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Office of Ecosystem Protection
1 Congress Street
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Glenn Haas, Director
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Mass. Dept. of Environmental Protection
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Re: Comments on draft Modification of NPDES Permit No. MA0100480 issued to the City of Marlborough, Massachusetts authorizing discharges into the Assabet River from its Westerly Waste Treatment Works

Dear Mr. Perkins and Mr. Haas,

The Organization for the Assabet River (OAR) is pleased to submit the following comments on the above referenced draft Modification increasing the Westerly wastewater treatment facility's average annual flow limit from 2.89 million gallons per day (mgd) to 4.15 mgd. OAR is a private non-profit watershed organization established in 1986 to protect, preserve, and enhance the natural and recreational features of the Assabet River, its tributaries and watershed. OAR has approximately 1,000 members and operates a successful EPA-approved volunteer water quality and stream flow monitoring program, a large-scale volunteer annual river clean-up, and a variety of educational workshops, canoe trips and other activities designed to foster enjoyment and good stewardship of the river.

OAR opposes the decision of EPA and MassDEP to allow the City of Marlborough to discharge an additional 1.26 mgd of treated effluent from the Marlborough Westerly wastewater treatment plant (WWTP) [1] to the Assabet River. The additional 1.26 mgd represents a 40% increase in flow from the Westerly Plant and is nearly equal to the Town of Maynard's entire permitted discharge of 1.45 mgd. The increased discharge is proposed largely to allow a 56% increase in the wastewater allocation to the town of Northborough, which utilizes the Marlborough Westerly plant through an Intermunicipal agreement.[2] If Northborough managed its own wastewater, the City of Marlborough would already have sufficient capacity at the Westerly plant (2.89 mgd) to handle increases in its own wastewater flows over the next twenty years.[3]

[1] The terms WWTF, WWTP and POTW are used interchangeably herein.
[2] This increase would be a 103% growth over Northborough's 2006 flow to the Westerly plant.
[3] CWMP Final Report, Marlborough, October 2007.

OAR objects to the increased effluent discharge and associated permit modifications because these allowances will delay and likely prevent restoration of Assabet River water quality by making future (Phase 2) phosphorus load reductions at the wastewater treatment plants more expensive and technically difficult to achieve. As is discussed in the Comments section below, EPA and MassDEP may not lawfully issue permits that allow for increased discharges without a demonstration that water quality standards will be met in the receiving water. As described in the Background section immediately following this Introduction, studies undertaken to determine whether water quality standards will be met in the Assabet River with the phosphorus mass load contained in this modification have thus far *not* made such a demonstration. Indeed, to the extent that they demonstrate anything, it is that water quality standards can not be met with the proposed new discharges under any reasonably anticipated scenario.

The new mass limits for phosphorus do not meet water quality standards and the flow increase violates state and federal antidegradation rules and MassDEP's TMDL for the Assabet River.[4] If granted, the extensive sewering in Northborough would severely decrease groundwater flows and stream flows in several trout streams. Increased effluent discharges will further increase the volume of unregulated pollutants, including pharmaceuticals, contained in the effluent entering the public drinking water supply of Billerica.[5] These concerns are described in detail following the Background section, below, which describes the Assabet River's eutrophication problem and the status of TMDL implementation.

BACKGROUND

The Assabet River

The Assabet River flows from Westborough for 31 miles through the city of Marlborough and the towns of Northborough, Berlin, Hudson, Stow, Maynard, Acton and Concord before joining the Sudbury River to form the Concord River, which empties into the Merrimack River, and then the Atlantic Ocean. The Assabet drains a 178-square mile watershed, home to some 177,000 residents. After decades of neglect, the Assabet began to come back to life in the late 1980s, when construction of wastewater treatment facilities eliminated discharge of raw sewage into the river. Since then the river's recreational use has grown. In 1999 the Assabet, Sudbury and Concord rivers were added to the nation's federal Wild and Scenic River system. RiverFest, an annual celebration of these three rivers, held 49 river-based events in 2008, from canoe trips to a fishing class, hosted by 57 individuals and organizations in the watershed. As the river's popularity as a recreational resource has grown, area residents have become increasingly active in its stewardship.

Yet much of the Assabet still suffers each summer and early fall from severe eutrophication--excessive nuisance plant growth, bad odors, and degraded recreation and wildlife habitat--as a result of an overload of nutrients from the WWTPs that discharge to the river (see photos in Attachment A). The river is impounded along its length by seven old mill dams and two flood control dams dating from the 1960s (Attachment B). The Assabet does not meet its designated Class B ("fishable and swimmable") state water quality standard. The current degraded condition of the River, and its causes, are well documented in MassDEP's TMDL for the Assabet River. The TMDL report describes the Assabet as an effluent-dominated, nutrient enriched (eutrophic) system. It states:

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[4] *Assabet River Total Maximum Daily Load for Phosphorus, Report No: MA82B-01-2004-01*, 2004.

[5] The Assabet River is a major tributary of the Concord River a designated treated public drinking water supply, which is the Town of Billerica's sole source of public drinking water. Assabet WWTPs contribute approx. 12 million gallons of effluent to the Concord River each day. When the Assabet plants reach their currently permitted design flows, that volume will increase to 15 mgd.

