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Please reply to: Concord Office

January 7, 2008

U.S. Environmental Protection Agency
Clerk of the Board, Environmental
Appeal Board
Colorado Building
1341 G Street, N.W., Suite 600
Washington, D.C. 20005

Re: **City of Keene, NPDES Permit NH010079**

Dear Sir or Madam:

Enclosed please find an original and five copies of a Petitioner's Motion for Leave to File Reply Memorandum and Reply Memorandum to Region 1's Memorandum in Opposition to Petition for Review.

Please feel free to contact the undersigned should you have any questions regarding this filing.

Very truly yours,

Andrew W. Serell

AWS/djk
Enclosure

cc: Samir Bukhari, Esquire
Ms. Donna Hanscom
Mr. John Gall

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

In the Matter of:	)	
City of Keene Keene, New Hampshire	)	NPDES Appeal No. 07-18

PETITIONER'S MOTION FOR LEAVE TO FILE REPLY MEMORANDUM

NOW COMES the City of Keene, New Hampshire ("City"), Petitioner in the above-captioned appeal, by and through its attorneys, and moves the Environmental Appeals Board to allow the City to file a reply memorandum to Respondent EPA-Region 1's ("EPA") Memorandum in Opposition to Petition for Review. In furtherance, the City states as follows:

1. By petition dated September 27, 2007, the City has filed an appeal of certain provisions of its final NPDES permit dated August 24, 2007.

2. By pleading dated November 20, 2007, EPA filed a Memorandum in Opposition to Petition for Review.

3. The City seeks leave to file a reply memorandum to EPA's Memorandum in Opposition. That reply memorandum is attached hereto. The rules of this Board contemplate that a reply memorandum may be filed with leave from the Board. In this instance, the Board should allow the City to file a reply memorandum for the following reasons:

a. The City filed its comments to EPA's draft permit, which comments focused primarily on the permit's proposed phosphorus limits, on or about August 23, 2006. The City's comments responded to EPA's analysis of the need for phosphorus limits which consisted

of approximately five and one-half (5 ½) pages in the Fact Sheet accompanying EPA's draft permit.

b. Thereafter, EPA took nearly a full year to issue its response to the City's comments and a final permit. Unlike the cursory discussion in the Fact Sheet, EPA's response to comments consisted of 64 pages, plus attachments.

c. The City was afforded a mere thirty (30) days to review and analyze EPA's proposed permit and response to comments and prepare its Petition for Review to the Environmental Appeals Board. Contrast this with the twelve (12) month period that EPA took in responding to the City's comments on the proposed phosphorus limit.

d. EPA was then afforded an additional sixty (60) days in which to respond to the City's Petition for Review, which resulted in EPA filing a 58-page Memorandum in Opposition. The Memorandum in Opposition addresses numerous issues that were not addressed in the Fact Sheet concerning the proposed phosphorus limit.

4. In light of the foregoing, it is only fair that the City should be afforded an opportunity to provide a brief rebuttal to EPA's Memorandum in Opposition.

5. The City is filing herewith a focused 19-page reply to EPA's Memorandum in Opposition which does not rehash the arguments previously raised by the City, but rather responds directly to arguments raised for the first time by the Agency in its Memorandum in Opposition.

6. This Board has discretion to allow the filing of a reply memorandum and the City submits that this Board should exercise its discretion to do so.

7. Allowing the filing of the memorandum will not prejudice any party.

8. EPA has advised that it intends to object to the relief requested in this motion.

THEREFORE, Petitioner City of Keene, New Hampshire respectfully requests that the Environmental Appeals Board:

A. Allow the City to file a reply memorandum to EPA's Memorandum in Opposition, which reply memorandum is attached hereto;

B. Uphold the City's appeal of the contested phosphorus limitations; and

C. Grant such other relief as may be just and proper.

Respectfully submitted,

CITY OF KEENE

By Its Attorneys,

RATH, YOUNG AND PIGNATELLI, P.C.
One Capital Plaza
Concord, New Hampshire 03302-1500
(603) 226-2600

1/7/08
Date

By: _____
Andrew W. Serell, Esquire

CERTIFICATE OF SERVICE

I, Andrew W. Serell, hereby certify that on this 7th day of January, 2008 a true and correct copy of the foregoing document was served via first class mail, postage paid to Samir Bukhari, Esquire.

By: _____
Andrew W. Serell, Esquire

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

In the Matter of:	)	
City of Keene Keene, New Hampshire	)	NPDES Appeal No. 07-18 NPDES Permit NH100790

PETITIONER'S REPLY MEMORANDUM TO REGION 1'S
MEMORANDUM IN OPPOSITION TO PETITION FOR REVIEW

I. EPA'S ARGUMENT THAT THE ASHUELOT RIVER FAILS TO COMPLY WITH STATE WATER QUALITY STANDARDS IS MISPLACED.

Among the arguments that EPA makes in support of its position that the Ashuelot River fails to meet state water quality standards due to the presence of phosphorus in the Keene wastewater treatment plant ("WWTP") discharge are the following:

A. That the River suffers from cultural eutrophication as evidenced by high concentrations of nutrients, excessive algal growth and failure to meet the state water quality standards for dissolved oxygen. (Respondent Regions I's Memorandum in Opposition to Petition to Review [hereinafter "EAB Pleading"], pages 20-26.)

