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October 7, 2008

U.S. Environmental Protection Agency  
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Re: Upper Blackstone Water Pollution Abatement District (UBWPAD)  
 NPDES Permit No. MA0102369, Millbury, Massachusetts  
 NPDES Appeal No. 08-12

Dear Ms. Durr,

Enclosed for filing and docketing in your usual manner please find an original and five copies of the Massachusetts Department of Environmental Protection's Supplemental Petition for Review (and exhibits thereto) and Request for Oral Argument in the above-captioned matter. This Supplemental Petition is filed in accordance with the timeframe established in the Environmental Appeals Board's Order Granting Extension of Time to Supplement Petitions and File Response, September 23, 2008.

Please return a date stamped copy of the Supplemental Petition for Review (without exhibits) and Request for Oral Argument to me in the envelope provided. Should you have any questions regarding this submittal please direct them to legal counsel in our Office of General Counsel, One Winter Street, Boston, Massachusetts, 02108 or by direct telephone as set forth below. Thank you for your attention to this matter.

Sincerely,

Karen L. Crocker, Counsel (617) 556-1195  
 H. Rebecca Cutting, Counsel (617) 556-1002  
 fax (617) 338-5511

Enclosures

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

ENVIR. APPEALS BOARD

**In re:**

**The Upper Blackstone Water Pollution  
Abatement District (UBWPAD)**

**NPDES PERMIT NO. MA0102369**

**NPDES Appeal No. 08-12**

**SUPPLEMENTAL PETITION FOR REVIEW**

**INTRODUCTION**

Pursuant to 40 C.F.R. 124.19(a), the Massachusetts Department of Environmental Protection ("MassDEP") submits this supplemental petition for review ("Supplemental Petition") of the conditions of National Pollution Discharge Elimination System ("NPDES") Permit No. MA0102369 ("Permit"), which was issued to the Upper Blackstone Water Pollution Abatement District ("UBWPAD") on August 22, 2008, by Region I of the United States Environmental Protection Agency ("Region I"). The Permit at issue in this proceeding authorizes UBWPAD to discharge effluent from the facility located at 50 Route 20, Millbury, Massachusetts to the Blackstone River. MassDEP contends that certain conditions are based on (1) clearly erroneous findings of fact and conclusions of law and (2) exercise of Region I's discretion and important policy considerations that the Environmental Appeals Board ("EAB") should, in its discretion, review. *See* 40 C.F.R. 124.19(a). Specifically, MassDEP challenges the following permit condition: The effluent limit for total nitrogen of 5.0 mg/l monthly average from May 1 through October 31.

On September 17, 2008, MassDEP filed a preliminary petition for review (“Preliminary Petition”) together with an assented-to scheduling motion that sought a short extension of time for the preparation of a more detailed petition. On September 23, 2008, EAB granted the motion, allowing MassDEP until October 8, 2008, to file this Supplemental Petition. Order Granting Extension of Time to Supplement Petitions and File Response, NPDES Appeal Nos. 08-11 and 08-12 (EAB, September 23, 2008) (“Scheduling Order”). (Hereinafter MassDEP’s Preliminary Petition and Supplemental Petition will be referred to collectively as the “Petition.”)

### **THRESHOLD PROCEDURAL REQUIREMENTS**

MassDEP satisfies the threshold requirements for filing a petition for review under 40 C.F.R. 124.00, to wit:

1. MassDEP has standing to petition for review of the Permit decision because it participated in the public comment period on the Permit. *See* 40 C.F.R. 124.19(a). In addition to submitting written comments, MassDEP gave comments orally at the public hearing held on May 9, 2008, at 7:00 p.m., at the Quinsigamond Community College in Worcester, Massachusetts. *See* May 9, 2007 Letter from Glenn Haas, MassDEP, to Roger Janson, Region I (“MassDEP Comments”) (attached hereto as Exhibit 4).
2. This Petition was timely filed in accordance with the Scheduling Order.
3. The issues raised by MassDEP in its Petition were raised during the public comment period and therefore were preserved for review. *See* MassDEP Comments (Exh. 4); UBWPAD Response to Comments, August 22, 2008, (“Response to Comments”) (attached hereto as Exhibit 2), pp. 26-27, 44-52, 54-55.

