



UPPER BLACKSTONE WATER POLLUTION ABATEMENT DISTRICT

Engineer Director / Treasurer Thomas K. Walsh, P.E.

May 24, 2007

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U. S. Environmental Protection Agency
NPDES Permits Unit – CPE
1 Congress Street – Suite 1100
Boston, MA 02114-2023

Attn: David Pincumbe

Mr. Glenn Haas, Director
Division of Watershed Management
Massachusetts Department of Environmental Protection
One Winter Street
Boston, MA 02108

**Re: Comments on Draft Permit
Upper Blackstone Water Pollution Abatement District
NPDES Permit No. MA0102369; State Permit No. M-181
Public Notice No. MA-016-07**

Dear Messrs. Pincumbe and Haas:

On behalf of the Upper Blackstone Water Pollution Abatement District (District), I respectfully submit the District's comments on the draft renewal of its NPDES and state permit identified above and proposed on March 23, 2007 by the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (DEP). As attested in the attached certified copy of their May 24, 2007 vote the District Board of Directors unanimously support these comments. The District's technical and legal comments are provided in Attachments A and B respectively, which are attached hereto and made a part hereof.

The Upper Blackstone facility treats wastewater from Worcester and eight surrounding communities. The District and its members do not question the intent or the noble goal of restoring the Blackstone River to a place where we can safely swim and fish. We embrace it. We want a clean Blackstone River and a healthy Narragansett Bay. But we want to achieve these conditions using common sense with careful planning, guided by proven science and based on sustainable and cost-effective engineering. To that end, we are sponsoring development of an advanced model of the Blackstone River that will be capable of broad use in evaluating the condition of the River and in assessing management options. Through development of the model we are also supporting work by the U. S. Army Corps of Engineers to preserve and develop habitat along the River, as well as River assessments being completed by U.S. Geological Survey and DEP. We want the benefits of our investments to justify the costs that will burden our rate payers (not the federal or state governments that impose these mandates).

The District believes that the draft discharge permit is not supported by current science, and it is not justified for several reasons. It is an expensive order that fails to consider \$180 million in ongoing capital improvements at the District, and as such imposes an unfair burden on District ratepayers, many of them members of Environmental Justice populations. Without evidence, it will require costly treatment changes that are not environmentally sustainable. Further, the permit imposes legal and administrative burdens on the District for management of member sewers through the co-permittee process that are not allowed in our enabling legislation and that the District has no authority to accept.

The District is financed by each of our member communities based on use, with Worcester paying nearly 90 percent of our costs. For the City of Worcester, the current \$180 million upgrade has increased treatment costs more than 300 percent in four years - and more cost increases will come to finance remaining construction. As a result, the city's sewer rates have more than doubled in four years. Median household income in Worcester is \$37,000, 35% below the state's median. To impose further costly requirements on Worcester and our other member communities without justification is simply wrong.

In 2001, the District and EPA negotiated a discharge limit for phosphorus (P) of 0.75 milligrams per liter (mg/L) in summer; with no limit on total nitrogen (TN). EPA based these limits on its river model, even though its own Science Advisory Board recommended against doing so. This model remains EPA's only scientific basis for effluent limits on the river today. EPA determined then that these were the limits needed to improve conditions in the Blackstone and to benefit Narragansett Bay (40 miles away). The current proposal lowers the P limit to 0.1 mg/L in summer and to 1.0 mg/L in winter; and TN is set at 5 mg/L in summer. Our new facilities will achieve less than 0.75 mg/L P and less than 8.0 mg/L TN year - round. We will be approaching the 40-50% summer TN reduction legislated by the Rhode Island Governor's Special Committee by 2009. We note that this goal was set without benefit of having set numerical water quality standards, or completion of a Total Maximum Daily Load (TMDL) assessment as required in EPA regulations.