B. That periphyton, macrophytes and algal growth caused by the phosphorus in the Keene WWTP discharge are unsightly, degrade the aesthetic quality of the river, create objectionable odors and oxygen demand when they die and alter the benthic environment by creating excessive growths of periphyton and other substances that can settle to the bottom. (EAB Pleading, pages 26-28.)

The Region's analysis is in error for the following reasons:

A. EPA's Use of the Concentration of Phosphorus as Evidence of Cultural Eutrophication is Improper.

Under New Hampshire Regulations, cultural eutrophication is defined as follows:

Env-Ws 1702.15 "Cultural eutrophication" means the human-induced addition of wastes containing nutrients to surface waters which results in excessive plant growth and/or a decrease in dissolved oxygen.

The definition does not include any reference to the concentration of nutrients in the receiving water, nor does it make any reference to any EPA criteria or guidance documents. This reflects the fact that eutrophication occurs when there is a union of suitable conditions including habitat, temperature, food supply (nutrients) and light. As EPA has stated, "[L]arge amounts of phytoplankton/periphyton biomass may not be observed even in highly enriched waters depending on whether optimal conditions exist for growth." (EAB Pleading, page 20.)

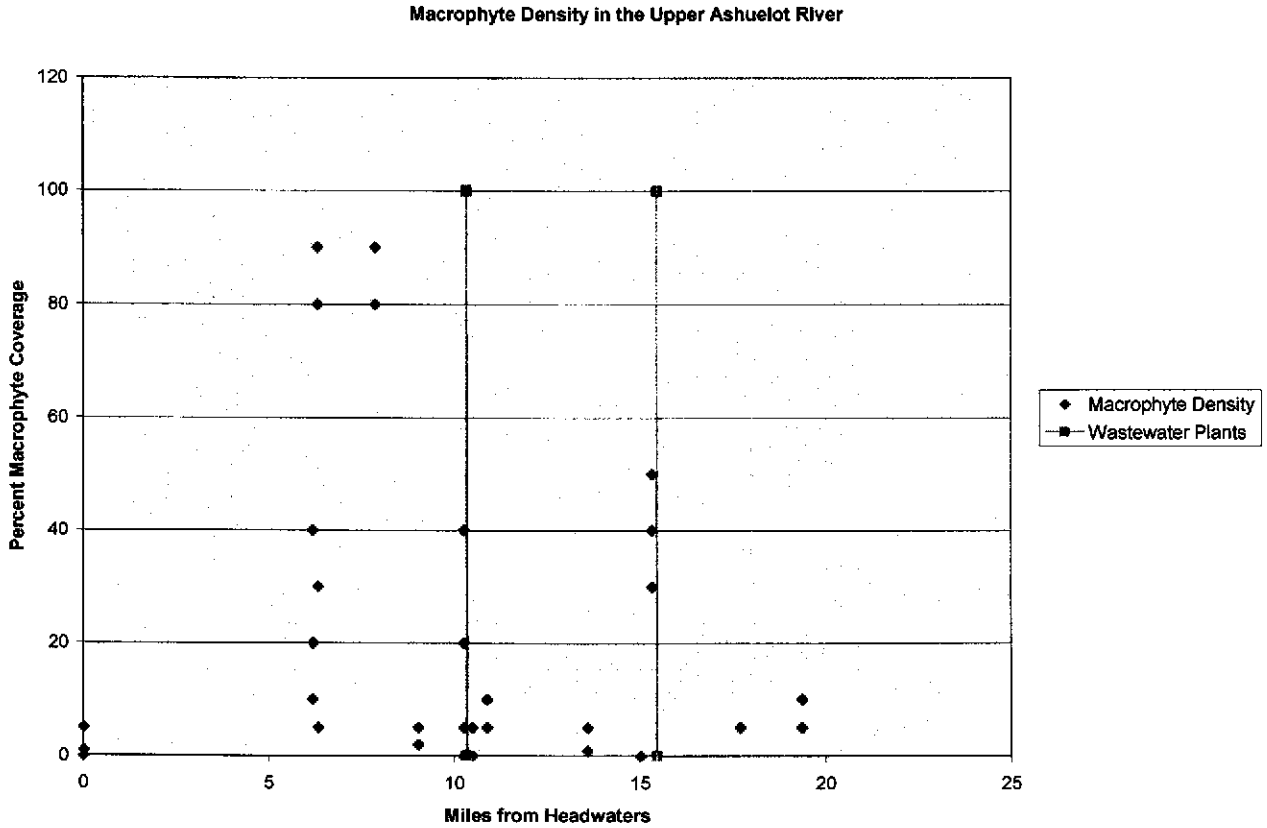
It is thus improper for the Agency to use concentration as a metric for determining whether the New Hampshire definition of cultural eutrophication has been met, because (1) that definition does not include the concentration of nutrients as a basis for determining cultural eutrophication, and (2) other factors could serve to mitigate the potential impacts of high nutrient concentrations on excessive plant growth and dissolved oxygen. In New Hampshire, the only way to establish cultural eutrophication is through the existence of either (1) excessive plant growth or (2) a decrease in dissolved oxygen, the two express regulatory criteria.