> "Due to the high phosphorus loading from the four major POTWs [publicly-operated treatment works] and the effects of the impoundments, the Assabet River is experiencing abundant rooted macrophyte growth and frequent excessive accumulations of *Lemna* species (duckweed) which often cover the river's surface, particularly in the slow moving reaches, embayments, and impoundments. Decay of dying duckweed causes odors and violations of dissolved oxygen standards. Excessive growths of both floating and rooted macrophytes are detrimental to primary and secondary contact recreation." (pp. 15-16)

The TMDL concluded: "To achieve the water quality goals embodied in this TMDL, stringent control of point source discharges of phosphorus from POTWs which discharge to the Assabet River will be needed in combination with a 90% reduction of sediment phosphorus loads." (p. 7) Phosphorus recycling from the sediments occurs in the impoundments created by the 6 mill dams (the 7th is breached) where nutrients are trapped, and stimulates explosive aquatic plant growth in the summer and fall.

Progress on Meeting Water Quality Goals: TMDL Implementation to Date

The TMDL prescribes a two-phase, ten year, "adaptive management" approach in which MassDEP and EPA jointly issue Phase 1 and Phase 2 NPDES discharge permits to the four municipal WWTPs. Phase 1 "interim" phosphorus limits on WWTP discharges were designed by MassDEP and EPA as an initial step toward meeting water quality standards. The agencies issued the Phase 1 permits in 2005 with limits of 0.1 mg/L Total Phosphorus (TP) during the growing season and ten times this (1.0 mg/L TP) during the winter. The permits remain in effect and contain a schedule for up-grading the WWTPs by 2010. The upgrade of the Marlborough WWTP is currently out of compliance with this schedule. The plant has also not met winter TP discharge limits currently in force.[6] During Phase 1 the communities were expected to evaluate the potential of sediment or dam removal to achieve the 90% reduction in sediment phosphorus flux specified in the TMDL.

In 2010, MassDEP and EPA will establish Phase 2 phosphorus limits – limits that will achieve water quality standards. In a 2005 letter to the municipalities with public WWTPs, MassDEP and EPA warned: "Depending on whether sediment remediation can reduce sediment phosphorus contributions enough to achieve water quality standards in the Assabet River, your facility may be required in the next permitting cycle to meet a more stringent 'Phase 2' limit by 2014."[7] It further stated: "Consistent with the TMDL implementation schedule, EPA and DEP will initiate development of Phase 2 permits in Spring 2008. If we determine that sediment remediation is unlikely to achieve necessary phosphorus reductions based upon the information available at that time, the agencies will establish new Phase 2 phosphorus effluent limits designed to ensure compliance with water quality standards." These statements are a reiteration of the TMDL: "Phase 2 limitation will be established in permits to be reissued in 2009 [now 2010[8]] if sediment remediation, based upon results of the sediment/dam evaluation, is not pursued, and/or new phosphorus criteria that may be developed in the interim by DEP and EPA are applicable." (p. 9)

In 2005 the US Army Corps of Engineers (ACOE) commenced a study of sediment and dam removal under the direction of MassDEP who is acting on behalf of the communities that use WWTPs

[6] Marlborough Westerly WWTP, January 2008 Discharge Monitoring Report, 2/6/08.
[7] Letter to Nancy Stevens, Donald Cowles, Paul Blazar and Walter Sokolowski from Ira Leighton, EPA and Robert Golledge, DEP, dated April 28, 2005. Attachment C herein.
[8] The final 5-year permits went into effect in 2005.

discharging to the river, known as the Assabet Consortium.[9] In the meantime, these Assabet communities have begun making multi-million dollar investments in WWTP upgrades to replace aging equipment and install new tertiary phosphorus removal technology capable of meeting the Phase 1 NPDES permit limits.

Status of the ACOE Study & Findings to Date

The ACOE commenced the *Assabet River Sediment and Dam Removal Study* in 2005 and is nearing completion. The study is intended to assess the feasibility of removing 90% of sediment phosphorus flux (i.e., phosphorus in sediment which is re-circulated in the water column) through either removing sediment, removing the 6 mill dams, or both. The study did not analyze the impact of further reducing growing season phosphorus limits at the WWTPs. It did, however, investigate the influence of winter phosphorus loads from the WWTPs on growing season in-stream phosphorus concentrations. The study did not model specific winter phosphorus limits at the WWTPs as part of this analysis.

At this time, the full ACOE report is not complete. However, the *Modeling Report* component of the study was completed in June 2008 by subcontractor Camp Dresser & McKee (CDM) for the ACOE. The Modeling Report concludes: "Of the alternatives evaluated in this study, no alternative or combination of alternatives is projected to result in a 90 percent reduction in phosphorus flux….Results of this modeling study suggest that the most beneficial improvements to Assabet River water quality can be achieved through planned WWTP improvements [Phase 1 limits], dam removal, and consideration of lower winter effluent limits than currently planned."[10]

The study recommended:

- Remove Ben Smith dam and if possible, Gleasondale and Hudson/Route 85 dams
- Remove sediment behind dams as part of dam removal to prevent sediment from moving downstream subsequent to dam removal
- Lower winter WWTP phosphorus discharge below 1.0 mg/L
- Dredging or sediment removal is not an effective alternative in reducing sediment flux. Dredging/sediment removal is proposed only in conjunction with dam removal to prevent the redistribution of accumulated sediment.[11]

As noted above, CDM recommended removing the Ben Smith Dam, the Gleasondale Dam and the Hudson Dam, adding: "The removal of the Ben Smith dam is a key component contributing to the system meeting the TMDL goal of 90% sediment phosphorus flux reduction…"[12] However, in May 2008 the owner of the Ben Smith Dam filed for a preliminary permit with the Federal Energy

[9] The Assabet Consortium consists of: Westborough, Shrewsbury (discharges to Westborough plant), Marlborough, Northborough (discharges to Marlborough Westerly plant), Hudson, and Maynard.
[10]. Assabet River Sediment and Dam Removal Study: Modeling Report. June 2008. Camp Dresser & McKee, p. ES-2.
[11] *Id.*, p. 6-8.
[12]. Assabet River Sediment and Dam Removal Study: Modeling Report. June 2008. Camp Dresser & McKee, p. 6-2.