The District's primary issues relative to the draft permit include:

- There is no defensible evidence that the proposed TN limits will improve the water quality in the Blackstone River or Narragansett Bay. DEP, the Narragansett Bay Commission and other Rhode Island dischargers all have challenged the science of the new nitrogen limit. In its comments on analysis conducted by Rhode Island Department of Environmental Management, DEP said that the limits were based on incomplete science at best and that it was more appropriate for the District to complete its ongoing upgrades and analyze what needs to be done next. In addition, DEP is undertaking studies with USGS of sediment transport in the Blackstone River to assess nitrogen attenuation and DEP is also studying the cost of TN compliance to better understand the financial impact of plant upgrades.
- The timing of the permit revisions is premature and illogical. Given that the District is scheduled to complete its current upgrade project in two years, it makes sense to operate the new plant for two full seasons beyond the completion date to assess its capabilities. At that time we will know what levels of P and TN the new plant can achieve. Other facilities along the river and around Narragansett Bay are also being upgraded and it makes sense to see how the river fares with all of these upgrades before imposing further mandates. Moreover, by December 2007, the results from a new model of the river developed by University of Massachusetts School of Engineering and the District's environmental consultants, CDM, will be known. The model, together with the results obtained by operating the improved plant, will provide the needed science to guide rational decision making - and complete required TMDLs. It would make sense to continue under the terms of the current permit until we have all had a chance to assess these results.

- The facilities currently being built by the District have predictable costs that are based on reliable treatment processes. If new facilities are to be built to achieve the latest proposed limits, the treatment processes will not be as sustainable, using large quantities of chemicals (including an energy source such as methanol) and about 20 percent more electricity. Chemical addition will increase sludge production, and since the inert chemicals in the sludge are more difficult to burn, the District will have to use more fuel for incineration, increasing air emissions, and landfill volume needed to dispose of more ash. We wonder if these negative environmental consequences were fully evaluated in assessing the draft permit limits.
- While we know some of the potential negative impacts, we don't know what the benefits will be from the new limits. The District believes that our ratepayers - many of them members of Environmental Justice populations - should know if another \$200 million to improve sewers and build the plant, plus an additional \$3.7 million to operate it annually will provide a commensurate or discernible benefit.


The District believes that a more common sense approach to establishing discharge limits for the Blackstone River is to complete the new river model; finish the current wastewater treatment improvements; optimize and fine-tune the new facilities; and monitor the results for two years. In 2012 we could review and revise river management decisions as needed based on science, experience and a true cost-benefit analysis. If we find that more stringent effluent limits than the new plant can achieve are needed to make a proven difference in water quality, the District can then undertake reasonable upgrades. We think this common sense cost-effective approach can be accomplished more cooperatively and with equal expedience to the alternative approach of drawn out court battles.

Our comments are based on relevant information known and available to us as of the date of this submission. The District reserves any rights it may have to revise or update these comments, or submit further comments upon the draft permit in the event that further information is developed or obtained by the District either independently or through the public comment process and/or the final permit.

In closing, the District respectfully requests that EPA and DEP incorporate the comments provided with this submittal into the final permit. The District welcomes the opportunity to meet with EPA and DEP to discuss these comments prior to release of the final permit.

We appreciate your attention and assistance in this matter and look forward to collaborating with you in assuring the quality of the Blackstone River. If you have any questions or require further information, please do not hesitate to contact me.

Very truly yours,
UPPER BLACKSTONE WATER
POLLUTION ABATEMENT DISTRICT


Thomas K. Walsh, P.E.
Engineer - Director / Treasurer

Enclosures:

- Certified copy – Board Vote, May 24, 2007
- A. Technical Comments
- B. Legal Comments

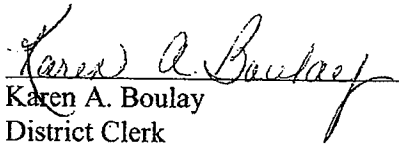
cc: Senator Edward M. Kennedy
Senator John F. Kerrey
Congressman James P. McGovern

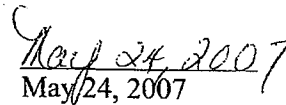
May 24, 2007

Upper Blackstone Water Pollution Abatement District
Board Meeting

I attest that at the meeting of the Board of Directors of the Upper Blackstone Water Pollution Abatement District on May 24, 2007 a unanimous vote was obtained with respect to the following motion of support:

A motion to support the comments being made by the Engineer-Director for the District to the United States Environmental Protection Agency and the Massachusetts Department of Environmental Protection on the draft renewal of our National Pollutant Discharge Elimination System Permit issued on March 23, 2007 that protest the stringent limits imposed in the permit which are scientifically unjustified, impose unnecessary and costly unfunded mandates on District rate payers, and that do not recognize the extensive work currently under construction at the District to improve water quality in the Blackstone River.