## ISSUES PRESENTED FOR REVIEW

MassDEP presents the following issues for review:

1. Whether Region I erred by failing to follow its own regulations when it established the effluent limit for total nitrogen as a concentration instead of in terms of mass because 40 CFR 122.45(f)(1) states that “[a]ll pollutants limited in permits *shall* have limitations, standards or prohibitions expressed in terms of *mass*” and none of the exceptions set forth therein applies. (Emphasis added.)
2. Whether Region I abused its discretion by setting the effluent limit for total nitrogen as a concentration because the selection of a concentration limit instead of only a mass limit is inconsistent with EPA’s policy of encouraging efficient wastewater treatment, its policy of encouraging water conservation, and its policy of addressing water quality impairments through mass limitations. *See* 33 U.S.C. § 1313; 40 C.F.R. 130.00; U.S. EPA NPDES Permit Writers’ Manual, December 1996 (“Permit Writers’ Manual”) (excerpts attached hereto as Exhibit 7), p. 67.
3. Whether Region I erred by relying upon a severely flawed December 2004 report by the Rhode Island Department of Environmental Management (RIDEM), entitled “Evaluation of Nitrogen Targets and WWTF Load Reductions for the Providence and Seekonk Rivers” (“2004 RIDEM Report”), as the basis for its selection of the Permit’s 5 mg/l concentration limit for total nitrogen. (The Report is attached hereto as Exhibit 8.)

## FACTUAL AND STATUTORY BACKGROUND

### I. Facts

UBWPAD owns and operates a wastewater treatment facility located in Millbury, Massachusetts that discharges effluent to the Blackstone River. Fact Sheet, draft NPDES Permit No. MA0102369 ("Fact Sheet") (attached hereto as Exhibit 3), p. 1. The facility is currently operating under a Permit issued on September 30, 1999, that was modified on December 19, 2001, by a settlement agreement in the form of a Region I administrative consent order ("Consent Order"). *Id.* at 2. The Consent Order established an eight-year timeframe for a series of upgrades designed to bring the facility into compliance with many of its discharge limits, including a summer season discharge limit of 0.75 mg/l for phosphorus. Response to Comments (Exh. 2), p. 24; Fact Sheet (Exh. 3), p. 5. The Consent Order contained no limit on total nitrogen. Response to Comments (Exh. 2), p. 24.

UBWPAD is now in the final stages of completing the 180 million dollar upgrade required by the Consent Order, and anticipates a timely start-up of the process train in 2009, in accordance with the terms of the Consent Order. Fact Sheet (Exh. 3), p. 5; Response to Comments (Exh. 2), pp. 22, 58. Region I has acknowledged that the upgrade was designed to achieve a concentration of total nitrogen of about 8-10 mg/l and that the facility will not be able to meet a concentration limit of 5 mg/l even after the 180 million dollar upgrade is completed. Response to Comments (Exh. 2), p. 26.

Although the current facility has a design flow of 56 million gallons per day ("mgd"), actual discharges over the past six years have ranged from an average of 30 to 43 mgd and fluctuate based on wet weather conditions. Fact Sheet (Exh. 3), p. 1; Response to Comments

(Exh. 2), p. 50 n. 11. When the upgrade is completed, the facility will have a new, lower design flow of 45 mgd. Response to Comments (Exh. 2), p. 58.

The Blackstone River is an interstate water that flows from Worcester, Massachusetts, south to Rhode Island where it discharges into the Seekonk River in Pawtucket. Fact Sheet (Exh. 3), p. 5. The Seekonk River flows to the Providence River, which flows into Rhode Island's Narragansett Bay (or "Bay"). *Id.* Rhode Island has listed the Seekonk River, Providence River and Upper Narragansett Bay as § 303(d) nutrient-impaired water bodies, but has not yet developed a nitrogen TMDL for the Upper Narragansett Bay system. State of Rhode Island 2004 303(d) List of Impaired Waters, Final, May 13, 2005 ("RI § 303(d) List") (attached hereto as Exhibit 6), p. viii; Response to Comments (Exh. 2), pp. 20-21. Narragansett Bay receives discharges from many other wastewater treatment facilities, including Attleboro and North Attleborough in Massachusetts, and Woonsocket, Bucklin Point, Fields Point, East Providence, Cranston, West Warwick and Warwick in Rhode Island. 2004 RIDEM Report (Exh. 8), pp. 27-28.

