

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

In the Matter of:)
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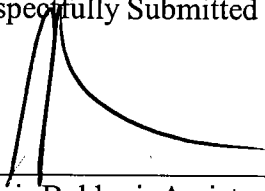
City of Keene)
Keene, New Hampshire)
)
_____)

NPDES Appeal No. 07-18
NPDES Permit NH0100790

**RESPONDENT REGION 1'S MEMORANDUM IN OPPOSITION
TO PETITION FOR REVIEW**

Respectfully Submitted by EPA-Region 1,

Dated: November 20, 2007



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40 C.F.R. § 131.12
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40 C.F.R. Part 133
40 C.F.R. Part 136

Federal Register Notices

44 F.R. 32,887 (June 7, 1979)
54 F.R. 23,868 (June 2, 1989)

EXHIBIT LIST

<u>Ex. No.</u>	<u>AR No.</u>	<u>Title</u>
1	A.1	National Pollutant Discharge Elimination System Permit NH0100790 Authorizing Discharges from the City of Keene Wastewater Treatment Facility Issued by EPA-Region 1 on August 24, 2007.
2	G.1	State of New Hampshire Revised Statutes Annotated, Chapter 485-A, Water Pollution and Waste Disposal (in relevant part).
3	G.2	State of New Hampshire Surface Water Quality Regulations, Chapter Env-Ws 1700 <i>et seq.</i>
4	G.3	Legislative Classifications of Surface Waters in New Hampshire (NHDES, October 2003).
5	G.4	State of New Hampshire Section 305(b) and 303(d) Surface Water Quality Report (NHDES, 2004).
6	J.1	Ashuelot River TMDL Study Area and Sampling Extent Map; Ashuelot River TMDL Sampling Stations.
7	J.2	The Ashuelot River: A Report to the General Court (NHDES 1993)
8	J.3	Map and Related Table Showing Location of Dams on the Ashuelot River.
9	A.5	City of Keene Wastewater Treatment Facility Draft Permit Fact Sheet.
10	K.1	Town of Swanzey Wastewater Treatment Plant Draft Permit Fact Sheet.
11	F.2.f	EPA Nutrient Criteria Technical Guidance Manual: Lakes and Reservoirs (April 2000).
12	F.2.d	EPA Nutrient Criteria Technical Guidance Manual: Rivers and Streams (July 2000).
13	B.1	Response to Comments.
14	F.2.b	EPA Quality Criteria for Water (1986) ("Gold Book").
15	E.24	Assabet River and Total Maximum Daily Load for Total Phosphorus (MassDEP, 2004).
16	F.2.e	EPA Ambient Water Quality Criteria Recommendations, Rivers and Streams in Ecoregion VIII (December 2001).

- 17 F.2.g Development and Adoption of Nutrient Criteria into Water Quality Standards, Geoffrey Grubbs, Director, EPA Office of Science and Technology (November 14, 2001).
- 18 J.12 NHDES Total Phosphorus Loading Analysis for the Ashuelot River TMDL.
- 19 I.10 Photos Showing Conditions in the Ashuelot River Upstream and Downstream of the Denman Thompson Bridge in West Swanzey and Accompanying Explanatory Email from Barbara Skuly, Ashuelot River Local Advisory Committee, to Jeanne Voorhees, EPA, dated September 19, 2006.
- 20 J.5 Freshwater Mussels of the Ashuelot River: Keene to Hinsdale (Nedeau, E. and S. Werle, Biodiversity, 2003, prepared for the United States Fish and Wildlife Service, Concord, New Hampshire).
- 21 D.1 Transcript of Public Hearing, Keene, New Hampshire, July 27, 2006.
- 22 A.3 New Hampshire CWA § 401 Water Quality Certification for NPDES Permit NH0100790.
- 23 G.7 New Hampshire Department of Environmental Services Plan for Adoption of Nutrient Water Quality Criteria (draft).
- 24 I.12 Email from Gregg Comstock, NHDES, to Jeanne Voorhees, EPA-Region 1, dated October 13, 2006.
- 25 G.5 New Hampshire 2006 Section 305(b) and 303(d) Consolidated Assessment and Listing Methodology (NHDES, 2005).
- 26 G.6 NHDES Description of River Water Quality Parameters.
- 27 J.15 Graphical Depiction of Continuous Dissolved Oxygen Monitoring Data Collected for the Ashuelot River TMDL (August 15-August 17, 2001) and Underlying Raw Data.

**RESPONDENT REGION 1'S MEMORANDUM IN OPPOSITION
TO PETITION FOR REVIEW**

Pursuant to 40 C.F.R. § 124.19, the New England region of the U.S. Environmental Protection Agency ("Region") respectfully submits to the Environmental Appeals Board ("EAB" or "Board") this response to the Petition for Review of Contested Permit Conditions filed by the City of Keene, New Hampshire ("City" or "Petitioner") in the above-captioned matter.

The Region reissued National Pollutant Discharge Elimination System Permit NH0100790 ("Permit") to the City of Keene Wastewater Treatment Facility ("Keene WWTF," "Keene WWTP" or "facility") on August 24, 2007. Ex. 1 (AR A.1). The Permit authorizes the discharge of treated wastewater effluent to the Ashuelot River. Petitioner seeks review of (i) the Permit's total recoverable lead, copper and zinc limits, and (ii) the Permit's monthly average total phosphorus effluent limits of 0.2 mg/l and 1.0 mg/l, applied seasonally from April 1 through October 31 (growing season) and from November 1 through March 31 (non-growing season), respectively.

Pursuant to 40 C.F.R. § 124.19(d), the Region has determined to withdraw and prepare a new draft permit with respect to the metals limits that have been challenged by Petitioner. Concurrent with the filing of its response to the City's petition, the Region has submitted to the Board a Notice of Withdrawal of Certain Contested Permit Conditions and a motion requesting the Board to dismiss as moot the City's petition for review insofar as it relates to the withdrawn conditions. Until such time as the new draft permit addressing the limits so withdrawn becomes final and effective, the corresponding portions of the City's previous NPDES permit, issued on April 15, 1994, shall remain in effect.

Thus, the sole remaining issue in this permit appeal relates to whether the Region's

decision to impose a water quality-based total phosphorus effluent limit on the Keene WWTF discharge to control the adverse effects of cultural eutrophication (*i.e.*, the human-induced nutrient over-enrichment of a water body) in the Ashuelot Rive was rational in light of the record. The central dispute between the Region and the City over the phosphorus limit pivots on a technical and scientific issue, namely, the existence and extent of cultural eutrophication in the Ashuelot River and whether phosphorus effluent discharges from the Keene WWTF contribute to this condition. The Region concluded that phosphorus effluent discharges from the Keene WWTF, which represent the dominant component of point source phosphorus loading to the Ashuelot River under critical low flow conditions, were encouraging cultural eutrophication in the river and, as a result, designated recreational and aquatic life uses were not being attained. Phosphorus effluent limits sufficient to control the effects of such cultural eutrophication were thus imposed in the Permit in order to ensure compliance with State water quality standards. Conflicting interpretations of record materials, including raw water quality data collected by the State and under a volunteer water quality monitoring program, have led to differences of opinion between the Region's experts and the City on this issue. However, because Petitioner has merely repeated earlier objections made during the comment period without endeavoring to demonstrate why the Region's response to those objections warrants review, and because the Region's technical determinations, made in an area of scientific uncertainty, were sound, review of these permit conditions should be denied.

I. STATEMENT OF THE CASE

1. STATUTORY AND REGULATORY BACKGROUND

a. The Clean Water Act

Congress enacted the Clean Water Act (“CWA” or “Act”) “to restore and maintain the chemical, physical, and biological integrity of the Nation's waters.” CWA § 101(a), 33 U.S.C. § 1251(a). To achieve this objective, the CWA makes it unlawful for any person to discharge any pollutant into the waters of the United States from any point source, except as authorized by specified permitting sections of the Act. *See* CWA §§ 301(a), 402(a), 33 U.S.C. §§ 1311(a), 1342(a). Section 402 establishes one of the CWA's principal permitting programs, the National Pollutant Discharge Elimination System, or NPDES. *See* 402(a), 33 U.S.C. § 1342(a). Under this section of the Act, EPA may “issue a permit for the discharge of any pollutant, or combination of pollutants” so long as the requirements of the CWA and its implementing regulations are met. *Id.* NPDES permits generally contain discharge limitations and establish related monitoring and reporting requirements. *See* CWA § 402(a)(1)-(2). The regulations governing EPA's NPDES permit program are generally found in 40 C.F.R. Parts 122, 124, 125 and 136.

NPDES permits are issued by EPA or, in those jurisdictions in which EPA has authorized a state agency to administer the NPDES program, by a state agency subject to EPA review. *See* CWA § 402(a)-(d). While the Region administers the NPDES permit program in New Hampshire (“State”), the Region and the New Hampshire Department of Environmental Services (“NHDES”) collaborate in the development of NPDES permit limits and conditions, a process which includes NHDES staff review of the draft permit, the final permit, the response to

comments, and certification under CWA § 401 that the permit complies with all applicable state law requirements. After EPA issues a final NPDES permit for a New Hampshire point source, the State interprets its water pollution control statute to authorize subsequent adoption of the federal permit as a state surface water discharge permit. *See* RSA 485-A:13,I(a). Ex. 2 (AR G.1) (New Hampshire Revised Statutes Annotated, Chapter 485-A, Water Pollution and Waste Disposal). NHDES typically adopts federal permits upon resolution of any permit appeals. NHDES compliance section staff then share inspection and enforcement responsibilities with EPA.

Section 301 of the CWA provides for two types of effluent limitations to be included in NPDES permits: “technology-based” limitations and “water quality-based” limitations. *See* CWA §§ 301, 303, 304(b), 33 U.S.C. § 1311, 1313, 1314(b); 40 C.F.R. Parts 122, 125, 131. Technology-based limitations, generally developed on an industry-by-industry basis, reflect a specified level of pollutant-reducing technology available and economically achievable for the type of facility being permitted. *See* CWA § 301(b). As a class, Publicly Owned Treatment Works (“POTWs”) must meet performance-based requirements based on available wastewater treatment technology. CWA § 301(b)(1)(B). The performance level for POTWs is referred to as “secondary treatment.” Secondary treatment consists of technology-based requirements expressed in terms of five-day biochemical oxygen demand (BOD₅), total suspended solids (TSS) and pH. 40 C.F.R. Part 133.

Water quality-based effluent limits, on the other hand, are designed to ensure that state water quality standards are met regardless of the technological and economic factors that inform the derivation of technology-based limitations. In particular, section 301(b)(1)(C) of the CWA

requires achievement of “any more stringent limitation [than the technology-based requirements set forth in Section 301(b)(1)(A) and (B)], including those necessary to meet water quality standards...established pursuant to any State law or regulation....” Thus, NPDES permits must contain effluent limitations necessary to attain and maintain the water quality standards, without consideration of the cost, availability or effectiveness of treatment technologies. *See U.S. Steel Corp. v. Train*, 556 F.2d 822, 838 (7th Cir. 1977) (finding “states are free to force technology” and “if the states wish to achieve better water quality, they may [do so], even at the cost of economic and social dislocations”); *see In re City of Moscow*, 10 E.A.D. 135, 168 (EAB 2001) (stating that section 301(b)(1)(C) “requires unequivocal compliance with applicable [water quality standards], and does not make any exceptions for cost or technological feasibility”); *see also In re New England Plating Co.*, 9 E.A.D. 726, 738 (EAB, 2001) (“In the first instance, there is little question that cost considerations play no role in the *setting* of effluent limits.”) (emphasis in original).

Water quality standards (“WQS”) under the Act consist of three elements, two of which are relevant here:¹ (1) a designated “use” of the water, such as for public water supply, aesthetics, recreation, propagation of fish, or agriculture; and (2) “criteria,” which specify the amounts of various pollutants that may be present in those waters without impairing the designated uses, expressed either in numeric form for specific pollutants or in narrative form (*e.g.*, waters shall contain no phosphorus or nitrogen in such concentrations that would impair any existing or

¹ The third component of the overall water quality standards program is the antidegradation policy, which requires states, as part of their water quality standards programs, to develop and adopt statewide antidegradation policies and to identify the methods for implementing such policies. *See* 40 C.F.R. § 131.12. The antidegradation policy is not at issue here.

designated uses, unless naturally occurring). *See* CWA § 303(c)(2)(A), 33 U.S.C. § 1313(c)(2)(A); *see* 40 C.F.R. §§ 130.3, 130.10(d)(4), 131.6, 131.10 and 131.11.

EPA's long-standing CWA regulations expressly authorize the establishment by the states of water quality standards based upon narrative criteria. *See* 40 C.F.R. §§ 131.3(b), 131.11(b)(2). As stated, section 301(b)(1)(C) of the Act requires NPDES permits to include effluent limitations as necessary to achieve, among other things, state WQS. Consistent with this statutory mandate, NPDES regulations implementing section 301(b)(1)(C) provide that a permit must contain effluent limits as necessary to protect state water quality standards, "including State narrative criteria for water quality." *See* 40 C.F.R. §§ 122.44(d)(1), 122.44(d)(5) (providing in part that a permit incorporate any more stringent limits required by section 301(b)(1)(C) of the CWA).² The courts have explicitly recognized that water quality criteria can be expressed in narrative form and, in that form, can be used to derive water quality-based effluent limits. *See American Paper Inst. v. EPA*, 996 F.2d 346, 351 (D.C. Cir. 1993) ("Congress'...intent, made explicit in section 301 of the CWA, [was] that *all* state water quality standards be enforced through meaningful limitations in NPDES permits") (emphasis in original); *American Iron & Steel Inst. v. EPA*, 115 F.3d 979, 990 (D.C. Cir. 1997) (discharge permits must incorporate limitations that ensure both numeric and narrative water quality standards are met).