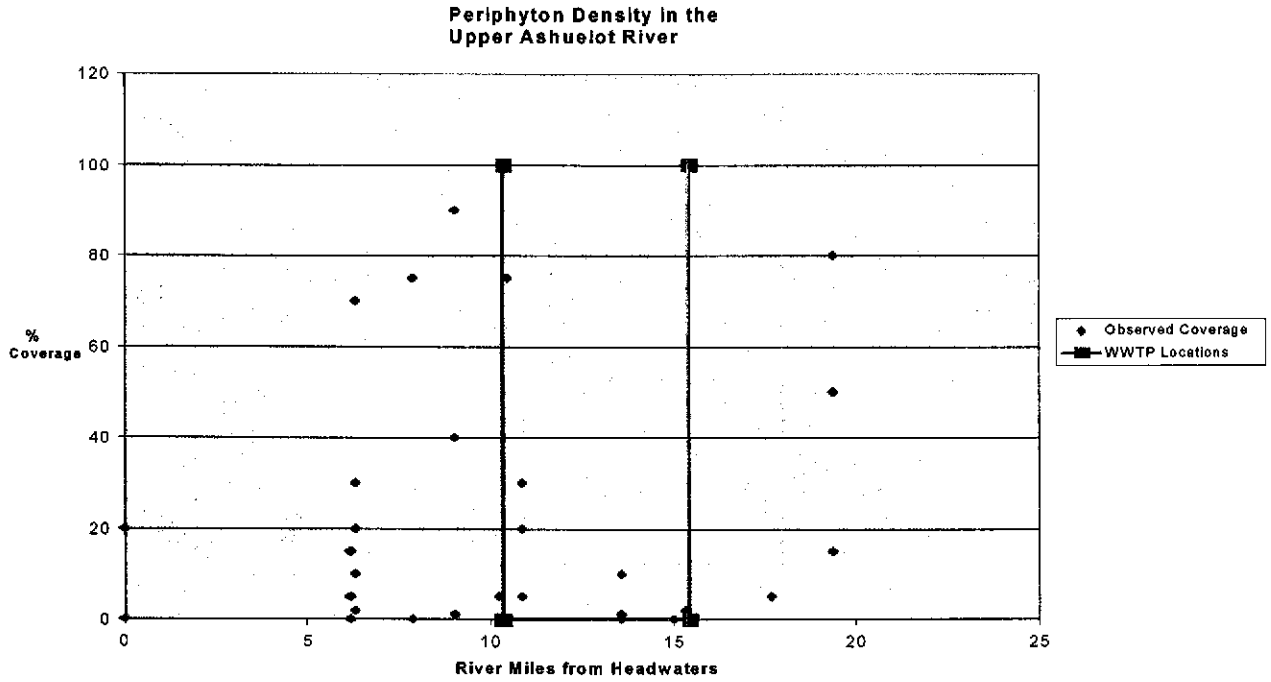
B. Macrophyte and Periphyton Coverage Data Contravenes the Agency's Position.

In its response to comments, the Agency has cited various information sources to support its position that the Ashuelot River suffers from the existence of excessive algal growth. (See EPA's Response to Comments, [hereinafter "RTC"], page 27; and EAB Pleading, pages 22 and 25.) This information includes observed chlorophyll a data and macrophytes/periphyton coverage data from Total Maximum Daily Load (TMDL) studies undertaken by the State, as well as data from studies taken to document the existence of the dwarf wedge mussel in the Ashuelot River. In interpreting and presenting the data, the Agency has consolidated it into broad ranges (0 to 100 % cover), usually with respect to the relationship between the data and the

wastewater discharges of Keene and West Swanzey. Presented this way, is difficult to determine if there is any underlying trend in the information

The following charts show the extent of macrophyte and periphyton coverage and chlorophyll a concentrations as observed by the New Hampshire DES during their river surveys from the summer of 2001 and 2002. These data are taken directly from Appendix I to the "Written Correspondence by John J. Gall, Jr., Camp, Dresser and McKee on behalf of the City of Keene," dated August 24, 2006 [hereinafter ("CDM Comments"], identified in the Administrative Record Index ("ARI") filed by the Agency as Document C.2. In these charts, the left side is upstream, and the right is downstream. The vertical bars represent the location of the wastewater plants. The Keene discharge is located at approximately River Mile 10.3 and the West Swanzey plant at River Mile 15.45.



