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

In re: Dominion Energy Brayton Point, LLC (formerly USGen. New England, Inc.) Brayton Point Station	)
NPDES Permit No. MA 0003654	)

PETITION FOR REVIEW

OF NOVEMBER 30, 2006 DETERMINATION ON REMAND ISSUED BY REGION 1

IN RELATION TO NPDES PERMIT FOR BRAYTON POINT STATION

SUBMITTED ON BEHALF OF DOMINION ENERGY BRAYTON POINT, LLC

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I. INTRODUCTION

Pursuant to 40 C.F.R. § 124.19(a) and the Board's February 1, 2006 Remand Order, Dominion Energy Brayton Point, LLC (the "Petitioner," the "Permittee" or "Brayton Point Station") petitions the Board for review of EPA Region 1's November 30, 2006 Determination on Remand (the "Determination on Remand" or "DOR") (AR 4065) and the final NPDES Permit No. MA 0003654 (the "Permit") for Brayton Point Station (AR 3370), which was affirmed by the Determination on Remand.[1] The Board had remanded the Permit to the Region on two substantive and two administrative issues. On the substantive issues, the Board directed Region I (1) either to provide a rational explanation for its selection of five days as the maximum number of allowable monthly exceedances in imposing thermal effluent discharge limits under Section 316(a) of the Clean Water Act or to modify the exceedance value and (2) either to supplement its response to comments with a sufficient rationale for the noise impacts analysis it had generated in relation to its "best technology available" determination under Section 316(b) of the Clean Water Act or to modify the permit requirements. DOR at 293. The first administrative issue had to do with correcting a typographical error regarding the total iron limit. *Id.* The second administrative issue concerned placing the "production foregone re-analysis" into the record. *Id.*

Two of the issues remanded by the Board go to the very foundation of the Permit. If there is no scientific basis for the Region's selection of five days as the maximum permissible duration of warm water temperatures, the Permit limits under section 316(a) are not justified and unnecessarily stringent. Similarly, because "production foregone" is a measure of the impacts of the Station's cooling water intake, if the Region's original estimate of "production foregone" is

[1] Of the two copies of the Determination on Remand sent to the Petitioner by certified mail, the first to arrive was received on December 2, 2006. Under the Board's Rules, the thirty-day period for filing this Petition was extended, first, from January 1, 2007 to January 2, 2007 because of the New Year's Day holiday and, then, to January 3, 2007

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 section 316(b) are unnecessarily stringent.

A petition for review will be granted by the Board where it is demonstrated that the NPDES permit decision was based on a clearly erroneous finding of fact or conclusion of law or if the decision involves an important matter of policy or exercise of discretion that warrants review. 40 C.F.R. § 124.19(a). The Board is the final decisionmaker for EPA, and therefore its review is not governed by traditional principles of judicial deference; rather its "determination is based on [an] independent review and analysis of the issue[s]." *In re Mobil Oil Corp.* 5 E.A.D. 490, 508, 509 n.30 (EAB 1994). Although the Board may defer to a regional office on technical issues, it will do so only if the "approach ultimately selected by the Region is rational in light of all of the information in the record," *In re NE Hub Partners, L.P.*, 7 E.A.D. 561, 568 (EAB 1998), and will not defer "[w]here the agency has failed to exercise its expertise." *Tex Tin Corp. v. EPA*, 935 F.2d 1321, 1324 (D.C. Cir. 1991). Furthermore, in reviewing agency action following remand, a reviewing body such as the Board should apply a greater degree of scrutiny than might otherwise be appropriate in order to ensure that "[t]he agency's action on remand [is] more than a barren exercise of supplying reasons to support a pre-ordained result." *Food Marketing Institute v. Interstate Commerce Commission*, 587 F.2d 1285, 1290 (D.C. Cir. 1978).

As explained below, other than correcting the typographical error, Region 1 has not addressed the Board's concerns in the Determination on Remand. Rather, the Region's determinations on each of the two substantive issues, as well as on one of the administrative issues, that are the subject of the remand are based on clear errors or law and fact and are not

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because of the President's declaration of January 2, 2007 as a Federal holiday. Counsel for the Petitioner confirmed this interpretation of the Rules with the Board on December 29, 2006.

based on substantial evidence in the record. Accordingly, Brayton Point Station requests that the Board grant its petition and review the challenged Permit conditions.[2]

II. FACTUAL AND STATUTORY BACKGROUND

The basic matter at issue in this proceeding is the type of cooling process to be used by Brayton Point Station, a power plant located on the shores of Mount Hope Bay in Southeastern Massachusetts. Like other power plants built before enactment of the Clean Water Act, Brayton Point Station has been permitted to withdraw water for cooling purposes and discharge that water back into Mount Hope Bay, a process known as once-through, open-cycle cooling. The neighboring State of Rhode Island petitioned Region I to modify Brayton Point Station's NPDES permit to impose more stringent limits. After extended proceedings, the Region issued a permit imposing new limits under Section 316(a) on the amount of heat Brayton Point Station could discharge into Mount Hope Bay and under Section 316(b) on the amount of water the Station could take in for cooling purposes. These limits were so stringent that each independently required Brayton Point Station to convert from once-through, open-cycle cooling to closed-cycle cooling.

Region 1 issued the Brayton Point Station Permit on October 6, 2003, the same date on which the Massachusetts Department of Environmental Protection ("MADEP") issued a parallel state permit, which has been stayed pending review of the Permit. On November 4, 2003, Brayton Point Station[3] filed a timely Petition for Review of certain conditions of the Permit (the

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[2] In addition, Brayton Point Station continues to challenge the Permit conditions on all of the grounds set forth in its prior petition.

[3] At the time the petition was filed, Brayton Point Station was owned and operated by USGenNE, Inc. ("US Gen NE"). Effective January 1, 2005, the ownership of Brayton Point Station was transferred from US Gen NE to Dominion Energy Brayton Point, LLC.

"2003 Petition"). In that petition and in further briefing before the Board, the Petitioner identified a variety of errors committed by the Region in the course of issuing the Permit. Brayton Point Station challenged the limits on its thermal discharge set forth in the variance granted by Region 1 under Section 316(a) because, among other grounds, the Region lacked a rational basis for its determination that five days was the maximum permissible duration of a chosen maximum temperature in a portion of Mount Hope Bay's waters. *See, e.g.,* 2003 Petition at 32. Brayton Point Station also argued that the Region had not established that the closed-cycle cooling technology required by the Region's Section 316(b) determination was "best technology available" because of, among other grounds, flaws in the Region's noise impacts analysis. *See, e.g.,* 2003 Petition at 27.

On February 1, 2006, the Board remanded the Permit to Region 1. Although for the most part the Board affirmed the Region, it remanded the final Permit for modification or further explanation of the thermal, five-day threshold criterion under 316(a) and for modification or a demonstration of the sufficiency of the Region's rationale for the noise impacts analysis it had generated in support of its "best technology available" determination under Section 316(b). DOR at 293. The Board also directed EPA to correct a typographical error regarding the total iron limit and place the "production foregone re-analysis" into the record. *Id.* The Region issued its Determination on Remand on November 30, 2006. (AR 4066). The Determination on Remand decided not to allow public comment, affirmed the Region's original conclusions and upheld the 2003 permit. DOR at 1.

III. THRESHOLD PROCEDURAL REQUIREMENTS

The Petitioner satisfies the threshold requirements for filing a petition for review under Part 124:

1. It has standing to petition for review of the permit decision because it presented comments to Region 1 during the public comment period on the permit and because it previously petitioned the Board for review of the final Permit, an appeal that resulted in the Board's issuance of the Remand Order. *See* 40 C.F.R. § 124.19(a). *See also* Comments submitted on behalf of Brayton Point Station set forth at AR 3263, Vols. I & II; US Gen NE Petition for Review dated November 4, 2003. *See also* Remand Order at 294 (indicating that, following a determination on remand, "Petitioner . . . may file an appeal with the Board pursuant to 40 C.F.R. § 124.19.").

2. The issues raised in this petition, to the extent they were reasonably ascertainable during the public comment period, were raised during the public comment period and were the subject of the Remand Order. 40 C.F.R. § 124.13; 40 C.F.R. § 124.19. The Region did not provide a comment period with respect to the Determination on Remand.

IV. SUMMARY OF PROCEDURAL, FACTUAL AND LEGAL ERRORS

On remand, the Region committed both procedural and substantive error. In terms of procedure, the Region has reopened issues beyond those mandated by the Board's remand. As to the issues that were remanded, it supplemented the record with materials favorable to its position while denying the Petitioner and the public an opportunity to participate in the supplementation of the record by way of comment. To the extent the Region's reopening of the record is allowed, the public, the Petitioner, and the scientific community must be given the opportunity to review and comment on the additional materials submitted and the related analysis.

In terms of substance, the Region's conclusions are arbitrary and capricious and not based on substantial evidence in the record but on clearly erroneous findings of fact and conclusions of law. Because the Region agreed that Brayton Point Station was entitled to a

variance under Section 316(a), the issue with respect to Brayton Point Station's discharge of heat is whether that discharge will ensure the protection and propagation of a balanced indigenous population of shellfish, fish and wildlife (the "BIP") as required by Section 316(a). In establishing the Permit limits, the Region chose to look only at a single life stage of a single fish species, juvenile winter flounder. On remand, the Region expressly reiterated that the thermal impacts from which it was seeking to protect juvenile winter flounder were those that would cause them to avoid otherwise preferred habitat. It made this decision after considering and rejecting use as a criterion of the lesser thermal impacts that would inhibit optimal growth. However, the only studies the Region produced to support its position were studies showing only that after prolonged exposure to various warm temperatures, the growth of juvenile winter flounder might be adversely affected. The Region produced on remand no evidence supporting a conclusion that juvenile winter flounder would avoid areas where it had remained warm for five days or that any such avoidance would harm the balanced indigenous population.