With the exception of the limit on total nitrogen, all of the Permit limits are required to comply with both the Massachusetts Surface Water Quality Standards and the Rhode Island Water Quality Standards. Fact Sheet (Exh. 3), p. 7. Because excess nitrogen is the limiting nutrient in marine waters, Region I set the Permit limit for total nitrogen in order to meet the Rhode Island Water Quality Standards for Narragansett Bay. Fact Sheet (Exh. 3), pp. 7, 11-15; Response to Comments (Exh. 2), pp. 79-80. In setting the 5 mg/l limit for total nitrogen, Region I relied on a December 2004 report by the Rhode Island Department of Environmental Management, entitled "Evaluation of Nitrogen Targets and WWTF Load Reductions for the Providence and Seekonk Rivers." Fact Sheet (Exh. 3), p. 12.

UBWPAD submitted a permit renewal application to Region I on November 8, 2005, and Region I issued a draft Permit on March 23, 2007. Response to Comments (Exh. 2), p. 1. The draft Permit set a summer season discharge limit of 0.1 mg/l for phosphorus and a limit of 5 mg/l monthly average for total nitrogen from May through October. Fact Sheet (Exh. 3), pp. 10, 14. MassDEP and many others provided comments on the draft Permit during the public comment period. *See* MassDEP Comments (Exh. 4); Response to Comments (Exh. 2), p. 1. MassDEP raised several issues in its comments, including that the effluent limit for total nitrogen should be expressed only in terms of mass instead of concentration. MassDEP Comments (Exh. 4), p. 1. UBWPAD, among others, challenged the credibility of the 2004 RIDEM Report. Response to Comments (Exh. 2), pp. 26-27, 44-52, 54-55. On August 25, 2008, MassDEP received a copy of the final permit dated August 22, 2008, with Region I's Response to Comments attached. (The final Permit is attached hereto as Exhibit 1.)

## **II. Relevant Statutes And Regulations**

The Permit was issued pursuant to Section 402(a) of the CWA and the regulations governing the NPDES permit program at 40 C.F.R. Parts 122, 124, 125 and 136. Section 401(a)(2) of the CWA and 40 C.F.R. 122.44(d)(4) require that NPDES permits be conditioned "in such manner as may be necessary to insure compliance" with the applicable water quality standards of any other affected state, here Rhode Island. Water quality-based limits are to be established in accordance with 40 C.F.R. 122.44(d) and 122.45. The regulations at 40 C.F.R. 122.45(f)(1) state that "[a]ll pollutants limited in permits shall have limitations, standards or prohibitions expressed in terms of mass," unless one of its three exceptions applies.

A final permit decision will be reviewed by EAB if the petitioner demonstrates that the Permit "is based on: (1) [a] finding of fact or conclusion of law which is clearly erroneous, or (2)

[a]n exercise of discretion or an important policy consideration which the [EAB] should, in its discretion, review.” 40 C.F.R. 124.19(a).

## ARGUMENT

### **I. Region I Erred By Failing To Follow Federal Regulations When It Selected A Concentration Limit For Total Nitrogen Instead Of A Mass Limitation.**

Region I erred as a matter of law when it selected a concentration limit for total nitrogen because 40 C.F.R. 122.45(f)(1) requires that effluent limits be expressed in terms of mass unless one of three exceptions applies, and Region I has not demonstrated that any of the exceptions applies. According to the regulation,

“[a]ll pollutants limited in permits shall have limitations, standards or prohibitions expressed in terms of mass except: (i) For pH, temperature, radiation, or other pollutants which cannot appropriately be expressed by mass; (ii) When applicable standards and limitations are expressed in terms of other units of measurement; or (iii) If in establishing permit limitations on a case-by-case basis under § 125.3, limitations expressed in terms of mass are infeasible because the mass of the pollutant discharged cannot be related to a measure of operation (for example, discharges of TSS from certain mining operations), and permit conditions ensure that dilution will not be used as a substitute for treatment.” 40 C.F.R. 122.45(f)(1).

