, and to respond to other related concerns raised on appeal by Petitioner regarding the Region's assessment of noise impacts. *Dominion* at 287-88, 293. Noise emissions are a secondary environmental effect considered by the Region in setting technology-based limits applying the BTA standard of CWA § 316(b). *Id.* at 285; Ex. R2 (DOR) at 35-37. The Region reassessed the issue, making certain changes to its analysis, and decided that its earlier conclusion that the Massachusetts regulations would likely be complied with should be reaffirmed, and that no changes to the Permit limits would be necessary or appropriate. Ex. R2 (DOR) at 2, 59. The Region again provided a detailed rationale for its decision. *Id.* at 32-59. The Massachusetts Department of Environmental Protection (the "MassDEP") concurred in writing with the Region's decision. Ex. R4 (AR 4029). *See also* Ex. R2 (DOR) at 2, 33, 42 n. 40, 46, 56. The Region also determined that it would not

be necessary to reopen the record for additional public comment on this issue and again explained the rationale behind its decision. *Id.* at 59-61.

The first administrative issue remanded required the Region to correct a typographical error in the Permit pertaining to the units for the total iron discharge limit. *Dominion* at 291-92; Ex R2 (DOR) at 1, 4-5. The Region addressed this through a minor permit modification. *Id.* at 1, 4-5; Ex. R5 (AR 4028). The second administrative issue remanded was for the Region to ensure that the administrative record includes a "production foregone re-analysis" document that was referred to as being attached to Appendix X of the RTC, Ex. 2 (RTC Vol. II) at App. X, p. 2, but was apparently missing. *Dominion* at 268, 293. The Region addressed this issue on remand by obtaining a copy of the missing attachment to Appendix X and physically placing it in the administrative record. Ex. R2 (DOR) at 1-2, 5; Ex. R6 (AR 4020).

The Remand Order indicated that Dominion could appeal the Region's decision on remand to the Board under 40 C.F.R. § 124.19, but that any appeal would be limited to the specific issues remanded by the Board, as listed at page 293 of the Remand Order. *Dominion* at 293-94. The Remand Order also dictated that an appeal to the EAB would be required to exhaust administrative remedies under 40 C.F.R. § 124.19(f)(1)(iii). *Id.*

On January 3, 2007, Dominion filed its "Petition for Review of November 30, 2006 Determination on Remand Issued by Region 1 in Relation to NPDES Permit for Brayton Point Station" (the "Petition" or "Petition for Review"). By letter dated January 18, 2007, the EAB directed Region 1 to file its response to the Petition no later than March 7, 2007. In compliance with the Board's order, Region 1 hereby files this Response to the Petition for Review.

II. Brief Statement of Factual Background

The facts of this case have been described in significant detail in prior briefing to the Board. The Remand Order also discusses the facts in detail. *See Dominion* at 15-24 (Part III). Region 1 provides a factual summary here to help place the current appeal in proper context.

The Mount Hope Bay estuary is an important part of the larger Narragansett Bay estuary, an estuary of national significance under the CWA's National Estuary Program. *Id.* at 7-8, 17. *See also* Ex. 4 (DPDD) at 7-132. Due to its shallow depth and freshwater input from several rivers, the Mount Hope Bay estuary should provide productive habitat, including critical spawning and nursery habitat for fish and other marine organisms. *See Dominion* at 17, 116-17, 130. Historically, it was considered a highly productive estuary and an important commercial and recreational fishing area. Ex. 2 (RTC) at II-1. By the 1970s and early 1980s, however, fish populations in Mount Hope Bay had become stressed, as indicated by monitoring data showing widely fluctuating fish abundance levels during this time. *See id.* at VII-28 to VII-29, III-28; Ex. 4 (DPDD) at 6-28. Then, in approximately 1985, and coincident in time to an approximate 40 percent increase in thermal discharge and cooling water withdrawals by BPS associated with increased plant operations and the conversion of generating Unit No. 4 from closed-cycle to open-cycle cooling, fish abundance in the bay collapsed. *Dominion* at 8, 16, n. 16; Ex. 4 (DPDD) at 2-3 to 2-4, Figures 2-6.1 and 2.6-2. Despite state and federal fishing restrictions in the area, *see* Ex. 4 (DPDD) at 6-47, 6-55; Ex. 2 (RTC) at VII-5, fish populations have yet to recover more than twenty years later. *See Dominion* at 8; Ex. 4 (DPDD) at 2-4; Ex. 2 (RTC) at VII-36 to VII-37. *See also* Ex. R2 (DOR) at 12, n. 12.

Mount Hope Bay is an interstate water body transected by the Massachusetts/Rhode Island

state line. *Dominion* at 17. Both states have given their portions of the bay their highest water quality classifications (either "SA" or "SB") and the designated uses for the waters include high quality fish habitat in both cases. *Id.* at 176, 181-82.

BPS is located in Somerset, Massachusetts, on the shores of Mount Hope Bay. *Dominion* at 15. The facility utilizes an open-cycle (or "once-through") cooling system that withdraws water from the Mount Hope Bay estuary, uses it to cool (or condense) steam, thereby heating the water, and then discharges the hot water back to the estuary. *Id.* at 8, 16-17. BPS currently has a thermal discharge of approximately 42 trillion British thermal units (tBTU) per year, with a maximum temperature of 95° F. *Id.* at 17. The thermal discharge plume significantly alters the bay's thermal regime. *See* Ex. 4 (DPDD) at 2-2, 6-23, 6-39, 6-56; Ex. 2 (RTC) at III-6, III-58, III-67. BPS also withdraws approximately one billion gallons per day of water from the bay, thus cycling an amount of water equivalent to the entire volume of the bay through the cooling system about seven times per year. *Dominion* at 17; Ex. 4 (DPDD) at 7-125. This causes the entrainment and impingement of billions of fish eggs and larvae, juvenile and adult fish, and other organisms, and when invertebrates are considered, the toll rises to trillions of organisms. *See Dominion* at 154, 203. *See also* Ex. 4 (DPDD) at 7-113 to 7-114, 7-125, 7-163, 7-166 to 7-167, 7-172; Ex. 2 (RTC) at IV-90.

While BPS uses open-cycle cooling, technology exists for closed-cycle cooling. A closed-cycle (or "recirculating") system uses a cooling apparatus, usually some type of cooling tower, to reduce the water's temperature so that it can be reused for additional cooling instead of discharging the hot water to a receiving water body. *Dominion* at 16. By reusing the water for cooling, closed-cycle cooling systems can decrease thermal discharges and cooling water

withdrawals by approximately 95 percent. *See id.* at 19, n. 19. Even for such a "closed-cycle" system, however, "make-up" water is needed to replace water lost to evaporation from cooling towers and periodic tower blowdown discharges. *Id.* at 16, n. 15.

The Permit's thermal discharge and cooling water withdrawal limits are at the center of this permit appeal. *Id.* at 5. The Permit allows an annual thermal discharge of 1.7 tBTUs, a maximum discharge temperature of 95°F, and a temperature increase limit (from influent to effluent) of 22°F. *Id.* at 19. The thermal discharge limits are not based on either technology or water quality requirements and are less stringent than those requirements would otherwise require. *Id.* at 13-14, 18-19. The limits *are* based on a site-specific variance under CWA § 316(a) and are designed to satisfy the biological criteria of that section of the statute. *Id.* Meeting these limits will result in an approximate 96 percent reduction in the thermal discharge from BPS's current once-through cooling operations. *Id.* at 19, n. 19. While Petitioner may meet the limits in any way it chooses, all parties agree that converting the BPS cooling system to closed-cycle cooling using some type of wet, mechanical draft cooling towers is likely the most cost-effective means of compliance. *Id. See also id.* at 8; Ex. R2 (DOR) at 5.

The Permit's cooling water intake capacity limits are based on the separate legal authority of CWA § 316(b) and the requirements of CWA §§ 301(b)(1)(C) and 401. *See Dominion* at 8-9, 143-45. In the absence of applicable national standards, Region 1 applied § 316(b) on a site-specific, Best Professional Judgment ("BPJ") basis. *Id.* at 15, 19, 151-52. To satisfy the requirements of CWA § 316(b) and Massachusetts and Rhode Island water quality standards, the Permit sets an intake capacity limit of 56 million gallons per day ("MGD"), with an additional 6.847 billion gallons per year allowed for occasional open-cycle cooling operations. *Id.* at 19,

143. Any such open-cycle cooling operations, however, are prohibited during the winter flounder spawning season (February through May) to avoid serious entrainment and impingement impacts. *Id.*

The Permit's intake capacity limits reflect achievable reductions if BPS's cooling system is retrofitted from an open-cycle system to a closed-cycle system using wet mechanical draft cooling towers for all four electrical generating units at the power plant. *Id.* at 19. The Region determined on a BPJ basis that such a cooling system upgrade constitutes the Best Technology Available for minimizing adverse environmental impact at BPS in accordance with CWA § 316(b). *Id.* It is undisputed that such a cooling system conversion is feasible and the most cost-effective way to comply with the Permit's intake limits. *See* Ex. R2 (DOR) at 5; Ex. 2 (RTC) at IV-9; Ex. 4 (DPDD) at 7-35 to 7-40. As with the Permit's thermal discharge limits, Petitioner may comply with the Permit's intake limits any way it chooses. *See* Ex. R2 (DOR) at 5.

Thus, the thermal discharge and cooling water intake limits are both independently expected to result in the conversion of the BPS cooling system to closed-cycle cooling. *See Dominion* at 8. This type of system would not, however, provide for completely "closed-cycle" cooling. The facility would still need to withdraw approximately 56 MGD for cooling tower make-up water and, after losses to evaporation, would still have a 38 MGD maximum daily discharge of thermal effluent. Although 56 MGD is still a substantial intake flow, it represents a 94 percent reduction from current operations and will achieve an equivalent reduction in entrainment and impingement losses. *See* Ex. 4 (DPDD) at 7-167; Ex. 2 (RTC) at IV-23.

III. Standard of Review

In the Remand Order, the Board discusses its standard of review in NPDES permit

appeals. *Dominion* at 25-28 (Part IV). The Board ordinarily reviews permits under 40 C.F.R. § 124.19(a) only when a petition shows a "clearly erroneous finding of fact or conclusion of law," but, "in its discretion, may also evaluate conditions of the permit that are based on the permit issuer's 'exercise of discretion or an important policy consideration.'" *Id.* at 26 (quoting 40 C.F.R. § 124.19(a)(2)). Furthermore, the Board's review authority "is to be 'sparingly exercised' and ... 'most permit conditions should be finally determined at the Regional level.'" *In re NE Hub Partners*, 7 E.A.D. 561, 567 (EAB 1998) (citation omitted), *rev. denied sub nom. Penn Fuel Gas, Inc. v. EPA,* 185 F.3d 862 (3d Cir. 1999).

The Remand Order also explained that "when a petitioner seeks review of a permit based on issues that are fundamentally technical in nature, the Board assigns a particularly heavy burden to the petitioner." *Dominion* at 27 (citations omitted).[3] When challenging a Region's technical judgments, "clear error or a reviewable exercise of discretion is not established simply because petitioners document a difference of opinion or an alternative theory regarding a technical matter." *Id.* at 27-28 (quoting *NE Hub*, 7 E.A.D. at 567). Where the conflicting views of the Region and a petitioner indicate "'bona fide differences of expert opinion or judgment on a technical issue, the Board typically will defer to the Region.'" *Id.* at 28 (quoting *NE Hub*, 7 E.A.D. at 567).[4] Where the science in an area is uncertain, a contrary opinion urged by a petitioner will neither establish that a rational, adequately explained judgment by the Region is clearly in error nor overcome the

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[3] The EAB explained "'this demanding standard serves an important function within the framework of the Agency's administrative process; it ensures that the locus of responsibility for important technical decisionmaking rests primarily with the permitting authority, which has the relevant specialized expertise and experience .'" *Id.* (quoting *In re Peabody W. Coal Co.,* CAA Appeal No. 04-01, slip op. at 16 (EAB, Feb. 18, 2005)).

[4] The Board also noted in the Remand Order that federal courts have shown similar deference to Agency technical decisions. *Id.* at 28, n. 30 (citing cases).

Board's traditional deference to Regional technical determinations. *Dominion* at 118.[5] *See also id. at 28 (*quoting *In re Envotech, L.P.*, 6 E.A.D. 260, 284 (EAB 1996) ("absent compelling circumstances, the Board will defer to a Region's determination of issues that depend heavily upon the Region's technical expertise and experience"). Thus, the Board reviews technical matters "'to determine whether the record demonstrates that the Region duly considered the issues raised in the comments and whether the approach ultimately adopted by the Region is rational in light of all the information in the record.'" *Id.* at 28 (quoting *In re Gov't of D.C. Mun. Separate Sewer Sys.*, 10 E.A.D. 323, 348 (EAB 2002)). *See also NE Hub*, 7 E.A.D. at 568.

Two additional principles governing Board review of NPDES permit appeals also apply to the present case. First, to preserve an issue for appeal to the EAB, "a petitioner must first demonstrate that all reasonably ascertainable issues and all reasonably available arguments supporting its position were raised by the close of the comment period as required by the NPDES procedural regulations." *Dominion* at 26 (citing 40 C.F.R. §§ 124.13(a) and 124.19(a)) (footnote and case citations omitted). Similarly, the Board has explained that when an issue could have been raised in a first petition for review but it was not, a party will not be permitted to raise that issue in a later petition appealing a decision on remand in the same case. *In re Carlota Copper Company,* 11 E.A.D. 692, 729 n. 43, 734-36 (EAB 2004); *In re Knauf Fiber Glass, GMBH,* 9 E.A.D. 1, 7 (EAB 2000). Second, it is insufficient for a petitioner merely to "repeat objections made during the comment period; rather, a petitioner must also demonstrate why the permit

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[5] *See also Lead Industries Assoc'n v. EPA*, 647 F.2d 1130, 1147 (D.C. Cir. 1980); *BASF Wyandotte Corp. v. Costle,* 598 F.2d 637, 652 (1st Cir. 1979) (judicial "review of agency rule-making is very limited, especially where the Agency must overcome technological and scientific uncertainty in making its delegated discretionary decisions"); *Hercules Inc. v. EPA*, 598 F.2d 91, 106-07, 115-17 (D.C. Cir. 1978).

issuer's responses to those objections (*i.e.*, the permit issuer's basis for its decision) is clearly erroneous." *Dominion* at 26-27 (citing 40 C.F.R. § 124.19(a)) (case citations omitted).

In its Petition, at 2, Dominion cites *Food Marketing Institute v. ICC*, 587 F.2d 1285, 1290 (DC Cir 1978), for the proposition that the Board should apply some unspecified greater level of scrutiny to Region 1's Determination on Remand to ensure that the decision is "more than a barren exercise of supplying reasons to support a pre-ordained result." *Food Marketing* is inapposite to the instant case. The *Food Marketing* court gave two reasons for applying a "somewhat greater degree of scrutiny" to a decision by the Interstate Commerce Commission ("ICC") decision, only one of which is even arguably relevant here.[6] First, the court pointed to the fact that the ICC's decision on remand reaffirmed an earlier decision that "departed drastically" from the agency's prior decisions and that it was "incumbent upon the agency carefully to spell out the bases of its decisions when departing from prior norms." 587 F.2d at 1290. No departures from prior norms are at issue in the present case.

Second, the court pointed to the fact that the ICC's decision on remand came to "precisely the same conclusion as the order previously remanded by this court." *Id.* While Region 1's Decision on Remand reaffirms its ultimate conclusions from the prior analyses and the Permit's limits were not changed, the Region's analyses on remand were modified in certain ways from the prior analyses. For example, in assessing cooling tower sound emissions on remand, Region 1 revised its earlier approach to account for predicted sound emissions from new air pollution control equipment to be installed at BPS, as Dominion had urged. *See Dominion* at 284. *See also*

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[6] *Food Marketing Institute* is also distinguishable in that it involves judicial review of an agency decision, rather than administrative review of an agency decision by that agency's own reviewing tribunal. *See NE Hub*, 7 E.A.D. at 568, n. 6 (discussing similarities and differences between EAB review and judicial review).

Ex. R2 (DOR) at 54-56. Similarly, with respect to the temporal threshold for exposure to excessive temperatures, the Region reevaluated materials in the existing record and supplemented the record with new information to address Petitioner's comments that the Region had not sufficiently explained its approach in setting the threshold at five days, as opposed to some other number. The Region's good faith, objective evaluation of these issues was far more than "barren exercise of supplying reasons to support a pre-ordained result."

It is also important to understand that regardless of the "somewhat greater degree of scrutiny" that the *Food Marketing* court indicated it would apply, 587 F.2d at 1289, the court did not alter the standard of review it applied to the agency decision. The court held that the "rational basis" test still applied. *Id. See also id.* at 1293 ("Because these conclusions [of the agency] are rationally based, [internal references omitted] we must accept them in the exercise of our limited review function."). The court also continued to give "considerable deference" to the ICC's "balancing of competing interests" where that balancing "will inevitably involve questions of policy that the Commission, because of its expertise and specialized function, is best situated to evaluate." *Id.* at 1293-94. Moreover, the *Food Marketing* court also clearly stated that:

> [t]o be sure, where, as here, the remand merely requires the agency further to elaborate its reasoning, there is no requirement that the agency arrive at a different substantive result upon reconsideration.

Id. at 1290. Thus, the court in *Food Marketing* upheld the agency's decision on remand to reaffirm its earlier decision because the court found "a sufficient articulation of reasons" for the result. *Id.* at 1294, 1295. In sum, *Food Marketing* does not support any alteration of the Board's standard of review or the degree of deference it gives technical decisions by the Regions.

ARGUMENT

In its Petition, Dominion argues that Region 1 has committed a variety of errors of fact and law warranting Board review and another remand of the Permit. The Region addresses issues related to the five-day critical temperature exceedance threshold first, followed by the closed-cycle cooling noise issue, and finally the production foregone re-analysis issue. Region 1 demonstrates that none of these issues warrants Board review or a further remand of the Permit.

Petitioner also alleges a number of procedural errors by Region 1. These are reflected in the Petition and are substantively repeated in Petitioner's "Motion to Supplement the Administrative Record" and "Motion to Exclude or to Strike Documents from the Administrative Record." Region 1 responds to these arguments in its "Region 1 Motion to Strike and Opposition to Petitioner's Motion to Supplement the Administrative Record," and "Region 1 Assent to Petitioner's Motion to Exclude or to Strike Documents from the Administrative Record," which are incorporated herein by reference and are filed today together with this Response. Once more, Region 1's response with regard to these procedural issues demonstrates that none warrants either EAB review or a further remand of the Permit.

IV. Petitioner Identifies No Issue Warranting EAB Review Regarding the Five-Day Critical Temperature Exceedance Threshold

A. Description of the Region's Determination under CWA § 316(a) on Remand

CWA § 316(a) requires that permit limits based on a variance under that provision "*will assure* the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on that body of water" (the "BIP"). 33 U.S.C. § 1326(a) (emphasis supplied). Region 1 rejected the variance proposed by Petitioner. *See Dominion* at 86-88, 102. Instead of

simply imposing the more stringent technology-based and water quality-based standards, however, the Region developed its own § 316(a) variance-based limits. *Id.* at 113-17. In addition to demonstrating that these limits are reasonable and consistent with applicable law, the Region's burden under CWA § 316(a) is to show that these limits are adequate to assure the protection and propagation of the BIP. The Region is not required to show that they are the least stringent limits that might possibly be developed to satisfy § 316(a). *Id.* at 110-12.

In applying § 316(a), the Region derived summer thermal discharge limits that would reasonably assure the protection and propagation of the BIP in Mount Hope Bay using three key elements: (1) a 24°C critical temperature to prevent juvenile winter flounder avoidance and other adverse effects; (2) a 10 percent area impact restriction to prevent major harm to key juvenile winter flounder habitat in Mount Hope Bay by the thermal plume; and (3) a five-day per month ceiling on how often the critical temperature could be exceeded beyond the 10 percent impact area during the summer ("five-day threshold").[7] *See, e.g., Dominion* at 113-17; Ex. 4 (DPDD) at 6-56. Region 1 then used a hydrothermal model agreed upon by the parties to predict the extent and intensity of BPS's thermal discharge plume under different possible permitting scenarios to derive permit limits that would satisfy the stated criteria. *Id.* at 6-39 to 6-40; 6-56 to 6-57.

In developing these permit limits, there were many impacts of concern in addition to juvenile winter flounder avoidance (*e.g.*, chronic mortality from heat exposure, proliferation of nuisance species, *etc.*). *See id.* The Region determined, however, that since juvenile winter flounder were the most sensitive species and life stage during the summer, limits stringent enough

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[7] The Region divided the year into two periods – referred to as "summer" (June through September) and "winter" (the rest of the year) – and developed a monthly thermal discharge for each. *See, e.g.,* Ex. R2 (DOR) at 15, n. 15. The winter limits are not at issue in the present appeal.

to prevent substantial juvenile winter flounder avoidance of key nursery habitat should also prevent many other substantial adverse impacts and reasonably assure the protection and propagation of the BIP. *See* Ex. 4 (DPDD) at 6-36, 6-37. *See* Ex. 2 (RTC) at III-34, III-36.

In the earlier stage of this appeal, the Board upheld the Region's overall analytical approach, as well as its specific selection of the 24°C critical temperature and 10 percent areal impact thresholds. *Dominion* at 126-27, 132-33. The Board agreed with Petitioner, however, that Region 1 had not adequately explained its selection of the five-day threshold. *See Dominion* at 133-35. Therefore, the Board remanded the Permit for the Region to revisit the issue and either reaffirm the five-day value or select another value, and to provide an adequate rationale for its decision. *Id. See also id.* at 293-94.

Petitioner's original comment, which the Region set out to address on remand, criticized the Region's approach to selecting a reasonably protective number of critical temperature exceedance days. In its comments on the Draft Permit, Dominion asserted that "EPA's approach ignores the biological significance of whether there were 6 days or 26 days of exceedance, and effectively concludes that the difference between 4 and 5 days of exceedance is critical, but the difference between 6 and 26 days is not." *See* Ex. 2 (RTC) at III-29. The Board also noted that Region 1 "did not explain . . . precisely why it ultimately selected five days (as opposed to any other number of days, such as six or seven)." *See also Dominion* at 134.

In its Determination on Remand, Region 1 reaffirmed the five-day threshold and provided a detailed rationale for selecting five days rather than a higher or lower value. *See* Ex. R2 at 21-30. The Region reviewed the scientific literature and available data and concluded that there was unavoidable technical uncertainty presented by the information:

> Region 1 concluded that the scientific literature and the available data did not definitively dictate a particular threshold for the number of days of critical temperature exceedance that should be allowed each summer month. Rather, it was necessary for the Region to exercise scientific and policy judgment in choosing a value from which permit limits could be derived that would provide reasonable assurance of the protection and propagation of the BIP in Mount Hope Bay.

Ex. R2 (DOR) at 28. In the face of this uncertainty, the Region exercised reasonable technical and policy judgment in re-evaluating the five-day threshold based on the available information. *See In re Public Service Company of New Hampshire*, 1 E.A.D. 332, 346 (Adm'r 1977) (NPDES permit) (Region "'must make decisions on the basis of the best information reasonably attainable,'" quoting EPA guidance). *See also Hercules Inc. v. EPA*, 598 F.2d 91, 107-08 (D.C. Cir. 1978) (Where the Agency is deciding among alternatives on "the frontiers of scientific knowledge," the "[d]ecision between the alternatives is a quintessential policy judgment within the discretion of EPA.").

First, the Region relied upon the paper by Casterlin and Reynolds (1982), Ex. R7 (AR 385), to identify three days as the starting point in the selection of a potential temporal threshold for exposure to high temperatures.[8] In the laboratory study discussed in this paper, juvenile winter flounder exhibited a clear avoidance response to excessive temperatures by the end of the three-day experiment. *See* Ex. R2 (DOR) at 24-25. Region 1 concluded that this study suggested a possible threshold of three days. Ex. 2 (DOR) at 25, 28.