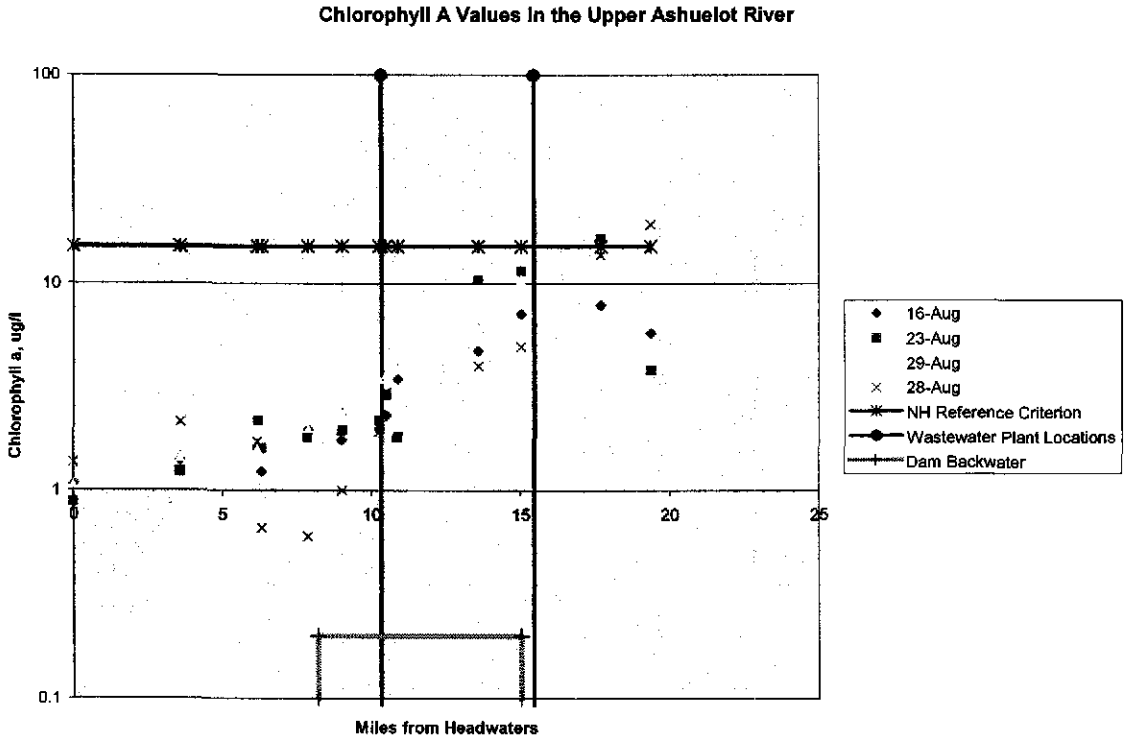


These charts show that the agency was not incorrect in its presentation of the macrophyte and periphyton data downstream of the Keene discharge. But they also show that the macrophytes and periphyton exist both above and far below the Keene discharge, and that for the most part the areas above the discharge experience greater coverage of macrophytes and periphyton than do the downstream sections. If, as the Agency suggests, the existence of macrophytes and periphyton was proof of cultural eutrophication attributable to the phosphorus in the Keene WWTP discharge, then one would expect more significant macrophyte and periphyton coverage immediately below the Keene WWTP discharge. This clearly is not the case.[1]

[1] The Agency also selectively uses elements of this data to buttress its position. For example, at page 38 of the RTC, the Agency observes that periphyton coverage was 75 % near the Keene outfall, indicating that this, rather than the chlorophyll a data was a more accurate characterization of the impact of the Keene discharge. What the Agency failed to discuss is the fact that far above the Keene discharge, periphyton coverage is often 100 %, thereby directly refuting the Agency's conclusion regarding the influence of the Keene discharge.

C. Chlorophyll A Data Does Not Support the Agency's Position.

The Agency also cites chlorophyll a data as the basis for declaring that cultural eutrophication exists, comparing the observed data to selected references from the literature, and dismissing more recent data presented by the City in its response to comments. The figure below shows the chlorophyll a concentration data from the State TMDL sampling in 2001 and 2002, the data relied upon by EPA. This data may be found in Appendix I of the CDM Comments, Document C.2. in the ARI. The concentration values are plotted on a logarithmic scale in order to present all the data points. As before, the figure goes downstream from left to right, and the location of the treatment plant discharges are indicated by vertical bars. The chart also shows the long pool created by the dam in West Swanzey, which creates artificial habitat favorable to the growth of algae, and the 15 ug/l reference value that the State of New Hampshire uses to assess the potential existence of eutrophic conditions in the development of their impaired waters list. This is the value that EPA should use in assessing the existence of eutrophication, as this value reflects New Hampshire's interpretation of its Water Quality Standard. See Petition for Review at pages 5-6.



The above chart shows that the chlorophyll concentrations increase downstream of the Keene discharge, presumably in response to the phosphorus from above Keene, the Keene WWTP phosphorus and the favorable habitat offered by the impoundment created by the dam in West Swanzey. It is important to note that if one takes out the extreme value observed on the 29th of August, these samples averaged 4.3 ug/l, well below the New Hampshire 15 ug/l reference criterion. The flow during this period was described by EPA as a critical low flow condition. (See RTC, page 38.)

Data presented by the City showing conditions during the 2002 through 2005 time period showed that the levels of chlorophyll a were substantially below the 15 ug/l standard, averaging 3 ug/l at a station just downstream of the Keene WWTP discharge, and 3 and 6 ug/l at stations further downstream. This data was included as Appendix F to CDM Comments, identified as document C.2. in the ARI, and are graphically depicted in Figure 1 in that document. EPA

dismissed this data because it "was not necessarily collected under critical low flow." (RTC, page 38.) EPA claims that "the standard" must be met at critical low flow conditions, citing Env-Ws1705.02(a) (EAB pleading, page 9). The Agency is mistaken.

Env-Ws1705.02(a) states:

Low Flow Conditions.

(a) The flow used to calculate permit limits shall be as specified in (b) through (d) below.

(b) For rivers and streams, the long-term harmonic mean flow, which is daily flow measurements divided by the sum of the reciprocals of the daily flows, shall be used to develop permit limits for all human health criteria for carcinogens.

(c) For tidal waters, the low flow condition shall be equivalent to the conditions that result in a dilution that is exceeded 99% of the time.

(d) For rivers and streams, the 7Q10 flow shall be used to apply aquatic life criteria and human health criteria for non-carcinogens.

EPA ignores that there is no "standard" for chlorophyll a or phosphorus. Although the State has published some 17 pages of aquatic life criteria covering over 100 pollutants, there are no aquatic life criteria for chlorophyll a, or for phosphorus for that matter. It is, thus, inappropriate for the Agency to assume that the non-existent criterion need be met at "critical, low flow conditions."

