VII. Miscellaneous Comments

Response #: VII.1	**Document #**: 1000, 1001, 1005, 1007, 1009, 1013, 1014, 1015, 1017, 1018, 1020, 1021, 1022, 1023, 1024, 1025, 1027, 1030, 1031, 1032, 1034, 1036, 1040, 1041, 1042, 1044, 1045, 1046, 1048, 1049, 1050, 1051, 1052, 1055, 1057, 1058, 1059, 1060, 1061, 1065, 1068, 1070, 1073, 1076, 1083, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1097, 1098, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1134, 1135, 1136, 1137, 1138, 1140, 1141, 1142, 1143, 1144, 1147, 1149, 1150, 1151, 1153, 1156, 1157, 1164, 1165, 1166, 1167, 1168, 1177, 1179, 1181, 1183, 1188, 1192, 1194, 1195, 1197, 1199, 1200, 1206, 1207, 1208, 1211, 1212, 1213, 1226, 1229, 1231, 1232, 1233, 1234, 1235, 1237, 1238, 1241

Comment
EPA received approximately 123 general or rhetorical comments on the Draft Permit. Many of the commenters offered their personal support of the Draft Permit conditions. A minority of the commenters personally opposed the Draft Permit's conditions in general terms.

Response
These general comments have been considered.

A. Legal

Response #**: VII.2- 9**	**Document #**: 1218

2. Comment
PG&E-NEG stated that BPS is not responsible factually or legally for the fishery decline in Mount Hope Bay. It stated that the CWA does not direct that permit limits be set at levels needed to "bring the fish back" but, rather, to ensure that operations (1) will not cause "appreciable harm" under CWA § 316(a), and (2) will prevent "significant adverse environmental impacts" under § 316(b). The permittee states that EPA has designed the permit conditions to try to bring back the fishery and to allow the relaxation of fishing restrictions, and that EPA has created a unique standard of law to apply only to BPS and that is unsupported by applicable facts or law.

Response
EPA has responded to these points elsewhere in this document, but reiterates some of that discussion below.

Consistent with the overarching purposes of the CWA, a goal of this permit is indeed to help give the fish populations in Mount Hope Bay a chance to recover. This goal does not, however, provide the legal basis for the permit limits. As discussed in EPA's July 22, 2002, Permit Determinations Document and elsewhere in this response to comments, the limits in the permit have been determined in accordance with the requirements of CWA §§ 316(a) and 316(b), and applicable State water quality standards, and need no further justification. EPA has, however, determined that the limits in this permit are likely to help restore the fishery as well.

Under CWA § 316(a), thermal discharge limits must be sufficient to assure protection and propagation of a "balanced indigenous population of shellfish, fish, and wildlife in and on that body of water." See July 22, 2002 Permit Determinations Document, § 6.2. It is true that EPA regulations addressing § 316(a) determinations for existing plants allow a permittee to meet this standard by a showing of no "appreciable

harm" from past thermal discharges. Ultimately, however, the question is whether protection and propagation of the BIP will be assured in light of the various other stressors that might exist. If the thermal discharges have caused no appreciable harm in the past, it is at least likely that they should assure protection and propagation of the BIP in the future. On the other hand, if the discharges have caused appreciable harm, then the discharge does not satisfy CWA § 316(a). While there may be many types of such "appreciable harm," EPA believes that when a discharge causes or contributes to the decline of a fishery, then it has caused appreciable harm and would not assure protection and propagation of the BIP (cumulative impacts must also be considered in this evaluation). Furthermore, if the discharge will cause or contribute to the prevention of the recovery of the BIP, that would also mean that it does not assure the protection and propagation of the BIP (and that it will not cause appreciable harm). An applicant could also fail to carry its burden under CWA § 316(a) without any demonstration on EPA's part that the applicant's discharge will prevent the recovery of a fishery. This is because there are other types of appreciable harm, as discussed in Chapter 6 of EPA's July 2002 Permit Determinations Document, and the burden is on the applicant to show that its discharge **will** assure protection and propagation of the BIP.

EPA has concluded that BPS's past thermal discharges have caused appreciable harm to the BIP. Furthermore, EPA rejected the § 316(a) variance-based limits proposed by the permittee because the Agency was not convinced that they were stringent enough to assure the protection and propagation of the BIP in Mount Hope Bay. In this Final Permit, however, EPA has established limits under § 316(a) that do assure the protection and propagation of the BIP.

The permittee cited *In the Matter of Public Service Company of Indiana, Inc., Wabash River Generating Station, Cayuga Generating Station*, in support of its interpretation of the CWA and the appreciable harm standard. (1 EAD 590 (November 29, 1979)) This case, however, simply reaffirms EPA's conclusions—i.e., that where past discharges have caused "appreciable harm," the statutory requirement of protecting the BIP has not been met and further thermal effluent reductions are needed.

CWA § 316(b) requires that the design, location, construction and capacity of CWISs reflect BTA for minimizing adverse environmental impacts. That being said, if the intake causes or contributes to a fishery decline or prevents the recovery of a BIP, these would be important **adverse environmental impacts** that must be minimized. They would not, however, necessarily be the only adverse impacts that must be addressed. Other impingement and entrainment effects must also be minimized. As discussed in the July 22, 2002, Permit Determinations Document and elsewhere in this response to comments, the mandate of CWA § 316(b) is not limited to requiring only that "significant" adverse impacts be minimized. Rather, all adverse environmental impacts, significant or otherwise, must be minimized by the application of BTA. See July 22, 2002, Permit Determinations Document §§ 7.2.5c and 7.2.5d. EPA has stated, however, that the "magnitude" of an impact is important in deciding the extent of "minimization" required. *Id.* Hence, more serious adverse impacts warrant more serious expenditures for reductions based on the "wholly disproportionate cost" test. *Id*. EPA has also recognized that *de minimis* impacts might not require minimization, but this is clearly irrelevant to the present case.

EPA considered the adverse effects of the BPS cooling water intakes from various perspectives—e.g., absolute numbers of organisms taken, percentages of populations taken, overall ecosystem/community effects. All of this was considered against the backdrop of the ecosystem's condition to determine what was needed to achieve "minimization." See July 22, 2002, Permit Determinations Document § 7.2.5c.

Finally, as discussed in the July 22, 2002, Permit Determinations Document and elsewhere in this document, the permit limits must also ensure compliance with any applicable State water quality standards. This Final NPDES Permit is consistent with all of these requirements under the CWA.

EPA has not based the permit on the view that BPS must be held legally accountable for the decline of winter flounder in Mount Hope Bay. As discussed above, EPA has developed these permit limits applying CWA §§ 316(a) and 316(b) and applicable water quality standards. EPA's assessment of what these provisions require must, however, take into account the current state of the fishery. See *In Re: Public Service Company of New Hampshire, et al.* (Seabrook Station, Units 1 and 2), 1977 EPA App. LEXIS 16, 19, 1 EAD 332 (1977) (in setting permit limits under CWA §§ 316(a) and (b), EPA must consider the existing environment, not some hypothetical environment). EPA also needs to consider what effects the plant may have had on the resource as the Agency assesses the effects it thinks the plant may have going forward. In this regard, EPA has considered the permittee's role in the collapse of the Mount Hope Bay fishery and has concluded that the permittee's operations have contributed significantly to the fishery's decline. Even if this were not the case, the permit's limits would still stand based on the other considerations detailed in EPA's analysis.

EPA also points out that limits that meet the standards of the CWA might not necessarily be sufficient to "bring the fish back." EPA recognizes that it does not have authority to impose additional permit conditions upon the permittee in an effort to bring the fish back. On the other hand, EPA does expect that as a **result** of the permit limits it is imposing, not only will CWA requirements be satisfied, but the fishery will also be given a chance to recover, as long as other necessary steps are also taken, such as controlling overfishing. EPA notes that these other steps **are** currently being taken (fishing restrictions, CSO controls, and other steps).

3. Comment
PG&E-NEG stated that the Draft Permit is objectionable because it is a "dramatic and unwarranted departure from BPS's prior permits and from the laws governing Region 1's decision.

Response
EPA notes that the permittee does not have an entitlement to receive the same permit every 5 years, and there is no grandfathering or safe haven created by earlier permits. Rather, the permit must be reviewed every 5 years. The question is whether the new permit conditions are warranted now. Moreover, the "departure" is not quite as "dramatic" as the permittee suggests. One of the earlier permits required Unit 4 to operate closed-cycle, thus restricting intake flow and thermal discharge. Moreover, an earlier permit also established maximum temperature limits of 90 °F and a smaller delta-T requirement than that allowed by this Final Permit. Earlier permits also indicated changes might be needed to respond to any biological problems. Finally, earlier permits also contained limits that were based on thermal modeling now demonstrated to have been incorrect.

4. Comment
PG&E-NEG stated that the Draft Permit is based on "fundamental misinterpretations and misapplications of the applicable legal standards for determining (1) the 'best available technology' to reduce water withdrawals by and thermal discharges from a power plant, (2) the 'best technology available' for minimizing the environmental impacts of flows, and, (3) the degree of protection necessary for a 'balanced, indigenous population of fish.'"

Response
EPA disagrees and has responded to these comments elsewhere in this document.

EPA also notes that the BAT standard does not apply to water withdrawals. The standards applicable to water withdrawals are the BTA standard under CWA § 316(b) and State water quality standards.

5. Comment
PG&E-NEG claimed that important information is missing from the Administrative Record and supported this claim by pointing to letters from its counsel, Wendy Jacobs, dated August 12, 2002, and October 4, 2002.

Response
EPA disagrees. EPA has responded to this point in memoranda and letters to the permittee, which are included in the Administrative Record and incorporated herein by reference (AR 3021, 3022, 3024, 3025, and 3060).

EPA has also responded to this point elsewhere in this response to comments.

6. Comment
PG&E-NEG argued that the "governing legislative, judicial, administrative, and agency precedents are ignored or distorted" by EPA in the Draft Permit analysis.

Response
EPA disagrees that it has done this. EPA has discussed relevant precedents in its decision document and, as pertinent, in these responses to comments.

7. Comment
PG&E-NEG stated that it "appreciates the need for EPA Region 1 to do all that it reasonably can to protect Mount Hope Bay," but that the permit conditions are overly stringent, will not bring fish back, will cost PG&E-NEG hundreds of millions of dollars, and these costs are "wholly disproportionate" to the benefits that will result. The permittee stated that the Draft Permit is "unjust and unlawful."

Response
EPA notes that PG&E-NEG thinks that the Agency should do all it "reasonably can" to protect Mount Hope Bay. EPA thinks the test for its actions is whether they are authorized by the law. EPA thinks its permit is so authorized. As such the permit is neither unjust nor unlawful. Other issues noted in the comment are addressed elsewhere in these responses to comments.

8. Comment
PG&E-NEG stated that EPA's decision is "rife" with errors of law that "severely distort the relative burdens of proof assigned" to EPA and the permittee, and that EPA misinterprets and misapplies applicable legal standards. As examples of this, the permittee points to the following:

a. EPA erroneously requires under CWA § 316(a) that BPS ensure the recovery of fish populations that have declined throughout the region, instead of correctly requiring that BPS's discharges only be adequate to protect the population existing in Mount Hope Bay "today."

b. EPA erroneously determined BAT-based limits for thermal discharges (under CWA § 301) and BTA-based limits for cooling water intake (under CWA § 316(b)), even though EPA Headquarters and Region 1 have previously determined what the BAT discharge and BTA intake limits should be for units like those at BPS.

Response
EPA disagrees and has responded to these points elsewhere in this response to comments.

EPA also notes that under CWA § 316(a), the permittee's discharge must not interfere with a BIP, which is not just the depleted population that happens to be left there today. See July 22, 2002 Permit Determinations Document § 6.2. This is an especially important consideration, given that the permittee has contributed significantly to the depletion of the population in Mount Hope Bay. The permittee's logic

would suggest that if the permittee's discharge had killed all the fish in the bay, the permittee could discharge unlimited amounts of heat because there would be no BIP to protect.

EPA also disagrees that EPA Headquarters and Region 1 have previously determined what BAT discharge and BTA intake limits should be for units like those at BPS. As discussed elsewhere in this response to comments, in the absence of national technology standards for existing power plants, EPA develops technology standards for thermal discharge and cooling water intake at power plants on a case-by-case, BPJ basis.

9. Comment
The permittee agreed that restoring Mount Hope Bay's fishery so as to allow the relaxation of current fishing restrictions in the bay is a "noble goal."

Response
The permit's goals and specific conditions are, instead, determined by the application of the requirements of the Clean Water Act (CWA). In this case that means the application of CWA §§ 316(a) and (b) as well as applicable CWA provisions related to technology-based and water quality-based requirements. The application of these provisions is informed by consideration of the CWA's stated purpose of, among other things, restoring and maintaining the biological integrity of our nation's waterways. EPA presently believes that by satisfying these statutory requirements in this permit, and taking into account the steps being taken to address other stressors (e.g., fishing restrictions), the fishery of Mount Hope Bay will have a strong opportunity to recover. Moreover, if the fishery recovers, then presumably it will be possible to relax fishing restrictions, at the appropriate time, so that the public will be able to enjoy the beneficial use of the natural resources that belong to them. Of course, this does not mean that all fishing controls will be eliminated; sound fishery management will undoubtedly continue to be needed in the future. The application of CWA §§ 316(a) and (b) and water quality requirements are discussed in detail elsewhere in this document.

Response #VII.10-14	**Document #**: 1132, 1133, 1150, 1175

10. Comment
One commenter stated that EPA's Draft Permit would set the stage for the "long overdue recovery of Mount Hope Bay's ecosystem," and that, with certain modifications, it would fulfill the CWA's mandate to restore and maintain the "biological integrity of the Nation's waters." (1132)

Response
EPA agrees with the comment that compliance by BPS with the new NPDES permit, in conjunction with other necessary actions being undertaken (e.g., fishing restrictions), is needed to help allow the recovery of the fishery and ecosystem of Mount Hope Bay. EPA also agrees that the new permit is consistent with the purpose of the CWA, as stated by Congress, which is to restore and maintain the biological, chemical, and physical integrity of the nation's waters.

11. Comment
One commenter stated that it fully supported the legal and technical analysis supporting EPA's Draft Permit but indicated concern about whether the Draft Permit limits were sufficient to protect the BIP, given the ongoing and prior damage to the Mount Hope Bay ecosystem. (1133)

Response
This comment is addressed in detail in EPA's July 22, 2002, Permit Determinations Document, as well as elsewhere in this document. EPA does, however, believe the new permit limits, in conjunction with other

steps being taken (e.g., fishing restrictions, CSO control), should be sufficient to allow recovery of the ecosystem. These conclusions can be revisited as necessary at permit reissuance.

12. Comment
One commenter noted that BPS is operating under a permit that was first issued in 1973 and amended three times, only to relax the standards each time. (1175)

Response
EPA discussed the permitting history in some detail in Chapter 3 of EPA's July 22, 2002, Permit Determinations Document. The comment is not strictly correct, in that uncertainty and controversy regarding where to set the permit limits led to some limits being relaxed and then tightened again in subsequent permit modifications. See EPA July 22, 2002, Permit Determinations Document, Ch. 3, n. 1. The commenter is correct, however, that the overall result of the various permit changes over time was to relax the permit limits over time. However, each permit reissuance must be addressed on the basis of the information available at the time of permit development. Thus, a relaxation of the permit might be appropriate at one time, while a tightening of the same permit's limits might be appropriate at another time.

13. Comment
One commenter stated that EPA and MA DEP findings indicate that BPS has routinely violated Conditions I.A.1.c. and I.A.1.g. of the current NPDES permit and that the full extent of damage to the ecosystem from these violations has not been documented because of limitations in the monitoring program. This commenter stated that this situation renders all the more urgent the need to finalize new, more stringent conditions, as the permittee presently continues to operate under the 1993 permit. The commenter pointed out that EPA is authorized to enforce narrative permit conditions and urged EPA to both (1) take immediate enforcement action to stop BPS's violations of its current permit, and (2) impose interim limits more stringent than the existing permit to govern BPS's operations. The commenter noted such action was necessary because even if the permittee accepted the Draft Permit terms, it has been estimated that it would take about 4 years before the entire power plant can operate on closed-cycle basis. (1133)

Response
Conditions I.A.1.c. and I.A.1.g. of the currently effective 1993 NPDES permit (No. MA0003654) provide as follows:

* * *

> c. The discharges shall not jeopardize any Class SB/SA use of Mount Hope Bay and shall not violate applicable water quality standards or degrade the aquatic habitat quality.

* * *

> g. The thermal plumes for the station shall: (a) not block the zones of fish passage, (b) not change the balanced indigenous population of the receiving water, and (c) have minimal contact with the surrounding shorelines.

These narrative provisions set environmental requirements that "backstop" the numeric thermal discharge limitations. The narrative provisions were created, together with significant biological monitoring requirements, to try to ensure adequate environmental protection in the face of significant and unavoidable uncertainty regarding the future environmental effects of the continued and increased thermal discharges and cooling water withdrawals by BPS. Indeed, as discussed in Chapter 6 of EPA's July 22, 2002 Determinations Document, recent thermal discharge plume modeling, satellite photography,

and thermal data have revealed that the original modeling by the permittee upon which the initial and existing CWA § 316(a) variances were based significantly underpredicted the extent of the thermal plume. It is now evident that the thermal plume often has much more than "minimal contact" with surrounding shorelines and that the thermal plume has interfered with fish migration and is capable of blocking zones of fish passage given its extent, location, and temperature. Furthermore, EPA has concluded that thermal discharges and water withdrawals by BPS have significantly contributed to the deterioration of the balanced indigenous population of organisms in Mount Hope Bay, degraded the aquatic habitat quality, and contributed to the violation of designated uses of the waterbody (as well as contributed to violations of the applicable dissolved oxygen standards). These conclusions are based on the analysis and findings discussed in Chapters 2, 5, 6 and 7 of EPA's July 22, 2002, Permit Determinations Document and elsewhere in this document. See also, e.g., AR 2056. Thus, even though BPS's discharge monitoring reports appear to indicate that the facility has largely complied with the **numeric** thermal discharge temperature standards in the permit (e.g., maximum temperature and temperature rise, see Condition I.A.2.a), other data indicate that the facility has not complied with the above-mentioned narrative "backstop" provisions of the permit.

Nevertheless, EPA has to date exercised its enforcement discretion not to take an enforcement action against BPS. Instead, EPA first joined the States in negotiating Memoranda of Agreement I & II with BPS to put a tighter cap on peak thermal discharges and cooling water withdrawals and agree on research goals. EPA then focused on developing a new permit for reissuance to BPS. This, of course, included an assessment of the environmental problems posed by the facility and the appropriate means of resolving any such problem. To date, EPA has continued to focus on getting the permit right, rather than on bringing an enforcement action. This does not necessarily mean that EPA would never decide to bring an enforcement action in response to the above violations, but it has no current plan to do so. See AR 2056.

EPA recognizes, however, that if its evaluation is correct, then not only has BPS contributed to the existing damage of the Mount Hope Bay ecosystem, but that the plant continues to perpetrate this harm as long as it continues operating under the existing permit (or MOA) conditions. This makes continued delay in achieving the new permit limitations a grave environmental concern. At the same time, EPA recognizes that the plant will need some time to install new cooling system equipment necessary to comply with the new NPDES permit limits. The question of what constitutes a reasonable implementation schedule is discussed in EPA's July 22, 2002, Permit Determinations Document as well as elsewhere in this document. Because of the need for time to upgrade the plant's cooling system, EPA expects to issue an administrative compliance order under CWA § 309(a) to BPS to provide a clear, reasonable, and enforceable timetable for BPS to achieve compliance with the new permit.

EPA recognizes that it might make sense to include reasonable interim limitations in such an administrative compliance order and will consider whether to do so. For example, it might make sense to impose interim limits with increasingly tighter thermal discharge and cooling water withdrawal requirements that will correspond to completion of the various phases of the cooling system improvements. As urged by the commenter, EPA might also need to consider whether additional enforcement action is warranted under the CWA to ensure suitable protection of the environment.

14. Comment

One commenter noted that the permittee has enjoyed unfair economic benefits due to its permit violations and that these benefits have been at the direct expense of Massachusetts and Rhode Island citizens and their natural resources. The commenter believed EPA should not allow the permittee to continue benefitting from its violations while new plants spend more to comply. The commenter argued that it is "time to level the playing field" between existing plants and newer plants. (1133)

Response
EPA agrees that damage to natural resources by BPS's cooling water system has occurred at the expense of Massachusetts and Rhode Island citizens. This issue is discussed elsewhere in this document. With respect to the call to "level the playing field" between existing and new power plants, the fact is that the CWA addresses existing and new plants identically in some contexts and differently in others. Specifically, CWA § 316(a) does not differentiate between new and existing plants. Similarly, facilities must satisfy applicable water quality standards regardless of whether the plant is new or existing. Technology-based standards, however, do allow different standards to be applied to new and existing plants if supported by consideration of the applicable factors from which the technology standard is derived. For example, a technology might be feasible at a new plant but not at an existing plant and, therefore, different technology-based standards could be applied to the two categories. The application of technology-based requirements is discussed in Chapter 4 (for BAT thermal discharge standards) and Chapter 7 (for BTA cooling water intake standards) of EPA's July 22, 2002, Permit Determinations Document as well as elsewhere in this document.

B. Economics

Response #: **VII.15-38**	**Document #**: 1004, 1035, 1045, 1064, 1075, 1110, 1130, 1132, 1133, 1150, 1167, 1168, 1171, 1172, 1174, 1179, 1184, 1187, 1206, 1208, 1223

EPA received a number of comments that the Agency has classified as dealing with economic issues in a general sense. These comments are addressed here. EPA also received comments, including some of the above-listed 20 comments, addressing specific types of economic issues. These include, for example, comments on the economic cost to the permittee of construction technologies that might be necessary for complance with the Draft Permit, the consideration of the costs and benefits of complying with the Draft Permit, and the possible effects of compliance with the Draft Permit on local taxes. Comments about these specific types of economic issues are addressed in other sections of this document.

1. General Comments

15. Comment
Several commenters stated that EPA's Draft Permit was both scientifically and economically sound. One of these commenters noted that EPA's Draft Permit shows the type of proper stewardship of natural resources that is needed to ensure future economic and environmental health. (1040) Another commenter, a university professor emeritus of economics and sociology, stated that EPA's justification for the Draft Permit is lucid and convincing and that he supports it. (1064)

Response:
EPA has considered these comments and notes that they support the Draft Permit's limitations and specifically agree with particular aspects of EPA's analysis, including the Agency's scientific and economic analyses.