Region I has not asserted (nor could it) that either the first or third exception applies.<sup>1</sup>

See Response to Comments (Exh. 2), p. 17. Instead, in its Response to Comments, Region I cited the second exception, “when applicable standards and limitations are expressed in terms of other units of measurement,” and explained that “[i]n this instance, we believe expression of limits on total nitrogen as concentration limits is necessary to meet Rhode Island’s water quality standards.” Response to Comments (Exh. 2), p. 17. As explained further below, this response relies on an impermissible reinterpretation of the plain language of the regulation and is illogical.

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<sup>1</sup> The first exception applies when the pollutant of concern cannot be measured in terms of mass and the third exception applies when a mass limitation would be infeasible because of the nature of the operations of the permittee. 40 C.F.R. 122.45(f)(1). Because mass limitations for total nitrogen are commonly used to regulate effluent from wastewater treatment plants, neither of these exceptions could apply here. See e.g., MassDEP Comments (Exh. 4), p. 1.



Further, Region I has failed to identify any “applicable standards and limitations,” within the meaning of the regulation, that “are expressed in terms of other units of measurement.”

Section 122.2 of the NPDES regulations defines “applicable standards and limitations” as follows:

“Applicable standards and limitations means all State, interstate and federal standards and limitations to which a ‘discharge’ ... is subject under the CWA, including ‘effluent limitations,’ water quality standards, standards of performance, toxic effluent standards or prohibitions, ‘best management practices,’ pretreatment standards ... under sections 301, 302, 303, 304, 306, 307, 308, 403 and 405 of CWA.” 40 C.F.R. 122.2.

Region I is required by the Clean Water Act to include in the Permit effluent limits necessary to comply with applicable state water quality standards. 33 U.S.C. § 1311(b)(1)(C); Fact Sheet (Exh. 3), p. 3. In setting the effluent limit for total nitrogen, Region I was required to consider Rhode Island’s water quality standards because excess nitrogen is typically the limiting nutrient in marine waters, in this case Rhode Island’s Narragansett Bay. Fact Sheet (Exh. 3), p. 7; Response to Comments (Exh. 2), pp. 79-80. Therefore, under 40 C.F.R. 122.2, Rhode Island’s water quality standards for total nitrogen are an “applicable standard” that could potentially trigger the second exception in 40 C.F.R. 122.45(1). Rhode Island’s Water Quality Regulations, however, establish only narrative criteria for nutrients in marine waters; they do not contain any water quality standard for total nitrogen expressed as a numerical standard in units of measurement of any kind. *See* Rhode Island Water Quality Standards (“RIWQS”) Rule 8.D.(3) and Table 2, Rule 8.D.(3)10 (attached hereto at Exhibit 5). Because Rhode Island’s water quality standards for total nitrogen are not “expressed in terms of other units of measurement,” they cannot trigger the second exception to the regulation. 40 C.F.R. 122.45(f)(1)(ii).

Apparently realizing this, Region I did not assert in its Response to Comments that Rhode Island’s water quality standards contained a standard for total nitrogen expressed as a

concentration. *See* Response to Comments (Exh. 2), p. 17. Instead, Region I claimed that expressing the effluent limit for total nitrogen as a concentration was somehow necessary in order to meet Rhode Island's narrative standard. *Id.* This argument is flawed for two reasons. First, it assumes that one unit of measurement (concentration) is more stringent than another unit of measurement (mass). While a mass limitation restricts a wastewater treatment plant to a finite amount of nitrogen discharged over a period of time, a concentration limit could result in either a lower or *higher* amount of nitrogen being discharged over the same period of time, depending upon the volume of the flows discharged. Concentration limits are not, therefore, necessarily more or less stringent than mass limitations.

Second, regardless of whether a concentration limit could be more stringent than a mass limitation, the exception cited by Region I does not permit selection of another unit of measurement in order to *meet* "applicable standards and limitations." *See* 40 C.F.R. 122.45(f)(1)(ii). The plain language of the regulation permits selection of another unit of measurement only "*when applicable standards and limitations are expressed in terms of other units of measurement.*" *Id.* (emphasis added). Region I has not identified any "standards and limitations to which" the facility's total nitrogen "discharge ... is subject under the CWA" that are expressed in terms of concentration.<sup>2</sup> 40 C.F.R. 122.2; *see* Response to Comments (Exh. 2), pp. 17-18. This is not surprising since Rhode Island's standard is expressed as a narrative and not as a particular unit of measurement. *See* RIWQS Rule 8.D.(3) and Table 2, Rule 8.D.(3)10 (Exh. 5). Because the regulation is mandatory ("[a]ll pollutants limited in permits *shall* have limitations ... expressed in terms of mass") and none of the three exceptions applies, Region I

