

I continue to feel that the subject strategy is not balanced or justified by evidence of nutrient enrichment that results in use impairment due to phosphorus in municipal discharges. The primary justification referenced in the revised strategy are the 21 water bodies identified on the Connecticut List of Waters Not Meeting Water Quality Standards due to nutrient enrichment and the assertion that nutrient enrichment has been identified as one of the most pressing water quality issues facing the nation as a whole to explain the emphasis that the EPA is placing on the issue. The Draft 2012 State of Connecticut Integrated Water Quality Report presently available on the DEEP website does not materially expand the listing of "freshwater waterbodies" identified as impaired due to nutrient enrichment caused by phosphorus in the 2008 Integrated Water Quality Report. Therefore, I continue to feel that the comments I made on the record of the hearing on the Proposed 2011 Revisions to the Connecticut Water Quality Standards continue to be relevant to the implementation of the subject strategy. Those comments are identified as Exhibit 45 in the hearing officer's report dated January 4, 2011. A copy of my comments are attached. Virtually all of the "freshwater waterbodies" listed as impaired due to nutrient enrichment continue to be identified as lakes rather than rivers or streams. I specifically point out and reiterate that the anthropogenic activity that is implicated in most of the nutrient enrichment pollution problems identified in Connecticut to date, as represented by impairment of use lists submitted every other year to the EPA and the Congress, is the existence of impoundments created by dams on flowing rivers or streams. The storage and recycling of phosphorus in impoundments is a significant factor that should be taken into account.

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Bureau of Water Protection and Land Use

Planning and Standards Division

Department of Environmental Protection

79 Elm Street

Hartford, CT 06106-5127

Attn: Traci Iott

**RE: Proposed Amendments to Connecticut's
Water Quality Standards**

Dear Mrs. Iott:

Appendix G of the proposed Water Quality Standards purports to outline the Connecticut *Implementation Strategy for Nutrient Control*. The first paragraph outlines federal requirements and federal administrative attitudes. The second paragraph outlines why nitrogen nutrient control and phosphorus nutrient control are being approached by separate methodologies, and the third describes the existing nitrogen nutrient control program which is presently being directed primarily at hypoxia in Long Island Sound. The fourth paragraph describes the proposed phosphorus nutrient control program referencing the USEPA *Nutrient Criteria [Technical Guidance] Manual: Rivers and Streams*. The final paragraph references two CTDEP documents associated with the phosphorus nutrient control program, the *Nutrient Reduction Strategy for Inland [Fresh] Waters: Phosphorus* and the *[Connecticut Methodology for] Freshwater Nutrient Management Technical Support Document* which is also limited to phosphorus nutrient control.

The *Nutrient Reduction Strategy for Inland Fresh Waters: Phosphorus* describes the numeric expression department staff intend to use to interpret the narrative statements embodied in existing Surface Water Quality Statements numbers 8, 18, 19 and 20. No revisions are proposed to statements numbers 8 or 18, and in statement number 20, it has been proposed that the word “eutrophic” be replaced by the words “culturally enriched”. “Culturally enrichment” is a new term of art defined in Appendix A to mean “the addition of excess nutrient input into surface waters from human sources in combination with other habitat factors that may cause high biological productivity, characterized by severe blooms of algae and/or extensive areas of dense macrophyte beds”. This term and definition has apparently been proposed to replace the term and definition of “eutrophication” which is proposed to be deleted from Appendix A. “Eutrophication” is presently defined to mean “the process of enrichment of surface waters with plant nutrients which may cause nuisance algae blooms and excessive growth of aquatic weeds”. I do not feel the substitution is an improvement and I do not feel that the definition of “cultural enrichment” is well drafted. If the term is retained, I feel that the definition should be modified to, at least, replace the phrase “from human sources” with “due to human activity” and I would also suggest replacing the words “input into” with “to”. Further, I consider the words “severe” and “extensive” in the definition to be relatively subjective.

Substantial modifications have been proposed to statement number 19. I suggest that the revised language is flawed independent of the addition of the phrases “or have the potential to contribute”, “restore impaired waters”, “prevent culturally enriched conditions” and “impair downstream waters”. The words “point and non-point sources” are descriptive of inanimate things that do not have the capacity to “apply” requirements imposed by the Commissioner. I suggest that the existing opening phraseology of statement number 19 be restored. I also suggest that the inclusion of the phrase “impair downstream waters” is not appropriate as I am sure that it is not intended that the Commissioner may require other reasonable controls as necessary to ... “impair downstream waters”. I further suggest that the existing phrase “as necessary” could be deleted from the statement as I am sure that it is not intended that the statement imply that the Commissioner would require Best Management Practices, discharge limitations or other reasonable controls that he or she did not feel was necessary.