16. Comment
One commenter stated that the famous economic text *The Wealth of Nations* by Adam Smith cautioned that when members of industry collaborate "the conversation ends in a conspiracy against the public," and that members of an industry have interests that are "always in some respects different from, and even opposite to, that of the public... ." As a result, he further cautioned that industry's proposals must be "long and carefully examined, not only with the most scrupulous, but the most suspicious attention ..., [as they]

have generally an interest to deceive and even to oppress the public, and who accordingly have, upon many occasions ... [done so].” (1064)

Response:
In response to what EPA takes to be the gist of the comment, the Agency points out that it has attempted to the best of its ability to independently and objectively assess the information pertinent to the development of this permit. This is sound regulatory practice and is necessary to properly discharge the Agency’s legal responsibilities, regardless of whether or not one subscribes to the views expressed in the quoted passages from Smith. Of course, time, budget, data constraints, and the basic permit application and development process require EPA often to rely on information provided by the permittee. The Agency has tried, however, to make reasonable judgments on such matters and to explain its analyses so that the sources of information it relies on are identified. Finally, the fact that there may be penalties applicable to the provision of false information to the government should provide a disincentive for a permittee to engage in such tactics. Beyond all this, however, EPA strives to work as cooperatively as possible with regulated entities and, in this case, has engaged in a great deal of cooperative effort and information sharing with the permittee, as well as with other Federal agencies, the States, and the interested public.

2. Proper Cost Test(s)

17. Comment
One commenter stated that it is unfair to give old, more-polluting power plants, such as BPS, a competitive advantage over new, less-polluting power plants by holding them to less stringent pollution control standards. Instead, EPA ought to “level the playing field” for all power plants with respect to pollution control performance requirements. (1133)

Response
The commenter raises an interesting policy argument regarding the issue of “grandfathering” older, existing power plants so that they are subject to less stringent environmental regulatory standards than new or newer facilities. Resolving this policy issue, however, is beyond the scope of this individual permit action.

EPA recognizes that the policy argument presented by the commenter is often raised with respect to the regulation of old power plants, see, e.g., AR 2272, but the approach taken by Federal law is up to the Congress. Under the Clean Water Act, the significance of whether a plant is “new” or “existing” varies across different legal standards, and this variation is reflected in the multiple standards that must be applied in developing the new NPDES permit for BPS. These different standards are discussed in EPA’s July 22, 2002, Permit Determinations Document.

18. Comment
The Town of Somerset Board of Selectmen stated first that EPA’s permit should impose only “economically achievable costs” and later that EPA should require the “best technology available at an economically practicable cost.” (1004)

Response
EPA’s July 22, 2002, Permit Determinations Document and this document discuss the role of cost considerations in applying the various environmental standards at issue for this permit, including CWA § 316(a), CWA § 316(b), water quality requirements, and certain technology-based standards. As indicated by this discussion, the role that cost considerations play varies among these standards. It is unclear which standard(s) the commenter is referring to in its comment. EPA believes that when the commenter refers to an “economically achievable cost” test, it may be referring to the BAT technology-based discharge

limitations standard. EPA also believes that when the commenter refers to a "best technology available at an economically practicable cost" test, it may be referring to the BTA standard for intake limitations under CWA § 316(b). EPA's discussion of these different standards is presented in Chapters 4 and 7 of the July 22, 2002, Permit Determinations Document, respectively, as well as elsewhere in this document. EPA has also explained that costs do not properly play a role in determining permit limitations based on CWA § 316(a) or applicable water quality standards. This is discussed in Chapters 5, 6, and 7 of the July 22, 2002, Permit Determinations Document and elsewhere in this document.

19. Comment

The Attorney General of Rhode Island stated that it was acceptable for EPA to consider costs to the company, as it had done, but that EPA had "discretion" regarding how much weight to give to these concerns. He also stated that consumer electric rates were not a factor that EPA was required to consider in any regard. He commented that EPA properly considered the six relevant factors, including cost, in setting BAT limits for thermal discharges. He stated that the permittee is now urging EPA to give cost greater consideration, but had previously argued to EPA that affordability was irrelevant. He commented that EPA, in any event, had properly considered costs and that the permittee's arguments were off-target. He also stated that economic issues should not overwhelm concern about harm to the bay and that if economics is considered, then the economic harm to the State of Rhode Island must also be considered. Finally, he cited to a decision by the United States Supreme Court holding that BAT limits require the maximum use of economic resources possible to eliminate pollutant discharges. (See *Crushed Stone*, 449 US at 74.) (1150, 1208)

Response

EPA's July 22, 2002, Permit Determinations Document and this document discuss the role of cost considerations in applying the various environmental standards at issue for this permit, including CWA § 316(a), CWA § 316(b), water quality requirements, and certain technology-based standards. As indicated by this discussion, the role that cost considerations play varies among these standards. Indeed, EPA has explained that costs do not properly play a role in determining permit limitations based on CWA § 316(a) or applicable water quality standards. Furthermore, in setting CWA § 316(b) technology-based intake limitations or discharge limitations based on applicable technology standards such as the BAT standard, EPA has interpreted the statute to require consideration of cost. A precise estimate of cost, however, is not mandated, and EPA agrees that the Agency is given a certain amount of discretion in weighing costs to reach its final permit determinations. EPA also agrees with the commenter that possible effects on consumer electric rates may not be a factor that EPA is **required** to consider, but EPA believes it **is** a factor that EPA has the discretion to consider in the course of evaluating costs and in applying the wholly disproportionate cost test under CWA § 316(b).

EPA agrees with the commenter that the Agency properly considered the required factors, including cost, in setting BAT limits for thermal discharges. EPA also agrees that the commenter has properly cited the United States Supreme Court's conclusion in the *Crushed Stone* case, **see** 449 US at 74, that BAT limits require the maximum use of economic resources possible to eliminate pollutant discharges. The commenter is also correct that the permittee argued that affordability was irrelevant to development of this permit in the context of arguing that it should not be asked to provide certain financial information that EPA had requested. EPA concluded, as discussed in the July 22, 2002, Permit Determinations Document, that affordability (i.e., economic practicability) **is** relevant in developing case-by-case BPJ limitations applying both the BAT standard to thermal discharges and the BTA standard for cooling water intake, though it is **not** relevant to determining limitations based on either CWA § 316(a) or water quality standards. EPA and the permittee ultimately agreed that the permittee would provide a narrower set of financial information than initially requested by the Agency, and EPA ultimately concluded that the proposed limitations in the Draft Permit were affordable. The permittee has submitted no significant

argument that these limitations are not affordable. While EPA's cost estimates have undergone some revision based on public comments, as discussed elsewhere in this document, EPA concludes that compliance with the Final Permit limits remains affordable for the permittee.

EPA does not believe that economic issues have overwhelmed concern about harm to the bay in this case. In any event, EPA believes it has properly applied the applicable legal standards in this case, including the pertinent environmental and cost considerations.

With respect to the comment that "economic harm to State of Rhode Island must also be considered," EPA made reasonable efforts to assess the social costs and benefits of the CWA § 316(b) permit limits. These estimates include effects on Rhode Island citizens. These benefits estimates are addressed elsewhere in this document.

None of these analyses, however, can quantify the complete economic harm from fish losses at the plant (or the full benefit of reducing this harm), and these analyses give no consideration to the loss of organisms other than fish. Moreover, these analyses do not consider the adverse effects of thermal discharges from the plant. Recognizing the shortcomings of the available methods for estimating the monetary benefits of making improvements at the power plant, EPA also considered the benefits of such improvements from a nonmonetized perspective, both quantitatively and qualitatively. This evaluation also considered the adverse impacts of plant operations on Rhode Island's natural resources.

In sum, EPA believes that the benefits of the proposed permit limitations justify the costs to the company and society of making the improvements that the Final Permit would require. As suggested by this analysis, compliance with the permit will substantially reduce the significant economic harm to public resources from BPS's operations.

3. Affordability to Permittee of Improvements Needed to Comply With the Draft Permit

20. Comment
A number of commenters stated that the permittee could afford the improvements needed at BPS to comply with the Draft Permit conditions and that the cost was not a reason to relax those conditions. (1035, 1208, 1150, 1132, 1133) One commenter specifically stated that the permittee had provided no data to substantiate claims that permit conditions would threaten BPS viability and that the low cost of BPS generation means that the plant is profitable now and would remain so even after complying with the conditions proposed in the Draft Permit. (1035)

Response
Based on our evaluation of economic information and consideration of public comments, EPA agrees that BPS can afford improvements at the power plant that will enable it to comply with the Final Permit limitations. EPA also agrees that cost is not a reason to relax the requirements for the BPS permit. As discussed in EPA's July 22, 2002, Permit Determinations Document and elsewhere in this document, the proper role of cost considerations varies across the different Clean Water Act standards that apply to the development of the new permit for BPS (e.g., CWA § 316(a), CWA § 316(b), water quality-based standards, technology-based discharge standards). Even where cost is a proper consideration, however, it is not a reason to relax the permit requirements in this case.

EPA also agrees with the comment that the permittee did not present substantiated claims that permit conditions would threaten the viability of BPS. Indeed, EPA does not believe the permittee actually presented any significant argument that the permit would threaten the plant's viability or result in the plant's closure. The permittee's arguments have concerned whether the permit's requirements are necessary or warranted, rather than whether they are affordable. Of course, many residents and representatives of the Town of Somerset, as well as local business interests, have expressed great concern

over any possible closure of the power plant because of the tax revenues provided by the plant that support many important town services and keep local taxes low. But none of these commenters has provided any argument or data indicating that the permit conditions would require the plant's closure.

EPA also agrees with the commenter that BPS's low production costs help to make the plant profitable and that the plant would remain profitable after compliance with the new NPDES permit. As discussed elsewhere, the plant's use of coal as its principal fuel source is a major reason why its production costs remain low, and the NPDES permit in no way impedes the continued use of coal.

21. Comment

Many commenters stated that BPS will not need to shut down to comply with the proposed permit conditions because of its high profitability, but that even if the plant did shut down, the region's electric supply is adequate and would remain so in the future. The Conservation Law Foundation (CLF) stated that even though increased costs might cut into PG&E's profits, BPS is extremely profitable and will continue to be profitable for PG&E even after new controls are installed. CLF also noted that closed-cycle cooling will enable BPS to sell **more** electricity during highly profitable peak demand, hot weather periods. (1035, 1150, 1132, 1133, 1075)

Response

As discussed elsewhere, EPA agrees that the requirements of the new NPDES permit will not require a closure of BPS. EPA agrees that the data appear to indicate that the New England region generally has an adequate supply of electricity, even without BPS, although BPS is currently an important baseload facility in the region's energy portfolio. Nevertheless, the NPDES permit will not cause such a closure. As is also discussed elsewhere, EPA agrees that the plant will remain profitable even after steps are taken to comply with the permit. The permittee has not presented any significant argument that the permit would result in plant closure, but rather pointed out that the costs of compliance will cut into (not eliminate) profits. EPA agrees that the cost of compliance is likely to reduce overall profits. This is discussed in EPA's July 22, 2002, Permit Determinations Document as well as elsewhere in this document.

Finally, EPA agrees that closed-cycle cooling at BPS will enable BPS to generate and sell more electricity during peak demand, hot weather periods when the highest prices are paid for electricity. Indeed, the permittee has agreed with this as well. These additional profits somewhat offset the costs of installing the technology required to comply with the permit. They are not, however, so substantial as to fully offset the compliance costs. Thus, the costs of compliance will still be significant. EPA's cost assessments for the Draft Permit and for the Final Permit have taken this offsetting factor into account. Apart from BPS profits, it should be mentioned here that the ability to generate more electricity during peak demand, hot weather periods also adds an important energy supply benefit. These periods are the times when the region's electric supply is stretched to the largest degree. Indeed, in the past plants such as BPS have sometimes requested permission to discharge more heat than otherwise allowed by their NPDES permits to ensure adequate electric supply to prevent brownouts or blackouts. Closed-cycle cooling would allow BPS to operate closer to the limits of plant capacity, helping to ensure a sufficient electric supply for the region without harming the environment.

22. Comment

The Attorney General of Rhode Island stated that a plant like BPS makes considerable profits because it burns cheap coal while the wholesale market price for electricity is set by the most expensive generators. He stated that BPS is an inexpensive coal-burning, baseload plant that rarely sets the market price. He indicated that the State hired an expert consultant to evaluate the profitability of BPS and found that the plant is highly profitable and that the permittee has earned considerable net revenues since it purchased the plant in 1998, with estimates ranging from approximately $500 million to approximately $750 million, depending on certain assumptions. The Attorney General's office stated that it had undertaken an

analysis that was conservative in a number of respects (e.g., did not consider installed capacity payments, did not include revenues from 1998) and still found that BPS was highly profitable, should remain so, and could afford the technology upgrades needed to comply with the permit. Its analysis states that the permittee indicated it had paid $398.5 million to purchase BPS in 1998 and that, therefore, the permittee made a 22 percent return on investment in 1999, a 32 percent return in 2000, and a 57 percent return in 2001. The last figure is based on net revenue for BPS during CY 2001 of around $227 million. The Attorney General's office points out that this is approximately three times the cost of the cooling system technology that EPA has based its permit limits on, and expenditures for the equipment would, of course, be amortized over many years. The Attorney General's office also states that such high returns clearly indicate that the permittee should be able to make the necessary pollution control investments while continuing to profitably reward investors as a result of BPS operations. In addition, the Attorney General stated that it undertook a conservative analysis that revealed that BPS should continue to earn significant net revenues even after conversion to a closed-cycle cooling system because units 1, 2, and 3 are inexpensive baseload, coal-fired units, and because reasonable projections of future market prices in New England, including the "standard offer" prices that will apply through 2009 in Massachusetts and Rhode Island for residential customers, should easily exceed the costs of generation. He stated that it would be entirely unreasonable to predict that BPS would shut down if required to convert to closed-cycle cooling. He further stated that his office concluded that the plant could afford about $30 of improvements per megawatt hour of electricity because the average sales price was $45 per mw-hr and the average production cost was $15 per mw-hr. His office concluded that since the cost of the proposed improvements would be around $3.11 per mw-hr, it was once again clear that BPS could afford the improvements while remaining very competitive with little effect on rates. Finally, he stated that these figures represented the best information his office could collect without the company providing internal confidential data, but that he had published these figures and the company had not refuted them. (1150, 1208)

Response

EPA agrees with the commenter that BPS has been an especially profitable plant since deregulation because BPS mostly burns coal, a relatively inexpensive fuel source, while wholesale electric prices are set by the most expensive generators. EPA agrees that BPS will rarely, if ever, set wholesale market prices. This is not the whole story, however, as BPS also sells electricity outside the wholesale markets. Nonetheless, EPA's analysis has considered the full picture and has also concluded that BPS is profitable and should remain so even after complying with the new permit limitations. EPA provided an analysis of this subject with the July 22, 2002, Permit Determinations Document and has now prepared a revised analysis in response to comments. While some of the figures have changed in the analysis in light of the Agency's new, increased estimate of the likely cost of the plant improvements needed to comply with the permit, the overall conclusions remain the same.

It should also be stated here that BPS's profitability has had only limited relevance in developing the proper NPDES permit limitations for BPS. The permit's thermal discharge limitations are based on CWA § 316(a), and profitability is irrelevant to setting limits under that provision. The permit's cooling water intake limitations are based on CWA § 316(b), which requires application of an "economic practicability" test. Economic practicability is not the same thing as profitability, but a plant's profitability may help to establish that certain expenditures are practicable. EPA has concluded that plant improvements needed to comply with the permit's intake limitations are economically practicable for BPS, and the plant's profitability supports this conclusion. In addition, the permittee itself has not presented any significant argument that compliance would be economically impracticable. It should also be noted that the permit's intake limitations cannot be made significantly less stringent owing to State water quality standards-related requirements. The plant's profitability is irrelevant to setting requirements necessary to comply with State water quality standards.

EPA notes that the commenter's conclusions regarding BPS profitability essentially agree with EPA's conclusions, although there are certain differences in the details of the respective analyses. EPA agrees with the commenter that the improvements needed at the power plant to comply with the NPDES permit should not result in plant closure and should have only a small effect on consumer electric rates. Finally, the Agency agrees with the commenter that the permittee's desire to keep certain financial information confidential[1] has made it more difficult for others to develop a precise estimate of exactly how much the plant can afford to spend while remaining viable, but it is not necessary to develop a precise estimate in this regard. Neither CWA § 316(b) nor § 304(b)(2)(B) requires the development of precise cost estimates, and since EPA has found that the costs at issue are economically practicable for BPS, the Agency need not go further and develop a precise estimate of exactly how much the plant can afford to spend.

23. Comment

The Attorney General of Rhode Island also commented that the overall larger fiscal problems being experienced by PG&E-NEG will not make BPS unprofitable or make the plant unable to afford the cooling system improvements needed to comply with the permit. He noted that the permittee has raised the issue of PG&E-NEG's overall fiscal problems, including 2nd quarter losses and securities downgrading, as reasons not to require conversion of the plant to closed-cycle cooling. He responds to this, however, by stating that the overall profitability of PG&E-NEG is irrelevant to whether BPS is a profitable asset. As long as BPS generates adequate profit over a reasonable time, he states, another entity will buy and operate BPS even if PG&E-NEG decides that it does not want to (i.e., if PG&E-NEG decides to sell BPS to raise capital to address other debts). The Attorney General states that the overall financial status of PG&E-NEG is not an appropriate consideration when developing the necessary permit limits under the CWA for BPS. He also comments that as a matter of public policy, the local public interest would not be served by making CWA permit decisions on the basis of facilitating BPS's serving "as a cash cow to plug financial holes" in other aspects of PG&E-NEG's operations. If EPA considered any of this, the Attorney General states that EPA also needs to consider costs to Rhode Island's environment and its commercial fishing and recreational industries, all while BPS has continued to use the State's resources free of charge. (1150)

Response

EPA agrees with the commenter that the fiscal problems being experienced by PG&E-NEG will not render BPS unprofitable or unable to afford the cooling system improvements needed to comply with the permit. EPA agrees that BPS is likely to remain in operation under the ownership of either PG&E-NEG or some new buyer of the plant. The permittee has, in fact, indicated to EPA and the media that it currently intends to sell BPS. EPA also agrees with the commenter that the CWA requirements to be reflected in the BPS NPDES permit generally should not be altered by the financial problems being experienced by the permittee's parent corporation, PG&E-NEG. For example, thermal discharge limitations necessary to ensure the protection and propagation of a balanced, indigenous population of organisms in the receiving water do not change because of a corporation's financial problems. It would also be inappropriate to allow a plant, for example, to destroy a bay in violation of applicable water quality standards simply because the facility, or its parent corporation, was experiencing economic difficulties.

[1] As discussed in EPA's July 22, 2002, Permit Determinations Document and indicated in EPA's Administrative Record, the permittee provided some financial information on a nonconfidential basis and some on a Confidential Business Information (CBI) basis. The permittee persuaded EPA that the Agency had sufficient information to draw the conclusions needed for the permit without reviewing certain additional financial information that had been requested earlier.

On the other hand, in our evaluation of the cost of necessary improvements under CWA § 316(b), EPA has considered recent changes in the financial condition of the merchant power industry and adjusted its estimate of the likely discount rate applicable to the company or a successor owner of BPS in light of the industry's current conditions. While it is not required to develop a precise cost estimate, the Agency still thinks making such adjustments in light of current information is reasonable and appropriate. EPA's analyses of the cost of plant improvements and related economic issues are presented in the July 22, 2002, Permit Determinations Document and elsewhere in this document. EPA also notes that while the permittee pointed to its deteriorating corporate financial condition in its comments on the permit, it did not present any significant argument that it could not afford the required improvements or that the plant would close if required to make those improvements. Moreover, given BPS's low production cost and thus substantial operating profitability, EPA believes that the current financial weakness of the company is not a relevant factor in determining the economic reasonableness or practicability of the permit requirements.

Finally, EPA agrees that the permittee has been able to use substantial public resources at no expense and that this is a substantial economic benefit to the company. For example, BPS has been able to withdraw approximately a billion gallons of water a day from Mount Hope Bay for power plant cooling. In the process, trillions of organisms have been killed or injured from entrainment and impingement and the water has been returned to the bay at substantially hotter temperatures that alter the aquatic habitat. Purchasing one billion gallons of water per day from a municipal water department would likely cost millions of dollars, if such copious amounts of water were even available. Of course, BPS is not the only facility that uses public resources in this manner, and it is not barred from doing so as long as it complies with the requirements of the CWA and other applicable laws. These natural resources do not, however, belong to PG&E-NEG, and the company is not allowed to use them in any manner they see fit regardless of the consequences. These natural resources belong to the public. EPA has concluded that changes in how these resources are used by BPS are necessary to comply with the CWA, and EPA believes this NPDES permit is consistent with the CWA's requirements and authorities.

24. Comment

One commenter stated that given the known problems with air and water pollution by the plant, she wondered why PG&E invested in the plant in the first place. (1075)

Response

EPA agrees that the air and water pollution issues were publicly known at the time that PG&E-NEG purchased BPS. While PG&E-NEG would have to explain the details of its decision to invest in BPS, it is likely that the company believed BPS would be a profitable power plant. EPA believes that the company has been correct in this regard and that, even with the improvements required by the NPDES permit and air pollution laws, the plant will continue to be profitable.

EPA further notes that, because the air and water pollution issues were publicly known at the time that the company purchased BPS, the company should have identified and assessed these issues as part of due diligence before purchasing the plant and, as a result, should have anticipated the need for financial outlays and other operational effects that will result from permit compliance. If we assume reasonable prudence on the part of company management, it will have factored the expectation of these outlays into its valuation of BPS and adjusted its offering price accordingly. In making these adjustments, the company should have, in effect, established a financial reserve for the future obligations associated with environmental improvements. Now, the company should draw on that reserve and meet its known and foreseeable obligations under the CWA for environmental improvements. While it is unfortunate that the company's financial circumstances have deteriorated since its purchase of BPS, EPA believes this deterioration is not a relevant factor in determining whether these environmental improvements should

now be undertaken under the CWA, particularly given BPS's low production cost and substantial operating profitability.

25. Comment
One commenter stated that she was willing to pay more for cleaner electricity, and that this will ultimately save money in avoided environmental harms and public health problems. She stated that if the plant can afford the improvements required by the Draft Permit, it should install them; if it cannot afford them, then it should shut down. Alternatives that can avoid environmental problems should be put in place. (1075)

Response
EPA agrees there will be benefits to the public from the environmental improvements necessitated by the permit. EPA has concluded that BPS can afford to make the necessary improvements and the plant will not need to close. Finally, EPA agrees that it is **generally** preferable to avoid or prevent environmental problems in the first place rather than to cause the problems and then try to fix them or offset them aftward.

