

TO: Traci Iott, CT DEP
FROM: Margaret Miner, Rivers Alliance of CT
RE: Review of CT Water Quality Standards

July 15, 2009

Thank you for this opportunity to offer preliminary, informal comments. I include below comments from RA, plus comments from a couple of other parties who have written to us.

A particularly urgent matter is review and revision of nutrient standards. In particular, we feel that DEP nutrient standards should be distinct from drinking-water standards, with scientific explanation of the appropriate standards. We are suffocating aquatic life with the present permissible level of nutrients.

Standards for limiting contamination of waters by endocrine disrupters, neurotoxins, and the like, need to be reviewed. The goals should be limits that are ecologically protective not just limits presumed to be protective of human health.

The standards, and related permits and guidance, for stormwater management, should be reviewed and revised to reflect current patterns of precipitation and snow melt.

Here follow specific comments:

Surface Water Standards:

" 5. If the Commissioner designates a high quality surface water as an Outstanding National Resource Water pursuant to federal regulations at 40 CFR 131.12(a) the high water quality shall be maintained and protected. The lowering of water quality is prohibited for such surface waters except where activities limited in time and scope will result in only temporary and insignificant changes in water quality and the activities will not result in water quality less than necessary to protect existing and designated uses. "

COMMENT: CT has no waters that have been designated as an Outstanding National Resource Water. The revision of the standards should be linked to review of this lack.

" 8. Water Quality Criteria do not apply to certain conditions brought about by natural causes. Natural hydrologic and geologic conditions may cause excursions from established criteria. The meaning of the word 'natural' is not limited to only those conditions which would exist in water draining from pristine land. Conditions which exist in the surface

water, in part due to normal uses of the land, may be considered natural, provided best

management practices are used. [emphasis added] It shall not be considered normal use of the land if

excursions from established Criteria adversely impact an existing or designated use. "

This is a key passage. Notice, that the meaning of "natural" (used with respect to flow or nutrient loading, or whatever) is significantly different from dictionary definitions of "natural." Basically the definition in the standards includes non-natural, man-made conditions if best management practices (BMPs) are in place. This would be objective (although fuzzy) and defensible if BMPs were defined as, say, "Highest-quality water-protection practices currently available." Given a stream flowing past a paved mall, one could come up with some kind of estimate of water conditions with and without best available stormwater management techniques." BUT here is the definition of BMPs.

Best Management Practices means those practices which reduce pollution and which have been determined by the Commissioner to be acceptable based on, but not limited to, technical, economic and institutional feasibility.

So, if the goal is to restore, say, a stream to its natural condition, this means to restore the stream to the condition the stream would enjoy if not-too-expensive, institutionally feasible (whatever that means) management practices were in place. This makes a science definition dependent on political judgments.

Comment: Rewrite these passages to avoid making the definition of "natural" dependent on economic and institutional considerations. Once an environmental goal is set. Then the feasibility of attaining that goal can be considered separately.

In connection with the reference to BMPs, we will repeat the comment that we submitted (unsuccessfully) on the revision of the state list of impaired waters.

COMMENT: The natural flow of a river means the flow with BMPs in place. Some rivers are interrupted by hydro dams. A BMP for a hydro dam is run-of-the-river flow management. Pond-and-release, or peaking, management is not a BMP for hydropower. Therefore, river segments above and below a pond-and-release hydro dam should be listed as impaired. The segment above will be unnaturally large and warm. The segment below will suffer from off-on flows.

Number 10 refers to Zones of Influence. These are areas where there is a discharge. The discharge may be permitted to exceed pollution limits and degrade w.q. within a certain area (zone of influence). For example, partially untreated sewage may be blended with fully treated sewage. A number of us have questioned the application of this concept in various permits. The decision is made on a case-by-case basis. The only numerical guideline in the standards refers to thermal pollution. Flow or volume allocations are also made for the management of discharges.