The specific regulatory mechanism by which narrative water quality criteria can be interpreted to derive water quality-based effluent limits is set forth at 40 C.F.R. §

² *See also* Final Rule Preamble for 40 C.F.R. Part 122.44(d)(1), 54 FR 23868, 23875 (June 2, 1989) ("[S]ection 301(b)(1)(C) requires NPDES permits to contain any effluent limitations necessary to meet all applicable water quality standards. A permit would be inconsistent with section 301(b)(1)(C) if the permit did not contain effluent limits necessary to attain and maintain both narrative and numeric water quality criteria.").

122.44(d)(1)(vi), which was promulgated in 1989 as part of a set of regulations related to the establishment of water quality-based effluent limits in compliance with section 301(b)(1)(C). These provisions amended 40 C.F.R. § 122.44(d)(1) (1988), which had simply required permits to contain requirements "necessary to....[a]chieve water quality standards established under section 303 of the CWA." As EPA explained in its preamble, "EPA's legal obligation to ensure that NPDES permits meet all applicable water quality standards, including narrative criteria, cannot be set aside while a state develops [numeric] water quality standards." *See* 54 Fed. Reg. at 23,877. *See also American Iron*, 115 F.3d at 990 (40 C.F.R. § 122.44(d)(1)(vi) was promulgated to create a national method for translating narrative criteria into numerical values).

Where a state has not established a numeric water quality criterion for a specific chemical pollutant that is present in the effluent in a concentration that causes or has a reasonable potential to cause a violation of narrative water quality standards, the permitting authority must establish effluent limits in one of three ways: (i) based on a "calculated numeric criterion for the pollutant which the permitting authority demonstrates will attain and maintain applicable narrative water quality criteria and fully protect the designated use"; (ii) on a "case-by-case basis" using CWA Section 304(a) recommended water quality criteria, supplemented as necessary by other relevant information; or (iii) in certain circumstances, based on an "indicator parameter." 40 C.F.R. § 122.44(d)(1)(vi)(A)-(C). This regulatory provision has been upheld as a reasonable, authorized attempt at necessary gap-filling in the CWA statutory scheme as it provides permit writers with guidance on how to translate state narrative water quality standards into numeric requirements. *See American Paper Inst.*, 996 F.2d at 348.

b. State Water Quality Standards and Section 303(d) Requirements

The applicable New Hampshire water quality standards (“NH Standards” or “Standards”) are found in 50 RSA 485-A, Ex. 2 (AR G.1), and the State’s Surface Water Quality Regulations, Chapter Env-Ws 1700 *et seq.* Ex. 3 (AR G.2). Under the NH Standards, surface waters are divided into water “use” classifications: Class A and B. *See* RSA 485-A: 8; Env-Ws 1702.11. The Ashuelot River has been classified by the State as a Class B water. *See* Ex. 4 (AR G.3) (Legislative Classifications of Surface Waters in New Hampshire (NHDES, October 2003)) at p. 2-5. Each of these classes is subject to class-specific criteria. *See* Env-Ws 1703.01, 1703.04, 1703.05-1703.32. Class B waters are designated as a habitat for fish, other aquatic life and wildlife and for primary (*e.g.*, swimming) and secondary contact (*e.g.*, fishing and boating) recreation. RSA 485-A: 8, II. Waters in this classification “shall have no objectionable physical characteristics.” *Id.* New Hampshire’s Standards also provide that the discharge of sewage or waste “shall not be inimical to aquatic life or to the maintenance of aquatic life in said waters.” *Id.*

These designated uses are protected by class-specific minimum narrative and/or numeric water quality criteria. With respect to nutrients, Env-Ws 1703.14(b) sets forth a class-specific criterion that prohibits instream concentrations of phosphorus in Class B waters that would impair any existing or designated uses. Meanwhile, Env-Ws 1703.14(c) establishes a minimum level of treatment for phosphorus discharges that “encourage cultural eutrophication” and requires such discharges to be treated to remove phosphorus to the extent necessary to ensure attainment and maintenance of water quality standards. Cultural eutrophication is defined as the “human-induced addition of wastes containing nutrients to surface waters which result in excessive plant growth and/or a decrease in dissolved oxygen.” *See* Env-Ws 1702.15.

Unless naturally occurring, Class B waters are also prohibited from containing benthic (*i.e.*, river bottom) deposits that have a detrimental effect on the benthic community (Env-Ws 1703.08), as well as from having slicks, odors, or surface floating solids (Env-Ws 1703.12) or color in concentrations that will impair any existing or designated uses (Env-Ws 1703.10). Additionally, Class B waters must not contain turbidity more than 10 NTUs (nephelometric turbidity units) above naturally occurring conditions. *See* Env-Ws 1703.11. Class B waters also must have a minimum dissolved oxygen saturation requirement of 75% (daily average), and an instantaneous minimum concentration requirement of at least 5 mg/l. *See* Env-Ws 1703.07(b).

Regardless of classification, NH Standards furthermore require that all surface waters meet certain baseline water quality criteria. *See* Env-Ws 1703.03 and 1703.04. All surface waters must be “free of substances in kind or quantity” that: (a) settle to form harmful deposits; (b) float as foam, debris, scum, or other visible substances; (c) produce odor, color, taste or turbidity which is not naturally occurring and would render it unsuitable for designated uses; (d) result in dominance of nuisance species; or (e) interfere with recreational activities. Env-Ws 1703.03(c)(1)(a)-(e).

The NH Standards require water quality-based NPDES permit limits for discharges to rivers and streams to be calculated based on critical low flow conditions in the receiving water. *See* Env-Ws 1705.02(a). The State has established this condition as “the lowest average flow which occurs for 7 consecutive days on an annual basis with a recurrence interval of once in 10 years on average, expressed in terms of volume per time period,” a formulation commonly referred to as the “7Q10.” *See* Env-Ws 1702.44. In addition, not less than 10% of the assimilative capacity of the receiving water must be held in reserve, which translates to setting

aside at least 10% of the available dilution. Env-Ws 1705.01. Thus, in New Hampshire, NPDES permits must be written to ensure that water quality standards are met even during critical low flow conditions.

Under Section 303(d) of the CWA, states are required to identify those water segments where the use of technology-based controls for pollution are insufficient to implement the applicable water quality standard, rendering such segments “water quality limited.” This list of “impaired waters” is known as the section 303(d) list. Once a segment is identified as “water quality limited,” the state is required under section 303(d) and 40 C.F.R. § 130.7, to establish total maximum daily loads (“TMDLs”) for the pollutant causing the failure to meet state water quality standards. While segments of the Ashuelot River have been identified on New Hampshire’s 2004 303(d) list of impaired waters, to date, no TMDL has been completed for the Ashuelot River.³

2. FACTUAL AND PROCEDURAL BACKGROUND

a. Facts

The Ashuelot River is a tributary of the Connecticut River located in southwestern New Hampshire. Ex. 6 (AR J.1) (Ashuelot River TMDL Study Area and Sampling Extent Map; Ashuelot River TMDL Sampling Stations); Ex. 7 (AR J.2) (The Ashuelot River: A Report to the General Court) (NHDES 1993) at 1. From its headwaters in Pillsbury State Park in Washington,

³ Although a draft TMDL has been under development since approximately 2000, when extensive sampling was performed for purposes of documenting water quality conditions and to calibrate and verify a water quality model, there is neither a firm projected date for completion of such a draft, nor for EPA-approval of a final TMDL. The Region believes a final, EPA-approved TMDL for the Ashuelot River is still several years away.

New Hampshire, the River flows south and west through the communities of Lempster, Marlow, Gilsum, Sullivan, Surry, Keene, Swanzey, Winchester and Hinsdale, to its mouth, where it enters the Connecticut River. Ex. 7 at 2. Land use along the upper portion of the Ashuelot River, from Washington to Sullivan is primarily forested and sparsely developed. *Id.* The lower reaches of the River, from Surry to Hinsdale, are characterized by a mix of forests, wetlands, farmland, and commercial, residential and industrial development. *Id.* The course of the Ashuelot River is studded by numerous dams and impoundments, with several situated downstream of Keene between Swanzey and Hinsdale. Ex. 8 (Map and Related Table Showing Location of Dams on the Ashuelot River) (AR J.3). Prior to its confluence with the Connecticut River, the Ashuelot River flows for a total of 64 river miles and drains an area of 420 square miles of southwestern New Hampshire. Ex. 7 at 2.

The Keene WWTF⁴ is situated in the Town of Swanzey along the banks of the Ashuelot River at approximately river mile 24 as measured from the confluence with the Connecticut River. Ex. 6. Keene's treatment facility has a design flow of 6.0 million gallons per day (MGD) and a monthly average flow of approximately 3.4 MGD. Ex. 8 (Fact Sheet) (AR A.5) at 2, 34. It collects and treats domestic, commercial and industrial wastewater from the City of Keene, the Town of Marlborough, and the Town of Swanzey,⁵ and also accepts septage and holding tank waste. *Id.* at 2. The wastewater undergoes activated sludge treatment and is then discharged

⁴ The Keene POTW is referred to variously as the WWTP (*e.g.*, Fact Sheet, Permit, Petition) and as the WWTF (*e.g.*, comments submitted by the City of Keene on the Draft Permit and the Response to Comments).

⁵ The Towns of Marlborough and Swanzey are co-permittees for conditions related to the operation and maintenance of their collection systems.

from an outfall designated “001” into the Ashuelot River. *Id.* at 2-3.

Another wastewater treatment facility owned and operated by the Town of Swanzey is located approximately 5 river miles downstream of the Keene treatment facility. Ex. 6. The Swanzey WWTF has a design flow of 0.160 MGD. Ex. 10 (AR K.1) at 1 (Town of Swanzey WTP Fact Sheet). Its treatment process consists of wastewater treatment lagoons. *Id.*

As mentioned, the Ashuelot River has been designated by the State as a Class B water body and as such must be suitable for, *inter alia*, aquatic habitat, swimming and other recreational purposes, and must meet generally applicable as well as class-specific water quality criteria. The segment of the Ashuelot River to which the Keene WWTF discharges appears on the State’s EPA-approved 2004 303(d) list as impaired for pH, percent dissolved oxygen (DO) saturation, aluminum and *Escherichia coli*. Ex. 5 (AR G.4) (State of New Hampshire Section 305(b) and 303(d) Surface Water Quality Report (NHDES, 2004)); Ex. 10 at 31-33 (summarizing impairments by segment from upstream of Keene to downstream of Swanzey). The Permit contains effluent limitations and/or conditions for pH, carbonaceous biochemical oxygen demand (CBOD₅), total suspended solids (TSS), ammonia as nitrogen (NH₃-N), minimum dissolved oxygen (DO), *Escherichia coli*, Whole Effluent Toxicity (WET), total recoverable copper, lead and zinc, and, finally, total phosphorus. Ex. 1 (Permit).

The Permit’s total phosphorus limits were imposed to control the effects of cultural eutrophication in the Ashuelot River. *See* Ex. 9 (Fact Sheet) at 19-20. Under undisturbed natural conditions, phosphorus concentrations tend to be very low in most aquatic ecosystems, including rivers and streams. *See* Ex. 12 (AR F.2.d) (EPA Nutrient Criteria Technical Guidance Manual: Rivers and Streams, or “Nutrient Technical Guidance Manual”) at 27 (Table 2) and 101 (Table

4); Ex. 13 (AR B.1) (Response to Comments, or “RTC”) at 23. Eutrophication refers to the slow aging process resulting from the natural accumulation of nutrients during which a river, lake, estuary, or bay gradually evolves into a bog or marsh. *See* Ex. 11 (AR F.2.f) (EPA Nutrient Criteria Technical Guidance Manual: Lakes and Reservoirs) at 2-6 to 2-8. Nutrient loading into a water body from human activities can rapidly accelerate this natural process, leading to the phenomenon known as cultural eutrophication. *See* Ex. 12 at 1, 4.

Nutrient enrichment ranks among the most frequent causes of impairment of the Nation’s waters. Ex. 12 (Nutrient Technical Guidance Manual) at 3. When phosphorus loading exceeds the assimilative capacity of the receiving water, it can cause excessive algal and/or plant growth. Specifically, phosphorous can promote the growth of nuisance levels of algae, such as phytoplankton (suspended algae)⁶ and periphyton (attached algae),⁷ and larger rooted and vascular plants known as macrophytes.⁸ *See* Ex. 12 at 3-5, 30-33, 35, 43-45, A-86; Ex. 14 at *id.* This plant growth degrades the aesthetic and recreational quality of the water body since it leads to increased turbidity, discoloration of water, odors, and biomass suspended in and on the water. *See* Ex. 12 at 4-5; Ex. 14 (AR F.2.b) (EPA 1986 Quality Criteria for Water) (“Gold Book”) at 240.

⁶ Phytoplankton is free floating, or water column, algae.

⁷ Periphyton is benthic attached algae. It clings to stems and leaves of rooted plants or other surfaces projecting above the bottom of a water body. *See* Ex. 12 at Appendix D, A-86.

⁸ Macrophytes are larger aquatic plants, as opposed to microscopic plants, including aquatic mosses, pond scum, ferns and larger algae, as well as vascular plants. *See* Ex. 12 at 43 and Appendix D, A-86.