26. Comment
The Somerset Board of Selectmen stated that EPA had underestimated what it would cost BPS to comply with the conditions of the Draft Permit and had overstated the company's ability to afford these costs. Town officials and individual employees from BPS expressed concern that the cost of complying with the permit could be "the straw that breaks the camel's back," when considered in conjunction with air pollution control expenses and could combine to put BPS out of business. (1168, 1004)

Response
As discussed elsewhere in this document, EPA believes its cost assessment for the Draft Permit was reasonable and appropriate. In response to comments, however, EPA has made some revisions to this assessment that have produced a somewhat higher cost estimate. EPA believes that its new cost estimate is also reasonable and appropriate. The revised analysis is discussed elsewhere in this document. EPA's revised cost estimate is still lower than the costs estimated by the permittee.

EPA's analysis continues to support the conclusion that the permittee can afford the improvements needed to comply with the new NPDES permit as well as with Clean Air Act requirements. The Agency's detailed financial analyses are discussed elsewhere in this document and in EPA's July 22, 2002, Permit Determinations Document. EPA does not believe the company has presented any significant argument that it cannot afford to satisfy these environmental requirements.

Effects on Consumers and the Local and Regional Economy

27. Comment
Many commenters stated that electric rates will not go up as a result of the expenses for permit compliance at BPS because plant costs "will not be automatically passed on to consumers" in the deregulated energy market. The Conservation Law Foundation of New England commented that increased costs at BPS to comply with the proposed permit would not likely affect consumers because BPS, as one of the cheapest units in New England, will rarely set the market price and in any event New England doesn't need BPS to ensure the reliability of the region's electric supply. (1035, 1110, 1132, 1150, 1184, 1208)

Response
EPA has assessed the potential effects on consumer rates of the improvements needed at BPS to comply with the new NPDES permit. The Agency provided such an assessment with the July 22, 2002, Permit Determinations Document and has revised that assessment in response to comments. EPA continues to find that the effect on consumer rates will be relatively small. EPA agrees that in the deregulated

wholesale electricity market, the permittee will not necessarily be able to pass its costs along to ratepayers. EPA also agrees that in the deregulated wholesale market BPS rarely sets the market price because of its low production costs and that the plant benefits from being paid based on the prices charged by more expensive generators. These matters are also discussed elsewhere in this document.

28. Comment

The Attorney General of Rhode Island stated that the permittee did not argue in its permit application materials either that consumer rates will increase by a significant degree if it is required to comply with the limits from the Draft Permit or that increased consumer electric rates are a reason not to impose the proposed permit conditions. He also commented that in nearly all cases under the current deregulated wholesale market the permittee will not be able to pass costs on to ratepayers. As a result, he stated that compliance expenses will only affect shareholders. The Attorney General indicated that his office hired an expert consultant who reviewed the consumer rate analysis prepared by EPA's consultant and found the results of that analysis to be "reliable and conservative." (1150)

Response

EPA agrees that its assessment of the potential consumer rate effects of NPDES permit compliance expenditures at BPS was reasonable and conservative. EPA has revised these estimates in response to comments and the figures have changed somewhat, but the rate effect is still relatively small. The Agency agrees that the permittee has not presented any significant argument that the NPDES permit will result in a major consumer rate effect, although it did disagree with certain aspects of EPA's analysis. EPA has responded to the permittee's comments elsewhere in this document.

29. Comment

The Attorney General of Rhode Island commented that any outages needed at BPS to install new cooling system technology to comply with the new requirements proposed by the Draft Permit would not pose any significant problems for the region's electric supply. He stated that his office hired an expert consultant to assess what impact, if any, modification of the BPS cooling system, and any associated generating unit outages, would have on "electric system reliability." On the basis of this analysis, his office concluded that the region's electric system can easily handle single unit at-a-time outages, or even outages of two units at-a-time not only during off-peak times, but also during peak winter and peak summer periods. The Rhode Island Attorney General indicates, however, that New England is overwhelmingly a peak **summer** market, suggesting that any potential concerns would be further reduced in the winter. He also states that capacity reserves are so significant in spring and fall that the system could easily accommodate multiple BPS units being simultaneously off-line for construction. In addition, his office agrees with EPA that BPS unit outages could be scheduled in conjunction with the independent system operator (ISO) to avoid peak periods, but reiterates that it is not necessary to do so for system reliability purposes. He also notes that the ISO has stated that the southeast Massachusetts/Rhode Island area is "export limited" in that this subarea has "significant amounts of locked-in generation beginning in 2002 due to lack of adequate export transmission capability." Finally, the Attorney General of Rhode Island also commented that apart from the question of unit outages, long-term generation efficiency losses as a result of installing cooling towers would be so minor as to have no consequence whatsoever for system reliability in New England or in the southeast Massashusetts/Rhode Island area. (1150)

Response

EPA generally agrees with the commenter's conclusions. EPA continues to believe, however, that consideration should be given to scheduling outages to avoid peak demand seasons, to minimize any potential pressure on the region's energy supply.

30. Comment
One commenter stated that if BPS shut down, people would get jobs in other fields. (1075)

Response
EPA does not believe the plant will need to close as a result of the NPDES permit.

31. Comment
Many commenters stated that BPS will not need to shut down to comply with the proposed permit conditions because of its high profitability, but that even if the plant did shut down, the region's electric supply is adequate and would remain so in the future. (1035, 1150, 1132, 1133, 1075)

Response
EPA agrees with the commenters that BPS will not need to close as a result of the NPDES permit. EPA also agrees that the region's current and future electric supply appears adequate even without BPS. Moreover, if BPS closed and the region needed more electricity, presumably new plants would come on-line to meet demand. Consumer electric rates would be higher, however, if BPS's generation was replaced by more expensive producers.

32. Comment
The Town of Somerset Board of Selectmen stated that environmental issues need to be considered in light of their "economic nexus." Various town officials requested that EPA investigate the effect that "shutting down" BPS would have on the economic well-being of the Town of Somerset as well as on electric consumers and the local regional economy. These Town officials stated that the Town's finances depend heavily on tax payments from the permittee and that the loss of these revenues could necessitate either large tax increases on personal and business property or significant reductions in municipal services (e.g., for education). The Board of Selectmen stated that this would be devastating to the Town and that this would occur at the same time that State and Federal aid to municipalities is diminishing. The Board of Selectmen also stated that if BPS shut down, the electricity it generated would need to be replaced by other, more expensive electric generation, which would increase electricity costs for consumers and make other power plants more profitable. (1004, 1168)

Response
EPA has concluded that BPS will not need to close as a result of the NPDES permit. This is discussed in detail in EPA's July 22, 2002, Permit Determinations Document and elsewhere in this document. The permittee has not raised any significant argument that closure would be required by the NPDES permit. EPA declines to conduct the wide-ranging assessment of the economic effects that would result around the region if BPS did close, and no such assessment is required under the CWA. EPA recognizes the Town's concerns related to tax payments and has discussed them elsewhere in this document. EPA agrees with the commenter that if BPS shut down, the electricity it generates would need to be replaced by other generators and that these generators would likely be more expensive (because BPS's production is so inexpensive and, therefore, profitable). EPA also agrees that this would likely result in increased costs for consumers, and that it would likely make some other power plants more profitable. With respect to the latter point, however, in applying the CWA, EPA is not concerned with making one plant more profitable at the expense of one or more other plants. EPA is concerned only with properly applying the CWA to each plant. In this manner, EPA strives to ensure a "level playing field" for all facilities in an industry. Of course, since some CWA standards are applied on a case-by-case basis to the specific facts of each situation—e.g., CWA § 316(a), § 316(b) (under present procedures), and water quality standards—applying the same standards to different facilities may result in different permit limitations.

33. Comment
The Town of Somerset's State Representative stated that BPS has played a key role in the area's economy for more than 30 years. She mentioned a study indicating that the BPS payroll was more than $15 million, and she stated that this money went to residents of the area who spent the money in the area. In addition, she stated that BPS spent approximately $8 million on goods and services from local businesses and had contributed tens of millions of dollars to local charities, in addition to its employees giving many hours of volunteer services to local charities. (1167) Representative Haddad's statements were echoed by a commenter who resides in Somerset. (1179)

Response
Although the Representative did not provide or otherwise identify the source of the statistics she cited, EPA has no reason to question them. Assuming they are accurate, they provide no reason to alter the NPDES permit's limitations. Again, EPA concludes that the permit will not require the closure of BPS. If anything, the permit requirements will likely result in some additional employment at the plant to construct (and perhaps to operate and maintain) the new equipment. Eventually, the region should also benefit from the recovery of the area's ecosystem and fishery so that current fishing restrictions can be relaxed.

34. Comment
The New England Council, a trade association of regional businesses, including PG&E, stated that it had studied New England's energy situation and concluded that the region's future economic health was linked to maintaining "reliable, reasonably priced energy and environmentally sound energy policies." This business group urged EPA to consider any implications that its NPDES permit might have for the region's energy situation, including any effects on the region's "fuel mix." The Council concluded that "fuel diversity" is one of the keys to ensuring a stable, reasonably priced fuel supply, and that coal-burning generation is an important element of ensuring adequate fuel diversity. It reached this view because New England relies far less on coal than do other parts of the nation, while coal is a cheaper fuel source with less volatile price shifts (than other fossil fuels such as oil and natural gas). The Council stated that BPS accounts for about half of New England's coal-burning generation and that any "premature" closure of a coal-burning plant like BPS could lead to increased prices for electricity in the region and a reduction in fuel diversity. It also stated that EPA's environmental goals were laudable, but that it was important to cautiously balance environmental goals with regional energy needs. The Council stated that it believes these two imperatives can go together. (1174)

Response
EPA agrees with the commenter that environmental and energy imperatives can be harmonized. EPA has considered the effects of the NPDES permit on New England's energy situation and on consumer rates. EPA has concluded that the region's energy supply will not be harmed and any consumer rate effects will be relatively small. In addition, complying with the permit by installing cooling towers will actually enable BPS to generate more electricity during hot weather, peak demand periods which actually will help the region's energy supply when it needs it most. Finally, the NPDES permit will not cause BPS to close and will have no effect whatsoever on BPS's ability to burn coal. Therefore, the permit should have no significant effect on the region's "fuel diversity." These issues are also discussed elsewhere in this document. (We also note that the commenter's point regarding the relative cheapness of coal as a fuel source generally corroborates the conclusion that EPA and many others have reached regarding the profitability of BPS.)

35. Comment
The Associated Industries of Massachusetts (AIM), a business trade association, commented that BPS is important to providing safe, reliable, affordable electricity for the New England economy. AIM stated that its members indicate that business is inhibited by a dearth of "competitively priced electricity" in the

region. AIM indicated, therefore, that electricity generation by BPS is important for helping to keep prices as low as possible. AIM further stated that preserving fuel diversity in the region was also important, which means keeping coal in the mix, given the great regional reliance on natural gas. AIM also stated that it was important to remember that BPS could not necessarily just pass all its costs along to consumers in the deregulated market. AIM noted that PG&E was preparing to "voluntarily" spend millions to reduce air pollutant emissions from its plant. Finally, AIM urged EPA to consider cost/benefit analysis.

Response

EPA has concluded that the NPDES permit will not cause the closure of BPS and will have no effect on the plant's ability to burn coal. Therefore, the permit is not likely to affect the region's fuel diversity. EPA has also conservatively assessed the consumer rate effects that the permit could have and has found them to be relatively small. The permit will also have no significant effect on the region's energy supply, which is currently more than adequate and is projected to remain so in the future. EPA understands that BPS cannot necessarily pass all its costs on to consumers in the deregulated market, but EPA also understands, as the commenter implicitly acknowledges, that BPS is a relatively cheap producer that is often paid through the wholesale markets based on the prices charged by higher-cost producers, and that this makes the facility quite profitable. EPA has considered costs and benefits where doing so is necessary under the CWA. Finally, EPA has considered the air pollution control technologies that are to be installed at BPS in various ways (e.g., consumer rate effects, impact to water pollutant emissions, etc.). EPA also notes, although it is not relevant to setting NPDES permit limits, that PG&E-NEG is not "voluntarily" spending millions to reduce air pollutant emissions. PG&E-NEG is required to take these actions by air regulations promulgated by the Commonwealth of Massachusetts.

36. Comment

Many commenters stated that by harming the fishery of the Narragansett Bay area, BPS operations have damaged the local economy, which relies, in part, on fishing for flounder and other species. Accordingly, some also commented that if BPS's damage to the ecosystem and fish populations is resolved (along with other stresses), then the local economy should be strengthened as a result of improved fishing. The Attorney General of Rhode Island stated that Mount Hope Bay had for millennia been an important nursery and spawning area for the area's fisheries, thus supporting a valuable commercial and recreational fishery throughout much of the 20th century. He further stated that the power plant had harmed these resources and thereby caused economic harm to Rhode Island's fisheries. He also commented that the plant's cooling system imposed costs to the environment and to commercial and recreational fishing and to all those who live nearby and enjoy the bay. (1035, 1132, 1133, 1075, 1208)

Response

EPA agrees with the commenters that BPS's operations have contributed to the decline of the area's fishery. EPA also agrees that this has had an effect on the area's economy and on public enjoyment of the area's natural resources. With fewer fish available for recreational and commercial fishing, fishing restrictions have been necessitated, and the Mount Hope Bay estuary ecosystem has suffered. EPA also agrees that reducing the power plant's impact on the ecosystem is likely, together with other measures being taken (such as fishing restrictions and abatement of Fall River combined sewer overflows), to contribute to the recovery of the ecosystem. This, in turn, would benefit the area's economy and restore to the public the beneficial uses of its natural resources.

Costs and Benefits

37. Comment

Many commenters stated that the Draft Permit should be complied with, noting that the resulting costs to ratepayers would be small and the resulting benefits to the health of the bay and ecosystem would be great. (1110)

Response
EPA agrees with these comments. Under CWA § 316(b), EPA prepared estimates of costs and benefits of complying with new cooling water intake limits in support of the Draft Permit. EPA believes those analyses were reasonable and appropriate. Nevertheless, EPA has revised its estimates of costs and benefits in response to comments on the Draft Permit. The revised figures are somewhat different from the earlier estimates, but EPA's overall conclusion remains the same. The cost to ratepayers is relatively small, the compliance costs for BPS are affordable, and the costs are not wholly disproportionate to the benefits under CWA § 316(b). Costs are not an authorized consideration for setting thermal discharge limits under CWA § 316(a).

38. Comment
The Town of Somerset Board of Selectmen stated that it felt the costs of complying with the permit were wholly disproportionate to the benefits, and the Town urged EPA to consider the cooling system proposed by the permittee as a first (and potentially only necessary) step. (1168, 1169)

Response
EPA certainly did carefully consider the cooling system proposed by the permittee. This is evident in the July 22, 2002, Permit Determinations Document. EPA disagrees that the costs of complying with the permit are wholly disproportionate to the benefits. EPA also notes that the wholly disproportionate costs test applies to intake limitations under CWA § 316(b), but not to thermal discharge limitations under CWA § 316(a) or any limits based on water quality standards.

C. Biology

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39. Comment
PG&E-NEG stated that the Draft Permit flows from the "flawed factual premise: that fish have declined to a greater extent in Mount Hope Bay than in Narragansett Bay."

Response
EPA disagrees with both points expressed in this comment. Available data indicate that such a differential decline has in fact occurred, and in any case, EPA did not base its Draft Permit on that differential decline. The Draft Permit does consider a finfish abundance analysis performed by Mark Gibson that highlights a statistical difference in abundance between fish stocks in Mount Hope Bay and stocks in Narragansett Bay. The differential patterns of abundance certainly suggest that there are site- specific factors affecting fish stocks in Mount Hope Bay. There is no question that this analysis played an important role in drawing attention to the issue of environmental decline in Mount Hope Bay. Independent of whether one believes the Gibson analysis to be correct, however, there is some basic factual information that has been clearly established. First, fish populations in Mount Hope Bay collapsed in 1984–85 and have remained at severely low levels of abundance since then. Second, BPS annually impinges and entrains large quantities of fish eggs, larvae, juveniles, and adults. Third, the current thermal plume from BPS covers virtually the entire surface of Mount Hope Bay at certain stages of the tide during the summer and fall, thus altering the bay's natural thermal regime and producing water temperatures that adversely affect resident species of fish.

These three facts, in conjunction with a variety of other data (e.g., presence of blue-green algal blooms, striped bass staying year round in the thermal plume, delayed migration and subsequent large impingement of Atlantic menhaden, mass mortalities of blue mussels, overwintering of the ctenophore *Mnemiopsis leidyi*, avoidance of much of the bay by adult winter flounder), show an ecosystem in peril. EPA's analysis of the available data suggests that impacts from BPS operations are significant contributors to the numerous changes observed in the Mount Hope Bay ecosystem. EPA's analysis of the thermal impacts is site-specific and based on data from Mount Hope Bay and the scientific literature. Additionally, the § 316(b) analysis attempts to put some of the entrainment and impingement losses into context by comparing losses to Mount Hope Bay population numbers. These analyses do not rely on comparisons with Narragansett Bay; they are sufficient on their own to support the limits in the Draft Permit. The differential decline of fish stocks in Mount Hope Bay only further justifies EPA's conclusion that reductions in thermal discharges and entrainment and impingement rates are necessary to protect the Mount Hope Bay ecological community.

40. Comment
PG&E-NEG stated that the Draft Permit is based on data of "questionable validity collected from only a small area of Mount Hope Bay."q

Response
EPA believes that the data underlying its assessment of fish abundance in Mount Hope Bay was collected in a scientifically sound manner and covers a representative area of the bay. The data that PG&E-NEG are referring to are trawl data collected by their own consultant, MRI. MRI has collected trawl data from 10 stations throughout Mount Hope Bay. PG&E-NEG has only recently questioned the validity of this data set based on their concerns with a change in sampling gear and some historic dredging in Mount Hope Bay. Neither PG&E-NEG nor MRI have presented any substantive information that would call into question the quality or validity of the trawl survey being conducted by MRI, thus EPA continues to believe it is an accurate representation of fish abundance in Mount Hope Bay.

Regarding the comment on the small area covered by the trawl survey, PG&E-NEG has estimated that this survey represents an area of approximately 5 square miles. EPA's interpretation of the MRI trawl survey is that this survey provides a good representation of the shallow (< 20 feet in depth) water areas of Mount Hope Bay, or approximately 9 square miles. Regardless of the discrepancy, EPA does not view 5 square miles of aquatic habitat as insignificant. It would be inconsistent with the CWA to allow the facility in this case to damage the biological community of even a 5-square mile area of an estuary, such as has resulted in Mount Hope Bay. Finally, Mount Hope Bay (especially the northern portion where the river systems enter the bay) has been a significant nursery area for a wide variety of invertebrate and finfish species. If the nursery and spawning locations for the impacted species are not protected, then there is limited hope of any meaningful recovery of the overall balanced indigenous population. Thus, EPA disagrees with PG&E-NEG's characterization of 5 square miles as being "small" and views this level of impact on a water body like Mount Hope Bay, particularly in a nursery area, as unacceptable. The current status of fish stocks in Mount Hope Bay and beyond only further supports the need to minimize the area of impact.

41. Comment
The permittee stated that Mount Hope Bay is only a "tiny part" of Narragansett Bay (14 square miles out of 146 square miles).

Response
EPA views 14 square miles of estuarine spawning and nursery habitat as a very important resource worthy of protection. See above response to comment.

42. Comment
The permittee stated that EPA acknowledges that thermal discharges from BPS do not reach Narragansett Bay waters.

Response
EPA has not stated that thermal discharges from BPS do not reach Narragansett Bay. To the contrary, EPA believes the data show that the BPS thermal plume reaches Narragansett Bay under some circumstances. Jack Mustard of Brown University publicly stated at the most recent New England Estuarine Research Society meeting, that satellite images have shown that, periodically, the thermal plume stretches from Mount Hope Bay into Narragansett Bay proper.

43. Comment
The permittee claimed that its consultants, as well as some independent experts, have "uniformly concluded" that fish populations have declined dramatically across the entire eastern seaboard, including Narragansett Bay. The permittee complained that "EPA states that BPS 'acknowledge[s] the dramatic decline of fish abundance in Mount Hope Bay in 1984 … [and that] the existence of a problem with fish populations in Mount Hope Bay is no longer in debate," but "BPS [only] acknowledges an **area-wide** decline in fish abundance . . . [and] does not agree that there has been a widespread differential decline in Mount Hope Bay or that the rate of decline in 1984 is itself significant."

Response
In response to the Gibson report, the owners of BPS initially disagreed that fish stocks in Mount Hope Bay had declined. Eventually, their position on the data changed and they acknowledged that fish stocks in Mount Hope Bay had in fact declined, but argued that this decline was part of a larger regional phenomenon. The intent of EPA's statement was to simply acknowledge the shift in position by BPS, and that the question of whether fish populations had or had not collapsed in Mount Hope Bay was no longer in debate.

44. Comment
The permittee stated that Collie and Delong are reputable scientists not affiliated with PG&E-NEG and they have concluded that fishery declines throughout Narragansett Bay have been steep; there has been no sign of recovery; and there are multiple reasons for this decline, with fishing, predators and global warming appearing to be major causes. The permittee also stated that Collie and Delong's work is supported by a September 17, 2002, presentation by Perry Jeffries, another scientist unaffiliated with PG&E, that concluded that winter flounder have declined by 96 percent in Narragansett Bay over the last 20 years.

Response
The work of these researchers does not conflict with EPA's conclusion that BPS is adversely affecting fish abundances in Mount Hope Bay. The Collie and Delong study divides Narragansett Bay into 11 discrete segments and examines age-specific mortality by geographic area. The authors list a suite of factors that are causing mortality to winter flounder, which include fishing, predators, and global warming, as well as the operations at BPS. Collie and Delong's opinion on the role of BPS is clearly articulated in their report:

> Although winter flounder substantially decreased in abundance throughout Narragansett Bay, they have decreased at a greater rate in Mount Hope Bay. There are some water quality issues that may be important in Narragansett Bay and Mount Hope Bay. However, the temperature rise and increased power plant flow in Mount Hope Bay may be of more concern. (Collie and Delong 2002).

EPA was not present at Jeffries' September 17, 2002, talk at the University of Rhode Island, though the Agency is familiar with his work in general. Jeffries was one of the first scientists to correlate small water temperature changes with winter flounder abundance. He noted that changes in winter water temperatures of as little as 1 ^{o}C, could result in dramatically reduced winter flounder abundance. BPS has been elevating water temperatures in Mount Hope Bay by approximately this amount for 35 years. The commenter stated that Jeffries concluded that winter flounder have declined by 96 percent in Narragansett Bay over the last 20 years. While EPA does not necessarily agree with this specific numerical value, EPA does agree that winter flounder abundance in Narragansett Bay has significantly declined over that period. This point does not contradict Collie and Delong's conclusion that flounder abundance in Mount Hope Bay has decreased at a greater rate and is being affected by BPS.