Similarly, the issue on remand regarding Brayton Point Station's cooling water intake is whether the Region has provided a sufficient rationale for its conclusion that noise levels resulting from use of closed-cycle cooling likely will not exceed applicable standards and that closed-cycle cooling, therefore, may be considered " best technology available." In addressing this issue, the Region considered both the Massachusetts standard and EPA's own guidance relating to noise and concluded that both likely would be met. At least as to EPA's own guidance, the Region's analysis was incorrect.

Indeed, even the Region's response to one of the administrative issues demonstrates that its Determination does not square with the facts. An important basis for the limitation on the quantity of cooling water the Permit allows Brayton Point Station to take in is a calculation of

the number of pounds of fish "production foregone" as a result of the effects of the Station's intake. "Production foregone" is an indicator of Brayton Point Station's impacts on the environment; if "production foregone" is overstated, the Station's impacts are exaggerated. Brayton Point Station's consultants pointed out in comments on the draft permit that the Region's estimate was grossly inflated by erroneous calculations. In their responses to comments, both the Region and its consultant Stratus Consulting, Inc. acknowledged errors and stated that a re-analysis had been performed, but no re-analysis was placed in the record. The Board, in remanding the Permit, directed Region I to place the "production foregone re-analysis" in the record because it had been evaluated and relied upon by the Region in developing the Final Permit. On remand, the Region placed additional text and tables authored by Stratus in the record, but these additions did not include a "production foregone re-analysis." Accordingly, the only credible estimate of "production foregone" contained in the record is that prepared by the Petitioners' consultants indicating that "production foregone" is approximately $1/300^{th}$ of the erroneous estimate on which the Region based the Permit limits.

Brayton Point Station identified numerous errors in its original Petition for Review dated November 4, 2003. Here, in accordance with the Board's Remand Order, Brayton Point Station limits its challenges to the issues listed in the Determination on Remand. *See* DOR at 294. In this Petition Brayton Point Station enumerates and briefly explains the procedural errors of law and the principal errors of fact. To ensure compliance with the Board's requirement regarding "Specificity of Petition" and to make certain all points are preserved for judicial review, the Petitioner includes as an exhibit hereto and incorporates by reference a detailed table of all of the errors subsidiary to those described herein, as well as technical reports further identifying additional errors committed by the Region. Table 1, Exhibits A and F.

A. THERE REMAINS INSUFFICIENT EVIDENCE IN THE RECORD TO SUPPORT REGION 1'S ARBITRARY FIVE-DAY THRESHOLD CRITERION.

In establishing a thermal limit under § 316(a) for the Brayton Point Station, the Region developed a three-factor equation requiring "that no more than 10 percent of the bay exceeds 24°C for five or more days per summer month" based on the warmest year (1999) in twenty in order to ensure that young winter flounder did not avoid otherwise preferred habitat. DOR at 21; (AR 3346 at III-13; AR 192 at 6-38). The Board's remand found there to be inadequate support in the record for the five-day threshold. *See* Remand Order at 134-135. The Region has not corrected that defect in its Determination on Remand, and it appears unlikely, from the sources EPA cites, that adequate support exists. The available scientific evidence fails to discuss what duration of exposure to elevated temperatures will elicit an avoidance response in juvenile winter flounder or what duration of their avoidance of habitat will result in harm to the BIP. As a result, the five-day analysis EPA puts forth appears to be more of an after-the-fact rationalization, which is a clear substantive error of law.

1. REGION 1'S FIVE-DAY THRESHOLD CRITERION HAS NO BIOLOGICAL BASIS.

The Region focused on avoidance in developing the limits established by the Permit. *See, e.g.,* DOR at 19, 27. (AR 192 AT 6-38, 6-39; AR 3346 at III-11, III-13, III-35). In order to prevent excessive avoidance of important nursery habitat for juvenile winter flounder in the summer, the Region determined that no more than 10 percent of the Bay could exceed 24°C for more than five days. *See, e.g.,* DOR at 19. Although it concluded that the 10 percent and 24°C limitations were acceptable standards, the Board found that the record was inadequate regarding the five-day limitation. *See* Remand Order at 134-135. Region 1 did not correct this deficiency on remand.

None of the scientific literature the Region added to the record provides support for the imposition of a five-day limitation. In fact, the Region itself recognizes the lack of scientific evidence, making the following concession:

> [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.

DOR at 23; *See also* (AR 192 at 6-38; AR 3346 at III-11).

In other words, there is no biological basis for the Region's use of five days as the maximum number of days per month when average temperatures in 10 percent of Mount Hope Bay can be as high as 24°C. The Board recognized in its Remand Order that the Region had provided no such basis. *See* Remand Order at 134-35. Although, on remand, the Region points to a number of studies to justify its selection of the five-day criterion, the justification offered -- that three days and seven days are rational alternatives, but one is a little too low and the other a little too high -- falls short. The scientific literature does not indicate that three days exposure to warm temperatures is an appropriate baseline value to trigger avoidance. Durations of exposure referenced in the scientific literature as producing effects on fish are all seven days or longer, and all relate to effects on growth physiology rather than avoidance. In sum, Region I's process for picking five days as the threshold criterion was arbitrary and is not supported by the record.

(a) The Only Reference In The Record To A Five-Day Period Appears In Materials Relating To State Water Quality Standards.

The only place in which the five-day exceedance threshold appears in the record is in MADEP's mixing zone analysis (AR 192, Appendix A), which was developed to implement state water quality standards. Such a standard is not appropriate for a Section 316(a) variance,

which comes into play only when it is determined, as the Region did here, that water quality standards are more stringent than is necessary to protect the BIP. It is for this reason (1) that at oral argument on the prior petition, the Board questioned counsel for the Region whether there was a basis other than the state mixing zone analysis for the five-day threshold, (2) that Region 1's counsel said there was an independent federal basis for the threshold, (3) that the Board remanded the matter for the articulation of that basis and (4) that on remand the Region cited the mixing zone analysis only as confirmation rather than the basis for the five-day exceedance threshold. See DOR at 26, n. 25. However, the Determination on Remand articulates no other basis.

(b) Three Days Is Not An Appropriate Baseline Value For Exposure Time To Trigger Avoidance.

Region 1 erroneously based its conclusion that three days was an appropriate baseline value for the exposure time necessary to trigger avoidance on a single study performed by Casterlin and Reynolds. *See* Casterlin and Reynolds (1982) (AR 385). A review of that study and a related earlier work by Reynolds makes clear that the results of Casterlin and Reynolds do not support Region 1's conclusion. *See* Reynolds (1977) (Exhibit B).

As a preliminary matter, Region 1's description of Casterlin and Reynolds' methodology indicates a fundamental misunderstanding of the study. *See* HDR/LMS Technical Review (Exhibit A) at 6-8. In that study, each winter flounder was placed for a three-day period into a two-chambered shuttlebox. *Id.*; (AR 385 at 178). Contrary to the Region's statement that the two chambers had a constant temperature, the water in one chamber in fact grew warmer whenever it was occupied by a flounder, and the water in the other grew colder whenever it was occupied. HDR/LMS Technical Review (Exhibit A) at 6-8; Reynolds (1977) (Exhibit B) at 301.

Observations of the fishes' movements between the two-chambers showed that winter flounder voluntarily occupied temperatures between 8°C and 27°C. (AR 385 at 178, Fig. 1).

Contrary to Region 1's conclusion, however, the Casterlin and Reynolds study tests winter flounder's preferred temperatures, not their avoidance temperatures. The study also does not test either preferred or avoidance temperatures over time. *See* HDR/LMS Technical review (Exhibit A) at 6-8. Casterlin and Reynolds did not report the temperature in the warmer chamber when flounder left it to go to the cooler chamber. Nor did they suggest that three days of exposure to warm temperatures affected flounder behavior; three days simply happens to have been the duration of the study. (AR 385 at 178). In fact, the 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. (AR 385). Accordingly, Region 1 erred in relying on the study as "a reasonable basis for concluding that by three days of exposure to the critical avoidance temperature, juvenile winter flounder would likely choose to avoid water at that temperature." DOR at 24.

(c) The Exceedance Frequency Thresholds All Exceed Seven Days And All Are Based On Growth Rather Than Avoidance.

The limits established in the Permit, it is important to keep in mind, are based on avoidance, not growth. Instead of focusing on the time necessary to elicit an avoidance response or the duration of avoidance that would result in harm to juvenile winter flounder, Region 1 relied on guidance documents and scientific literature identifying optimal growth temperatures. *See* DOR at 23. Based on this literature, Region 1 says that an exceedance frequency threshold of seven days or ten days would not protect the BIP. *Id.* at 28.