Regulatory Commission (FERC) for a hydroelectric project.[13] This project would depend upon the Ben Smith Dam remaining in place.

OAR'S COMMENTS ON THE DRAFT NPDES PERMIT MODIFICATION:

1. The draft permit does not comply with the federal and Massachusetts Clean Water Acts.

A. The following mass total phosphorus limits will not meet water quality standards: Total Phosphorus (TP) 2.4 lbs/day average monthly load (April, May-Oct.); the Total Phosphorus (TP) 24 lbs/day average monthly load (Nov.-March); and the Total Phosphorus (TP) 4.8 lbs/day maximum daily load (April only).

Regulations promulgated under the Clean Water Act provide that no NPDES permit may be issued "[w]hen the imposition of conditions cannot ensure compliance with the applicable water quality requirements of all affected States."[14] In the case of the Marlborough Easterly plant which discharges to Hop Brook in the Sudbury River watershed, the NPDES discharge permit was remanded because EPA Region 1 "failed to demonstrate . . . that the Permit, as written, will ensure compliance with applicable Massachusetts water quality standards."[15] The proposed Modification for the Marlborough Westerly plant violates this requirement.

As established in the TMDL, the above phosphorus load allocations provide reasonable assurance that the water quality standards will be met *only* if the quantity of phosphorus recycled and released by the sediments, known as "sediment phosphorus flux," is reduced by 90%. However, CDM's 2008 phosphorus flux modeling concludes that none of the dam or sediment removal alternatives would result in a 90% phosphorus flux reduction. In other words, phosphorus loads from the wastewater treatment plants must be further reduced because the 90% reduction cannot be achieved through dredging and dam removal alone. Furthermore, the Study recommended reducing winter total phosphorus limits below 1.0 mg/L at the Westerly and other treatment plants:

> "This study also resulted in significant findings regarding the seasonality of sediment phosphorus flux. An additional consideration to meet the TMDL target of 90% reduction in sediment phosphorus flux is winter phosphorus discharge limits for at [sic] WWTFs. Based on results of this modeling effort, it was concluded that winter limits for the WWTFs, below the current planned limit of 1 mg/L would contribute significantly to the reduction in sediment phosphorus flux.
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> "If no other improvements were implemented, further reductions in summer P discharge limits, below 0.1 mg/L, would not contribute significantly to further reduction in sediment phosphorus flux. This is because the winter instream phosphorus concentration has such a strong effect on the P flux the following summer." (Sec. 6, p.7)[16]

[13] Letter from Donald Clarke, Counsel to Wellesley Rosewood Maynard Mills LP to FERC, et al., dated July 11, 2008. In 2007 WRMM LP received a $500,000 grant from the Massachusetts Renewable Energy Trust to study, design and construct a hydropower system.
[14] 40 CFR § 122.4(d).
[15] *City of Marlborough, Massachusetts, Easterly Wastewater Treatment Facility*, NPDES Appeal No. 04-13, Environmental Appeals Board, Aug. 11, 2005, at 9 ("Hop Brook case").
[16] The current, Phase 1, permits limits for Total Phosphorus are: 1.0 mg/L (Nov.-March), 0.1 mg/L (April-Oct).

The Study did not identify specifically what the lower winter limits should be. The Study also did not evaluate the impact of lowering phosphorus concentrations and loads from the treatment plants during the growing season. As noted above, CDM asserted in the study that lower growing season limits would provide little benefit to the river as long as winter loads remained high, i.e., at 1.0 mg/L Total Phosphorus (TP), which corresponds to the new 24 lbs TP/day winter limit in the draft permit modification.

The TMDL, however, did establish that lower phosphorus limits at the treatment plants during the growing season would produce the same water quality results as the selected TMDL allocation[17] (the "planned improvements" in the CDM Study), with less reliance on sediment flux reductions and less uncertainty. Specifically, the TMDL documented that a growing season effluent limit of 0.05 mg/L TP would attain standards in combination with a 75%--instead of a 90%--sediment flux reduction. Despite this information, EPA and MassDEP chose as their preferred alternative for Phase 1 NPDES permitting, the TMDL allocation with the greatest uncertainty with respect to reduction of sediment phosphorus. The agencies have done this again in the draft permit modification by using mass limits for phosphorus that assume sediment phosphorus flux can be reduced 90% by means of dredging and dam removal.