However, although the Region has explained that thermal discharges causing significant avoidance of critical nursery habitat by juvenile winter flounder would be contrary to assuring the

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[8] Neither the Region nor Petitioner identified any other scientific paper or data that specifically addressed the temporal exposure required to cause a significant avoidance response by juvenile winter flounder.

protection and propagation of the BIP, *see, e.g.,* Ex. 2 (RTC) at III-11; Ex. 4 (DPDD) at 6-38 to 6-39, 6-55 to 6-57; Ex. R2 (DOR) at 19, the Region also explained on remand that there is unavoidable uncertainty involved in applying the results of the Casterlin and Reynolds (1982) laboratory study to the natural environment. *See id.* at 25, 28. Another consideration informing the Region's view of the three-day threshold suggested by Casterlin and Reynolds (1982) was uncertainty in determining the impact that avoidance of critical nursery habitat resulting from such an exposure would have on the overall health of the BIP. *See id.* Though the impact of juvenile winter flounder being forced to avoid their habitat is adverse for many reasons, the Region had neither qualitative nor quantitative assessments indicating precisely how significant or extensive the impact would be from avoidance after a three-day exposure to temperatures above 24°C. *See id.* Therefore, the Region concluded that some upward adjustment from a "floor" of three days would be reasonable, though it was cognizant that longer exposures would be likely to cause greater avoidance and additional adverse impacts. *Id.* at 25-26, 28-29.

The Region reviewed the scientific literature and EPA technical documents and determined that seven days was the next duration of exposure (after three days) for which scientific assessments were available that clearly linked temperature exposure time to adverse biological effects. EPA technical guidance and scientific literature indicated that exposures above 24°C for seven or more days would be likely to cause significant adverse impacts to the growth of juvenile winter flounder. *Id.* at 25-29. Here Region 1 relied on EPA's "Quality Criteria for Water (1986)," also known as the "Gold Book," Ex. R8 (AR 4002), and scientific papers by Sogard (1992), Ex. R9 (AR 4011), and Meng *et al.* (2000), Ex. R10 (AR 4013). *See* Ex. R2 (DOR) at 25-29. The Gold Book, Ex. R8, suggested that an exposure of seven days was "extensive" and

that seven-day exposures to temperatures even less than 24°C could cause significant adverse growth impacts for juvenile winter flounder. *See* Ex. R2 (DOR) at 26-28. A seven-day exposure would also be likely to cause even greater avoidance and related adverse impacts than an exposure of three days. *Id.* at 26, 29.

Meanwhile, the Sogard (1992) and Meng *et al.* (2000) papers provided empirical evidence suggesting that serious adverse growth effects occur at least by the ten- and fifteen-day exposures they evaluated. *Id.* at 28. The Region concluded that these two papers help to confirm that an exposure of ten days or more would be unacceptable. These papers also provided general empirical support for the Gold Book's suggestion that lengthy exposures to temperatures even less than 24°C could cause significant adverse growth impacts for juvenile winter flounder. These papers did not investigate exposures less than ten days, so they could not be used to determine whether an exposure period of less than ten days might be acceptable. *Id.* Based on the Gold Book, therefore, the Region ruled out summer permit limits that would allow exposures to temperatures above 24°C for periods of seven or more days per month. *Id.* at 28-29.

Thus, Region 1's analysis identified a range of possible values for the temporal threshold *between* three and seven days (*i.e.*, either four, five or six days). *See id.* at 28-29. From this range, Region 1 selected five as a reasonable and appropriate value. *See id.* at 29-30. Factors cited by the Region as reasons for adopting the five-day threshold include the following:

1. As the number of exceedance days increase above three, it becomes more likely that the exceedance will, in fact, cause avoidance in an increasing percentage of the population;

2. As the duration of avoidance increases, the risk of indirect mortality and adverse sublethal effects increases;

3. Because the days during which critical nursery habitat would exceed the critical avoidance temperature as a result of the thermal discharge are likely to occur consecutively, when considering the days per month of exposure by juvenile winter flounder to excessive temperatures, it is sustained exposure that is at issue;

4. A desire to minimize the absolute number of exposures in light of indications that "thermal stress in fish accumulates more rapidly than it dissipates";[9]

5. The "depleted state of the Mount Hope Bay BIP";

6. The stringent burden of proof for § 316(a) variance determinations;

7. The technical uncertainty regarding the selection of the value and "the risks to the winter flounder population if the Region erred in its judgment"; and

8. The fact that no party to the permit proceeding has offered any "evidence specifically establishing that the value selected by the Region is excessively stringent, or that a specific, alternative value would be sufficient to assure the protection and propagation of the BIP."

See Ex. R2 (DOR) at 26, 29. As the Region explained in the Determination on Remand:

> In light of all of these factors, Region 1 concluded that it would be reasonable to select a critical temperature exceedance threshold of five days. This value falls in the middle of the narrow range of values that remained for consideration following Region 1's scientific analysis. The Region concluded that the five day cut-off value was consistent with its approach of selecting reasonably conservative values throughout its CWA § 316(a) variance analysis.

Ex. R2 (DOR) at 29. *See also id.* at 26 (discussing factors Region 1 took into account), 30. The Region's analysis was rational, legal, and reflects consideration of the relevant issues.

Before addressing Petitioner's objections to the Region's analysis, it bears repeating that deference to the Region's judgment and expertise is at its apex in areas of technical and scientific uncertainty. *NE Hub*, 7 E.A.D. at 567-68. ("In cases where the views of the Region and the

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[9] Dominion's challenge to the Region's reliance on Bevelhimer and Bennett (2000) for this proposition is detailed in Table 1 attached to its Petition. Region 1 responds to this challenge in Appendix A to this Response.

petitioner indicate bona fide differences of expert opinion or judgment on a technical issue, the Board typically will defer to the Region.").[10] *See also Dominion* at 118; *Hercules*, 598 F.2d at 107-08, 106-07 (defining the scope of the inquiry as whether the agency's conclusion falls within the "zone of reasonableness" and "not whether its numbers are precisely right."). With this general legal principle in mind, the Region will address each of Petitioner's arguments below.

B. Petitioner Fails to Demonstrate Clear Error With Respect to the Biological Basis of the Five-Day Threshold

Petitioner lodges two broad challenges to the Region's analysis. First, Dominion states that the Region established a thermal limit under CWA § 316(a) "in order to ensure that young winter flounder did not avoid otherwise preferred habitat." *See* Petition at 8. Petitioner suggests that minimizing avoidance impacts was the Region's goal to the exclusion of any other purpose or related biological consideration. *See id.* at 6, 11. This overly narrow statement of the Region's purpose in addressing the five-day threshold issue is a fundamental, and incorrect, premise of Petitioner's argument. Far from limiting its inquiry to avoidance, the Region set summer thermal discharge limits in order to establish a CWA § 316(a) variance that would meet the statutory standard of assuring the protection and propagation of the balanced indigenous population of fish, shellfish and wildlife in and on Mount Hope Bay. *See Dominion* at 113–17. *See also* Ex. 4 (DPDD) at 6-3 to 6-10.

As explained below, the Region's focus on avoidance has never excluded consideration of other significant harm to the species or the BIP, such as growth inhibition, increased mortality,

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[10] *See also BASF Wyandotte Corp. v. Costle,* 598 F.2d 637, 652 (1st Cir. 1979) (judicial review is limited "especially where the Agency must overcome technological and scientific uncertainty in making its delegated decisions").

increased susceptibility to predation or diminished reproductive success. To the contrary, the Region expressly indicated that it developed the variance-based limits using an approach that considers other adverse effects, including growth impacts. *See* Ex. 4 (DPDD) at 6-19 to 6-20, 6-34 to 6-36, 6-37, 6-44 to 6-45, 6-51 to 6-52, 6-55 to 6-57 (considering relationship between size and mortality rates due to predation, sublethal effects, trophic effects, mortality and other harms); Ex. 2 (RTC) at III-11, III-13, III-28, III-65 (considering other adverse effects such as increased predation, reduced feeding and forced burrowing). *See also* Ex. R2 (DOR) at 22.[11] In fact, consistent with EPA guidance, the Region considers growth impacts to be potential grounds for *denying* a variance. *See* Ex. 4 (DPDD) at 6-20. Dominion has not identified any reasoned basis in law, fact or policy why these adverse biological effects cannot or should not continue to inform the selection of the five-day threshold. After all, the ultimate purpose of the threshold is not merely to prevent avoidance effects, but to reasonably assure the protection and propagation of the BIP.

Equally unavailing is Dominion's second broad argument, an aggressively stated but unfounded assertion that the Region's decision has "no biological basis." *See* Petition at 8-9. Petitioner's assertion that the Region's selection of the five-day threshold is not sufficiently supported by the administrative record, *see* Petition at 8-9, is grounded in nothing more than the

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[11] Avoidance impacts also cannot be entirely separated from other impacts. Juvenile winter flounder forced to avoid their optimal habitat may experience reduced growth (*e.g.*, avoidance by burrowing may result in cessation of feeding), *see* Ex. 2 (RTC) at III-28, and/or mortality as a result. *See,* Ex. R2 (DOR) at 26. *See also* Ex. R2 (DOR) at 18 (explaining that "activities that disrupt normal feeding and activity levels (such as decreased feeding, excessive activity levels, burrowing in cooler sediments or engaging in other avoidance behavior) will detract from the quantity of energy directed to growth . . . [, and i]f these activities are sustained for an extended period, they will reduce growth rates and contribute to the overall predation mortality rate."); Able and Fahay (1998) (AR 692) (the longer juvenile winter flounder stay at a size susceptible to predation, the greater the predation mortality).

Region's acknowledgment of the undeniable scientific uncertainty involved in setting the maximum number of days that the key nursery habitat of juvenile winter flounder in Mount Hope Bay can be allowed to exceed critical avoidance temperatures while still reasonably assuring the protection and propagation of the BIP. Petitioner quotes the following passage from the Region's Determination on Remand, :

> [t]here is uncertainty regarding the precise exposure time required to elicit an avoidance response. There is also uncertainty regarding the precise overall effect that various periods of avoidance will have...[the available scientific literature] neither establishes (nor speculates as to) the exact duration of exposure to critical temperatures that will elicit an avoidance response or the precise duration of avoidance of nursery habitat by juveniles that will result in significant indirect mortality.

Petition at 9 (quoting Ex. R2 (DOR) at 23). Dominion construes Region 1's acknowledgment of uncertainty to be a concession that its determination "lack[s] scientific evidence" and Petitioner then leaps to the conclusion that "no biological basis" exists for the five-day threshold. *Id.*

Yet, this conclusion does not follow. Nothing in the above-quoted language from the Determination on Remand suggests a lack of scientific evidence underlying the Region's selection of the five-day threshold. To the contrary, the Region expressly concluded that the scientific literature was sufficient to establish evidence of adverse biological impacts occurring with increasing severity at various points from three to fifteen days. S*ee* Ex. R2 (DOR) at 23-28 (discussing Casterlin and Reynolds (1982), the Gold Book, Sogard (1992) and Meng *et al.* (2000)). However, even after reasonably narrowing the range of days that the critical nursery habitat should be allowed to exceed the avoidance temperature threshold by eliminating the

extreme ends of the spectrum,[12] the Region was still left with residual scientific uncertainty. *See id.* at 28-30.

Thus, Region 1 explained in the Determination on Remand that the scientific literature does not establish an "exact" or "precise exposure time required to elicit an avoidance response" for juvenile winter flounder in general, nor does it establish:

> definitive, site-specific benchmarks for *juvenile winter flounder in Mount Hope Bay* that can be precisely calibrated to prevent or minimize the potential for thermal discharges from BPS to drive the fish from their key habitat in the bay or otherwise materially diminish the overall health and abundance of the community. Instead, the literature contains evidence of a variety of harmful behavioral and physiological changes that occur *by* various points across a spectrum of exposure times.

Id. at 23 (emphasis in original). *See also id.* at 25. Section 316(a) does not, however, demand absolute certainty in establishing thermal discharge limits sufficient to reasonably assure protection and propagation of the BIP. As the Region has explained:

> [a]lthough the § 316(a) standard is extremely rigorous, EPA has not interpreted § 316(a) to require absolute certainty before a variance could be granted. *In re Public Service Company of New Hampshire*, 10 ERC at 1265. In reality, achieving absolute certainty about a § 316(a) determination is likely to be impossible. *See Id.* EPA has stated, however, that "[t]he greater the risk, the greater the degree of certainty that should be required." *Id.* at 1265. *See also* 44 Fed. Reg. 32894 (June 7, 1979).

See Ex. 4 (DPDD) at 6-10 to 6-11. If the presence of uncertainty or interstitial gaps in data or scientific knowledge were to preclude the Region from moving forward, the 316(a) variance

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[12] *See* Ex. R2 (DOR) at 24 (rejecting one and two days on the basis that the precise extent to which such an exposure would cause avoidance is unknown) and 27-29 (rejecting seven days or more on the basis that the exposure would be considered "extensive" and would result in excessive growth inhibition among other adverse effects).

process would quickly grind to a halt.[13] In the end, the Region "'must make decisions on the basis of the best information reasonably attainable.'" *Pub. Serv. Co. of New Hampshire*, 1 E.A.D. at 346 (quoting EPA guidance).

The Region did just that in this case, exercising an informed judgment in light of the relevant body of scientific literature, as well as the legal mandates and policy imperatives of section 316(a).[14] Even a cursory review of the Region's discussion concerning the uncertainty it confronted when determining a temporal threshold adequate to assure the protection and propagation of the BIP exposes Dominion's allegation of "no biological basis" to be unfounded and a mis-characterization of the Region's position. An allegation like this–not only unsubstantiated, but plainly contradicted by the record—cannot constitute grounds for review. *See, e.g., In re Avon Custom Mixing Servs., Inc.,* 10 E.A.D. 700, 708 (EAB 2002).

The proper inquiry is not whether there is uncertainty, but whether the Region reasonably considered the uncertainty and dealt with it in a rational way. In the Determination on Remand, the Region explained that, "[p]redicting thermal effects is a function of species, life stage, exposure temperature, and exposure duration and frequency . . . [but] the scientific literature has not produced data on every possible variation and combination of these factors." *Id.* at 22. Thus, based on the evidence in the record, "some amount of interpolation between study results or

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[13] Such a limitation, incidentally, could also prove to be detrimental to thermal dischargers, who are seeking permit limits at variance with otherwise more stringent discharge limits by application of CWA § 316(a).

[14] Region 1's review of the best available relevant literature appears not only to have been sufficient, but also exhaustive. Neither Dominion nor its consultant have identified any other scientific paper that included a different maximum duration of exposure for avoidance, or any paper that directly or indirectly contravenes Region 1's selection of the five-day threshold. In fact, Dominion's consultant independently conducted a literature search of "316(a) guidance documents and other associated EPA water quality documentation" and found only two documents that it believes are relevant to the five-day threshold issue, *see* Petition, Table 1 at 9 (Item 13), one of which Region 1 already relied on and the other of which adds nothing material on this issue, as discussed below in § IV.E.

extrapolation is necessary in the derivation of precise values in setting permit limits." *Id.* This approach is plainly reasonable in the context of section 316(a) variance determinations, and particularly when dealing with an ecological setting as complex as Mount Hope Bay's, because "'mathematical certainty regarding a dynamic biological situation is impossible to achieve, particularly where desirable information is not obtainable,'" *Pub. Serv. Co. of New Hampshire*, 1 E.A.D. at 347 (quoting EPA guidance).

On appeal, Petitioner does not squarely confront the merits or demerits of the approach taken by the Region, which, as discussed above, *supra* at § IV.A, was (A) to draw reasonable inferences from the scientific literature and EPA guidance to establish biologically-based minimum and maximum potential temporal thresholds, and (B) then to apply a set of factors grounded in science, as well as in the law and policy pertinent to § 316(a), to select the final threshold. *See* Ex. R2 (DOR) at 26, 29. *See also Hercules,* 598 F.2d at 116-17 (quoting *Gulf Oil Corp. v. Hickel*, 435 F.2d 440, 446 (D.C. Cir. 1977) ("An agency confronted with a complex task may rationally turn to simplicity in ground rules...at least where no fundamental injustice is wrought.")).

In the prior proceedings, Dominion argued that the Region's approach ignored the possible "biological significance of whether there were 6 days or 26 days of exceedance [of critical temperatures]." The Region's analysis on remand clearly addressed this issue and provided reasons for selecting a five-day threshold, as opposed to some other number of days. Dominion contends, however, that Region 1 "did not correct the deficiency." Petition at 8. Yet, Petitioner's caricature of the Region's selection methodology (*e.g.*, "one is a little too low and the other a little too high") fails to address the specifics of the Region's reasoning. *See* Petition at 9. As such,

these arguments amount to little more than a restatement of Petitioner's original objections and they fail to establish an issue warranting review by the Board. S*ee, e.g., Peabody*, CAA Appeal No. 04-01, slip op. at 16 ("the petitioner may not simply reiterate comments made during the public comment period, but must substantively confront the permit issuer's subsequent explanations").[15]

For its part, Dominion neither outlines an alternative approach for rationally selecting the number of days that the critical nursery habitat in Mount Hope Bay can be allowed to exceed the critical avoidance temperature while still reasonably assuring the protection and propagation of the BIP – much less identifies why any such approach should be preferred over that taken by the Region – nor demonstrates that Region 1's five-day threshold is unreasonable or clearly in error. Petitioner also does not advance any proposed alternative temporal threshold value to justify a variance from otherwise applicable technology-based or water quality-based standards.[16] Dominion obviously does not argue that the Region has failed to carry its burden to identify a limit that is stringent enough to protect the BIP, since it argues the limits are too stringent. *See* Petition at 12, 14. The closest Dominion comes to proposing a value is in Table 1 appended to the Petition, which states, equivocally, "HDR/LMS found support for frequency of exceedance or durations of exposure of seven or more days, but none for five days or less in the context of

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[15] Dominion's failure to address the Region's analytical process for selecting the five-day threshold is particularly striking given the Board's disposition of the critical temperature threshold issue, where the Region faced an analogous technical challenge. *See, e.g., Dominion*, at 125, n. 151 (noting that use of Casterlin and Reynold (1982) to select a critical temperature threshold "necessarily requires scientific judgment as to what the most appropriate cutoff point on the downside of the distribution curve should be") and at 126-127 (finding "no clear error in [the Region's] decision to take a relatively conservative approach" in selecting the 24°C threshold).

[16] It is worth recalling that the mixing zone analysis, though more stringent overall, also proposed a maximum duration of five days per month of temperatures above 24°C. *See* Ex. 4 (DPDD) at App. A (MassDEP mixing zone analysis), pp. 12-13.

thermal limits for sublethal effects." *See* Table 1 (Item 13) at 9. This tentative suggestion buried in the Table appended to the Petition does not establish clear error warranting Board review.

At most, Dominion's objections amount to a difference of opinion or an alternative theory (although, again, none is actually stated by Petitioner) regarding a highly technical issue – *i.e.*, the selection of the maximum permissible duration of exposure to high temperatures. This is insufficient for establishing an issue warranting EAB review. *See NE Hub*, 7 E.A.D. at 567-68; *Peabody*, slip op. at 16-17. Because Region 1 has demonstrated that it "duly considered the issues raised in the comments and . . . [that] the approach ultimately selected by the Region is rational in light of all of the information in the record," the Board should deny review. *See NE Hub*, 7 E.A.D. at 568.

C. Petitioner Fails to Identify an Issue Warranting Board Review Regarding the Region's Selection of the Temporal Threshold for Critical Temperature Exceedances Based on the Scientific Literature and Other Relevant Factors

1. Petitioner Fails to Identify Clear Error Regarding Region 1's Reliance on Casterlin and Reynolds (1982) in Setting the Temporal Threshold

Dominion argues the Region drew unwarranted scientific inferences from Casterlin and Reynolds (1982), Ex. R7, regarding the exposure time needed to trigger avoidance of warm water by juvenile winter flounder. *See* Petition at 10-11. The Region concluded that this study provided a reasonable basis for identifying three days as the starting point for a period of exposure to temperatures above the critical temperature that would likely trigger significant avoidance. Ex. R2 (DOR) at 24-25. Petitioner suggests that the study was designed to test juvenile winter flounder's preferred temperatures and, therefore, that inferences regarding avoidance tendencies are necessarily improper. *See* Petition at 11.

As discussed in the Determination on Remand, Ex. R2 at 24, the Casterlin and Reynolds (1982) research was designed to study "age-specific behavioral responses to temperature." *See* Ex. R7 at 177. *See also* Ex. 4 (DPDD) at 6-34; Ex. 2 (RTC) at III-11, III-28. Individual juvenile winter flounder were tested in electronic shuttleboxes and allowed to voluntarily occupy a range of temperatures. *Id.* The resulting frequency of distribution over the three-day period was summarized in Figure 1 of the study. *Id.* at 178. *See also* Ex. R2 (DOR) at 24 and Ex. 8 (reproducing Figure 1 from the study). Dominion does not and cannot contest these facts.[17]

Moreover, Dominion's currently stated view regarding the paper's implications for avoidance is contradicted by the express conclusion of the study. The study's authors wrote that the *"upper avoidance temperature of 27 °C evident in our data (Fig. 1)* is consistent with the temperature at which Radle (1971) observed cessation of feeding, and is near the ultimate upper incipient lethal temperature reported by Hoff & Westman (1966)." Ex. R7 at 179 (emphasis added). *See also* Ex. R2 (DOR) at 24-25. Petitioner's currently stated view also sharply contrasts with its own previously stated interpretation of the paper. Dominion's prior position was that "Casterlin and Reynolds concluded that avoidance began approximately at 27." *See* Brief in Support of USGenNE's Appeal of the NPDES Permit for Brayton Point Station, June 7, 2004, at 13, 16 n. 31. *See also Dominion* at 125, n. 151.[18] Thus, although Petitioner itself employed the

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[17] Indeed, Dominion also points to the frequency distribution figure as documenting the temperatures that the fish selected. *See* Petition at 11.

[18] As the Board observed, *Dominion* at 125, n. 151:

> Significantly, although the authors do state that "avoidance responses are initiated at or below 27°C," as quoted by Petitioner, DEBP Suppl. Br. at 14, the authors also state that the final temperature "preferendum" was at 18-19°C and that "sublethal effects such as inhibition of feeding occur" between 20 and 29°C, *id.*, Ex. C, at 179. The authors' statements (as well as the study results) are

study in a failed effort to establish a definitive avoidance threshold at 27°C, it now asserts that the study does not even test "avoidance temperatures." *See* Petition at 11.

Dominion's present argument that no reasonable inferences can be drawn regarding avoidance behavior cannot be reconciled with its earlier stance. To preserve an issue for review, a petitioner must raise issues with a reasonable degree of clarity. *Dominion* at 27. Petitioner's shifting, inconsistent positions on this issue fail this test. Furthermore, a petitioner must raise an issue during the original public comment period and the first appeal in order to preserve it for an appeal of a Regional decision on remand, unless adequate justification for failing to do so is shown. *See Carlota Copper,* 11 E.A.D. at 729 n. 43, 734-36 (an available issue not raised in first appeal is not preserved for appeal of remand decision); *Knauf Fiber Glass,* 9 E.A.D. at 7 (same). Petitioner's new argument that Casterlin and Reynolds (1982) is not relevant for assessing thermal avoidance also fails this test. *See Dominion* at 141-42 (dismissing arguments on appeal that contradict the views petitioner stated in its comments on the draft permit). Given that juvenile winter flounder avoidance and the import of the Casterlin and Reynolds (1982) study have plainly been important issues in both the development of the Permit and the earlier stage of this appeal, there is no reason that Petitioner could not have previously stated the view it now urges – that the study says nothing about avoidance.[19] Instead, Petitioner previously stated the opposite.

> rather ambiguous in that they contain ranges of values and therefore do not point to an absolutely definitive temperature threshold value, much as Petitioner would try to imply otherwise.