Region I's conclusions in this regard are clearly erroneous. As an initial matter, Region 1's reliance on growth physiology is arbitrary and inappropriate. *See* HDR/LMS Technical

Review (Exhibit A) at 8-10. The limits established in the Permit are based on avoidance of habitat, not on growth of juvenile winter flounder. Two of the variables in the Region's three-part equation for establishing the limits on the Station's thermal discharge are based on avoidance. Region 1 chose to focus on avoidance rather than growth because, as it indicated in its Determination on Remand,

> 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 effects of small, short-term reductions in growth rates is less clear.

DOR at 19. *See also* DOR at p. 27; (AR 192 at 6-38; AR 3346 at III-11). The Region's attempt to support the Permit limits based on avoidance with literature regarding the biologically distinct function of growth -- a function on which the Region specifically declined to rely on because its effects on the BIP were unclear, should be rejected.

In addition, Region 1 misinterpreted the findings and relevance of the scientific literature. Rather than demonstrating that exposures to temperatures of 24°C or more for longer than five days would likely harm the BIP, the scientific studies on which Region 1 relied found decreasing growth rates only after ten and fifteen-day exposures to temperatures substantially in excess of 24°C. *See* HDR/LMS Technical Review (Exhibit A) at 8-10 (discussing Region 1's treatment of AR 4011 and AR 4013). These growth studies[4] demonstrate that Region 1's 24°C and five-day criteria are overly conservative and are not supported by the scientific literature. Furthermore, these studies made no definitive findings as to whether differences in growth rates were attributable to increased temperatures, differences in habitat or some combination of the two. *See id.* In fact, a more recent study by Meng *et al.*, one of the authors on which Region 1 relies, observed that winter flounder are found in greater abundance in disturbed habitats and, indeed,

[4] Growth inhibition typically occurs at lower temperatures than avoidance. *See* DOR at 19.

that high temperatures can actually enhance juvenile winter flounder growth rates. *See* Meng *et al.* (2005) (Exhibit C) at 1515 ("Currents are less pronounced in coves and upper estuaries, and temperatures tend to be higher, enhancing growth"). *See also* HDR/LMS Technical Review (Exhibit A) at 9-10. While relying on Meng's early work (AR 4013), Region 1 does not cite the author's more recent work.

(d) Region 1's Ultimate Selection of Five Days Is Arbitrary.

In the end, the best the Region can do by way of providing a justification for its five-day exceedance threshold is to say that it is the mid-point between end points of three days and seven days. DOR at 28-29. The problem is that the two end points are irrelevant. The criterion is avoidance, and neither of the end points has anything to do with avoidance. Three days just happens to be the length of a study by Casterlin and Reynolds (AR 385) that did not really test avoidance, much less determine how long young winter flounder could be exposed to warm temperatures before beginning to exhibit avoidance behavior. *See* HDR/LMS Technical Report (Exhibit A) at 6-8. Seven days is the period set forth in EPA guidances that also have nothing to do with avoidance. Rather, these guidances set guidelines, which are not supported by the referenced literature, as to what average temperatures over the course of seven days will likely inhibit growth. A calculation that five is the mean of three and seven may be true as a matter of arithmetic, but it is an arbitrary basis for setting a permit limit that mandates fundamental, extremely expensive changes in the operation of a major power plant.

The Region's attempt to provide a basis for the five-day exceedance threshold is manifestly a post-hoc rationalization for a standard that has no independent scientific basis. Five days is simply the period set forth in MADEP's mixing zone analysis and the longest duration for which the Region had data. In that regard, all of the temperature modeling was performed by

consultants for Brayton Point Station at the Region's direction. Five days was the longest duration that the Region requested to have modeled. See Exhibit D to USGen Reply Brief, July 22, 2004; AR 386.

2. IN CHOOSING A FIVE-DAY THRESHOLD, THE REGION DEPARTED FROM THE AGENCY'S OWN GUIDANCE.

In selecting a threshold of five days, the Region departs from EPA's consistent practice of considering a longer period when evaluating exposure to heat. The Agency's standard references concerning thermal and water quality effects on aquatic life and habitats -- the 1977 guidance entitled *Temperature Criteria for Freshwater Fish: Protocol and Procedures* (EPA 1977) (without appendices, Exhibit D), the Red Book (AR 4035) and the Gold Book (AR 4002) -- use a duration of seven days. Although these documents do not relate directly to a Section 316(a) variance, they are the Agency's own guidance relative to temperature. The Region failed to consider certain of these sources at all. It did consider the Gold Book but rejected the seven-day duration it contains on the ground that this duration shows an effect at a temperature lower than 24°C. That effect, however, is on growth, which occurs at a lower temperature than avoidance. DOR at 27-28. Moreover, it must be kept in mind that the guidance is for compliance with water quality standards, and the Region already has determined that water quality standards establish limits that are unnecessarily stringent for protection of the BIP in Mount Hope Bay. *See, e.g.,* AR 192 at 8-3; DOR at 15. Therefore, 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.

3. ALTHOUGH NOT A REMAND ISSUE, THE REGION MAKES A NUMBER OF ADDITIONAL ERRORS IN ITS ATTEMPT TO BOLSTER THE 24°C CRITERION.

Although the Board did not remand Region 1's decision with respect to the 24°C criterion, in the Determination on Remand the Region made a number of additional erroneous arguments in its attempts to bolster support for the 24°C temperature threshold. For example, the Region continues to fail to consider the well-established phenomenon of acclimation, despite the recognition of this concept in the scientific literature and by the scientists on whom the Region relies, resulting in the application of thermal limits that are unnecessarily conservative and overly restrictive. *See* HDR/LMS Technical Review (Exhibit A) at 7-8; 9-10. The Region also fails to acknowledge sampling results from Mount Hope Bay showing that juvenile winter flounder are inhabiting waters with temperatures as high as 28°C, placing in question the Region's use of 24°C as the temperature which will cause avoidance in juvenile winter flounder. *See* HDR/LMS Technical Review (Exhibit A) at 8, 18. Additional errors are identified in Table 1 and the HDR/LMS Technical Review (Exhibit A).

4. THE REGION ERRONEOUSLY CHARACTERIZES THE RECENT DATA AS TO WINTER FLOUNDER POPULATION.

Recent sampling data contradicts the Region's assertion 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* DOR at 12, n.12. Brayton Point Station has been collecting young-of-year winter flounder in beach seines since 1993. There has been a perceptible increase in the number collected, with data for the current year, which is submitted herewith, showing the highest levels. See HDR/LMS Technical Review at 5 and Figure 1. Moreover, one of the scientists relied on by the Region published an article this year describing recent sampling results in Mount Hope Bay and elsewhere in Narraganset Bay and noting indications of a potential

Health and Welfare With An Adequate Margin of Safety" (the "Levels Document") (AR 4001). *See* DOR at 57 ("Region 1 and Hatch found that [the 55 dBL L_{dn}] level would not be exceeded.") (citing AR 4005 at 9). However, Hatch based this conclusion only on sound level measurements made at relatively quiet times of the year and ignored other, more appropriate measurements made by the Region's own consultant. *See* Epsilon Technical Review (Exhibit F) at 1. The latter measurements indicate that the 55 dBL L_{dn} value would be exceeded at four of the five receptors studied, with sound levels ranging from 54 dBL L_{dn} at New Gardners Neck to 58 dBL L_{dn} at Home Street/Kenneth Avenue and Perkins Street. *See id.* If the limits in the EPA guidance are exceeded, then closed-cycle cooling would not be the best technology available.

C. REGION 1 FAILED TO CORRECT PREVIOUSLY IDENTIFIED ERRORS IN ITS "PRODUCTION FOREGONE RE-ANALYSIS".

The Board's remand included a direction to the Region to place the "production foregone re-analysis" prepared by its consultant Stratus Consulting, Inc. in the record. *See* Remand Order at 293. The Board gave this direction because "the Region evaluated and relied on this document in developing the Final Permit." *Id.* at 268. Brayton Point Station's consultant pointed out that errors in calculations made the Region's original estimates of "production foregone" greatly excessive. When these errors were corrected, the impacts of Brayton Point Station under the constrained operation proposed by the Station for the Permit dropped dramatically. Specifically, the Region's estimate of 54 million pounds per year became 185,000 pounds, $1/300^{th}$ of Region 1's estimate. (AR 3263, Vol. II, Tab 11 at II-19). The Region acknowledged having made errors and stated that those errors had been corrected in a re-analysis of "production foregone" (AR 3347, Appendix X at 2), which inadvertently had not been placed in the record. However, in its response to comments, the Region continued to refer to the

admittedly erroneous estimate of "more than 54 million pounds per year." (AR 3346 at IV-69). Similarly, the Board, while directing the Region to place the reanalysis in the record, also continued to refer to the mistaken original estimate of "about 55 million pounds for Petitioner's proposed approach." Remand Order at 154.

On remand, the Region did not comply with the Board's direction. The Region states that it had placed in the record "a new copy of the complete document, including previously missing attachments." DOR at 2, 5. However, although the additional attachments suggest that a "production foregone re-analysis" was performed, none of them is or contains such a re-analysis. *See* HDR/LMS Technical Review (Exhibit A) at 3. The 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."