This is particularly true because the Agency's own guidance recommends against applying nutrient criteria at extreme flow conditions, and because this EPA region has recently approved a Total Maximum Daily Load (TMDL) based on average summer conditions. The Agency's guidance entitled "Information Supporting The Development Of State And Tribal Nutrient Criteria For Rivers And Streams In Nutrient Ecoregion VIII",[2] identified as document F.2.c. in the Administrative Record Index, provides as follows:

[2] Nutrient Ecoregion VIII includes the Ashuelot River.

EPA encourages States and Tribes to:

> Identify appropriate periods of duration (how long) and frequency (how often) of occurrence in addition to magnitude (how much). EPA does not recommend identifying nutrient concentrations that must be met at all times; rather a seasonal or annual averaging period (e.g., based on weekly or biweekly measurements) is considered appropriate. However, these central tendency measures should apply each season or each year, except under the most extraordinary conditions (e.g., a 100-year flood). (Page 8)

Thus, the Agency's own guidance contradicts its stated position on the flow regimes at which chlorophyll a data are relevant.

In addition, EPA Region I has recently approved the Nutrient (Phosphorus) TMDL for the Lower Charles River that was based on meeting seasonal average chlorophyll a values of 10 ug/l, in order to prevent chlorophyll a from reaching more than 20.5 ug/l more than 10 % of the time. See, page 6 of "EPA New England's TMDL Review" of the Lower Charles River Basin Nutrient (phosphorus) TMDL, attached to letter of Stephen S. Perkins, Director, Office of Ecosystem Protection, EPA Region 1 to Laurie Burt, Commissioner, Massachusetts Department of Environmental Protections, included as Attachment A.[3] This limit was also not developed using 7Q10 flow or any other "critical low flow."

It is thus not clear that if and when New Hampshire adopts numeric standards for phosphorus or chlorophyll a, it will require that such standards be met at critical low flow conditions. Presumably these are issues that the State will address as it develops it own nutrient criteria. In any event, there is no regulatory or scientific basis for rejecting the 2002-05 data on the grounds that it was not collected during low flow periods.

In summary, both the 2001-02 TMDL chlorophyll a data relied upon by EPA, and the 2002-05 chlorophyll a data submitted by the City both undermine, rather than support, the

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[3] The City submits that this should be included in the record due to the highly relevant nature of the material, as well as the fact that the report itself was not "reasonably available" during the public comment period, in that it was completed after the close of the public comment period. See 40 C.F.R. § 124.12.

Agency's position that the relevant segments of the Ashuelot River are subject to cultural eutrophication.

D. Dissolved Oxygen Conditions Do Not Support the Agency's Claims.

The Agency has argued that dissolved oxygen below the state's standard of 75 % is indicative of eutrophication attributable to the phosphorus in Keene's discharge. (EAB Pleading at pages 25, 26 and 27). These arguments (and EPA's response to comments) fail to take into account the arguments raised in the City's comments on the draft permit concerning the relationship between DO conditions in the River above the Keene discharge:

> EPA's analysis of the system ignores the most significant data from the TMDL that shows that sampling points upstream of the Keene discharge clearly violate State Water Quality Standards. For example, data collected at station 19-ASH, adjacent to Tenant Swamp and upstream of the WWTF discharge, shows dissolved oxygen values below the 5 mg/l state standard, and saturations below the state's 75% requirement. The influence of these observations on downstream DO has not been evaluated by EPA. (See, CDM Comments at Section V, document C.2. in the ARI).

Attached hereto as Attachment B is information from the 2001/2002 TMDL showing the dissolved oxygen concentration and % saturation.[4] These show that during the study period of August 15 to 17, 2001 the DO at station 19a-ASH, which is above the Keene discharge, was well below the NH instantaneous standard of 5 mg/l and the daily average 75 % saturation. This condition appears to have persisted for at least 9 days until the 24th of August, when the instream values were still below the 5 mg/l and 75 % saturation values. By the 28th, the DO at this location appears to have returned to more normal conditions. There is no information available to indicate how long before August 15th these conditions existed.

This information suggests that DO conditions below the Keene discharge reflect the depressed DO conditions that existed above the Keene discharge during the TMDL studies, and

[4] This data is included in the Administrative Record as Appendix I to the CDM Comments, document C.2. in the ARI, but is reproduced in Attachment B for ease of reference.

not the influence of the Keene WWTP discharge as suggested by EPA. In the latter part of the 2001 sampling, August 28 through August 30, the DO conditions below the Keene discharge were worse than those at 19a-ASH. This is logically the effect of a slug of low DO water from upstream traveling to those downstream locations. Data for 2002 indicate that low DO conditions were again observed at 19a-ASH, upstream of the Keene discharge, while the values below the Keene discharge were within standards, again demonstrating the significance of DO conditions above the Keene discharge.