Comment: We ask for more numerical precision in this section, and also that the allocations be made public in a single source so that applicants and DEP staff themselves can see with one click what allocations DEP has made for diversions and discharges. Some water bodies are overallocated.

Standard 11 relates to flow, and gives as minimum flow the drought measure of 7Q10 unless a water or power utility may by law draw below that. It also cites the out-dated CT Minimum Flow

Regulation, which DEP is in the process of upgrading. In the meantime, we have no significant flow protection.

Comment: We ask DEP to protect flows by adopting the narrative standard: Flows adequate to support existing and designated uses. This will not interfere with creation of new flow regulations. It will be a good guideline.

The numerical limits on various substances need a thorough review. I hope the scientists out there will offer specific suggestions. However, here are some general observations. In setting limits on nitrogen, phosphorus, salt, etc., state policy tends to follow drinking water standards. But the level at which ecological impairment may take place can be much lower.

Comments from Daniel Kenny, Housatonic River Watershed, advocate

Two years ago the Ct Legislature passed a bill that provides tax incentives for more small "run of river" hydro generation in our rivers and streams. .. **We need to list all moving water bodies as potentially impacted by this legislation.**

[Additional, related remarks by M. Miner: There have been two legislative bills promoting small, run-of-the-river hydro. As I commented in the section on streamflow above, the impact of dams needs to be better accounted for in the water quality standards.]

I agree with the comments made about need for more environmental clarity on BMP's.

Excerpts from comments by soil scientist Sigrun Gadwa, who may send more formal comments late:

Instead of the too- flexible current language, I would suggest using concrete, non-fuzzy criteria to define the "natural" nutrient concentrations in associated streams/pools/seeps in a non-subjective way, to develop a tiered set of nutrient standards. Certain resources, like bogs, sandy swamps, and headwater streams and seeps need especially conservative standards. These criteria can easily be suitable for regulation language, namely soil type, and botanical community class (based on Metzler & Barrett's Classification of CT), stream order, and certain hydrological properties, such as perennial discharge or discharge at a mid-slope position.

Standards for water resources with elevated nutrient levels from existing anthropogenic inputs, stormwater, farming or septic systems, should be comparable to those for non-impaired water resources with similar soils, pristine or protected by the very best modern technology and land-use planning (e.g sand filters or submerged gravel wetlands). This is because those impaired resources could be restored, if the better available BMP's were retrofitted, or a sewerline were put in, or agricultural practices were changed. There is language in the CT Inland Wetlands regulations, such that permitted activities shall not impede the potential for restoration. This is typically used to deny filling of wetland

fields that could be restored by planting. However, in my professional opinion, this language is equally applicable to a stream receiving discharge from mediocre stormwater basins that could be retrofitted with sand filters that really treat > 95% of phosphorus/nitrogen or submerged gravel wetlands that really treat > 95% of phosphorus/nitrogen.

Even non-impaired major rivers and associated alluvial soils do have higher natural nutrient levels than headwaters streams. I recommend moderately conservative standards for them, comparable to a higher order non-impaired reference river like the Salmon River or Pine Brook - say, no higher than 1 mg/l nitrate-N for discharge into the resource. This is 10% of the current health standard for drinking water (10 mg/l), but triple the draft EPA criterion of 0.31 mg/l. The current level of nitrogen in the resource, may be over 2 mg/l, and proximal nutrient inputs to a big river may be trivial due to dilution. However, cumulative and downstream impacts (e.g. to estuarine coves and Long Island Sound) are also of concern here, such that a strict standard widely applied would have great regional benefits. Note that nitrogen is typically limiting in silty rivers and floodplain wetlands because phosphorus is readily available from fine textured soil particles. I recommend a higher standard than the draft EPA standards; very tentatively I suggest 0.1 mg/l rather than .024 mg/l. Note that floodplain understory vegetation and marsh vegetation also becomes more rank, invasive-infested, and less diverse in response to substantial nitrogen inputs.