In addition, this plant growth can degrade the habitat for fish and aquatic life by physically altering the naturally existing benthic environment. It does so by either growing directly on the water body's bottom (periphyton), or by growing near the water body's surface (macrophytes) or in the water column (phytoplankton) and then settling to the bottom as detritus. *See* Ex. 12 at 4-5, 35, Appendix D, A-86. Increased algal biomass can also reduce habitat availability by altering the composition of native species in an aquatic system. *Id.* at 5.

Excessive algae and plant growth can also reduce in-stream dissolved oxygen concentrations to levels that negatively impact aquatic life.⁹ Aquatic biomass exerts an oxygen demand on a water body both while it is alive (as result of respiration), and after it dies (as a result of decomposition). The decomposition of dead plant matter in addition produces unpleasant sights and strong odors, again negatively impacting recreational uses. *See* Ex. 12 (Nutrient Technical Guidance Manual) at 5, 35; *see also* Ex. 15 (Assabet River TMDL) at 15, 24.

In crafting an approach to address the adverse nutrient-driven impacts described above, several general points are important to bear in mind. First, “[i]n flowing systems, nutrients may be rapidly transported downstream and the effects of nutrient inputs may be uncoupled from the nutrient source, [which] complicat[es] source control.” *See* Ex. 12 (Nutrient Technical Guidance

⁹ In eutrophic systems, plant and algae photosynthesis and respiration can cause large diurnal dissolved oxygen swings. Ex. 12 (Nutrient Technical Guidance Manual) at 35; Ex. 15 (Assabet River and Total Maximum Daily Load for Total Phosphorus (MassDEP, 2004)) (AR E.24) at 27. Aquatic plants and algae produce oxygen in daylight conditions as they undergo photosynthesis and consume oxygen at night as they respire. The result is “large daily dissolved oxygen fluctuations that can be extremely low in the early morning hours but can become extremely high (supersaturated) in the late afternoon.” *Id.* In addition, seasonal declines in DO concentrations also occur as aquatic vegetation dies and decays. *Id.* at 1-2. Dramatic DO concentration changes, particularly very low DO levels, can be lethal to fish and benthic organisms. *Id.*

Manual) at 3. Second, eutrophic conditions are often exacerbated around impoundments and in other slow moving reaches of rivers, where detention times increase relative to free flowing segments of rivers and streams. *Id.* at 32. Third, once the cycle of eutrophication begins, it can be difficult to reverse. This is because “nutrients can be re-introduced into a waterbody from the sediment, or by microbial transformation, potentially resulting in a long recovery period even after pollutant sources have been reduced.” *Id.* at 3. Therefore, one key function of a nutrient limit is preventive, because phosphorus has the ability to persist and accumulate in the water column and sediments. A second key objective is to protect downstream receiving waters “regardless of [their proximity] in linear distance.” *See* Ex. 14 (Gold Book) at 241; Ex. 12 at 11.

During the permit reissuance process, the Region evaluated the sources of phosphorus loading into the Ashuelot River, as well as relevant physical, chemical and biological impacts of such loading in the receiving water. At the end of this inquiry, the Region concluded that the magnitude of phosphorus loading into the Ashuelot River was exceeding the River’s capacity to assimilate it and that, as a consequence, the receiving waters were exhibiting signs of cultural eutrophication. Eutrophic conditions in the Ashuelot River have resulted in excessive plant growth in the form of water column algal biomass; significant amounts of unsightly aquatic growth such as duckweed (a species commonly associated with eutrophic systems)¹⁰ and macrophytes; changes to the benthic habitat resulting from attached periphyton and algal growth; unpleasant odors; and turbidity. Ex. 9 (Fact Sheet) at 16-19; Ex. 13 (RTC) at 23-28. Based on the foregoing, and as more fully described below in Section I.2.a.ii, the Region determined that

¹⁰ *See, e.g.*, Ex. 15 (Assabet River TMDL) at 24 (using levels of duckweed as a metric of eutrophication because of its impact on recreational uses).

designated uses and various water quality criteria designed to protect such uses were not being attained in the Ashuelot River. The Region also concluded that phosphorus discharges from the City's wastewater treatment facility were both encouraging cultural eutrophication and contributing to the nonattainment of the New Hampshire Standards. Ex. 9 at 19-20; Ex. 13 at 23-29. Therefore, in accordance with section 301(b)(1)(C) of the CWA, the Region imposed monthly average total phosphorus effluent limits of 0.2 mg/l (applied seasonally from April 1 through October 31) and 1.0 mg/l (applied seasonally from November 1 through March 31) in the City's permit, which the Region determined to be sufficiently stringent to ensure compliance with the NH Standards. See Ex. 9 at *id.*; Ex. 13 at 61-63.

(i) The Region's General Approach to Assessing the Trophic State of Rivers and Streams

EPA nutrient criteria technical guidance states that water column concentrations of total phosphorus; algal biomass as chlorophyll *a*; turbidity and transparency; and flow and velocity are the primary factors to consider when selecting water quality variables to evaluate or predict the condition or degree of eutrophication in a water body. See Ex. 12 (Nutrient Technical Guidance Manual) at 29-38; Ex. 9 (Fact Sheet) at 15-19; Ex. 13 (RTC) at 19-20, 23-25. Phosphorous is often used as a primary causal indicator of eutrophication in rivers and streams because it is the critical limiting nutrient for nuisance aquatic plant growth. See Ex. 12 at 30. Without sufficient concentrations of bioavailable phosphorus, high levels of nuisance plant biomass will not occur even if conditions are otherwise optimal for eutrophication (*i.e.*, adequate light, sufficiently long detention times, *etc.*). *Id.*

Chlorophyll *a* "is considered the most important biological response variable for nutrient-related problems." *Id.* at 31. Chlorophyll *a* is a molecule which constitutes the major pigment in

most, though not all, algae. Water column chlorophyll *a* is a sensitive response indicator of phytoplankton, which is algal biomass suspended in the water column. *Id.* at Appendix D, A-84. However, water column chlorophyll *a* cannot be used as the *only* measure of eutrophication, since it fails to capture the full extent of nutrient related impacts in most rivers and streams. *Id.* at 32. This is because certain types of aquatic plant growth associated with eutrophication, including periphyton (*i.e.*, benthic, attached algae) and macrophytes, are not measured by water column chlorophyll *a*.¹¹ Ex. 13 at 35-36 (RTC). For example, a river segment might be expected to have a high periphyton (attached) rather than phytoplankton (suspended) algal biomass depending on its particular morphological and hydrological features (*i.e.*, high current velocity, low turbidity/color, open canopy, shallow stream depth, minimal scouring, limited macroinvertebrate grazing, gravel or larger substrata, and smaller depth to width ratio). *Id.* Thus, in river reaches where periphyton and/or macrophytes dominate as opposed to phytoplankton, chlorophyll *a* measurements alone may not accurately characterize the trophic state of the water body, and other response indicators of eutrophication would also need to be considered in the evaluation of the degree of eutrophication in a water body. *Id.* Secondary response variables include primary organic matter productivity, dissolved oxygen and pH. *See* Ex. 12 (Nutrient Technical Guidance Manual) at 35-45.

In the absence of a numeric criterion for phosphorus in a state's water quality standards, the Region typically relies on nationally recommended criteria for guidance, supplemented to the extent necessary by other information, such as information published by EPA under section 304(a)

¹¹ Benthic chlorophyll *a* can be difficult to measure "due to its patchy distribution and occurrence on non-uniform stream bottoms." *See* Ex. 12 (Nutrient Technical Guidance Manual) at 31.

of the CWA, and relevant technical and scientific literature.¹² See 40 C.F.R. § 122.44(d)(1)(vi)(B). EPA has recommended total phosphorous concentrations for receiving waters in various technical guidance materials. The 1986 Gold Book recommends in-stream phosphorous concentrations of 0.1 mg/l for any stream not discharging directly to lakes or impoundments to control the effects of cultural eutrophication. Ex. 14 at 240. Meanwhile, the 2000 Nutrient Criteria Technical Guidance Manual cites various protective instream phosphorus concentration values from the peer-review scientific literature ranging from 0.01-0.09 mg/l to control periphyton and from 0.035 to 0.070 mg/l to control phytoplankton. Ex. 12 at 101 (Table 4). The Gold Book and Nutrient Criteria Technical Guidance Manual values are based on the effects associated with nutrients in a water body. See Ex. 9 at 19; Ex. 13 at 61. The effects-based approach applies empirical observations of a causal variable (*i.e.*, phosphorus) and a response variable (*i.e.*, chlorophyll *a*) associated with adverse nutrient-related water quality impacts, such as nuisance aquatic plant growth. *Id.* This approach provides threshold values above which adverse effects are likely to occur. *Id.*

On the other hand, EPA's 2001 EPA Ambient Water Quality Criteria Recommendations identify phosphorus concentrations for so-called "reference" conditions in waters within specific ecoregions across the country which are minimally impacted by human activities, and which are

¹² Section 304(a)(1), 33 U.S.C. § 1314(a)(1), directs EPA to publish water quality "criteria" guidance encompassing a scientific assessment of the health and ecological effects of various pollutants, including "information on the effects of pollutants on biological community diversity, the factors affecting rates of eutrophication and rates of organic and inorganic sedimentation for varying types of receiving waters." EPA periodically issues recommended ambient water quality criteria, including the Gold Book, stated purpose of which is to present scientific data and guidance concerning the environmental effects of pollutants, which can then be used to derive regulatory requirements. See Ex. 14 at 2.

therefore representative of waters without cultural eutrophication. Ex. 16 (AR F.2.e) (EPA Ambient Water Quality Criteria Recommendations, Rivers and Streams in Ecoregion VIII, December 2001, or “Recommended Ecoregional Criteria”) at vii; Ex. 17 (AR F.2.g) (Development and Adoption of Nutrient Criteria into Water Quality Standards, Geoffrey Grubbs, Director, EPA Office of Science and Technology, November 14, 2001, or “Nutrient Criteria Development Memorandum”) at 13-15. Reference-based values are statistically derived from a comparison among a population of rivers in the same ecoregion class. See Ex. 9 (Fact Sheet) at 19; Ex. 13 (RTC) at 61-63. Specifically, reference conditions are a quantitative set of river characteristics (physical, chemical and biological) that represent minimally impacted conditions. *Id.* at 61. They are based on the 25th percentile of *all* nutrient data, including a comparison of reference conditions for the aggregate ecoregion versus subcoregions. *Id.* Keene is within Ecoregion VIII, designated as the “Nutrient Poor Largely Glaciated Upper Midwest and Northeast.” Ex. 16 at 4. The recommended reference-based criteria for this ecoregion are a total phosphorous concentration of 0.01 mg/l and chlorophyll *a* concentration of 0.63 ug/l. Ex. 16 at viii.¹³

¹³ This more recent guidance does not supplant the Gold Book guidance or the other peer-reviewed literature cited to in the Nutrient Technical Guidance Manual and relied on by the Region. The Gold Book and the other technical literature relied upon by the Region continue to validly comprise “relevant information” under 40 C.F.R. § 122.44(d)(1)(vi)(B). The memorandum accompanying the Recommended Ecoregional Criteria outlines several approaches for deriving numeric criteria in addition to outright adoption of EPA recommended criteria. These alternatives include developing criteria “that fully reflect localized conditions and protect specific designated uses using the process described in EPA’s Technical Guidance Manuals for nutrient criteria development,” and “developing criteria protective of designated uses using other scientifically defensible methods and appropriate water quality data.” Ex. 17 (Nutrient Criteria Development Memorandum) at 15. The approach taken by the Region to implement a narrative nutrient criterion though a numeric effluent limit derived using site-specific water quality data and effects-based phosphorus concentration thresholds set forth both in EPA guidance and peer-

When assessing the trophic state of rivers and streams, the Region analyzes causal variables—*e.g.*, ambient phosphorus concentrations, receiving water flow, *etc.*—as well as several response variables—*e.g.*, ambient chlorophyll *a*, dissolved oxygen, *etc.* The Region affords the most weight to instream phosphorus and chlorophyll *a* levels, although, with respect to the latter variable, it recognizes that supplemental reference to several other response variables may be necessary to capture the spectrum of potential eutrophic impacts. Because neither EPA guidance nor the scientific literature establishes any definitive quantitative thresholds for any of these variables, the Region applies its best professional scientific judgment and technical expertise in (i) consulting a wide range of guidance, technical information and site-specific data; (ii) considering a variety of possible methodological approaches; and (iii) establishing a sufficiently protective limit on a site-specific basis. The Region also endeavors to “ground truth,” to the extent possible, the validity of any conclusions regarding eutrophication made on the basis of raw instream water quality sampling data or projected instream concentrations against record evidence (*e.g.*, field surveys) of visual impacts of cultural eutrophication, with the caveat that large amounts of phytoplankton/periphyton biomass may not be observed even in highly enriched waters depending on whether optimal conditions exist for growth. Ex. 12 (Nutrient Technical Guidance Manual) at 21, 32.

(ii) The Region’s Assessment of the Trophic State of the Ashuelot River Downstream of Keene WWTF

reviewed scientific literature generally falls within the latter category.

In the Region's view, the weight of the evidence demonstrates that the Ashuelot River is culturally eutrophic. During August of 2001 and 2002, NHDES sampled the Ashuelot River to collect data for a future TMDL. Ex. 9 (Fact Sheet) at 16-17. These data were central to EPA's analysis because the TMDL sampling was conducted both upstream and downstream of the Keene discharge under low flow, high temperature receiving water conditions in August that were representative of 7Q10 conditions. Ex. 13 (RTC) at 9-10. A summary of pertinent data obtained during the sampling is presented in Table Three of the Fact Sheet (at 17) and Table One of the Response to Comments (at 24). The data represent samples of effluent taken from the two WWTFs in the TMDL study area, Keene and Swanzey, and of the Ashuelot River upstream and downstream of these facilities. The data indicated that both total phosphorus, the primary causal variable of eutrophication, and water column chlorophyll *a*, the chief response variable of eutrophication, were present in concentrations consistent with those found in eutrophic waters. Ex. 9 (Fact Sheet) at 16-19; Ex. 13 at 23-25 (RTC).