D. CLEAR PROCEDURAL ERRORS OF LAW

1. BECAUSE THE DETERMINATION ON REMAND RAISED SUBSTANTIAL NEW QUESTIONS, THE REGION ERRED BY NOT REOPENING THE RECORD.

In remanding the Permit to Region 1 on the 5-day threshold issue, the Board stated that "the Region may have to reopen the record for additional public comment in relation to new material." Remand Order at 135. On February 17, 2006, Petitioner requested that Region 1 "re-open the record and accept public comment." (AR 4023). On April 3, 2006, Region 1 responded, stating that it "had yet to make any decisions about the remanded issues, including whether or not to re-open the record for additional comment." (AR 4024). In the Determination on Remand, the Region stated that it had decided it was not required to provide an opportunity to comment, and, therefore, would not do so. DOR at 30-33; 59-61. The Region's failure to open the record for public comment constitutes clear error.

The relevant regulations provide that if substantial new questions are raised, the Regional Administrator may "[r]eopen or extend the comment period . . . to give interested persons an opportunity to comment on the information or arguments submitted." 40 C.F.R. § 124.14(b). In prior decisions, the Board has recognized the importance of making analyses on which a permit relies available for public comment. *See, e.g., Hawaii Electric Light Co., Inc.*, 8 E.A.D. 66, 102-103 (EAB, November 25, 1998); *In re Knauf Fiber Glass*, 8 E.A.D. 121, 175-176 (EAB, February 4, 1999). Although a decision whether to reopen the record for public comment is to some extent discretionary, reopening the record may be necessary where information relied on or arguments put forth by the Region raise substantial new questions. *See Id. See also In re GSX Services of South Carolina, Inc.*, 4 EAD 451, 465 (EAB, Dec. 29, 1992).

Here, although the Region did not modify the permit limits, the analysis in the Determination on Remand in support of the five-day criterion raises substantial new questions, necessitating a reopening of the record. Specifically, while the Region argued that the Permit limits were designed to prevent "juvenile winter flounder avoidance of important nursery habitat," *see* Region 1 Brief of July 8, 2004 at 19, in seeking to justify the five-day threshold, the Region relied almost exclusively on sources describing the effects of temperature on winter flounder growth rates. *See* DOR at 26-29. The Region's shift from relying on harm to the BIP resulting from winter flounder avoidance as the basis for the permit limits to relying on effects on winter flounder growth is not merely a refinement or rearticulation of Region 1's previous work in support of the Draft or Final Permit, or even a logical outgrowth thereof, but is rather a substantial change requiring a reopening of the record for public comment.

Brayton Point Station is entitled to a meaningful opportunity to review and comment on the Region's reliance on new information before a determination on remand. The failure to

provide an opportunity to comment constitutes clear error. Accordingly, Brayton Point Station asks that the Board reopen the record.

2. THE BOARD SHOULD TREAT PETITIONER'S EVIDENTIARY SUBMISSIONS AS PART OF THE RECORD IN THIS CASE.

Because Brayton Point Station was denied the opportunity to comment on the new analyses contained in the Determination on Remand and the sources added to the administrative record, this Petition provides Brayton Point Station with its first opportunity to respond to these issues. Thus, if the Board does not require that the proceeding be reopened, then Brayton Point Station requests that the Board treat Petitioner's evidentiary submissions as part of the administrative record for this case. *See, e.g., In re Metcalf Energy Center*, PSD Appeal No. 01-7, 01-08 (Aug. 10, 2001), unpublished final order at 22, n.13 (treating "extra-record" evidence that was not considered in the determination and had not been included in the administrative record as part of the administrative record for the case where the appeal before the Board "provided the first opportunity for parties to submit their views" on the analysis).[5]

In the alternative, the Board should consider Brayton Point Station's evidentiary submissions under one of the recognized exceptions to the general rule that the "focal point for judicial review should be the administrative record [] in existence." *Camp v. Pitts*, 411 U.S. 138, 142 (1973). Courts have allowed supplementation of the record on review when they need background information to determine whether all relevant factors were considered because it is often impossible, especially when highly technical matters are involved, for a court to determine whether an agency took into consideration all relevant factors unless it looks outside the record

[5] Petitioner would be willing to waive its procedural challenge related to the Region's failure to reopen the public comment period if it were permitted to present new evidence challenging the Region's analysis during the briefing period. *See, e.g., In the Matter of Three Mountain Power, LLC*, PSD Appeal No. 01-05 (April 25, 2001), unpublished final order at 2.

to determine what matters the agency should have considered but did not. *See, e.g., The Fund for Animals v. Williams*, 391 F.Supp. 2d 191 (D.D.C. 2005); *National Wilderness Institute v. U.S. Army Corps of Engineers*, 2002 U.S. Dist. Lexis 27743 at *9-*12 (D.D.C. Oct. 9, 2002). A court may also look beyond the record if it appears that the agency deliberately or negligently excluded documents that may have been adverse to its decision. *See, e.g., id.*

In this case, review of Brayton Point Station's evidentiary submissions is appropriate as the submissions demonstrate that Region 1 did not include pertinent documents that were adverse to its determination[6] and failed to consider issues that should have been considered by the Region in its Determination on Remand. Alternatively, the attached submissions by Brayton Point Station demonstrate that it was prejudiced by the Region's decision not to provide an opportunity for comment and provide additional support for a remand to the Region with a direction to receive comment.

3. NUMEROUS DOCUMENTS ADDED TO THE RECORD SHOULD BE STRICKEN AS THEY STRAY BEYOND THE SCOPE OF THE REMAND.

The Region committed procedural legal error when it supplemented the administrative record with a number of documents relating to issues other than those remanded. Although on remand, the Region could supplement the administrative record, its authority to do so was limited to supplementation on those issues that were remanded to the Region for further explanation. The administrative record is to contain information that was before the Regional Administrator at the time he made his determination. Permitting the Region to supplement the

[6] For example, Meng (2005) (Exhibit C) is a later study conducted by the same author as AR 4013, on which the Region relies heavily in the Determination on Remand to support its contention that exposure to 24°C for 10 or more days would likely have a significant adverse effect on growth. *See* Determination on Remand at 28. Meng's more recent study, which, having been published in 2005, was available to the Region during the remand proceedings, found that winter flounder densities were highest in coves and upper estuaries and noted that "in coves and upper estuaries, temperatures tend to be higher, enhancing growth." Temperatures during the study ranged to more than 26°C. Meng states: "An estuarine life history – which includes adaptations to fluctuating salinities, temperatures, and dissolves oxygen – also allows winter flounder to exploit many habitats."

record with materials extraneous to the remand would be inconsistent with the Board's instruction that the subject matter of an appeal following the remand proceedings be limited to the "above-listed issues," *see* Remand Order at 294, and would create the unfair and untenable situation where the Region could, as it has attempted to do in this case, add new materials to the record on which the Permittee would be barred from commenting. Such a circumstance would be fundamentally unfair, would violate Brayton Point Station's statutory right to comment and would cause great prejudice to Brayton Point Station.

Accordingly, the Board should exclude from the administrative record the exhibits identified in the motion to exclude or strike filed herewith. The Region discusses these documents solely in relation to the Region's selection of the 24°C temperature threshold. That issue was not remanded to the Region for reconsideration. Therefore, all materials used solely in relation to that issue should be stricken. Brayton Point Station has included its comments on these extraneous materials in order to preserve its arguments in relation to these materials should the Board refuse to strike them from the administrative record.

VI. RELIEF REQUESTED

For all of the foregoing reasons, Brayton Point Station requests that the Board grant it the following relief:

(1) Grant the petition and the motions for leave to file a brief, to supplement the administrative record and to exclude or strike exhibits submitted herewith and conduct a review of the Permit, and

(2) Upon review of the Permit, remand the proceeding to Region I with directions to issue a new permit after (a) reopening the record for public comment and (b) correcting the clear errors of law and fact upon which the Permit is based.

By its attorneys,

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Date: January 3, 2007

Summary of Biological Errors in:
U.S. EPA Region 1 Determination on Remand from the EPA Environmental Appeals Board
Brayton Point Station, NPDES Permit No. MA0003654

Error No.	Topic	Description of Error
1.	**Production Foregone Re-Analysis**	The Environmental Appeals Board (EAB) *Remand Order* directed Region 1 to place the "production foregone re-analysis" performed by one of the Region's consultants (Stratus Consulting Inc.) in the administrative record "[b]ecause the Region evaluated and relied on this document in developing the Final Permit". Region 1 states on page 2 of the *Determination on Remand* (AR 4065) that "the referenced material was inadvertently left out of the administrative record" and on page 5 that "Region 1 has now placed a new copy of the complete document, including previously missing attachments, in the administrative record as AR 4020." AR 4020 is the same memorandum from Stratus Consulting Inc. to Phil Colarusso EPA – New England, labeled as Exhibit X in Region 1's *Response to Comments* (AR 3346) with the addition of certain text and three tables labeled "Commercial Fishing Losses and Benefits at Brayton Point", "Percentage of Total Impacts Occurring to the Commercial and Recreation Fisheries and Commercial Value per Pound for Species Impinged and Entrained at North Atlantic Facilities" and "Recreational Fishing Losses at Brayton Point". However, none of these tables contain estimates, or corrected estimates, of production foregone. It 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. For example, on page 7-126 of the *Determinations Document* (AR 192) Region 1 states "well over 54 million pounds of...nekton production is foregone due to entrainment and impingement" with the Enhanced Multi-mode scenario while in its *Response to Comments* (AR 3346 Comment IV.47, p. IV-69), Region 1 states it "estimated that the loss of non-commercial fish would be more than 54 million pounds per year." However, when corrected for the errors Region 1 acknowledges it made, this value is reduced by a factor of nearly 300, so that 54,000,000 pounds becomes 185,000 pounds (AR 3263, Vol. II, Tab 11, pp. II-19). The "attachment" provided in AR 4020 does not fulfill EAB's expectation (from page 12 of the *Remand Order*) that "[t]he missing 're-analysis' details the production foregone calculations performed by Stratus Consulting Inc. in response to comments pointing out several errors in the initial calculations." The attachment neither details the production forgone calculations nor does it provide the corrected numbers.
2.	**Mount Hope Bay Finfish Declines**	Region 1 states on page 11 and 12 of the *Determination on Remand* that: > Relying on trawl data provided by the applicant, the Region observed that the average abundance of winter flounder, windowpane, tautog and hogchoker amounted to less than 1 fish caught per otter trawl sample. Id. at 6-55. In the case of winter flounder, this represents a 100-fold reduction over historical levels. Region 1's analysis concluded that BPS operations were a significant contributor to the declining quantity of fish in Mount Hope Bay, and moreover, that the facility's thermal plume had adversely affected the habitat in the bay by warming the bay's water to the point that it restricted the movement of the remaining fish by producing temperatures that caused thermal avoidance or