A much lower standard is essential for oligotrophic/low mesotrophic resources. Very low natural phosphorus levels and vulnerability to both phosphorus and nitrate inputs is associated with both sandy and peaty soils - hence the low nitrogen standard (1 mg/l) in New Jersey's pine barren area. (New Jersey's thresholds, for use in their site-specific model- are based on soil types.) Bogs and sandy isolated wetlands can be identified based on vegetation and soils and need the highest level of protection

Data from consulting projects that I have personally worked on, confirms that headwaters portions of watercourses and headwaters pools with forested to very lightly developed landuses have very low nutrient levels, especially in compact till soils and shallow-to - bedrock soils, less than 0.01 mg/l. This is shown in the data I sent you last week from Haddam Neck, Oxford, Middlebury, and East Hampton.

What I have not seen is an adequately large data set that shows a causal relationship between gradations of impairment with different levels of elevated nutrients. Maybe this is something to develop a major foundation grant for. Just because a stream has an extremely low nutrient concentration does not necessarily mean that it would be negatively affected by even a several fold increase. The cause & effect links have not been well established. Even if there is a correlation, it is hard to be sure that some other associated pollutant like zinc or a triazine herbicide may not be responsible.

Tolerance thresholds for vernal pool amphibians is also not known. I have data on what appeared to be a healthy vernal pool with over 1.5 mg/l total nitrogen. Depending on stream/pool size and through-flow, the EPA draft threshold of 0.31 mg/l nitrate-N per liter discharge may or may not be too high for these resources. I would suggest focused

data collection to determine appropriate thresholds for headwaters wetlands, and development of a dilution models that can be used to calculate post-development concentrations in the receiving headwaters resource. A workable approach might be to require applicant to keep below a very conservative threshold, or to use a model.

Deep friable till and outwash soils typically have groundwater discharge at the base of the slope into perennial seeps, streams, and swamps, and can be identified by indicator species and by wetland boundaries that extend over twenty feet upslope. Major nutrient levels are not quite as low, but these water resouces have high botanical value, rare species potential, and wildlife potential (one of the "13 Imperiled Communities" in Connecticut). One of the data sets I provided you, Margaret, from Reeds Brook watershed in Cornwall, falls into this category. Indicator plant species include sphagnum mosses (easiest), golden saxifrage, swamp saxifrage, *Carex brunnescens*, *Glyceria melicaria*. Faunal indicators are dusky salamander and spring salamander, and a diverse, robust population of ETP macroinvertebrates.

Sigrun N. Gadwa, MS, PWS
Ecologist, Registered Soil Scientist
183 Guinevere Ridge, Cheshire, CT 06410
Phone: 203 271 1949 mobile: 203 537 1869
Fax: 860 647 8397

--- On **Mon, 7/13/09, Rivers Alliance of CT** <rivers@riversalliance.org> wrote:

From: Rivers Alliance of CT <rivers@riversalliance.org>
Subject: RE: nutrient data
To: "Sigrun Gadwa" <sigrun.gadwa@sbcglobal.net>
Date: Monday, July 13, 2009, 8:54 PM

Hello Sigrun: I just sent out message embedded below. Any chance you can get your science observations and recommendations into the DEP (or to me) in the next day or so? M

Dear All: The DEP is asking for comments on its Water Quality Standards. The standards set the rules for water protection in the state under the Clean Water Act. They are the basis for deciding whether waters are impaired or not, and what should be permitted in water uses.

The standards have not been upgraded for almost ten years. (I believe there is a law suit pending relating to this hiatus. The law specifies a review and upgrade every three years.) DEP is asking people to comment on the existing standards prior to releasing a formal draft revision.

This is a rare and wonderful opportunity to get your ideas up to the DEP and to share them with your colleagues, so that we may develop joint recommendations as time goes on. I say "as time goes on, " because the deadline for this round of comments is July 15. But your comments need not be elaborate. For example, Rivers Alliance has long sought the addition of a stream flow standard, which might be as simple as "Flows adequate to support existing and designated uses."