In addition, the most current EPA guidance documents and reports support even lower total phosphorus limits in the range of 0.020 mg/L to 0.024 mg/L. In 2000, EPA issued its recommended nutrient criteria or "reference conditions" for river and streams located in Ecoregion XIV, which includes all of Massachusetts and three Level III sub-ecoregions.[18] EPA's Level III sub-ecoregion 59, also known as the Northeastern Coastal Zone, includes the Assabet River watershed. The recommended Total Phosphorus criterion or reference condition for this Level III sub-ecoregion is 0.02375 mg/L (hereafter rounded to 0.024 mg/L).[19] This criterion was empirically derived to represent conditions of surface waters that are minimally impacted by human activities and protective of aquatic life and recreational uses.[20]

In 2003, the New England Interstate Water Pollution Control Commission published a study, conducted by ENSR, of instream nutrient data for New England rivers and streams.[21] This EPA-funded report, which included phosphorus data collected from Massachusetts rivers and streams in 1994-1998, confirmed the earlier recommendations of EPA's 2000 guidance document. Specifically, the more comprehensive phosphorus data set analyzed by ENSR for the Northeastern Coastal Zone (EPA sub-region 59) showed that in minimally impacted rivers and streams, the expected total phosphorus concentration would be in the range of 0.020 mg/l – 0.022 mg/L,[22] slightly less than the 0.024 mg/L total phosphorus criterion recommended in EPA's 2000 guidance document.

Because the Marlborough Westerly plant and the three other municipal plants discharging to the river serve as the Assabet's major tributaries under critical lowflow (7Q10) conditions and discharge

[17] The TMDL phosphorus load allocation selected for all Assabet municipal WWTPs, assuming a 90% reduction in sediment phosphorus flux, was: 0.1 mg/L TP (April 1-Oct. 31, the "growing season"). The mass load at the Westerly plant was set at 2.4 lbs/day TP (growing season). TMDL, p. 39, Table 10.
[18] *Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria; Rivers and Streams in Nutrient Ecoregion XIV*, US EPA, Office of Water, EPA 822-B-00-022, December 2000, AR Index Reference II.F.4.a.
[19] *Ibid*., page 15, Table 3a.
[20] Based on the 25th percentile of all nutrient data assessed from Level III, sub-ecoregion 59.
[21] *Collection and Evaluation of Ambient Nutrient Data for Rivers and Streams in New England, Data Synthesis Report, Final Report*, NEIWPCC, September 2003, AR Index Reference II.E.7.c.
[22] *Ibid*. pages 6-12, Table 6-4.

directly into or upstream of impoundments,[23] the Phase 2 effluent limits for total phosphorus should be comparable to background concentrations found in New England's healthy rivers and streams. The foregoing points to a course of action supported by the new data: the agencies need to define and establish more stringent winter and growing season phosphorus limits that will allow the river to meet water quality standards.[24]

B. **Allowing an increase in effluent discharged by any Assabet River WWTP will undermine the ability of the Westerly plant and all WWTPs discharging to the Assabet to comply with Phase 2 limits and hence the ability to meet water quality standards**.

The draft permit modification contains no mechanism to ensure compliance with Phase 2 limits, when issued, to meet water quality standards. To stay within a mass loading limit required under the TMDL, as soon as the currently permitted flow is exceeded, Marlborough's WWTP phosphorus-removal rates will have to be higher than previously anticipated. The Draft Statement of Basis shows that this would be 0.07 mg/L at the load specified in the permit modification. As a result, even higher removal efficiency in Phase 2 will be required.[25]

It is clear that the agencies recognized that the permit modification might undermine the ability of Marlborough to meet Phase 2 limits. The Draft Statement of Basis originally posted on the EPA website (Attachment D), and subsequently replaced, had clear requirements that the permittee not utilize a revised design flow until it "demonstrated that the Phase II effluent limit is technologically achievable at that facility." This requirement was eliminated from the subsequent Draft Statement of Basis.

Permitting an increase in effluent flow will have a ripple effect. The Assabet River is already dominated by effluent. During low flow conditions it is up to 80% effluent at the Maynard USGSS gage.[26] An increase in upstream discharge increases the proportion of effluent present in the streamflow required to dilute the discharge of downstream WWTPs. Thus an increase in effluent flow from one plant can trigger higher investments at another plant to meet Phase 2 limits. The town of Shrewsbury, which discharges via the Westborough WWTP at the Assabet headwaters, stated its intention to request an increase in effluent flow if the Marlborough request is successful: "The Town of Shrewsbury reserves its right to conduct a similar [antidegradation] study in the future concerning the impact of adding flows beyond the current flow limit of 7.68 mgd at the Westborough WWTP. Indeed, the Town of Shrewsbury might have undertaken such a study during the previous phase of this CWMP/EIR (Phase III) had it known that this option was available at the outset…"[27] This cascading effect of future effluent discharge increases should be of great concern to all communities in the watershed.

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[23] Discharges to impounded rivers and lakes require more stringent criteria than discharges to free-flowing rivers. *Quality Criteria for Water 1986,* EPA (EPA "Gold Book").

[24] The Syracuse NY WWTP, discharging to Lake Onondaga, has a year-round TP limit of 0.02 (12-month rolling average) with effect from Dec. 2012, and an interim year-round limit of 0.12 mg/L TP from 2006-Nov. 2012.

[25] For example, if EPA and DEP set Phase 2 growing season limits at 0.03 mg/L, with an associated mass load limit based on the original design flow, the Westerly plant at 4.12 mgd would have to meet a growing season TP load of 0.72 lbs/day (0.03 mg/L x 8.34 conversion factor x 2.89 mgd = 0.72 lbs/day) and 0.02 mg/L TP concentration (0.72/8.34 x 4.12 mgd = 0.02 mg/L). It has not been established that the upgraded Westerly WWTP will be able to consistently achieve a 0.02 mg/L TP concentration.