45. Comment

PG&E-NEG stated that its consultants have reviewed the data and have concluded that the decline in Mount Hope Bay fish is no different from that in Narragansett Bay, and that there is "no evidence" that BPS has "caused the decline." The permittee also states that there is no evidence that winter flounder are at as low levels as EPA calculates or that winter flounder density is different in Mount Hope Bay than in Narragansett Bay. The permittee further asserted that EPA's permit is based entirely on the conclusion that such a difference does exist between the two bays.

Response

At the outset, EPA must emphasize that the permit is not based entirely on the decline in the Mount Hope Bay fish abundances, much less on the premise that there has been a differential decline in fish stocks between Mount Hope Bay and Narrangansett Bay. With that said, EPA has found compelling evidence that while the abundance of winter flounder in both bays is quite low, Mount Hope Bay has suffered a greater decline in winter flounder abundance than has Narragansett Bay, and thermal discharges and intake impingement at BPS have contributed to the decline. EPA has discussed this evidence in Chapters 6 and 7 of the July 22, 2002 Permit Determinations Document and elsewhere in this document. EPA gave careful consideration to scientific studies from a variety of sources, including PG&E-NEG's consultants. From these analyses, EPA concluded that significant reductions in BPS's thermal discharge and intake flows were necessary to protect the Mount Hope Bay fishery consistent with CWA requirements.

EPA also points out that the permittee carries the burden of proof when requesting a § 316(a) variance. Specifically, PG&E-NEG, as the applicant, must prove to EPA's satisfaction that the permit limits it requests will assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on Mount Hope Bay. CWA § 316(a), 33 U.S.C. § 1326(a). As discussed in § 6.2.3 of the July 22, 2002, Permit Determinations Document, this burden of proof is quite rigorous. The principal Senate sponsor of the CWA, Senator Muskie, stated that only applicants "which could establish beyond any question the lack of relationship between federally established effluent limitations and that water quality which assures . . . the protection and propagation of a [BIP]" should receive a § 316(a) variance. L. History 1977, p. 642. PG&E-NEG has not met this standard for the variance-based limits it has requested. Indeed, there appears to be some disagreement among PG&E-NEG's own consultants regarding the abundance of winter flounder in Mount Hope Bay. For example, Ray Hillborn exclusively used impingement rates to calculate that, contrary to EPA's assertion of low winter flounder abundance, there are 300,000 winter flounder in Mount Hope Bay. Deborah French-McCay, also hired by PG&E-NEG, concluded that winter flounder abundance had remained low due to predation by cormorants. Meanwhile, Collie and Delong, whom PG&E-NEG cites as reputable, independent scientists, have indicated that operations at BPS likely played a role in the decline of Mount Hope Bay's winter flounder population.

46. Comment
PG&E-NEG said the Mount Hope Bay fishery will not recover even with the complete elimination of BPS. It stated that the fishery problem is regional and fishing restrictions will need to be enforced if the fishery is to recover. It further stated that the restrictions are not being enforced.

Response
EPA's goal is to assure the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on Mount Hope Bay, which necessarily includes the recovery of the Mount Hope Bay ecosystem. Reductions in thermal discharges and entrainment and impingement at BPS play a critical role in achieving that goal. EPA acknowledges that other factors such as overfishing have contributed to the decline of the Mount Hope Bay fishery. However, it bears noting that these factors are being addressed. Severe fishing restrictions have been in place for Mount Hope Bay proper for a number of years, and within the last 5 years additional restrictions have been implemented in Narragansett Bay and offshore Rhode Island waters. Additional restrictions for fishermen catching winter flounder in Federal waters will likely be in place by spring of 2004 (Tom Nies, New England Fisheries Management Council, pers. comm.). These restrictions have resulted in a significant loss of revenue to commercial fishermen and retailers that support recreational fishing. PG&E-NEG contends that the fishing restrictions have not been adequately enforced. Whether or not this is true, EPA does not have jurisdiction to enforce fishing restrictions. EPA's role is to regulate BPS's operations in such a way as to protect the Mount Hope Bay ecosystem. Furthermore, the fact that fish abundances in Mount Hope Bay have failed to recover even after fishing restrictions have been in place and the City of Fall River has implemented improvements in its wastewater treatment suggests that overfishing is not the sole cause of the decline. EPA believes that for the Mount Hope Bay ecosystem to recover, significant reductions in thermal discharges and intake flows need to occur at BPS, in addition to compliance with fishing restrictions and continued improvement in wastewater and CSO treatment by the City of Fall River.

47. Comment
PG&E-NEG states that EPA's permit is based on the "erroneous legal and factual assumption" that BPS should be held accountable for the decline of winter flounder and other fish in Mount Hope Bay. PG&E-NEG further states that EPA's "error" stems from reliance on flawed studies by Mark Gibson of the RI DEM. PG&E-NEG asserted that EPA did not independently analyze the data underlying Gibson's studies. PG&E-NEG also stated that as early as 1995 BPS had asked Gibson to consider additional data in his analysis but he did not. PG&E-NEG also claimed that the agencies asked questions about a draft of Gibson's report that he never answered.

Response
EPA has responded to the legal aspect of this comment elsewhere in this document. Here EPA responds to the scientific aspect of the comment. The 1995 report from Mark Gibson expressed concerns regarding thermal impacts to Mount Hope Bay that agency scientists and biologists had been articulating repeatedly since the 1970s. The Administrative Record is filled with memos from various biologists who have worked on BPS re-permitting issues in the past, warning against raising the discharge temperature and allowing the conversion of Unit 4 to open-cycle cooling. It is fair to say that the 1995 Gibson report provided statistical support for what many agency scientists had been suspecting for quite some time.

Upon receiving the 1995 Gibson report, EPA sent it out for peer review. Gibson also sent his report out to approximately a dozen colleagues for peer review, and members of the Brayton Point TAC reviewed it as well. Consultants hired by BPS also reviewed it. In total, over 25 reviewers provided comments on this document. The vast majority of the reviewers had only minor comments. All of the independent reviewers (i.e., those not hired by BPS) agreed with the major conclusions of the report. Gibson did issue a revised version of this report in 1996 responding to the majority of the comments he was given. He responded to the substantive comments and did not change the final conclusions in the report. EPA saw that the report

and its conclusions withstood a substantial amount of scrutiny from a diverse audience. EPA thus believed it supported, along with other available information, requiring substantial reductions in thermal discharges and cooling water withdrawals from BPS.

48. Comment
PG&E-NEG complained that prior to issuing the draft report EPA did not review "three short, concise reports" submitted by its hired expert regarding Narragansett Bay marine biology and its hired expert on fish population dynamics that explained certain flaws in Mark Gibson's work.

Response
EPA did not have the opportunity to review and comment on these reports prior to issuing the Draft Permit because it received them when EPA's Draft Permit was about to be issued. The technical reports came in on July 2, 2002; EPA issued the Draft Permit on July 22, 2002. EPA indicated that it would consider these reports as comments on the Draft Permit and address any issues raised by them in the response to comments document. EPA believed this approach was appropriate given the ample opportunity that PG&E-NEG had to address the Gibson report before EPA issued its Draft Permit. The Gibson report had been out since 1996 and had been thoroughly reviewed by numerous scientists. Moreover, EPA had been developing the Draft Permit for several years before issuing it. PG&E-NEG therefore had more than sufficient time and opportunity to raise its concerns regarding the Gibson report.

49. Comment
PG&E-NEG said it provided impingement data on all fish, vegetation, and other organisms trapped on the intake screens. It stated that entrainment data were collected "year round" from 1972 to 1985 and since 1992 has been collected every few days between February and May. In addition, PG&E-NEG stated that the monthly "MRI original trawl" data set has also been collected since 1972 and covers the 5 square miles nearest the plant.

Response
EPA notes that BPS has been monitoring the type and quantity of organisms that end up on their intake screens to Units 1, 2, and 3. Currently, BPS does not monitor impingement on the intake from Unit 4. It also collects limited entrainment data exclusively for winter flounder. It does conduct a trawl survey, though it is debatable what area that survey represents. At a minimum, it represents 5 square miles, but EPA believes it is representative of the shallow water (< 20 feet deep) habitat in Mount Hope Bay. This shallow water habitat is approximately 9 square miles in area.

50. Comment
PG&E-NEG stated that all the data show that the entire Narragansett Bay ecosystem has experienced a steep decline in demersal fish since at least the mid-1980s and that fish have not recovered anywhere in this ecosystem. The permittee wrote that there are multiple plausible explanations for this and no identified single cause. PG&E-NEG stated that "each and every scientist" agrees that this problem is regional in scope, that overfishing is a big part of the problem, and that fishing must be better managed in order to permit a recovery. The permittee stated that these regional fishery problems exist not only in Mount Hope Bay but also in Narragansett Bay, southeastern Massachusetts waters, and Peconic Bay in New York. The permittee also stated that Mark Gibson is the only scientist who believes that there has been any recovery of fish populations anywhere in Narragansett Bay, and that EPA mistakenly relied on Gibson's report of a slight recovery. The permittee argued that the data indicated a slight recovery only in 1995 and 1996 and that since that time population levels have receded to, and remained at, an all-time low. The permittee cited to a report by Collie and Delong (July 2002).

Response
Most scientists would agree that fishing mortality is an important part of the population dynamics for winter flounder and tautog. However, most scientists would also agree fishing mortality for hogchoker and windowpane should be fairly negligible, yet these species collapsed as well. Thus, regional fishing mortality alone cannot explain the collapse of all the species in Mount Hope Bay. Other site-specific stressors are likely more important.

The most recent winter flounder stock assessment for the Southern New England/Mid-Atlantic region shows that stock spawning biomass bottomed out in the early to mid-1990s and has shown a modest recovery from 1996 to 2001 (Figure 6). This regional trend is not reflected in abundance trends in Mount Hope Bay, where winter flounder abundance continues to "flatline." This suggests that site-specific stressors are also affecting winter flounder abundance. Collie and Delong (2002) make this exact point in their report. They acknowledge the importance of the larger regional stressors, such as fishing mortality and long-term temperature rise, but also state that site specific stressors, such as BPS, are critical to winter flounder abundance in Mount Hope Bay.

Finally, EPA's permit does not rely on the recovery of winter flounder in Narragansett Bay in the mid-1990s, though the lack of a similar recovery in Mount Hope Bay does support its conclusion that site-specific factors in Mount Hope Bay are controlling fish abundance.

Collie, J.S. and A.K. DeLong 2002. Examining the decline of Narragansett Bay winter flounder Final Report to RI DEM Division of Fish and Wildlife. 150 pp.

51. Comment
PG&E-NEG claimed that EPA's Draft Permit is based on the Agency erroneously concluding that a correlation between the modification of Unit 4 at BPS and the fishery collapse must mean that the modification **caused** the collapse. The permittee argues that "Gibson's theory of parsimony" embodies that error, and that EPA makes the same error. The permittee stated that coincidence does not equal causation. Moreover, it stated that the supposed coincidence did not even occur.

Response
PG&E-NEG incorrectly characterized EPA's analysis. Neither EPA nor Gibson have made the assumption that PG&E-NEG suggests. Both EPA and Gibson, in his report, recognize that the correlation in time between the significant increase in plant operation (cooling water flow and heat rejection) and the significant decrease in fish abundance does not prove a cause-and-effect relationship. From a purely scientific perspective, the only way to prove that BPS is causing a fishery decline in Mount Hope Bay would be to shut the plant off, wait for the fish populations to recover, and then monitor changes in fish abundance after turning the plant back on. Absent such an experiment, EPA must rely on existing scientific studies, which have collectively led EPA to conclude that BPS has had a significant negative impact on the Mount Hope Bay fishery.

PG&E-NEG is also incorrect in denying the coincidence in time between the increase in plant operations and fish abundance. It is quite clear from plotting cooling water flow versus fish abundance that there is a correlation in time. See Figure 7. Finally, EPA could not identify other factors that could affect fish population abundance over such a widespread area for such a long period of time. Eliminating other possible causes does not establish cause and effect in regards to plant operation, but it certainly strengthens the case that the facility is reasonably likely to be at least partially responsible for the decline.

52. Comment
PG&E-NEG stated that EPA should base its permit on the limits proposed by the permittee because BPS currently has only a small adverse environmental effect in a confined area, and with the reductions in

thermal discharge and cooling water intake flow that it proposes, any remaining adverse effects would be negligible. The proposed reductions would, the permittee stated, reduce thermal discharges and intake volumes to the levels prevailing in 1970. The permittee further stated that there is no legitimate claim that the Mount Hope Bay fishery was suffering in 1970 and that 1970 is approximately 15 years before the Unit 4 conversion that Mark Gibson concluded precipitated the collapse.

Response

EPA disagrees with these comments for several reasons. First, EPA disagrees that the impact is small or confined. Fish populations have collapsed throughout most of Mount Hope Bay. In addition, a host of thermally induced environmental changes have occurred in the Bay. These changes are discussed in Chapter 6 of the July 22, 2002, Permit Determinations Document and elsewhere in this document. EPA does not consider these circumstances to represent a small adverse environmental effect in a confined area.

Second, simply put, the path of the recovery of an ecosystem might not trace the path of the decline. In other words, once populations decline to a certain low level, more extreme measures may be needed to promote a recovery. As an example, consider winter flounder populations in Mount Hope Bay. As stated in EPA's § 316(a) and (b) analysis, winter flounder populations are subject to numerous sources of stress. Fishing mortality, plant-induced losses, and natural mortality all play a role in determining long-term population trajectories. The cumulative losses might change from year to year, depending on fluctuations in any and all of the individual stressors. Fishing and plant operations can be regulated, but natural mortality, such as predation losses, cannot be reduced by regulation. PG&E-NEG have commented that predation by cormorants and sand shrimp has increased through time and might be an important factor in winter flounder abundance in Mount Hope Bay. Increases in natural mortality do not alter the CWA requirements to assure the protection and propagation of the BIP.

It is EPA's judgement that both significant reductions in fishing mortality and power plant-related mortality are required to induce a recovery of the Mount Hope Bay system. The control of BPS operations includes both the reduction in entrainment and impingement losses, and the reduction in thermal discharge and subsequent improvement in habitat quality. Fishing restrictions are already in place, as discussed elsewhere in this document.

53. Comment

PG&E-NEG's comments criticized the scientific work by Mark Gibson of the RI DEM. The permittee stated that concern over the Mount Hope Bay fishery began with Gibson's study in 1996 which triggered an "understandable groundswell of concern" by regulatory agencies and fishermen over the health of the ecology of the bay. The permittee argued, however, that Gibson's 1996 report lays the blame on the conversion of Unit 4 from closed-cycle to open-cycle cooling, but that now Gibson writes that fish populations were already declining to a differential degree as compared to Narragansett Bay from 1972 to 1985, even before the Unit 4 conversion. The permittee stated that Gibson has more recently concluded that Mount Hope Bay's winter flounder population had a historical high of 380,000, but has now declined to around 7,428. From these numbers, the permittee maintained, EPA has extrapolated to its conclusion that the power plant takes 80 percent of the bay's winter flounder.

Response

EPA's interpretation of finfish abundance changes in Mount Hope Bay is based on Gibson's 1996 report, the comments of peer reviewers on that report, input from the TAC, and EPA's own interpretation of the data. The dramatic decline in winter flounder abundance in the 1984–85 time frame is the most obvious feature of Figure 7, which plots winter flounder abundance in Mount Hope Bay through time. However, it is EPA's opinion, and this has been shared by other reviewers of Gibson's 1996 report, that winter flounder populations show a general decline from 1972 to 1984. This general decline is characterized by

dramatic abundance swings that can be interpreted as an unstable population. EPA believes that winter flounder populations were declining and unstable prior to the increase in plant operation in 1984, but the conversion of Unit 4 to open cycle cooling was the final straw for a population already in trouble.

The number of winter flounder in Mount Hope Bay is a general point of interest as it provides an important comparison for entrainment and impingement losses. PG&E-NEG has consistently compared entrainment and impingement losses to the commercial landings of winter flounder for the entire state of Rhode Island. From an ecological perspective, this comparison makes little sense. Due to the high fidelity of winter flounder to their natal spawning sites (demonstrated by a RI DEM tagging study and supported by several published scientific papers), it is more appropriate to compare plant mortality rates to discrete Mount Hope Bay populations. Gibson used five different methods to determine a pre-1984/85 winter flounder population level. Using this pre-1984–85 estimate and the MRI standard trawl series as a scaler, Gibson derived an estimate of average winter flounder abundance of 7,500 fish for the years 1992–1999. The years 1992–1999 were used to match PG&E-NEG's entrainment sampling and estimate of entrainment and impingement losses. For winter flounder, entrainment and impingement losses totaled approximately 30,000 Age 3 adult equivalents. Thus, if the plant takes 30,000 adults and 7,500 are left in the bay, that equates to a total population of 37,500 fish. The plant's take is approximately 80 percent of the adult population. EPA acknowledges that there is some variability associated with these estimates, so the exact number of fish in the bay might be somewhat larger or smaller. However, the general point is that BPS takes a disproportionate number of winter flounder from the Mount Hope Bay system and in order to assure the protection and propagation of the BIP, these losses need to be significantly reduced.

54. Comment

PG&E-NEG stated that its consultant Ray Hilborn has refuted the analysis by Mark Gibson that EPA's analysis is based on. According to the permittee, EPA has concluded, based on the Gibson analysis, that a 26 percent loss of Mount Hope Bay's winter flounder would occur as a result of EPA's proposed permit limits based on closed-cycle cooling for all four units and that this would be acceptable. Yet, PG&E-NEG stated that its more accurate analysis shows that its proposed permit limits based on the Enhanced Multi-Mode technology approach would result in a loss of only 5 percent of the bay's winter flounder population. The permittee argued, therefore, that this should be acceptable to EPA.

Response

EPA does derive an estimate that closed-cycle cooling would still result in a loss of 26 percent of winter flounder in Mount Hope Bay. EPA does not judge this to be acceptable and if continued it would likely interfere with the long-term recovery of winter flounder in Mount Hope Bay. It simply acknowledged the impact, and recognized that BPS will likely not be able to significantly improve upon that level by further technological fixes. Also, as the winter flounder population recovers in response to the Final Permit, and other measures, the percent loss will drop well below 26 percent. Additionally, EPA recognizes that there are other sources of mortality on winter flounder (i.e., fishing, predation). Changes in mortality rates for these stressors need to be considered as well. It has always been EPA's contention that continued strict fishery regulations, as well as enhanced pollution control at BPS are needed to stimulate a recovery of winter flounder stocks. EPA disagrees with PG&E-NEG's modeling efforts that produce a loss of 5 percent of the winter flounder in Mount Hope Bay. The details of this are discussed below. Moreover, EPA would view the taking of 5 percent of the winter flounder population and large quantities of other species as an adverse impact that warrants minimization. Finally, EPA's permit limits are based on more than just impacts on winter flounder.

55. Comment

PG&E-NEG stated that EPA apparently rejects its studies because they were performed by consultants hired by the company. The company claimed that statements by EPA at public meetings describing the permit support its contention.

Response
EPA has never made any statements disparaging the work produced by PG&E-NEG or its consultants based solely on the origin of that work. EPA has spent well over 20 years working with some of PG&E-NEG's current consultants. The Agency carefully considers each analysis or piece of information that is submitted to it, independent of the source. If skepticism was expressed about the work produced by consultants to PG&E-NEG at the public hearing and our public information sessions, those comments were made exclusively by members of the public.

56. Comment
PG&E-NEG commented that its consultant Joseph DeAlteris analyzed the data and found that the winter flounder decline in Mount Hope Bay was "generally" no different from that found in Narragansett Bay. The permittee stated that DeAlteris found "fundamental errors and omissions in the data" used by Gibson. The permittee argued that these errors include the following:

a. Gibson's analysis "mistakenly (and misleadingly)" used only the MRI standard trawl data from the "upper one third of the bay" and treated them as representative of the whole bay.

b. Gibson "ignored" the RI DFW's own, extensive data set on the lower bay that has been collected since 1979.

c. Gibson "incorrectly (and misleadingly)" included in his "comparative analysis" trawl samples from Rhode Island Sound and Block Island Sound, but should not have because these are offshore waters that are not part of Narragansett Bay and represent entirely different habitat types. Gibson inappropriately used this data as if they represented Narragansett Bay. The permittee stated that the offshore data "cannot properly be compared with data collected in either Mount Hope Bay or Narragansett Bay."

d. Gibson incorrectly used impingement data in his analysis that had not been adjusted for flow and that this renders the data "meaningless." The permittee asserted that the proper analytical metric is the number of fish impinged "per unit of flow, not the total number of impinged fish"

e. PG&E-NEG stated that DeAlteris "corrected" Gibson's data errors by dropping the Rhode Island Sound and Block Island Sound data and using "corrected" impingement data. He then compared Narragansett Bay abundance trends to the three data sets available to represent Mount Hope Bay abundance (i.e., the MRI standard trawl, the impingement data, and the Wilcox trawl data). The permittee stated that DeAlteris' results "definitively refute Gibson's conclusion of a large-scale difference in fish trends and fish densities between Mount Hope Bay and Narragansett Bay."

Response to a and b
The MRI trawl survey includes a sampling station below (i.e., south of) Spar Island (Figure 8). EPA calculated the proportion of the bay represented by the MRI sampling if a straight line is drawn across the bay at the approximate location of the Spar Island sampling station and at 90 degrees to the eastern shoreline. All MRI sampling using the standard trawl took place north of this line. Thus, MRI data should be representative of the area of the bay north of this same line. Using this simple areal delineation, EPA finds that 55 percent of the bay, rather than the DeAlteris estimate of 33 percent, is represented by the MRI standard trawl. DeAlteris appears to have inappropriately used the Massachusetts/Rhode Island state line in his estimation of the proportion of the bay represented by the MRI sampling, apparently ignoring the location of the MRI standard trawl station south of Spar Island.

Second, if the MRI stations are used in conjunction with depth information, and if spawning stock flounder densities are stratified by depth (as they appear to be), then the MRI data more likely can be used as estimators for winter flounder abundance for most of Mount Hope Bay (about 9 square miles).

Third, winter flounder have an affinity for spawning near sources of freshwater input at the head of Mount Hope Bay. Other surveys do not sample the upper portion of the Bay; thus the MRI standard trawl is the best indicator of the reproducing adult population of flounder in Mount Hope Bay.