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<sup>2</sup> Although Region I notes that a few other wastewater treatment plant permits also contain concentration limits for total nitrogen, effluent limitations in other permits are not "applicable" to this Permit within the meaning of the regulation and therefore cannot trigger exception (ii). *See* 40 C.F.R.122.2.

violated the regulations when it expressed the total nitrogen effluent limit in a unit of measurement other than mass. *See* 40 C.F.R. 122.45(f)(1).

**II. Assuming *Arguendo* That Region I Had Discretion Under The Regulations, The Selection Of A Concentration Limit For The UBWPAD Facility Was An Abuse Of Discretion Because It Conflicts With EPA Policy.**

Even if Region I had discretion under the regulations to choose a concentration limit, Region I abused its discretion because the selection of a concentration limit instead of only a mass limit for the UBWPAD facility is inconsistent with EPA's demonstrated policy preferences. EPA regulations and guidance express a policy preference for encouraging efficient wastewater treatment and water conservation. In addition, the fact that EPA's TMDL program requires the use of mass limitations indicates both a legislative and agency policy preference for mass limitations as the most effective way to address impaired waters. *See* 33 U.S.C. § 1313; 40 C.F.R. 130.00.

EPA's guidance for NPDES permit writers discourages the use of concentration limits for facilities with a history of providing efficient wastewater treatment. Permit Writers' Manual (Exh. 7), pp. 66-67. In the guidance, EPA includes a discussion of 40 C.F.R. 122.45(f)(2), which states that "[p]ollutants limited in terms of mass additionally may be limited in terms of other units of measurement ...." *Id.* The guidance goes on to explain in which circumstances the addition of a concentration limit would *not* be helpful:

"In certain situations, the use of concentration limits may not be appropriate since they may discourage the use of innovative techniques, such as water conservation by the permittee. For example, if a facility had a history of providing efficient treatment of its wastewater and also wished to practice water conservation, inclusion of concentration limits would not be appropriate (i.e., concentration limits would prohibit decreases in flow that would concurrently result in an increase in pollutant concentration)." *Id.* at 67.

Although the current design flow of the UBWPAD facility is 56 mgd, its actual discharges over the past six years have ranged from an average of 30 to 43 mgd. Response to Comments (Exh. 2), p. 50 n. 11. Further, Region I acknowledged in its Response to Comments that about 15 mgd of the facility's actual discharge is attributable to infiltration and inflow. *Id.* at 4. Therefore, by setting a concentration limit instead of only a mass limit, Region I effectively penalized the facility for its low flows, directly contradicted its own policy in favor of greater efficiency and conservation and provided a disincentive for UBWPAD to address its infiltration and inflow issues. *See* Permit Writers' Manual (Exh. 7), p. 67.

Even the regulations themselves reflect a policy preference for efficiency and conservation. As noted above, 40 C.F.R. 122.45(f)(1) requires the use of a mass limitation except in three specific circumstances. The third exception, which permits the selection of another unit of measurement when mass limitations are infeasible due to the nature of a facility's operations, cautions that other permit conditions must "ensure that dilution will not be used as a substitute for treatment." 40 C.F.R. 122.45(f)(1)(iii). This language indicates that EPA recognizes that concentration limits encourage dilution and discourage efficiency and conservation. *See id.*

Finally, the fact that the statutory program designed to address impaired waters requires the use of mass limitations indicates that mass limitations are not just EPA's policy preference but the Legislature's as well. 33 U.S.C. § 1313; 40 C.F.R. 130.00. Although Region I has been quick to point out that Narragansett Bay has no TMDL for nitrogen, the absence of a TMDL hardly precludes the use of a mass limitation. In a letter approving a TMDL for New York's Long Island Sound, a similarly impaired water body that shares many of the same characteristics of Narragansett Bay, EPA applauded New York and Connecticut for "adopting a no-net increase