[26] TMDL, p. 13.

[27] Shrewsbury CWMP/FEIR, 2007, p. 2-15.

C. Increasing the average annual flow limit from 2.89 MGD to 4.15 MGD violates state water quality regulations because EPA, MassDEP, the City of Marlborough and the Town of Northborough failed to demonstrate that there is "no feasible alternative."

Antidegradation review is absent. Under the federal Clean Water Act and Massachusetts water quality regulations (314 CMR 4.00) an antidegradation review is required for the expansion of an existing wastewater treatment facility. Marlborough's request for a permit modification to allow a discharge flow increase is based on the document in Appendix A of the Marlborough FEIR/CWMP entitled "Marlborough Massachusetts Westerly Wastewater Treatment Facility Additional Information Related to Increased Flow to the Assabet River October 2007." The contents of this document, including the evaluation of alternatives to the flow increase, were challenged in comments on the draft and final CWMPs by OAR, the Town of Stow, Conservation Law Foundation, Wild & Scenic River Stewardship Council, and 14 environmental organizations. However, we have seen no review of this document or analysis of whether and how it meets the requirements of state and federal antidegradation provisions.

Further, the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) Secretary's Certificate (Ian Bowles, 12/03/07) on the final CWMPs for the Assabet Consortium states:

> "As part of the NPDES Permit Modification review process, the City of Marlborough will also be required to satisfactorily demonstrate to EPA and MassDEP that the proposed increase of the City's discharge flow limits would be in compliance with applicable water quality requirements for the Assabet River, would not cause or contribute to a violation of water quality standards, and that no feasible alternatives exist to the City's proposed wastewater flow increase, as described in the FEIR. In consultation with the MEPA Office, EPA has indicated that EPA's NPDES Permit Modification review process will require additional analysis of the City of Marlborough's proposed increase of the City's discharge flow limits and its potential impacts to the water quality standards and designated uses established for the Assabet River and its tributaries; to stream flows and watershed imbalances to the Assabet River and its tributaries; and to the Concord River, a designated Wild and Scenic River.
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> "The NPDES Permit Modification review process will also require the City of Marlborough to further evaluate water conservation, I/I [infiltration and inflow] removal and water reuse alternatives to identify additional opportunities to reduce Marlborough's and Northborough's future wastewater flow estimates." (pp. 9-10)

There is no evidence that the above analysis or evaluations by the City of Marlborough or the agencies have been done. It has not been demonstrated that the flow increase would not cause or contribute to a violation of water quality standards.

EPA's Response to Comments on the Draft NPDES Permits issued in 2004 (the permits currently in effect) states:

> "The agencies encourage Marlborough to explore other alternatives to address increased flow projections. *Any groundwater recharge of wastewater would be an improvement over direct discharges of wastewater* [emphasis added].Groundwater recharge provides additional treatment and attenuation of phosphorus in the effluent….The Assabet River is already dominated by effluents (approximately 80% of the river flow during low flow periods is wastewater.) At design discharge flows the percentage of the 7Q10 flow that is comprised of wastewater effluent is expected to approach 100%. Increasing flow still more would increase

the frequency and duration of conditions in which the river is comprised almost entirely of wastewater effluent and could further degrade the health of the waterway. As the TMDL Response to Comments also notes, effluent dominated flows are of concern in terms of public health (the Assabet River is the sole source of the Town of Billerica's public drinking water supply) as well as the health of fish populations." (p. 30)

Antidegradation rules allow an increase in effluent discharge only if there is *no feasible alternative*. The proposed increase violates the state's Antidegradation rule and in so doing violates MassDEP's TMDL which states: "Based upon the modeling results current permitted flows will be allowed. However, any request to increase a discharge beyond currently permitted volumes would require supporting documentation satisfying DEP's Antidegradation Policy that no other feasible alternative exists including, but not limited to, the discharge of additional treated effluent to groundwater to help restore tributary flows." (p. 8) As the Marlborough and Northborough Comprehensive Wastewater Management Plans (CWMPs) clearly documented, feasible alternatives do exist. MassDEP and EPA have chosen to disregard state and federal Antidegradation policy.

Where feasible alternatives exist, NPDES permittees must adopt those alternatives rather than increase their flow. Simply studying the alternatives does not comply with the law. OAR has pointed out in comments on the Final Comprehensive Wastewater Management Plans (CWMPs) of Northborough and Marlborough that there are indeed alternatives to an effluent flow increase.[28] Alternatives include: I/I reduction, water conservation and reuse, controls on sewer expansion, decentralized/package WWTPs, and ground disposal at the Boundary Street site (Northborough) or other sites. For Marlborough, severing the intermunicipal agreement would provide adequate capacity for Marlborough's needs throughout the planning period, and is thus an alternative.[29]

It appears that initially the agencies recognized that alternatives, such as source reduction of wastewater through water conservation and reuse, did exist. The Draft Statement of Basis (Attachment D), originally posted on the EPA website and subsequently replaced, required that the permittee evaluate alternatives through a Conservation/Reuse study with an EPA-approved scope of work, followed by a cost-effectiveness study. Comparison of the original Draft Statement of Basis with the subsequent Draft Statement of Basis, shows that the conditions under which the requested flow increase was to be granted have been significantly weakened. Further, the requirement to "participate in a …water conservation and/or reuse" evaluation, with no requirement to adopt its recommendations, is meaningless. No permit should be issued if there are feasible alternatives.