Karen A. Boulay
District Clerk


May 24, 2007

ATTACHMENT A

Summary of Technical Issues/Comments

**Draft NPDES Permit No. MA012369; Public Notice No. MA-016-07
Upper Blackstone Water Pollution Abatement District
50 Route 20
Millbury, MA 01527**

This document outlines the District's technical issues and concerns with the draft NPDES Permit referenced above (the "Draft Permit") and provides constructive improvements for your consideration. It is our view that the analysis presented by EPA fails to make a comprehensive technical argument in support of its proposed permit limits for the following major reasons:

EPA ignores the prior work it has done on the issue of phosphorus loadings to the Blackstone River and the impacts of these loadings on the ecology of the River. That work provides clear indications that modest revisions to the existing permit levels could result in achievement of the EPA's water quality objectives.

EPA adopts dated references (circa 1968) to develop their permit limits. The references used appear to have been developed to protect water supply reservoirs and lakes, and are poorly documented and explained. Presumably, if these were as unequivocal of the need for phosphorus control as the EPA now claims, then phosphorus limitations would have been included in every NPDES permit ever issued to the District, and to the vast majority of NPDES permits issued across the nation.

EPA appears to ascribe all of the observed low levels of oxygen in the Providence and Seekonk Rivers to the discharge of nitrogen, ignoring physical factors such as stratification and temperature and other sources of oxygen demanding pollutants, which impact the dissolved oxygen condition of those rivers.

EPA fails to justify its application of experiments conducted at URI on Narragansett Bay to the Providence and Seekonk River system. There are significant physical differences between the two systems that are acknowledged, but then neglected in the development the limits.

EPA has made conceptual assumptions concerning the sources of nutrients in the Blackstone River that are internally inconsistent, and as a result makes mathematical errors concerning the impact of the District's discharge on the Providence and Seekonk River systems

EPA has adopted high flow effluent limitations far more stringent than is required of other dischargers, and which appear unwarranted to protect water quality.

Comments supporting these observations are presented in the following material.

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Draft NPDES Permit No. MA012369; Public Notice No. MA-016-07

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A. Phosphorus Limit of 0.1 mg/L (April 1 – October 31) and 1.0 mg/L (November 1 – March 31)

In developing its proposed permit limit for total phosphorus the EPA did not consider relevant facts, and acted without proper consideration of the circumstances. The EPA simply adopted an outdated nutrient recommendation, and applied it in a manner inconsistent with the EPA's own recommendations and caveats. The EPA's limit is flawed because:

- It relies on irrelevant data to justify the limit
- It improperly adopts outdated guidance and ignores the EPA's own caveats concerning the guidance
- The recommended in-stream value is unsubstantiated
- It ignores other studies of nutrient enrichment conducted in Massachusetts
- It disregards its own prior studies of the Blackstone River
- It ignores ongoing efforts by the Massachusetts Department of Environmental Protection to establish its own nutrient criteria.
- It effectively creates a water quality standard for the Blackstone, the adoption of which must follow certain specific procedures

The Permit Relies On Irrelevant Data to Justify the Limit

The information cited in the Fact Sheet to create the impression that the proposed permit limits are justified is erroneously applied. The Fact Sheet states:

The impacts associated with the excessive loading of phosphorus are documented in the following reports: *Blackstone River Initiative Report*, May 2001 (EPA New England); *Blackstone River Basin 1998 Water Quality Assessment Report* (Mass DEP); *Blackstone River Watershed 2003 DWM Water Quality Monitoring Data*, May 2005 (Mass DEP); *Phase I: Water Quality Evaluation and Modeling of the Massachusetts Blackstone River, Draft - March 2004* (US Army Corps of Engineers – <http://www.nae.usace.army.mil/projects/ma/blackstone/wqe.htm>); and *Blackstone River Watershed 2003 Biological Assessment*, April 4, 2006 (Mass DEP), as well as in the Massachusetts and Rhode Island 303(d) Lists of Impaired Waters as discussed above.