[19] Petitioner's suggestion that Casterlin and Reynolds (1982) addresses temperature *preference* but not temperature avoidance amounts to a semantic distinction of no significance in the context of the determination at hand. The study's authors do explain that their data suggests a temperature "*preferendum*" of 19°C, but also state that it reveals an upper avoidance temperature of 27°C. Ex. R7 at 179. In this context, preference and avoidance can loosely be thought of as two sides of the same coin. For example, Casterlin and Reynolds (1982) could be said to demonstrate that 100% of juvenile winter flounder in the study preferred temperatures above 8°C and below 27°C

Furthermore, even if not dismissed for failure to preserve this argument, Petitioner's inconsistent positions cannot demonstrate *clear* error by the Region or provide a compelling reason for the Board to abandon its traditional deference to the Region's judgment on technical issues. *See Envotech,* 6 E.A.D. at 284-87.

Another argument mounted by Dominion is that Casterlin and Reynolds (1982) cannot be used to inform the answer to the temporal exposure threshold question because the study's design and results do not reveal precisely when avoidance occurred within the three-day study period. *See* Petition at 11. Petitioner states that "[t]he study provides no indication whether the winter flounder began to exhibit signs of avoidance at hour two, hour twelve or hour seventy-two of the study." *Id.* As a result, according to Petitioner, the study cannot be used to discern relevant information regarding the duration of exposure needed to trigger avoidance. This argument must fail, however, because the Region specifically considered this issue and reasonably addressed it in the Determination on Remand.

Specifically, the Region explained that it interpreted the cumulative frequency distribution resulting after three days of exposure:

> . . . to indicate that by three days of exposure to the critical temperature, juvenile winter flounder would be likely to express their temperature preferences. Therefore, based on this study, the Region *conservatively* regarded three days as a baseline value for the exposure time necessary to trigger avoidance.

Ex. R2 (DOR) at 24 (emphasis added). The Region then went to explain in a footnote that:

100% percent of the time, or that they avoided temperatures below 8°C and above 27°C 100% percent of the time. In any event, none of this makes any difference here, as Region 1 reasonably used the study for the task at hand.

> [i]n this context, Region 1 uses the term "conservative" to refer to its scientific interpretation of the data from the study, rather than the degree of environmental protectiveness of the Region's approach. Although it is unlikely that all the fish waited (or would wait in the natural environment) until the 72nd hour to avoid sub-optimal temperatures – rather, it is likely that avoidance began before that point – the data from the study does not provide a firm basis for that conclusion because it only looked at a three-day exposure.

See id. at 24-25, n. 24. Thus, the Region's position, which does not require marking the precise onset of avoidance prior to three days, recognizes and fully accounts for the fact that Casterlin and Reynolds (1982) does not precisely identify the time prior to three days at which significant avoidance occurred in the laboratory.[20] The Region reasonably interpreted the study, however, to indicate that avoidance was manifest at least "by three days." *Id.* at 24.

Dominion also states that the study did not "suggest that three days of exposure to warm temperatures affected flounder behavior; three days simply happens to have been the duration of the study." *See* Petition at 11. The Region agrees that the study does not demonstrate that three days of exposure was needed to trigger avoidance and was not specifically designed to assess the avoidance response of juvenile winter flounder from a three-day exposure. This does not, however, render irrelevant the study's results after its three-day exposure period. On the contrary, the cumulative frequency data over the three-day period showed that avoidance of temperatures

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[20] Indeed, the fact that the study indicates that avoidance was manifest by three days but does not reveal whether significant avoidance occurred at lesser exposure times would suggest, if anything, that three *or fewer* days might be a reasonable temporal exposure threshold. Ex. R2 (DOR) at 24-25, n. 24, 28. This observation only cuts against Petitioner's interest, which is in having a higher threshold, and Petitioner plainly has not argued that the threshold should be shortened. Thus, Petitioner demonstrates no error by the Region here, but if it had, such error would be harmless to Petitioner and would not warrant EAB review. *See In re City of Moscow, Idaho,* 10 E.A.D. 135, 143, n. 23 (EAB 2001) (Region's mistaken use of a higher design flow (3.6 MGD) to calculate permit limits was harmless because it benefitted permittee); *Old Dominion Electric Cooperative*, 3 E.A.D. 779, 797 (Adm'r, 1992) (petitioners "are in no position to oppose" a decision on an issue that benefitted their interests).

below 8°C and above 27°C was complete. *See* Ex. R7 (Figure 1); Ex. R2 (DOR) at Exhibit 8. Moreover, and as Dominion's consultant observes, Casterlin and Reynolds (1982) shows that over the three-day period, the juvenile winter flounder in the experiment chose to spend 84% of the time below the critical temperature threshold selected by the Region (*i.e.*, 24°C) as necessary to assure protection and propagation of the BIP. *See* Petitioner's Table 1 (Item 16) at 10 ("the fish tested spent a total of 16% of the three day study period at temperatures 24 to 27°C"). *See also* Ex. R7 (Figure 1); Ex. R2 (DOR) at Exhibit 8. Based on these observations, one reasonable, logical conclusion to draw from the cumulative frequency data in Casterlin and Reynolds (1982) is that juvenile winter flounder in this laboratory study appeared to exhibit an avoidance response *by* at least three days, the precise conclusion that the Region drew. *See* Ex. R2 (DOR) at 24-25.

Dominion never grapples with the Region's analysis. By stating objections related to issues that the Region already reasonably factored into its analysis, Petitioner does not meet the threshold necessary to demonstrate grounds for review. *See Dominion* at 26-27 (to identify an issue warranting EAB review, petitioner must demonstrate why permit issuer's response to the issue is clearly in error). *See also In the Matter of Osborn Heirs Company*, 2 E.A.D. 929, 934-35 (EAB 1989) (holding that petitioner's listing of "a number of factors that the Region should have taken into account in interpreting" certain data without a corresponding "show[ing] that the Region in fact failed to take these factors into consideration" does not demonstrate error).

Petitioner's failure to engage the Region's analysis is exacerbated by the nature of the determination at issue. The Region's analysis of Casterlin and Reynolds (1982) is quintessentially technical in nature and should receive deference from the Board. *See Envotech,* 6 E.A.D. at 284. Moreover, where technical questions relate to the appropriateness of the data upon which the

permit issuer relied in making its decision, as they do here, such choices are generally left to the discretion of the permitting authority. *In re Knauf Fiber Glass, GmbH,* 8 E.A.D. 121, 147 (EAB 1999). *See also Hercules*, 598 F.2d at 115 ("Choice among scientific test data is precisely the type of judgment that must be made by EPA," not a reviewing court.). Dominion has failed to carry the "heavy burden" associated with obtaining review of this technical issue. *See Dominion* at 27.

Dominion also contends that Casterlin and Reynolds (1982) does not accurately demonstrate avoidance, because it "did not report the temperature in the warmer chamber [of the laboratory "shuttlebox"] when flounder left it to go to the cooler chamber." *See* Petition at 11. It is difficult to discern exactly what Petitioner is getting at here. Dominion does not clearly explain what effect more detailed temperature data, if available, would have on the Region's use of Casterlin and Reynold (1982).[21] Just as the Region need not "guess the meaning behind imprecise comments," *Dominion* at 27 (citing *In re Westborough and Westborough Treatment Plant Board,* 10 E.A.D. 297, 304 (EAB 2002)), the Board should not speculate about or try to fill in the gaps in unclear claims of error on appeal. *See In re New England Plating*, 9 E.A.D. 726, 737 (EAB 2001) ("The petitioner must not only identify disputed issues but must *demonstrate* the specific reasons why review is appropriate." (emphasis in original)). Suffice it to say, Dominion cannot at this point conclude whether any such data would cut in favor of the Region, against it, or somewhere in between. Dominion's argument hinges on unreported data that is of uncertain significance to

[21] The Region, like the study's authors, looked to the *cumulative frequency* with which the fish chose various temperatures over the course of the three-day experiment. The Region's interpretation of Casterlin and Reynolds (1982) is not predicated on the respective shuttle box temperatures at the precise moment the fish moved from warmer to cooler environments.

the interpretation of the paper by the Region, and thus amounts to mere surmise. *See Osborn*, 2 E.A.D. at 934 (denying review and noting that the petitioner does not "provide any explanation of how any of these factors [that the Region allegedly should have considered] should have led the Region to reach a different conclusion."). To ensure that the locus of scientific and technical decision-making remains in the regional level, the Board should decline to engage in this sort of speculation. *See In re Three Mountain Power, LLC,* 10 E.A.D. 39, 58 (EAB 2001). In any event, the relevant fact remains that the study resulted in a cumulative frequency distribution after three days of exposure that showed to a significant degree that the juvenile winter flounder were demonstrating a preference for certain temperatures and avoiding others within that time frame.

Petitioner also claims that the Region was led astray by a misunderstanding about the methodology employed by Casterlin and Reynolds (1982). Ex. R7. *See* Petition at 10. In its Determination on Remand, the Region stated that Casterlin and Reynolds (1982) conducted a lab experiment involving "constant temperature shuttleboxes . . . [in which] temperatures did not vary." *See* Ex. R2 at 24. Petitioner submits as its Exhibit B a paper by Reynolds (1977) that is cited in Casterlin and Reynolds (1982) and that describes the methodology used in the study reported in the later paper. *See* Pet. Ex. B (Reynolds (1977)) at 301. The Region had not seen or reviewed the Reynolds (1977) paper until Petitioner submitted it to the Board in this appeal,[22] but having now reviewed Reynolds (1977), Region 1 agrees with Petitioner that the Determination on Remand mistakenly describes this particular aspect of the Casterlin and Reynolds (1982) study

[22] Given that the Region had not seen or reviewed the Reynolds (1977) paper until Petitioner submitted it to the Board on appeal. As explained in Region 1's Motion to Strike and Opposition to Petitioner's Motion to Supplement the Administrative Record, Petitioner's Exhibit B and arguments related to it should be stricken from the record on appeal.

methodology (*i.e.*, temperatures *did* vary in the shuttleboxes). This is of *no import*, however, because the methodology issue in question does not affect the conclusions that the Region drew from the study.

Reynolds (1977) describes the mechanics of the experiment as follows:

> Temperature is varied by a simple "on-off" control and will continue to increase so long as the heaters are on in the "hot" chambers or to decrease so long as the refrigeration pumps are on for the "cold" chambers. Thus, the temperatures of the "hot-side" and "cold-side" chambers are continually either increasing or decreasing in parallel, and the differential between the two is controlled by thermal lag in heat transfer through the constrictions between the hot and cold sides.

Petition, Ex. B at 301. Thus, the shuttleboxes were not held at constant temperatures, as the Region's description of the study suggested. Instead:

> At any one time, there are two different temperatures available in the device, the "hot-side" and the "cold-side" temperatures, usually differing by about 2°C. The mean of these two temperatures is the mean water temperature. The fish shuttles back and forth between these, at any instant occupies either one or the other ("the occupied temperature").

See id. at 301-302. In other words, temperatures rose or fell in a chamber until the juvenile winter flounder chose to leave it for a cooler or warmer environment.

The Region's mistaken description of this aspect of the study's methodology in no way undermines the Region's correct interpretation of the scientific conclusions of the study and their relevance for the determination at hand. The study's conclusions present the juvenile winter flounder's cumulative frequency of distribution across a range of different temperatures by the end of the three-day exposure. *See* Ex. R7 at 178, Figure 1. It is this frequency of distribution that is

critical to the Region's interpretation of the study and its application to the identification of a temporal threshold for permitted exposure to temperatures above the critical temperature. Whether temperatures were variable within the shuttleboxes is irrelevant so long as the study accurately assessed the amount of time the juvenile winter flounder spent *at each temperature* to generate a legitimate frequency of distribution. Dominion does not challenge the sufficiency of the study's methodology or accuracy of its data for this purpose in any way. As discussed above, the Region did not attempt to apply a temporal threshold less than three days based on the study; the Region only relies upon the author's conclusion (formerly shared by Petitioner) that at least after the three-day exposure in the study, avoidance of particular temperatures was demonstrated.

Thus, the Region's error in describing the study's methodology did not lead to a material or "fundamental misunderstanding of the study" as Dominion claims. *See* Petition 10. Nor does this error undermine the Region's discussion of the frequency of distribution. Indeed, Dominion has not identified *how* the Region's mistake even arguably bears on the inference the Region ultimately drew from the study or *why* that inference would be rendered erroneous. *See New England Plating*, 9 E.A.D. at 737 (petitioner must not only allege errors, but show specific reasons why review is appropriate).

Thus, at worst, the Region's description of Casterlin and Reynolds (1982) constitutes harmless error, as the Region did not premise its determination to use Casterlin and Reynolds (1982) to establish the baseline value of three days on the existence of constant temperature in the shuttleboxes. Indeed, had the Region *deleted* the portions of text from the Determination on Remand suggesting that the study's methodology used constant temperature shuttleboxes, the discussion still would have proceeded logically to the Region's ultimate conclusion. *See* Ex. R2

(DOR) at 24. Any inaccuracy in describing the methodology is well within the realm of harmless error because a separate, unrelated fact – namely the final overall frequency of distribution outlined in Figure 1 – drove the Region's conclusion regarding evidence of a significant avoidance response by the end of the three-day experiment. *See In re Hadson Power 14-Buena Vista*, 4 E.A.D. 258, 278-86 (EAB 1992) (discussing harmless error finding in *Old Dominion*, 3 E.A.D. at 780-82 (reliance on invalid reasoning is harmless error where permit issuer also relied on other reasonable grounds for decision)). *See also In re Spokane Reg'l Waste-to-Energy*, 2 E.A.D. 809, 815 (Adm'r 1989) (failure of permit issuer to consider certain technology in its best available control technology analysis deemed harmless error because it would not have had any effect on the outcome of the permit determination).

2. Petitioner Fails to Demonstrate Clear Error in the Region's Consideration of Adverse Growth Impacts When Determining a Temporal Exposure Threshold to Assure Protection of the BIP

Dominion asserts that the Region's consideration on remand of adverse growth impacts when determining the temporal exposure threshold is "arbitrary and inappropriate" because the Permit's limits were based on "avoidance of habitat, not on growth of juvenile winter flounder." *See* Petition at 11. This assertion should be rejected.

Avoidance behavior and growth rates are "biologically distinct" processes but, as discussed above, considering one while applying CWA § 316(a) does not warrant exclusion of the other, and the Region has not made such a mistake in this case. Nowhere in the record has Region 1 diminished the role, or foreclosed the use of, growth physiology as a relevant factor in crafting variance-based thermal discharge limits necessary to reasonably assure the protection and

propagation of the BIP. Indeed, the opposite is true.

The Region clearly stated that it developed the variance-based limits using an approach that considers growth impacts and regards these and other sublethal impacts to be potential grounds for denying a variance. *See* Ex. 2 (RTC) at III-11, III-28; Ex. 4 (DPDD) at 6-20, 6-27, 6-34, 6-37.[23] In describing the "area impacted" analytic approach it employed in crafting the variance-based limits, Region 1 stated:

> [t]his approach identifies likely adverse biological effects associated with critical water temperatures and seeks to minimize them in important habitat areas to assure protection and propagation of the BIP. EPA's 1977 CWA § 316(a) Technical Guidance Manual ("1977 EPA Draft 316(a) Guidance") (AR 645), recognizes that not all areas of receiving waters are of equal ecological value. It highlights the particular importance of spawning and nursery habitats and emphasizes the need to avoid impacting those areas. *Id.* at 29; *see also*, DPDD 6-19 to 6-20. The guidance indicates that when assessing thermal discharge effects on fish, spawning and nursery areas cannot be considered to be "low potential impact areas." *The guidance goes on to state that a § 316(a) variance may need to be denied if, among other things, the thermal discharge would cause direct or indirect mortality from excessive heat, would reduce reproductive success or growth as a result of plant discharges, or would cause exclusion from unacceptably large areas.*

Ex. R2 (DOR) at 16 (emphasis added). While the Region ultimately focused *primarily* on avoidance behavior to establish the maximum allowable temperature and maximum area impacted, it did not "specifically decline to rely" on growth as Dominion contends. *See* Petition at 12. What Region 1 in fact stated was:

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[23] Dominion's own biothermal assessment also examined the impact of the thermal plume on both habitat avoidance *and* growth, among other parameters. *See* Ex. 4 (DPDD) at 6-32.

> Although use of optimal growth temperatures would have yielded a more conservative (*i.e.*, stricter) limit, given that the optimal growth temperature is lower than the avoidance temperature, Region 1 decided to focus *principally* on avoidance temperatures in the development of summer permit limits. This is because thermal discharges that would cause juvenile fish to avoid the key nursery areas would be causing a clear, significant harm to the BIP of this receiving water, while the overall effect of small, short-term reductions in growth rates is less clear. As stated above, juveniles forced to avoid key nursery habitat are likely to experience significant indirect mortality. Thermal discharges that render Mount Hope Bay's critical nursery habitat unsuitable for juvenile winter flounder would be directly undermining the value of the habitat provided by the bay and could not be said to be assuring the protection and propagation of the bay's BIP. Thus, Region 1 concluded that if thermal discharge limits would cause excessive forced avoidance of the key nursery habitat for juvenile winter flounder in the summer – *not to mention reduced growth rates* – then those limits would not satisfy CWA § 316(a).

Ex. R2 (DOR) at 23 (emphasis added). Thus, the Region considered avoidance *and* other effects, such as growth inhibition and mortality. This is consistent with the Region's approach as explained in the record for both the Draft and Final Permits. *See* Ex. 2 (RTC) at III-11, III-28; Ex. 4 (DPDD) at 6-20, 6-27, 6-34, 6-37.

While Region 1 "principally" focused on avoidance effects because "the overall effect of small, short-term reductions in growth rates is less clear," the Gold Book and the Sogard (1992) and Meng *et al.* (2000) papers indicate, as discussed above, that growth effects resulting from a temporal threshold of seven or more days would neither be small nor short-term.[24] Ex. R2 (DOR) at 27-29. Given that unacceptable adverse effects on growth would result from exposures to

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[24] Not only do these materials suggest the growth effects would be significant, but the Region pointed out that growth inhibition for juvenile winter flounder could contribute indirectly to mortality, *see* Ex. R2 (DOR) at 18, 28, and that each of the modeled discharge scenarios showed that when 24°C was exceeded for five or more days, it was exceeded for many more than five days. *Id.* at 23 n. 22.

temperature in excess of 24°C for seven days or more, Region 1 determined that the temporal threshold would have to be less than seven days. The Region found that by seven days, "the weekly average temperature...would *substantially exceed* the Gold Book's suggested value of 20°C for *avoiding excessive adverse effects* on growth." Ex. R2 (DOR) at 27-28 (emphasis added). Therefore, the Region decided that:

> . . . it should not go as far as to accept a seven-day threshold for exceedances of the critical temperature of 24°C because doing so would be inconsistent with the Gold Book's suggested weekly average standard of approximately 20°C for avoiding excessive inhibition of growth, as well as the Gold Book's indication that an exposure of more than seven days to 20°C should be considered an "extensive" exposure.

Id. at 29. The Region's rejection of a seven-day threshold on the basis of excessive inhibition of growth after an extensive exposure is fully consistent with its position regarding the difficulty of assessing the "overall effects of small, short-term reductions in growth rates" on the BIP (see quotation above). The Region concluded that given the growth effects that result, a temporal threshold of seven days or more would not satisfy CWA § 316(a)'s command to assure the protection and propagation of the BIP in Mount Hope Bay. Ex. R2 (DOR) at 28.

Dominion also wrongly assumes that the Region arbitrarily shifted from focusing entirely on avoidance impacts at three days to focusing entirely on growth impacts at seven days. In fact, based on Casterlin and Reynolds (1982), it was evident to the Region that many juvenile winter flounder would *already* be exhibiting an avoidance response by three days and that this response, and harm resulting from it (such as indirect mortality), would likely worsen as seven days is

approached. Ex. R2 (DOR) at 26.[25] Therefore, in deciding how many days of exposure to allow beyond three, the Region considered avoidance, growth inhibition, and other effects to determine where to draw the line for the temporal threshold. *See* Ex. R2 (DOR) at 22-26; Ex. 4 (DPDD) at 6-45, 6-57. All of this is perfectly appropriate under CWA § 316(a).

Dominion's argument that the Region is somehow precluded from considering growth impacts when determining the maximum duration of exposure to temperatures above the critical avoidance temperature is inconsistent with the mandate of CWA § 316(a) to reasonably assure the protection and propagation of the BIP. To adopt the blinkered approach advanced by Petitioner and ignore evidence of substantial, independently consequential impacts on the BIP would represent an irrationally rigid reliance on avoidance effects.[26] It would also be inconsistent with EPA's interpretation of the statute as represented in the § 316(a) implementation guidance discussed above and in the Permit record. Ex. 46. *See also* Ex. 4 (DPDD) at 6-14 to 6-15. As the Region's decision was adequately explained and supported by the record, the Board should defer to Region 1's technical assessment and deny review. *See Peabody*, slip op. at 16-17.

Dominion's claim that Region 1 misinterpreted the scientific literature in concluding that exposure to temperatures above 24°C for ten to fifteen days would cause substantial impacts on juvenile winter flounder growth is also wide of the mark. *See* Petition at 12-13. Dominion

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[25] As Region 1 stated, ". . . as the number of exceedance days increase above three, it becomes more likely that the exceedance will, in fact, cause avoidance. Finally, as the duration of avoidance increases, the risk of indirect mortality and adverse sublethal effects increases." *Id. See also id.* at 24.

[26] Although the Region did not conduct this analysis, it is possible that five days would still represent an appropriate threshold based on avoidance alone. Even if the Region strictly limited the factors it considered to avoidance, the available information – namely Casterlin and Reynolds (1982) – would still suggest a starting point of three days and a small upward adjustment would still be reasonable (*e.g.*, to account for differences between laboratory conditions and the natural environment in Mount Hope Bay). Petitioner offers no scientific argument in favor of an alternative, threshold higher than five days.

challenges the Region's reliance on Sogard (1992), Ex. R9, arguing that the study showed decreasing growth rates only after exposure to temperatures "substantially in excess of 24°C." Dominion further contends that the average temperature of the experiment was not 24°C, but 26.5°C. Yet, neither of these points demonstrates error by the Region.

Dominion's assertion that the studies relied on by the Region show decreasing growth rates at temperatures "substantially in excess of 24°C" is demonstrably untrue. Sogard (1992) shows a progression of ever-decreasing growth rates resulting from exposure to temperatures between 18.5 to 26.5°C, including at 24.1° C (which approximates the critical temperature threshold used to derive the variance-based limits). The Region explained that Sogard (1992) "measured growth in caged juvenile winter flounder at a range of temperatures for 10 days and found a significant reduction in growth rates at temperatures of 24°C and above." *See* Ex. R2 (DOR) at 28. Data for juvenile winter flounder exposed to 24.1°C and 24.3°C demonstrate substantially less growth than fish exposed to temperatures between 20°C and 21°C and roughly three times less growth than fish exposed to temperatures between 18°C and 19°C. *See* Attachment A to this Response ("Graphical Representation of Data in Sogard (1992): Growth Versus Temperature"). *See also* Ex. R9 (Sogard (1992), specifically Table 3 (Mean Temperatures) and Figure 3 (Mean Increase in Total Length)). The data further demonstrate that growth is even more severely retarded at higher temperatures.[27]

Dominion's contention that "no definitive statement can be made regarding the effect of

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[27] Dominion's reference to the statement in Sogard (1992) that the "warmer water temperatures in Little Egg Harbor could have been detrimental to winter flounder growth in late June experiments" and that such experiments had average temperatures ranging from 26.4-26.5°C does nothing to undercut the Region's conclusion that detrimental growth impacts are *also* occurring at lower temperatures based on its review of experiments in Great Bay conducted at 24.1-24.3°C. *See* Ex. R9 at p. 40 (Table 3) (Mean Temperatures) and p. 43 (Figure 3) (Mean Increase in Total Length).

temperature on growth" based on Meng *et al.* (2000), Ex. R10, because the study was uncontrolled and unrepresentative fails to acknowledge that Region 1 never made a "definitive statement" based on that study.[28] Petition, Table 1 (Item 20) at 11-12. *See also* Petition at 12. The Region instead stated that Meng *et al.* (2000) "*suggested* that temperatures greater than 25°C negatively affected growth rates in experiments ranging from 10-15 days." Ex. R2 (DOR) at 28. While Region 1 recognizes the inherent complications associated with field studies, and the inability to control variables to the same extent as in laboratory studies, it does not believe that field studies should be wholly discounted on this basis. The Region already explained its view regarding lab and field studies in response to an earlier comment by the Petitioner. *See* Ex. 2 (RTC) at III-28 (discussing strengths and weaknesses of each). The authors of Meng *et al.* (2000), specifically acknowledge the issue of representativeness ("Green Hill differed from other ponds in size, flushing rate, and salinity"), but go on to conclude that even given these factors, "it is likely that the high temperatures affected growth." *See* Ex. R10 at 293. Dominion has not demonstrated that the Region erred by its limited reliance on the authors' express conclusions in a peer-reviewed journal article.