The City also presented information from the volunteer monitoring program that supports its contention that the City's discharge has had little effect on the oxygen dynamics of the river. The City noted that supersaturation of dissolved oxygen (EPA's original rationale for declaring the River enriched with phosphorus) occurred above as well as below the City's discharge, and that the frequency of supersaturation was very infrequent. See, CDM Comments at Section V, document C.2. in the ARI. At pages 10-11 of its Response to Comments, EPA included the data in a Table, and observed that:

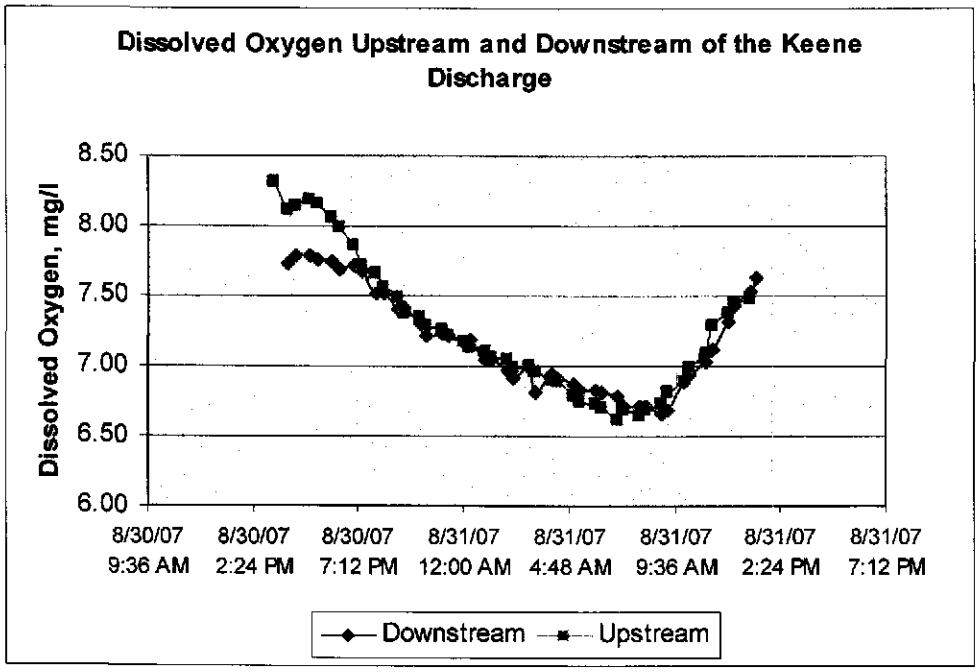
> As can be seen in the table, the VRAP sampling done in 2001 and 2002 was done at the closest to critical low flow conditions and shows the lowest dissolved oxygen concentration and saturation values downstream of Keene, including a concentration violation of 4.99 mg/l at Ash-16 on August 17, 2002. (RTC, page 11.)

Remarkably, the Agency failed to note that the data taken from the upstream sample location during the same time frame was far lower, with an observed value of 3.9 mg/l. See VRAP sampling data included as Appendix F to the CDM Comments, document C.2. into the ARI, 3rd page of 2002 Ashuelot River Raw Data. This paints a picture entirely consistent with the 2001 TMDL data: low DO values upstream influence the DO below Keene, regardless of the output of the Keene WWTP.

The City has also taken supplemental DO data for this past summer, when the flow in the River approached 7Q10 flows and was consistent with the flows observed in the 2001/2002 TMDL sampling. This data is attached hereto at Attachment C.[5] According to the data contained in the TMDL data report, flows in 2001/2002 ranged form 25 to 45 cfs at the West Swanzey gage. In 2007, the flow on 8/30/2007 was 32 cfs, approximately in the midpoint of the 2001/2002 flows. DO data from August 30, 2007 for points above and below the Keene discharge are shown in the following figure. These data indicate that the DO levels both upstream and downstream of the Keene discharge are roughly consistent and the River is in conformance with the New Hampshire DO standards both above and below the Keene discharge. These data indicate that the DO deficiencies observed in 2001 and 2002 as part of the TMDL and VRAP studies were the result of low DO above the Keene discharge, and not attributable to the Keene discharge.[6]

[5] This data was obtained by City personnel using an in-situ DO meter. The City submits that this data should be included in the record due to the highly relevant nature of this data, as well as the fact that this 2007 data was not "reasonably available" during the public comment period. See 40 C.F.R. § 124.13.

[6] Data for August 30-31 was selected because it is the period during which river flows were in the range of the 2001-02 data cited by EPA, at a time when one would expect DO impacts to be most significant.



E. The Agency's Attribution of Impaired Aesthetic and Benthic Conditions and Odors In the Ashuelot to the City's Discharge is Misleading.

The EPA argues that algal growths caused by the phosphorus in the Keene discharge are unsightly, degrade the aesthetic quality of the river, create objectionable odors and oxygen demand when they die and alter the benthic environment by creating excessive growths of periphyton and other substances that can settle to the bottom. (EAB Pleading, 26-28). The support for the Agency's argument are field notes for sites immediately downstream of the Keene discharge from the TMDL studies, and studies on the Dwarf Wedge Mussel.

The Agency's analysis is both misleading and biased for several reasons:

First, as clearly indicated in the preceding analysis of the TMDL periphyton and macrophyte data, there are significant periphyton and macrophytes above the Keene WWTP discharge, and thus it is incorrect to assert that the Keene discharge is the source of these impairments.

Second, the Agency failed to incorporate all the information from the Dwarf Wedge Mussel studies into their analysis. For example, the description of Site 1, which is at the junction of the Branch River and the Ashuelot, above the Keene discharge indicates that:

> There seemed to be a large quantity of very good mussel habitat at this site...Sparganium sp was common in some locations, although the dense forest canopy shaded the stream in places and inhibited macrophyte growth...Tires and other trash littered the stream bottom and stream banks and there was some orange colored flocculent evident in pools and also coming out of the Branch. There was also a skim of hydrocarbons in some pools. Water Quality is of high concern here... We believe that water quality is the major reason for the virtual absence of mussels at site 1 and the Branch maybe the primary culprit. The Branch smelled very foul and there was a lot of fungi/bacteria/metals in the water. (See study identified as Document J.5. in the Administrative Record Index, page 1 of the Appendix (unnumbered)).