policy for nitrogen loads.” April 3, 2001, Letter from the Long Island Sound Office of the U.S. EPA to the Comm’rs of the Conn. Dept. of Env’tl. Prot. and the N.Y. State Dept. of Env’tl. Conservation, (“TMDL Approval Letter”) (attached hereto as Exhibit 9), p. 1. This “no-net increase” policy was adopted by New York and Connecticut a decade before the Long Island Sound TMDL was approved. *See* Response to Comments (Exh. 2), p. 20; TMDL Approval Letter (Exh. 9), p. 1. Therefore, the fact that Narragansett Bay has no TMDL does not preclude Region I from setting only a mass limitation for total nitrogen that, unlike a concentration limit, would ensure no net increase in nitrogen loading to the Bay from the UBWPAD facility. On the contrary, the fact that Upper Narragansett Bay is a § 303(d) nutrient-impaired water body awaiting development of a TMDL is all the more reason why only a mass limitation, both the Legislature’s and EPA’s preferred method for addressing impaired waters, should be utilized. *See* RI § 303(d) List (Exh. 6), p. viii.

### **III. Region I Erred By Relying On The Severely Flawed 2004 RIDEM Report When Establishing The Concentration Limit For Total Nitrogen.**

Region I’s decision to establish a Permit concentration limit of 5 mg/l for total nitrogen was based on conclusions drawn by the Rhode Island Department of Environmental Management (“RIDEM”) in a December 2004 report entitled “Evaluation of Nitrogen Targets and WWTF Load Reductions for the Providence and Seekonk Rivers” (“2004 RIDEM Report” or “Report”). Fact Sheet (Exh. 3), p. 12. To reach these conclusions, RIDEM applied and analyzed the results of a laboratory experiment conducted back in the 1980s by the University of Rhode Island’s Marine Ecosystem Research Laboratory (“MERL Study” or “Study”). 2004 RIDEM Report (Exh. 8), p. 1. As explained further below, Region I erred in relying on the Report because RIDEM’s application of the results of the MERL Study to the Narragansett Bay system was highly flawed.

First, the Report failed to account for the significant differences between the simple, physical model used for the MERL Study experiments and the numerous dynamics influencing an estuarine system like Narragansett Bay. *See id.* The Report began by explaining that RIDEM's initial effort to construct a mathematical model proved unsuccessful in matching the mixing characteristics of the estuarine setting found in the Providence and Seekonk Rivers as they enter Narragansett Bay:

"It has recently been determined that due to problems encountered when modeling the interaction between the deep channel and shallow flanks of these water bodies, the mass transport component of the model system cannot be successfully calibrated and validated. This problem has been encountered in other estuaries and has not been resolved with state of the art numerical solution techniques. Because water doesn't mix in the model as it does in the rivers, we are unable to simulate the chemical and biological behavior of the system in the water quality phase of the modeling effort." *Id.*

Instead, RIDEM reverted to an older and less sophisticated vehicle: laboratory experiments. *Id.* The MERL Study was conducted entirely in a laboratory in nine 13,000 liter tanks filled with lower Bay water that were each enriched with an increasing factor (1 times, 2 times, etc.) of a static combination of inorganic nitrogen, phosphorus and silica. *Id.* The tanks were then tested for chlorophyll-a, dissolved inorganic nitrogen and dissolved oxygen. *Id.* The Study made no attempt to account for the Bay's many variables (such as the effect of tides, currents, and stratification on dispersion, dilution and detention time) and sources (such as contributions of nutrients from septic systems, combined sewer overflows, atmospheric deposition, sediment and stormwater runoff) that led RIDEM to abandon the mathematical model in first place. Response to Comments (Exh. 2), p. 92; 2004 RIDEM Report (Exh. 8), p.10.

RIDEM's extrapolation of the MERL data to the Providence and Seekonk River system based on a comparison of surface area loading is just one example of how poorly the MERL experiment worked as a model. *See* 2004 RIDEM Report (Exh. 8), pp. 9-10. In order to

determine how the Rivers might respond to nutrient reductions, RIDEM compared nitrogen loading data it had collected from the Rivers in 1995-1996 to the nutrient loads introduced to the MERL tanks. *Id.* In order to do that, RIDEM calculated the nitrogen loading per unit of surface area of the Rivers and compared it to the dissolved nitrogen loading per unit of surface area of the MERL tanks. *Id.* On the basis of this comparison, RIDEM arrived at the conclusion that the Rivers most closely resembled the MERL tanks that were enriched with between 4 times and 8 times the nutrient load utilized in the Study. *Id.* This conclusion would be valid *only* if the Rivers were shallow, static environments like the MERL tanks. *See id.* By comparing surface area loadings, RIDEM completely factored out the effect of tides, currents, sediments and stratification on the dispersion and dilution of nitrogen in the River system. *See id.*