I will include here other points we hope DEP will address. Many of [you will have points of your own](#). If you have data relating to improvements in standards for nitrogen, phosphorus, dissolved oxygen, limits on herbicides, or any other aspect of the standards, please include them for the

DEP (and Rivers Alliance would love to have a copy). Again, your comments can be quite informal, as this is an early stage of action and not the be-all-and-end-all. The more serious challenge will come when DEP releases a draft revision of the w.q. standards.

The link to the standards is http://www.ct.gov/dep/lib/dep/water/water_quality_standards/wqs.pdf
The person to write (now that Lee Dunbar has retired) is Robert.Hust@ct.gov

The general goal of the Clean Water Act is fishable and swimmable surface waters [and maintaining or restoring high-quality waters](#). The state sets w.q. standards to describe what must be done to attain that goal. Using these standards, waters are classified according to quality and designated uses: swimming, fishing, boating (non-contact uses), habitat, etc. The anti-degradation policy requires that the state not permit activities that will lower w.q. or limit designated uses. The standards also set goals for raising water quality. Using the standards, if water is found to be impaired, the state is obligated to some action (sooner or later) to eliminate that impairment.

Here follow some points RA will make:

Under Surface Water Standards:

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limiting contamination of waters by endocrine disrupters, neurotoxins, and the like, need to be reviewed. The goals should be limits that are ecologically protective not just limits presumed to be protective of human health.

Can't think of anything more right now, but hope you will! (Also please correct my comments as necessary.) Thanks, Margaret

Rivers Alliance of Connecticut
7 West Street, POB 1797
Litchfield, CT 06759
Tel: 860-361-9349
Fax: 860-361-9341
Cell: 203-788-5161
[Http://www.riversalliance.org](http://www.riversalliance.org)

Contacts:

Margaret Miner
Rose Guimaraes
Amanda Branson

From: Sigrun Gadwa [mailto:sigrun.gadwa@sbcglobal.net]

Sent: Saturday, July 11, 2009 1:07 PM

To: rivers@riversalliance.org

Subject: nutrient data

Margaret,

Sorry to interrupt your meeting on Friday morning. Data I sent you was mostly used in public hearings opposing lots with septic systems discharging towards headwaters watercourses, tables that I had already put together. But we have much else in our files - have been doing water quality assessments for over ten years. Please call if you have other needs. Once I know a particular site is comparable, I can also send report excerpts.

Regarding reliability - key in any PH: most of data is already in a database maintained by CAWS (Connecticut Association of Wetland Scientists). Lab results sheets and chain of custody forms are on file. Clients included towns, citizens groups, & some developers of residential projects, so the data is also already in assorted municipal IWWC files.

To refresh your memory my firm, Carya Ecological Services, & Rema Ecological Services, (George Logan) are part of the same environmental consulting collaborative. George is also interested in the nutrient conundrum - including modeling used to determine nutrient concentrations below a proposed project, e.g. the New Jersey model.

Sigrun

PS You mentioned on Wednesday that Roman Zajak pointed out that phosphorus inputs are also important. Per an eminent authority, Wetzel (Limnology, 2nd edition) this is much more the case in lakes than in shallow streams, because the sediment in the streambed provides enough phosphorus that it is rarely a limiting nutrient. Check Paul

Heisig's (USGS) landmark large scale study correlating on water quality with upstream landuses in the Croton River Watershed. It should be on-line. My interpretation of the graphs and the narrative, was that algal smothering of the streambed began at about 1 to 1.5 mg/l.

Sigrun

*Sigrun N. Gadwa, MS, PWS
Ecologist, Registered Soil Scientist
183 Guinevere Ridge, Cheshire, CT 06410
Phone: 203 271 1949 mobile: 203 537 1869
Fax: 860 647 8397*