a. Groundwater discharge is feasible: The Marlborough and Northborough CWMPs show that land has been purchased by the town of Northborough next to the wastewater treatment plant for this purpose, and that a groundwater discharge is technically feasible. While it was rejected for financial reasons, it should be no surprise that groundwater discharge is more costly than discharge to the river. As noted by Conservation Law Foundation in comments on Marlborough's final CWMP: "cost and technological considerations may not be considered in setting water quality-based limitations in NPDES permits."[30] In setting the

[28] OAR comments to Ian Bowles, Secretary of Energy and Environmental Affairs, Nov. 26, 2007.
[29] Intermunicipal Agreement for Wastewater Collection, Treatment and Disposal between City of Marlborough, Massachusetts and Town of Northborough, Massachusetts, dated January 1, 1990, amended August 22, 2003.
[30] Conservation Law Foundation, November 26, 2007, Comments on City of Marlborough final Comprehensive Wastewater Management Plan and Environmental Impact Report, Phase III/IV – Evaluation of Most Feasible Options and Recommended Plan (EOEA No. 12348). Citing EAB decision: *Westborough and Westborough Treatment Plant Board*, 10 E.A.D. 297, at 312 (2002).

criteria for evaluating ground disposal sites in Phase II of the CWMP, all sites outside a 5 mile radius of the Marlborough Westerly WWTP were excluded. This severely constrained the analysis of alternatives, excluding package plants and decentralized systems that could reduce the flows to the existing WWTP. Such systems are in widespread use in other communities in the watershed.

In addition, while the cost differential between groundwater discharge and increased discharge to the river needs to be re-evaluated in light of the increased costs of discharge to the river that would be imposed by a permit modification (allowing increased discharge) and Phase 2 limits that reduce phosphorus concentrations to levels that meet water quality standards. That comparison has yet to be made. Without such a cost comparison in place, it is arbitrary and capricious to rule out groundwater discharge as too costly an alternative to increased discharge to the river.

b. Projected flows from the 2001 Needs Analysis (CWMP Phase I) should be revised to reflect changes in technology and successful efforts to conserve water.[31] Northborough has not reevaluated the wastewater projections of the Phase I (2001) study in light of new technologies or land use objectives. Reductions in projections were achieved by simply moving some sewer extension projects beyond the 2030 planning horizon. In addition, according to Marlborough's CWMP Phase IV report, the city has been successful in reducing wastewater flow by reducing residential per capita water use and reducing its infiltration and inflow (I/I) rate. This results in a major reduction of wastewater flow. However, the gains made by conservation have not been used to reduce effluent flows. Northborough also reduced residential water use substantially, but this sizeable savings does not appear to reduce the very high projected wastewater flows. (CWMP Phase I, p. 3-30)

c. Reduce Infiltration and Inflow. Northborough's final CWMP shows a high level of I/I into its sewer system in Industrial Area A. "During this period of seasonal groundwater elevation, infiltration represents more than half of the total wastewater flow from Northborough."[32] In addition to work performed by the town, Northborough should *require* developers to perform or fund I/I removal. A 2007 study prepared for EEA shows that MassDEP sets ratios from 4:1 to 10:1.[33] Both Marlborough and Northborough would benefit from requiring I/I offset ratios well over 3:1.

d. Require industrial and commercial enterprises to conserve water. Future industrial wastewater represents 79% of Northborough's anticipated new wastewater flows. These flow projections assume no water reuse**.** The town provides no evidence that current or future industries will be required to conserve water or reduce wastewater flows beyond basic state requirements. This is despite efforts by the Arc of Innovation 495/MetroWest

[31] See OAR comments on the Assabet Consortium CWMP/FEIRs dated Nov. 26, 2007, for a full discussion.
[32] Northborough CWMP Phase I Report, p. 2-44.
[33] In Saugus a 10:1 ratio was reduced to 6:1 once 250,000 GPD of inflow had been removed, and the ratio will go to 4:1 once 500,000 GPD removal is reached. "Minimizing Municipal Costs for Infiltration & Inflow Remediation: A Handbook for Municipal Officials", June 30, 2007, Prepared for EOEA, Watershed Improvement Program by Steven Perlman, NPRWA. p. 29.

Corridor Partnership to promote water reuse.[34] If the municipalities take water reuse seriously, then it should be factored into flow estimates over the 20-year time horizon.

e. Put institutional controls in place: The EEA Secretary's Certificate required the Final CWMPs to "include a description of those legal and institutional mechanisms that each Consortium community proposes to employ to control sewer connections and extensions…" (p. 10) Neither Marlborough nor Northborough have proposed or implemented bylaws to limit sewer connections in accordance with municipal plans and capacity. In contrast, other communities have taken concrete steps to preserve the integrity of their flow allocation. Westborough, for example, obtained Town Meeting approval to petition the State for Special Legislation to enact flow limiting by-laws which enable the town to deny sewer connections and enforce flow allocations to needs areas.

f. Investigate Innovative/Alternative Systems: I/A systems have the potential to reduce sewer connection needs. There are around 17 I/A technologies approved by MassDEP to replace failing septic systems. Northborough should demonstrate that these alternatives have been evaluated in its sewer needs areas. Decentralized facilities discharging to the ground have been used successfully in many communities, such as Acton.