Given the MERL Study's failure to account for real-world variables, it is hardly surprising that RIDEM's attempt to "ground-truth" its application of the data came up short. In the Report, RIDEM compared actual, observed concentrations of dissolved inorganic nitrogen for the Providence and Seekonk Rivers to the concentrations predicted by the MERL Study and discovered that the Study over-predicted the concentration by as much as four times in some areas. 2004 RIDEM Report (Exh. 8), p.12. RIDEM speculated that this discrepancy was attributable to the "large differences" in flushing time between the actual conditions of the Rivers (a couple of days) and the assumptions made by the Study (twenty-seven days), and other variables not accounted for such as uptake by microalgae and denitrification of the bottom waters. RIDEM then conceded the obvious point that "the MERL system is not a perfect analog." *Id.* at 12, 27.

Second, the Report misapplied data in its calculation of the rate of nitrogen attenuation that should be applied to UBWPAD's discharges. Because several of the wastewater treatment

plants contributing effluent to the Providence and Seekonk Rivers discharge directly to tributary rivers, any calculation of their nitrogen contribution to the Rivers must take into account some natural attenuation of nitrogen as the effluent flows downstream. For some of these facilities, RIDEM compared nitrogen loading data collected from the Rivers during the period 1995-1996 to discharge records kept by these facilities during the same time period. *Id.* at 9, 18-20. UBWPAD, however, did not have discharge records for nitrogen during that period, so RIDEM substituted estimates based on 2000-2002 UBWPAD data in order to calculate an attenuation rate of 13%. *Id.* at 18-20. In other words, RIDEM calculated the rate of attenuation for UBWPAD's discharges by comparing the nitrogen loads in its discharges in 2000-2002 to the nitrogen loads in the Providence and Seekonk Rivers *five years earlier*. *Id.*

Third, the Report misrepresented the results of the MERL Study by implying that the Study demonstrated a direct correlation between increases in nitrogen concentration and resulting increases in chlorophyll-a and decreases in dissolved oxygen when in fact the Study did not separately analyze the effect of nitrogen increases. As the Report explained at the outset, the tanks utilized in the MERL Study were enriched with concentrations of inorganic nitrogen, phosphorus and silica. *Id.* at p. 1. Although individual tanks were enriched by escalating factors of the nutrients, all the tanks were enriched with the same ratio of the three nutrients. *Id.* The Study did not isolate the effect of nitrogen increases as the Report's Figures 4 and 10 appear to reflect. *Id.* at 4, 8. It is therefore unclear how each individual nutrient contributed to the resulting concentrations of chlorophyll-a and dissolved oxygen. *See id.*

Finally, the Report attempted to extrapolate total nitrogen concentration limitations based on data that measured only dissolved inorganic nitrogen. *Id.* at 19-20. Total nitrogen consists of both dissolved inorganic nitrogen and organic nitrogen. Because different wastewater treatment



methodologies result in different effluent ratios of dissolved inorganic nitrogen and organic nitrogen, the particular treatment methodology of a given wastewater treatment plant must be taken into consideration in order to determine how its total nitrogen is divided into dissolved inorganic nitrogen and organic nitrogen. Given that RIDEM only had data based on dissolved inorganic nitrogen, it is unclear whether RIDEM did anything but guesstimate when converting dissolved inorganic nitrogen data to total nitrogen loads. *See id.*

In the Response to Comments, Region I conceded the Report's vulnerabilities:

"[T]here are uncertainties associated with use of a physical model such as the MERL tank experiments. As noted in the Fact Sheet and further detailed in this response to comments, the MERL tank experiments cannot completely simulate the response of chlorophyll a and dissolved oxygen to nitrogen loadings in a complex, natural setting such as the Upper Narragansett Bay. These differences may overestimate the impact that a given nitrogen load would have on the Seekonk and Providence Rivers." Response to Comments (Exh. 2), p. 6.