The MRI standard trawl index appears to be the best indicator of winter flounder populations in Mount Hope Bay based on statistical grounds as well. Judging from Gibson's analyses, prior to the collapse of this population, the MRI trawl survey sampled a full-size range of winter flounder. The survey in current form makes over 100 tows per year compared to 24 for the RI DFW monthly fixed-station survey at Spar Island and RWC or the average six tows per year in Mount Hope Bay for the RI DFW random spring-fall survey cruises. Gibson's analyses of RI DFW trawl and seine survey data show that survey precision improves as sample size increases, with precision reaching acceptable levels at 40 to 50 tows per year. Thus, population size estimates made using the MRI data should be the most precise of all the surveys.

Response to c

The goal of the Gibson (2002a) study was to separate local and regional factors that influenced winter founder abundance. This was done to clarify the role of BPS in the background of fishing mortality, increases in water temperature, enhanced predation, among other factors. Gibson (2002a) emphasize the need for adequate control data in the before-after control impact (BACI) design, and also stressed the need for control replication. Krebs (1989) reviewed this topic in his Chapter 8 on experimental design. He defines a control as "an experimental unit that has been given no treatment." In the context of the Gibson (2002a) study this means no power plant impact, and thus Gibson used survey data far from the plant for a control.

DeAlteris, on the other hand, removed data from stations in Rhode Island coastal waters and analyzed only the Narragansett Bay subset of RI DFW trawl data. He purported to show that trends in abundance of winter flounder in Mount Hope Bay were not very different from that in greater Narragansett Bay. By shifting the location of control samples closer to BPS and Manchester Street Station, DeAlteris muddies the comparisons and ensures that station impacts will be more difficult to detect. That is, the controls are contaminated by power plant effects.

BPS might also have impacts on greater Narragansett Bay. Based on tagging studies, winter flounder that spawn in Mount Hope Bay later migrate through portions of Narragansett Bay into cooler coastal waters (Saila, 1962; Powell, 1992). Losses of adult winter flounder through BPS impacts reduce the adult migratory stock available for harvest in these areas. The company implicitly accepts this because it calculates equivalent adult losses from entrainment casualties at BPS and compares them to fishery landings data for the entire state.

Literature Cited:

Gibson, M.R. 2002a. Winter flounder abundance near BPS, Mount Hope Bay revisited: separating local from regional impacts using long-term abundance data. RI Division Fish and Wildlife Research Reference Document 02/1.

Krebs, C.J. 1989. *Ecological Methodology*, Harper and Row, Publishers, New York. 654 pp.

Powell, J.C. 1992. Winter flounder population assessment. Performance Report, F-26-R-26, Job VI-1. RI Division of Fish and Wildlife.

Saila, S.B. 1962. Proposed hurricane barriers related to winter flounder movements in Narragansett Bay. *Trans. Am. Fish. Soc.* 91:189-195.

Response to d

In a report from Gibson, August, 2002, the author questioned the BPS impingement index as a reliable measure of winter flounder abundance and EPA finds his argument compelling: "It is not based on a rigorous statistical design but rather is a sampling of fish trapped on the revolving screens located at the intake structures. Because the sampling is only at one station which was not assigned randomly, the sample design lacks randomization and replication design elements." Thus, there is no basis for inference and no basis to assess variability. Further, a comparison of length frequency data from trawl and impingement catches shows that impingement samples are biased toward small fish (Figure 9). This likely occurs because of differences in screen (0.375") and trawl (1.5") mesh but also because of a difference in water velocity at the screens and through the otter trawl. Whereas water velocities at the screens range from 0.5 to 1.6 fps (US Gen 2001a), the standard trawl is pulled at 4.2 fps. Maximum swim speed in fish is known to be a power function of body size (Peters 1983). Considering his published relationships for maximum and optimum speeds as a function of body mass (flounder would be intermediate performers), station screen velocities will approach or exceed those estimated for young-of-the-year and Age-1 flounder. Trawl velocities exceed maximum speeds of all sizes of flounder except those approaching their maximum theoretical length (>40 cm). Since the reproducing adult stock showing fidelity to Mount Hope Bay is the population of concern, the standard trawl survey is the preferred index.

Literature Cited:

Gibson, M.R. 2002a. Winter flounder abundance near BPS, Mount Hope Bay revisited: separating local from regional impacts using long-term abundance data. RI Division Fish and Wildlife Research Reference Document 02/1.

Response to e

Personnel from the RI DFW found that there were errors in the data series reported by DeAlteris from RI DFW trawl survey records. In Table 2 of the DeAlteris report, a flounder abundance index is provided for lower Mount Hope Bay from the RI DFW trawl survey. RI DFW personnel reviewed their computer database and trawl logs but could not replicate the DeAlteris numbers for Mount Hope Bay (Figure 10). Average absolute error between the DeAlteris values and the RI DFW numbers exceeded 100 percent. Because of this, EPA can have no confidence in the DeAlteris correlation and time trend analyses.

Problems associated with the impingement analysis have been stated above. Those associated with the PG&E-NEG analysis using the Wilcox trawl are reviewed below.

Gibson, M.R. 2002a. Winter flounder abundance near BPS, Mount Hope Bay revisited: separating local from regional impacts using long-term abundance data. RI Division Fish and Wildlife Research Reference Document 02/1.

57. Comment

PG&E-NEG stated that EPA "admits" that "if regional factors were responsible for the decline, then trawl abundance curves would look similar." The permittee stated that DeAlteris has "conclusively demonstrate[d] that the abundance curves for Mount Hope Bay and Narragansett Bay **do** look similar."

Response

EPA disagrees. If regional factors were solely responsible for changes in abundance, then abundance curves between Narragansett Bay and Mount Hope Bay would be **identical.** However, there is a statistically significant difference in abundance between the two waterbodies and thus the trawl abundance curves are not identical. This suggests that a site-specific factor is responsible for creating the difference.

58. Comment
PG&E-NEG stated that DeAlteris has found that

a. There are no significant differences in abundance trends for any species between Narragansett Bay and the lower 9 square miles of Mount Hope Bay (as measured by the RI DFW trawl data).

b. There are no significant differences in abundance trends for any species between Narragansett Bay and the upper 5 square miles of Mount Hope Bay (as measured by impingement data).

c. There are no significant differences in abundance trends for most species between Narragansett Bay and the upper 5 square miles of Mount Hope Bay (as measured by the MRI standard trawl). The only evidence of a difference in abundance trends for the two bays is between the MRI standard trawl data for winter flounder and scup in the winter of 1985–1986. Data were equivocal with respect to two species in the upper one-third of Mount Hope Bay. For other species there is no significant difference in abundance trends at any time between 1972 and 2000, regardless of which data set is used to represent Mount Hope Bay.

d. There were no significant differences in the density of fish collected by the Wilcox trawl in Mount Hope Bay and in Narragansett Bay from 1997 to the present.

e. There is no evidence of a pre-1984 decline in Mount Hope Bay any different from Narragansett Bay, or that Mount Hope Bay flounder populations were "unstable" or "prone to collapse," as EPA states. The permitee also argued that EPA's sole support for its contention in this regard is a 1996 letter from Delbert Hicks in which the point is stated but not substantiated.

Response to a

First, the EPA points out that the area south of Spar Island is not 9 square miles, which would be about 64 percent of the Bay. The area below the bay as represented by sample stations below Spar Island is about 6.3 square miles, or about 45 percent of the bay (see responses above).

Conclusions drawn by DeAlteris through the analysis of the RI DFW trawl data are an important component of the DeAlteris analysis and it is imperative that one understands the assumptions behind the comparisons. DeAlteris used both RI DFW stations (Spar Island and RWC) to represent the lower Mount Hope Bay basin. One of these near Spar Island is a shallow water station. The other, RWC, is a very deep station (approximately 55 feet), near the outlet of Mount Hope Bay, and is the only area of Mount Hope Bay that appears to have an abundance of adult winter flounder.

The average depth of Mount Hope Bay is 18 feet. The depth of the RWC station is about 55 feet. Only about 5 percent of the bottom area in Mount Hope Bay is at the same or at lower depths than that at the RWC station (Chinman and Nixon, 1985). It appears that the RWC (deep) station area might be a cool water refuge for winter flounder during the warmer months (Figure 11). The RWC deep hole is connected to upper Narragansett Bay and the Sakonnet River via deep channels and it is possible that some of the relatively abundant flounder here are not of Mount Hope Bay origin. Therefore, if high temperatures are affecting bottom water temperatures over much of Mount Hope Bay, which is relatively shallow, it is inappropriate to select data from a deep hole with cooler water to represent the benthic community in Mount Hope Bay. The MRI trawl data and RI DFW data from Spar Island are the most representative of the majority of Mount Hope Bay. Also see response to comments below.

See also discussion above regarding the MRI standard trawl data as the best indicator of the reproducing adult population of flounder in Mount Hope Bay among the different surveys. Among the surveys, the MRI standard trawl is preferable on statistical grounds. Based on the above information, it appears inappropriate to use the two RI DFW stations (two samples per year) to typify the benthic population in

Mount Hope Bay below Spar Island. Because statistical power is a function of sample size, the ability to detect real changes will be fairly low if the RI DFW stations are compared to other more robust surveys.

Literature Cited:

Chinman, R.A. and S.W. Nixon. 1985. Depth-area-volume relationships in Narragansett Bay. Graduate School of Oceanography. The University of Rhode Island. NOAA/Sea Grant Marine Technical Report 87.

Response to b
This comment is addressed above.

Response to c
The RI DFW compared RI DFW Mount Hope Bay Winter Flounder Indices reported by DeAlteris to a data set recomputed by the RI DFW Agency from the Survey database and trawl logs. There were discrepancies between the two data sets of over 100 percent. Thus, it appears that the DeAlteris database was flawed and any conclusions that can be drawn from his comparisons would also be flawed.

As noted above, the MRI data should be appropriate to characterize about 55 percent (not 1/3) of the bay if a simple areal delineation is used by drawing a line across the bay slightly south and west of the bay at 90 degrees to the eastern shoreline. If the MRI stations are used in conjunction with depth information, and if spawning stock flounder densities are stratified by depth (as they appear to be), then the MRI data more likely can be used as estimators for winter flounder abundance for about 9 square miles of the bay (over 64 percent of the bay).

The 1984–87 time period is important because of the substantial downward trend in abundance in the MRI data set during that period. Any trend analyses conducted for Mount Hope Bay should not be conducted in the absence of data from this period. DeAlteris concedes that when this period is included in the trend analysis, winter flounder abundance trends from this more northerly section of the bay do show a decreasing trend when normalized by other trawl data from regional databases.

Response d
In Attachment II.B, Lawler, Matusky, & Skelly Engineers LLP (LMS) compares the densities of winter flounder (approximated with catch per unit trawl effort (CPUE) data) in three non-random portions of Narragansett Bay that LMS designates as “upper Mount Hope Bay,” “lower Mount Hope Bay,” and “Narragansett Bay.” LMS arbitrarily chose the Rhode Island/Massachusetts political boundary as the delineation between “upper” and “lower” Mount Hope Bay, irrespective of important factors such as hydrodynamic or ecological differences between these regions. The “Narragansett Bay” samples are represented by only two trawl sites (Warren River and Ohio Ledge) in the uppermost reaches of Narragansett Bay and therefore cannot be taken to be representative of winter flounder densities throughout most of Narragansett Bay.

LMS used an Analysis of Variance (ANOVA) model to compare CPUE data across the three regions and between two depth categories arbitrarily chosen as trawls < 20 feet deep and trawls > 20 feet deep. LMS assigns the trawl data from the Ohio Ledge site to the “deep” category and data from the Warren River to the “shallow” category. According to NOAA Chart 13221 “Narragansett Bay,” Ohio Ledge depths range from 8 to 18 feet and depths in the area of the Warren River as described in Fig. II. B-2 are 5 to 20 feet deep. Thus, it is not clear why LMS assigned the Ohio Ledge trawl site to the “deep” category and the Warren River site to the “shallow” category. The lack of a real difference in depths between the two areas calls into question the validity of the LMS comparisons between “deep” and “shallow” areas.

LMS concluded from its analysis that the "mean CPUE of winter flounder in upper Mount Hope Bay, as measured by Wilcox trawl, was not different from that measured in lower Mount Hope Bay and Narragansett Bay." LMS further stated that the "results demonstrate that winter flounder abundance in upper Mount Hope Bay has not been differentially depleted as a result of BPS (BPS) operations."

There are several flaws in the LMS statistical design and analysis of the Wilcox trawl data that preclude LMS from making any scientifically defendable statements about winter flounder abundance in the three regions or the importance of BPS to any real differences in abundance that might exist across the greater Narragansett Bay.

First, what LMS has presented Attachment II.B is an *a posteriori* analysis, not specifically designed to compare these three regions. An appropriate *a priori* statistical design would have included equal sampling effort across all stations. LMS provides no data describing the sample sizes for each of the regions. One is left to infer from Figures II. B-1 and II. B-2 in the LMS report, that only one trawl sample was collected in each year at the Warren River and Ohio Ledge sites, while multiple trawl samples were taken at the Mount Hope Bay sites. The inequality in sampling sizes contributes to heterogeneity of variances across the three regions, a constraint that precludes the use of parametric tests such as ANOVA, as discussed below. Low sample sizes could also have contributed to the low statistical power (the ability to detect a difference when it does in fact exist) of the analysis. For example, the power to detect differences among the three study regions is so low that even if a difference existed, the LMS analysis would have had a low probability of detecting it. EPA's ability to detect a difference between sites, in the three cases mentioned, ranged from 10 percent to about 38 percent.

Low power is a result of a low number of samples, but also a result of high variability in sample results. According to M. Scherer (Szal, pers. comm., 2003), winter flounder catch per tow in the year 2000 in the shallow stations in Mount Hope Bay ranged from zero to eight. (six shallow stations). Sampling was conducted once per month. In February no winter flounder were caught at any of the sites; in May, zero to eight fish/tow were captured. In Narragansett Bay very few fish were caught in the shallow station (only one station); typically zero to one. In both Mount Hope Bay and Narragansett Bay, deep stations provided a much wider range in numbers of fish.

Secondly, LMS inappropriately uses the ANOVA model. In order to use an ANOVA model to compare responses among groups, two conditions must be met. First the responses (in this case CPUE) must have a "normal" distribution. The fact that LMS transformed the CPUE data as ln[CPUE+1] would lead one to believe that the data were not normal. However, LMS never describes whether or not the test for normality was performed on the data and if the normality requirement was met with the ln transformation. If the ln-transformed data are not normal, it is totally inappropriate to be using the parametric ANOVA test. The nonparametric Kruskal Wallace test is the alternative analysis (Sokal and Rohlf 1981). The second assumption that must be met in order to use the ANOVA model appropriately is that the variances among the different groups (regions or depths) must be homogeneous. The test for homogeneity of variances is a basic component of any ANOVA software so it is not clear why LMS did not include this information. Once again, if the homogeneity of variances assumption is not met, the ANOVA model is inappropriate. One quick way to test for homogeneity of variances is to use the F_{max} test (Sokal and Rohlf 1981). This test calculates the ratio of the maximum variance in a group to the minimum variance in a group and compares this ratio to the F_{max} Table. EPA calculated the F_{max} for the data presented in Table II.B-2. F_{max} for the "Shallow", "Deep", and "Shallow or Deep" comparisons are 13.7, 14.7, and 52, respectively, all of which are significant at the $p < 0.05$ level, meaning that the variances within the groups of these comparisons are **not** homogeneous and the ANOVA model is inappropriate. An alternative analysis is the "approximate test of equality of means" using the Games and Howell Method (Sokal and Rohlf 1981). As stated above, it is likely that the unequal sample sizes among groups, a flaw in the LMS experimental design, led to unequal variances among groups.

Third, EPA can say with certainty that two stations in Narragansett Bay cannot give a representative perspective of winter flounder populations in Narragansett Bay.

In summary, LMS has used inappropriate stations (no "deep" station in Narragansett Bay), too few number of stations to represent Narragansett Bay, a weak statistical design, and the wrong statistical test in its comparison of Wilcox trawl catches. Further, had LMS used the appropriate statistical analysis, the study likely would still have suffered from low power, thus preventing the analysis from detecting actual differences had they existed. Without the appropriate statistical design and analysis, the LMS report provides no valid, scientifically supportable information to add to the discussion of why winter flounder abundance in Mount Hope Bay is severely depleted over historical abundances.

Literature Cited:

Sokal, R.R. and F.J. Rohlf. 1981. *Biometry*. W.H. Freeman and Company, New York, NY, 859 pp.

Response to e
Gibson stated that although Van Winkle, *et al.* (1981) found that impingement indices were of limited value in detecting abundance changes and that trawl-survey data had been shown superior over fishery dependent data, he considered impingement data in the cited study. Gibson compared impingement rates from the Manchester Street Station to those from the BPS and found that impingement rates of winter flounder at the BPS have decreased steadily since 1972 and remain low. By comparison, those at the Manchester Street Station did not appear to follow either a downward or upward trend over the same approximate time period. Gibson used annual impingement rates as reported by BPS. This data merely consists of the number and types of fish impinged over some predetermined sample time. This result is extrapolated up to an annual total. This extrapolation can be done using time or flow. Thus, if one were to sample impingement rates for a week, one could multiply the results by 52 to calculate an annual total. A second approach would be to measure the flow for the week and extrapolate based on the total annual flow for the plant. Because BPS is a baseload plant and runs fairly consistently, either approach should produce comparable results.

Literature Cited:

Gibson, M.R., 2001. Winter flounder abundance near BPS, Mount Hope Bay.

59. Comment
PG&E-NEG stated that Collie and Delong (2002) support the permittee's conclusions because they partitioned the RI DFW trawl data into specific units and in the "spring survey" for "lower Mount Hope Bay" found no significant decline in winter flounder in Mount Hope Bay.

Response
Collie and Delong (2002) conclude that BPS is impacting winter flounder populations in Mount Hope Bay. For additional detail, see above.

Collie, J.S. and A.K. DeLong 2002. Examining the decline of Narragansett Bay winter flounder Final Report to RI DEM Division of Fish and Wildlife. 150 pp.

60. Comment
PG&E-NEG stated that contrary to the "Gibson hypothesis," the increase in flow and heat from the July 1984 conversion of Unit 4 from closed-cycle to open-cycle cooling did not actually occur until 1987 because other units were out of service or operating at reduced loads during that period. The permitee asserts that EPA's own analysis shows this. According to the permittee, the steep decline in the 1985–86 MRI standard trawl occurred **before** the thermal discharge and intake flow increases associated with the

Unit 4 conversion. Therefore, the permittee argued that BPS could not have caused the steep decline. The permittee further stated that the "Gibson hypothesis" is undermined by DeAlteris' work because while Gibson argues that the impact of the Unit 4 conversion is evidenced by a differential decline in the fish populations of Mount Hope Bay and Narragansett Bay, DeAlteris argues that his work shows there was no such differential decline. The permittee asserted that if there was any differential decline at all it occurred only for certain species in the winter months of 1985–86, but there was no increase in thermal discharge or water withdrawals during those months or, with one exception, in the prior 6 months. The permittee stated that while there was an increase in the thermal discharge in August 1985, the level was similar to levels reached "in recent years and yet there has been no corresponding sharp decline in MRI's original trawl data for these years." Therefore, the permittee concludes that BPS thermal discharge in August 1985 "is **not** accountable" for the declines in the number of fish caught in the MRI trawl in the winter months of 1985–1986.

Response

While it is true that the waste heat rejection (as TBtu) on a yearly basis was much higher after 1986 than it was before that time and reached its peak in 1989, heat rejection steadily climbed from 1981 through 1985 (Figure 12). It declined slightly in 1986 but then continued to climb until 1989. The dramatic decrease in winter flounder populations, based on the MRI trawl data, over the years 1984 through 1988 and the continued flat-line at near zero levels after that time, concurs with the theory that the system reached a breaking point in the mid-1980s from which it has not recovered. Whether or not the system reached a breaking point prior to the time when BPS reached peak heat rejection is irrelevant. From 1984 through 2000, both intake flows and heat rejection were either at the same level or at higher levels than they had been in 1984.

Based on this information, it is likely that combined impacts from heat and entrainment and impingement were greater after 1984 than prior to that time. Fish populations (winter flounder, tautog, and windowpane) in MRI trawls all continued to decline through the years 1984 through 1987 and appeared to bottom-out in 1988, coinciding with the theory that the system reached a breaking point in the mid-1980s from which it has not recovered.

61. Comment

PG&E-NEG stated that there was "no coincidence" in time between the conversion of Unit 4 and the decline of the Mount Hope Bay fishery. The permittee went on to state, however, that there were **other** significant stresses on the fish and habitat of Mount Hope Bay at that time. Specifically, the permittee points to the following factors:

a. The dredging of 1000 bushels of quahogs from the Lee River in the summer of 1985.

b. Hurricane Gloria occurred in September 1985.

c. Dredging at the Taunton River intake of BPS in the area of MRI standard trawl sites during October to December 1985.

Response

EPA maintains that there is a clear correlation in time between fish abundance and both plant flow and heat rejection. Collie and Delong (2002), investigators that PG&E continually point to in an attempt to make their case, cite the strong correlation between winter flounder abundance and BPS cooling water flow as one reason they conclude that BPS is having an impact on winter flounder in Mount Hope Bay.

EPA does not agree that the other factors listed above would produce the extensive, long-term impacts observed in Mount Hope Bay. The one-time dredging of quahogs and of the BPS intake channel would be

expected to result in a short-term, localized impacts on benthic communities. However, neither of these events would affect multiple species over a 5 to 9 square mile area for 18 years hence. Hurricane Gloria certainly would be sufficient to impact a widespread area, but again it is an event that is of limited duration. It is unlikely to have affected multiple species for 18 years subsequent to its passing. Hurricanes and dredging occur all over New England on a fairly regular basis without an associated loss of fish stocks in multiple species to the magnitude observed in Mount Hope Bay. It is not realistic to attribute such a dramatic collapse in multiple fish stocks and the subsequent flatlining of the populations on hurricanes or one-time dredging activities.

EPA believes, after careful consideration, that BPS's operations constitute the only stressor that could so significantly affect such a large area of Mount Hope Bay for such an extended duration. BPS takes in almost 1 billion gallons of cooling water a day (1/50th of the volume of the bay) and discharges water back to the bay up to 30 ^{o}F warmer than ambient. The net effect of the thermal discharge is to elevate, on average, the entire 14 square miles of Mount Hope Bay by 1.5 ^{o}F in the surface zone (i.e., down to the 6-foot depth). BPS runs continually 24 hours a day for essentially the whole year (some units do go down for scheduled maintenance and Unit 4 is only run during peak energy times). No other stressor exerts such a widespread and continuous influence on the Mount Hope Bay system at an equivalent magnitude.