Specifically, except at stations located above the Keene WWTF and on the South Branch of the Ashuelot River, which enters the mainstem approximately 0.5 miles downstream of the Keene WWTF, the data illustrated that total phosphorous concentrations at all sampling stations on the mainstem exceeded the Gold Book value (0.1 mg/l), the values cited in the Nutrient Technical Guidance Manual (0.01 to 0.09 mg/l to control periphyton and from 0.035 to 0.07 mg/l to control phytoplankton) and the recommended reference-based criterion for this ecoregion (0.010 mg/l). Ex. 9 (Fact Sheet) at 17; Ex. 13 (RTC) at 24. For example, the maximum ambient total phosphorus recorded at each of the five stations ranged downstream of the Keene WWTF were 1.132 mg/l, 0.287 mg/l, 0.265 mg/l, 0.265 mg/l, and 0.244 mg/l, in downstream order.

Water column chlorophyll *a* data collected as part of the TMDL study also provided insight into the level of algal biomass in the water column, and thus the trophic state of the Ashuelot River. Ex. 9 (Fact Sheet) at 18. The range of recommended instream water column chlorophyll *a* concentration levels to prevent nuisance conditions and water quality degradation in streams is 8 ug/l to 15 ug/l. Ex. 13 (RTC) at 25 (citing Nutrient Technical Guidance Manual at 101-102). The water column chlorophyll *a* data, which ranged from 1.97 ug/l to 69.64 ug/l, exceeded the Nutrient Technical Guidance Manual's values at various stations. *Id.*¹⁴ A comparison of these values with those in EPA guidance documents and the scientific literature again indicated that the Ashuelot River, in particular downstream of the West Swanzey WWTF, was eutrophic. *Id.*; Ex. 13 (RTC) at 25.

Viewing these elevated instream measures of the primary (phosphorus) and response (algal biomass as chlorophyll *a*) indicators of eutrophication in light of relevant EPA guidance and peer-reviewed technical literature, and bearing in mind that the Keene WWTF is the dominant source of bioavailable phosphorus loading to the Ashuelot River under critical low flow conditions,¹⁵ the Region concluded that discharges from the facility were "encouraging cultural eutrophication" in

¹⁴ These water column chlorophyll *a* data also exceeded the recommended ecoregional chlorophyll *a* criterion of 0.63 ug/l at all stations.

¹⁵ Under conditions at the time the sampling was performed for the TMDL, the Keene WWTF represented approximately 72.3% of the annual total phosphorus loading and the nonpoint sources represent approximately 27.7% of the annual load immediately downstream of the Keene WWTF. Ex. 18 (NHDES Total Phosphorus Loading Analysis for the Ashuelot River TMDL) at 2 (AR J.12). Further downstream just below the Swanzey WWTF, the combined total phosphorus loading from the Keene and Swanzey WWTFs represented approximately 64.6% of the annual load and the nonpoint sources represent approximately 35.4% of the annual phosphorus load. *Id.* At the furthest point downstream within the study area, the combined total point source loading represented approximately 64% of the annual phosphorus loading and the nonpoint sources represent approximately 36% of the total load in the river. *Id.*

the receiving waters within the meaning of Env-Ws 1703.14(c) and Env-Ws 1702.15.¹⁶ Ex. 13 at 25 (RTC). The Region went on to explain in its Response to Comments that it believed that this conclusion could be drawn based on instream phosphorus and chlorophyll *a* data alone, because it was adopting a protective approach wherein nutrient problems are addressed *before* a culturally eutrophic system begins exhibiting significant manifestations (*e.g.*, visible algal blooms) of nutrient over-enrichment. *Id.*¹⁷

With that said, the administrative record for the Permit included substantial additional evidence that the system had progressed into a culturally eutrophic state. Ex. 13 at 25 (RTC).

¹⁶ As mentioned, chlorophyll *a* is a direct measure of algal biomass suspended in the water column. High levels of water column algal biomass are a form of “excessive plant growth” and thus meet the definition of cultural eutrophication under Env-Ws 1702.15.

¹⁷ As explained in the Response to Comments, the Region believes that a protective approach that imposes nutrient limits *prior* to the appearance of significant visual manifestations of cultural eutrophication is reasonable. *See* Ex. 13 (RTC) at 25. Even if significant visual evidence of eutrophication is not present in a water body, the imposition of a water quality-based effluent limit for phosphorus might still be appropriate under the Region’s approach if there are elevated ambient phosphorus concentrations (*i.e.*, indicating excessive nutrient enrichment in the receiving waters) and chlorophyll *a* concentrations (*i.e.*, indicating excessive algal biomass growth in the water column) in the receiving waters. NPDES regulations do not preclude imposition of a phosphorus effluent limit designed to prevent the onset of such conditions. This protective approach is appropriate given that the Region is required to impose a limit where the reasonable *potential* exists for violations of water quality standards. *See* 40 C.F.R. § 122.44(d)(1),(5). Moreover, such a limit must *ensure* compliance with water quality standards. *In re City of Marlborough*, 12 E.A.D. 235, 250 (EAB 2005) (“a mere possibility” of ensuring compliance with water quality standards does not “ensure” compliance with such standards). *See also* Ex. 17 (Nutrient Criteria Development Memorandum) at 19 (stating that 303(d) listing decisions should “ideally occur prior to highly visible responses such as algal blooms to facilitate a more proactive approach to management[,]” and states should “consider excessive levels of nitrogen and phosphorus as a basis for listing regardless of the status of early response variables such as chlorophyll *a* or turbidity.”). As discussed above, preventing the cultural eutrophication cycle from beginning is important, since once begun it is difficult to break. *See* Ex. 12 (Nutrient Technical Guidance Manual) at 3. Thus, the Region adopts a reasonably conservative approach when permitting nutrient discharges.

Consistent with the Region's conclusion (based on ambient phosphorus and chlorophyll *a* concentrations) that the Ashuelot River was culturally eutrophic, the record also contained ample evidence of visible occurrences of nuisance aquatic plant growth downstream of the discharge. *Id.* at 26-28. For instance, a survey conducted for the US Fish and Wildlife Service during the summers of 2001 and 2003 at various points downstream of the Keene WWTF outfall identifies: "[a]quatic macrophytes & filamentous algae were common downstream of the effluent;"¹⁸ "abundant aquatic macrophytes along the edge" of the river¹⁹; "lots of emergent macrophytes along the banks, and also lots of duckweed²⁰ 'rafts' floating by"²¹; "quite a lot of algae on all submerged surfaces making it difficult to see mussels in some places, and also large 'rafts' of duckweed[,]" as well as some submerged macrophytes²²; and "[l]ots of algae & other slimy stuff on submerged surfaces....Water quality here was not great[;] [n]utrients seemed to be the main problem – there was lots of algal growth and the water was quite turbid."²³ *See also* Ex. 19 (photos showing significant amounts of attached periphyton both upstream and downstream of the Denman Thompson Bridge in West Swanzey, which is downstream of the Keene WWTF and upstream of the Swanzey WWTF).

¹⁸ Ex. 20 (Freshwater Mussels of the Ashuelot River: Keene to Hinsdale) at Appendix 1, Freshwater Mussel Data Form for Site 9.

¹⁹ *Id.* at Freshwater Mussel Data Form for Site 11.

²⁰ Excessive accumulations of duckweed are often found in eutrophic water bodies. *See, e.g.*, Ex. 15 (Assabet River TMDL) at 15, 24.

²¹ *Id.* at Mussel Data Form for Site 14.

²² *Id.* at Mussel Data Form for Site 15.

²³ *Id.* at Mussel Data Form for Site 16(1).

The impairments described above all occurred upstream of the Swanzey WWTF. There is also evidence of impairment downstream of the Swanzey facility (e.g., “I [the surveyor] had visited this area a few years before but did not survey here, and at the time there were obvious signs of eutrophication (excessive algal growth, turbidity). This will probably happen later this summer.” Ex. 13 (RTC) at 26. NHDES field notes from August 29, 2001 indicate a “solid duckweed mat” at Station 12 that was “stinky.” *Id.* See also Ex. 13 (RTC) at 27.

These observations generally correspond with the NHDES field data collected in the course of developing the TMDL, and submitted to the Region by the City’s consultants during the comment period, which record numerous instances of significant coverage by aquatic plants and algae in the Ashuelot River. See Ex. 13 (RTC) at 27 (summarizing portions of NHDES TMDL sampling field worksheets). For example, beginning upstream of the Keene WWTF at Stations 21-Ash, 20A-Ash, 19-Ash 17-Ash, 16M-Ash, and 16D-Ash, the percent cover information collected on August 16, 23, and 29, 2001 and August 28, 2002 for macrophytes ranged between 0 % to 80 %-90% cover and periphyton ranged between 0 % to 100 % cover. *Id.* In the segment of the Ashuelot River downstream of the Keene WWTF, and upstream of the Swanzey WWTF, the percent cover of macrophytes ranged between 0% and 33% and periphyton ranged between 0% and 75%. *Id.* Downstream of the Swanzey WWTF, at Stations 14-Ash and 12-Ash, the percent cover for macrophytes ranged between 0% and 33% and periphyton ranged between 0-33% and 80%. *Id.*

In addition to these visible impacts of eutrophication, continuous monitoring data collected for the TMDL show nonattainment of the minimum dissolved oxygen saturation criterion of 75% both upstream and downstream of the treatment plant at stations 16D-Ash and

16B-Ash and also show that the 5 mg/l criterion was nearly violated at station 16D-Ash (a low value of 5.07 was recorded on 8/17/2001). *Id.* at 9; Ex. 27 (AR J.15) (Graphical Depiction of Continuous Dissolved Oxygen Monitoring Data Collected for the Ashuelot River TMDL (August 15-August 17, 2001) and Underlying Raw Data.).

(iii) The Region's Assessment of Whether Standards Were Being Attained in the Ashuelot River Downstream of the Keene WWTF

The Region next concluded that the nutrient-driven impairments described above had resulted in nonattainment of New Hampshire's Standards. Ex. 13 (RTC) at 27-28. In particular, the Region found that noxious plant growth of the kind and extent found in the Ashuelot River downstream of the Keene WWTF clearly violates RSA 485-A: 8, II, which requires a Class B receiving water to be free of objectionable characteristics and to be suitable for swimming and other recreational purposes, and which prohibits the discharge of sewage or waste from being "inimical to aquatic life or to the maintenance of aquatic life in said waters." *Id.* Large floating mats of duckweed and abundant macrophytes, for example, are of concern as they are unsightly and degrade the aesthetic quality of the Ashuelot River, physically interfere with recreational uses such as swimming and boating, and create objectionable odors in late summer and early fall when they die and degrade on the riverbanks (*see, e.g.*, NHDES field survey noting stinking duckweed mats). *Id.* The significant amounts of periphyton described above also physically alter the benthic aquatic environment both by attaching to and growing on the Ashuelot's bottom, which alters the natural beneficial habitat used by the river's benthic organisms and other aquatic life (*see, e.g.*, Fish and Wildlife surveyor observation that the amount of the algae on submerged surfaces made it "difficult to see mussels in some places"). *Id.* The decomposition of phytoplankton,

macrophytes and periphyton exerts an oxygen demand on the receiving water, which has been shown to fail to maintain the minimum 75% dissolved oxygen saturation for Class B waters, and is thus also harmful to the aquatic life in the Ashuelot. There is also the potential for such detritus to settle into the sediments, altering the benthos, where it can further disrupt the dissolved oxygen dynamics of the river.

Such excess plant productivity also results in nonattainment of numerous class-specific and minimum water quality criteria set forth in the New Hampshire water quality regulations. *See* Env-Ws 1700 *et seq.* For example, abundant duckweed and other macrophyte growth, which appear on the surface of the water and produce odors when they decompose, violates the Class B criterion found at Env-Ws 1703.12, which prohibits slicks, odors, and surface solids that impair designated uses, in this case recreational uses. Ex. 13 (RTC) at 28. This growth, as well as significant amounts of water column algal biomass, also contravenes minimum criteria set forth at Env-Ws 1703.03, which prohibits substances in kind or quantity that (a) settle to form harmful deposits, (b) float as debris, scum, or other visible substances, (c) produce odor, color or turbidity rendering the receiving water unsuitable for designated uses, and (e) interfere with recreational activities. *Id.* Examples of significant percent coverage by aquatic biomass in the Ashuelot River have been observed by the NHDES and significant amounts of turbidity in the Ashuelot River have been noted in the U.S. Fish and Wildlife fresh water mussel surveys. The occurrences of large amounts of periphyton attached to the Ashuelot's bottom contravene Env-Ws 1703.08 (Benthic Deposits).

Because the Region determined that phosphorus discharged from the Keene WWTF was contributing to the impairment of designated uses in the Ashuelot River in violation of Env-Ws

1703.14(b) (which prohibits instream phosphorus concentrations that would impair such uses), the Region determined that a phosphorus effluent limitation was necessary to ensure compliance with Standards. Ex. 13 (RTC) at 28.