But, as the EPA well knows, the District is in the process of constructing facilities to comply with the phosphorus limit contained in the 2001 permit, according to a schedule agreed to by the EPA. Thus the "excessive phosphorus levels" alluded to by the EPA that led to the conditions cited in the Fact Sheet are not the conditions that will exist after the completion of the ongoing construction, but rather reflect the same loadings that compelled the implementation of the 0.75 mg/l phosphorus limitation. In that respect, it was misleading to suggest that the referenced information compelled the draft limits. Moreover, the cited reports

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contain no quantitative data on the occurrence of macrophytes and or periphyton. Development of quantitative data with respect to these two metrics is a necessary precursor to the development of programs to reduce their existence to acceptable levels.

The Permit Improperly Applies EPA Guidance

The permit references The 1986 Quality Criteria for Water as the source document for its recommend instream concentration. The 1986 document is clear that there is no national criteria for control of Phosphorus. (See Attachment A1 to this document) It begins by saying "Although a total phosphorus criterion to control nuisance aquatic growths is not presented, it is believed that the following rationale to support such a criterion, which currently is evolving, should be considered." (Gold Book, page 240 of 477). It goes on to describe various recommendations and observations of Mackenthun and Hitchinson concerning tolerable levels of phosphorus in receiving waters. It also suggests that:

The majority of the Nation's eutrophication problems are associated with lakes or reservoirs and currently there are more data to support the establishment of a limiting phosphorus level in those waters than in streams or rivers that do not directly impact such water. There are natural conditions, also, that would dictate the consideration of either a more or less stringent phosphorus level. Eutrophication problems may occur in waters where the phosphorus concentration is less than that indicated above and, obviously, such waters would need more stringent nutrient limits. *Likewise there are those waters within the Nation where phosphorus is not now a limiting nutrient and where the need for phosphorus limit is substantially diminished.* Such conditions are described in the last paragraph of this rationale. (Gold Book, page 241 of 477)

The last paragraph contains a number of caveats that need to somehow be taken into account in the development of the criterion. The factors include the following

1. Naturally occurring phenomena may limit the development of plant nuisances.
2. Technological or cost effective limitations may help control introduced pollutants.
3. Waters may be highly laden with natural silts or colors which reduce the penetration of sunlight needed for plant photosynthesis.
4. Some waters morphometric features of steep banks, great depth, and substantial flows contribute to a history of no plant problems.
5. Waters may be managed primarily for waterfowl or other wildlife.
6. In some waters nutrient a other than phosphorus is limiting to plant growth: the level and nature of such limiting nutrient would not be expected to increase to an extent that would influence eutrophication.
7. In some waters phosphorus control cannot be sufficiently effective under present

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technology to make phosphorus the limiting nutrient. (Gold Book, page 243 of 477)

Thus, although there was no criterion established in the 1986 document, and the rationale was only evolving and proposed for consideration, the EPA elected to ignore the caveats about its use. This was improper because, as discussed below the EPA had the tools to make substantive assessments that could incorporate these caveats, and which would not have relied on the irrelevant field data to support its conclusions.

The Recommended In-Stream Value Used In Developing the Permit Limit Is Unsubstantiated

The 1986 Quality Criteria for Water suggests a level of 0.1 mg/l as "a desired goal for the prevention of plant nuisances in streams or other flowing waters" and references a 1973 publication of Kenneth Mackenthun, a copy of which is included as Attachment A2 to this document. However, that document does not present information concerning the development of the 0.1 mg/l "desired goal", but rather makes reference to a 1968 paper published in the Journal of the American Waterworks Association by the same author. A copy of the 1968 paper is included as Attachment A3 to this document. The 1968 document indicates that " ... A considered judgment suggests that to prevent biological nuisances, total phosphorus should not exceed 100 ug/l P at any point within the flowing stream, nor should 50 ug/l be exceeded where waters enter a lake, reservoir or other standing water body ..." (Mackenthun, 1968 p 1053). A careful reading of this document suggests that it is referencing streams which are tributary to water supply reservoirs and lakes and standing waters that serve as sources of water supply. This would explain why it was published in what would otherwise be thought to be about water supply, and not water pollution. Moreover, the 1968 document presents no information concerning the development of the recommendation – and so it presents no guidance on how it should be applied – seasonally, monthly, or over the growing season?

