

Chairman, Wareham Board of Health  
Town of Wareham  
54 Marion Road  
Wareham, MA 02571

February 6, 2003

RE: Proposed Board of Health guidelines for nitrogen removal systems in the Town of Wareham

Members of the Board of Health:

The Town of Wareham Planning Board has recently become aware of the need to reduce the amount of nitrogen released within certain sub-watersheds to ensure the long-term protection of coastal water quality. This heightened awareness will likely result in the Planning Board requiring advanced nitrogen removal onsite wastewater disposal systems, or advanced community wastewater systems, for selected new development within these sensitive sub-watersheds. The Planning Board requirement for these systems may be the result of a negotiation with the project proponent or required through some future discharge standard established by the town. In either case, it is expected that some new developments will be served by advanced nitrogen removal onsite wastewater disposal systems or community wastewater systems.

The enforcement officer for the Planning Board is the Building Inspector. Therefore, the Building Inspector must be provided a checklist from the Planning Board of properties where advanced nitrogen removal onsite wastewater systems or community systems are required. The Building Inspector should not issue occupancy permits unless the applicant installs the wastewater treatment systems in accordance with Special Permits issued by the Planning Board. We are recommending that the Planning Board should also copy the Board of Health on its list of properties requiring advanced nitrogen removal systems, and inform the Board of Health what discharge standard (ppm = mg/l discharge concentration) the applicant is expected to meet.

With respect to onsite wastewater system installation, the Board of Health's principal obligation is to ensure that all septic systems or shared or community systems, including nitrogen removal systems, are properly installed with appropriate setbacks, and other specifications pursuant to the state's Title 5 regulations, and all local Board of Health regulations. For advanced nitrogen removal wastewater disposal systems or community systems installed as a response to any Planning Board requirement, local regulation, or negotiation to reduce nitrogen loading to the environment will require additional actions and oversight by the Board of Health to be fully effective. These additional actions are described below.

For nearly all alternative design septic systems, the Massachusetts DEP requires “operation and maintenance” contracts with a licensed vendor, and quarterly inspections. DEP can also require the use of nitrogen removal onsite septic systems in Zone 2s of public water supplies, and in the watershed of “nitrogen sensitive” coastal embayments. However, no coastal watersheds have yet been designated as nitrogen sensitive embayments. If a nitrogen removal system is installed in a town under the state’s “general permit” provisions, and it is outside of a Zone 2 or state designated nitrogen sensitive area, then DEP will require only operation and maintenance contracts and quarterly inspections. They will not require nitrogen testing or any other effluent monitoring (normally quarterly testing is required for the first two years). In other words, they will not require conformance with any municipal nitrogen standard, even if the system is installed in a municipally designated nitrogen sensitive area or for the specific purpose of reducing nitrogen discharge to the environment.

With respect to nitrogen removal performance, DEP “certifies” a system as being a nitrogen removal system if it discharges 19 ppm or less total nitrogen. However, some technologies may have superior performance, and an applicant may wish to use these technologies to achieve a management district’s specific nitrogen-loading standard. Typically, as part of a special permit application, the applicant will propose a specific effluent discharge concentration in the loading model to stay below the nitrogen loading limit “pounds per acre” required or negotiated for the project. This nitrogen-loading limit will translate into a specific maximum total nitrogen discharge concentration in the treated wastewater from the onsite system which should be sampled from the distribution box immediately prior to discharge to the soil absorption system.

The Massachusetts Septic System Test Center has found that there is negligible removal of nitrogen within the soil absorption systems receiving effluent from advanced nitrogen removal onsite wastewater system. However, some advanced shallow soil absorption systems employ subsurface “drip irrigation” systems that support turf grass or other vegetation. The Buzzards Bay Project recommends a 20% credit of additional nitrogen removal (average annual) for these types of systems, beyond the nitrogen removal documented at the distribution box for nitrogen removal systems.

Example: A nitrogen removal onsite system is connected to a shallow soil drip irrigation system. An observed total nitrogen concentration at the effluent distribution box of 20.0 ppm (=mg/l), shall be adjusted to 16.0 ppm to account for the minimum nitrogen removal expected of this type of soil absorption system.

In light of the proceeding discussion, the Board of Health could adopt the attached regulations to meet the Town of Wareham’s nitrogen management goals, compliment actions by the Planning Board, and to fill in gaps in DEP’s alternative septic system program. These requirements are simple, direct, and would be easy to enforce.

The Board of Health should consult with its legal council to determine if they already have the existing authority to adopt these regulations. If not, the Planning Board and Board of Health could jointly submit a General Bylaw at the next town meeting. The heart of such a bylaw might need only say “The Board of Health may adopt regulations for the operation, maintenance, monitoring, and evaluation of alternative design and advanced nitrogen removal onsite

wastewater disposal systems that are required to be installed under any town zoning or non-zoning bylaw, negotiated agreement, or local regulation to ensure they are meeting required discharge limits and performance.” You would of course work with Town Counsel to craft the precise language needed for such a bylaw.

Please do not hesitate to call me should you have additional questions regarding this matter.

Sincerely,

Joseph E. Costa, PhD  
Executive Director

cc: Planning Board  
Board of Selectmen

attachment: sample regulations

**Sample Board of Health Regulations for Alternative Onsite Wastewater Systems  
required by local bylaws, regulations, or negotiated agreements  
to meet specific nitrogen loading limits**

For any advanced nitrogen removal onsite wastewater disposal systems installed in the Town of Wareham to comply with any zoning or non-zoning bylaw or local regulation to limit nitrogen, or by negotiated agreement included in a permit issued by the town, the following rules will apply.

**1) Operation and Maintenance Reporting**

Owners of alternative septic systems or their operators are required to submit to the Board of Health copies of their Operation and Maintenance agreements and submit quarterly inspection reports to the Board of Health.

**2) Evaluation of the Nitrogen Standard**

The testing of alternative septic systems shall be conducted immediately prior to discharge to the soil absorption system (typically at the effluent distribution box). If the effluent from an advanced wastewater treatment system is further treated by injection into a shallow subsurface irrigation system supporting turf grass or other vegetation, nitrogen discharge from this type of soil absorption system will be presumed to be 20% less than measured at the distribution box. Performance at the distribution box, or after adjustment for any shallow drip irrigation system, will be compared to effluent discharge limits specified in any special permits or loading models in support of a special permit. If a discharge limit is not specified for any reason, the system will be presumed to be a nitrogen removal system if it discharges 19 ppm or less.

**3) Performance Monitoring**

Onsite systems must be tested to confirm performance and conformance with town nitrogen loading standards. Systems must be tested for pH, TKN (Total Kjeldahl Nitrogen), and the summed concentration of nitrate + nitrite. Testing must be performed at a DEP or EPA certified laboratory. During the first two years after installation, testing must be quarterly. The average Total Nitrogen concentration (=TKN+Nitrate+nitrite) must meet the wastewater standard established as part of a Special Permit. If the standard is met during the last annual period, then testing will be reduced to once per year.

**4) Failure to Meet Discharge Limits**

A failure to meet the required standard at any time will require the resumption of quarterly testing until the standard is achieved for three consecutive quarters. If a system fails to meet discharge limits for 4 consecutive quarters, the Board of Health will require modifications or retrofits to the system as appropriate to achieve discharge limit goals.