The [*Connecticut Methodology for*] *Freshwater Nutrient Management Technical Support Document* describes the methodology that was used to define the “best attainable condition” at any point on a stream or river in terms of the phosphorus loading. The points that were evaluated in the document are associated with 43 facilities that convey treated sanitary sewage into fresh water streams other than the Connecticut River. It was stated that facilities from which treated sanitary sewage is discharged into the Connecticut River were excluded because the river is “tidally influenced by brackish water”. I submit that the facilities from which treated sewage is discharged into the Connecticut River are not fundamentally different from those discharges directed to tributaries of that river that were evaluated. The Connecticut River is not brackish in the vicinity of any of the existing treated sanitary sewage discharges to the river. The effect of this exclusion is that the “cultural enrichment” effects resulting from the discharges from the Enfield, Suffield, East Windsor, Windsor Locks, Pequonock, South Windsor, East Hartford, Hartford, Glastonbury, Rocky Hill, Mattabessett, Portland, Middletown and East Hampton water pollution control facilities in Connecticut into the fresh water of the Connecticut River have not been evaluated as part of development of the strategy and no analysis was made of upstream sources of phosphorus in Massachusetts, New Hampshire or Vermont. The strategy suggests that phosphorus treatment will be required at the Winsted, Plymouth, Bristol, Plainville, Farmington, and Simsbury water pollution control facilities and that amount of phosphorus in the discharges from the New Hartford and Canton water pollution control facilities will be capped. All of the above listed discharges enter the Connecticut River through the Farmington River. Similarly, the strategy suggests that phosphorus treatment will be required at the Vernon and Manchester water pollution control facilities which discharge to the Connecticut River through the Hockanum River. By implication it appears that the absence of significant man made impoundments on the Connecticut River may have influenced the scope of the analysis.

The introduction to the technical support document referenced above defines the problem being addressed as “excessive nutrient enrichment” referencing 21 “freshwater waterbodies” that have been identified in the Connecticut 2008 Impaired Waters List for Nutrient/Eutrophication Biological Indicators stating that these waterbodies are identified on Figure 2 of the document. It is also pointed out that a high percentage of the waterbodies listed as impaired in the nationwide Impaired Waters Lists are nutrient-related impairments. A recent EPA status report on State Adoption of Numeric Nutrient Standards dated December 2008 indicated that states had listed over 10,000 impairments for phosphorus and nitrogen pollution apparently referring to 2006 Impaired Waters Lists. It is noted that all of the “freshwater waterbodies” identified on Figure 2 are listed in the 2008 State of Connecticut Integrated Water Quality Report, which contains the 2008 Impaired Waters List, and that they are identified as Lakes rather than Rivers or Streams in the listings. The actual number shown on Figure 2 is 20 and the actual number identified on the 2008 Impaired Waters List as impaired due to nutrient related causes is 19 since Lake Zoar is not identified as impaired for nutrient/eutrophication biological indicators or excess algae growth on the list. Only five of the listed lakes are located downstream of existing treated sanitary sewage discharges: West Thompson Lake, an USACOE flood control impoundment below reach 07 on the Quinebaug River; Aspinook Pond, an impoundment behind an inactive hydroelectric dam below reach 02 on the Quinebaug River; Union Pond, an impoundment behind an old mill dam

below reach 04a on the Hockanum River that is now a recreation area; Hanover Pond, an impoundment behind an old mill dam below reach 03 on the Quinnipiac River; and Lake Lillinonah, an impoundment behind a large hydroelectric dam below reach 03 on the Housatonic River. The referenced river reaches are those described in the 2008 Integrated Water Quality Report referenced above. No river or stream reaches that are not impounded and identified as lakes have been identified as impaired due to nutrient related causes. Therefore, it appears that the phosphorus control strategy being addressed by the process described in the technical support document is aimed at solving pollution problems in rivers and streams that have not yet been identified.

The analysis in the technical support document did set forth a procedure by which the total phosphorus load at any point on a river or stream could be approximated by calculating the estimated land cover phosphorus load discharged from non-point sources based on mapped land use and a determining the load of phosphorus discharged from point sources based on direct measurements. Phosphorus export coefficients were estimated for forested areas, urban areas and agricultural areas. The best attainable condition based on land use was the defined by assuming that best management practices would be capable of reducing the phosphorus loading from urban and agricultural lands by 60% and by assuming no phosphorus loading reductions from forested land. The focus of the strategy then became the phosphorus loading reductions that could be achieved at point sources and calculations were done to define the need to reduce the phosphorus load in existing treated sanitary sewage discharges. This caused the focus of the strategy to be directed at the fresh water rivers and streams to which such discharges occur. Four of the rivers originate out of state, namely the French River, the Quinnebaug River, the Connecticut River, and the Housatonic River. Phosphorus loading from out of state was recorded in the analysis of discharge locations on the Quinnebaug and French Rivers, but it is not clear how the data was acquired or if the data included the phosphorus load from existing treated sanitary sewage discharges in Massachusetts. The same situation prevails with respect to the Housatonic River, however out of state phosphorus loadings to Connecticut River were not analyzed as discussed above.

I do not feel that the statistical analysis that is described in the technical document is balanced or that it achieves the stated objective of presenting a scientifically defensible approach to providing a numeric interpretation of Connecticut's narrative [surface water] policy statements. I feel the department staff should regroup and focus first on identifying the pollution problems that are created by nutrient enrichment before treatment requirements are imposed that may not solve the problems. I would also point out that the anthropogenic activity that is implicated in most of the nutrient enrichment pollution problems identified in Connecticut to date, as represented by impairment of use lists submitted every other year to the EPA and the Congress, is the existence of impoundments created by dams on flowing rivers and streams.

I would also like to comment on the surface water quality classification maps that were noticed as being included in the proposed amendments to the Connecticut Water Quality Standards. Although it was not clear in the notice that the classification maps were being revised, the *Proposed Water Quality Classification* maps were posted together with the *Current Water*

Quality Classification on the DEP website. I feel that eliminating the mapped references to existing water quality on the mapping is inappropriate as it will remove data that are valuable to the viewing public. Water quality monitoring and assessment reports and water pollution source mapping are not available on the DEP website. I suggest that it would be appropriate to update outdated existing conditions mapping on the water quality classification maps without following the process described in subsection (b) of section 22a-426.

Sincerely,

LOUREIRO ENGINEERING ASSOCIATES, INC.

Robert B. Taylor
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