The EPA's Approach Ignores the Approaches Taken for Other Studies of Nutrient Enrichment Conducted in Massachusetts

In recent times the EPA and Commonwealth have collaborated on the development of Total Maximum Daily Load Studies to establish nutrient management goals. These studies have been or are being conducted on the Assabet, The Nashua River and the Lower Charles River. The TMDL studies on the Assabet and Lower Charles are available on DEP's website (see <http://www.mass.gov/dep/water/resources/tmdls.htm>). Studies on the Nashua are reported to be underway and supportive of phosphorus effluent limits proposed for the City of Leominster, but are not yet available for public review. The studies of the Lower Charles and the Assabet clearly attempted to take into account the myriad of factors presented as caveats in the EPA's 1986 guidance, as well as others. In the case of the wastewater plants discharging to the Assabet River, limits were developed based not on the diluted concentration of phosphorus in the receiving waters, but rather on the reduction in aggregate biomass (measured as chlorophyll-a) achieved in response to reductions in wastewater loads and sediment phosphorus sources. For the Charles River, required reductions in phosphorus

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loadings from various sources were developed based on seasonal average chlorophyll a levels, rather than in-stream, dilution driven phosphorus levels. This criterion was declared to be adequate to "satisfy all Class B narrative (nutrients, aesthetics and clarity) and numeric (dissolved oxygen in the photic zone of the upper water column and pH) criteria as specified in the MAWQ" (Draft Nutrient TMDL Development for the Lower Charles River Basin, Massachusetts, page vii). Such investigations attempt to address the many factors that impact the growth of nuisance algae; comparable studies should have been undertaken on the Blackstone, rather than resorting to overly simplistic concentration and dilution based analyses.

The EPA Disregards Its Own Prior Studies of the Blackstone River

In order to support the development of the 0.75 mg/l permit limit contained in the existing permit the EPA developed a wasteload allocation using the QUAL2E model that was developed as part of the Blackstone River Initiative (BRI). Although the EPA argues that the model was not used to assess cultural eutrophication, it was used to assess the fate of chlorophyll a under various phosphorus control strategies. Seasonal average chlorophyll a was directly used in the Charles as a measure of cultural eutrophication, and in the Blackstone model it serves as an indicator of general plant growth. The Blackstone model runs indicated that at extreme low flow conditions (as compared to seasonal average values) with the phosphorus limitations contained in the existing permit (0.75 mg/l) and with 25 % reduction in sediment phosphorus flux, that chlorophyll a levels would be reduced substantially from 67 ug/l to 22 ug/l. The increased seasonal average flow would undoubtedly have lowered the chlorophyll-a limits further, both as a result of dilution and significantly reduced residence time that would serve to mitigate algal growth.

We had never thought that the previous implementation of the Qual2E model was particularly well done. But it represented the EPA's estimate of the best science it had at the time. It seems surprising then that it was not used in the development of this permit, particularly since the Fact Sheet accompanying this permit makes reference to the response to comments from the previous permit. Those responses indicated that "We believe that the model in its current form is scientifically sound and that further refinements will have little effect on the model predictions... the model indicates that under the permit conditions chlorophyll-a values and diurnal dissolved oxygen variations will still be at levels of concern relative to eutrophication impacts (RTC, 1999 permit page 5). If the model were sufficient to indicate problems then, why was it not used in this permit development to determine an appropriate level of control?"