(iv) *The Region's Derivation of Phosphorus Effluent Limit*

Federal regulations implementing section 301(b)(1)(C) of the CWA expressly require that state water quality standard, including narrative criteria be achieved. *See* 40 C.F.R. §§ 122.44(d)(1). The regulations further provide a permit writer with three options to interpret a narrative criterion and to derive a numeric effluent limit to implement the criterion. *See* 40 C.F.R. §§ 122.44(d)(1)(vi)(A)-(C). Under one of those options, 40 C.F.R. § 122.44(d)(1)(vi)(B), EPA is authorized to, “Establish effluent limits on a case-by-case basis, using EPA’s water quality criteria, published under Section 304(a) of the CWA, supplemented where necessary by other relevant information.”

Consistent with the methodology described in Section 2.a.i above, the Region characterized the trophic state of the Ashuelot River by analyzing instream phosphorus and chlorophyll *a* levels, as well as other variables such as dissolved oxygen impacts, and by examining available field surveys indicating visual manifestations of eutrophication. Consistent with 40 C.F.R. § 122.44(d)(1)(vi)(B), the Region then looked to a broad range of relevant evidence, including the Recommended Ecoregional Nutrient Criteria, the Nutrient Technical Guidance Manual, the Gold Book recommended value, and other effects-based values in the peer-reviewed scientific literature, to determine a protective phosphorus effluent limit.

EPA determined to employ the effects-based Gold Book recommended concentration (0.1 mg/l) rather than the reference condition-based ecoregional criterion (0.01 mg/l). *See* Ex. 9 (Fact

Sheet) at 19; Ex. 13 (RTC) at 61-63. The ecoregional criterion reflects minimally disturbed conditions. Ex. 13 (RTC) at 62. While these conditions will support designated uses, they may also represent better water quality than is necessary to support such uses. See Ex. 13 (RTC) at 61-62. The Gold Book value is based on the effects associated with nutrients in a water body. This approach links empirical observations of a causal variable such as phosphorus and a response variable such as chlorophyll *a* to specific water quality impairments (*i.e.*, periphyton, phytoplankton). Ex. 13 at 61. While the Region still gave consideration to the ecoregional criterion in its analysis, the Region ultimately opted for the effects-based approach because it is often more directly associated with an impairment to designated uses (*i.e.* aquatic habitat, swimming). *Id.*

The Region determined that an effects-based phosphorus effluent limit of 0.2 mg/l would be sufficient to ensure compliance with NH Standards. Under 7Q10, which again is the hydrological condition for which water quality-based permit limits must be calculated, a phosphorus effluent limit of 0.2 mg/l will result in an instream concentration of 0.096 mg/l. Ex. 13 (RTC) at 61; Ex. 9 (Fact Sheet) at 19-20. This ambient concentration is consistent with the Gold Book recommended value of 0.1 mg/l. *Id.* After adjustments are made to account for different receiving water flow assumptions underlying the Permit limit versus the literature values (*i.e.*, 7Q10 versus summer seasonal average flows), a 0.2 mg/l limit also results in an instream phosphorus concentration that falls within the range of effects-based values cited in the Nutrient Technical Guidance Manual and in the peer-reviewed scientific literature (0.01-0.09 mg/l to control periphyton and 0.035 mg/l to 0.07 mg/l to control plankton). See Ex. 13 (RTC) at 62. Specifically, as demonstrated in Exhibit C of the Response to Comments, under long term average

summer conditions (the mean flow for the months of July, August, and September from 1996 through 2005), the estimated instream concentration of total phosphorus would be about 0.026 mg/l; under average flow conditions during the driest summer (the mean flow for July, August, and September 1997, which was the lowest mean summer flow from 1996 through 2005), the instream concentration would be about 0.039 mg/l; and under the lowest summer monthly average flow condition (the mean flow in August 2002, which was the lowest observed summer monthly average flow), the instream concentration would be about .065 mg/l. *Id.* at 62-63. These flow-adjusted concentrations are also substantially closer to the ecoregional reference-based criterion of 0.01 mg/l.

Based on the record before it, the Region concluded that achievement of the recommended Gold Book value instream will be sufficient to ensure compliance with Standards, as it can be expected to control excessive aquatic plant growth. Ex. 9 (Fact Sheet) at 19; Ex. 13 (RTC) at 63. While limits are established based on meeting ambient targets during 7Q10 flow conditions, the Region also determined that it was critical to control phosphorus inputs during the entire growing season. Ex. 9 at *id.*; Ex. 13 at 39-40 n. 29. This reasonably conservative approach is important in aquatic systems where the cycle of cultural eutrophication is already underway, as is the case in the Ashuelot River. Ex. 13 at *id.* Excessive phosphorus discharged during the growing season accumulates in plant biomass and can often be retained in the system through settling in slow moving/impoundment sections of the river. *Id.* Phosphorus can then recycle into the water column, exacerbating eutrophic conditions during critical periods. *Id.* In order for the river to be restored to health, this cycle must be broken by limiting the amount of excessive phosphorus

available for uptake by aquatic plants. *Id.* In the Region's experience, aquatic plant growth begins in April and continues through October in New England rivers. *Id.*

Finally, the Region imposed the winter effluent limit of 1.0 mg/l in order to minimize the potential for particulate phosphorus that settles in the sediments, recycles in the water column during the warmer months and promotes plant growth. Ex. 9 (Fact Sheet) at 20; Ex. 13 (RTC) at 58. Although the Region understood that high river winter flows will help to flush particulate phosphorus downstream, merely displacing the effects of such loading further downstream does not address the underlying water quality concern. Ex. 13 at *id.* There is still a potential for phosphorus to settle behind impoundments downstream. *Id.* As discussed above, one key function of a nutrient criterion is to protect downstream receiving waters. *Id.* (citing Gold Book at 241).

b. Procedure

The City's prior permit was issued on April 15, 1994, and expired on April 15, 1999. Ex. A.10 at 1. The expired permit was administratively extended pursuant to 40 C.F.R. § 122.6(a)(1) because the City timely filed a complete application for permit reissuance under 40 C.F.R. § 122.21.

From June 22, 2006 to August 25, 2006, the Region solicited public comments on a draft NPDES permit ("Draft Permit"). A public hearing was held on July 27, 2006, at the Keene Public Library in Keene, New Hampshire. Ex. 21 (AR D.1) (Transcript of Public Hearing). At the public hearing, the Region extended the original public comment period, scheduled to expire on August 24, 2006, by an additional 21 days, pursuant to a written request from the City. *Id.* at 26-

27. Extensive comments were received from the City and its consultant, Camp, Dresser and McKee. Additional comments were received from the Town of Swanzey Sewer Commission and Barbara Skuly, the chairman of Ashuelot River Local Advisory Committee.

After preparing a response to comments and obtaining certification pursuant to CWA § 401 from the State, *see* Ex. 22 (AR A.3), EPA issued a final permit authorizing the discharge on August 24, 2007. On September 28, 2007, the City timely petitioned the Board for review of the Final Permit. Upon reviewing the City's Petition, the Region issued a notice of uncontested and severable conditions on October 18, 2007, putting the portions of the permit that had not been challenged into effect on December 1, 2007.

II. STANDARD OF REVIEW

This Petition for Review was brought pursuant to 40 C.F.R. § 124.19(a), which creates a direct appeal to the EAB of federally-issued NPDES permit decisions. Although the Board has broad authority to review decisions made in NPDES permit cases, EPA intended the Board's power of review to be exercised "only sparingly." *See* 44 Fed. Reg. 32853, 32887 (June 7, 1979). With respect to appeals under Part 124 regarding NPDES permits, EPA policy calls for most such permits to be finally adjudicated at the regional level. *Id.*

In proceedings brought under 40 C.F.R. § 124.19(a), the Board generally will not grant review unless the petitioner establishes that a permit condition is based on a clearly erroneous finding of fact or conclusion of law, or involves an exercise of discretion or an important policy consideration that the Board determines warrants review. 40 C.F.R. § 124.19(a)(1)-(2); *In re Carlota Copper Co.*, 11 E.A.D. 692, 708 (EAB 2004). The burden of demonstrating that review is warranted rests with the petitioner. 40 C.F.R. § 124.19(a); *see Rohm & Haas*, 9 E.A.D. 499,

504 (EAB 2000). A petitioner must argue with specificity why the Board should grant review. *In re Puerto Rico Electric Power Authority*, 6 E.A.D. 253, 255 (EAB 1995). To meet the threshold of specificity required under 40 C.F.R. § 124.19(a), a petitioner must take two necessary steps: (1) state the objections to the permit that are being raised for review, and (2) explain why the Region's previous response to those objections is clearly erroneous or otherwise warrants review. *See Michigan Dep't of Env'tl. Quality v. EPA*, 318 F.3d 705, 708-09 (6th Cir. 2003) (citing *In re Puerto Rico Elec. Power Auth.*, 6 E.A.D. at 255).¹⁷ Thus, the mere repetition of objections made during the comment period or the "mere allegation of error" without specific supporting information are insufficient to warrant review. *In re Phelps Dodge Corp.*, 10 E.A.D. 460, 496, 520 (EAB 2002); *In re Knauf Fiber Glass, GmbH*, 9 E.A.D. 1, 5 (EAB 2000).

Additionally, clear error or reviewable exercise of discretion is not established simply because petitioner presents a difference of opinion or alternative theory regarding a technical matter. *In re Town of Ashland Wastewater Treatment Facility*, 9 E.A.D. 661, 667 (EAB 2001). Instead, when a petitioner challenges the Region's technical judgment, "[p]etitioners must provide

¹⁷ Under the regulations that govern this permitting proceeding, a permit issuer must "briefly describe and respond to all significant comments on the draft permit." 40 C.F.R. § 124.17(a)(2). The Board has interpreted this provision as meaning that a response to comments need not be of the same length or level of detail as the comments and that related comments may be grouped together and responded to as a unit. *E.g.*, *In re Hillman Power Co., LLC*, 10 E.A.D. 673, 695-97 & n.20 (EAB 2002); *In re NE Hub Partners, L.P.*, 7 E.A.D. 561, 582-84 (EAB 1998), review denied sub nom. *Penn Fuel Gas, Inc. v. U.S. EPA*, 185 F.3d 862 (3d Cir. 1999). The Board has also held, however, that a response to comments must address the issues raised in a meaningful fashion and that the response, though perhaps brief, must nonetheless be clear and thorough enough to adequately encompass the issues raised by the commenter. *See, e.g., Hillman*, 10 E.A.D. at 696 n.20. Moreover, the administrative record must reflect the permit issuer's "considered judgment." *In re Austin Powder Co.*, 6 E.A.D. 713, 720 (EAB 1997). In other words, the permit issuer "must articulate with reasonable clarity the reasons for its conclusions and the significance of the crucial facts it relied upon in reaching those conclusions." *In re Ash Grove Cement Co.*, 7 E.A.D. 387, 417-18 (EAB 1997).

compelling arguments as to why the Region’s technical judgments or its previous explanations of those judgments are clearly erroneous or worthy of discretionary review.” *Id.* at 668 (citing *In re Ash Grove Cement Co.*, 7 E.A.D. 387, 404 (EAB 1997)). Moreover, where the science in an area is uncertain, a contrary opinion urged by a petitioner will neither establish that a rational, adequately explained judgment by the Region is clearly in error nor overcome the Board’s traditional deference to regional technical determinations. *In re Dominion Energy Brayton Point, L.L.C.*, 12 E.A.D. 490, 511 (EAB 2006). This particularly heavy burden advances the policy imperative of “ensur[ing] that the locus of responsibility for important technical decisionmaking rests primarily with the permitting authority, which has the relevant specialized expertise and experience.” See *In re Peabody W. Coal Co.*, 12 E.A.D. 22, 34 (EAB 2005), citing *In re NE Hub Partners, L.P.*, 7 E.A.D. 561, 567-68 (EAB 1998), rev. denied sub nom. *Penn Fuel Gas, Inc. v. EPA*, 185 F.3d 862 (3d Cir. 1999). (“[W]here a permit decision pivots on the resolution of a genuine technical dispute or disagreement, the Board prefers not to substitute its judgment for the judgment of the decisionmaker specifically tasked with making such determinations in the first instance.”) In such cases, deference to the Region’s decision is generally appropriate if “the record demonstrates that the Region duly considered the issues raised in the comments and if the approach ultimately selected by the Region is rational in light of all of the information in the record.” *NE Hub Partners* at 567-68. If conflicting views of the Region and a petitioner indicate “bona fide differences of expert opinion or judgment on a technical issue, the Board typically will defer to the Region.” *Id.* at 567-68.

III. ARGUMENT

1. **THE REGION DID NOT COMMIT REVIEWABLE ERROR, ABUSE ITS DISCRETION OR RAISE AN IMPORTANT POLICY CONSIDERATION WARRANTING REVIEW IN ESTABLISHING THE PERMIT LIMITS FOR PHOSPHORUS**

Petitioner alleges that the Permit's phosphorus limits are based on erroneous findings of fact. First, Petitioner contends that the Region's conclusion that the Ashuelot River is culturally eutrophic contradicts the State's position on the matter. *See* Petition at 4-5. Second, Petitioner argues that the Region misconstrued chlorophyll *a* data when assessing the trophic state of the river, ignored more recent data provided by the City, and compounded its mistake by failing to account for recent phosphorus load reductions from various point and nonpoint sources. *See id.* at 5-6. Third, Petitioner claims that the Region improperly analyzed dissolved oxygen supersaturation data, again ignored more recent data collected provided by the City, and once more exacerbated its error by failing to recognize phosphorus source reductions. *See id.* at 7-8. As demonstrated below, Petitioner has not carried its burden of showing that the Region committed any clear error of fact or other reviewable error in issuing the Permit with these conditions. Therefore, Petitioner's request for review should be denied.

a. **The Region Did Not Commit Any Error of Fact By Establishing the Permit's Phosphorus Limits Under Section 301(b)(1)(C) of the CWA**

Petitioner argues that the Region committed clear error of fact by concluding that the Ashuelot River was culturally eutrophic and that discharges from the Keene WWTF were contributing to such conditions despite the absence of any "evidence that the State believes that the Keene WWTP is contributing nutrients which cause cultural eutrophication." *See* Petition at 4-5. The City asserts that the State has never identified Ashuelot River as culturally eutrophic, which in its view implies that the State does not believe the river to be so impaired. In support of

this position, the City cites to a draft State document entitled “Plan for Adoption of Nutrient Water Quality Criteria,” which states, “based on...reports and professional experience, we believe there are not many New Hampshire waterbodies for which water quality does not support designated or existing uses (primarily aquatic life and swimming) due to cultural eutrophication enrichment.” *See* Petition at 4; Ex. 23. As further evidence of the State’s ostensible position on this issue, Petitioner observes that the 303(d) listing for the segment into which the Keene WWTF discharges identifies the source of water quality impairment as “Municipal (Urbanized High Density Area),” as opposed to specifically identifying the facility, as has been done in other instances. *See* Petition at 4-5.