Error No.	Topic	Description of Error
		attraction. Region 1's account does not acknowledge recent studies (Study #1. Rountree and Lynch, 2003, and Study #2. DeAlteris et al., In Press, described below) that have determined that the declines in abundance of winter flounder, windowpane, tautog and hogchoker in Mount Hope Bay are consistent with those in Narragansett Bay, nor does it consider the analyses of Wilcox trawl survey data presented in the Brayton Point Station annual reports which shows that the abundance of each of these species is not statistically different in Mount Hope Bay and Narragansett Bay (see, for example, Chapter 9 of the Brayton Point Station 2005 Annual Hydrological and Biological Monitoring Report, AR 4032). The DeAlteris et al. (In Press) analysis has been updated as part of the 2004 and 2005 annual reports (AR 4032 and AR 4058) and the updates support the conclusions of the original analysis. Study #1: Rountree and Lynch (2003) presentation at the New England Estuarine Research Society (NEERS) Spring 2003 Conference Rountree, R.A[1]. and T. Lynch[2]. [1]School for Marine Science and Technology, UMass Dartmouth, 706 S. Rodney French Blvd., New Bedford, MA 02744; [2]RI Department of Environmental Management, Division of Fish and Wildlife, Marine Fisheries Office, 3 Fort Wetherill Road, Jamestown RI 02835 Spatial and temporal patterns of the fish assemblages in the greater Narragansett Bay estuarine system: is Mt. Hope Bay different? **Abstract:** Winter flounder abundances have experienced dramatic declines throughout the greater Narragansett Bay estuarine system, including within Mt. Hope Bay. However, a controversy has developed as to whether or not the decline has been more severe in Mt. Hope Bay. To address this issue, we chose to use data from the long-term Seasonal Trawl Survey conducted by the Rhode Island Department of Environmental Management (RIDEM). This is the only data set that both encompasses a time frame (1979-2001) that includes the period before and after the decline of winter flounder, and has good spatial coverage of all of the greater Narragansett Bay system, including Mt. Hope Bay. We analyzed the RIDEM Seasonal Trawl Survey data to examined time trends in the abundance of winter flounder and 28 other species from 9 different areas within the greater Narragansett Bay system. No significant difference was found in the decline of winter flounder in Mt. Hope Bay compared to other areas. In fact, the trend for Mt. Hope Bay was intermediate to other areas, with several areas exhibiting stronger decline trend. The fish assemblage was observed to have undergone a dramatic shift from benthic to pelagic species in all areas of Narragansett Bay. This pattern is strongest in the shallow embayments (Greenwich Bay, Sakonnet River, Mt. Hope Bay, Wickford Harbor and upper Narragansett Bay), and weakest in the deep central bay areas. In conclusion, we find that changes in winter flounder abundance and in the fish assemblage between 1979 and 2001 in Mt. Hope Bay are similar to those observed in other parts of the greater Narragansett Bay system, and reflect processes operating on a Narragansett Bay-wide scale. Conference abstracts: http://neers.org/main/library/abstracts/spring03.htm Study #2: DeAlteris et al. (In Press) manuscript in the Northeastern Naturalist Trends in Fish Abundance in Mount Hope Bay: Is the Brayton Point Power Station

Error No.	Topic	Description of Error
		Affecting Fish Stocks? Joseph T. DeAlteris[1], Thomas L. Englert[2] and John A.D. Burnett[2] [1]University of Rhode Island Department of Fisheries, Animal and Veterinary Science Building 50, East Farm Kingston, RI 02881 USA;[2]Lawler, Matusky and Skelly Engineers LLP One Blue Hill PlazaPearl River, NY 10965 USA **Abstract:** Trends in abundance for winter flounder (Pseudopleuronectes americanus),windowpane (Scophthalmus aquosus), hogchoker (Trinectes maculatus), tautog (Tautoga onitis) and scup (Stenotomus chrysops) in upper and lower Mount Hope Bay were compared to trends in Narragansett Bay to assess the effect of natural and anthropogenic stressors including Brayton Point Power Station on Mount Hope Bay fishes during 1972 to 2001. Sources of data included the Rhode Island Division of Fish and Wildlife trawl survey for Narragansett Bay and lower Mount Hope Bay, the University of Rhode Island Graduate School of Oceanography trawl survey for Narragansett Bay, and the Marine Research Inc. trawl and Brayton Point Station impingement surveys for upperMount Hope Bay. Analysis of Covariance and Tukey-Kramer multiple comparison tests were used to evaluate differences in the slopes of transformed abundance indices during 1972-2001 and for two subsets of years, 1972 to 1985 and 1986 to 2001, periods of lower and higher power plant cooling water withdrawals, respectively. Trends in abundance of these species in both upper and lower Mount Hope Bay are not substantively different from those in Narragansett Bay during any of the three time periods evaluated. This is evident through either a high-level visual inspection of the slopes measured for each species, time period, and area or a more detailed inspection of the analysis of covariance results and Tukey-Kramer confidence intervals associated with each slope estimate. Natural and anthropogenic stressors unique to Mount Hope Bay, including Brayton Point Station, have not caused Mount Hope Bay fish stocks to change at rates different from those observed for the same stocks in Narragansett Bay. This supports the conclusion that large-scale factors such as overfishing, climate change, and increased predator abundance are more likely to be the cause of the observed declines in important species such as winter flounder in Mount Hope Bay, as well as Narragansett Bay Citation: DeAlteris, J.T., Englert, T.L. and J.A.D. Burnett. In Press. Trends in Fish Abundance in Mount Hope Bay: Is the Brayton Point Power Station Affecting Fish Stocks? Northeastern Naturalist. 12 (Special Issue 3) Excerpt from Chapter 9, page 9-9 of the Brayton Point Station 2005 Annual Hydrological and Biological Monitoring Report, AR #4032, When catches of the five target species in the Wilcox trawl were compared between Mount Hope Bay and Narragansett Bay, no statistically significant differences were detected among upper Mount Hope Bay, lower Mount Hope Bay and Narragansett Bay during any year [1996-2005] for any of the five species analyzed. A comparison of average catch rates of winter flounder in shallow-water and deep-water tows among the three areas also showed no significant difference within any year.
3.	**Winter flounder juveniles – fish size, water depth and mortality**	Region 1 states on page 18 of the *Determination on Remand* that, Juvenile winter flounder minimize predation mortality by inhabiting shallow water (<2 m). The consequence for juvenile winter flounder of being forced to avoid their preferred shallow water habitat is likely to be increased predation

Error No.	Topic	Description of Error
		mortality.[18] [The footnote referenced in the previous sentence states,] [18]For example, Manderson *et al.* (2004) (AR 4019) examined the use of shallow water by juvenile winter flounder. They found that juvenile size increased with depth; thus the smallest size classes were in waters less than 1 meter deep. Region 1's suggestion that Manderson et al. (2004) found that juvenile size increased with depth is not correct. Manderson et al. (2004) in fact said the exact opposite on page 7, As fish increased in size, the median and range of depth of occurrence gradually decreased. Large fish >35 mm SL were concentrated in habitats ~1 m deep. [And] In May, large flounder were more strongly associated with shallow habitats than small fish. Manderson et al. (2005)'s statements regarding predation are not as definitive as Region 1 suggests and indicate that there is still much unknown about the interaction of habitat, predators and young winter flounder. Manderson et al. (2005) states on page 12 that "[a]lthough summer flounder were more abundant in deeper water where they appeared to represent a predation threat to winter flounder, other observations indicate that the predators use shallow habitats."
4.	**Winter flounder juveniles - predation and water depth**	Region 1 states on page 18 of the *Determination on Remand* that, In addition, in early life stages, newly settled young-of-the-year winter flounder are vulnerable to a number of predators, including sand shrimp (Taylor and Collie, 2003) (AR 4022), green crabs (Fairchild and Howell, 2000) (AR 4015) and summer flounder (Manderson et al., 2004) (AR 4019). The longer the period of time that juveniles stay within a size that is susceptible to predation, the greater the mortality rate from predation. (Able & Fahay, 1998) (AR 692). The Station thermal discharge is likely to promote increased growth during the spring and early summer and may actually decrease the time period for which juveniles are susceptible to predation. Taylor and Collie (2003) (AR 4022) state, Susceptibility to predation then gradually decreases after settlement until a refuge is attained when flounder reach 24 mm TL [total length] (Witting and Able 1995). Thus faster-growing flounder are likely to have a survival advantage because their exposure to the 'mortality window', a period lasting several months characterized by high predator-induced mortality, is shortened. A recent sampling study conducted by Meng et al. (2005)[1] in Narragansett Bay found that winter flounder densities were "highest in coves and upper estuaries regardless of the amount of human disturbance." In explaining this result, Meng et al. (2005) state, "[c]urrents are less pronounced in coves and upper estuaries, and temperatures tend to be higher, enhancing growth." Temperatures during the study ranged to over 26°C.
5.	**Confirmation that avoidance rather than**	While Region 1 says it did not base the five-day criterion on growth, it continually brings discussions of growth into its justification of the five-day criterion. Examples of this inconsistency

[1] Meng, L., Cicchetti, G. and S. Raciti. 2005. Relationships between juvenile winter flounder and multi-scape habitat variation in Narragansett Bay, Rhose Island. Transactions of the American Fisheries Society. 134: 1509-1519.