D. **Ammonia-Nitrogen loads will increase**

The state's Antidegradation Review Procedure for Discharge Requiring a Permit under 314 CMR 3.03 states: "Any existing point source discharge containing nutrients in concentration that encourage eutrophication or growth of weeds or algae shall be provided with the highest and best practical treatment to remove such nutrients."[35] The lack of an average monthly mass load limit for Ammonia-Nitrogen will result in an increase of this nutrient pollutant in all seasons. The Anti-backsliding provision of the federal Clean Water Act prohibits modification of a permit "to "contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit." An increase in discharge without a limit on the mass load violates this provision.[36]

2. Other Impacts to Consider

A. **Metals, already present in toxic levels in impoundment sediments, and other pollutants, will increase.**

a. Metals will add contamination to already contaminated impoundment sediments. Average monthly copper concentration in the effluent discharged has been allowed to increased by 230%, from 13 ug/L to 30 ug/L. Given that sediments in downstream impoundments contain toxic levels of zinc, arsenic, lead, nickel, cadmium, chromium, and copper, no additional loading of metals should be allowed.[37] Unless the Hudson dam is removed, the metals will settle in the impoundment sediments, exacerbating contamination. Regarding bottom pollutants or alterations, state Water

[34] *Once is Not Enough: A Guide to Water Reuse in Massachusetts*, MAPC and 495/MetroWest Corridor Partnership, November 2005.
[35] Antidegradation Review Procedure for Discharge Requiring a Permit under 314 CMR 3.03, VII (c) 3 (Control of Eutrophication). Division of Water Pollution Control.
[36] 33 USC 1342 (o).
[37] *Sediment Studies in the Assabet River, Central Massachusetts, 2003*, USGS, Scientific Investigations Report 2005-5131, 2005, Fig. 11, Hudson impoundment, p. 16.

Quality Standard 314 CMR 4.05(5)(b) requires that, "all surface water shall be free from pollutants…or from alterations that adversely affect the physical or chemical nature of the bottom."

b. Antibacksliding rules, Clean Water Act (33 USC 1342(o)). The draft permit contains mass load limits for aluminum, copper and nickel, but for none of the other 120 EPA Priority Pollutants. All pollutants can be expected to increase with increased effluent flow unless proven otherwise. For example, there is no established limit for zinc, which is present in the Marlborough effluent at concentrations of 0.048 mg/L[38], discharging to the Assabet River in-stream concentration of 0.032, resulting in a net increase in pollutant concentration of 0.016 mg/L.[39] An increase in effluent flow will increase discharge of this pollutant.

c. The background level of nickel was not accounted for in the calculations establishing permitted nickel concentrations and loads. At low flow conditions, the receiving water is largely composed of effluent from the Westborough WWTP, which releases nickel at up to a 0.01 mg/L concentration.[40] In addition Nickel is present at a toxic probable effect level (PEL) in the Hudson impoundment downstream of the Marlborough discharge at 4 out of 7 sampling sites.[41] An increased flow discharge would add to this burden; additionally the nickel will settle on the uppermost layer of the sediment where it would have the maximum negative effect.

B. **The Modification fails to protect existing uses.** Increased flow violates Antidegradation Provisions of the Massachusetts Surface Water Quality Standards at 314 CMR 4.04 and the federal Clean Water Act (40 CFR 131.12(a)(l):

a. The existing uses of "aquatic life" are not protected. EPA guidance on protecting existing aquatic life/wildlife uses states: "Water quality should be such that it results in no mortality and no significant growth or reproductive impairment of resident species. Any lowering of water quality below this full level is not allowed."[42] Aquatic life is defined (314 CMR 4.02) as: "A native, naturally diverse, community of aquatic flora and fauna…" Recent studies show that WWTP effluent, typically containing pharmaceuticals and personal care products (PPCPs) and other endocrine disruptors, has a damaging effect on fish populations. See Attachment E. Assuming that the Marlborough Westerly WWTP discharge contains average quantities of these unregulated substances, it would be likely that the Assabet River aquatic life is negatively affected. In particular, male fish in effluent dominated streams have been found to develop female characteristics, leading to reproductive failure. The draft Modification provides no information about these and other contaminants. Nor does it document upstream concentrations of regulated pollutants.

[38] This concentration is below recommended water quality criteria of 120 ug/L or 0.12 mg/L.
[39] Marlborough West Plant, 4th Quarter Aquatic Toxicity, December 2006, Environmental Monitoring Laboratory, Inc., Wallingford CT.
[40] Whole Effluent Toxicity Report, Westborough WWTP, 2007-2008, EnviroSystems, Hampton NH. Low flow conditions used in copper effluent limits put the proportion of Westborough wastewater to clean base flow at 6:1 under 7Q10 conditions. Draft Permit Modification Statement of Basis, p. 5.
[41] *Sediment Studies in the Assabet River, Central Massachusetts, 2003*, USGS, Scientific Investigations Report 2005-5131, 2005, Fig. 11, Hudson impoundment, p. 16.
[42] *Water Quality Handbook*, Ch. 4: Antidegradation. EPA, updated 2007, p.5.

b. The existing uses of "treated water supply" are not protected. The Assabet River is a major tributary to the Concord River which is the sole public drinking water supply of the town of Billerica. The permitted wastewater flow contributed by the Assabet is 15 mgd. The concentration of unregulated pollutants in the untreated water, including contaminants of emerging concern such as PPCPs, will increase with additional effluent discharged to the Assabet, increasing overall pollution levels. There is no evidence that the current treatment systems of the Billerica drinking water supply system remove these pollutants. The Modification provides no information about these and other contaminants.