In addition, several other studies have pointed out that urban development, as well as natural and manmade modifications to the River itself, have resulted in the same impairments that the EPA attempts to ascribe to the phosphorus in the Keene discharge. The Ashuelot River Corridor Management Plan (Document J.4. in the Administrative Record Index) identifies several important characteristics of the River that influence the formation of the degradation cited by EPA. In describing the section of the River directly above the Keene discharge from the Stone Arch Bridge in Keene down to the confluence of the Branch River the corridor management plans states:

> A new instream habitat appears in this segment also: flat water. Upstream from the Stone Arch Bridge in Keene, River habitats are mostly cold fast moving water riffles over gravel and stones and rapids coursing through boulders with interspersed pools. But here the nearly flat valley floor imposes a very low gradient and the river begins to meander, flow rates slow, bottom sediments become finer and deeper (sand, silt, and organic debris - "mucky"). Attendant changes in water characteristics include increased temperature, lowered dissolved oxygen and increased turbidity. There is a distinct qualitative change in the character of the Ashuelot River at the head of this segment which typifies much of the remainder of the River. The River is also impounded in Keene by the former Colony Mill Pond dam (the pond was reduced to the river channel by filling for development). The impoundment extends about three miles upstream from West St. River habitats include deeper water, lower oxygen content, and much more emergent vegetation. Red fin pickerel, creek chub, and sun fish are abundant here with pickerel weed beds,

> emergent grasses, and silky dogwood at the river's edge. The slower water coincides with increased sediment load entering the river from Keene's storm water runoff - contributing to higher turbidity and the accumulation of contaminants in River bottom sediments. (See page 10.)

In discussing the section of the River from the Branch River down to the Mill Street Bridge in Winchester (which includes the Keene discharge), the Plan also identifies the impact of the Surry Mountain flood control structure thusly:

> There is another condition arising in the northerly rural segment. The River channel is filling with sediment. The low gradient in this segment (i.e. the River is flowing through relatively flat land so the water flows languidly and does not have the power to move material), the high sediment load from upstream storm water runoff, and attenuation of annual runoff peaks by Surry Dam flood control management (i.e. the River does not flood as high in the spring or during other big runoff events, rather, the runoff from upstream is stored in the reservoir and released slowly and not allowed to spill onto the floodplain) is filling the River channel with sediment. Without the flood control structures at Surry Mountain and Otter Brook, the River would have periods of flooding, especially spring snow melt, when the river water would scour out sediment deposited in the River bed since the last flood and move it downstream or deposit it on the floodplain areas. That has not been happening since those two flood control dams were installed. Sediment washed into the River upstream settles to the bottom in this slow moving water and is not removed. (See page 15.)

It is thus clear that manmade conditions have altered the natural dynamics of the river such that sedimentation and the development of low dissolved oxygen conditions occur <u>above</u> the Keene discharge and cannot be ascribed to the discharge itself based on the information in the record.

Third, studies conducted by the New Hampshire DES for the removal of the Homestead Dam in West Swanzey have indicated that Homestead Dam causes increased sedimentation in the impoundment above the Dam, and as shown by the chlorophyll a plots above, provides habitat for algal growth. Removal of the dam, now anticipated for 2008, is expected to reduce detention times in the impoundment significantly, thereby decreasing the opportunity for algal growth. The removal will also change the hydraulics of the river such that it will become

somewhat steeper, velocities will increase and natural riffle sections that had been flooded by the backwater of the dam will emerge, reducing the potential for sedimentation in the pool above the dam. (See Document J.2.in the Administrative Record Index.)

From the information contained in the administrative record, it is clear that any claimed degradation of the quality of the Ashuelot River exists above the Keene discharge, and is attributable to factors other than the City's discharge.

In summary, EPA's analysis of the conditions of the Ashuelot River is neither accurate nor persuasive. The Agency attributes DO deficiencies, excessive algal growth, odiferous conditions and the potential for benthic deposits to the Keene WWTP discharge, while the information in the record clearly shows that all of these effects exist above the Keene WWTP discharge. The record evidence discussed herein presents reasonable and compelling reasons why the conditions reported by the Agency are attributable to factors other than the Keene WWTP discharge. It is thus both inappropriate for the Agency to argue, and impossible for the Agency to establish, that the limit provided in this permit is necessary to attain water quality standards in the Ashuelot River.

II. EPA'S EFFLUENT LIMIT IS IMPROPERLY DERIVED

Assuming, *arguendo*, that the Agency could establish that the Ashuelot River failed to meet water quality standards due to the Keene discharge, the Agency still has failed to adequately support its proposed limit of 0.2 mg/l. EPA argues that the 0.2 mg/l effluent limit proposed in the current permit is necessary to achieve the State's Water Quality Standards, as it can be expected to control excessive aquatic plant growth. (EAB pleading at page 29 and 30) The Agency adopts a recommended value of 0.1 mg/l in the receiving water to achieve this end, relying on reference values contained in the 1986 Gold Book. The 0.1 mg/l recommended value

is matched to the dilution of the Keene discharge under critical low flow conditions to arrive at a 0.2 mg/l limit.