Dominion also suggests that another, more recent (field) study conducted by Meng *et al.* (2005), Petition, Ex. C, supports the proposition that "winter flounder are found in greater abundance in disturbed habitats and, indeed, that high temperatures can actually enhance juvenile winter flounder growth rates." *See* Petition at 12-13. This paper is not in the administrative

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[28] Region 1 notes that Petitioner also relies on field studies and field data in its arguments based on its Exhibit C (Meng *et al.* (2005)) and certain 2006 field data presented in its Exhibit A.

record for the Permit and the Region had not seen it until receiving the Petition for Review.[29] Having now reviewed Meng *et al.* (2005), Region 1 disagrees with Petitioner's effort to interpret the paper to support the conclusions that "high temperatures" may be good for juvenile winter flounder growth, and that habitat disturbance may be good for abundance. This was not what the study's authors concluded or wrote. Rather, in the course of discussing the densities of juvenile winter flounder they found in the Providence River, the study's authors discussed a variety of physical and chemical factors that make upper estuaries and coves preferred nursery habitat. Among these factors, they note that "[c]urrents are less pronounced in coves and upper estuaries, and temperatures tend to be higher, enhancing growth." *See* Petition Ex. C at 1515. Yet, *higher than what* the authors do not specify. In other words, the paper does not identify any specific temperatures as being associated either with higher growth rates for juvenile winter flounder or with the collection of any particular number of fish. As Region 1 has explained, fish have an optimal growth temperature and temperatures above or below that level will not result in optimal growth.[30] Meng *et al.* (2005), does not question this.

Dominion emphasizes that "[t]emperatures during the study ranged to over 26°C," appearing to suggest that large numbers of juvenile winter flounder were caught at such

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[29] Because it is outside the administrative record, Petitioner's Exhibit C and arguments related to it should be stricken from the record for this appeal, as explained in Region 1's Motion to Strike and Opposition to Petitioner's Motion to Supplement the Administrative Record.

[30] Meng *et al.* (2005) does not support the blanket principle that "high temperature" is good for juvenile winter flounder. The temperature/growth relationship resembles a bell-shaped curve. *See* Coutant (1972), Ex. 37 (AR 3203). Increasing temperature on the left-side of the curve will increase growth up to an optimum temperature, but then as temperatures continue to increase past the optimum, the right-side of the curve will show growth decreasing as temperature increases. Rose *et al.* (1996) (AR 4012) regard 15°C as an optimum temperature for juvenile winter flounder growth. Sogard (1992), Ex. R9, indisputably showed that juvenile winter flounder growth declines from 18-26°C. Dominion's effort to suggest "high temperatures" are good for juvenile winter flounder growth is entirely unpersuasive.

temperatures. *See* Table 1 (Item 20) at 12. This, however, says nothing about growth rates at such temperatures. The paper, in fact, provides no information about growth rates at any temperatures. Moreover, the paper does not identify the temperatures at which *any* specific number of juvenile winter flounder were collected. It only identifies that the temperatures during its sampling effort ranged from 14.4 to 26.1°C with an average of 21.4°C in 2002 and from 13.4 to 26.4°C with an average of 20.6°C in 2003. Petition, Ex. C at Table 1. Finally, this argument also should be stricken because Petitioner appears to advance it to renew its challenge to the selection of 24°C as the critical temperature for juvenile winter flounder avoidance and that issue was not remanded and is beyond the proper scope for this appeal. *See Dominion* at 293-294; *Knauf,* 9 E.A.D. at 7.

Like Meng (2005), Region 1 has also maintained that coves and upper estuaries – including specific areas around BPS – are prime nursery habitat for juvenile winter flounder. *See, e.g.,* Ex. R2 (DOR) at 17; Ex. 4 (DPDD) at 6-56. Temperatures in these shallow waters will tend in summer to be higher than those in deeper waters, but temperatures that are too high can lead to significant avoidance, growth inhibition, and other adverse effects. That is a key reason that Region 1's Permit limits under CWA § 316(a) seek to limit BPS's thermal discharge to Mount Hope Bay. Nothing in Meng *et al.* (2005) questions this.[31]

Meng *et al.* (2005) is also of tenuous factual relevance to the issue on appeal here. The conclusions in the paper are drawn from upper Narragansett Bay, not Mount Hope Bay. Even granting for the sake of argument Petitioner's suggestion that the study indicates that juvenile

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[31] Furthermore, whether some level of *physical* habitat disturbance can be tolerated by winter flounder – Meng *et al.* (2005) characterize the species as a "habitat generalist," Petition Ex. C at 1515 – has nothing to do with the effects of high water temperatures on the species.

winter flounder are doing relatively well in Narragansett Bay's upper estuaries and coves, Dominion's reliance on the paper begs the question of why juvenile winter flounder are *not* thriving in similar areas in Mount Hope Bay.[32]

Finally, Dominion concedes that *both* studies that the Region relied upon, Sogard (1992) and Meng *et al.* (2000), Exs. R9 and R10, found decreasing growth rates after the ten and fifteen-day exposures that they evaluated. However, Dominion attempts to distinguish those studies by arguing that they were conducted at "temperatures substantially in excess of 24°C." *See* Petition at 12. Petitioner cites to temperatures in the range of 26.4-26.5°C in Sogard (1992) as examples of such excessively high temperatures. *See* HDR|LMS Report at 9. *See* Table 1 (Item 19) at 11. The Region has already addressed the fact that Petitioner's argument ignores the decreasing rates of growth also seen at elevated temperatures short of 26°C. This line of argument also either contradicts or, at best, is incongruous with its position regarding Meng *et al.* (2005) – *i.e.*, that higher temperatures enhance growth – where, in Dominion's words, "[t]emperatures during the study ranged to over 26°C." *See* Table 1 (Item 20) at 12. In Dominion's view, it appears that temperatures over 26°C at once increase and decrease growth rates. Petitioner cannot have it both ways. Such mutually contradictory arguments cannot demonstrate clear error by the Region or present a compelling reason for the Board not to give its typical deference to the Region's determination of scientific issues. *See NE Hub,* 7 E.A.D. at 567-68 (requiring compelling demonstration of error before disturbing a technical determination by the Region).

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[32] As the Region has previously pointed out, "Gibson's (2002A) analysis of regional effects shows that fish stocks are behaving differently in Mount Hope Bay than other comparable areas in Narragansett Bay." *See* Ex. 4 (DPDD) at 6-56. *See also Dominion* at 95, n. 109 ("It does not seem illogical that BPS would have greater impacts on Mount Hope Bay, the water body upon which it is situated and from which it withdraws water and into which it discharges its thermal effluent.").

3. The Region's Selection of a Five-Day Threshold is Consistent with Agency Guidance

Dominion next argues that the Region departed from consistent practice under available EPA guidance, and failed to consider certain relevant guidance at all, in setting its five-day temporal threshold. *See* Petition at 14. Petitioner's argument is baseless.

Specifically, Petitioner cites to Quality Criteria for Water (1976) (the "Red Book") (AR 4035), the more recent Gold Book (1986), Ex. R8, and the Temperature Criteria for Freshwater Fish: Protocol and Procedures (EPA 1977), Petition, Ex. D, and argues that these documents dictate that in assessing temperature "for compliance with water quality standards" exposures of seven days must be used in assessing growth impacts. *Id.* at 14.[33] Petitioner then suggests that while Region 1 has focused on avoidance effects, adverse growth impacts occur at lower temperatures than those that cause avoidance. Petitioner further suggests that the Region developed a variance under CWA § 316(a) because it found that water quality standards were more stringent than necessary to protect the BIP in this case. Taking all these things together, Petitioner argues that "if the Gold Book's seven-day duration is sufficient to ensure compliance with water quality standards, that seven-day period properly serves as a floor rather than a ceiling for an exceedance threshold in a Section 316(a) variance." *See* Petition at 14.

Dominion's argument based on EPA's water quality guidance is riddled with inconsistencies. Petitioner objects to the Region's consideration of adverse growth impacts at all as "arbitrary and inappropriate" because avoidance, Petitioner asserts, must be the sole benchmark

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[33] Region 1 notes that these guidance materials are not for determining "compliance with water quality standards." They are for use by EPA and states in developing ambient water quality criteria for temperature. States can, of course, develop even more stringent water quality standards. In this case, Massachusetts standards led to limits that were more stringent and allowed no discharge at times.

for setting a temporal threshold. Petition at 11. Yet, a few pages later, it criticizes the Region for failing to follow the approach to assessing growth impacts in EPA's water quality criteria guidance. *See* Petition at 14. If, as Dominion argues, avoidance is the only permissible object of inquiry, then why should growth considerations be used to establish the floor of an avoidance-based regime? Furthermore, while Dominion complains that the Region considered growth inhibition at all, its consultant explicitly concludes that its technical review of the water quality guidance documents "*found support* for [a] frequency of exceedance or duration of exposure of *seven or more days*," which is based on growth impacts. *See* Petition, Table 1 at 9 (emphasis added).[34] Dominion's attempt to argue that growth effects are both relevant and irrelevant cannot demonstrate clear error by the Region on this technical issue. This internally inconsistent argument cannot persuasively undermine the reasonable stance adopted by the Region. *See NE Hub,* 7 E.A.D. at 567-68.

Petitioner's argument fails for other reasons as well. To begin with, the Region has explained previously, neither statute nor regulation commands that the effects of thermal impacts on a BIP be assessed in a particular way under CWA § 316(a). *See Dominion* at 107; Region 1 Response to Petition for Review (Dec. 24, 2003) at 76-77. Region 1 has also explained that each variance determination under CWA § 316(a) involves a fact-specific inquiry that is "necessarily unique." *See id. (citing Wabash,* 1 E.A.D. 590, 600 (Adm'r 1979)). *See also In the Matter of Pub. Serv. Co. of New Hampshire, et al. (Seabrook Station, Units 1 and 2),* 1 E.A.D. 455, 490-91

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[34] Dominion states that "HDR|LMS conducted its own review of existing 316(a) guidance documents and other associated EPA water quality documentation to determine if they provide any guidance regarding the period of time that should be considered for frequency of exceedance of thermal limits or time to elicit an avoidance response. The following two documents [Temperature Criteria for Freshwater Fish and Red Book] were found to contain *relevant information with respect to exposure temperature frequency and duration.*" (emphasis added). *See* Petition, Table 1 (Item 13) at 9.

(Adm'r 1978). In addition, the Region has also noted that EPA regulations identify certain factors that a Region may take into account in a § 316(a) analysis. *See id.* (citing 40 C.F.R. §§ 125.72(b) and 125.73(b)). Relevant here is 40 C.F.R. § 125.73(b) (emphasis supplied), which provides only that:

> [i]n determining whether or not the protection and propagation of the affected species will be assured, the Director *may* consider any information contained or referenced in any applicable thermal water quality criteria and thermal water quality information published by the Administrator, or any other information he deems relevant.

Thus, the Region was not required to look to the water quality criteria guidance at all but, consistent with 40 C.F.R. § 125.73(b), the Region decided to use the water quality criteria development document as well as other sources of information in a reasonable way in the context of this CWA § 316(a) variance determination.[35]

Moreover, while insisting that the water quality documents should control the instant § 316(a) variance analysis, Petitioner admits that these guidance materials "do not relate directly to a Section 316(a) variance." *See* Petition at 14. Petitioner also fails to mention that there *is* an EPA guidance document developed expressly to support Agency personnel in making variance determinations under CWA § 316(a), the EPA, Interagency 316(a) Technical Guidance Manual and Guide for Thermal Effects Sections of Nuclear Facilities Environmental Impact Statements (Draft) (May 1, 1977). Ex. 46 (AR 2021). As explained previously by the Region, although this

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[35] The Region's administrative record includes both the Red Book and the later Gold Book. Both include the same formula for assessing growth impacts, so the Region cited to the later Gold Book. When Petitioner states that the Region failed to consider certain guidance materials at all, it is apparently pointing to EPA's *Temperature Criteria for Freshwater Fish.* Petition at Exhibit D. Petitioner's complaint is off-target. Petitioner claims that the *Temperature Criteria for Freshwater Fish* uses a seven-day duration for assessing growth impacts, but the Gold Book and Red Book on which the Region *did* rely, do so as well. Therefore, the additional guidance document would add nothing. In addition, winter flounder is a *marine*, not freshwater, species. The Region cited to the later Gold Book which addresses both saltwater and freshwater species. There is nothing inappropriate about this choice.

guidance is not binding, Region 1 made reasonable use of it in its analysis. *See Dominion* at 86-87. *See also* Ex. 4 (DPDD) at 6-14 to 6-45, 6-56. This guidance identifies multiple factors that can and should be considered and suggests that *both* growth and avoidance effects are among the appropriate potential decision factors.[36] *See id.* at 6-14, 6-20, 6-54 to 6-55. *See also* Region 1 Response to Petition for Review (Dec. 24, 2003) at 77. The § 316(a) guidance also does not dictate that impacts must be assessed based on exposures of seven days or more. Thus, there plainly is no legal requirement that the Region use seven days as the floor in its analysis of temporal thresholds, or even use the referenced guidance documents at all, in applying CWA § 316(a). Region 1 has not departed from any applicable EPA guidance or practice.

D. Dominion Does Not Demonstrate Error or Abuse of Discretion in Region 1's Reference to the State Mixing Zone Analysis

The Board should reject Dominion's contention that the Region's selection of the five-day threshold was in fact based on the state's mixing zone analysis and had no other scientific foundation. *See* Petition at 9, 13.[37] The MassDEP's mixing zone analysis states that "[i]n doing its evaluation of hydrodynamic model predictions for temperature suitability, MA DEP determined five days or more per month to be an unacceptable duration in terms of Mt. Hope Bay exceeding target temperatures." Ex. 4 (DPDD) at App. A ("Thermal Discharge Mixing Zone Recommendation, Brayton Point Station, Somerset, Massachusetts, July 15, 2002") at 12-13. In

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[36] This guidance also suggests that no variances should be granted for thermal discharges to spawning or nursery habitats. *See* Ex. 46 at 29; Ex. 4 (DPDD) at 6-19.

[37] The Board has already ruled that arguments that the Region's variance determination are based on the state's mixing zone analysis are not preserved for appeal. *See Dominion* at 141-42. Therefore, any such arguments are barred in this appeal. Petitioner is also manifestly incorrect because, although sharing certain elements, the two analyses were very different and the state's mixing zone resulted in more stringent limits. *See Dominion* at 108, n. 128, 142. *Compare* Ex. 4 (DPDD) at Ch. 6, *with* Ex. 4 (DPDD) at App. A (MassDEP mixing zone analysis).

its Determination on Remand, the Region provided a detailed technical rationale for its reaffirmation of the five-day threshold entirely separate from the state's conclusion for its mixing zone. Ex. R2 (DOR) at 21-30. In reaching its conclusion, however, the Region also, in a footnote, "took notice" of the five-day value from the state's mixing zone. *Id.* at 26-27, n. 25. The Region carefully delineated the narrow role the state's judgment played in lending support to the Region's decision regarding the five-day value under CWA § 316(a). *Id.*

While recognizing the different legal standards applicable under the state water quality standards and CWA § 316(a), the Region also saw no reason to regard MassDEP's conclusion as entirely irrelevant. On the contrary, Region 1 explained that:

> Given the general similarity between the CWA § 316(a) requirement to provide thermal conditions assuring the protection and propagation of the BIP and the requirement under the applicable Massachusetts water quality standards for SA and SB waters that conditions be maintained to provide excellent or healthful fish habitat, respectively, Region 1 regarded the basic concordance between the Region and MassDEP on the five day value as further evidence that the value was both adequately protective and reasonable.

See id. Thus, it is evident that the reference to a five-day threshold in the mixing zone analysis only supplemented the evidentiary basis for the Region's selection of the five-day threshold. The five-day threshold has sufficient basis in the record regardless of whether the value from the state's mixing zone analysis is considered.

Dominion's contention that the state's mixing zone value is the sole basis in the record for the five-day value is plainly contradicted by the Region's analysis presented in the Determination on Remand, which is entirely separate from the mixing zone analysis. Petitioner fails to address the ample, independent rationale provided by the Region for the five-day threshold in the

Determination on Remand and, instead, asserts that the Region afforded determinative weight to the state's conclusion. Dominion's unsupported assertion should be rejected by the Board. *See Dominion* at 27 (demonstration of error must be specific and substantiated). *See also Three Mountain Power,* 10 E.A.D. at 58 ("[t]he Board will not overturn a permit provision based on speculative arguments.")[38]

V. Region 1 Did Not Err in its Discussion of the 24°C Critical Temperature Criterion and Substantive Arguments on this Issue Are Outside the Proper Scope of This Appeal

Dominion alleges that the Region erred in its "attempts to bolster support for the 24°C temperature threshold." *See* Petition at 15. As a threshold matter, the Region was mindful that the scope of the issues remanded by the Board was limited to the five-day temporal threshold issue and the closed-cycle cooling noise issue, *see Dominion* at 294, and did not intend to further bolster its rationale for the 24°C critical temperature. The Region fully explained that its purpose in discussing the derivation of the critical temperature and the maximum areal impact, as well as the general legal and statutory background, was solely to provide helpful context for readers. The Region stated as follows:

> [b]elow Region 1 describes the resolution of the two remanded administrative issues and sets forth its determinations with regard to the two remanded substantive issues. While the purpose of this document is limited to addressing the specific issues remanded by the EAB, the Region has provided factual and legal background to eliminate or minimize the need for the reader to refer to other documents or recall the relevant issues.

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[38] *See also In re Masonite Corporation,* 5 E.A.D. 551, 561-62 (EAB 1994) (rejecting as speculative petitioner's argument that "the Region's decision is really based on a simple misreading of the raw data" by the agency's consultant where the Board concluded "the Region was not relying solely" on such information in arriving at its decision).

Ex. R2 (DOR) at 3. The discussion of the remanded five-day threshold (*see id.* at 21 to 34) is self-contained. Region 1 agrees, however, with Petitioner that any new materials cited in the background discussion of the 24°C critical temperature should be removed from the administrative record and the Region has done so. *See* "EPA Region 1 Assent to Petitioner's Motion to Strike Documents from the Administrative Record."

Petitioner also makes two substantive arguments here attacking the 24°C critical temperature, specifically, (I) that the Region failed to consider temperature acclimation when establishing its variance-based limits and (ii) that the Region erred in setting a 24°C critical temperature threshold because recent beach seine data indicate juvenile winter flounder are found at 28°C. *See* Petition at 15. These arguments are beyond the proper scope of this appeal and should be dismissed.[39] *See Dominion*, at 293-294. *See also Knauf,* 9 E.A.D. at 7.

In addition, these arguments, which also appear in Petitioner's Table 1, are entirely without merit. The Region addresses them in Appendix A to this Response.

VI. Petitioner Identifies No Issue Warranting EAB Review with Regard to the Winter Flounder Population

Dominion also argues, Petition at 15-16, that the Region erred in stating that "in the roughly four years since Region 1 arrived at its conclusion regarding the BIP in Mount Hope Bay, the BIP has shown no sign of recovery." *See* Ex. R2 (DOR) at 12, n. 12. This argument is beyond the proper scope of the appeal of the Determination on Remand because the status of the fish

[39] The fact that the Region discussed the critical temperature issue as background for the Determination on Remand cannot reopen issues already disposed of by the Board. Indeed, to hold otherwise, would discourage the inclusion of helpful background explanation in a remand decision that may be necessary and useful for the public's understanding of the issue. Without such background, the remanded issues would be addressed entirely out of context and readers would be required to obtain and review multiple other documents to identify that context.

population was not remanded by the Board. *See Dominion*, at 293-94.

As the Region stated in the Determination on Remand:

> While this analysis on remand is directed toward explaining the Region's selection of the five-day critical temperature exceedance threshold, it should be pointed out that in the roughly four years since Region 1 arrived at its conclusion regarding the BIP in Mount Hope Bay, the BIP has shown no sign of recovery.

Ex. R2 (DOR) at 12, n. 12. The Region's judgments under CWA § 316(a) are and have been informed by the depleted state of fish populations in Mount Hope Bay. *See* Ex. R2 (DOR) at 29. Here, the Region narrowly limited its assessment to a factual summary of the most recent annual biological monitoring report submitted by the Permittee and a comparison of trawl data against historical data also submitted by the Permittee. The Region looked to this information on remand to determine whether there had been any significant improvements in the fish populations in the Bay since the issuance of the Final Permit in 2003. The Region also believed that the updated information would be useful in apprising the interested public of conditions in Mount Hope Bay.

The current Permittee's trawl data indicated that fish populations had not significantly increased, particularly when compared to historical data. Notably, the Petitioner does not challenge the factual accuracy of either the Region's summation of the current trawl data or its summary of comparative data from past years. The Region's explanatory footnote does not open the door to a wide-ranging reevaluation of the health of fish populations in Mount Hope Bay. Petitioner's attempt to engage in such a reevaluation should be rejected.

Furthermore, when Petitioner argues that "there has been a perceptible increase" in the number of "young-of-the-year" winter flounder (*i.e.*, juveniles) with the largest collection being in its most recent year of data, it points to two pieces of evidence both of which are outside the

administrative record. *See* Petition at 15-16. One is a lay article (*i.e.*, not a peer-reviewed scientific paper) "collaborated in" by a number of people including Mark Gibson of the Rhode Island Department of Environmental Management (the "RI-DEM"). Petition at Ex. E at 1. The other is new, 2006 data collected by Petitioner and discussed in its consultant's report appended to the Petition as Exhibit A.[40] Region 1 had never seen either of these items until the Petition was filed and they are not part of the administrative record for this case. Therefore, these materials and arguments based on them should be stricken from the record for this appeal, as explained in Region 1's Motion to Strike and Opposition to Petitioner's Motion to Supplement the Administrative Record.

Petitioner's arguments in this regard are also without substance. The Petitioner argues that there has been a "perceptible increase" in young-of-the-year winter flounder caught in beach seines since 1993, with 2006 showing the highest levels. *See* Petition at 15. In addition, Dominion claims that a scientist previously relied upon by the Region recently has published an article that "noted indications of a potential recovery of winter flounder." *Id.* at 15-16. This "perceptible" increase and "potential recovery" together lead the Petitioner to question the "fundamental premise" of the permit.

Yet, the Region has pointed to sharp declines in finfish abundance over the past thirty years, including a *collapse* of winter flounder populations, a scientific conclusion the Board has sustained. *See, e.g., Dominion* at 102; Ex. 2 (RTC), Figures 7 and 9. *See also* Ex. 4 (DPDD) at 6-

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[40] Under the Permit, the beach seine data referred to here is collected annually and submitted, along with other information, in its final form (presumably after going through a process of quality control/quality assurance) in a biological monitoring report submitted to the Region in September of the following calendar year. Thus, the report submitted in 2006 includes 2005 data, the report submitted in 2005 includes 2004 data, and so on. *See* AR 4032, 4056, 4057, 4058. Dominion's most recent report was submitted in 2006, Ex. R11, and it includes data collected in 2005 and does not include the 2006 data Dominion now refers to.

55 to 6-56. Nothing offered by Petitioner alters this overwhelming environmental reality.