C. **The Modification will exacerbate water imbalance**. This draft permit modification will enable sewering plans to proceed, which are predicted to reduce streamflow in Assabet tributaries in Northborough upstream of the Marlborough WWTP. A 2004 USGS study showed that increasing sewering (particularly in Northborough), increasing water withdrawals to permitted volumes, and increasing WWTP discharge to permitted flows, will result in a significant increase in the percentage of streamflow which enters the Assabet River as wastewater.[43] The simulation also shows a 0.2 mgd decrease in September (the critical low-flow month) of non-storm tributary streamflows in Cold Harbor and Howard brooks in Northborough (Fig. 36 in the USGS Study), a 49% decrease in streamflow (see Attachment F to this letter). The simulation showed that Hop Brook would experience a 23% decrease in September streamflow. Northborough's Howard and Hop brooks both support brook trout populations. This model anticipated less sewer system expansion than proposed in the CWMP, and no increase in WWTP permitted flow, and is likely to underestimate the impact of Northborough's proposed sewer extensions.

D. **Effluent discharge limits are based on dilution by streamflow**. The TMDL notes the centrality of streamflow in determining effluent discharge limits: "While non-point sources must be considered, the seasonality of the eutrophication problem, as manifested by nuisance aquatic plant growth, is most directly related to the presently high loadings of phosphorus from the POTWs combined with limited inflow from groundwater during the natural growing season for aquatic vegetation." (p. 19) When WWTP discharges reach currently permitted design flows, in late summer and fall the river water will consist of nearly 100% effluent. Restoring streamflow, rather than depleting it, would have broad benefits.

CORRECTIONS TO DRAFT PERMIT MODIFICATION

Total Residual Chlorine limit in parentheses should be in micrograms (ug) not milligrams (mg). Winter CBOD maximum daily concentration should be in mg/L not lbs/day.

CONCLUSIONS

The proposed Modification does not meet the requirements of the Clean Water Act. The TMDL and new information from the government-funded ACOE study show that reductions in phosphorus flux from river sediments alone will not be a solution. Hence, the phosphorus loading from wastewater discharges will need to be reduced from the Phase 1 permit levels. This Modification, with added phosphorus mass loading limits, should have limits that meet water quality standards. As noted earlier, the agencies are engaged in developing Phase 2 limits at this time. All permits and permit

[43] *Simulation of Ground-Water Flow and Evaluation of Water-Management Alternatives in the Assabet River Basin, Eastern Massachusetts*, USGS, Scientific Investigations Report 2004-5114, 2004, p. 69.

modifications issued from this point onwards should contain discharge limits that will meet water quality standards given this new information, and contain enforceable schedules for meeting such discharge limits. We also urge the agencies to provide for an assessment of the impacts of contaminants of emerging concern, particularly pharmaceuticals, on Assabet River aquatic life without delay.

We hope that these comments are useful.

Yours sincerely,

Amanda Davis
Executive Director

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Barry Brenner, Town of Northborough
David Cash, Undersecretary for Policy, EEA
Philip Griffiths, Undersecretary for Environment, EEA
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US Representative Niki Tsongas
Senator Pamela Resor
Representative Cory Atkins
Representative Stephen LeDuke
Representative James Eldridge
Representative Patricia Walrath
Board of Selectmen, Town of Stow

Attachments

A: Photographs of Assabet River Eutrophication
B: OAR Newsletter Article on Dams
C: MassDEP/EPA Letter
D: Draft Statement of Basis for Marlborough Draft Permit Modification (posted 7/9/08 and withdrawn)
E: Selected references on pharmaceuticals in wastewater and their effects on aquatic life
F: Predicted impact of water withdrawals, sewering and wastewater discharge on streamflow

E. Selected references on pharmaceuticals in wastewater and their effects on aquatic life

Source: Statement of Robert M. Hirsch, USGS, April 15, 2008, before the Committee on Environment and Public Works, Subcommittee on Transportation Safety, Infrastructure Security and Water Quality regarding pharmaceuticals in the environment: http://www.usgs.gov/aboutusgs/news_events/testimony.asp

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Endocrine disruption found in fish exposed to municipal wastewater effluent: http://toxics.usgs.gov/highlights/wastewater_fish.html

F: Predicted impact of water withdrawals, sewering and wastewater discharge on streamflow

Current vs. Future Non-storm Streamflows in September		
Assabet Subbasin	**% Decrease in Streamflow**	**Municipalities**
Fort Meadow Brook	**98%**	Hudson, Marlborough
Cold Harbor & Howard Brooks	**49%**	Northborough, Shrewsbury, Boylston
Hop Brook	**23%**	Northborough, Shrewsbury, Westborough
Stirrup Brook	**10%**	Westborough, Marlborough

Source: Based on data from USGS, *Simulation of Ground-Water Flow and Evaluation of Water-Management Alternatives in the Assabet River Basin, Eastern Massachusetts*. Scientific Investigations Report 2004-5114. Future flows based on currently permitted water withdrawals and wastewater discharges, with extension of Northborough sewer system to all developed areas.