The claim that a 0.1 mg/l phosphorus concentration at 7 Q10 Flow at the point of discharge is necessary to prevent excessive aquatic plant growth is unfounded. The rationale is insufficient for the following reasons:

A. As described above, there is no basis for the Agency to assume that the 0.1 mg/l recommendation, even if it is a correct recommendation, needs to be met at the extreme low flows represented by 7Q10. The proper flow at which the standard needs to be met will be determined by the New Hampshire nutrient strategy, which is yet to be developed. If, for example, the proper metric was a summer average condition, as the Agency approved for the Lower Charles River, the allowable concentration would be much higher.

B. As the Agency acknowledges, concentration alone is insufficient to cause effects in the receiving water. As observed by EPA "large amounts of phytoplankton/periphyton biomass may not be observed even in highly enriched waters depending on whether optimal conditions exist for growth." (EAB pleading , page 20.)

C. More fundamentally, the 1986 Gold Book recommended value provides no substantive basis for the assertion that a 0.1 mg/l phosphorus concentration is necessary to prevent excessive aquatic plant growth in the Ashuelot River. The 1986 Gold Book specifically disclaims the existence of any criteria for phosphorus to control nuisance aquatic plants. Rather, it suggests that various approaches should be considered to develop limits. See Phosphate Phosphorus, Quality Criteria for Water 1986, EPA 440/5-86-001, identified as Item F.2.b. in the ARI.

EPA apparently relies on the following statement in the Gold Book to support its selected "target" instream concentration of 0.1 mg/l:

> ... a desired goal for the prevention of plant nuisances in streams or other flowing waters not discharging directly to lakes or impoundments is 100 ug/l (0.1 mg/l) total P (Mackenthun, 1973). See id.

The Gold Book recommendation itself provides no basis for concluding under what conditions the 100 ug/l recommendation should be applied, what types of plants are prevented, or what other factors need to be taken into consideration when applying this recommendation. More fundamentally, when one examines the Gold Book reference carefully, it is clear that the "recommended" instream value is not applicable to rivers such as the Ashuelot.

The Gold Book cites to a book by Kenneth M. Mackenthun entitled, *Toward a Cleaner Aquatic Environment* (Mackenthun, K.M., 1973, U.S. Government Printing Office, Washington, D.C.) which states:

> 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 water enters a lake, reservoir or other standing water body.

A copy of the relevant portion of that book is attached hereto as Attachment D.[7] The book provides general guidance on the assessment of pollution problems. The book, however, proves no guidance on the application or derivation of the 100 ug/l recommendation. Rather, the recommendation in the 1973 Mackenthun book is a verbatim quote from a 1968 article by the same author, Mackenthun, K.M., *The Phosphorus Problem*, J. Am. Waterworks Assn., 60 (a), 1047-1054 (1968).

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[7] The two Mackenthun publications should be regarded as part of the administrative record because (1) they are cited in the Gold Book which is part of the administrative record and (2) they are articles by an EPA employee (Mr. Mackenthun is identified as the Director, the Division of Applied Technology of the Environmental Protection Agency) and, as such, constitute "[m]aterial readily available at the issuing Regional Office or published materials which are generally available" under 40 C.F.R. § 124.18(e).

The 1968 article, *The Phosphorus Problem,* was published in the Journal of the American Waterworks Association, and is attached hereto as Attachment E. This article represents an attempt to deal with phosphorus enrichment of lakes and reservoirs used for water supply, where nuisance growths of algae lead to taste and odors, can cause water treatment filter clogging problems and can create strong citizen disapproval.

With respect to phosphorus, lakes and reservoirs are materially different from rivers and streams, in that lakes usually represent a final repository for nutrients originating in the watershed: except in limited cases, what comes into the lake stays in the lake and can be continually recycled as part of the ecosystem. In most lakes, the optimum conditions that give rise to algal blooms are always present. Rivers and streams, on the other hand, may, or may not present optimum conditions for algal growth, as the Agency has acknowledged, and the nutrients can be continually be displaced downstream where they may, or may not, encounter conditions suitable for growth.

As a result, even in this article, there is nothing that would lead one to the conclusion that 100 ug/l is an appropriate instream concentration in the Ashuelot that would lead to prevention of nuisance aquatic growth. The Ashuelot is not a tributary to a lake or reservoir used for drinking water supply, and the State is well on its way to eliminating those downstream impoundments crated by dams that could give rise to optimum growth conditions. Such a limit may be appropriate for discharges to tributaries to lakes and reservoirs used for water supply, but that does not include the Ashuelot River.

Taken collectively, these comments indicate that the Ashuelot River is a far more complicated system than is assumed in EPA's simplistic dilution-driven limit development. The proper approach to integrating all of these effects is to develop a TMDL that properly accounts

for all inputs and processes, as well as the current and future configuration of the river, and establishes proper measures of water quality compliance. Only then could the City be reasonably assured that the $16 million it would need to spend to meet the limit in the current permit is money well spent.

Respectfully submitted,

CITY OF KEENE

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1/7/08
Date

By: _____
Andrew W. Serell, Esquire

CERTIFICATE OF SERVICE

I, Andrew W. Serell, hereby certify that on this 7th day of January, 2008 a true and correct copy of the foregoing document was served via first class mail, postage paid to Samir Bukhari, Esquire.

By: _____
Andrew W. Serell, Esquire