Error No.	Topic	Description of Error
	growth is the basis of Region 1's biothermal analysis	follow. Region 1 states on page 19 of the *Determination on Remand* that, > 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 is less clear. Region 1 also states on page 27 that "[i]n conducting its 316(a) variance analysis, Region 1 opted to focus on avoidance temperatures rather than temperatures designed specifically to reduce adverse effects on growth." In spite of these statements and others supporting its use of avoidance criteria in developing the thermal limits for Brayton Point Station, Region 1 turns to studies on growth in its attempt to establish a basis for the five-day criterion. In doing so, the Region introduces new references and arguments to the record that deal with growth and not avoidance temperature.
6.	**Juvenile winter flounder use of preferred habitat**	Region 1 states on page 19 of the *Determination on Remand* that, > ...juvenile winter flounder naturally prefer to inhabit the shallow, sandy subtidal areas that predominate in the northern portion of the bay. See Determinations Document (AR #192 at 6-56). However, these areas are particularly susceptible to the effects of the thermal plume given their proximity to the discharge canal and their relatively shallow depth. There is limited dilution available and limited time for the dissipation of heat from the thermal plume between the point of discharge and the nursery habitats. Beach seine collections conducted in the tributaries to Mount Hope Bay show that young-of-the-year (YOY) winter flounder continue to occupy shallow portions of the Bay near the plant throughout the summer (Chapter 10 of AR #4032 and AR 4058). For the most recent year of data analyzed (2005), winter flounder were collected at the highest average abundance levels at the highest temperature recorded during summer sampling (28°C) (AR #4032, Figure 10-2). This suggests that these YOY winter flounder may in fact be seeking out the warmest temperatures and not avoiding them. Average YOY winter flounder beach seine collections in Mount Hope Bay, June-August 1993-2006, show that YOY abundance was higher in 2006 than during any other year in the time series (see Figure 1 of *HDR|LMS Technical Review of: U.S. EPA Region 1 Determination on Remand from the EPA Environmental Appeals Board Brayton Point Station NPDES Permit No. MA0003654. January 2007.*)
7.	**Adult winter flounder temperature preferences**	Region 1 states on page 19 of the *Determination on Remand* that "[t]he permittee's trawl data from Mount Hope Bay indicate that adult and older juvenile winter flounder are vacating the shallow waters during the warmer times of the year (AR 3346, RTC III at 39-40)." (internal footnote

Error No.	Topic	Description of Error
		omitted). Movement of adult winter flounder out of estuaries when temperatures exceed 15°C is well documented by McCracken (1963)[2] and shown to be a universal life history trait for this species that is not in any way unique to Mount Hope Bay. Adult winter flounder movements as related to temperature was fully explored and addressed in AR #3263, Vol. II, Tab 11 (pp. I-4 and I-10). Region 1 has not acknowledged the details provided therein. AR #3263, Vol. II, Tab 11 (p. I-4) shows that it is well documented that adult winter flounder leave shallow shoreline waters when temperatures reach approximately 15°C. This is simply an evolutionary adaptation where 15°C acts as a cue signaling that Mount Hope Bay and other regions such as Narragansett Bay have begun their normal seasonal warming, a cue to which adult winter flounder respond to by moving into deeper ocean waters.
8.	**Region 1's avoidance temperature data**	Region 1 states on page 19 of the *Determination on Remand* that, > The Rhode Island Department of Environmental Management (RI DEM) submitted data comparing winter flounder abundance with temperature (Reitsma, 2002) (AR# 355). The data suggests that winter flounder response to water temperature is fairly dramatic. Figures 6.3-2 and 6.3-3 of the DPDD (AR 192) show that adult winter flounder abundance drops to nearly zero above 15°C and juvenile abundance declines in a similar fashion above 24 or 25°C. The response of these fish are dramatic and indicative of a temperature threshold effect. See Error # 7 as to why Region 1's comments regarding adult winter flounder are not applicable to the avoidance question. AR 3263, Vol. II, Tab 11, p.1-5 details Region 1's misinterpretation of the field data regarding juvenile winter flounder. Furthermore, as discussed in Error #6 above, beach seine collections conducted in the tributaries to Mount Hope Bay show that YOY winter flounder may in fact be searching out temperatures warmer than 24 and 25°C and not avoiding them.
9.	**22.2°C as a lower limit for avoidance**	The EAB states (excerpt from the *Remand Order* on page 21 of the *Determination on Remand*) that "[t]he studies the Region relied on in its selection of a temperature threshold value of 24°C show a range of avoidance temperatures from 22.2°C to somewhere "at or below 27°C." Region 1 states on page 20 of the *Determination on Remand* that "Region 1 decided to rely on a reported value toward the mid-range of the available avoidance temperatures on record." (internal footnote omitted). The reference to the lower limit of 22.2°C is based on misinterpretation of the scientific literature. Region 1 drew from Olla et al. (1969) (AR 532), a paper submitted by HDR|LMS earlier in support of the conservative assumption that, in response to elevated temperatures, winter flounder might burrow in the substrate instead of fleeing. HDR|LMS disagrees with Region 1's supplemental interpretation of the Olla paper—namely, that the burrowing was an artifact of stress derived from the 22.2°C temperature, the temperatures that occurred at the time of the observation. Winter flounder have evolved to be able to hide by quickly burrowing in a shallow soft bottom. As stated

[2] McKracken, F. 1963. Seasonal movements of the winter flounder, *Pseudopleuronectes americanus* (Walbaum), on the Atlantic Coast. J. Fish. Res. Bd. Canada. 20:551-586.

[3] DeAlteris, J., Gibson, M., and L.G. Skrobe. 2000. *Fisheries of Rhode Island*, Narragansett Bay Summit 2000, White Paper, Working Draft.

Error No.	Topic	Description of Error
		in the Fisheries of Rhode Island Narragansett Bay Summit 2000 white paper (DeAlteris, Gibson, and Skrobe, 2000) [*Working Draft*] [3], ...when they are on soft bottom they usually lie buried, all but the eyes, working themselves down into the mud almost instantly when they settle from swimming. Flounders that live on the flats usually lie motionless over the low tide to become more active on the flood, when they scatter in search of food... Though they spend most of their time lying motionless, they can dash for a few yards with astonishing rapidity. It is in this manner that they usually feed, not by rooting in the sand (Bigelow and Schroeder 1953). Thus, winter flounder burrowing is a natural behavior and it is not "brought on" by temperatures in excess of 22.2°C. Based on its misinterpretation of the Olla et al. (1969) study, Region 1 mistakenly assumes that the avoidance temperature range is 22.2°C to 27°C. This error is compounded by the fact that the Region relies on this range to suggest that the 24°C value it used in developing the thermal discharge limits is in the middle of the range of avoidance temperatures. Region 1 should have recognized that avoidance temperature is a function of acclimation temperature and that the 24°C value is not representative of avoidance temperatures over the summer period.
10.	**Region 1 does not acknowledge the importance of acclimation temperature**	Region 1 states on page 22 of the *Determination on Remand* that "[p]redicting thermal effects is a function of species life stage, exposure temperature, and exposure duration and frequency." In this statement and in its thermal analyses, Region 1 continues to disregard the importance of acclimation temperatures despite documents in the administrative record that discuss its importance. For example, Bevelhimer and Bennett (2000) (AR 3201), cited by Region 1 on page 26 of the *Determination on Remand* state that "[i]t is common knowledge that the recent thermal history of a fish acclimates it to higher temperatures, thereby extending its tolerance limit (Parker and Krenkel, 1969; Jobling, 1994)." On page 252 of AR 4010, Coutant (1977) states that "[e]ach species of organism (and often each distinct life stage) has a characteristic physiological tolerance range of temperature as a consequence of acclimations (internal biochemical adjustments) made while at previous holding temperature." and "[t]he tolerance range is adjusted upward by acclimation to warmer water and downward by acclimation to cooler water." On page 255, Coutant (1977) also states that "optimum temperatures (such as those producing the fastest growth rates) are not generally necessary at all times to maintain thriving populations and are often exceeded in nature during summer months." The Gold Book (1986) (AR 4002) states that "[t]he tolerance of organisms to extremes of temperature is a function of their genetic ability to adapt to thermal changes within their characteristic temperatures range, the acclimation temperature prior to exposure, and the time of exposure to the elevated temperature (Coutant, 1972)." Acclimation explains why YOY winter flounder have been collected in Mount Hope Bay at temperatures up to 32°C (Figure 10-1, AR# 4032) and why the 24°C criterion used by Region 1 in its thermal discharge analysis is inappropriate.
11.	**Region 1 acknowledges knowing little about exposure times that will elicit avoidance**	Region 1 acknowledges that it knows little regarding exposure times necessary to elicit avoidance. Region 1 states on page 23 of the *Determination on Remand* that "There is uncertainty...regarding the precise exposure time required to elicit an avoidance response", and, The available scientific literature primarily relied upon by the Region discusses the impacts of temperature from exposure times of 3 to 15 days. This body of work neither establishes (nor speculates as to) the exact duration of exposure to critical temperatures that will elicit an avoidance response or the precise