Collie, J.S. and A.K. DeLong 2002. Examining the decline of Narragansett Bay winter flounder Final Report to RI DEM Division of Fish and Wildlife. 150 pp.

62. Comment

PG&E-NEG says that the MRI Wilcox trawl data collected since 1997 is the "only strictly comparable measure of fish abundance that exists for all three areas" (i.e., "upper" and "lower" Mount Hope Bay and Narragansett Bay). The permittee says that these data "definitively" show fish abundance to be the same for all the areas and that both Mark Gibson of the RI DEM and EPA ignore the Wilcox trawl data. The permittee complained that EPA, instead, relies on a modeling exercise by Gibson to conclude that BPS is taking 80 percent of Mount Hope Bay's winter flounder.

Response

The Wilcox trawl data survey provides additional information to consider, but it is very short in duration compared to the other surveys. Additionally, the power of that survey to detect a difference between various stations has not been determined. Limited sampling, in combination with high variability, might preclude one from detecting real differences between populations. The Wilcox trawl data survey is of limited utility due to its short duration, limited number of samples, and the fact that it has missed the collapse of the fish stocks in Mount Hope Bay. Neither PG&E-NEG's population dynamics consultant, Hillborn, nor its fisheries consultant, DeAlteris, used this survey in their analyses. Hillborn specifically discounted it in his October 3, 2002, submission to EPA by stating: "Because this data series is relatively short (1997-present), the Wilcox trawl data has not been used for estimating winter flounder abundance."

The analysis done to estimate the percent of the population taken by BPS was conducted by EPA to put an appropriate frame of reference on the entrainment and impingement losses from BPS. It was not intended to look at differences between waterbodies in fish abundance as is intended with the Wilcox trawl survey. Thus, the Wilcox trawl survey and EPA's population analysis are not directly comparable. EPA did not consider one analysis in lieu of another as PG&E-NEG suggests.

63. Comment

PG&E-NEG stated that another of its consultants reviewed the fish population issues and concluded that Mark Gibson of RI DEM underestimated the present winter flounder populations in Mount Hope Bay, and that BPS water withdrawals do "**not** account for a large loss in population." The permittee said that its consultant Raymond Hilborn constructed a new model using "simpler, more biologically reasonable

assumptions" than Mark Gibson did and that Hilborn's model shows Mount Hope Bay winter flounder populations significantly larger than what Mark Gibson calculated. The permittee stated that Hilborn estimates that there were between 292,000 and 394,000 adult winter flounder in Mount Hope Bay during 1986 to 1999 and that it is significant that these numbers "matched closely" with an estimate of 279,953 during 1989–90 that Gibson made in a 1993 analysis. The permittee further states that "using Region I's calculations" and his own population estimate, Hilborn shows that the permit limits proposed by PG&E-NEG would result in the entrainment and impingement of less than 5 percent of the Mount Hope Bay's winter flounder. The permittee argued that this is far less than an 80 percent take and much less than the 26 percent take that EPA has deemed acceptable. PG&E-NEG stated that Hilborn's estimates are the most reliable ones because they avoid Gibson's alleged errors of "confusing data for upper bay with entire bay," avoid making unnecessary assumptions, and are consistent with empirical data from the Wilcox trawl. The permittee also cited comments by another of its consultants, Kenneth Rose, to support its contention that Hilborn's estimates are most reliable.

Response

The discrepancy in winter flounder population estimates between EPA and Hillborn largely arise from differences in interpreting what areal extent each fish sampling program represents. In EPA's estimate of winter flounder abundance in Mount Hope Bay, it relied on the MRI trawl survey as a scaler of abundance for all of Mount Hope Bay. Hillborn's estimate relies on prior work done by PG&E-NEG consultant Joseph DeAlteris. DeAlteris commented that the MRI trawl survey represented only 5 square miles of Mount Hope Bay and that winter flounder abundance for the rest of the bay, about 9 square miles, should be represented by stations sampled by the RI DFW survey.

DeAlteris' depiction of what areal extent is represented by each trawl survey is artificial. He asserts that the MRI trawl survey represents fish abundance in only the Massachusetts portion of Mount Hope Bay. As seen in Figure 8, the MRI standard trawl survey has 1 station that is one mile south of the state border well into Rhode Island waters. Thus, for this and other reasons, DeAlteris' assertion that this trawl survey represents only 5 square miles is flawed. Based on the results of this survey and the RI DFW survey, EPA believes that the MRI survey presents a reasonable estimate of fish abundance.

Additionally, DeAlteris' assertion that the RI DFW trawl survey represents the lower 9 square miles of Mount Hope Bay is flawed. The RI DFW fixed-station survey is intended to look at long-term trend abundance over all of Rhode Island state waters. Due to its large geographic scope, the number of sampling stations and frequency of sampling is limited for any specific waterbody in the survey. In Mount Hope Bay, there are only two stations, a shallow water (< 20 feet depth) station near Spar Island and a deep water (> 55 feet depth) station near the connection between Narragansett Bay and Mount Hope Bay. Mount Hope Bay is predominantly a shallow water system. Using published depth contours for Mount Hope Bay, EPA estimates that 88 percent of surface area of the bay is less than 30 feet deep. EPA also estimates that only approximately 3 percent of Mount Hope Bay is greater in depth than 45 feet. DeAlteris treats the two RI DFW stations mathematically equal and as a result greatly overstates the relative importance of their deep water station. By default, this station contributes 50 percent of the data to the analysis though it is representative of, at best, 3 percent of the depth contours of the bay. This station, possibly due to its depth, location, and cooler water temperatures, consistently produces many more fish than the shallow water station near Spar Island. Both the MRI and RI DFW trawl surveys show a distinct depth preference by winter flounder in Mount Hope Bay. The MRI survey shows that for their time series approximately 80 percent of the winter flounder they catch are found in deep water (> 20 feet). The RI DFW survey shows similar results with 88 percent of their winter flounder caught in their deepwater station. Thus, the artificially increased importance of the deepwater station tends to inflate the winter flounder abundance numbers in what DeAlteris calls lower Mount Hope Bay. This results in an artificially minimized difference between lower Mount Hope Bay and Narragansett Bay.

Hillborn derives a population estimate based on three different approaches. One is based on the work done by DeAlteris and his parceling Mount Hope Bay into segments. The flaws of that work are discussed in the previous paragraph. Hillborn's second approach uses impingement rates as an index of abundance. It has long been the position of EPA and the majority of the Brayton Point TAC that impingement rates provide a good qualitative measure of relative fish abundance, but it is not a quantitative technique. Impingement is measured at the intake screens, thus this analysis is based solely on one sample. If fish were equally distributed throughout Mount Hope Bay, one might be able to make a case that a single sampling location would suffice. However, EPA knows from the MRI trawl survey that fish are not equally distributed. As stated previously, MRI takes about 80 percent of the winter flounder that they catch in one station, which is the trawl station in the deeper water in front of the intake structure. Due to their proximity to the intake structure, fish in this area have a much higher probability of being impinged than fish in other portions of the bay. This makes extrapolating impingement rates to a baywide population estimate dubious at best. The effect of the greater concentration of flounder immediately in front of the intake will result in higher impingement rates that, when extrapolated on a baywide basis, will significantly artificially inflate the population estimate of winter flounder. Finally, Hillborn's third approach is to use an estimate derived by Mark Gibson for Narragansett Bay winter flounder concentrations and apply those concentration values to the area of Mount Hope Bay. Hillborn's justification for assuming equal fish densities in Mount Hope Bay and Narragansett Bay is the comparability of catches in the Wilcox trawl series. However, EPA questions the validity of this assumption based on the relatively short duration of the survey and limited number of stations involved. In his October 3, 2003, comment letter to EPA, Hillborn discounts using the Wilcox trawl results due to the limited duration of the survey, but later cites it as the sole evidence that the assumption of equal fish density in both Mount Hope Bay and Narragansett Bay. Data from RI DFW stations in both Mount Hope Bay and Narragansett Bay suggest that there is a clear difference in winter flounder density from shallow water stations in Mount Hope Bay compared to shallow water stations in Narragansett Bay. Shallow water stations in Mount Hope Bay have much lower densities of winter flounder, thus Hillborn's assumption of equal densities will result in an overestimate of fish population numbers in Mount Hope Bay.

PG&E-NEG pointed to comments solicited from Ken Rose for support of Hillborn's analysis. Rose provides comments on Gibson's Fishery Production Foregone model and Hillborn's alternate Production Foregone Analysis. Neither of these speak directly to the question of what the winter flounder population is in Mount Hope Bay and so Rose's comments do not directly support the larger Hillborn assertion of a population of 300,000 winter flounder in Mount Hope Bay. Rose points out that the primary difference between Gibson's Fishery Production Foregone model and Hillborn's Production Foregone Analysis is the difference in interpreting what area the MRI trawl survey really represents. Hillborn relies on the DeAlteris assertion that this represents one-third of the Bay, while Gibson assumes it represents the entire bay.

64. Comment

PG&E-NEG stated that the population of young winter flounder in Mount Hope Bay is not less than the population in Narragansett Bay. According to the permittee, Region 1 relies in part on a length frequency distribution analysis for two species, argues that it indicates a population decline in Mount Hope Bay driven by a loss of young fish rather than older fish, and then argues that this is more indicative of a plant discharge/intake effect than of overfishing. The permittee argued that EPA's analysis had "analytical shortcomings and data misrepresentations which invalidate its conclusion," and that EPA's analysis was "incomplete, biased and unreliable." According to the permittee, specific problems with the analysis include the following:

a. Instead of examining all the data, EPA "selectively analyzed only one of four data sets" available for Mount Hope Bay" and chose the poorest one for reflecting young and small fish.

b. Instead of using all the data from the one set that was analyzed, EPA looked only at 3 years of data from the 30 years of data that exist, whereas examination of all 30 years shows no difference and the only years that do show a difference are the 3 years that EPA used.

c. EPA compared data collected with a fine mesh trawl in Narragansett Bay to data collected with "coarse mesh" trawl in "upper Mount Hope Bay," which is "inappropriate" due to the different selectivity of the different nets.

d. Examination of the length frequency data from "other" years along with "other data sets (including the impingement data) shows that the decline of winter flounder in Mount Hope Bay is in the larger fish, which suggests a fishing effect, rather than a BPS effect.

Response
EPA disagrees with the comment. The Agency considered all the data. The permittee stated that EPA selected data from only one survey of the four surveys available. EPA assumes that the four surveys that they are referring to are the MRI standard trawl survey, the MRI Wilcox trawl survey, the RI DEM trawl survey, and impingement data. EPA chose data from the MRI survey, because it is the most comprehensive survey in Mount Hope Bay and it spans the time period before and after the collapse in 1984. The Wilcox trawl survey has only recently been instituted and thus, has no value in assessing pre-collapse size distribution. Using impingement data is inappropriate, because smaller fish have a greater probability for impingement than larger fish, due to their correspondingly reduced swimming ability. Thus, impingement data are biased towards smaller size classes of fish. The RI DEM survey is not as robust as the MRI survey, so it was not used. EPA reviewed the MRI data and graphically presented a subset of that data set merely to illustrate its point.

The shift in size distribution within Mount Hope Bay cannot be explained by differences in mesh size as the mesh size used by MRI was consistent throughout the study. The comparison to Narragansett Bay did require using data from a survey with different mesh size. This was done simply to illustrate that Narragansett Bay (after the collapse in Mount Hope Bay) had a winter flounder population with a larger size range distribution. EPA believes this is a valid qualitative comparison.

65. Comment
PG&E-NEG stated that no scientist other than Mark Gibson of the RI DEM has found any evidence that winter flounder are recovering in Narragansett Bay but not in Mount Hope Bay. The permittee commented that it had one of its consultants investigate this issue and he concluded that data from 1995–1996 showed a brief, modest increase in winter flounder in Narragansett Bay and that the data since that time have shown a decline to record low levels. According to the permittee, the Wilcox trawl data show no difference in winter flounder density between Mount Hope Bay and Narragansett Bay since 1997 (when the Wilcox trawl began). The permittee also asserted that EPA's reference to the recovery of fish stocks on George's Bank is irrelevant because it is a different stock, and the appropriate comparison is to the Narragansett Bay stock. In addition, the permittee stated that a study by Collie and Delong (July 2002) concludes that winter flounder in Narragansett Bay are not recovering, and that another researcher (Jeffries) recently reported that, consistent with conditions in Mount Hope Bay, winter flounder in Narragansett Bay have declined by 96 percent in the last 20 years and are not recovering.

Response
The permittee attempted to depict winter flounder stocks as declining regionally by providing some specific examples of local populations that have declined. EPA disagrees with PG&E-NEG's

characterization of a regional decline in winter flounder. In other responses in this document, EPA presents data from the most recent Southern New England regional stock assessment for winter flounder, of which Rhode Island is a part. This stock shows a modest recovery in recent years, one that is not reflected in Mount Hope Bay.

Winter flounder in Narragansett Bay are at low levels, but RI DEM data continue to show that they persist at a higher abundance than in Mount Hope Bay. Finally, the difference in long term abundance trends remains statistically different between Mount Hope Bay and Narragansett Bay.

66. Comment
PG&E-NEG stated that EPA apparently "did not read" either the Collie or Jeffries papers since they were not in EPA's Administrative Record.

Response
EPA did read the year one interim report from Collie and Delong before issuing its Draft Permit. This is listed in the Literature Cited section of the § 316 (a) and (b) Permit Determinations Document. The final version of this paper, with conclusions not substantively different than the interim report, came out after EPA had issued the Draft Permit. EPA has read the Final Report and included it in the content of its responses and its Administrative Record. EPA also reviewed the Jeffries paper that the commenter makes reference to and that is cited in a number of our responses. EPA believes that both papers make numerous points that support the Agency's final conclusions. Those specific points are discussed in other responses.

67. Comment
PG&E-NEG argued that EPA fails to follow the Agency's own "Stressor Identification Guidance Document" which was "issued in 2000 to address effects on fish populations." The permittee further stated that this Guidance makes clear that statistically significant correlations between variables do not prove causation and that it is "'wrong' to conclude that 'statistically significantly correlated variables have a causal relationship.'" The permittee also stated that it is "completely inappropriate to do so on the basis of a single observed correlation, especially where no comprehensive attempt has been made to rule out other possible causal factors." According to the permittee, EPA nevertheless relied on an incorrect analysis of Mark Gibson of the RI DEM that "clashes with principles of sound scientific inquiry."

Response
As EPA has stated in previous responses, it has not claimed that the data collected to date establish a causal relationship, in the strictest scientific terms, between plant operation and fish abundance in Mount Hope Bay. EPA did consider alternate explanations (fishing, global warming, dissolved oxygen, predation) for the collapse of fish stocks in Mount Hope Bay. However, none of these alternate explanations could reasonably explain the timing, magnitude in extent of decline and area affected, number of affected species, and duration of the effect of the finfish collapse in Mount Hope Bay. EPA presented evidence, which included field data, observational data, and modeling to support the position that BPS is currently having a substantial impact on the Mount Hope Bay ecosystem. Our analysis is not inconsistent with EPA's guidance document.

Response #: VII.68	**Document #**: 1133

Comment
EPA received one comment stating that the 1976 NPDES permit was issued against the advice of all State and Federal biologists involved with the permit at the time.

Response
A memo written by Russ Isaac of MA DEP reports that at a June 30, 1976, public hearing, Jan Praeger of EPA, Juan Gonzales, and Clarence Tarzwell were all opposed to the issuance of the permit with an increased thermal discharge limit. Prager went so far as to say that he would prefer to see violations of standards at better-sited plants, such as Pilgrim, than the proposed increase in thermal discharge at BPS.

Response #: VII.69	**Document #**: 1159

Comment
One commenter supports the use of the 0.333-mm mesh icthyoplankton net in sampling fish eggs and larvae.

Response
The 0.333-mm mesh net will continue to be used for sampling of fish eggs and larvae.

Response #: VII.70	**Document #**: 1180

Comment
EPA received one comment stating that winter flounder populations in some areas, such as Georges Bank, are thriving despite heavy fishing pressure.

Response
The most recent Stock Assessment Review Committee reports on winter flounder show that spawning stock biomass for winter flounder populations in the Gulf of Maine and Georges Bank are well above the maximum sustainable yield (Figures 4 and 5). Although these populations sustain heavy fishing pressure, they appear to be fairly resilient. The southern New England winter flounder stock is still well below the spawning stock biomass that would result in the maximum sustainable yield to the fishery (Figure 6). As a result, fishing mortality has been reduced and will be reduced further to allow a rebuilding of the stock. Spawning stock biomass for this population bottomed out in the mid-1990s, but has shown a slight recovery (Figure 6).

Response #: VII.71	**Document #**: 1056

Comment
EPA received one comment stating that Mount Hope Bay and the biological community should be monitored even after cooling towers are installed.

Response
EPA's permit continues the ambient monitoring program so that future changes in the biological community will be tracked.

Response # : VII.72	**Document #**: 1220

Comment
EPA received one comment stating that runoff from the coal pile is negatively affecting winter flounder spawning grounds.

Response
Winter flounder are believed to spawn in brackish waters, so the lower portion of the rivers that feed into Mount Hope Bay are the most likely areas for spawning activity. These areas are in the northern part of the bay and in relatively close proximity to the station. BPS does spray water over the coal pile to

minimize loss of coal dust to the wind. Undoubtedly, some quantity of coal is lost to the bay during transfer from coal-delivering vessels and storage. Unfortunately, the quantity of material lost and the significance of its effect are currently unknown.

Response # : VII.73	**Document #**: 1034

Comment
EPA received one comment stating that fish in North Watuppa Pond have the highest levels of mercury of any other pond in the State. The commenter suggests that the high levels of mercury are due to air emissions from the Brayton Point and Montaup power plants.

Response
This permit addresses only the water-related discharges from BPS into Mount Hope Bay. Air emissions are currently being addressed by a separate MA DEP and EPA effort.

Response # : VII.74	**Document #**:1026

Comment
EPA received one comment stating that discharging the waste heat to the bay or releasing it to the atmosphere is a waste of a resource that could be reused.

Response
There is no question that waste heat has been put to multiple good uses in other locations. In fact, an LNG storage facility proposed for Brayton Point has suggested it would use some of the waste heat from BPS to warm and vaporize the LNG.

D. Air Quality

Response #: **VII.75**	**Document #**: 1004, 1007, 1021, 1028, 1032, 1035, 1036, 1042, 1052, 1062, 1063, 1067, 1071, 1072, 1078, 1079, 1080, 1081, 1084, 1085, 1088, 1091, 1092, 1118, 1137, 1138, 1169, 1198, 1201, 1209, 1212, 1213, 1217, 1220, 1222, 1229,1237,1242, 1243

Comment
EPA received approximately 38 comments regarding air pollution from BPS.

Many commenters pointed out that BPS is a significant source of air pollution and expressed concern over breathing polluted air. Some commenters offered personal observations of “soot stained homes and cars” (1032), or the “brown/orange haze that covers the northern part of Mount Hope Bay.” (1062) Another commenter stated that “looking up at the sky, I could see a thick yellowish plume under the black clouds and realized it was from Brayton Point.” (1137)

Some commenters requested that EPA “include the air quality issue of Brayton Point” (1080) and “urge[d] the EPA to address the negative effects of the BPS on the air quality” (1081) as part of the NPDES permit action.

One commenter noted that PG&E is expending “a quarter of a billion dollars on environmental improvements for both air quality improvements and reductions in thermal discharge.” (1169)

One commenter stated, “The air quality in this community is exceptionally good.” (1237)

Response

The new NPDES permit for BPS is being issued under federal and state water pollution control laws. This permit does not and cannot regulate air pollutant emissions. Nevertheless, EPA agrees that air pollution from BPS is of concern. Air pollution concerns are addressed on the Federal level through the Clean Air Act (CAA) and, on the State level through Massachusetts Air Pollution Control regulations (310 CMR 7.00).

BPS is currently updating its air pollution control equipment pursuant to MA DEP air regulations. This upgrade will result in significant reductions of air pollution from the facility. The controls, scheduled to be in place by 2006, are predicted to result in annual reductions of approximately 18,500 tons of sulfur dioxide, 7,600 tons of nitric oxides, and 4,000 tons of carbon monoxide. See June 2003 report by the permittee's consultant, TRC, Inc.

EPA's proposed NPDES permit may require that the facility install mechanical draft cooling towers which could result in additional particulate emissions from the facility.

The issues of air pollutant emissions that could result from operating cooling towers at BPS will be subject to further review in the development of MA DEP and EPA air permits. There is currently insufficient information to precisely evaluate the potential air quality impacts and any mitigation measures associated with cooling tower operation at BPS that may be necessary. BPS will be required to submit additional information pertaining to air quality impacts and mitigation measures before it receives the necessary approvals to construct and operate cooling towers with an air pollution emission rate exceeding 1 ton annually, which would include particulates such as salt.

As part of its air quality review, MA DEP will determine whether the BPS cooling technology meets the BACT standard. The BACT evaluation includes a comparison of available air pollution control technologies with respect to their efficiency, reliability, feasibility, and cost. BACT review will likely consider wet and dry cooling, salt- and freshwater cooling, alternative cooling towers, and, mist and drift elimination options. It is important to note that the company itself, in its November 2001 316(a) and 316(b) Demonstration Document, stated that "[t]he usual drift dispersion pattern results in salt deposition and saline air concentrations that represent only a slight increase over ambient coastal conditions." See Volume IV, p. 3-3. The company also submitted comments regarding particulate emissions from cooling towers, and in these comments it stated that "[b]ecause emitted water droplets potentially result in particulate emissions, in this case, mostly salt, cooling tower drift (or water droplets) would need to be controlled from the cooling tower to a level consistent with BACT. The most stringent level of control currently demonstrated in practice is the use of very high efficiency drift eliminators (0.0005 percent of the circulating water volume emitted as drift). This control would reduce drift to approximately 1.3 gallons per minute (gpm) in the case of the Enhanced Multi-Mode, whereas the 72-cell configuration would result in about 7.8 gpm of drift." See October 3, 2002 report by the permittee's consultant, TRC, Inc., p. 4.

BPS will also be required to apply to EPA for a permit in accordance with the PSD program if the selected cooling technology's emissions exceed certain thresholds. Massachusetts recently remanded this program to EPA. BPS will need to coordinate this permit review process with both EPA and MA DEP.