Moreover, it should be noted that the in-stream values that the EPA seeks to apply in this permit were known as far back as 1968 – the date of their original publication and certainly 1986 when they were incorporated into the Gold Book. If these are immutable criteria that need to be met under all conditions, as the EPA now claims, why then were they not used in the BRI analyses? The answer of course, is that to adopt them and apply them in the manner now proposed is too simplistic, and does not reflect real world conditions.

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The EPA Ignores Ongoing Efforts by the Massachusetts Department of Environmental Protection to Establish Its Own Nutrient Criteria

As is required by EPA, the Commonwealth of Massachusetts is developing its own criteria for nutrients that will be used for determining compliance with its nutrient criteria. The Commonwealth periodically reports on the progress of these efforts as part of the State and EPA Performance Partnership Agreement (PPA). According to the most recent PPA, this activity is ongoing. Given that recent nutrient TMDL's in the Commonwealth have relied on response criterion (e.g. biomass reduction, water clarity or chlorophyll a levels) rather than specific numeric criterion, it would seem that the EPA should have at least attempted to use these metrics, rather than arbitrarily selecting a numeric criterion.

The Fact Sheet Improperly Characterizes the Massachusetts Water Quality Standards

The Fact Sheet is in error at page 7 when it suggests that the limits on phosphorus are necessary to meet technology based standards of the Massachusetts Surface Water Quality Standards. As presented on page 10, the EPA rejects the use of its interpretation of the Commonwealth's technology based requirement for highest and best practicable treatment, suggesting that such a level of treatment is insufficient because "the receiving water does not provide sufficient dilution to ensure that a limit of 0.2 mg/l would adequately control eutrophication to meet water quality criteria". Thus, the limits presented in this Fact Sheet are not technology based standards under Massachusetts FS page 10, contrary to the claim of page 7 of the Fact Sheet.

Note that the District does not believe that the Commonwealth's requirement for highest and best practicable treatment compels the use of a 0.2 mg/l phosphorus limit. The actual language from the Commonwealth's water quality standards defines it as "...The best practicable waste treatment technology for publicly owned treatment works that is the most appropriate means available on a regional basis for controlling the direct discharge of toxic and non-conventional pollutants to navigable waters....". 314 CMR 4.02 and further, that

"...Any existing point source discharge containing nutrients in concentrations that would cause or contribute to cultural eutrophication, including the excessive growth of aquatic plants or algae, in any surface water shall be provided with the most appropriate treatment as determined by the Department, including, where necessary, highest and best practical treatment (HBPT) for POTWs and BAT for non POTWs, to remove such nutrients to ensure protection of existing and designated uses..." 314 CMR 4.05(5)(c).

It is thus clear that if higher levels of phosphorus discharge would serve to mitigate cultural eutrophication, that those levels are acceptable under Massachusetts' Water Quality Standards.

The District's Proposed Way Forward

The District suggests that the most appropriate way forward is for it to complete construction of the upgraded facilities, that the District should monitor operation of these facilities for a

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period of not less than two full growing seasons that the District, in conjunction with others, should complete and refine its ongoing modeling efforts, which would form the basis of a TMDL by the Commonwealth. Thereafter, the permit should be modified to incorporate the appropriate level of treatment. The current consent agreement could be modified to affect these efforts. The District believes that this approach is substantially in agreement with the proposal submitted by the Commonwealth of Massachusetts at the permit hearing of May 9, 2007.

More importantly, this approach is entirely consistent with the intention of the 1999 permit. As the EPA indicated in their response to comments on that permit

"...It is important to note that [the] permit limits reflect a phased approach and are based on a WLA designed to increase minimum predicted dissolved oxygen levels to 5.0 mg/l. The model indicates that under the permit conditions chlorophyll-a values and diurnal dissolved oxygen variations will still be at levels of concern relative to eutrophication impacts. *If these problems persist*, then more stringent phosphorus limits will need to be implemented..." RTC, 1999 permit, page 5, emphasis supplied.

It thus seems clear that the EPA expected the District to complete the upgrade of the facilities and to assess the efficacy of the improvements before moving forward with new limits.