Error No.	Topic	Description of Error
		duration of avoidance of nursery habitat by juveniles that will result in significant indirect mortality. It is evident from these statements that there is no firm scientific foundation for the 5-day duration selected by Region 1.
12.	**Three days as a baseline value to trigger avoidance**	Region 1 states (page 24) "The scientific literature does, however, provide a reasonable basis for concluding that by three days of exposure to the critical avoidance temperature [24°C], juvenile winter flounder would likely choose to avoid water at that temperature" (internal footnote omitted). Contrary to Region 1's statement, the exposure time required to elicit an avoidance cannot be determined based on Casterlin and Reynolds (1982). A review of the Casterlin and Reynolds' (AR 385) methodology is warranted for this discussion. Casterlin and Reynolds provide the following brief explanation of the testing aquarium in their manuscript: "The fish were tested individually for 3-day periods, in two-chambered versions of Ichthyotron-type electronic shuttleboxes described by Reynolds (1977)." Therefore much of the following description comes from Reynolds (1977)[4]. Casterlin and Reynolds utilized a two-chambered shuttlebox (i.e., two aquaria separated by a narrow opening) where water temperature in the "hot-side" and "cold-side" are regulated by an aquarium heater and refrigerated water, respectively. Fish occupying the hot-side initiate heating of the water in the hot-side, while fish occupying the cold-side initiate cooling of the cold-side. The authors wrote "[t]hus, the temperatures of the "hot-side" and cold-side" chambers are continually either increasing or decreasing in parallel, and the difference between the two is controlled by thermal lag in heat transfer through the constrictions between the hot and cold sides." Each of 16 winter flounder was tested individually for a 3-day period with documentation of their occupation of the range of temperatures observed in the shuttleboxes. Results are summarized in Fig. 1 of Exhibit 8 to the *Determination on Remand.* Casterlin and Reynolds (1982) characterize the data in Figure 1 as "Pooled data for all the fish were used to construct a relative frequency distribution of voluntarily occupied (self-controlled) or preferred temperatures" suggesting that no avoidance occurred within the temperature range, 8 to 27°C selected by the fish. In fact the fish tested spent a total of 16% of the three day study period at temperatures of 24°C or greater. However, an avoidance temperature, and thus an avoidance response, was not measured in the experiment conducted by Casterlin and Reynolds (1982). Instead, they measured temperatures selected by the test subjects over a three day period after acclimation for two weeks or more at temperatures of 15-17°C. Actual collections of juvenile winter flounder in Mount Hope Bay, where these fish are forced to compete for food, avoid predation, and adjust to other factors, are more useful in determining potential avoidance temperatures. Beach seine collections of young-of-the-year-winter (YOY) winter flounder conducted in the tributaries to Mount Hope Bay provide a better context within which to examine potential avoidance temperatures. These data show that YOY winter flounder in Mount Hope Bay typically occupy, and likely seek out, temperatures well above 24°C. For example, for the most recent year of data analyzed (2005 collections), winter flounder were collected at the *highest* average abundance levels at 28°C, the highest temperature recorded during summer sampling (see AR 4032, Figure 10-2). This suggests that the 27°C value noted by Casterlin and Reynolds (1982) does not represent a strict threshold for avoidance of juvenile winter flounder interacting with their natural environment and therefore an avoidance response was not observed in the study.

[4] Reynolds, W.W. 1977. Fish orientation behavior: an electronic device for studying simultaneous responses to two variables. J. Fish. Res. Board Can. Volume 34: 300-304.

Error No.	Topic	Description of Error
13.	**Exposure duration criterion**	Region 1's five-day criterion relies in large part on the assumption that three days exposure is sufficient to trigger avoidance. However, as discussed above, Casterlin and Reynolds (1982) does not support this concept. HDR|LMS conducted its own review of existing 316(a) guidance documents and other associated EPA water quality documentation to determine if they provided any guidance regarding the period of time that should be considered for frequency of exceedance of thermal limits or the time to elicit an avoidance response. The following two documents were found to contain relevant information with respect to exposure temperature frequency and duration. A summary of the relevant statements from each document is provided below. USEPA (1977) Temperature Criteria for Freshwater Fish: Protocol and Procedures[5] - This EPA protocol recommends a mean temperature value (expressed as the maximum weekly average temperature) that is designed to protect critical life stage functions such as spawning, embryogenesis, growth, maturation and development. The maximum weekly average temperature (MWAT) parameter is defined on page 10 as "the mathematical mean of ...daily temperatures over a 7-day consecutive period." "Redbook" Quality Criteria for Water (USEPA 1976)6 – On page 420 of this document EPA states, "For any time of the year there are two upper limiting temperatures for a location...one limit consists of a maximum temperature for short exposures...the second value is a limit on the weekly average temperature..." This weekly average water temperature is the value to be used for comparison to long-term non-lethal thermal limits like Criterion 2, the "critical temperature", in Region 1's thermal analysis for BPS. Similar to Region 1's review of guidance documents, the one performed by 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 thermal limits for sublethal effects.
14.	**Region 1 errs in its characterization of the Casterlin and Reynolds (1982) methodology**	Region 1 states on page 24 of the *Determination on Remand* that, > Casterlin and Reynolds (1982) (AR 385) conducted a lab experiment which allowed juvenile winter flounder to select their preferred water temperature in a series of constant temperature shuttleboxes. Temperatures within any individual shuttlebox did not vary. And on page 25, "The temperatures in the study's shuttleboxes were maintained at constant levels, whereas the water temperatures in Mount Hope Bay will fluctuate somewhat over the course of a day." Region 1's characterizations of the Casterlin and Reynolds (1982) methodology are not correct. See Error #12 for detailed description of Casterlin and Reynolds (1982) methodology. Because Region 1 misunderstood the study's methods it makes an erroneous comparative statement about the study and the aquatic environment within Mount Hope Bay.

[5] This document is cited on EPA's webpage (http://www.epa.gov/waterscience/criteria/wqcriteria.html) titled "Current National Recommended Water Quality Criteria," as footnote "M" under "Non Priority Pollutants."

[6] This document was cited on page B-21 of the *November 2001 USGenNE 316(a) and (b) Demonstration*, as well as on the above noted EPA webpage.

Error No.	Topic	Description of Error
15.	**EAB errs in summarizing Casterlin and Reynolds (1982) results**	The EAB is quoted on page 25 of the *Determination on Remand* as summarizing Casterlin and Reynolds (1982) as "[f]ish apparently selected temperatures of 24, 25, and 26°C for about 4-5% of the time and a temperature of 27°C for about 3% of the time." In the Casterlin and Reynolds study, winter flounder selected temperatures of 24, 25 and 26°C a total of approximately 13% of the time (approx 4.2 to 4.8% for each degree within this range), not 4-5% of the time.
16.	**Casterlin and Reynolds (1982) acclimation temperatures**	In its interpretation of Casterlin and Reynolds (1982) Region 1 does not account for the effect of acclimation temperature on the study results. The fish studied by Casterlin and Reynolds (1982) were acclimated to 15-17°C, well below the summertime ambient temperatures in the portions of Mount Hope Bay and adjacent waters uninfluenced by the thermal plume. They observed that approximately 16% of the fish sought out temperatures of 24 to 27°C, 7 to 12°C above their acclimation temperature. This suggests that the fish were seeking out warmer water than the fish were acclimated to. As pointed out by Bevelhimer and Bennett (AR 3201), Coutant (AR 410) (See Error #10 for details), tolerance temperatures are a function of acclimation temperature. Figure 2-2 of Appendix B of the BPD 316 (a) and (b) Final Demonstration shows that avoidance for winter flounder acclimated to 15-17°C is 26-27°C. Thus, the Casterlin and Reynolds (1982) results support the tolerance line in Figure 2-2, not the single value avoidance temperature, of 24°C used by Region 1.
17.	**Thermal stress accumulates more quickly than it dissipates**	On page 26 of the *Determination on Remand*, Region 1 relies on Bevelhimer and Bennett (2000) to support their claim that "thermal stress in fish accumulates more quickly than it dissipates (Bevelhimer and Bennett, 2000) (AR 3201)". This concept is simply an assumption that Bevelhimer and Bennett (2000) employed in their mathematical modeling without justification or support from the literature. Bevelhimer and Bennett (2000) wrote "[f]or this demonstration, we assume that Z = 0.25; therefore, recovery occurs at a rate 25% of that at which it accumulates." The authors also acknowledged little is known on this topic when they wrote, > One aspect of stress accumulation of which little is known is stress recovery when exposure to high temperatures is removed. The temperature at which recovery occurs, the rate of recovery, and the length of time for full recovery are largely unknown. [And] The effects of fluctuating temperature regimes on temperature tolerance, thermal stress accumulation and recovery, and growth are still largely a mystery.
18.	**Seven-day maximum temperature of 20 °C**	On page 27 and 28 of the *Determination on Remand*, Region 1 references an equation contained in the Gold Book (1986) (AR 4002) to determine "that if the 24°C critical avoidance temperature is exceeded for seven days in a month, and those seven days would be consecutive, then the weekly average temperature for that week would substantially exceed the Gold Book's suggested value of 20°C for avoiding excessive adverse effects on growth". The Gold Book (1986) does not "suggest" the temperature value of 20°C, but instead provides an equation for which Region 1 provided input values. Region 1 attempts to apply this equation and references Rose et al. (1996) (AR 4012) and Manderson et al. (2002) (AR 4016) as sources for an