The Region specifically addressed both of these points in its Response to Comments. First, the Region observed that the Petitioner’s reliance on the draft policy’s statement regarding the number of eutrophic water bodies in the State essentially begged the question at the center of the Permit and now on appeal:

The Region does not need to rebut the NHDES’s view in its draft policy concerning the overall number of nutrient impaired waters prior to imposing a phosphorus limit. Even if the Region agreed with NHDES’s assessment, the question would still remain whether the Ashuelot River is among those few impaired waterbodies.

See Ex. 13 (RTC) at 36. In answer to this question, the Region in the Fact Sheet and Response to Comments cited to the extensive evidence of impairment resulting from nutrient enrichment in the Ashuelot River elsewhere in the Fact Sheet and Response to Comments, much of which is essentially undisputed by the City in its Petition (*e.g.*, instream phosphorus concentrations above all recommended values in EPA guidance and the peer reviewed literature set forth in the record;

existence of visual impairments consistent with eutrophication, *etc.*) *Id.* at 23-28, 36; Ex. 9 (Fact Sheet) at 16-19.

Second, with respect to the particular formulation used for the 303(d) listing, the Region explained that it had sought and received clarification from the State that it is not appropriate to infer that NHDES's broad characterization of the source of the impairment as "Municipal (Urbanized High Density Area)" was intended to exclude the Keene facility. *See* Ex. 13 (RTC) at 49-50. Rather, NHDES clarified to EPA that the broad phrasing was used because the DO violations were occurring upstream and downstream of the WWTF and, consequently, "DO violations were not due entirely to the Keene WWTF but rather to a combination of point and nonpoint source[s]." Ex. 24 (AR I.12) (Email from Gregg Comstock, NHDES, to Jeanne Voorhees, EPA-Region 1, dated October 13, 2006).

In addition to rebutting the factual premise of the commenter's argument, the Region explained the function of a 303(d) listing and its relationship to the other provisions of the CWA, noting that regardless of whether a particular pollutant appears on the state's current 303(d) list, "EPA is obligated to impose a water quality-based effluent limit for a pollutant if there is a reasonable potential that the discharge will cause or contribute to a violation of water quality standards. *See* CWA § 301(b)(1)(C) and 40 C.F.R. § 122.44(d)(5)." *See* Ex. 13 (RTC) at 50 n 33. Even if the State had not believed a phosphorus effluent limit to be necessary in order to ensure compliance with relevant water quality standards, that would not have been dispositive. EPA would still have been bound to exercise its independent judgment and impose a limit if it determined one was necessary to protect water quality standards. *See NRDC v. U.S. EPA*, 279 F.3d 1180, 1186 (9th Cir. 2002) ("Under the CWA, the EPA has its own independent obligation

to determine whether a permit will comply with the states' [WQSs]."). EPA's regulations likewise interpret the statute to impose such an independent duty upon the Agency when it issues an NPDES permit. *See* 40 C.F.R. §§ 122.4, 122.44(d)(1), (5). *See also* *Arkansas v. Oklahoma*, 503 U.S. 91, 110 (1992) (explaining that 40 C.F.R. § 122.4(d) "effectively incorporates into federal law those state-law standards the Agency reasonably determines to be applicable").

Although the Region gave the Petitioner's comments due consideration, Petitioner does not squarely confront, or even acknowledge, the Region's responses and explain why they are clearly erroneous or otherwise warrant review. Instead, the City basically reiterates comments made on the Draft Permit. Compare Ex. 13 (RTC) at 34-36, 48 with Petition at 4-5. Mere repetition of objections made during the comment period or "mere allegations of error" without specific supporting information are, however, insufficient to warrant review. *Puerto Rico*, 6 E.A.D. at 255. On this basis alone, review should be denied.

Petitioner's argument should also be rejected on substantive grounds. The Region's technical analysis pertaining to the trophic state of the Ashuelot was rational, was supported by substantial evidence and thus should be upheld as reasonable. The Region's reasoned conclusions on this issue, grounded firmly in the record through ample citation to site-specific data, EPA guidance, and peer-reviewed scientific materials, cannot be overturned simply on the basis of a negative inference drawn from a November 19, 2007 draft State policy and a narrow reading of a 303(d) listing not shared by NHDES. In fact, Petitioner's claims about the State's true position are mere surmise.

Conjecture on the part of Petitioner cannot form the basis of a finding of clear error.¹⁸ See *In re Three Mountain Power, LLC*, 10 E.A.D. 39, 58 (EAB 2001) (“The Board will not overturn a permit provision based on speculative arguments.”); *In re Texas Indus, Inc.*, 2 E.A.D. 277, 279 (Adm’r 1986) (“Less speculation and more empirical evidence is needed by petitioner to justify review of the permit.”). Such a showing does not amount to a demonstration of error, much less the type of compelling demonstration of error required to disturb the Region’s carefully considered technical determination. Review should thus be denied.

b. The Region Did Not Commit Any Error of Fact In Its Analysis of Water Column Chlorophyll *a* Data

*(i) Petitioner’s Arguments Regarding Water Column Chlorophyll *a* Data*

Petitioner asserts that EPA wrongly concluded that the Ashuelot River was at risk of eutrophication (*i.e.*, “mesotrophic”) based on its analysis of the available chlorophyll *a* data. See Petition at 5-6. Rather, Petitioner contends that the receiving waters are not eutrophic, but rather

¹⁸ While the State has in the past expressed a desire to use a completed, EPA-approved TMDL as the basis for the Keene WWTF phosphorus effluent limit and indicated that such a TMDL could potentially yield a less stringent limit than 0.2 mg/l, the fact remains that the Ashuelot River TMDL is still years away from completion and, indeed, has not even been delivered in draft form to the Region. As mentioned above, it has been undergoing development since 2000. Because the Ashuelot River is currently suffering from cultural eutrophication as a result of ongoing point source phosphorus loading from the Keene WWTF and in light of numerous past delays regarding completion of the Ashuelot River TMDL, the Region believed it was reasonable to move forward with a water quality-based effluent limit without waiting for a final, EPA-approved TMDL. See Ex. 13 (RTC) at 30. NHDES has never presented the Region with any water quality-based rationale to justify imposition of a limit less stringent than the one included in the Permit, which was determined to be sufficiently low to ensure compliance with the NH Standards following a lengthy, highly technical inquiry.

they are “oligotrophic.”¹⁹ In support of its argument, Petitioner claims that chlorophyll *a* concentrations immediately downstream of the Keene WWTF are below the 15 ug/l threshold used by the State in the context of 303(d) listing decisions, a number Petitioner claims has been established by the State to be a “de facto” water quality criterion. *Id.* at 5; *see* Exhibit 25 (NHDES Description of River Water Quality Parameters) at 1. Chlorophyll *a* concentrations immediately downstream of the facility, Petitioner notes, are also below the oligotrophic/mesotrophic boundary set forth in Table 4 of the Fact Sheet (*i.e.*, <4 ug/l). *Id.* The City bases its conclusion that the Ashuelot River is not eutrophic on chlorophyll *a* data relied upon by the Region in developing the Draft Permit as well as more recent volunteer river monitoring data included in its comments on the Draft Permit, which Petitioner alleges the Region ignored. *Id.* Although Petitioner expressly concedes that chlorophyll *a* levels several miles downstream of the Keene WWTF *are* in excess of even the State’s purported de facto criterion, the City implies those result from the Swanzey WWTF discharge. *Id.* at 6. Finally, Petitioner argues that “numerous nutrient discharges to the Ashuelot river have been eliminated” and the Region’s reliance on stale data erroneously led it to impose an overly stringent limit. *Id.* at 6.

The Region considered each of these points in the Response to Comments. The Region first observed that the chlorophyll *a* value of 15 ug/l has neither been adopted by NHDES as a water quality criterion nor been approved by EPA, and thus the premise of the City’s argument

¹⁹ This trophic status is “characterized by a small supply of nutrients (low nutrient release from sediments), low production of organic matter, low rates of decomposition” and high DO. Ex. 12 (Nutrient Technical Guidance Manual) at Appendix D, A-86.

was faulty. Ex. 13 (RTC) at 36.²⁰ The Region also explained that NHDES has been using a chlorophyll *a* value of 15 ug/l as a threshold value for 303(d) listing determinations related to nutrient impacts to a single designated use only—primary contact recreation—and not to assess nutrient related impacts on other designated uses, such as aquatic life. *Id.* As the Region noted in the Response to Comments, when authorizing a discharge pursuant to an NPDES permit, however, the Region is obligated to consider *all* applicable designated uses and water quality criteria. *Id.* at 18-19. The Region further noted that the available technical literature and EPA guidance suggests that water column chlorophyll *a* criteria will likely need to be significantly less than 15 ug/l in order to be sufficiently protective of standards. *Id.* As noted above, the Region has an independent obligation to ensure that an NPDES permit contains effluent limits stringent enough to comply with water quality standards. Moreover, the State itself specifically states that the chlorophyll *a* threshold of 15 ug/l is provided “only as general guidance.” *Id.* at 43. Finally, the Region expressed technical and conceptual reservations about the capacity of a chlorophyll *a* criterion alone to capture the full range of adverse nutrient related impacts. *Id.* at 35, 43.

EPA also considered, responded to, and after due consideration rejected, Petitioner’s interpretation of the existing chlorophyll *a* data in the record. EPA acknowledged that these data indeed indicate, at least at certain stations, chlorophyll *a* concentrations below the mesotrophic

²⁰ Given the City’s concern over the Region’s imposition of a phosphorus effluent limitation in the absence of a numeric water quality standard promulgated and approved in accordance with CWA § 303, *see infra* at Section III.2.b, its proposal to treat a chlorophyll *a* value referenced in a State listing document as a de facto criterion is contradictory at best. Moreover, the same document relied upon by Petitioner as proof that the State has adopted a de facto chlorophyll *a* criterion of 15 ug/l also states that ambient total phosphorus should not exceed 0.05 mg/l, a concentration that is indisputably being exceeded in the receiving water immediately downstream of the Keene WWTF. *See* Ex. 25 at 4. The City does not, however, claim that this latter value should as well be viewed as a de facto criterion. Petitioner cannot have it both ways.

threshold of 4 ug/l set forth in the Fact Sheet. Ex. 13 (RTC) at 38, 46, 48-49. However, the Region observed that the chlorophyll *a* data referenced by Petitioner were not necessarily representative of downstream chlorophyll *a* concentrations, whereas there remains undisputed record evidence of chlorophyll *a* levels well above 4 ug/l. Specifically:

[T]he chlorophyll *a* data cited does not support the conclusion that the receiving waters are free from excessive plant growth. It only indicates that some stations do not have excessive water column algae, which is one component of aquatic plant growth. As documented in the Fact Sheet, excessive water column algae is present at other stations.

Id. at 48-89. *See, e.g., id.* at 24 (indicating chlorophyll *a* levels as high as 69.64 ug/l several miles downstream of the Keene WWTF). This variability is due to the fact that water column chlorophyll *a* concentrations are highly dependent on the hydrology of the river (*e.g.*, flow velocity, presence of dams or impoundments) and surrounding physical features (*e.g.*, riparian canopy). *Id.* at 35-36.

This variability also led the Region to caution against an over-reliance on water column chlorophyll *a* as the sole indicator of eutrophication. Ex. 13 (RTC) at 35, 43, 46. Thus, the Region stated:

[Chlorophyll *a*] is not adequate as the *only* indicator of eutrophication to document the full extent of nutrient related impacts in most rivers/streams, because stream segments with high current velocity, low turbidity/color, open canopy, shallow stream depth, minimal scouring, limited macroinvertebrate grazing, gravel or larger substrata, and smaller depth to width ratio would be expected to have a high periphyton biomass, which is not measured by water column chlorophyll *a*. For instance, in river reaches where macrophytes and/or periphyton dominate, these indicators of eutrophication also need to be considered in the development of numeric criteria. *Id.* at 35-36.