B. Total Nitrogen Limit of 5 mg/L (May 1 – October 31)

In developing its proposed limit for Total Nitrogen, the EPA did not consider relevant facts, and acted without proper consideration of the circumstances. The EPA has essentially adopted the methodologies and limits proposed by the Rhode Island Department of Environmental Management as part of its *Evaluation of Nitrogen Targets and WWTF Load Reductions for the Providence and Seekonk Rivers*, December 2004 and RIPDES permits issued to implement the results of this evaluation. This document and related documents including the comments and responses to comments submitted on the RIPDES permits for East Providence, The Narragansett Bay Commission - Bucklin Point, the Narragansett Bay Commission - Fields Point and the City of Woonsocket are extensively referenced in the EPA's Fact Sheet.

The EPA's analysis and limits are flawed because:

- EPA's analysis fails to take into account facts presented by RIDEM that clearly justify different limits for the UBWPAD discharge.
- RIDEM's Analysis failed to take into consideration several factors critical to the development of proper nitrogen limits and RIDEM failed to respond to comments raised by various parties with respect to these factors. EPA has also failed to respond to these comments.
- Other Factors not previously raised undermine EPA and RIDEM's analysis.

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- RIDEM's implementation of its permit limits artfully delays attainment of a 5 mg/l discharge in Rhode Island, if such a level will ever be met.

EPA's Analysis Fails To Take Into Account Facts Presented By RIDEM That Clearly Justify Different Limits For The UBWPAD Discharge

EPA and RIDEM have used an 87 % delivery factor as an estimator of the amount of nitrogen discharged at UBWPAD that is delivered to The Seekonk River (EPA Fact Sheet. However, in its response to comments, RIDEM has said the following:

The fate and transport from the MA/RI state line to the mouth of the River expected when WWTF's meet their current permit limits, was evaluated by applying the methods described above to the results of the 1997 WLA model. It was determined that 79% of the MA loading at the state line and 86% of the Woonsocket WWTF load will be delivered to the mouth of the Blackstone River when the required WLA is met. By combining the delivery from each MA WWTF to the state line with that from the state line to the mouth of the river, refined deliver factors were computed for each MA WWTF. It was determined that between 71 and 77% of the individual MA WWTFs nitrogen loading will be delivered to the mouth of the River (72% for UBWPAD) and 86% of the Woonsocket WWTF. In the DEM evaluation, the Woonsocket and UBWPAD WWTFs were both assigned a river delivery factor equal to 87%.

Thus, while RIDEM may have used 87 % as a River delivery Factor, their actual analysis indicates that for the Upper Blackstone, the value is actually 72 %, assuming compliance with the 2001 permit limits for phosphorus. If only 72 % of the discharge makes it to the Seekonk River, then this suggests that an effluent limit of 6.94 mg/l is more appropriate if one accepts RIDEM's analysis – or that the limit on plants discharging directly into the Seekonk and Providence Rivers ought to have an equivalent limit of 3.6 mg/l.

Compounding this error is that fact that RIDEM's analysis to produce the 87 % value used in their analysis is conceptually flawed. According to their supporting materials, the 87 % factor reflects the fact that the amount of nitrogen discharged out the Blackstone River in 1995/1996 (1,552 kg/day) was 87 % of the amount discharged from the Upper Blackstone and Woonsocket treatment plants (1,782 kg/day). But this analysis ignores the baseload associated with the watershed, which RIDEM has separately estimated at 370 kg/day, and the nitrogen discharge of other plants in the Blackstone River Watershed in Massachusetts and Rhode Island. RIDEM makes no separate estimate of the load from these 8 plants. A reasonable estimate suggests that the loadings from these plants could approach an additional 400 kg/d, which would make the delivery factor for the combined Woonsocket and District discharge drop to 61% ($1,552 / (1,782 + 370 + 400)$). If, as indicated by RIDEM that the UBWPAD river delivery factor was actually at 72 % as compared to the combined 86 %, then the UBWPAD river delivery factor would be 51 % ($61 * (72 / 86)$). If the river delivery factor is only 51 %, then the appropriate limits for the UBWPAD discharge to ensure an equivalent 5 mg/l discharge at the mouth of the Blackstone is 9.8 mg/l.