Error No.	Topic	Description of Error
		optimum growth temperature of 15°C. However, Rose et al. (1996) conducted a modeling study and provides no data on optimum growth.[7] Manderson et al. (2002) reference the same Rose et al. (1996) modeling study and Armstrong (1995)[8]. Armstrong (1995), however, studied the effect of salinity on winter flounder growth and also does not provide optimum growth temperatures. None of the references support the contention that 15°C is the optimum growth temperature for juvenile winter flounder. This confirms our prior search for such information and our statement on page 4-14 and 4-15 of the AR 555 that "the literature does not provide any data on winter flounder optimal growth temperatures." Region 1's analysis is thus incorrect because: 1) there appears to be no evidence that 15°C is the optimum growth temperature for juvenile winter flounder, and 2) growth physiology should not be used to justify the duration of an avoidance response nor a threshold temperature based on avoidance.
19.	**Effect of temperature on growth - Sogard (1992)**	Region 1 states on page 28 of the *Determination on Remand* that "Sogard (1992) (AR 4011) 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." Sogard (1992) does not support this statement. Sogard (1992) states that "warmer water temperatures in Little Egg Harbor could have been detrimental to winter founder growth in late June experiments." The average temperature for this experiment is reported in Sogard's Table 3 as 26.4 - 26.5°C, not 24°C. Furthermore, Region 1's reliance on growth studies is inconsistent with its thermal discharge analysis which is based on avoidance (as discussed in Error #5).
20.	**Effect of temperature on growth – Meng et al (2000)**	Region 1 states on page 28 of the *Determination on Remand* that "Meng et al. (2000) (AR 4013) measured growth rates in caged juvenile winter flounder in Rhode Island coastal lagoons and suggested that temperatures greater than 25°C negatively affected growth in experiments ranging from 10-15 days." Meng et al. (2000) reported that winter flounder growth was lowest at the Green Hill site in the third experiment, when temperatures exceeded 25°C. Importantly, Meng et al. (2000) also state that "Green Hill differed from the other ponds in size, flushing rate, and salinity, but it is likely that the high temperatures affected growth." Due to the uncontrolled nature of the experiment and the significant differences in habitat where the juveniles were caged, no definitive statement can be made regarding the effect of temperature on growth in this study. In a more recent paper, Meng et al. (2005)[9] state that winter flounder densities were highest in coves and upper estuaries regardless of the amount of human disturbance. In explaining this result,

[7] Rose et al. (1996) does not support the 15°C value. Rose states that metabolic losses consist of a "routine component which depends on weight and temperature and an active component" and "On the basis at which metabolic rates were reported ,T_r is set to 15°C for juveniles." In other words, Rose et al. (1996) uses the 15°C value in one of his equations because that is the temperature at which the routine metabolic rate (metabolism when the fish is not constantly swimming but only spontaneously active) was reported in Voyer and Morrison (1971) (Voyer, R.A. and G.E. Morrision. 1971. Factors Affecting Respiration Rates of Winter Flounder (*Pseudopleuronectes americanus*). J. Fish. Res. Board Can. Volume 28: 1907-1911.). In their discussion of 15°C, Voyer and Morrison (1971) refer to the fact that McCracken (1963) did not find adult winter flounder in waters having temperatures greater that 15°C.

[8] Armstrong, M.P. 1995. A comparative study of the ecology of smooth flounder *Pleuronectes putnami* and winter flounder *Pleuronectes americanus* from Great Bay, New Hampshire. PhD dissertation, University of New Hampshire.

[9] Meng, L., Cicchetti, G. and S. Raciti. 2005. Relationships between juvenile winter flounder and multi-scape habitat variation in Narragansett Bay, Rhose Island. Transactions of the American Fisheries Society. 134: 1509-1519.

Error No.	Topic	Description of Error
		Meng et al. (2005) state "Currents are less pronounced in coves and upper estuaries, and temperatures tend to be higher, enhancing growth." Temperatures during the study ranged to over 26°C.
21.	**Chronic mortality**	Region 1 states in footnote 27 on page 29 of the *Determination on Remand* that "[i]t is worth remembering that the company's own consultants began to record levels of chronic mortality in juvenile winter flounder occurring after only a three-day exposure (albeit under less stringent discharge conditions than those contemplated by Region 1's 316(a) variance). Supra at IV.A.b.4." HDR|LMS evaluated chronic mortality after 72 hours of exposure which is a standard and accepted approach when testing for mortality. This has no relevance to the duration of exposure to elevated temperature that will elicit an avoidance response. Avoidance is a much different response in that it can be influenced by a multitude of factors. For example, as pointed out on page 265 of Coutant (1977) (AR 4010) an interesting aspect of ongoing research is "determining under what conditions temperature selection is the major factor affecting distribution and under what conditions other factors (like habitat, feeding, avoidance of predators and other factors) interfere with temperature selection and they become the principal factors."
22.	**Region 1 claimed thermal impacts**	On page 11 of the *Determination on Remand*, Region 1 states that, > The numerous adverse, thermally related impacts and ecosystem changes experienced in Mount Hope Bay and contributed to by BPS were summarized by the Board as follows: According to the Region, the most obvious and least contested of these are: negative effects on the phytoplankton (i.e., absence of normal winter-spring phytoplankton bloom, appearance of nuisance algal blooms), increased abundance of certain animal species in the bay (i.e., increased abundance of smallmouth flounder, overwintering of striped bass and bluefish in the discharge canal, and overwintering of the ctenophore (*Mnemipsis leidyi*), and decreased abundance of certain fish (i.e., thermal avoidance of most of the bay by adult winter flounder). Each of these issues has already been addressed in detail in the Administrative Record and shown to be either unsupported by evidence (i.e., nuisance algal blooms, increase in smallmouth flounder and striped bass) (Page 55, 64 and 62-62, respectively, AR 3263) overstated (i.e., bluefish) (Footnote 117 on page 64, AR 3263), conjecture (i.e., ctenophore blooms) (Page 54, AR 3263; LMS, 2002), or baseless (i.e., avoidance by adult winter flounder) (See Error #7).
23.	**New Information in the *Determination on Remand***	Region 1 states on page 31 of the *Determination on Remand* that, > The analysis on remand has neither raised nor has to deal with any substantial new questions or issues. Rather, the Region has re-evaluated the same issues and questions assessed and discussed previously. The Region's analysis on remand also has not involved the collection of new data. Rather, it has involved the reconsideration of existing information. While the above may be true, Region 1 did add a number of documents to the Administrative Record, via the *Determination on Remand* (e.g., Rose et al., 1996 [AR 4012], Manderson et al., 2002 [AR 4016]), that are referenced in support of the remanded five-day criterion. In support of other criterion within their thermal discharge analysis, Region 1 references studies that were not published until after the Draft Permit was issued and therefore could not have been used to develop the criteria. For example, Manderson et al. (2004) (AR 4019) and Taylor and Collie (2003) (AR

Error No.	Topic	Description of Error
		4017) were not available at the time the Draft Permit was issued, yet Region 1 cites to these documents on page 18 of the *Determination on Remand* to support its 24°C thermal discharge criterion.
24.	**Recovery of the BIP**	Region 1 states in footnote 12 on page 12 of the *Determination on Remand* that "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 sing of recovery." In fact, YOY winter flounder in Mount Hope Bay – the species and life stage on which Region 1 bases its summertime criterion, are currently exhibiting evidence of a possible recovery. As shown in Figure 1 of *HDR|LMS Technical Review of: U.S. EPA Region 1 Determination on Remand from the EPA Environmental Appeals Board Brayton Point Station NPDES Permit No. MA0003654. January 2007.*, since 1993, the June-August index of abundance for YOY winter flounder has increased by an order of magnitude without any change in plant operation over the last decade. This trend is consistent with Narragansett Bay-wide trends noted by Gibson et al. (2006)[10] who state "The abundance of 'young-of-the-year' winter flounder (Age 0) has increased in Narragansett Bay shallows based on DFW beach seine surveys." and "It may be that Bay conditions have recently changed such that the survival of young-of-the-year winter flounder has improved. This could be evidence of the beginning of a recovery."

[10] Gibson, M., Lazar, N., Lynch, T., and J.C. Powell. 2006. How Are the Fish Doing? 41 N. A publication of the Rhode Island Sea Grant and University of Rhode Island Coastal Institute. Volume 3(1).