To illustrate that instream chlorophyll *a* concentrations may not be fully reflective of downstream water quality impacts, the Region cited to an NHDES survey conducted on August 16, 2001, that

recorded observations of periphyton (75% coverage) and scattered/common macrophyte coverage at Station 16-Ash, which is immediately downstream of the Keene WWTF, and stated, “[t]his demonstrates that nuisance plant growth resulting from cultural eutrophication conditions can prevail even where chlorophyll *a* levels are relatively low (3.44 ug/l).” *Id.* at 38.²¹

In addition, the Region stated that even if a chlorophyll *a* value of 15 ug/l were used, it would not alter the Region’s ultimate determination. The data documented in the Fact Sheet and in the Response to Comments demonstrate—and the City in its Petition concedes—that even 15 ug/l was being exceeded a short distance from the Keene WWTF in the receiving water downstream of the Swanzey WWTP.²² *Id.* at 36; Petition at 6. Due to the tendency of phosphorus to be retained in the water column and/or transported downstream, EPA nutrient guidance emphasizes—as does the Region in its Response to Comments—that when establishing phosphorus effluent limits, a permit issuer must taken into account downstream impacts of the pollutant. *See, e.g.,* Ex. 9 (Gold Book) at 241; Ex. 12 (Nutrient Technical Guidance Manual) at 5 (“In flowing systems, nutrients may be rapidly transported downstream and the effects of nutrient inputs may be uncoupled from the nutrient source[.]”) at 3. *See also* discussion *supra* at Section I.2.a. Thus, notwithstanding the

²¹ The Region also observed that the volunteer river monitoring data were not collected under critical low flow conditions in the context of rejecting the use of such data to assess DO impacts in the Ashuelot River. Ex. 13 (RTC) at 9-10.

²² In response to a claim by the City that dead algae in the Swanzey’s WWTP’s effluent was causing elevated chlorophyll *a* levels, the Region conducted a mass balance analysis and concluded, “It is clear that the Swanzey WWTF chlorophyll *a* accounts for a relatively small fraction of in-stream chlorophyll *a* observed downstream.” Ex. 13 (RTC) at 45. The Region determined that the chlorophyll *a* levels are largely a result of excess plant productivity, which is primarily caused by upstream phosphorus discharges from the Keene WWTF and to a lesser extent by much smaller phosphorus loading from the Swanzey WWTF. *Id.* The City did not contest the Region’s analysis.

fact that chlorophyll *a* levels *immediately* downstream of the discharge were comparatively low, the existence of chlorophyll *a* levels above the State's 303(d) listing threshold value a few miles downstream of the Keene WWTF tends to favor *application* rather than removal of the protective phosphorus effluent limit in the City's discharge permit.

In its Petition, the City essentially repeats its earlier comments verbatim, contesting neither the factual nor legal predicates of the Region's careful re-examination of the chlorophyll *a* data prompted by City's comments and included in the Response to Comments. Compare Ex. 13 (RTC) at 44 with Petition at 5-6. In so doing, the City makes the same error that the Region cautioned against in its Response to Comments: high concentrations of chlorophyll *a* weigh in favor of a conclusion that eutrophication is occurring in a water body, yet the converse is not true. Indeed, adopting Petitioner's view of chlorophyll *a* could lead one to erroneously conclude that certain stretches of the Ashuelot River are not eutrophic even in the face of undeniable visual manifestations of cultural eutrophication (*e.g.*, "stinking" mats of floating duckweed, turbidity, large amounts of attached periphyton). *See supra* at Section II.2.a.ii. Petitioner's decision to essentially repeat its earlier comments verbatim is fatal to its claim for review. *See Knauf*, 9 E.A.D. at 5. Its failure to confront the Region's explanation is all the more striking because its burden is particularly heavy where the Region's technical and scientific judgment—the interpretation of chlorophyll *a* data and the inferences drawn therefrom—is at issue. *See Ashland*, 9 E.A.D. at 667. As Petitioner has also failed to carry its burden on this count, the Board should deny review.

(ii) Petitioner's Arguments Regarding Phosphorus Source Reductions

In its Response to Comments, the Region also addressed Petitioner's argument that recent phosphorus nonpoint source reductions had obviated the need for a limit and that failing to take these reductions into account resulted in error. The reductions cited by Petitioner related primarily to the elimination of illicit connections to storm water drains. The Region concluded that reliance upon the earlier data collected in 2001 and 2002 was reasonable, stating, "The information provided by Keene does not identify the magnitude of the nonpoint source load reductions associated with these improvements," and that "it is very unlikely that they would justify imposition of a less stringent phosphorus limit, in part because these loadings would be relatively small in proportion to [POTW] point source loading." Ex. 13 (RTC) at 53. To illustrate, the Region pointed out that the combined point source loading from the Keene and Swanzey WWTFs represented approximately 65% of the total phosphorus loading into the Ashuelot River. *Id.*

In addition to nonpoint source reductions, the City also referenced recent reductions of phosphorus effluent discharges from the City as another reason to forego a phosphorus effluent limit in the Permit. *Id.* at 52. The Region disagreed. After consulting discharge monitoring report data, the Region concluded that the Keene WWTF effluent discharge still contains phosphorus in concentrations that will cause or contribute to violations of water quality standards, observing that "recent months['] average monthly phosphorus effluent concentrations have ranged from a low of 0.75 mg/l in June 2006 to a high of 1.55 mg/l in April 2006, both well above the 0.2 mg/l that the Region has determined to be necessary to ensure compliance with water quality standards." *Id.*

With respect to future potential reductions cited by Petitioner in its comments, such as, for example, compliance with an interim limit that may be imposed after the permit is issued through an administrative order and possible dam removal, the Region explained that, “[i]n order to reasonably factor future reductions into its analysis, the Region would require a heightened level of assurance and specificity in order to conclude that such reductions will actually occur. *See, e.g.,* 40 C.F.R. § 122.44(d)(1)(ii) (directing EPA to consider ‘existing controls on point and nonpoint sources of pollutions’ when evaluating reasonable potential).” Ex. 13 (RTC) at 53 (emphasis added). Regarding Petitioner’s claim that dam removal would lead to improvements in the receiving water, the Region agreed that restoring the riverine flow would improve aquatic habitat in the Ashuelot, but from a perspective of nutrient impacts would also “result in the transport of greater amounts of phosphorus downstream to other reaches with significant aquatic plant growth and may exacerbate nutrient impacts below the Keene WWTF.” *Id.* at 52. The Region voiced qualms over the “potential for phosphorus to settle behind impoundments downstream, for example in South Winchester and Hinsdale,” and determined that, “[m]erely displacing the effects of such loading further downstream does not address the underlying water quality concern.” *Id.*

Rather than substantively confronting the Region’s response, Petitioner instead reiterates its original comments, essentially word for word. Compare Ex. 13 (RTC) at 50-52 with Petition at 5-6. The burden of demonstrating why the Region’s subsequent explanations are clearly wrong or otherwise warrant review falls squarely on the Petitioner. *See Puerto Rico Elec. Power Auth.*, 6 E.A.D. at 255. As mentioned, the burden is especially heavy where the Petitioner seeks review of the Region’s technical expertise. *See Ashland*, 9 E.A.D. at 667. As the City has not carried its

“particularly heavy burden,” the Board should decline to substitute its judgment for that of the Region’s experts and should deny review. *See Peabody*, 12 E.A.D. at 33. *See also Three Mountain Power, LLC*, 10 E.A.D. at 58 (“The Board will not overturn a permit provision based on speculative arguments.”)

c. **The Region Did Not Commit Any Error of Fact In Its Analysis of Dissolved Oxygen Data**

Petitioner contends that the Region’s conclusions regarding dissolved oxygen impacts in the Ashuelot River are based on outdated data and “ignores DO data collected more recently, including the 2001-2002 TMDL data²³ and the 2002-2005 Volunteer River Monitoring Program

²³ After making a cursory reference to the 2001-2002 TMDL data and alleging that the Region ignored such data, Petitioner does not to pursue this point in its Petition. The City made two points with respect to these data, both of which were addressed by the Region. First, the City stated that the TMDL data showed upstream violations of the minimum DO saturation requirement and the minimum DO criterion of 5 mg/l and that these upstream influences suggest that the Keene WWTF is not responsible for adverse DO responses in the river. Ex. 13 (RTC) at 48. The Region considered the relevance of upstream DO impairments to the need to impose a phosphorus effluent limit on the Keene WWTF, as the Region explained in its Response to Comments (at 50) and again explains in the main body this document, *infra* at p. 49-50. In its Petition, the City offers no response.

City may also be referring to comments it made on the Draft Permit regarding the relationship between algal biomass and dissolved oxygen. Specifically, after noting the TMDL data indicated the absence of any violations of the State’s 5 mg/l DO and a single instance of DO saturation falling below the 75% criterion in a particular impoundment downstream of the Keene WWTF, the City concluded that “algae have no particular adverse impacts on the dissolved oxygen regime of the Ashuelot.” Ex. 13 (RTC) at 48. The Region disagreed with this conclusory assessment, observing that eutrophic bodies can maintain DO levels above 5 mg/l because “high productivity during the day elevates DO levels to a point where they do not fall below 5 mg/l when respiration occurs at night.” *Id.* at 50. The Region also noted that it “looks to a broad range of causal and response variables” in addition to DO impacts since DO is not the most reliable indicator of eutrophication. *Id.* The Region in addition pointed out eutrophication has adverse impacts on uses independent of its impact on DO. *Id.* Finally, the Region did not ignore, but rather carefully considered the TMDL data, concluding, “Continuous monitoring data collected for the TMDL which is under development shows that violations of this criterion occurred both upstream and downstream of the treatment plant at stations 16D-Ash and 16B-Ash

data.” See Petition at 6-8. In its Petition, the City specifically asserts that the volunteer river monitoring program data shows that supersaturated conditions exist upstream of the Keene WWTF where instream phosphorus concentrations are below 0.1 mg/l. See Petition at 7. Petitioner also observes that, at most stations, dissolved oxygen varies between 87 and 95 percent saturation, apparently relying on recent NHDES data collected in 2006. *Id.* Petitioner further claims that the removal of downstream dams heighten the Region’s error. *Id.*

The Region adequately responded to each of the issues raised by Petitioner in its Response to Comments. The Region concluded that the 2002-2005 volunteer river monitoring data were of little use in evaluating the existence of supersaturation because they were collected at the wrong time (*i.e.*, many of the samples were collected in the early morning when DO levels would be near minimum daily values). *Id.* at 49. The Region also questioned the validity of the sample showing upstream supersaturation:

Out of five years worth of volunteer monitoring data, only data on July 26, 2003 showed DO levels above saturation. Supersaturated levels of DO in ambient waters can result from excessive plant productivity and/or the entrainment of oxygen as water flows over a dam. Since the data was taken in the early morning when the DO levels would not be elevated by plant productivity (*i.e.*, photosynthesis), and the stations are not below dams, the validity of this sample is questionable. This conclusion is further supported by the low pH values (plant productivity/photosynthesis elevates in-stream pH levels), and the fact no other surveys show supersaturated DO levels above the Keene WWTF. In fact, only one volunteer monitoring survey (July 31, 2001) collected afternoon DO data. *Id.*

After reviewing the data provided by Petitioner, the Region additionally observed that Petitioner had failed to note the existence of supersaturated conditions (with a peak value of 144%) at

and also shows that the 5 mg/l criterion was nearly violated at station 16D-Ash (a low value of 5.07 was recorded on 8/17/2001).” *Id.* at 9, 32 (observing that the TMDL data show numerous violations of DO saturation criteria). The City does not address any of these points in its Petition.

stations downstream of the Keene WWTF. *Id.* Absent a mechanical aeration mechanism, a water body would be unlikely to become supersaturated except due to photosynthesis. *Id.*

With respect to minimum DO saturation, the Region acknowledged that while the recent 2002-2005 volunteer monitoring data provided by the Permittee did not indicate violations of the State saturation criterion, such data were not obtained under low flow summer conditions and would not be expected to reflect DO under summer 7Q10 conditions. *Id.* at 32. Consequently, the Region determined that “these recent data do not impact EPA’s fundamental conclusion that imposing a phosphorus effluent limit on the Keene WWTF is necessary to ensure compliance with water quality standards[.]”²³ *Id.* The Region rejected the use of the 2006 data for similar reasons, noting that they not only were preliminary, but were collected at stream flows approximately 10 times the 7Q10. *Id.* at 50.

More fundamentally, the Region rejected the City’s view that the existence of DO impairments upstream of the facility militated against imposing a phosphorus effluent limit on the Keene WWTF:

The fact that nonpoint sources of pollutants, including phosphorus, may be causing some impairment at upstream stations does not change the fact that under 7Q10 conditions there is documented cultural eutrophication and the Keene WWTF dominates the phosphorus loading even when considering upstream loading. *Id.* at 50.

²³ Petitioner again repeats its argument that the Region’s purported error in examining the dissolved oxygen data in the record gains heightened importance given past and future dam removal. Petitioner partially quotes the Region’s response that the future removal of the Homestead Mill Dam in 2008 will improve water quality and aquatic habitat, but misleadingly excludes the Region’s related explanation that dam removal will merely displace the effects of eutrophication to downstream impoundments and will not be sufficient to ensure compliance with water quality standards. For this reason, as the Region has explained, the critical element of restoring uses in the Ashuelot River remains reducing the point source loading of phosphorus into the river. Ex. 13 (RTC) at 52.

As the Region has noted, there is no continuous point source discharge of phosphorus upstream of the Keene WWTF. *Id.* at 28. Under conditions during which the TMDL sampling was undertaken, the Keene WWTF represented approximately 72.3% of the annual total phosphorus loading and the nonpoint sources only 27.7% immediately downstream of the Keene WWTF. *Id.* Thus, the Region concluded that, Petitioner's observation did not persuasively counsel against imposition of a phosphorus effluent limit on the facility.²⁴

In its Petition, the City references a portion of the Region's response with respect to the volunteer monitoring data:

EPA attempts to discount this [sic] data on the grounds that its [sic] was 'not obtained under low flow summer conditions.' However, the City is currently obtaining DO data during low flow conditions and will continue to do so through future low flow conditions. Data developed during the summer of 2007 is consistent with the aforementioned data showing no violations of the minimum DO saturation criteria.