While Petitioner claims its new juvenile winter flounder data show an increase in 2006, this data point is far from demonstrating a recovery of fish populations in Mount Hope Bay. For reasons not apparent to the Region, Dominion presents juvenile winter flounder data from 1993 to 2006, while excluding data from 1992. The 1992 numbers were higher than in 2006. *See* Ex. R20 (AR 4056) at 7-54, Figure 7-7. The Region also observes that 2004 and 2005 were near historically low levels when viewed over the past thirteen years, but were preceded by two relatively higher years in 2002 and 2003. These data indicate that in the past, relatively higher levels (such as in 1992, 2002 and 2003) have not resulted in sustained high levels of juveniles in following years or in any perceptible change in adult fish populations in subsequent years. It also remains to be seen if the juveniles from 2006 will successfully recruit to the adult fishery. Adult fish remain at record-low numbers through the most recent data, still measured in *tenths of fish per tow*, whereas they averaged over 40 per tow prior to the collapse. *See* Ex. R11 at 5-29, Table 5-10. Moreover, whatever the levels of juveniles were in 1992 or 2006, it does not indicate what the levels should be or were before the collapse of fish populations in 1985. Additionally, while winter flounder is a very important species, data has shown that 16 of 21 species have declined in Mount Hope Bay. *See* Ex. 4 (DPDD) at 2-3. Thus, even assuming for the purpose of argument that the 2006 data shows a one-year increase in young-of-the-year winter flounder over levels seen in recent years, it would not undermine the fundamental premise of the Permit.

Finally, Petitioner also points to a lay article collaborated in by RI-DEM scientist Mark Gibson. This document states only that "[i]t *may be* [emphasis added] that [Narragansett] Bay conditions have recently changed such that the survival of young-of-the-year have improved. This

could be [emphasis added] evidence of the *beginning* [emphasis added] of a recovery." Petition, Ex. C at 3. Even had these tentative statements related to Mount Hope Bay, which they did not,[41] or appeared in a peer-reviewed journal, which they did not, they hardly amount to cause to reevaluate the fundamental basis of the permit.[42]

Without a compelling demonstration of error, the Board should decline to substitute its judgment for that of the Region's experts and, therefore, deny review. *See Peabody,* CAA Appeal No. 04-01, slip op. at 16-17.

VII. Petitioner Raises No Issue Warranting EAB Review Pertaining to the Permit's Cooling Water Intake Limits Under CWA § 316(b)

Petitioner raises two sets of issues related to the Permit's cooling water intake limits under the technology-based requirements of CWA § 316(b). The first involves the Region's consideration of cooling tower sound emissions. The second involves Region 1's documentation of its production foregone calculations. Neither raises an issue warranting EAB review.

A. Petitioner Raises No Issue Warranting EAB Review Pertaining to Region 1's Consideration of Closed-Cycle Cooling Noise Impacts

Region 1 selected wet, mechanical draft cooling towers as the Best Technology Available for minimizing adverse environmental impacts under CWA § 316(b) (BTA) at BPS. In its analysis for the Draft Permit, Region 1 considered sound emissions from the closed-cycle cooling conversion as a possible secondary, "non-water" environmental effect. *See* Ex. R2 (DOR) at 35-37. *See also Dominion* at 285.

In response to comments on the Draft Permit, Region 1 conducted an extensive re-analysis

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[41] *See* Ex. 4 (DPDD) at 6-55 to 6-56 (discussing Gibson (2002A)).

[42] These statements also do not appear to have been made by Mark Gibson of RI DEM. *See id.* at 3.

without taking additional public comment. The Board held that the Region did not abuse its discretion in deciding not to seek additional public comment, *Id.* at 288 n. 347, but also held that:

> [b]ecause of the potential significance of the noise impacts analysis on the determination of the appropriate BTA for BPS, and because we cannot determine whether Petitioner's concerns about the NIA are legitimate given the current state of the record, we conclude that the Final Permit must be remanded to the Region to supplement its response to comments with a rationale that addresses Petitioner's concerns raised on appeal regarding the NIA or to modify the permit requirements, as appropriate.

Id. at 288. *See also id.* at 293. The primary shortcoming identified by the Board was that the "record lacks sufficient information to indicate whether or not BPS, if converted to closed-cycle cooling, will likely violate Massachusetts' noise regulations." *Id.* at 287. The Board also identified several related, subsidiary issues to be addressed (*e.g.*, should sound emissions from planned new air pollution control equipment be included in the assessment under state requirements). *Id.* at 287 and n. 346. In addition, the Board noted that Petitioner had argued on appeal "that the Region 'did not even attempt to demonstrate that the 72 cooling tower [cells] needed for closed-cycle cooling [for the entire power plant], taken together with existing station operations, could be operated within the regulatory limits and therefore has not demonstrated that the state requirements can be met.'" *Id.* at 284.

On remand, Region 1 fully addressed the concerns raised by Petitioner on appeal, as well as any additional issues raised by the EAB in the Remand Order. *See* R2 (DOR) at 43-61. As part of this work, Region 1 again contracted with its expert consultant Hatch to prepare an Addendum to its original Noise Impact Assessment (the "Addendum to the NIA"). Ex. R12 (AR 4005). *See also* Ex. R2 (DOR) at 40-42, 46. Based on this analysis, the Region again concluded that BPS

will likely be able to convert entirely to closed-cycle cooling using mechanical draft, wet cooling towers *without* violating Massachusetts' noise control regulations. Ex. R2 (DOR) at 46, 54-56. *See also* Ex. R12 (Addendum to the NIA) at 2, 9, 11. In addition, without prejudging its later plan review and approval process, MassDEP has indicated in writing that it concurs with Region 1's conclusions. *See* Ex. R4 (AR 4029). *See also* Ex. R2 (DOR) at 42 n. 40, 46, 56. Therefore, Region 1 found that the cooling tower technology identified as BTA was "available" and there was no reason to change its earlier determination of BTA technology-based cooling water intake limits for the BPS Permit. Ex. R2 (DOR) at 59.

1. Petitioner Raises No Issue Warranting EAB Review Regarding Region 1's Determination that Closed-Cycle Cooling at BPS Will Likely Comply with MassDEP Noise Control Regulations

Petitioner identifies no issue warranting EAB review regarding Region 1's reassessment of closed-cycle cooling noise issues. Indeed, the Petition raises no specific issue whatsoever related to the primary question on remand (*i.e.*, whether compliance with MassDEP noise control regulations is likely).

Initially, the Petition, at 6, states only that (emphasis supplied):

> . . . the Region considered both the Massachusetts standard and EPA's own guidance relating to noise and concluded both likely would be met. *At least as to EPA's own guidance*, the Region's analysis was incorrect.

Region 1 will discuss the "EPA guidance" issue further below, but suffice it to say here that it is separate from the questions on remand concerning the MassDEP requirements. The Petition, at 16-17, later presents an only marginally more involved discussion of noise issues in which Dominion makes only the following broad, unsubstantiated assertions:

- "[t]he Region's Determination fails to acknowledge that regulatory levels for noise will likely be exceeded"; and
- ". . . the Region relied on a supplemental report by its noise consultant, Hatch, . . . to support its conclusion that sound levels would be acceptable . . . [but t]he Hatch Addendum does not provide the requisite support."

Id. The Petition does not, however, provide any specific suggestions of clear error with respect to the issues on remand, which relate to compliance with the MassDEP noise control requirements.[43] These broad, unsupported assertions of error are not adequate to identify an issue warranting EAB review in the face of the Region's detailed analysis. *See Dominion* at 27 (demonstration of error must be specific and substantiated); *Carlota Copper,* 11 E.A.D. at 735 (citing *In re New England Plating Co.,* 9 E.A.D. 726, 737 (EAB 2001), and other cases).

Dominion offers additional technical arguments concerning Region1 's Determination on Remand in a consultant's report submitted as Exhibit F to the Petition. The Region addresses the arguments in Petitioner's Exhibit F in Appendix A (Item 25) to this Response and demonstrates that none raises an issue warranting EAB review or further remand of the Permit.[44, 45]

2. Petitioner Raises No Issue Warranting EAB Review Concerning the EPA Noise Levels Information Document

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[43] The reference to "regulatory levels" seems in context to refer only to the EPA-developed noise levels, which Petitioner refers to as "regulatory guidance." *See* Petition at 16. The MassDEP regulations do not set any specific numeric standards limiting sound emissions. *See* Ex. R2 (DOR) at 47-48. Furthermore, as the Region explains below, the EPA levels neither have the force of law nor are likely to be exceeded here, if interpreted in a reasonable way.

[44] Exhibit F principally presents arguments related to the "EPA guidance" mentioned above, but also presents one argument related to the number of cooling tower cells in the array assessed by the Hatch analysis. This could indirectly relate to the assessment of compliance with state requirements. In any event, Region 1 addresses all of these arguments in Appendix A to this Response and demonstrates that none warrants EAB review.

[45] Exhibit F not only comments on certain aspects of the Region's DOR, but also presents new data and arguments related to this data. As explained in Region 1's Motion to Strike and Opposition to Petitioner's Motion to Supplement the Administrative Record, Petitioner's Exhibit F is outside the administrative record and, therefore, this new data and arguments related to it should be stricken from the record on appeal.

Region 1's assessment of sound emissions from closed-cycle cooling focused on whether Massachusetts noise control standards were likely to be satisfied. The Region's analysis also considered a reference level from an EPA information document entitled, "Information On Levels Of Environmental Noise Requisite To Protect Public Health And Welfare With An Adequate Margin Of Safety" (EPA 550/9-74-004), that was issued in March 1974 by EPA's then-extant Office of Noise Abatement and Control (the "EPA Noise Levels Information Document" or the "EPA Information Document"). Ex. R13 (AR 4001). While the Region found that the pertinent level from the EPA Information Document would not be exceeded, the EPA level is not, in any event, a legally binding standard. Petitioner now raises a number of issues related to the Region's consideration of the EPA sound level. These arguments should be rejected because Petitioner has failed either to preserve these issues for EAB review or to establish that they would otherwise warrant Board review.

Region 1 has correctly and repeatedly stated in the record that no federal noise requirements or regulations govern the closed-cycle cooling issues here. Until now, Petitioner has not questioned this fact. In the current Petition, however, Dominion raises new issues regarding application of the EPA Noise Levels Information Document.

In issuing the EPA Information Document, the Agency stated clearly and repeatedly that the identified levels should not be regarded or used as federal noise standards, regulations or even goals. EPA explained:

> There was a great deal of concern during the preparation of this document that the levels identified would be mistakenly interpreted as Federal noise standards. The information contained in this document should not be so interpreted.

Id. at 8.[46] EPA also stated that:

> Throughout this report, the words "identified level" are used to express the result of the inquiry mandated by Section 5(a)(2). The words "goals", "standards", or "recommended levels" are not used since they are not appropriate. Neither Congress nor the Environmental Protection Agency has reached the conclusion that these identified levels should be adopted by states and localities.

Ex. R13 at 7. *See also id.* at Title Page, Foreword-2, 4.[47] Thus, the noise levels from the EPA Information Document are not legally binding, as the Region and Hatch have explained, but are sometimes used by noise assessment professionals as a possible reference point in their work. *See* Ex. R12 (Addendum to NIA) at 9; Ex. R2 (DOR) at 57.

As Region 1 has also explained, neither CWA § 316(b) nor other federal law, regulation or EPA guidance dictates how noise impacts are to be assessed in setting BTA technology standards under § 316(b). *See* Ex. R2 (DOR) at 36. Thus, Region 1 was not required to consider the EPA Information Document here at all.

In the DPDD, Region 1 provided a somewhat general analysis of cooling tower noise issues. *See* Ex. R2 (DOR) at 38-39; Ex. 4 (DPDD) at 7-34, 7-37, 7-43 to 7-44, and 7-169. The Region did not discuss the EPA Noise Levels Information Document but emphasized that there are no applicable federal noise regulations. Ex. 4 (DPDD) at 7-43. In its comments on the Draft

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[46] EPA further explained that ". . . the levels identified here will provide State and local governments as well as the Federal Government and the private sector with an informational point of departure for the purpose of decision-making." *See id.*

[47] Similarly, in a Summary Document that EPA issued in an effort to make the EPA Noise Levels Information Document more easily understood by the lay public, *see* Ex. R14 (Summary of EPA Noise Levels Information Document) at p. i, EPA stated that, "[p]erhaps the most fundamental misuse of the Levels Document is treatment of the identified levels as regulatory goals." *Id.* at 24. *See also id.* at 25.

Permit, Petitioner wrote that for a 72-cell cooling tower array at BPS, "it is likely that EPA's guidance limiting outside residential sound level exposure to less than 51 dBA would . . . not be met." Ex. 33 (Vol. II, Tab 13, p. 3 (TRC Report, Oct. 3, 2002)). TRC provided no data or documentation to support its claim and erroneously stated that the relevant EPA noise level was 51 dBA. The level from the EPA's Information Document that is actually at issue here is a day /night level of 55 dBA L_{DN}. *See* Ex. R2 (DOR) at 57.[48]

In response to comments on the Draft Permit, Region 1 undertook a more detailed noise assessment, while reiterating that there are no governing federal noise regulations. *See* Ex. 2 (RTC) at IV-84. As a result, Hatch's initial NIA for the Region appropriately focused on MassDEP noise requirements and concluded they would likely be satisfied. *See* Ex. 2 (RTC Vol. II), App. L at 9. The initial NIA also, however, briefly discussed the EPA Noise Levels Information Document, correctly identifying the relevant level from the document as 55 dBA L_{DN}. Ex. 2 (RTC), App. L at 5, n. 4. *See also* Ex. R2 (DOR) at 57.

In its earlier appeal of the Final Permit to the Board, Petitioner raised no issues regarding the EPA Noise Levels Information Document. Petitioner also did not question Region 1's repeated statements that there are no applicable or binding federal noise regulations. *See* EPA Region 1 Response to Petition for Review (Dec. 24, 2003) at 59, 112 and Response to Table 2, items 54 and 89. Petitioner also neither argued that the 55 dBA L_{DN} level would be exceeded nor claimed that it had to be applied in any particular way. Petitioner, instead, focused on issues

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[48] The EPA Information Document, Ex. R13 at 4, states that "undue interference with activity and annoyance will not occur if outdoor [sound] levels are maintained at an energy equivalent of 55 dB." *See also id.* at 3, Table 1. As Hatch explains in the Addendum to the NIA, Ex. R12 at 9, an L_{DN} of 55 dBA is equivalent to a sound level of 49 dBA for a steady sound. *See also* Ex. 2 (RTC Vol. II), App. L (the "initial NIA") at 5.

related to the Massachusetts regulations. As a result, none of Petitioner's issues related to the EPA Information Document or its legal effect have been preserved for appeal. An issue that could have been raised in a prior petition but was not, cannot be raised in a later petition challenging a decision on remand in the same proceeding. *Carlota Copper,* 11 E.A.D. at 729 n. 43, 734-36; *Knauf Fiber Glass,* 9 E.A.D. at 7.

Furthermore, these issues are all beyond the scope of appeal authorized by the Board in the Remand Order. The Board remanded the permit for Region 1 to determine whether the MassDEP regulations were likely to be satisfied and to address the concerns expressed by Petitioner on appeal about the initial NIA. Since none of these concerns involved the EPA Information Document, the Board's Remand Order did not remand any issue related to it. Since the Board ordered that any subsequent appeal must be limited to the remanded issues, *Dominion* at 293-94, issues related to the EPA Information Document are beyond the scope of appeal authorized by the Remand Order and should be dismissed. *See Knauf Fiber Glass,* 9 E.A.D. at 7.

Moreover, Region 1's voluntary consideration of questions related to the EPA noise levels provides no basis for revisiting already settled issues in this appeal. In the Determination on Remand, Region 1 clearly stated its understanding that questions related to the EPA noise levels had not been remanded by the Board and did not have to be addressed. *See* Ex. R2 (DOR) at 56. *See also id.* at 43-46 (detailing the noise issues on remand). Nevertheless, Region 1 explained that because its evaluation on remand newly assessed sound levels *including* sound from the new air pollution control equipment to be installed at BPS, the Region felt it appropriate to compare the predicted sound levels against the levels from the EPA Information Document again. Ex. R2

(DOR) at 56, 57.[49] The Region's inclusion in the Determination on Remand of this unnecessary, supplemental evaluation cannot revive issues already resolved by the Board's Remand Order.[50]

Substantively, Dominion's arguments about the EPA Information Document do not establish any issue warranting EAB review and are incorrect on the merits. Petitioner argues that Region 1's analysis "does not show likely compliance with EPA's own *regulatory guidance* for noise," Petition at 16 (emphasis added), and that "[i]f the levels in the EPA guidance are exceeded, then closed-cycle cooling would not be the best technology available." Petition at 17. This line of argument is fatally flawed.

Regardless of Petitioner's newly coined phrase – "regulatory guidance" – the EPA Noise Levels Information Document is not legally binding and is not enforceable. Indeed, Petitioner's own comments on the Draft Permit only refer to a noise level from an "EPA guidance," Ex. 33 (Vol. II, Tab 13, p. 3 (TRC Report, Oct. 3, 2002)), while Petitioner's Exhibit F states only that the 55 dBA L_{DN} level from the EPA Information Document is a "guideline value" that is a "often used to put total sound levels in an area into context." Petition, Ex. F at 2. There is no suggestion that the sound level from the EPA Information Document has the force of law or that its application is required by federal or state law. In addition, as Region 1 has explained previously – and Petitioner has never even attempted to contradict – neither statute, regulation nor guidance dictates how EPA should evaluate and weigh secondary noise effects in assessing technological

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[49] The Region again found that predicted sound levels from the plant, including the cooling towers and air pollution control equipment, would not exceed the 55 dBA L_{DN} level from the EPA Information Document. Ex. R2 (DOR) at 57; Ex. R12 (Addendum to NIA) at 9.

[50] If it was improper for Region 1 to have addressed the levels from the EPA Information Document on remand because it was beyond the scope of the Remand Order, then the remedy would be to strike this discussion from the Determination on Remand rather than to reopen in this appeal an already closed issue.

alternatives for BTA under CWA § 316(b). *See* Ex. R2 (DOR) at 36; EPA Region 1 Response to Petition for Review (Dec. 24, 2003) at 23. Thus, assessing noise is plainly an area where the Agency has broad discretion. *See id.* at 23, n. 31; *Riverkeeper, Inc. v. United States Environmental Protection Agency*, 358 F.3d 174, 185-86, 195-96 (2d Cir. 2004) (litigation concerning EPA's Phase I § 316(b) Rule) (citing *BP Exploration & Oil, Inc. v. EPA*, 66 F.3d 784, 802 (6th Cir. 1995); *Weyerhaeuser Co. v. Costle*, 590 F.2d 1011, 1045-52 (D.C. Cir. 1978)).

The Region's focus in this case has appropriately been on the MassDEP regulations. At this point, both Region 1 and the MassDEP have reasonably concluded that cooling tower sound emissions will likely comply with MassDEP regulations. Therefore, even if the sound levels would exceed the level from the EPA Information Document – which Region 1 concludes will not be the case – Region 1 would not have abused its discretion in deciding that closed-cycle cooling represents the BTA. *See* Ex. R13 (Addendum to NIA) at 8-9 (the nature of cooling tower sound and the small change in sound levels indicates that adverse community reaction is unlikely). *See also In re Phelps Dodge Corp. Verde Valley Ranch Development*, 10 E.A.D. 460, 521-22 (EAB 2002) (finding no abuse of discretion in Region's exercise of a "significant policy choice" to regulate site under one statute and not another where Region "truly had discretion" and "path charted by the Region was legitimate and legally authorized").

Dominion also critiques the Region's assessment of whether the relevant level from the EPA Information Document would be exceeded on certain specific technical grounds. *See* Petition at 17 and Ex. F, pp. 1-2. Specifically, the Petition asserts that the Region incorrectly compared predicted sound levels against the 55 dBA L_{DN} level in the EPA Information Document using a baseline of winter/spring sound levels when it should have used the louder summer sound

levels that Hatch had measured in September 2003 as the baseline. Petition at 17 and Ex. F, p. 1. This broad, unsupported assertion is insufficient to establish clear error or an issue warranting EAB review. *See Dominion* at 27 (demonstration of error must be specific and substantiated).

The question of whether Hatch should have used its summer measurements as a baseline for applying the 55 dBA L_{DN} level in the EPA Information Document also has not been preserved by Dominion. Petitioner's comments on the Draft Permit suggested that an (incorrect) noise level of 51 dBA from "EPA guidance" would be exceeded, but appear to have based this assertion on winter/spring baseline levels that Petitioner had collected for the air pollution control project. *See* Ex. R2 (DOR) at 40, n. 36; Ex. 33 at Vol. II, Tab 13, p. 3 (TRC Report, Oct. 3, 2002). There was no suggestion that summer baseline levels had to be collected and used for any purpose whatsoever, and Petitioner does not appear to have collected summer information itself. *Id.* Petitioner could have commented that summer baseline levels needed to be collected and used in an application of the EPA level, but it did not do so. Thus, Region 1 had no reason to address this new summer baseline issue in its Response to Comments and Petitioner cannot raise it now. *See* 40 C.F.R. § 124.13.

In addition, all the information needed to raise this issue was available at the time of Petitioner's initial appeal, but Petitioner was silent on it. Hatch's summer measurements were presented in the initial NIA included in the RTC. Ex. 2 (RTC) at App. L, p. 2.[51] The initial NIA also discussed the 55 dBA L_{DN} level from the EPA Information Document but did not compare it against predicted sound levels using the summer data as the baseline. *Id.* at 3. Rather, Hatch

[51] This same data was used on remand. Hatch collected no new data for Region 1's Determination on Remand. Ex. R12 (Addendum to NIA) at 2, 10; Ex. R2 (DOR) at 60.

calculated predicted sound levels with closed-cycle cooling using a baseline of the winter/spring measurements. *Id.* at 4-6. Petitioner raised no concern about any of this until now, despite the fact that all of its current arguments, including all of the arguments presented in its Exhibit F, could have been developed and presented in the initial appeal. Issues that could have been raised in an original petition for review cannot be raised in a second petition appealing a decision on remand. *Carlota Copper*, 11 E.A.D. at 729, n. 43, 734-36; *Knauf Fiber Glass,* 9 E.A.D. at 7.[52]

In Appendix A to this Response, Region 1 addresses various additional technical arguments related to the EPA Information Document that are presented in Petitioner's Exhibit F.

B. Petitioner Fails to Raise an Issue Warranting Either Board Review or a Permit Remand with Regard to Region 1's Production Foregone Analysis

Contrary to Dominion's argument, Region 1 complied with the Board's order to ensure that the "production foregone re-analysis" referred to as being "attached" to a September 16, 2003, memorandum by the Region's consultant, Stratus Consulting, Inc. ("Stratus") (the "Stratus Memorandum"), Ex. 2 (RTC Vol. II), App. X at 2, is included in the administrative record. *See Dominion* at 267-68. Furthermore, Petitioner's substantive arguments concerning the production foregone issue are beyond the scope of the appeal permitted by the Board's Remand Order and should be dismissed. *Dominion* at 293-94. *See also Knauf Fiber Glass,* 9 E.A.D. at 7.

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[52] It should also be noted that while Dominion now argues that the 55 dBA L_{DN} level from the EPA Noise Levels Information Document must be applied, and must be applied based on summer baseline sound levels, Petitioner appears neither to have mentioned the EPA Information Document nor collected any summer measurements in its noise analysis submitted to MassDEP as part of its request for state approval of its proposed air pollution control equipment. *See* Ex. R7 (Addendum to NIA) at 3-4, 7-9 and Attachment B2 (TRC Plan Approval Application (for new BPS air pollution control equipment)) at 4-1, 5-1. Thus, Petitioner's argument is belied by its own conduct with regard to the air pollution control equipment.

1. Region 1 Complied with the EAB's Order to Ensure that the Missing Attachment to the Stratus Memorandum is in the Administrative Record

The Remand Order addresses the production foregone issue in the context of economic benefit issues under CWA § 316(b). *Dominion* at 267-68. *See also id.* at 155. Region 1 and Stratus have used the term "production foregone analysis" to refer to a particular portion of the Region's overall economic benefits analysis that indirectly estimated "use values" for forage fish lost to entrainment and impingement at BPS. *See* Ex. 4 (DPDD) at 7-139. *See also id.* at 7-136 to 7-138; Ex. 2 (RTC) at IV-47. The term "production foregone" has also been used to refer to estimates of the lost future production of various species of fish (expressed in pounds of fish) as a result of entrainment and impingement of those species by BPS, thus providing an estimate of lost "biomass." *See Dominion* at 153, n. 180. The production foregone biomass figures are based on underlying entrainment and impingement data and, in turn, underlie subsequent stages of the production foregone economic analysis. *See id.* at 267; Ex. 4 (DPDD) at 7-138, 7-139.