Regarding the comment that air quality is exceptionally good in Fall River, EPA offers the following response. EPA and MA DEP provide and maintain an ambient air quality network that provides a broad picture of air quality over a large area to characterize the State's overall compliance with Federal health-based air quality standards. Massachusetts meets all the current standards, except ozone, which is a New England regional problem. Fall River is contained in what EPA and MA DEP refer to as the eastern Massachusetts serious ozone nonattainment area. This designation means that the area is currently in

nonattainment of the Federal air quality standard for ozone. In New England, the States operate a network of approximately 55 ozone monitoring stations during the ozone season (April 1 to September 30). Large industrial sources of air pollution such as power plants (e.g., BPS) are known contributors to ozone pollution, as are other sources such as motor vehicles. More information on air quality in eastern Massachusetts can be obtained from EPA's Air Quality Unit at (617) 918-1983 or by visiting EPA Region 1's Web site at http://www.epa.gov/region01/topics/air.

Commenters may obtain more information on air pollution requirements and regulations applicable to BPS by contacting EPA's Air Permits section at (617) 918-1650 or by contacting the MA DEP Air Division at (508) 946-2776.

E. Coal

Response #: **VII.76**	**Document #**: 1062, 1173, 1174, 1195, 1198, 1210, 1215, 1228, 1229, 1237

Comment
EPA received approximately nine comments regarding the use of coal as the fuel at BPS.

Many of these comments expressed concern that EPA's action could result in the shutting down of BPS, thereby reducing the percentage of electricity generated by burning coal. Commenters argued that this could reduce fuel diversity and cause the New England market to become overly dependent on natural gas for fuel. Commenter 1215 stated, "Another matter the EPA should consider is that, by 2005, the energy mix in New England could include 60 percent gas. If Brayton Point is not a player, would that number be 75 percent or even higher?" Commenters urged EPA to consider "…that any solution that is reached regarding Brayton Point must recognize the consequences to the diversity of the region's fuel mix and the economy." (1174)

Some commenters expressed concern over the air pollution that is generated by burning coal.

Response
EPA acknowledges the concerns expressed regarding fuel diversity. However, this permit addresses only the water pollution aspects of BPS's operation. The permit does not affect the type of fuel that the facility burns in any way. EPA's policy is to maintain a "fuel neutral" position when implementing its mandated environmental regulatory programs under the CWA.

Furthermore, EPA does not believe that this permit will result in the closure of the facility. Indeed, PG&E-NEG has not suggested that it would. Therefore, this permit should not affect the fuel mix in New England.

Concerns regarding air pollution from BPS are discussed elsewhere in this response-to-comments document.

F. Water Quality

Response #: **VII.77**	**Document #**: 1029, 1033, 1088, 1140, 1141, 1145, 1204, 1220

Comment
EPA received numerous comments relating to the chemicals used at BPS, their subsequent discharge to Mount Hope Bay, and the potential by-products formed. These commenters urged EPA to ". . . take a closer look at any chemicals that are being used and what effect they have on the waters of Mount Hope Bay." (1088)

Many commenters opposed the use of biocides at the facility. Commenter 1145 submitted a petition signed by approximately 650 individuals that stated, in part, "We object **strongly** to the use of **any biocide** at the plant. We want alternative technologies used instead." The petition also stated that "[w]e ask that all discharges—chemicals and/or metals be **filtered or neutralized at their point of least dilution.**"

One commenter (1204) expressed concern that chemicals were leaching from a fly ash pit along the shore of the Sakonnet River into the bay, stating, "…walk along the shore of the Sakonnet and see the fly ash pit that leaches out into the bay."

Two commenters were concerned with potential sediment contamination due to the discharge of chemicals from the facility, stating, "…these toxins settle in the mud of the sea floor, they mutate and they extinguish marine life." (1220)

Response

BPS has used, and plans to use, a variety of chemicals throughout the facility for a range of applications. The company is required to list all the chemical compounds it intends to discharge into the receiving water (Mount Hope Bay). EPA is required to limit any pollutant or pollutant parameter (conventional, nonconventional, toxic, and whole effluent toxicity) that is or may be discharged at a level that causes or has "reasonable potential" to cause or contribute to an excursion above any water quality criterion. For the Draft Permit, EPA evaluated the proposed chemicals to be discharged from BPS for "reasonable potential" to cause or contribute to an excursion of water quality criterion and, where appropriate, developed Draft Permit limits for such chemicals. EPA also applied the technology-based limits for the Steam Electric Power Generating Point Source Category (found at 40 CFR Part 423) to BPS's Draft Permit.

Based on commenter 1088's request, EPA has reevaluated the intended use of chemicals at BPS and the subsequent discharge of these chemicals to Mount Hope Bay. After consultation with the MA DEP, EPA has added an additional monitoring and reporting requirement for vanadium at outfall 004A. This was added in order to monitor Brayton Point Station's current discharge of wastewater for the presence of vanadium. EPA has concluded that the limits contained in the Permit, including the WET testing requirement, are sufficiently stringent to ensure compliance with the Massachusetts water quality standards and satisfy the technology requirements at 40 CFR Part 423.

EPA offers the following response to the comment opposing the use of biocides at the plant. (1145) The facility will use sodium hypochlorite to control biological growth throughout plant systems, including the condenser tubes and the service water system. Sodium hypochlorite is a biocide commonly used throughout the power generating industry. BPS employs a "targeted" chlorination cycle designed to minimize the use, and therefore the discharge, of chlorine. Additionally, the facility demonstrated its use of another method of biofouling control in the condenser tubes, namely, the SIDTEC system. This system uses mechanical means to remove any built-up fouling material from the condenser tubes (so-called "rockets" that are buoyant and are distributed through the condenser tubes with the cooling water). This system will further reduce BPS's chlorine use. EPA has established water quality-based limits for chlorine at outfall 001 and technology-based chlorine limits for the future cooling tower blowdown at internal outfall 003. EPA believes mthese limits are consistent with state and federal requirements and will therefore allow the use of sodium hypochlorite as outlined in the Draft Permit.

BPS has also requested the use of an additional biocide, namely, Spectrus CT1300, for use in the service water system. The service water system is separate from the cooling water system. EPA determined that an acceptable Draft Permit limit for this chemical is 0.2 ppm. This limit was derived using the chemical's toxicity effect on Mysid shrimp and the dilution of the receiving water, as well as the expected

concentration to be used at the facility. In addition to putting a numerical limit in the permit, EPA is also requiring the facility to conduct quarterly WET testing when Spectrus CT1300 is in use. This testing requirement will allow EPA to monitor and verify that the discharge from BPS, including the Spectrus CT1300 chemical, is not toxic to aquatic life. In response to comments, EPA obtained additional information on Spectrus CT1300 with regard to its half-life and environmental fate. This information indicates that Spectrus CT1300 is relatively short-lived in the environment and will have a significant reduction in concentration (by one-half) within about 5 hours (see Administrative No. 3213). Therefore, EPA will allow the use of Spectrus CT1300 as outlined in the Draft Permit.

As previously discussed in the response to air pollution concerns, this permit addresses the intake and discharge of cooling water and wastewater from BPS in accordance with the CWA. EPA is not aware of any chemicals leaching from fly ash pits along the Sakonnet River. If any such releases have been observed, however, they should be reported to EPA's Office of Site Remediation and Restoration at (617) 918-1200 or the Southeast Regional Office of MA DEP at (508) 946-2700.

The issue of sediment contamination is addressed elsewhere in this response-to-comment document.

G. Other

Response #: **VII.78**	**Document #**: 1218

Comment

In the cover letter transmitting its comments on the permit, PG&E-NEG complained of inadequacies in EPA's Administrative Record for the NPDES permit. First, the permittee claimed that it "highlighted" gaps in the record in an August 21, 2002, letter it sent to EPA. It stated that a number of documents were "missing" from the record and that it would shortly provide a list of these missing documents. The permittee also stated that it "reserves its right to submit additional comments relating to" information recently made available by the MA DEP or any information later made available by EPA and/or the MA DEP.

Response

In a letter dated August 21, 2002 (AR 3068), the permittee alleged inadequacies in the Administrative Record. In comments on the permit, the permittee cited this letter, seeming to retain the views it had previously presented. EPA's view, however, is that its Administrative Record supporting the Draft Permit satisfied applicable legal requirements. EPA has responded to the allegations in the permittee's August 21, 2002, letter in two memoranda and a letter to the permittee, all of which are included in the Administrative Record and incorporated herein by reference (AR 3024, 3025, 3060).

In its August 21, 2002, letter, the permittee also requested that the public comment period for the Draft Permit be extended from September 4, 2002, to November 15, 2002. This would have resulted in a total comment period of nearly 4 months (the Draft Permit was issued on July 22, 2002). EPA regulations require comment periods for NPDES permits to last a minimum of 30 days. See 40 CFR § 124.10(b). Nevertheless, EPA initially went beyond the minimum requirement and set a 45-day comment period (to end on September 4, 2002). In response to the permittee's request, and despite disagreeing with the permittee's complaints, EPA extended the comment period by an additional 30 days (i.e., until October 4, 2002). See AR 3023, 1162, 1163, 3024, and 3025. This extension stretched the comment period to 2.5 months (or 75 days), well beyond the minimum requirement of 30 days. EPA believes this comment period was reasonable.

As stated above, EPA responded to the allegations in the permittee's August 21, 2002, letter in two memoranda and a letter to the permittee included in the Administrative Record and incorporated herein by

reference (AR 3024, 3025, 3060). A few additional points should be made here, however. First, the permittee stated in its August 21, 2002, letter that it would provide a list of documents that should be included in EPA's Administrative Record but that were missing from it. As of the date of issuance of this Final Permit, the permittee still has provided no such list. Second, in a December 2, 2002, letter, the permittee reiterated and augmented many of its complaints about the Administrative Record and again called for the comment period to be reopened. In addition, the permittee called for the permit proceedings to be "stayed" in light of EPA headquarters' work toward issuance of new, final regulations applying CWA § 316(b) to existing large power plants such as BPS. Again, EPA disagrees with the permittee's complaints about the Administrative Record and has rejected the requests that the comment period be reopened or that the permit proceedings be stayed. EPA believes its approach on these issues was reasonable and appropriate. The Agency notes that the permittee's December 2, 2002, letter was submitted nearly 2 months **after** the close of the comment period (despite the fact that, as the permittee was fully aware, the proposed regulations referred to in the letter were formally presented for public comment in April 2002 and have been under development for much longer than that). Nevertheless, EPA considered the permittee's letter, and the Agency's responses to it are set forth in a letter (AR 3021) and a memorandum to the file (AR 3022), both of which are in the Administrative Record and incorporated herein by reference.

Response #'s: VII.79	**Document #'s:** 1000

Comment

One commenter stated that the bottom sediments of Mount Hope Bay should be tested for contamination, and that quahogs, an important regional resource, should be tested for arsenic and other heavy metals.

Response

Quahogs have been routinely tested for heavy metal contamination, including arsenic. In general, heavy metal concentrations in quahog tissue have been relatively low. Testing of the sediments themselves has not been required, although proposed dredging associated with the siting of proposed LNG storage facilities would likely result in chemical testing of sediments throughout Mount Hope Bay.

Response #'s: VII.80	**Document #'s**: 1002

Comment

One commenter indicated that "the ecological system has improved a lot," referring to the fact that he has seen more cormorants and harbor seals recently. The commenter did not believe that the station kills as many fish as are taken by anglers and asked for more fishing restrictions.

Response

Trends in cormorant populations are discussed in the July 22,2002, Permit Determinations Document, and EPA acknowledges that their populations have increased substantially since the 1980s. However, the observation of more cormorants and harbor seals does not necessarily equate with a healthy ecosystem or with balanced, thriving fish stocks. Boston Harbor, even at its worst point, had an abundance of both cormorants and harbor seals. Severe fishing restrictions are currently in place, although additional regional controls are needed. Fishermen will soon be required to make significant additional sacrifices when Amendment 13 of the Northeast Multispecies Fishery Management Plan is enacted (this is expected to happen by next spring). Amendment 13 is intended to significantly reduce fishing mortality on a number of groundfish species, including winter flounder.

Response #'s: VII.81	**Document #'s**: 1006, 1011, 1182

Comment
Several commenters, some referring to the transcripts of the CBS News broadcasts on August 28 and 29, 2002, expressed concern that increased air emissions might contribute to the effect of global warming and that the proposed permit "may cause more problems than what already exists." (1006) These commenters also suggested that "glacial warming and El Niño have resulted in changes in the ocean water temperatures, and these changes are a hundred times more detrimental to the fish population in Mount Hope Bay than the effect of the Brayton Point Power Plant." (1011)

Response
Several researchers (Oviatt 1994, MRI 2002) have independently established that water temperatures within Narragansett Bay and Mount Hope Bay have been increasing over the last 30 to 40 years. This trend has not been conclusively attributed to human-induced global warming or some natural long-term climatic variation. EPA believes that the effects of global warming on Mount Hope Bay are much less significant than the effects of the thermal discharge from BPS. EPA has calculated that long-term temperature rise contributes an additional 0.0383 TBtu/year in heat, whereas BPS's current permitted discharge contributes up to 42 TBtu/year. To the extent that global warming is raising water temperatures, it makes BPS's thermal discharges all the more problematic.

Response #'s: VII.82	**Document #'s**: 1011

Comment
One commenter believed that the fishing vessels that use dragging nets might be a significant cause of the low abundance of fish in the bay and suggested that more restrictions on this type of fishing could be helpful.

Response
It has been established that fishing gear dragged on the ocean floor can have significant impacts on benthic habitats. This is particularly a problem in deepwater habitats, where natural levels of disturbance are low, or in habitats that have high levels of structural complexity, such as corals, sponges, or seagrasses. Fishing gear tends to fragment and, in extreme cases, eliminate these habitats, which can require extended recovery times. In Mount Hope Bay, commercial harvesting by trawlers has been eliminated. A limited amount of trawling is being done by MRI and the State of Rhode Island for monitoring purposes. In addition, Mount Hope Bay is shallow with a structurally simple muddy/silty bottom. The benthic community associated with this type of bottom type tends to be fairly resilient to disturbance from storms or trawling. The limited amount of trawling combined with the natural resilience of the benthic habitat in Mount Hope Bays makes habitat destruction from fishing gear a very minor problem.

Response #'s: VII.83	**Document #'s**: 1016

Comment
One commenter suggested that horticultural or floricultural processes could reuse the heat generated from the plant and that the Department of Agriculture should be consulted in this regard.

Response
EPA recognizes that this is a promising idea but currently has no knowledge of any similar applications.

Response #'s: VII.84	**Document #'s**: 1034, 1189

Comment
Commenters indicated that the Draft Permit "advances environmental justice for the residents of Fall River and surrounding communities" and describes the unusual number of pollution sources in the area. In addition, the commenter stated that "the bay is not PG&E-NEG's private pond to debase and destroy. It is all of ours."

Response
These comments have been considered. EPA agrees that Mount Hope Bay is an important public resource.

Response #'s: VII.85	**Document #'s**: 1043, 1105, 1111, 1124

Comment
Commenters offered editorials regarding PG&E-NEG's likely arguments against the permit and the commenters' support for the Draft Permit.

Response
These comments have been noted. EPA has responded to specific points raised both against and in support of its permit elsewhere in this document.

Response #'s: VII.86	**Document #'s**: 1053

Comment
The commenter asked EPA to provide assistance to the City of Fall River regarding its effort to eliminate the CSO discharges.

Response
The City of Fall River currently has a Consent Decree with the Conservation Law Foundation (CLF) addressing its CSO discharges. EPA has worked with the City regarding other water pollution control issues.

Response #'s: VII.87	**Document #'s**: 1054

Comment
A commenter was concerned that the mercury and other hazardous materials in the water make the fish unsafe for human consumption.

Response
While EPA acknowledges the commenter's concern, this issue is outside the scope of this permit. This permit addresses BPS's water discharges. BPS does not discharge mercury in its liquid waste stream. The issue of mercury emissions from Brayton Point's stacks is being addressed by EPA's Air Program.

Based on a mandate given to EPA by Congress in section (112)(n)(1)(A) of the Clean Air Act, as amended, the EPA performed a study of the hazards to the public health reasonably anticipated to occur as a result of hazardous air pollutants (HAP) emissions by electric utility steam generating units (power plants). The results of the study where released in a Report to Congress on February 24, 1998. In the study, EPA identified mercury as the hazardous air pollutant of potential greatest concern from coal-fired utilities.

EPA was also required to determine whether, based on the results of the study and any other applicable information, regulation of HAP emissions from the industry was appropriate and necessary. On December 20, 2000 (65 FR 79825), EPA announced that it will regulate emissions of mercury and other air toxics from coal- and oil-fired power plants. Proposal of emission standards will be on or before December 15, 2003, with promulgation following on or before December 15, 2004.

Response #'s: VII.88	**Document #'s**: 1055, 1072

Comment
One commenter, who lives near the plant, strongly supported EPA's efforts and believed that the plant cares only about profits and would manipulate findings so that it does not have to pay for environmental controls.

Response
In developing this permit, EPA has carefully and objectively evaluated information submitted by the permittee as well as all other parties.

Response #'s: VII.89	**Document #'s**: 1056, 1138

Comment
Commenters supported the Draft Permit and encouraged the immediate enforcement of the corrective actions as well as continued environmental monitoring to determine the bay's recovery progress.

Response
These comments have been noted. As discussed elsewhere in this document, the Draft Permit contains monitoring provisions that will provide consistent documentation of the environmental conditions in the bay.

Response #'s: VII.90	**Document #'s**: 1079

Comment
One commenter speculated that her husband's recent respiratory health issues are related to the air emissions from BPS, noting that they moved downwind of the plant 3 years ago.

Response
Although the Agency cannot speak to the cause of the respiratory issues mentioned by the commenter, EPA agrees that air pollution from BPS is of concern. However, this permit addresses only discharges to water under the CWA. Air pollution concerns are addressed on the Federal level through the CAA and on the State level through Massachusetts Air Pollution Control regulations (310 CMR 7.00).

BPS is currently updating its air pollution control equipment pursuant to MA DEP air regulations. This upgrade will significantly reduce air pollution from the facility. The controls, scheduled to be in place by 2006, will result in annual reductions of approximately 18,500 tons of sulfur dioxide, 7,600 tons of nitric oxides, and 4,000 tons of carbon monoxide. See June 2003 report by permittee's consultant, TRC, Inc.

Response #'s: VII.91	**Document #'s**: 1034, 1036, 1094 1119, 1129

Comment
The commenters offered editorials supporting the permit.

Response
These comments have been considered.

Response #'s: VII.92	**Document #'s**: 1096

Comment
One commenter asked to know "what the elevated temperatures may be doing to other marine life and our environment?"

Response
EPA refers the reader to Chapter 6 of the July 22, 2002, Permit Determinations Document for a discussion of thermal impacts on marine life.

Response #'s: VII.93	**Document #'s**: 1101, 1102, 1105, 1111, 1112, 1124, 1144, 1212

Comment
Several commenters supported the requirement of closed-cycle cooling and regular, long-term monitoring, including of shellfish and sediments, and they indicated that improvements should be implemented as soon as possible regardless of intense pressure to make the permit less stringent.

Response
These comments have been noted. EPA has discussed monitoring requirements and the issues surrounding closed-cycle cooling elsewhere in this document.

Response #'s: VII.94	**Document #'s**: 1116

Comment
One commenter endorsed EPA's effort to reduce thermal loading to the bay and also asked that "hazardous waste dumping by BPS be brought to an end as well."

Response
This comment has been noted. This permit addresses water pollution issue only.

Response #'s: VII.95	**Document #'s**: 1118

Comment
One commenter, who supports EPA's efforts, described the decline of quahogs in the Kickamuit River and asked that the station be closed.

Response
EPA is not aware of any quantitative data on quahog densities in the Kickamuit River that document a decline. In addition, EPA has never advocated closing BPS. EPA believes that BPS's cooling technology can be upgraded, and that the changes in technology stemming from this permit will result in significant benefit to the Mount Hope Bay ecosystem.

Response #'s: VII.96	**Document #'s**: 1121

Comment
One commenter showed strong support for the Draft Permit and attached his article, published in the September 19, 2002, issue of the *Sakonnet Times*. The article described the station's destructive effects on marine life and asked that BPS comply with § 316(b) of the CWA by installing closed-cycle cooling.

Response
This comment and the newspaper article have been noted. EPA has discussed the impacts on marine life of impingement and entrainment at BPS, as well as technology issues and other aspects of CWA § 316(b), elsewhere in this document.

Response #'s: VII.97	**Document #'s**: 1131

Comment
Another commenter discussed the many stressors on Mount Hope Bay. While the commenter supported EPA with respect to requiring the station to reduce water withdrawal and thermal loading, the commenter also believed that it is unreasonable to require the entire plant to be converted to closed-cycle cooling.

Response
EPA has considered the other possible stressors on aquatic life in Mount Hope Bay. The Agency does not believe that the existence of these other stressors means that BPS should not be required to reduce its own impacts on the bay in compliance with the CWA. Furthermore, other entities have taken steps to address the other significant stressors on Mount Hope Bay. Commercial and recreational fishermen have already been required to make significant sacrifices in an attempt to allow winter flounder stocks to recover. Proposed future restrictions will require fishermen to significantly reduce their catches even further. The City of Fall River is being required to upgrade its sewage treatment and increase its control of combined sewer overflows at a cost of well over $115 million.

Response #'s: VII.98	**Document #'s**: 1148

Comment
One commenter supported the Draft Permit but asked EPA to reconsider dry cooling as BAT under § 316(a) and BTA under § 316(b). The commenter acknowledged that EPA briefly considered dry cooling, but the analysis was abbreviated and not carried forward for more detailed analysis. The commenter listed several reasons for EPA to reconsider dry cooling:

- The land use pattern is likely to remain industrial for the long term (>50 years) and should be considered for the "long-term amortization schedule as part of the feasibility of a wholly disproportionate cost analysis."
- The Mystic and Fore River plants have expanded and have been retrofitted using dry cooling, and they are both in estuarine locations.
- Neither PG&E-NEG nor EPA has determined that dry cooling is infeasible at the site.
- If wet cooling is approved, then it will "likely result with attendant consequences on regulatory agencies, taxpayers, and the Mount Hope Bay ecosystem."
- Any siting of new steam electric generating stations in estuarine areas would probably be limited to facilities with dry cooling only.

Response
EPA believes that its analysis for dry cooling at BPS went far enough and has not pursued it further in response to comments. EPA agrees that the land use pattern is likely to remain industrial, but notes that it based its cost on the expected useful life of the equipment. EPA agrees that the above-mentioned facilities have been expanded and use dry cooling, but disagrees that the facilities have "retrofitted" existing cooling systems with dry cooling. These installations have involved new generating units being constructed at existing power plant sites.