However, the Region has never seen the data to which Petitioner refers, and they were not relied on directly or indirectly during the development of the Permit. These data are thus outside the administrative record and should not be considered. *See In re Gen. Motors Corp.*, 5 E.A.D. 400, 405 (EAB 1994) (declining to consider data developed after the final permit decision). In addition, this is not a demonstration of clear error, but instead appears to acknowledge the legitimacy of the Region's original objection. With this single exception, Petitioner otherwise reacts to the Region's explanation and analysis of the data outlined above by repeating its comments verbatim. Mere repetition of objections made during the comment period or "mere

²⁴ In a less forgiving light, the logical implications of the City's arguments appears to cut against its own interest. If conditions above the Keene WWTF are *already* undergoing significant, adverse dissolved oxygen impairments, then significant additional point source phosphorus loading from the Keene WWTF would only exacerbate such conditions.

allegations of error" without specific supporting information are insufficient to warrant review.

Phelps, 10 E.A.D. at 496, 520.²⁵ As no compelling reason is offered that would cast the Region's technical judgments into question on this issue, the Board should decline to review it. *Ashland*, 9 E.A.D. at 667.

2. THE REGION DID NOT COMMIT REVIEWABLE ERROR, ABUSE ITS DISCRETION OR RAISE AN IMPORTANT POLICY CONSIDERATION WARRANTING REVIEW IN DERIVING A NUMERIC EFFLUENT LIMIT TO IMPLEMENT THE STATE'S NARRATIVE PHOSPHORUS CRITERION

Petitioner argues that the Region's imposition of a phosphorus effluent limit to implement the State's narrative nutrient criterion constitutes reviewable error because it violates the State's draft nutrient policy and was established in the absence of a TMDL. *See* Petition at 8-10.

Petitioner also contends that reliance on the Gold Book recommended value to establish a phosphorus effluent limit which would control cultural eutrophication constitutes an impermissible attempt to establish a State water quality standard. *See* Petition at 8-10. Petitioner does not demonstrate error, abuse of discretion or the existence of an important policy consideration warranting review regarding any of these issues.

a. State Draft Nutrient Policy

Petitioner argues that the Region's approach is inconsistent with the State draft nutrient policy, which rejects the statistically driven, reference condition-based approach to deriving nutrient criteria described in the ecoregional criteria document in favor of a numeric limit for chlorophyll *a*. *See* Petition at 8. The City states that, "While EPA may indeed be right that it is not legally bound to follow the State's Nutrient Policy in imposing a permit limit, the fact that it is

imposing a permit limit in direct contravention to the State's Nutrient Policy warrants enhanced scrutiny by this Board, particularly where the financial consequences of EPA's Permit decision are so severe." *Id.* at 10.

In the Response to Comments, the Region addressed these points. The Region raised a number of concerns with respect to relying on the State draft nutrient policy. First, the plan as submitted to the Region by the City was (and remains) in draft form, Ex. 13 at 34-35, 43, and it was therefore unclear what weight, if any, the Region should afford the document. Second, the plan was not an EPA-approved policy within the meaning of 40 C.F.R. § 131.13, *id.* at 43, and the Region was therefore not bound to follow it, a point which Petitioner expressly concedes. Indeed, the State has never requested the Region to abide by it. Third, the draft policy in its current form was of limited use to the Region in deriving a phosphorus effluent limitation for both conceptual and practical reasons: the Region pointed out that the policy's stated intent to rely on chlorophyll *a* as the single measure of eutrophication would fail to capture the full range of nutrient-related impacts, *id.*, and the Region also observed that any criteria based on a response variable like chlorophyll *a* must also include a translating mechanism for establishing limits on the causal variable (*i.e.* phosphorus), *id.* at 35-36. *See also* discussion of draft policy and chlorophyll *a supra* at Section III.1.a, b.

In its Petition, the City does not address any of the Region's responses regarding its decision not to follow the State's draft policy or its views on the appropriate use of chlorophyll *a* in assessing trophic impacts. Here, as above, the City merely echoes, to a large extent word for word, its comments on the Draft Permit, while adding that departure from the policy combined

with the large cost associated with the treatment plant upgrade warrant review.²⁶ To obtain review, Keene must do more than simply reiterate comments made during the public comment period without substantively confronting the permit issuer's subsequent explanations. *See Knauf*, 9 E.A.D. at 5. Review of the Region's approach with respect to the State's draft nutrient policy should therefore be denied.

b. Implementation of Narrative Nutrient Criterion

Petitioner contends that the Region's use of its "recommended" Gold Book criterion to calculate an effluent phosphorus limit constituted an impermissible attempt to establish a State water quality standard inconsistent with the provisions of section 303 of the CWA. Petition at 10-11.

Contrary to the commenter's claim, the Region's imposition of an effluent limit consistent with the Gold Book value of 0.1 mg/l is not an attempt to establish a State water quality criterion for nutrients. In its Response to Comments, the Region dealt with this issue in detail and clearly explained that the limit was being imposed under the existing NH Standards under the authority of federal law, specifically section 301(b)(1)(C) of the CWA, and that the narrative nutrient criterion was being implemented in accordance with federal regulations located at 40 C.F.R. § 122.44(d)(1)(vi). Ex. 13 (RTC) at 19-20, 41. As previously noted, *supra* at Section I.1.a, 40 C.F.R. § 122.44(d)(1)(vi) describes three options available to permit writers when deriving numeric effluent limits from narrative water quality criteria. None of these involves the

²⁶ It is uncontroverted that cost is not a legitimate basis to challenge a water quality-based effluent limit, which the Region explained in the Response to Comments. Ex 13 (RTC) at 34.

establishment of water quality standards. Rather, these are merely three options for permit writers to use when interpreting existing state narrative water quality criteria.

Of the three, 40 C.F.R. § 122.44(d)(1)(vi)(B) is the one utilized by the Region in deriving the phosphorus effluent limitation in the Permit and the one relevant to this appeal. That section authorizes permit issuer's to "[e]stablish effluent limits on a case-by-case basis, using EPA's water quality criteria, published under section 304(a) of the CWA, supplemented where necessary by other relevant information." EPA's criteria guidance documents, including the Gold Book, the Recommended Ecoregional Nutrient Criteria and the Nutrient Technical Guidance Manual, are published pursuant to section 304(a) of the Act. *See* 33 U.S.C. § 1314(a). Each document contains information that is useful both in the development of numeric water quality criteria *and* in the establishment of water quality-based NPDES permit limits.

Consistent with this regulation, when determining the trophic status of the receiving waters and deriving a protective site specific phosphorus effluent limit that would meet the narrative phosphorus criterion, the Region looked to a variety of sources, including the Gold Book, the Recommended Ecoregional Nutrient Criteria, the Nutrient Technical Guidance Manual and peer-reviewed scientific literature. Ex. 13 (RTC) at 19. The Region explained that it used Section 304(a) information and recommended criteria as *guidance* to interpret the State's narrative criterion for nutrients for 40 C.F.R. § 122.44(d)(1)(vi)(B) and not as substitutes for state water quality criteria. *Id.* The Region's use of the Gold Book and other relevant materials published under Section 304(a) to develop a numeric phosphorus limit sufficiently stringent to achieve the narrative nutrient criterion is entirely consistent with applicable NPDES regulations and is

reasonable.²⁷

In its Petition, the City does not address any portion of the Region's rationale regarding its imposition of a numeric limit pursuant to Section 301(b)(1)(C) and 40 C.F.R. § 122.44(d)(1)(vi), but instead has simply reiterates its comments on the draft permit. Compare Ex. 13 (RTC) at 19 with Petition at 8-11. Yet, "Petitioners for review may not simply repeat objections made during the comment period; instead they must demonstrate why the permitting authority's response to those objections warrants review." *Knauf*, 9 E.A.D. at 5.²⁸ In choosing not to confront the Region's explanation of its derivation of the Permit's phosphorus limits, Keene continues to simply ignore several critical points that distinguish the actual adoption of water quality standards from the options set forth in 40 C.F.R. § 122.44(d)(1)(vi) for interpreting the criteria such standards contain. Thus, review should be denied.

3. THE REGION DID NOT COMMIT REVIEWABLE ERROR, ABUSE ITS DISCRETION OR RAISE AN IMPORTANT POLICY CONSIDERATION WARRANTING REVIEW BY IMPOSING A PHOSPHORUS

²⁷ Petitioner states: In fact, EPA recognizes that its Gold Book recommendation constitutes an "attempt to characterize reference conditions on a broad ecoregion or sub-ecoregion scales *irrespective of designated uses . . . or levels of refinement within the same type of designated use . . .*" (*Id.* at p. 5). Thus, EPA's Gold Book criteria, upon which EPA ultimately based its proposed Permit limit, is *not* related to the protection of designated uses in New Hampshire's Class B streams." Petitioner is mistaking the Recommended Ecoregional Nutrient Criteria, which EPA considered but opted not to use in this particular case, with the effects-based approach actually taken by the Region. Ex. 13 (RTC) at 34-35.

²⁸ Keene's challenge must also fail to the extent it can be construed as a challenge to the regulation. The Board has repeatedly recognized that the regulations authorizing appeals to the Board contemplate review of conditions of permits, not review of the statutes and regulations which are predicates for such conditions. *See, e.g., In re City of Port St. Joe & Fla. Coast Paper Co.*, 7 E.A.D. 275, 286-87 (EAB 1997) (rejecting challenge to validity of regulations or policy judgments underlying them in permit appeal proceeding); *see further In re Suckla Farms, Inc.*, 4 E.A.D. 686, 696 (EAB 1993).

EFFLUENT LIMIT PRIOR TO COMPLETION OF A TMDL

Petitioner argues that the Region's imposition of a phosphorus limit in the absence of a TMDL constitutes reviewable error and an abuse of discretion. *See* Petition at 11.

The Region addressed this issue in the Response to Comments. When reissuing an NPDES permit, EPA is obligated as a matter of statute and regulation to include any water quality-based effluent limitations necessary to ensure compliance with applicable water quality standards. *See* Ex. 13 (RTC) at 30. *See also* CWA § 301(b)(1)(C); 40 C.F.R. §§ 122.44(d)(1), (5) (requiring EPA to incorporate “any more stringent limitation, treatment standards, or schedule of compliance requirements established under Federal or State law or regulations in accordance with” section 301(b)(1)(C)); 40 C.F.R. § 122.4(d) (prohibiting permit issuance where “the imposition of conditions cannot ensure compliance with water quality requirements of all affected states”). Thus, upon establishing that there was a reasonable potential for phosphorus concentrations in the Keene WWTF's effluent to cause or contribute to a violation of water quality standards, the Region was compelled to include a phosphorus effluent limit sufficiently stringent to ensure compliance with standards. *See* 40 C.F.R. § 122.44(d)(1)(i).

As it explained in the Response to Comments, neither the CWA nor EPA regulations require that a TMDL be completed before a water quality-based limit may be included in a permit. *See* Ex. 13 (RTC) at 30-31; Ex. 9 (Fact Sheet) at 7. Rather, water quality-based effluent limitations in NPDES permits must be “consistent with the assumptions and requirements of any *available* [emphasis added] wasteload allocation.” 40 C.F.R. § 122.44(d)(1)(vii)(B). Thus, an approved TMDL is not a precondition to the issuance of an NPDES permit for discharges to an

impaired segment. This interpretation is consistent with the preamble to 40 C.F.R. § 122.44(d)(1), which expressly outlines the relationship between subsections 122.44(d)(1)(vi) (*i.e.*, procedures for implementing narrative criteria), and subsections (d)(1)(vii):

The final point about paragraph (vi) is that in the majority of cases where paragraph (vi) applies waste load allocations and total maximum daily loads will not be available for the pollutant of concern. Nonetheless, any effluent limit derived under paragraph (vi) must satisfy the requirements of paragraph (vii). Paragraph (vii) requires that all water quality-based effluent limitations comply with "appropriate water quality standards," and be consistent with "available" waste load allocations. Thus for the purposes of complying with paragraph (vii), where a wasteload allocation is unavailable, effluent limits derived under paragraph (vi) must comply with narrative water quality criteria and other applicable water quality standards.

54 Fed. Reg. at 23,876. If a TMDL is eventually issued by NHDES and approved by EPA, the the phosphorus effluent limitation in any subsequently issued NPDES permit must be consistent with the wasteload allocation assigned to the Keene WWTF. Until then, however, the Region must base effluent limits for phosphorus on its interpretation of the narrative criteria in the currently approved water quality standards. Indeed, the purpose of water quality standards is not only to "establish the water quality goals for a specific water body" but also to "serv[e] as the regulatory basis for establishment of water quality-based treatment controls and strategies beyond the technology-based level of treatment required by section 301(b) and 306 of the Act." *See* 40 C.F.R. § 130.3. In this case, as explained above, the Region considered the long delays associated with completion of the TMDL for the Ashuelot River in addition to the existing cultural eutrophication in the Ashuelot River, and concluded it was reasonable to move forward to impose a water quality-based phosphorus effluent limitation even in the absence of a TMDL. Ex. 13 (RTC) at 30.

Petitioner has not attempted to demonstrate why the Region's explanations were

flawed—indeed, they have not even acknowledged them. Petitioner has merely repeated its earlier objections, an approach that this Board has repeatedly held is insufficient to warrant review. *Phelps*, 10 E.A.D. at 496, 520. Review of the challenged phosphorus limit and the related TMDL issue should be denied.

IV. CONCLUSION

For the foregoing reasons, the Petitioner's review for Board review should be denied.

Respectfully submitted,



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