The Board noted that Stratus had acknowledged that some of the values used in the production foregone analysis should be changed, but that Stratus "also explained that it had re-analyzed the data for the Final Permit." *Id.* at 267 (quoting Ex. 2 (RTC Vol. II), App. X at 2). The Stratus Memorandum stated that "a re-analysis was conducted incorporating these changes (see attached)," *see* Ex. 2 (RTC), App. X at 2, but the referenced attachment with the re-analysis did not appear to be attached to the memorandum. *See id.*; *Dominion* at 267. The Board went on to point out that Stratus and Region 1 had agreed that the "practical effect on the final benefits assessment was 'insignificant,'" *id.* (citing Ex. 2 (RTC) at IV-47 and Vol. II, App. X at 2), and

that the changes had little effect on the overall benefits values. *See also id.* at 267, n. 321.

In response to Petitioner's complaint that although Region 1 acknowledged that certain changes should be made to the production foregone calculations prepared for the Draft Permit, it still mentioned one of the old, uncorrected biomass figures from the DPDD in one response to a comment on the Draft Permit, the Board ruled that, "the mere fact that, at one point in the Responses to Comments document, *see* RTC at IV-69, the Region cited to the production foregone figure from the Determinations Document does not itself demonstrate clear error." *Dominion* at 267-68. The Board then further ruled:

> However, notwithstanding the questionable importance of Stratus' production foregone re-analysis to the Region's overall benefits analysis, because the Region evaluated and relied upon this document in developing the Final Permit, it should properly be part of the administrative record. Accordingly, if this document is not already in the administrative record, the Region is instructed on remand to add this document to the administrative record.

Id. at 268. *See also id.* at 6 and 293.

In response to the Board's order, the Region obtained a copy of the missing attachment to the Stratus Memorandum and placed a copy of the Memorandum *with the attachment* in the administrative record as AR 4020. Ex. R6 (AR 4020). *See also* Ex. R2 (DOR) at 4. Then while preparing its response to the current Petition for Review, the Region discovered that the "missing attachment" had actually been in the record all along but had been misfiled as separate Appendices V and W to the RTC. *Compare* Ex. R6, *with* Ex. 2 (RTC Vol. II), Apps. V, W and X. In any event, Region 1 complied with the Board's Remand Order to ensure that the missing attachment to the Stratus Memorandum is in the administrative record.

Still, the Region believes that Petitioner raises a valid administrative record point that will be addressed here. The attachment to the Stratus Memorandum includes text explaining changes in the "production foregone analysis" between the Draft and Final Permits and data tables providing the key end results of the economic analysis. *See* Ex. R6; Ex. 2 (RTC Vol. II), Apps. V and W. These end results are the foregone yield of commercial and recreational species, which reflects in part the production foregone of forage fish, and the monetary value of this foregone yield. *See* Ex. R6; Ex. 2 (RTC Vol. II), Apps. V and W. *See also* Ex. 4 (DPDD) at 7-138, 7-139.

Petitioner requests, however, that the underlying "production foregone" data or "numbers" from a stage of the analysis prior to generating the foregone yield figures also be placed in the record. Again, these are the estimates (in pounds of fish) of lost biomass resulting from entrainment and impingement at BPS and the attachment Stratus prepared for the Stratus Memorandum did not include these underlying figures. Petitioner requests those figures, correctly stating that the attachment to the Stratus Memorandum with the foregone yield and economic value data indicates that new production foregone figures were, in fact, developed. Petition at 18. Petitioner urges "[i]t is important that Region 1 provide the corrected production foregone numbers" and not just the foregone yield and dollar values. *Id.*, Table 1 at 1 (Item 1).

The Region has no objection to Dominion's request that the production foregone biomass data be physically included in the administrative record. This data was not part of the "missing attachment" but it is part of what underlies the analysis that is presented in the attachment and it is part of the administrative record for the Permit. Again, this is not new data; it is data that was developed for, and is part of, the overall economic re-analysis addressed in the Stratus Memorandum and the attachment to it. To remedy this administrative record issue, Region 1 has

now physically placed the "production foregone numbers" and certain related data from the re-analysis in the administrative record. The Region has given the material administrative record number AR 4068 and is providing a copy of the material herewith as Exhibit R15.[53]

Petitioner argues that "[t]he Region's non-compliance with the Board's order merits a second remand with a direction to reopen consideration of the intake limits that were based, in significant part, on estimates of 'production foregone.'" Petition at 18. Yet, as explained above, Region 1 complied with the terms of the Remand Order by placing a copy of the missing attachment to the Stratus Memorandum in the record; indeed, it turns out the attachment was there all along. Furthermore, the Region has now physically placed the production foregone data underlying the Stratus analysis in the record. Petitioner identifies no basis for a second remand.

2. Petitioner's Substantive Arguments Regarding Production Foregone Should be Dismissed Because They Are Beyond the Scope of Appeal Authorized by the Board and Do Not Otherwise Establish an Issue Warranting EAB Review

Beyond the administrative record issue, Dominion makes a number of arguments concerning production foregone that are beyond the scope of the appeal permitted by the Remand Order. The Board limited any appeal to the issues listed on page 293 of the Remand Order. *Dominion* at 293-94. The only issue remanded concerning production foregone was the administrative record issue discussed above. Therefore, Petitioner's additional, substantive arguments related to production foregone should be dismissed. *See Knauf,* 9 E.A.D. at 7.

Petitioner's additional, substantive arguments should also be dismissed because some

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[53] Exhibit R15 includes a transmittal memorandum from Stratus to Region providing the data in question and a series of data tables. Table 1 provides entrainment and impingement figures, Table 2 provides the "production foregone numbers," and Tables 3 through 22 provide "life history parameter" data that was used in the analysis.

repeat arguments already rejected by the Board and others assert new arguments that have not been preserved. First, Dominion repeats its complaint that Region 1 acknowledged in the RTC that certain changes should be made to its production foregone analysis but nevertheless mentioned one of the production foregone numbers from the DPDD in one of its responses to comments on the Draft Permit. *See* Petition at 18 (citing Ex. 2 (RTC) at IV-69). The Region's mis-step in this regard was inconsequential and had no effect on the Final Permit. *See* Ex. 2 (RTC) at IV-41 to IV-45, IV-47 (discussing the Region's conclusions under the wholly disproportionate cost test). Moreover, the Board already addressed this issue, holding it did not constitute clear error warranting a remand. *Dominion* at 267-68.

Second, Petitioner repeats its prior argument that the total production foregone figure (in pounds of fish) estimated for entrainment and impingement from its Enhanced Multi-Mode proposal should be 185,000 pounds, as proposed by its consultant. *See* Petition at 17. Region 1 previously stated its disagreement with this value and indicated that it does not concur with all of Petitioner's consultant's arguments that it claims lead to its preferred figure, and the Board addressed this point as well. *See Dominion* at 267 n. 320. *See also* Ex. 2 (RTC) at IV-47 and Vol. II, App. X at 2. At most, Petitioner reiterates an area of differing technical opinion and the Board should defer to the Region on this issue. Region 1 further discusses this issue in Appendix A (Item 1) to this Response, which responds to arguments in Table 1 to the Petition.

Finally, Petitioner presents the new argument that the Region's production foregone calculations are both in error and go to the "very foundation of the permit," and that "if the Region's original estimate of production foregone is significantly overstated, then the effects of the Station's cooling water intake on fish populations are less than calculated by the Region, and

the Permit limits under § 316(b) are unnecessarily stringent." Petition at 1-2. *See also id.* at 6-7. This argument, too, is beyond the scope of the appeal permitted by the Board's Remand Order and should be dismissed for that reason. It is also wrong on the merits.

The production foregone calculations do not go to the "very foundation" of the permit. They provided the basis for an indirect estimate of the monetized use value of forage fish. This value was so low, even based on the initial production foregone estimate by Stratus, that changes to the values make no significant difference to the Region's overall assessment of benefits. *See* Ex. 2 (RTC) at IV-47; Ex. 2 (RTC Vol. II) at App. X, pp. 1-2. *See also* Ex. 4 (DPDD) at 7-139 to 7-140; Ex. 2 (RTC) at IV-24 to IV-26. The Board has also already addressed this issue. *Dominion* at 267-68. *See also id.* at 155.

Furthermore, while the Region did consider production foregone biomass numbers in the DPDD as one metric indicating relative levels of adverse impact among various permitting alternatives, *see Dominion* at 153-54, it was neither the only such indicator nor the primary one. Region 1 also assessed many other indicators of the adverse impact of the power plant's cooling water intake on the ecosystem of Mount Hope Bay, and the Board dealt with many of these issues in detail (*e.g.*, absolute levels of entrainment and impingement, winter flounder population impacts, population impacts on other species, adult fish losses). *See, e.g., Dominion* at 152-54. *See also id.* at 209-13.[54] The assessment of these other effects was not based on the production foregone numbers and would not be affected by changes in those numbers. Review of Region 1's discussion of the ecological benefits of the various permitting options and application of the

[54] *See also* Ex. 4 (DPDD) at 7-107 to 7-109 (impingement losses), 7-113 to 7-116 (entrainment losses), 7-119 (winter flounder population losses), 7-123 (losses for species other than winter flounder), 7-127 to 7-130 (overall fish population collapse); Ex. R2 (RTC) at IV-21 to IV-23.

wholly disproportionate cost test also reveals that production foregone values did not play a central role in the decision. *See* Ex. 2 (RTC) at IV-21 to IV-23, IV-41 to IV-45; Ex. 4 (DPDD) at 7-162 to 7-164, 7-166 to 7-172. Indeed, the production foregone biomass numbers are not mentioned in the RTC except in the one response noted by Petitioner and discussed above.

VIII. Region 1 Has Committed No Procedural Error of Law Warranting EAB Review or a Remand of the Permit

Dominion argues in the Petition that Region 1 has committed several procedural errors of law. Petition at 18-22. Petitioner presents the same issues and argument in its "Motion to Supplement the Administrative Record" and "Motion to Exclude or to Strike Documents from the Administrative Record." Region 1 responds to these issues and arguments in the "Region 1 Motion to Strike and Opposition to Petitioner's Motion to Supplement the Administrative Record," and "Region 1 Assent to Petitioner's Motion to Exclude or to Strike Documents from the Administrative Record," which are incorporated herein by reference and are filed today with this Response. Region 1's response with regard to these issues demonstrates that none warrants either EAB review or further remand of the Permit

IX. CONCLUSION

For the reasons set forth above, Petitioner has identified no issue warranting review or further remand of the Permit by the Board.

Respectfully submitted by EPA Region 1,

Dated: March 5, 2007

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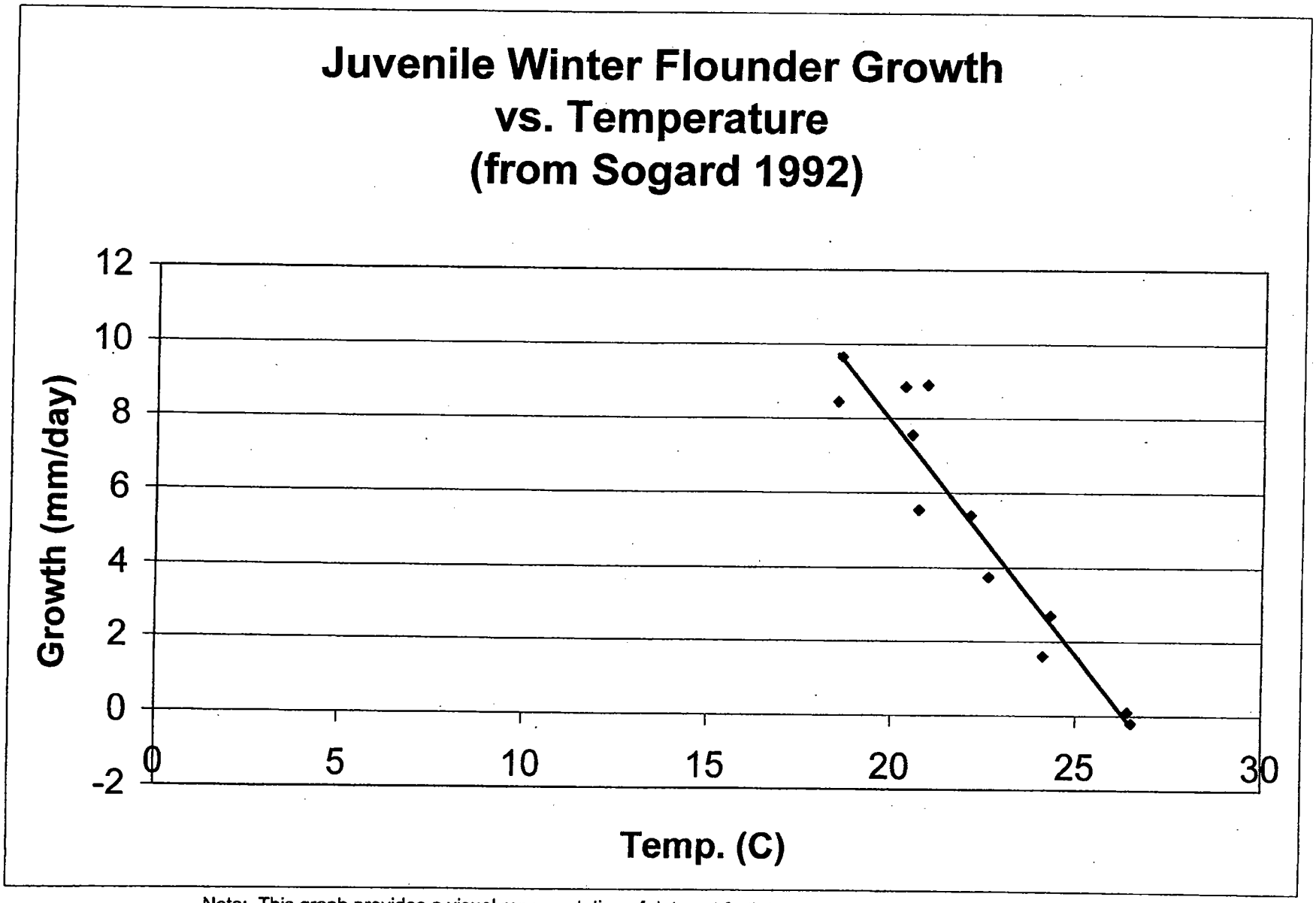
Attachment A



Note: This graph provides a visual representation of data set forth in Table 3 (Mean Water Temperatures) and Figure 3 (Mean Increase in Total Length) of Sogard (1992), Ex. R9. The Region, in addition, conducted a simple linear regression of the relationship between water temperature and winter flounder growth. A computer generated line was drawn through the data with the following equation and assessment of data variance: y=-1.2496x+32.84 r2=0.9103

Appendix A

RESPONSE BY REGION 1 TO ADDITIONAL ARGUMENTS PRESENTED IN PETITIONER'S TABLE 1 AND EXHIBITS

1. Production Foregone (Table at p. 1; LMS Report at pp. 2-4)

The substantive arguments presented by Petitioner in Item 1 of its Table are beyond the scope of appeal allowed by the Board's decision in *In re Dominion Energy Brayton Point, L.L.C. (Formerly USGen New England, Inc.) Brayton Point Station*, NPDES Appeal No. 03-12, slip opinion, at 293-294 (EAB, Feb. 1, 2006) ("Remand Order") (any future appeal is limited to the two remanded issues). Region 1 has explained this in its Response to the Petition for Review at § VII.B.2. With regard to production foregone, the Board's Remand Order only directed the Region to ensure that the "missing" attachment to Appendix X to the Response to Comments (the "Stratus Memorandum") was physically in the administrative record. *See* Ex. 2 (RTC Vol. II), App. X at 2. The Region did this by obtaining a copy of the attachment from Stratus and placing it in the record. Ex. R6 (AR 4020). The Region later determined that the attachment was actually already in the record, having been misfiled as Appendices V and W to the RTC. Ex. 2 (RTC Vol. II), Apps. V and W. *See* Response to Petition at § VII.B.1.

While Petitioner complains that the re-calculated production foregone biomass numbers (in pounds of fish) are not contained in the attachment Stratus provided, Stratus discussed its production foregone calculations (and its re-analysis) in terms of their role in the economic analysis. This analysis was prepared for EPA to indirectly estimate the "use value" of the production foregone of forage fish lost to entrainment and impingement at Brayton Point Station. *See, e.g.,* Ex. 2 (RTC Vol. II), App. X at 1-2; Ex. 4 (DPDD) at 7-137 to 7-140. *See also* Ex. 2 (RTC) at IV-25 to IV-26. Thus, Stratus prepared the attachment to provide text discussing (a) changes to the analysis, and (b) data tables presenting the last two, key stages of the economic analysis. These last two stages involve the foregone yield figures for species of commercial and recreational importance, which reflects among other things the production foregone of the forage fish, and the monetary value of the foregone yield. *See* Ex. R6; Ex. 2 (Vol. II), Apps. V, W and X at 1-2. In any event, Region 1 duly ensured that the attachment that Stratus had prepared pertaining to the production foregone re-analysis was included in the record. Indeed, it was in the record all along.

The Region now recognizes, as stated above, that Petitioner is calling for the "production foregone numbers" – *i.e.*, the production foregone biomass figures (expressed in pounds of fish) underlying the foregone yield and economic values that are presented in the attachment – to be physically placed in the administrative record. As stated in the Region's Response to the Petition, at § VII.B.1, Region 1 believes that this is a valid request, and it has obtained the material from Stratus and placed it in the record as AR 4068. It is also filed herewith as Exhibit R15.

Beyond the administrative record issue, Petitioner reiterates its complaint that the Region

cited to a figure from its Draft Permit Determinations Document (the "DPDD"), Ex. 4, even though it had acknowledged that certain changes needed to be made to the production foregone analysis that would have changed the figure. This issue is beyond the scope of the issues remanded by the Board, and the Board has already ruled that this does not constitute clear error warranting a remand. *See Dominion* at 267-68. *See also* Response to Petition for Review at § VII.B.2.

Petitioner also repeats its argument that when "corrected for the errors the Region acknowledges it made," the 54 million pounds per year figure from the DPDD "becomes 185,000 pounds." This argument is also beyond the scope of the remand as substantive questions related to this figure were not remanded. Moreover, Petitioner's statement is misleading. Region 1 has *not* acknowledged errors that result in the 54 million pound figure becoming 185,000 pounds. *See* Ex. 2 (RTC) at IV-47 and Vol. II, App. X at 2. The latter is Petitioner's consultant's figure and a figure that the Region has never agreed to. *See Dominion* at 267, n. 320. Stratus's agreement to some of the changes urged by Petitioner's consultants did not, and does not, constitute assent to all the changes that Petitioner claims result in its figure of 185,000 pounds. *See* Response to Petition for Review at § VII.B.2.

In addition, Stratus' revised production foregone figures developed at the time of the Final Permit, as discussed above, *see* Ex. R15, show that there were not major changes to the Region's estimates. At the time of the Draft Permit, Stratus estimated a total production foregone from BPS operations, based on certain intake flow rate assumptions, of approximately 69 million pounds per year. *See* Ex. 4 (DPDD) at 7-124, Table 7.5-10. This is also discussed on page F3-11 and Tables F3-9 and F3-10 of the Brayton Point Station Case Study that Stratus prepared for EPA in support of the Phase II CWA § 316(b) rulemaking and the Permit, and which was incorporated into the administrative record for the Draft Permit by reference in the DPDD. Ex. 4 at 7-137. Region 1 then scaled this value upward or downward based on the intake flow rates that would be associated with different facility operating scenarios. *Id.* at Table 7.5-11. In this fashion, the Region estimated, among other things, that a production foregone of approximately 54 million pounds would result from Petitioner's "enhanced multi-mode proposal," while a production foregone of approximately 3 million pounds would result from converting the facility entirely to closed-cycle cooling. *Id.* (Because of "make-up water" withdrawals, there are still entrainment and impingements losses associated with closed-cycle cooling.)

The production foregone "re-analysis" conducted by Stratus in support of the Region's final permit changed the figure of approximately 69 million pounds of production foregone per year to approximately 51.5 million pounds per year. *See* Ex. R15 at Table 2. Using the latter figure as the starting point, the Region's flow-adjusted figures for different operating scenarios would change by the same proportions. Therefore, the figures would change from approximately 54 million to approximately 40 million pounds per year of production foregone for the enhanced multi-mode proposal, and from approximately 3 million to approximately 2 million pounds per year of production foregone for full closed-cycle cooling. The approximately 40 million pound

figure is still a large value – especially when compared to the 180,000 pound figure cited by Petitioner – and it is of the same order of magnitude as the prior 54 million pound figure. The relative differences among the options also remain identical.

Finally, Petitioner suggests that "[i]t is important that Region 1 provide the corrected production foregone numbers because Region 1 used its uncorrected production foregone estimates in arguing that Brayton Point Station is having an adverse impact on Mount Hope Bay." Petition, Table 1 at 1. While the Region is physically placing the requested numbers in the record, the fact is that these numbers are not of significant importance for the Permit. This is because, as the Region explains in its Response to the Petition, and has explained previously in the record for the Permit, the economic analysis based on these numbers was not ultimately a significant component of the Region's benefits assessment. *See Dominion* at 267, n. 321. *See also id.* at 155; Ex. 2 (RTC) at IV-25 to IV-26, IV-41 to IV-43, IV-47; Ex. 2 (RTC Vol. II), App. A at 1-2. In addition, the Region relied far more significantly on other factors to demonstrate the serious adverse impact that BPS is having on the Mount Hope Bay ecosystem. While the production foregone estimates presented in the DPDD were used as one of several metrics to help depict the differences in entrainment impacts that would result from different intake flow levels associated with different operating scenarios, *see Dominion* at 153-54; Ex. 4 (DPDD) at 7-125 to 7-126, the Region relied more significantly on the collapse of fish populations, the absolute levels of entrainment, and the assessment of population effects to various fish species, including winter flounder, to assess the adverse effects of entrainment on the Mount Hope Bay ecosystem. *See, e.g., Dominion* at 153-55; *see also id.* at 209-13, Ex. 2 (RTC) at IV-21 to IV-23, IV-41 to IV-43; Ex. 4 (DPDD) at 7-109 to 7-125

2. Mount Hope Bay Finfish Declines (Table at pp. 1-3; LMS Report at pp. 5, 17)

Dominion argues that the Region (I) fails to "acknowledge recent studies" from 2003 purportedly showing that Mount Hope Bay and Narragansett Bay are suffering similar rates of decline in winter flounder, windowpane, tautog and hogchoker abundance, and (ii) fails to consider the "Wilcox" trawl survey data allegedly reflecting that Mount Hope Bay and Narragansett Bay have similar abundance levels for those species.

This argument is beyond the scope of the appeal permitted by the Remand Order. *Dominion* at 293-294. It is thus procedurally barred. *See also In re Knauf Fiber Glass, GMBH,* 9 E.A.D. 1, 7 (EAB 2000).

In addition, the Board has already disposed of the differential fish decline issue in the Region's favor. *See Dominion* at 137-138 ("Petitioner claims that although it had submitted information before and during the comment period demonstrating that the fish abundance trends in Mount Hope Bay and Narragansett Bay are statistically similar, the Region failed to adjust its analysis to correct for this information. [citation omitted] Petitioner's statement mischaracterizes the record and, more importantly, fails to demonstrate why the Region's responses to comments on this point were erroneous."). *See also id.* at 210-212 (upholding the

Region's conclusion regarding "the problems it believed to be inherent in the other data sets it considered but did not use, such as the DeAlteris, [footnote omitted] Hilborn, and LMS studies" and the Region's explanation of "deficiencies in Wilcox trawl data."). Thus, the argument should be dismissed.

Petitioner states that a study by another of its consultants, Joseph DeAlteris, has been updated for the company's 2004 and 2005 annual monitoring reports (AR 4032 and AR 4058) and that "the updates support the conclusions of the original analysis." Petition, Table 1 at 2. Petitioner identifies the study in question as DeAlteris *et al.* (In Press). Assuming this characterization of the updates to the DeAlteris material to be accurate – *i.e.*, that the information adds support to an analysis previously submitted by Petitioner – the issue should be considered decided. *See Dominion* at 137-138, 210-212.