EPA agrees that dry cooling has not been determined to be infeasible at the site, but EPA also has not determined it to be feasible at BPS. EPA found an example of a retrofit from open-cycle cooling to dry cooling. At a minimum, EPA continues to conclude that the engineering task would be extremely complex, resulting in costs well above those estimated for cooling towers. In addition, space constraints could preclude a complete dry cooling retrofit at BPS.

EPA disagrees that any siting of new facilities in estuarine locations would necessarily be limited to dry-cooled facilities. The Newington Power Plant in Newington, New Hamphire, is located in an estuarine area and has been permitted using wet cooling towers.

The economic and environmental consequences of closed-cycle wet cooling are discussed in detail elsewhere in this document.

Response #'s: VII.99	**Document #'s**: 1149

Comment
The commenter expressed concern that the 2.5-inch mesh size of the net required by the Draft Permit might not restrict the majority of juvenile fish and some anadromous fish from entering the discharge canal. The commenter recommended continued monitoring. The commenter was also concerned that the business confidentiality claim provisions (p. 27) of the Draft Permit may be applied to monitoring results.

Response
The mesh size of the net at the end of the discharge canal is not intended to keep fish of all sizes out of the discharge canal, since the velocity of the discharge stream itself tends to keep smaller fish out of the discharge canal. Moreover, when finer mesh nets have been used in the past, fish still managed to get into the discharge canal.

EPA's permit continues the current monitoring program that has been in place since 1972. The results of the monitoring program have always been, and will continue to be, a matter of public record.

Response #'s: VII.100	**Document #'s**: 1152

Comment
The commenter requested that the Draft Permit include the following restrictions to the allowance for once-through cooling water: "(1) reduce the flow and thermal discharge rates to those specified in MOA II, (2) limit its use to failure of the closed-cycle cooling system and periods of excessive fogging or icing, (3) limit the number of consecutive blocks of time once-through cooling may be used, and (4) prohibit its use during summer and biologically sensitive periods."

Response
EPA has prohibited the 122 hours of once-through cooling during the winter flounder spawning season (February 1 through May 31). EPA feels the adoption of this restriction is necessary to minimize the biological impact of the 122 hours of once-through cooling.

Response #'s: VII.101	**Document #'s**: 1154

Comment
One commenter noted that "a significant ancient Native American archaeological site is located within the BPS property" and that a Project Notification Form must filed with the Massachusetts Historical Commission if any new construction is proposed on the property.

Response
The ancient Native American archaeological site is actually located within the Somerset Station property upstream of BPS on the shore of the Taunton River.

Response #'s: VII.102	**Document #'s**: 1155

Comment
One commenter supported the Draft Permit and indicated that EPA correctly identified that the main issue of concern for minimizing impacts on EFH is the thermal discharge into the bay.

Response
This comment has been considered.

Response #'s: VII.103	**Document #'s**: 1158

Comment
The commenter was concerned that "the proposed monitoring protocols will not provide the best measure for documenting the restoration and sustainability of the Mount Hope Bay ecosystem." Specifically, the measures do not consider "loss and/or restoration of genetic variability (biodiversity)." This could be done by amending the monitoring requirements of the Draft Permit to use native populations that have adapted to the coastal waters of Massachusetts in the toxicity tests. Furthermore, testing protocols should include all life stages of the species used and field testing to determine whether and how fecundity is affected.

Response
EPA shares the commenter's concern regarding the genetic variability of populations in Mount Hope Bay. However, EPA does not believe that modifying for this specific permit a peer-reviewed toxicity test protocol that has been established for an entire category of regulated facilities is warranted. In addition, although information regarding effects on fecundity is important, there are currently no standard methods for examining this issue. Without the framework of peer-reviewed standard methods, any resulting analysis would have questionable value.

Response #'s: VII.104	**Document #'s**: 1161

Comment
The commenter believed that discharge and withdrawal limits will result in a violation of Rhode Island water quality standards. Permit conditions will violate State temperature and temperature-change requirements, and entrainment and impingement impacts associated with once-through cooling will violate the general criteria for the protection of aquatic life. The commenter requested the following changes to the Draft Permit:

- The permit should specify the analytical methodology used to evaluate compliance with the 0.2-ppm limit for the Spectrus CT1300.
- The permit should require a report on intake flow specifiying frequency and sample type.
- The permit should not allow calculation in place of sampling to determine cooling tower chemical use.
- The permit should clarify footnote 1 in parts A-6 and A-7, and describe how minimum detection levels will be applied to mass-based limits.

Response
EPA agrees that an analytical method should be included to determine compliance with the Spectrus CT1300 limit of 0.2 ppm and has specified the method in the permit. EPA also agrees that monitoring and reporting of the intake flow should be included in the permit, and it has been included. EPA disagrees that the permit should not allow the calculation of cooling tower chemical concentrations in lieu of sampling. The effluent guidelines found at 40 CFR Part 423 clearly allow this method of compliance determination.

EPA has changed the limits for copper and iron from mass-based limits to concentration-based limits and has therefore deleted footnote 1 from the Draft Permit section A.6 and A.7 (note the Final Permit renames these sections to A.8 and A.9 respectively).

Response #'s: VII.105	**Document #'s**: 1173, 1174

Comment
Commenters pointed out that the region has become dangerously dependent on gas as a fuel source since deregulation and the subsequent installations of new natural gas-fired plants.

One commenter indicated that ISO-NE predicts that by 2005, New England will be 65 percent dependent on gas. This dependence could have a serious adverse impact on the reliability and cost of energy. In addition, the current Draft Permit might cause the station to go out of business. One commenter urged that caution be used to protect the economy as well as the environment.

Response
EPA does not believe that this permit will result in BPS going out of business, or that the permit will affect fuel diversity in the region. EPA discusses these issues in response to comments on the use of coal elsewhere in this document.

Response #'s: VII.106	**Document #'s**: 1177

Comment
One commenter indicated that Mark Gibson's report was reviewed, discussed, and acknowledged by the Agency and the company in 1997. The commenter stated that all parties involved agreed that the data were real and the decline coincided with the changes in operation at the station. The commenter also pointed out that it is not necessary for anyone to prove that the company is the most significant factor in the decline in fish populations in the bay. The company is still allowed to withdraw 56 MGD and is also granted a variance of the State's thermal discharge limits. The commenter asked EPA to "enforce the narrative conditions in the current permit or modify the current permit and immediately require interim measures … ."

Response
EPA and other members of the TAC agree with the general conclusions of the 1996 Mark Gibson report. PG&E-NEG does not agree with its conclusions. EPA believes it has authority to take an enforcement action under the current permit, but as discussed elsewhere, EPA has chosen to focus its present efforts on developing a more protective and effective Permit for BPS. See responses elsewhere in this document for more detail.

Response #'s: VII.107	**Document #'s**: 1190

Comment

One commenter supported the permit and could not understand how others could attribute the higher water temperature in the bay to global warming. She indicated that it is her personal experience that the Mount Hope Bay is warmer than both Kingston Bay and Plymouth Bay.

Response
This comment has been considered.

Response #'s: VII.108	**Document #'s**: 1192

Comment
From personal observation one commenter believed that the bay is thriving and that the extent of the environmental controls in the Draft Permit is the result of the threat of a lawsuit. He also commented that there are many fish, cormorants, and fishers in the area.

Response
EPA has designed this permit to meet the requirements of the CWA with respect to thermal discharges and intake flows. The Agency discusses these legal requirements as well the state of the biological community of Mount Hope Bay in detail elsewhere in this document.

Response #'s: VII.109	**Document #'s**: 1193

Comment
One commenter stated that PG&E-NEG is using "scare" tactics to avoid spending the money to "clean up the plant." He also said that the issue "shouldn't even be about money" and mentions people's health and the legacy that is left to the citizens' grandchildren. He has personally seen the degradation of the bay over his lifetime.

Response
This comment has been considered.

Response #'s: VII.110	**Document #'s**: 1197

Comment
One commenter stated that he believes that the scientific evidence is compelling and questions why PG&E-NEG does not accept responsibility and correct the problem. He asked that PG&E-NEG "be a good corporate citizen" and that it is "time for action."

Response
This comment has been considered.

Response #'s: VII.111	**Document #'s**: 1198

Comment
One commenter supported the Draft Permit and told of his personal observation of the degradation of the Lee and Cole Rivers. The commenter believed that the products from burning "over 3 million tons of coal annually" (sulfur dioxide, nitrogen oxide, lead, mercury, and other heavy metals) are directly related to many health-related issues including asthma, pulmonary disease, and learning disabilities. He also commented that BPS is a "significant" and "noticeable" contributor to global warming.

Response
This comment has been considered.

Response #'s: VII.112	**Document #'s**: 1199

Comment
One commenter who supports the Draft Permit indicated it is "just common sense" that the use of a billion gallons per day by the plant will have "a catastrophic effect upon the existing fragile ecosystem" of Mount Hope Bay and that the science might not exist that would fully assess the total negative impacts. Furthermore, he stated that the cost is less than $12 per year to reduce "this ecological destruction by 96 percent" and questions how people could justify their nonaction to their children and grandchildren.

Response
This comment has been considered.

Response #'s: VII.113	**Document #'s**: 1201

Comment
One commenter indicated that the Draft Permit could possibly cause the plant to close, which would result in higher taxes. The higher taxes would be difficult for citizens and businesses, but they would be especially difficult for seniors in the community, who are more financially vulnerable. The commenter asked EPA to "balance" its approach and "please do not take a chance of imposing extraordinary remedies that could possibly wreak havoc on our small community."

Response
EPA does not believe that this action will cause the closure of BPS. This issue is discussed elsewhere in this document.

Response #'s: VII.114	**Document #'s**: 1208

Comment
One commenter indicated that "Rhode Island does stand by ready to initiate its own parallel state public nuisance action" and is prepared to discuss a resolution, although PG&E-NEG so far is unwilling to do so.

Response
This comment has been considered.

Response #'s: VII.115	**Document #'s**: 1211

Comment
One commenter stated that to protect the resource of Mount Hope Bay, it is first necessary that conditions be established for the return of a healthy resource, and only then can it be protected. The commenter indicated that DEM has no reason to overstate the problem, identify the wrong cause, or ignore multiple causes. They are only interested in their statutory mandate to solve the problem without hassling PG&E-NEG and without playing politics. The DEM does, however, object to understatement of the problem and to what it views as false claims regarding the causes of the problem. Not only was overfishing addressed by using restrictions but the collapse happened after this action was taken. The commenter vehemently disputed what he called PG&E-NEG's "misleading propaganda." The commenter explained how the current PG&E-NEG proposal will continue to cause harm and violate water quality standards. He also stated that the company is using intimidation and misrepresentation to avoid taking responsibility. Last,

the commenter indicated that by law, it is the company's burden to demonstrate that the Draft Permit is "more stringent than necessary to assure restoration of the resource" and that its "own proposal provides assurance that a balanced indigenous population can survive."

Response
This comment has been considered, and the issues regarding the health of Mount Hope Bay's biological community and the causes of its decline have been addressed elsewhere in this document.

Response #'s: VII.116	**Document #'s**: 1212

Comment
A group of commenters supported the Draft Permit and asked that BPS upgrade its facility with the existing technologies needed to end the destruction of the fragile ecosystem of Mount Hope Bay, which is "critical to the health and prosperity of our region."

Response
This comment has been considered.

Response #'s: VII.117	**Document #'s**: 1215

Comment
One commenter contended that, contrary to what other people have said, BPS is a necessary power plant in New England. The commenter said that power plants are put on-line for transmission and voltage supply rather than the energy they produce and that BPS is a "major player" in the role of supporting the New England grid. This commenter urged EPA to consider the need to preserve fuel diversity and low-cost, reliable power in the region.

Response
EPA has concluded that this permit will not cause the closure of BPS. In addition, EPA notes that the region currently has excess generation capacity. EPA responds to the issue of fuel diversity elsewhere in this document in response to comments on coal. The effect of EPA's action on the price of electricity is also discussed elsewhere in this document.

Response #'s: VII.118	**Document #'s**: 1217

Comment
One large group of commenters supported the Draft Permit, asked for continued monitoring, and also asked that improvements to the plant be made as soon as possible. Support is based on the unacceptable level of local impacts and the significant cumulative burden locally and regionally on both air and water resources.

Response
This comment has been considered.

Response #'s: VII.119	**Document #'s**: 1220

Comment
One commenter quoted from the October 1978 Environmental Impact Statement for BPS that "[i]n view of the importance of winter flounder, the close association of its spawning grounds to the coal pile runoff and the stress it is already under from entrainment and impingement, this impact should be considered

significant." The commenter believed that the decline in winter flounder "occurred simultaneously with the elimination of the land held chemical waste pond."

Response
EPA notes that coal pile runoff is contained and sent to the facility's wastewater treatment facility for treatment before it is discharged to Mount Hope Bay. EPA believes available information indicates that the decline of winter flounder occurred simultaneously with the increase of cooling water and heat discharge to the bay. EPA is unaware of any adverse environmental consequences associated with the "elimination of the land held chemical waste pond" but notes that the facility is required to treat chemical waste to an acceptable level before discharge to the environment, which eliminated the need for chemical ponds or lagoons.

Response #'s: VII.120	**Document #'s**: 1224

Comment
One commenter supported the Draft Permit and was concerned about the heat, chemicals, and biocides that are discharged into Mount Hope Bay and how it also affects the ecosystems of the five adjoining rivers. The commenter also called attention to the lack of blue crabs, horseshoe crabs, and eelgrass.

Response
EPA recognizes that the lower portions of the freshwater rivers that enter Mount Hope Bay are critical estuarine habitats that support spawning and the nursery habitat of many species. EPA's permit is drafted with these areas specifically in mind. See Chapter 6 of EPA's July 22, 2002, Permit Determinations Document for further details. As for the lack of blue crabs, horseshoe crabs, and eelgrass, the goal of EPA's Permit is to reduce adverse impacts from operations at BPS to an extent that will assure the protection and propagation of the BIP and allow for the recovery of the total Mount Hope Bay ecosystem. This includes more than just fish species; it includes the normal assortment of native species including crustaceans, aquatic vegetation, and other aquatic life (i.e., the BIP of Mount Hope Bay).

Response #'s: VII.121	**Document #'s**: 1229

Comment
One commenter alleged that the haze over BPS at dawn contains arsenic and mercury. The commenter believed that having breathed air downwind of the plant her whole life is the cause of her illness. The commenter asked if the station is a wholesale producer to other power companies as well as a local supplier of power. The commenter was concerned about the hazardous chemicals being discharged into Mount Hope Bay and did not believe there is overfishing in the bay.

Response
EPA has addressed concerns about air pollution, chemical discharges, and overfishing elsewhere in this document. EPA is unable to answer the commenter's question about whether BPS is a wholesale supplier or a local supplier of electricity but notes that the issue is not relevant to the issuance of this Draft Permit.

Response #'s: VII.122	**Document #'s**: 1230

Comment
One commenter supported the Draft Permit and was disturbed that "entrainment and the resulting destruction of uncounted larvae and juvenile fish" had not yet been addressed at the public hearing. Because he had not heard any "testimony on those economics," the commenter asked directly, "What is the value of that lost resource?" The commenter cited both the scientific data and observations of commercial and recreational fisherman as documenting the decline in fish populations.

Response
EPA agrees that fish populations in Mount Hope Bay have declined. EPA discusses economic analyses estimating the value of the fish elsewhere in this document.

Response #'s: VII.123	**Document #'s**: 1231

Comment
One commenter indicated that people who believe that the Draft Permit requires a choice between Mount Hope Bay and BPS are not correct. The Draft Permit provides "a strong step forward" for both. The commenter believed there was a consensus about the causes of decline in fish populations long before the Draft Permit. This commenter questioned the validity of some of the "last minute stuff" that the company has submitted and urged EPA to move forward without delay. In addition, the commenter declared that it is the company's "burden to demonstrate that they are not having a negative and substantial impact on the ecology of Mount Hope Bay" and that BPS has not done so.

Response
This comment has been considered.

Response #'s: VII.124	**Document #'s**: 1237

Comment
One commenter questioned whether the Draft Permit will be the solution to the problems in Mount Hope Bay and declared that "if the solution doesn't solve the problem, none of us are served." The commenter believed that EPA should reevaluate the facts to make sure they "have it right." This commenter also noted that a group named CERES rates companies in terms of social investment. They ranked 100 utility companies throughout the United States and PG&E-NEG was rated the third cleanest or "green"company out of the 100.

Response
EPA has carefully considered the extensive comments it received on the Draft Permit and believes it has correctly assessed the facts and applied the law. EPA notes that the commenter mischaracterized the work CERES did in regard to ranking utilities. CERES produced a report entitled *Benchmarking Air Emissions of the 100 Largest Electric Generation Owners in the U.S.—2000*. This report compiled air emission data (as reported to EPA from the companies) and reported it on a per megawatt generated basis. While this work is worthwhile, it did not conclude that "PG&E was rated the third cleanest or 'green' company out of 100." The report did rank PG&E-NEG as the third lowest producer of CO_2 emissions (pounds) per megawatt hour of electricity produced.

Response #'s: VII.125	**Document #'s**: 1239

Comment
One commenter pointed out that the bay is not owned by PG&E-NEG, yet they are "using the water to cool down their system as if it's a right, and now we're impeding on them because we're asking them to use it in a sensible manner. It's not theirs."

Response
This comment has been considered.

Response #'s: VII.126	Document #'s: 1240

Comment
One commenter indicated the PG&E-NEG bought the facility in 1998 and is investing $170 million to improve air emissions. The commenter also stated that the company has offered to invest another $60 million for water-based controls. The commenter wanted to make clear that the company is "committed to protecting the bay" but that it wanted to make sure that there is at least an equal return on its investments. The commenter, speaking for PG&E-NEG, asked EPA to look at the facts and the science and make a balanced decision that both protects the bay and jobs and continues to provide low-cost electricity.

Response
EPA has undertaken thorough and painstaking consideration of the relevant facts, science, and concerns surrounding this permit. EPA believes that the resulting permit is fair and protective and fully complies with the CWA.

Response #'s: VII.127	**Document #'s**: 1218

Comment
One commenter indicated that the EPA Fact Sheet, which was distributed at the informational and public meetings, was "misleading to readers" and that it "may bias readers toward believing that BPS is the largest influence on conditions in the Bay." The commenter believed that the "natural processes of seasonal heating and cooling and tidal flows have a far greater influence on the temperature" and that the input from the natural energy of the sun should have been compared to the heat input of BPS. The commenter also took issue with the EPA's description of the volume of one billion gallons. Furthermore, the commenter stated, that "the term 'eggs' is not equivalent to most people's concept of 'organisms'" and cites another permit where entrainment of large numbers of clam eggs did not have an adverse impact on a local ecosystem.

Response
EPA points out that the Fact Sheet the commenter cited should not be confused with the Fact Sheet prepared in support of the Draft Permit as required by 40 CFR 124.8 and 124.56. The document cited by the commenter was produced to provide general information and announce several public meetings and hearings. EPA is not required to respond to comments made regarding an informational brochure, but it does offer the following:

EPA does not agree that the EPA Fact Sheet was at all misleading to readers. After years of study, EPA has determined that BPS has a significant influence on the temperature of Mount Hope Bay. Additionally, EPA regards natural processes (e.g., sunlight, wind, rain, and tidal flow) as natural background conditions, and they are the baseline from which external (or man-made) influences are measured from, not an influence to use for comparing with. EPA believes that it is counterintuitive to claim that a natural environment or ecosystem has an influence on itself and, furthermore, to compare that influence with manmade negative influences and impacts on that same natural environment or ecosystem. Moreover, an extended temperature rise of 1.5 ˚F in this particular shallow estuary is a significant increase above "natural" conditions. EPA has documented evidence that the combination of both the rise in temperature and the removal of significant numbers of fish, larvae, and eggs daily by impingement and entrainment has had a significant impact on several fish species in Mount Hope Bay. Also, the Fact Sheet in question discussed other manmade influences on the bay and measures that have been taken to mitigate them (fishing management, sewage treatment, and CSO projects). Regarding the volume of water used by BPS on a daily basis, EPA compares the volume of the bay with the volume of water used daily by BPS to give readers a perspective as to how much water the plant uses. EPA does not agree that the volume of one billion gallons should have been compared to the natural flow of the bay, as the commenter opines. However, EPA is aware that Mount Hope Bay does have tidal influences. Regarding the commenter's feeling that the input from the natural energy of the sun should have been compared with the heat input of

BPS, again, EPA regards natural background levels of heat energy from the sun as an unadulterated level in which ecosystems naturally exist or thrive and should not be used for comparison with man-made influences above those natural levels. EPA also disagrees that, as the commenter stated, "the term 'eggs' is not equivalent to most people's concept of 'organisms'." EPA considers that each fish egg has "the capacity to develop into a new individual capable of independent existence." (*Merriam-Webster's Collegiate Dictionary, 10th Edition*, 1993). EPA acknowledges that fish do "produce gigantic numbers of eggs" because so few will survive. However, these eggs are a source of food in the natural ecosystem cycle and for human consumption, as the commenter pointed out. The Brayton Point Permit is based on highly site specific analyses. Therefore, EPA believes that it would be fallacious to compare the impacts on the organisms in Mount Hope Bay with the amount of clam eggs entrained through a New Hampshire plant or the amount of eggs consumed as food in a New York City restaurant.

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Comment

One commenter made the following three points:

- Correlations are not equivalent to causation, and treating them as such is erroneous.
- A large number of factors that affect fish populations were not examined. The commenter lists as examples climate variation, overfishing, variations in heat input, pathogens, chlorination, low dissolved oxygen levels, chemicals and pollution, an increase in predator species, competitor species, and habitat loss.
- The "theory of parsimony" is not reliable and Gibson's use of it is incorrect.

Response

EPA has consistently acknowledged that the analysis done by Gibson in 1996 does not establish a scientific cause and effect relationship. The only way to do that would be to shut down BPS, wait for fish stocks to return, and then restart the facility and observe any changes in fish abundance. EPA considered a suite of alternative explanations for the collapse of fish stocks in Mount Hope Bay, including global warming, overfishing, poor water quality, low dissolved oxygen, increase in predators, dredging, and brown tides. EPA's consideration of each of these factors is contained in its 316(a) and (b) Permit Determinations Document or elsewhere in this response to comments Document.

Finally, the 1996 Gibson analysis, including his use of the "theory of parsimony," survived a very thorough peer-review process. EPA acknowledges that Mount Hope Bay is a complex ecosystem, but its detailed 316(a) and (b) analyses support Gibson's original claim that BPS is having a dramatic impact on fish abundance in Mount Hope Bay.