Region I further explained that it "was required to exercise its technical expertise and scientific judgment based on the available evidence when translating these laboratory results and establishing the permit limit." *Id.* at 49. Region I failed, however, to explain precisely how it adjusted for the uncertainties other than to state repeatedly that it selected a less stringent concentration limit in light of the uncertainties. *See e.g., id.* Given that the Report ultimately recommended an effluent concentration limit of 5 mg/l for total nitrogen for the UBWPAD facility, it appears that Region I instead disregarded the acknowledged "uncertainties," failed to "exercise its technical expertise and scientific judgment," and merely adopted the conclusions of the Report wholesale. *See* 2004 RIDEM Report (Exh. 8), pp. 28, 30.

## CONCLUSION

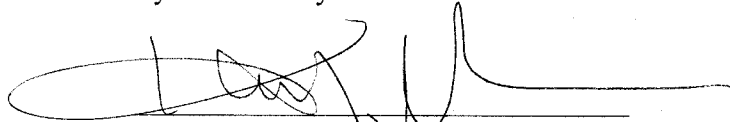
For all the reasons set forth herein, MassDEP respectfully requests the following relief:

1. That EAB grant MassDEP's Petition for Review; and
2. That EAB remand to Region I for further permitting procedures, including but not limited to: (a) an order requiring it to strike the Permit condition imposing a total nitrogen concentration limit of 5 mg/l and directing that only a mass limitation be applied; and (b) an order requiring Region I to remedy any clearly erroneous conclusions of law or fact or abuses of discretion.

Respectfully Submitted,

MASSACHUSETTS DEPARTMENT OF  
ENVIRONMENTAL PROTECTION

By Its Attorneys:



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October 7, 2008

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C.**

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ENVIR. APPEALS BOARD

**In re:**

**The Upper Blackstone Water Pollution  
Abatement District (UBWPAD)**

**NPDES PERMIT NO. MA0102369**

**NPDES Appeal No. 08-12**

**REQUEST FOR ORAL ARGUMENT**

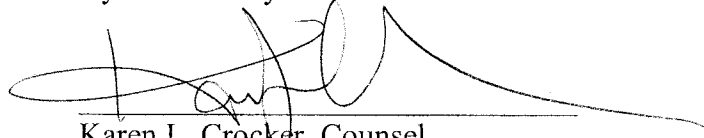
The Massachusetts Department of Environmental Protection hereby requests that the Environmental Appeals Board ("EAB") order oral argument in the above-captioned matter. Oral argument would assist EAB in its deliberations on the issues presented by the case for the following reasons:

1. The application of 40 C.F.R. 122.45(f)(1) in expressing an effluent limit in terms other than mass is a matter of first impression for the Board; and
2. The inadequacies of the December 2004 report by the Rhode Island Department of Environmental Management, entitled "Evaluation of Nitrogen Targets and WWTF Load Reductions for the Providence and Seekonk Rivers" is of a sufficiently complex nature that oral argument would materially assist EAB's understanding of the issues raised.

Respectfully Submitted,

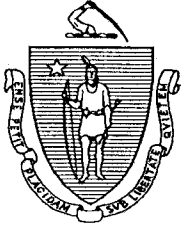
MASSACHUSETTS DEPARTMENT OF  
ENVIRONMENTAL PROTECTION

By Its Attorneys:

A handwritten signature in black ink, appearing to be 'Karen L. Crocker', written over a horizontal line.

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October 7, 2008



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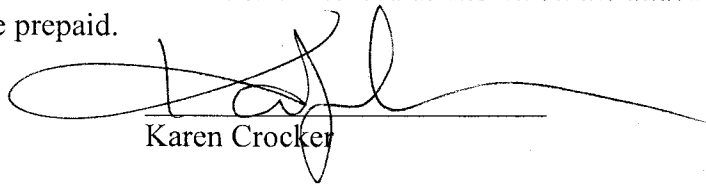
IAN A. BOWLES  
 Secretary

LAURIE BURT  
 Commissioner

CERTIFICATE OF SERVICE

I, Karen Crocker, do hereby certify that I did on this date serve a copy of the  
 aforementioned papers in this matter on the Parties of Record as shown on the attached Service  
 List by first class mail postage prepaid.

October 7, 2008



Karen Crocker

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