To the extent that the specific arguments on the comparative declines in abundance between Narragansett Bay and Mount Hope Bay are new and differ from those made in the original petition for review in any respect, the Petitioner should not be allowed to raise them at this late stage in the proceedings. *See In re Carlota Copper Company,* 11 E.A.D. 692, 729 n. 43, 734-36 (EAB 2004); *Knauf*, 9 E.A.D. at 7. *See also In re BP Cherry Point*, PSD Appeal No. 05-01, slip op. at 15 n. 27 (EAB June 21, 2005) (allowing new substantive issues to be raised after permit issuance "would run contrary to principle that administrative record for a permitting decision is complete at the time of permit issuance").[1]

Petitioner also cites to, and quotes from, two specific documents in this item. The first is so-called "Study #1," which is actually an abstract of a presentation at a conference in the Spring of 2003. This document was created after the close of the public comment period on the Draft Permit, which closed on October 4, 2002. Petitioner did not submit this document either prior to the Region's issuance of the Final Permit in October 2003, or prior to the Region's issuance of its Determination on Remand. Petitioner never submitted it to the Region until the filing of its Petition. "The administrative record in an NPDES permit proceeding is considered complete on the date the final permit is issued." *See Dominion* at 38, *citing* 40 CFR § 124.18(c). *See also*, *Dominion* at 40-41 (declining to consider post-decisional information). This document is not in the administrative record. The document and arguments related to it should be stricken from the record on appeal.

The second item is so-called "Study #2," which is the paper by Petitioner's consultant that is mentioned above – *i.e.*, "DeAlteris *et al.,* In Press." This document is not in the administrative record, and the Region has never seen it. As a result, this document and arguments concerning it should also be stricken from the record on appeal.

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[1] The analysis reflected in this paragraph applies equally to Petitioner's suggestion that the Wilcox trawl data included in the 2006 annual monitoring report (AR 4032) further supports the original conclusion regarding differential abundance levels.

3. Winter Flounder Juveniles—Fish Size, Water Depth and Mortality (Table at pp. 3-4, LMS Report pp. 13-14)

The Region has assented to Dominion's motion to strike this document (*i.e.*, Manderson *et al.* (2004) (AR 4019)) from the administrative record. *See* "EPA Region 1 Assent to Petitioner's Motion to Strike Documents from the Administrative Record" (the "Assent to Motion to Strike"). This issue is thus moot and should be dismissed.[2]

4. Water Flounder Juveniles – Predation and Water Depth (Table at p. 4, LMS Report pp. 10, 19)

Petitioner contends that, based on Meng *et al.* (2005), Petition, Ex. C, thermal discharge from BPS is likely to increase growth rates and, based on Taylor and Collie (2003) (AR 4022), that this will reduce predation mortality (which is, in part, size-dependent). This argument is beyond the scope of the remand and should be dismissed. *See Dominion* at 293-294. *See Knauf*, 9 E.A.D. at 7.

This argument should also be stricken from the record on appeal because it relates to material not in the record. Meng *et al.* (2005) was not submitted to the Region prior to issuance of the Determination on Remand, *see* EPA Region 1's Motion to Strike and Opposition to Petitioner's Motion to Supplement the Administrative Record ("Region 1's Motion to Strike"). In addition, Region 1 has assented to Dominion's motion to strike Taylor and Collie (2003) and removed it from the record. (Taylor and Collie (2003) formerly had been given the administrative record number AR 4022.) *See* Assent to Motion to Strike. *See also Dominion* at 38, 40-41.

Furthermore, as explained in the Response to Petition at § IV.C.2, Meng *et al.* (2005), does not establish that the thermal discharge is likely to increase growth rates for juvenile winter flounder in Mount Hope Bay. The study does not provide information regarding growth rates at various temperatures. Petitioner states that "[t]emperatures during the study ranged to over 26°C," Petition, Table 1 at 4, appearing to suggest that this study collected juvenile winter flounder at temperatures over 26°C and that their growth rates were enhanced. Such an interpretation of the study would be unfounded. The paper only reports that temperatures measured in the study's 2002 sampling ranged from14.4 to 26°C, with an average temperature of 21.4°C, and in the 2003 sampling from 13.4 to 26.4°C, with an average of 20.6°C. The paper does not report the specific temperatures at which any juvenile winter flounder were collected, and it provides no information regarding comparative growth rates and specific temperatures. Therefore, it is not possible to determine the relative growth rates, or abundance of fish, at various water temperatures from the data in Meng *et al.* (2005), including whether any fish at all were captured at temperatures over 26°C.

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[2] Dominion refers to both "Manderson (2004) (AR 4019)" and "Manderson (2005)." The latter reference appears to be a typographical error.

5. Confirmation that Avoidance Rather than Growth is the Basis of Region 1's Biothermal Analysis (Table at pp. 4-5)

This issue is responded to in the Region's Response to Petition at § IV.A, B and C.2.

6. Juvenile Winter Flounder Use of Preferred Habitat (Table at p. 5, LMS Report pp. 14-15)

In its Determination on Remand, the Region stated, "juvenile winter flounder naturally prefer to inhabit the shallow, subtidal areas that predominate in the northern portion of the bay, [and] these areas are particularly susceptible to the effects of the thermal plume given their proximity to the discharge canal and their relatively shallow depth." *See* Ex. R2 (DOR) at 19.

In response, Petitioner argues that juvenile winter flounder are "seeking out the warmest temperatures" in the Bay near the BPS plant rather than avoiding them, citing to beach seine data purportedly showing a comparatively high number of fish collected at 28°C. *See* Petition, Ex. A, Figure 2 (reproducing Figure 10-2 of the Dominion's 2006 annual monitoring report (AR 4032)). Dominion also argues that according to recent beach seine data young-of-the-year abundance was higher in 2006 than in any year since 1993, citing to Petition, Ex. A, Figure 1.

These arguments relate to the selection of the critical avoidance temperature, and thus should be dismissed as beyond the scope of the remand. *See Dominion* at 293-294. *See Knauf,* 9 E.A.D. at 7. The critical temperature threshold for avoidance has, in addition, already been ruled on by the Board in the Region's favor. *See Dominion* at 117-127.

Substantively, Petitioner's reliance on Figure 2 for the proposition that juvenile winter flounder are seeking out warmer temperatures is misplaced. The data set forth in Figure 2 represent a very small percentage of the total available data. Specifically, Figure 2 only presents data from a single year. Moreover, only two samples were conducted at 28°C. This is significant because a fish found at 28°C is not necessarily seeking out that temperature, but may simply be en route to an area of the Bay with a different, cooler temperature. To obtain a more representative picture of the data, Region 1 concludes that a wider set of data should be reviewed.[3] Figure 10-1, also taken from Petitioner's 2006 annual monitoring report, shows data from 1992-2004 and thus presents a more representative data set. *See* Ex. R11 (AR 4032) at p. 10-5. In that graph, the predominant number of sampling events occurred between 20-27°C. The Region consolidated the data in Figures 10-1 and 10-2 to estimate the actual number of fish collected at each temperature. This calculation was simply done by multiplying the average number of winter flounder caught per seine haul estimated from the Petitioner's graphs, by the number of sampling events, resulting in a specific number of fish caught at each temperature. The total number of fish was calculated by summing the values at each temperature. The

[3] It is unclear to Region 1 why Dominion presented only 2005 data and ignored the prior 12 years of data.

percentage of the total catch shown in Attachment A (to this Appendix A to the Response to the Petition) was calculated by dividing the catch at each temperature by the total catch and then multiplying by 100. The curve peaks at 24°C, the critical avoidance temperature selected by the Region, and declines at temperatures higher than 24°C. Less than 2% of the total were caught at 28°C. Thus, it is apparent from a brief review of the historical data provided by Petitioner that fish are not "seeking out" the water with temperatures of 28°C.

Even without this more comprehensive view of the data, the Region still regards the data in Figure 10-2 as consistent with its determination with respect to the avoidance temperature threshold. In Figure 10-2, 66% of fish are found at temperatures below 24°C. Not only has the Region previously supported, and the Board found rational, its conclusion that 24°C represents a reasonable avoidance temperature for juvenile winter flounder, but it bears remembering that, as discussed in Region 1's Response to the Petition at IV.C.1, Petitioner itself previously argued that Casterlin and Reynolds (1982) established an avoidance temperature of 27°C for juvenile winter flounder, which contradicts its present argument that the organisms are attracted to temperatures of 28°C.

The Region also discusses the substantive flaws in Dominion's interpretation of Figure 1 of HDR|LMS Report in the Response to Petition at § VI. The Region notes, however, that the 2006 data described in Figure 1 was not relied upon by the Region in the permitting process and is not part of the administrative record of the permit. Indeed, the Region had never seen Petitioner's new data until it was submitted with the Petition for Review. This data and arguments concerning it should be stricken from the record on appeal, as explained in Region 1's Motion to Strike. *See Dominion* at 38, 40-41.

7. Adult Winter Flounder Temperature Preferences (Table at pp. 5-6, LMS Report p. 19)

In its background discussion of the 24°C critical temperature in the Determination on Remand, the Region stated that adult and older winter flounder are vacating the shallow waters of Mount Hope Bay during the warmer times of the year. Ex. R2 (DOR) at 19. Dominion argues in response that adult winter flounder are not being driven to deeper waters because of higher water temperatures, but instead are exhibiting an evolutionary migratory response triggered by temperatures of 15°C.

This argument regarding the behavior of adult winter flounder in response to warm water temperatures is beyond the scope of the appeal authorized by the Board's Remand Order. *See Dominion* at 293-294. *See Knauf,* 9 E.A.D. at 7.

Moreover, the Board also has already concluded that the Region did not err in its finding of appreciable harm, which included evidence of avoidance of most of the bay by adult winter flounder. *See, e.g., Dominion* at 88, 102.

In addition, as a substantive matter, if adult winter flounder react the same way to

temperature cues as a result of evolution, one would expect to see similar responses at the same depths in adjacent water bodies. As already explained by the Region, however, adult fish are driven out of shallow stations in Mount Hope Bay to deeper water earlier and to a much greater extent than comparable depth stations in Narragansett Bay. *See* Ex. 2 (RTC) III-39 to III-40. *See also* Region 1's Response to Petitioner's "Table 1 ": Alleged Errors on Biological Issues (filed on Dec. 24, 2003, in connection with the original petition for review) at p. 21.

8. Region 1's Avoidance Temperature Data (Table at pp. 5-6, LMS Report pp. 19-20)

Petitioner argues that the Region misinterpreted Rhode Island Department of Environmental Management ("RI-DEM") field data concerning adult and juvenile winter flounder abundance. *See* Ex. R2 (DOR) at 19 (discussing Figures 6.3-2 and 6.3-3 of the DPDD).

The argument relates to the selection of the critical avoidance temperature "threshold effect" observed by the Region and should be dismissed on the grounds that it is beyond the scope of the remand. *See Dominion* at 293-294. *See Knauf,* 9 E.A.D. at 7.

Additionally, the Region's interpretation of the RI-DEM field data concerning juvenile winter flounder has already been decided in the Region's favor by the Board. *See, e.g.,* Dominion at 123-124, n. 150.[4]

See also Response Nos. 6 and 7 above.

9. 22.2 C as a Lower Limit for Avoidance (Table at p. 6-7, LMS Report pp. 12-13)

Petitioner argues that the Region mistakenly set the lower end of the range of potential avoidance temperatures at 22.2°C based on its mistaken interpretation of Olla *et al.* (1969). This argument is beyond the scope of the remand, as it relates to the selection of the critical avoidance temperature, and should be dismissed. *See Dominion* at 293-294. *See Knauf,* 9 E.A.D. at 7.

The issue of whether Olla *et al.* (1969) could reasonably be interpreted to link burrowing behavior and exposure to high temperatures was already raised and responded to during the

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[4] The Board states:

> Petitioner also claims that the Region used data from only two of eighteen stations, and that a consideration of all plots 'shows no correlation between particular temperatures and decreasing numbers.' DEBP Suppl. Br. at 14. However, in light of the Region's conservative approach, which we find technically supportable, it is not surprising that it emphasized the plots containing data showing the lowest temperatures at which the fish appear to avoid. Furthermore, the study cited by Petitioner states that, although for many of the stations abundance of winter flounder increased even as the temperature rose above 24 or 25°, for three stations, the abundance of winter flounder declined 'as water temperature approached or rose above 24°C.' DeAlteris 2002 Analysis at 3.

comment period. *See* RTC at III-28 (discussing its interpretation of Olla *et al.* in connection with burrowing behavior). The Board determined that the Region's treatment of Olla *et al.* (1969) to be rational and supported by the record. *See Dominion* at 121.

Here, Dominion additionally cites to materials (a "working draft" white paper by DeAlteris, Gibson and Skrobe, 2000) not relied upon by the Region in the permitting process and not part of the administrative record of the permit. *See Dominion* at 38, 40-41 (declining to consider post-decisional information). This material and arguments related to it should be stricken from the record.

10. Region 1 Does Not Acknowledge the Importance of Acclimation Temperature (Table at p. 7, LMS Report p. 12)

Dominion argues that the Region fails to account for acclimation temperature, but this argument is directed at the Region's selection of the critical temperature of 24°C, not the selection of the temporal threshold. The argument is thus beyond the scope of the remand and should be dismissed. *See Dominion* at 293-294. *See Knauf,* 9 E.A.D. at 7.

The issue was, in addition, already raised and responded to during the comment period. *See, e.g.,* Ex. 2 (RTC) at III-10, III-12, III-24, III-25; Ex. 4 (DPDD) at 6-34 to 6-35. The EAB specifically upheld the Region's treatment of the acclimation issue in selecting the critical temperature:

> [T]he Region did discuss the issue of acclimation and its differences of opinion with Petitioner over this issue and its applicability to various studies. In fact, the Region addressed this general issue numerous times in its Response to Comments document as well as in its Determinations Document. *See, e.g.,* RTC at III-10, -12, -24, -25; DPDD at 6-34 to -35. Thus, we find that the Region did duly consider and respond sufficiently to comments relating to acclimation, including those relating to the 24.4 [degrees] C value.

See id. at 122.

The Petitioner's reference to Figure 10-1 from the Brayton Point Station 2006 annual report as support for acclimation is unpersuasive. *See* Ex. R11 (AR 4032) at p. 10-5. The Region has never contended that *all* fish will choose to avoid temperatures greater than 24°C, but the scientific literature and field data suggest that a substantial percentage of them will. *See, e.g.*, *Dominion* at 125, n. 151 (discussing Casterlin and Reynolds (1982) and Duffy and Luders (1978)). *See also* RTC at III-11 ("A population is composed of many individuals, all with their own temperature preferences. If one were to study the temperature preferences of this theoretical population, one would find that some individuals are affected at lower temperatures than others;

but as temperatures continue to increase, 100 percent of the individuals are affected."). Even Figure 10-1 demonstrates that a significant majority of fish prefer temperatures of 24°C or below. *See* Response No. 6 above for a more detailed discussion of Figures 10-1 and 10-2 in Ex. R11.

11. Region 1 Acknowledges Knowing Little About Exposure Times that will Elicit Avoidance (Table at pp. 7-8)

In its Response to the Petition for Review, Region 1 refutes Dominion's argument that the Region's acknowledgment of uncertainty implies that there is "no firm scientific foundation" for the five-day threshold. *See* Response to Petition at § IV.B.

12. Three Days as a Baseline Value to Trigger Avoidance (Table at p. 8, LMS Report pp. 6-8)

See Response to Petition at § IV.C.1.

To the extent that Petitioner argues that Casterlin and Reynolds (1982) (AR 385), Ex. R7, cannot be used to establish an avoidance temperature, the argument should be procedurally barred, as once again, the Region notes that the issue of critical avoidance temperature is outside the scope of the remand. *See Dominion* at 293-294. *See Knauf,* 9 E.A.D. at 7. The Region's inquiry on remand was focused on the duration that the critical nursery habitat could exceed 24°C and still reasonably assure the protection and propagation of the BIP, not the 24°C value itself. Dominion should not be permitted to reargue the critical avoidance temperature at this stage in the proceedings.

Dominion refers to and makes arguments based on Petitioner's Exhibit B ("Fish Orientation Behavior: An Electronic Device for Studying Simultaneous Response to Two Variables," Reynolds (1977)), a paper that is not in the administrative record and which the Region had not seen until it was submitted with the Petition for Review. This material and the arguments related to it should be stricken from the record on appeal, as explained in Region 1's Motion to Strike. Region 1 has also responded to arguments concerning Reynolds (1977) in its Response to the Petition, at § IV.C.1.

Petitioner also contends that field collection data rather than laboratory conditions are more useful in determining avoidance temperatures. Petitioner previously took the opposite position. *See* Ex. 33 (AR 3263), Vol. II at I-5 (LMS Response to EPA MA0003654 Determinations Document) ("The traditional way to define thermal tolerances is via laboratory studies."). This new argument has not been preserved for this appeal. *See Dominion* at 141-42 (dismissing new argument presented for the first time on appeal when Petitioner presented the opposite argument in its comments on the permit). In any event, the Region did not rely solely on laboratory studies when establishing the critical temperature exceedance threshold. *See Dominion* at 118-123 (noting that the Region relied on a combination of field and laboratory data and holding such reliance to be reasonable).

Dominion argues that field data from 2005 indicates that "winter flounder were collected at the highest average abundance at levels of 28°C, the highest temperature recorded during summer sampling," citing to Figure 10-2 (also referred to by Petitioner as Figure 2 above), Ex. R11 (AR 4032) at p. 10-6. On the basis of this figure, Petitioner concludes, "[t]his suggests that the 27° value noted by Casterlin and Reynolds (1982) does not represent a strict threshold for avoidance" in their natural environment. The Region never asserted that 27°C represented a "strict" avoidance threshold. It was in fact the Petitioner that took that position. *See* Brief in Support of USGenNE's Appeal of the NPDES Permit for Brayton Point Station, June 7, 2004, at 13, 16 n. 31. *See also Dominion* at 125, n. 151. Individual fish will react slightly differently to different temperatures. Again, the Region has never contended that all fish will choose to avoid temperatures greater than 24°C, but the scientific literature and field data suggest that a substantial percentage of them will. The Region recognized that within any population, individual fish will demonstrate a range of responses. The Region believes it is most prudent to set permit limits that would be protective of the vast majority of fish rather than the exceptions caught at 28°C. *See* Response Nos. 6 and 10 above.

Figure 10-2 also does not show that year-of-the-young winter flounder "typically occupy, and likely seek out," temperatures above 24°C. The Petitioner's interpretation of the data is unwarranted. *See* Response 6 above.

13. Exposure Duration Criterion (Table at p. 9, LMS Report p. 11)

See Response to Petition at § IV.C.3.

Petitioner's argument here references and relies upon Petitioner's Exhibit D, which is not in the administrative record. That document and arguments related to it should be stricken from the record on appeal, as explained in Region 1's Motion to Strike. Region 1 has also responded to arguments concerning Reynolds (1977) in its Response to the Petition.

14. Region 1 Errs in its Characterization of the Casterlin and Reynolds (1982) Methodology (Table at p. 9-10, LMS Report pp. 6, 8)

Petitioner also claims that the Region's assumption that the laboratory experiment in Casterlin and Reynolds (1982) (Ex. R7) was conducted under constant rather than variable temperature conditions led a "fundamental misunderstanding of the study." The Region disagrees. *See* Response to Petition at § IV.C.1.

The only potential relevance of this methodological issue is that the Region used the notion of constant temperatures under laboratory conditions, as opposed to variable temperatures in the bay, as part of its rationale for adjusting the temporal threshold *upward* from three days. Ex. R2 (DOR) at 25, 28. This was based on the theory that the temperatures in Mount Hope Bay would be more variable than were experienced in the laboratory and, as a result, avoidance in the

Bay might not mimic the laboratory exactly. *Id.* Therefore, when Dominion states, "[b]ecause Region 1 misunderstood the study's methods it makes an erroneous comparative statement about the study and the aquatic environment within Mount Hope Bay," Table 1 (Item 14) at 9, it argues against its own interest. The existence of more dynamic temperatures in the shuttle boxes than the Region had thought would, if anything, tend to cut *against* an upward adjustment.

Furthermore, despite the temperature variability in the shuttleboxes, there is still uncertainty involved in translating study results under laboratory conditions to the natural environment, as the Region has maintained. Not only is this generally so, as the Region has explained, *see, e.g.*, Ex. 2 (RTC) at III-28; Ex. 4 (DPDD) at 6-34, but while temperatures varied in the Casterlin and Reynolds (1982) shuttleboxes, as described above, this variation was not specifically designed to precisely mirror the ways that water temperature varies in the real world. Thus, the Region continues to believe that its upward adjustment is reasonable.

Even assuming Petitioner is correct, Petitioner has identified harmless error at most. *See In re City of Moscow, Idaho,* 10 E.A.D. 135, 143, n. 23 (EAB 2001) (Region's mistaken use of a higher design flow (3.6 MGD) to calculate permit limits than provided in the city's permit application (3.5 MGD) harmless error because it benefitted permittee). *See also Old Dominion Electric Cooperative*, 3 E.A.D. 779, 797 (Adm'r, 1992) (petitioners "are in no position to oppose" a decision on an issue that benefitted their interests). The error is also harmless because the Region deemed an adjustment upward appropriate for an independent reason, namely because "the overall effect of avoidance associated with three days of exceedance of the critical temperature cannot be predicted with certainty, though any such avoidance clearly represents some adverse effect and poses an increased threat of indirect mortality." Ex. R2 (DOR) at 25. *See In re Hadson Power 14-Buena Vista*, 4 E.A.D. 258, 278-86 (EAB 1992) (discussing harmless error finding in *Old Dominion*, 3 E.A.D. at 780-82 (reliance on invalid reasoning is harmless error where permit issuer also relied on other reasonable grounds for decision)).

15. EAB Errs in Summarizing Casterlin and Reynolds (1982) Results (Table at pp. 9-10, LMS Report p. 16)

Dominion argues that the EAB inaccurately summarized Casterlin and Reynolds (1982) in stating, "Fish apparently selected temperatures of 24, 25, and 26 [degrees] C for about 4-5% of the time and a temperature of 27 [degrees] C for about 3% of the time." *See Dominion* at 124, n. 151. This argument is beyond the scope of the issues remanded by the Board and, therefore, is beyond the scope of the appeal authorized by the Remand Order.

Moreover, while Petitioner reads the Board's statement to mean that juvenile winter flounder spent a *total* of 4-5% of the time between 24-26°C, rather than 4-5% at each temperature, Region 1 believes that a more reasonable, and more likely, reading of the Board's language is that the fish spent 4-5% of the time at each temperature (*i.e.*, at 24, 25 and 26°C). This reading seems readily apparent when considered against the object of interpretation, the

cumulative frequency graph set forth in Figure 1of Casterlin and Reynolds (1982), which clearly indicates frequencies of between 4-5% at each of these values.

16. Casterlin and Reynolds (1982) Acclimation Temperatures (Table at p. 10, LMS Report p. 14)

See Item 10 above.

17. Thermal Stress Accumulates More Quickly than it Dissipates (Table at p. 10, LMS Report pp. 16-17)

Dominion questions the Region's reliance on Bevelhimer and Bennett (2000), Ex. R18 (AR 3201), to conclude that there is evidence that thermal stress accumulates more rapidly than it dissipates. Petitioner claims that the study's use of this concept was simply an assumption "employed in their mathematical modeling without justification or support from the literature." Yet, Petitioner is incorrect in stating that there is no support in the study for the principle relied upon by the Region regarding stress accumulation and dissipation. In fact, the study expressly cites to specific ecotoxicoligical damage-repair models. Ex. R18 at S213. The models, as summarized in Figure 2 of Bevelhimer and Bennett (2000), include a "recovery delay" component, indicating that the authors believe there may not be a strict correspondence between stress accumulation period and the stress dissipation period. The authors also refer to "an additional effect" of chronic exposure to sub-lethal temperatures that can be stressful but not lethal, and to the fact that "prolonged exposure to nonlethal temperatures causes physiological stress which can reduce a fish's tolerance of high temperatures and ultimately affect population success." *Id.* at S212. Thus, while Petitioner is correct that the authors of the paper assume a particular rate of recovery delay – specifically, that recovery occurs at a rate 25% of that at which it accumulates, *id.* at S213 – the Region did not utilize this particular rate of recovery delay in its assessment. The Region used the general concept and continues to believe this was reasonable based on this scientific paper.

The Region expressly recognized the "unavoidable scientific uncertainty regarding whether particular thermal discharge limits will be sufficient" to assure the protection and propagation of the BIP, *see* Ex. R2 (DOR) at 22, and the "risks to the winter flounder population if the Region erred in its judgment," *see id.* at 29. In light of the fact that the days of critical temperature exceedance exposure will most likely be consecutive under the variance based-limits, the Region was concerned about the effects of prolonged or repeated stressful thermal exposures. *Id.* Although the Region was aware that the science in the area of temperature stress/recovery has not conclusively resolved all questions, the Region decided that it was reasonable to include the concept of recovery lag as one factor among several in its decision-making calculus given the model's implications for the BIP. Thus, the Region explained that, "there is evidence that thermal stress in fish accumulates more quickly than it dissipates (Bevelhimer and Bennett, 2000) (AR 3201), which underscores the necessity of minimizing the duration, frequency and absolute number of exposures to high temperatures." *See* Ex. R2 (DOR)

at 26. In light of the foregoing, limiting the absolute number of exposures was prudent and consistent with the overall reasonably conservative approach adopted by the Region. *Id.*

While Dominion disagrees with the Region's view of the paper, clear error or a reviewable exercise of discretion is not established simply because petitioners present a difference of opinion or alternative theory regarding a technical matter. *See Dominion* at 27-28 (quoting *NE Hub*, 7 E.A.D. at 567).

18. Seven-day Maximum Temperature of 20°C (Table at pp. 10-11, LMS Report pp. 8-9)

Dominion challenges the Region's calculation of the recommended Gold Book criterion for temperature, claiming that the Region's selection of the optimum growth temperature (which is needed to derive the criterion) was unwarranted. Specifically, the Petitioner asserts that the literature on which the Region relies—Rose *et al.* (1996) (AR 4012) and Manderson *et al.* (2002) (AR 4016)—does "not support" that 15°C is the optimum growth temperature for juvenile winter flounder. *Id.* The Region's reliance on two peer-reviewed papers, including the statement in Manderson *et al.* (2002) that "the juvenile growth response to temperature is thought to be unimodal with an optima at approximately 15°C," to derive the optimal growth temperature was reasonable. Petitioner does not recommend an alternative to the one utilized by the Region. As Petitioner confirmed by its literature review, an optimal growth temperature for juvenile winter flounder has not been definitively established, but the Region had a reasonable basis for the temperature it selected for this input to the Gold Book formula. Thus, at most, Petitioner has identified a difference of opinion between its experts and the Region's experts on a technical matter, which is insufficient to demonstrate error. *See Dominion* at 27-28 (*quoting NE Hub*, 7 E.A.D. at 567).

Even if a higher optimal temperature were chosen, Dominion does not state what the effect of that would be on the Region's ultimate conclusion. The Gold Book recommended temperature would still be below the critical avoidance temperature of 24°C so long as the optimal growth temperature is less than 20°C. *See In the Matter of Osborn Heirs Company*, 2 E.A.D. 929, 934-35 (EAB 1989) (denying review for failure to provide explanation of how certain factors that the petitioner argued should have considered would have changed the Region's conclusion). It is worth recalling in this regard that Sogard (1992) and Meng *et al.* (2000) both suggest that highest growth rates in their studies occurred at temperatures less than 20°C (at approximately 18°C). Immediately after citing the optimal growth temperature as 15°C, Manderson *et al.* (2002) itself states, "Young fish exposed to temperatures higher than 20°C in the laboratory show feeding inhibition, lower food conversion efficiencies and slower growth rates than fish exposed to cooler water," citing, *inter alia*, Casterlin and Reynolds (1982). *See also* Ex. 4 (DPDD) at 6-37 and App. A ("Thermal Discharge Mixing Zone Recommendation, Brayton Point Station, Somerset, Massachusetts, July 15, 2002"), p. 21 (discussing Klein-MacPhee (2002), a personal communication, that sublethal effects begin at 20°C). Because the Region has demonstrated that it considered the relevant information and ultimately selected a

rational approach in light of all of that information, the Board should deny review. *See NE Hub.* at 567-68.

19. Effect of Temperature on Growth – Sogard (1992) (Table at p. 11, LMS Report p. 9)

See Response to Petition at § IV.C.2.

20. Effect of Temperature on Growth – Meng et al (2000) (Table at pp. 11-12, LMS Report p. 10)

See Response to Petition at § IV.C.2 and Response No. 4 above.

21. Chronic Mortality (Table at p. 12)

Dominion contends that its use of a three-day exposure to measure chronic mortality "has no relevance to the duration of exposure to elevated temperatures that will elicit an avoidance response." The Petitioner has provided no substantiated basis for its statement. The Petitioner's assertion that three days is a standard duration for chronic exposure is unsupported by the record. *See, contra,* NPDES Permit Writer's Manual at G-3 (defining chronic as a "relatively long period of time, often one-tenth of the life span or more"). The Region believes that it is reasonable to presume that juvenile winter flounder will attempt to avoid waters prior to dying from thermal exposure. Accordingly, it stands to reason that the duration at which chronic mortality occurs is indeed relevant to the duration at which avoidance may occur. The Region continues to believe its limited reference to Petitioner's assumptions regarding chronic mortality as corroborative evidence supporting its selection of a five-day threshold was reasonable.

22. Region 1 Claimed Thermal Impacts (Table at p. 12, LMS Report pp. 17-18)

Petitioner states that it continues to disagree with many of thermal impacts cited by the Region as a basis for its finding of appreciable harm (*i.e.,* nuisance algal blooms, increase in smallmouth flounder, *etc.*). This argument is beyond the scope of the remand and should be dismissed. *See Dominion* at 293-294. *Knauf,* 9 E.A.D. at 7 (EAB 2000). The Board also has already determined no clear error with respect to the Region's finding of appreciable harm, which included evidence of avoidance of most of the bay by adult winter flounder. *See Dominion* at 88, 102.

23. New Information in the Determination on Remand (Table at pp. 12-13, LMS Report pp.)

See Region 1 Assent to Motion to Strike.

24. Recovery of the BIP (Table at p. 13)

In addition, Petitioner references and makes arguments based on its Exhibit A, including new data never seen by the Region until it was filed with the Petition for Review, and Exhibit E. Neither of these documents are in the administrative record and neither had ever been seen by Region 1 until they were filed by Petitioner with its Petition for Review. These materials and arguments based on them should be stricken from the record on appeal, as explained in Region 1's Motion to Strike. In addition, the Region responds to arguments concerning Exhibits A and E in its Response to the Petition for Review, at § VI.

25. Additional Region 1 Responses to Arguments in Petitioner's Exhibit F

Region 1's Response to Petition for Review, §VII.A.2, addresses certain issues raised by Petitioner's Exhibit F. Responses to additional issues raised by Exhibit F are provided here.

All but one of the comments in Petitioner's Exhibit F relate only to what Petitioner refers to as the "EPA guidance." The sole comment that could potentially relate to compliance with MassDEP regulations is as follows:

> [t]he Hatch noise analysis continues to rely on the 56-cell cooling tower scenario based on their "Manufacturer 2" design. This contradicts the Stone & Webster design which calls for a 72-cell cooling tower. The sound level modeling by Hatch has not evaluated a 72-cell tower. A higher number of cooling tower cells will translate into higher sound levels assuming the same reference sound level per cell. The fact that "Manufacturer 1" could not meet the MA DEP limits with several of its mitigation options, and "Manufacturer 2" could only meet the limits with its most extreme mitigation package, should be a cause for concern when it comes to noise compliance for a 72-cell cooling tower.

Petition, Ex. F at 2. This comment relates to Dominion's argument during Petitioner's first appeal, as noted by the Board, that the Region failed to demonstrate that a 72-cell cooling tower array would be able to meet state noise control regulations. *Dominion* at 284. This argument also relates to a comment by Petitioner on the Draft Permit regarding sound levels anticipated from a 72-cell tower. *See Dominion* at 286. In essence, Dominion has argued that because a 72-cell tower is needed, an analysis that does not involve 72 cells cannot establish compliance with the applicable state regulations.

It was unclear to Region 1 whether the Board had actually intended to remand the "72-cell issue." The Region was unsure because it had responded to the issue in its Responses to Comments issued with the Final Permit and had explained (a) why it concluded that fewer than 72 cooling tower cells would be needed, and (b) why it analyzed the 56-cell array in its noise assessment. Ex. 2 (RTC) at IV-85 to IV-88. In responding to the initial Petition for Review, Region 1 also directly responded to "the 72-cell issue" raised by Petitioner. *See, e.g.,* EPA

Region 1 Response to Petition for Review (Dec. 24, 2003) at 56, Table 2, p. 58 (Item 88). The 72-cell issue also was not specified among the issues to be addressed on remand that are detailed on page 287 and in footnote 346 of the Remand Order. *See Dominion* at 287 and n. 346. Nevertheless, the Region addressed this issue again on remand because the Board mentioned it on page 284 of the Remand Order and stated on pages 288 and 293 that on remand the Region needed to address the issues raised by Petitioner on appeal that concerned the Region's noise impact assessment.

On remand, the Region addressed Petitioner's 72-cell argument as follows:

> Region 1 disagrees with the fundamental premise of this argument. As the Region explained in its RTC, at IV-85 to IV-88, Region 1 concluded that significantly fewer than 72 cooling tower cells will be required to convert BPS to closed-cycle cooling and that using 72 cells, as BPS argued was necessary, would likely overstate the sound levels that would result from converting BPS to closed-cycle cooling. Therefore, the Region's assessment was based on the sound emissions from the number of cooling tower cells that the vendors contacted by Hatch actually indicated would be needed to convert BPS to closed-cycle cooling. Region 1 believes this was a reasonable and appropriate approach to the analysis.

Ex. R2 (DOR) at 58-59 (footnotes omitted). Dominion's suggestion in Exhibit F that there should be "concern" over whether or not a 72-cell cooling tower will be able to comply with state noise requirements is a speculative argument that is insufficient to demonstrate clear error by the Region. *See In re Three Mountain Power, LLC,* 10 E.A.D. 39, 58 (EAB 2001) ("[t]he Board will not overturn a permit provision based on speculative arguments"). The Region has explained why the cooling tower array it assessed was appropriate and will likely comply with state regulations, and Dominion has not demonstrated why Region 1's response is inadequate. Instead, Dominion merely restates Stone & Webster's original prediction that 72 cells would be needed without responding to or refuting the specific reasons given by the Region for its conclusion that Stone & Webster had overestimated the number of cooling tower cells that would be needed. *See* Ex. R2 (DOR) at 58-59; Ex. 2 at IV-85 to IV-88. This is not enough to establish an issue warranting review. *See Dominion* at 26-27 ("On appeal, it is not sufficient merely to repeat objections made during the comment period; rather, a petitioner must also demonstrate why the permit issuer's responses to those objections (*i.e.*, the permit issuer's basis for its decision) is clearly erroneous.").

In addition, Dominion's argument in Exhibit F that only certain of the mitigation options considered by the Region appear likely to result in compliance with state noise control standards does not establish an issue warranting EAB review. The Region already identified this fact itself, but also identified the following more salient points: (a) mitigation options *are* available that will likely result in compliance, Ex. R2 (DOR) at 54-56; Ex. R12 (Addendum to the NIA) at 2, 7-9,

11; (b) additional measures may be possible at BPS that would further reduce the facility's overall sound emissions, if necessary or desirable, *id.* at 12; *see also* Ex. R2 (DOR) at 54, 56; and (3) most importantly, the MassDEP reviewed the Region's assessment and concurred that compliance with state requirements was likely. Ex. R2 (DOR) at 42, n. 40, 46, 56; Ex. R4 (AR 4029). At most, Dominion has demonstrated a difference of technical opinion regarding the 72-cell issue, and the Board should defer to the Region on this issue. *See Dominion* at 27-28 (Board typically defers to the Region in cases of bona fide differences of opinion on technical issues).

In its Petition and Exhibit F, Petitioner also raises a number of issues related to an EPA information document entitled, "Information On Levels Of Environmental Noise Requisite To Protect Public Health And Welfare With An Adequate Margin Of Safety" (EPA 550/9-74-004), that was issued in March 1974 by EPA's then-extant Office of Noise Abatement and Control (the "EPA Noise Levels Information Document" or the "EPA Information Document"). Ex. R13 (AR 4001). In its Response to the Petition for Review, at § VII.A.2, Region 1 responds to the issues raised in the Petition regarding the EPA Information Document. The Region's Response demonstrates, among other things, that none of these issues have been preserved for review in the instant appeal. Below the Region further responds to the issues that are raised in Petitioner's Exhibit F.

Petitioner argues that summer sound levels must be used as the baseline for considering the 55 dBA L_{DN} level from the EPA Noise Levels Information Document. Region 1 explains in its Response to the Petition that this is the relevant noise level to consider from the EPA Information Document. The Region's Response to the Petition also explains not only that this issue has not been preserved for review, but that the EPA Information Document is a non-binding information document that imposes no requirements whatsoever on the Region. Here the Region will discuss additional substantive reasons that Petitioner's argument is incorrect.

Hatch collected data in the summer of 2003 merely to provide a point of comparison with the existing data on winter/spring sound levels and to consider the sound level changes that would result in the summer from the addition of cooling towers at BPS. *See, e.g.,* Ex. R12 (Addendum to NIA) at 6, n. 2, 9-11. Hatch focused on the *changes* in sound levels that would occur because – in the absence of extreme levels – it is the *change* in sound levels that is most important for assessing impacts to the public from a new source of sound. *See* Ex. R12 (Addendum to NIA) at 8, 9, 11; Ex. R2 (DOR) 55-56 (predicted changes in summer levels). MassDEP also focuses on changes in sound levels in applying its regulations and policies. *See* Ex. R2 (DOR) at 49 (MassDEP noise control policy focuses on changes in sound levels and pure tones). The results in this case indicated that changed sound levels from adding the power plant, including the air pollution control equipment and the cooling towers, to the summer background levels (without the plant) were likely to have little effect because (a) the changes ranged from 0.5 to 2.5 dBA across the different receptor sites, (b) increases of a sound from 2 to 3 dBA are barely noticeable, and © no pure tone conditions were predicted. *See* Ex. R12 (Addendum to NIA) at 11; Ex. R2 (DOR) 55-56.

For the purpose of applying the state regulations and policies, however, Hatch conducted its analysis of sound level changes using the quieter winter/spring background levels. *See* Ex. R12 (Addendum to NIA) at 6-9; Ex. R2 (DOR) at 55. This was more conservative (*i.e.*, more likely to see noise effects). It was also consistent with both direction received from the state and the approach taken by Petitioner itself in seeking state approval of its new air pollution equipment. *See* Ex. R12 (Addendum to NIA) at 6; Ex. R2 (DOR) at 52, 55.

Hatch then used the same winter/spring measurements as the baseline for comparing predicted sound levels against the 55 dBA L_{DN} level from the EPA Information Document. Ex. R12 (Addendum to NIA) at 9; Ex. R2 (DOR) at 56-57. Hatch explained that the nature of cooling tower noise (steady and produced, at least in part, by falling water) is less likely to provoke complaints, that the 55 dBA L_{DN} would not be exceeded by facility noise at BPS, and that at the sites where that level would be reached or nearly reached, the change in sound levels was so little that it would be unlikely to provoke a change in community reaction. Ex. R12 (Addendum to NIA) at 9; Ex. R2 (DOR) at 57. This analysis was entirely reasonable and the MassDEP identified no problems with it.[5] *See* Ex. R4.

Petitioner's argument that EPA was "incorrect" in concluding that the 55 dBA L_{DN} level from the EPA Noise Levels Information Document would not be exceeded, Petition at 6, turns on the premise that the summer sound levels must be used as the baseline for the analysis. Yet, nothing in the EPA Information Document dictates that result and Petitioner points to nothing that does. *See* Ex. R13 (EPA Information Document). Moreover, using summer baseline levels and applying the 55 dBA L_{DN} level from the EPA Information Document as if it was a strict regulatory limit – which it is not – would defy common sense, as is explained below.

Hatch's summer measurements indicated that background sound levels during summer nights appeared to be significantly higher than during the winter/spring nights due to insect and frog noise (and not power plant noise). *See* Ex. 2 (RTC Vol. II), App. L (Initial NIA) at 3-4; Ex. R12 (Addendum to NIA) at 9-10 and Table 5. The data in Table 5 of the Addendum to the NIA demonstrates that in the summer the existing power plant is adding small levels of sound to the natural background, while the data in Table 6 shows that the future power plant (including existing operations, the new air pollution control equipment, and the new cooling towers) would also add very little to the louder natural summer background.[6] *Id.* at Tables 5 and 6.

Dominion now argues that Hatch should have used its summer measurements as the baseline against which to compare predicted sound levels against the 55 dBA L_{DN} level from the EPA Noise Levels Information Document. Petitioner states that in Exhibit F it has used Hatch's calculated summer levels *without* the power plant as the baseline – *compare* Petition, Ex. F at

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[5] The EPA Noise Levels Information Document states that, ". . . States and localities will approach this information according to their individual needs and situations." Ex. R13 at Foreword - 2.

[6] No new data was collected for these tables. They are based entirely on existing data.

Attachment A (data tables), *with* Ex. R12 (Addendum to the NIA) at Table 5 – and then calculated L_{DN} levels at each monitoring site. Petitioner states that this analysis indicates that 55 dBA L_{DN} will be exceeded at 4 of the 5 receptor locations *even without the power plant.* Pet. for Rev. at 17, Ex. F at 1 ("the existing L_{dn} during the summer is already above 55 dBA"). In other words, the level is exceeded in the summer due to the insects and frogs. All that this succeeds in demonstrating, however, is that if the 55 dBA L_{DN} level from the EPA Noise Levels Information Document was enforced in the manner that Dominion now suggests, then BPS would not be permitted to operate at all, at least in the summer, much less to add new air pollution control equipment (and cooling towers) to the facility.

Region 1 submits that this would be an absurd result and it is plainly not required by the EPA Noise Levels Information Document, much less by federal or state law. This result would be especially absurd given that the state has indicated that, "[b]ased upon a review of Department records, the existing facility has not caused a condition of air pollution due to sound emissions since the coal conversion in the 1980's." Ex. R12 (Addendum to NIA) at 4 and Attachment B1 (MassDEP Conditional Plan Approval for New Air Pollution Control Equipment at BPS), p. 17 of 26. This means that the state has not deemed these sound emissions to be either a nuisance or injurious, or deemed them to unreasonably interfere with the comfortable enjoyment of life or property. *See* Ex. R2 (DOR) at 47 (quoting 310 CMR 7.00 (MassDEP regulation defining "Air Pollution")). Consistent with this, the MassDEP also reported receiving no public comments expressing concern about noise from the new air pollution control equipment during its public review and hearing process on the plan approval for that equipment. *See id.* at 52.

In sum, Petitioner has not identified a clear error of fact or law, or any other issue warranting EAB review. At most, Petitioner has demonstrated a difference of opinion on how best to consider the 55 dBA L_{DN} level from the EPA Noise Levels Information Document in this case. The Board should defer to the Region's reasonable and considered judgment on this issue.

Dominion's Exhibit F also raises three additional technical questions and issues related to the continuous monitoring data collected by Hatch in September 2003. These issues are as follows:

1. Petitioner's consultant questions Hatch's choice of the Home Street/Kenneth Avenue site for collecting continuous monitoring data, suggesting that the site is farthest from the "main BPS stack," that "higher distance from BPS typically translates into lower sound levels depending on what other local noise sources are nearby," and that higher background sound levels have been measured at the Perkins Street site.

2. Petitioner's consultant points out that for Hatch's continuous monitoring work, the L_{90} was estimated rather than directly measured. The consultant states that it is not difficult to conduct such direct measurement and that L_{90} values are "defined as background in Massachusetts" and, therefore, it questions why the L_{90} was not directly measured.

3. Petitioner's consultant questions why Hatch collected data for approximately 21 or 22 hours rather than 24 hours, stating that a full 24 hours is common practice.

None of these issues warrant EAB review.

To begin with, none has been preserved for this appeal. Hatch reported all of the above-mentioned aspects of its continuous data collection effort – the monitoring site, the estimation of L_{90} values, and the 21.5 hours of data collection – in the initial NIA. *See* Ex. 2, App. L at 4, n. 3 and Fig. 2. Yet, Petitioner raised none of these issues in its first Petition for Review. There is no justification for this failure and Petitioner should not now be permitted to raise these issues in its current Petition for Review of the *Carlota Copper*, 11 E.A.D. at 729, n. 43, 734-36; *Knauf Fiber Glass, GMBH,* 9 E.A.D. at 7.

Furthermore, none of these points raises a significant question about the analysis by Hatch or the Region's conclusions. The simple fact is that the continuous measurement data did not play an important role in the review and was collected merely as supplementary information. It was useful to reveal that sound levels increase significantly on a summer evening due to natural sounds (*e.g.,* insects and frogs), but the main analysis done to address state requirements was based on shorter-term monitoring at night. *See* Ex. R7 (Addendum to NIA) at 3-4, 7-9. Not only was this acceptable to MassDEP, *see* Ex. R8, but Petitioner itself also used short-term (winter/spring) night measurements when seeking approval of its proposed new air pollution control equipment. *See* Ex. R7 (Addendum to NIA) at 3-4, 7-9, Attachment B2 at 5-1, 5-3. Indeed, Petitioner reported *no* continuous or summer data at all. *See id.* This belies any implication that such data collection is critical to the review.

A few additional points are also worth making here. With respect to selection of the Kenneth Avenue/Home Street monitoring location, the choice was made because there was an accessible site overlooking the power plant. *See* Ex. 2, App. L (legend for Figure 2). This is not unreasonable. While Petitioner's consultant suggests this would be the quietest site given its distance from the "BPS main stack," the actual data collected by Hatch shows it to have yielded the second highest levels on the night the measurements were taken. *See* Ex. R7 (Addendum to NIA) at 10-11 (Tables 5 and 6). Indeed, the highest L_{DN} values calculated by Petitioner's consultant were for the Kenneth Avenue/Home Street location. *See* Petition, Ex. F at 1 and Attachment A, third page (note: all pages of the Attachment are labeled as "Page 1").

Furthermore, Petitioner's consultant provides distances from various sites to what it refers to as the "main BPS stack," rather than from the cooling tower site as reported in the Hatch report, which are the ones relevant to the cooling tower evaluation. *Compare* Ex. 2, App. L at 7 (table), *with* Pet. for Rev, Ex. F at 2. Petitioner's measurements also present data that is not in the record and it and arguments related to it should be stricken from the record on appeal.

In any event, all of this relates to the continuous data collection only and, as stated above, this data collection is immaterial to the results of the analysis because shorter term data was

collected at *each of the identified receptor sites* and then used for the purpose of evaluating likely compliance with Massachusetts regulations and for consideration in comparison to the EPA sound level. Therefore, even if there was a problem with selecting the Kenneth Avenue/Home Street site for collecting continuous monitoring data, and none has been demonstrated, it would not undermine the Region's conclusions because they were not based on the continuous monitoring results.

Finally, with respect to the questions raised by Petitioner's consultant regarding Hatch's collection of 21.5 (rather than 24) hours of data and estimation of L_{90} values for the continuous data collection, Petitioner demonstrates no reason why either makes any difference for the continuous data collection effort. In addition, as stated above, the continuous data collection was unimportant for the main analysis in any event. Finally, for the shorter term data collection that actually was used in the primary analysis for consideration of Massachusetts requirements, Hatch *did* directly measure (rather than estimate) the L_{90} values. *See* Ex. 2, App. L at 3. In sum, Dominion has identified no issue warranting EAB review.

Attachment A