

# Regulation of Sewage Disposal Systems to Protect Pond Water Quality

## 1. Purpose and Authority.

1.1 Based on the monitoring data and analysis of water quality of freshwater ponds as documented in *Brewster Freshwater Ponds: Water Quality Status and Recommendations for Future Activities* dated 2009, prepared by Coastal Systems Group, School for Marine Science and Technology, University of Massachusetts Dartmouth and the Cape Cod Commission Water Resources Program; the *Evaluation of Methods to Control Phosphorus in Areas Served by Onsite Septic Systems* dated 2006, prepared by the Massachusetts Alternative Septic System Test Center of the Barnstable County Department of Health and Environment; *The Massachusetts Buffer Manual* dated 2003 prepared by the Berkshire Regional Planning Commission; the Response Curves for Phosphorus Plume Lengths from Reactive-Solute-Transport Simulations of Onland Disposal of Wastewater in Noncarbonate Sand and Gravel Aquifers dated 2004 and prepared by the U.S. Geological Survey; and the *Integrated Water Resources Management Plan – Phase II* by Horsley Witten Group, Inc. dated January 2013; the Brewster Board of Health concludes that in order to preserve the ponds in Brewster and to protect public health the nutrient (phosphorus) loading to the ponds must be reduced. Existing sewage disposal systems have been identified as a source of nutrient loading to the ponds, and actions beyond those found in *The State Environmental Code, Title 5* (310 CMR 15.000) must be undertaken to protect and restore Brewster's ponds and to prevent harmful algal blooms that can impact public health.

1.2 In accordance with Massachusetts General Laws, Chapter 111, Section 31 and 127A, as amended, and for the protection of public health and the environment, the Brewster Board of Health hereby establishes and adopts the following regulations, which supplement Massachusetts 310 CMR 15.000.

## 2. Applicability

This regulation shall apply to existing and proposed subsurface sewage disposal systems located in proximity to Brewster lakes and ponds as described below. For any use subject to this regulation, garbage disposals are not allowed and only phosphate free (less than 0.5% phosphorous) dishwashing detergents, soaps and cleaners shall be discharged to the system.

## 3. Definitions

B Horizon: Soil horizon that formed below an A, E, or O horizon and is dominated by obliteration of all or much of the original rock structure and shows one or more of the following:

1. Illuvial concentration of silicate clay, iron, aluminum, humus, carbonates, gypsum, or silica, alone or in combination;
2. Evidence of removal of carbonates;
3. Residual concentration of sesquioxides;
4. Coatings of sesquioxides that make the horizon conspicuously lower in value, higher in chroma, or redder in hue than overlying and underlying horizons without apparent illuviation of iron;

5. Alteration that forms silicate clay or liberates oxides or both and that forms granular, blocky, or prismatic structure if volume changes accompany changes in moisture content; or
6. Brittleness.

Downgradient: The direction that groundwater flows, downstream of a lake or pond.

Non-Compliant System: For the purposes of this regulation a non-compliant system is a sewage disposal system leaching facility located within the upgradient 0-300 foot buffer of a lake or pond or the downgradient 100 foot buffer of a lake or pond that does not conform to the requirements of 310 CMR 15.000 or Section 7 of this regulation.

Lake: Any open body of fresh water with a surface area of 10 acres or more, and shall include great ponds.

Leaching Facility: A system of trenches, galleries, chambers, pits, field(s) or bed(s) together with effluent distribution lines and aggregate which receives effluent from a septic tank or treatment system.

Pond: Means any open body of fresh water with a surface area of less than 10 acres, either naturally occurring or man-made by impoundment, which is never without standing water due to natural causes, except during periods of extended drought. For purposes of this definition, extended drought shall mean any period of four or more months during which the average rainfall for each month is 50% or less of the ten year average for that same month. Basins or lagoons which are part of wastewater treatment plants shall not be considered ponds, nor shall swimming pools or other impervious man-made retention basins. The limit of a pond is defined by the landward extent of bordering vegetated wetlands that surround it or by the mean high water mark if bordering vegetated wetlands are absent.

Setback Distance: For the purposes of this regulation, the required setback distance for a sewage disposal system leaching facility from a lake or pond is 300 feet if a lot is upgradient of the lake or pond, and 100 feet if the lot is downgradient of the lake or pond.

Upgradient: Of or pertaining to the place(s) from which groundwater originated or traveled through before reaching a lake or pond.

Vegetated Buffer: A protective strip of native plantings between a lake or pond and human activity that acts as a filter, capturing many of the pollutants from runoff.

#### **4. Determining whether a Lot is Downgradient or Upgradient from a Lake or Pond**

This regulation applies to sewage disposal systems whose leaching facilities are located within 300 feet of a lake or pond on the upgradient shoreline, and 100 feet of a lake or pond on the downgradient shoreline. For most lakes and ponds, a determination can be made as to whether a lot is downgradient or upgradient of any lake or pond by referencing map XXXXX dated XXXX. A copy of this map is on file at the Brewster Board of Health Office at 2198 Main Street, Brewster, Massachusetts and can be found at [www.brewster-ma.gov/----](http://www.brewster-ma.gov/----).

Where the setback to a lake or pond has not been mapped, it is assumed that the 300-foot upgradient setback applies around the lake or pond shore. Also, for lots adjacent to very small ponds where the upgradient and downgradient shorelines have not been mapped by the town and for lots that straddle the downgradient/upgradient boundary, the lot is considered to be upgradient and the 300-foot setback applies. A lot owner may challenge this determination by hiring a competent hydrogeologist or engineering professional of their choosing to conduct an onsite hydrologic assessment that clearly demonstrates to the satisfaction of the Board of Health that the lot in question is indeed downgradient of the lake or pond.

## **5. Setback Distances**

### **5.1 New Construction**

5.1.1 All new sewage disposal system leaching facilities for new construction shall be located or installed at a distance greater than 100 feet downgradient or greater than 300 feet upgradient from all lakes and ponds.

5.1.2 If a developable lot was in existence prior to the effective date of this regulation, new construction of a sewage disposal system leaching facility may be permitted within the setback distances specified in Section 5.1.1 above by the Board of Health so long as the applicable design, treatment and best management requirements in Section 7 are met.

### **5.2 Expansions in Use**

For existing leaching facilities within 100 feet downgradient or 300 feet upgradient of a lake or pond, no change in use or change or addition to the structure that would increase the design flow is allowed unless it is demonstrated successfully by the applicant that all applicable design, treatment and best management requirements in Section 7 are met.

## **6. Upgrade of Non-Compliant Systems**

All leaching facilities of existing sewage disposal systems within 300 feet upgradient of a lake or pond or 100 feet downgradient of a lake or pond shall be considered to be non-compliant systems and shall be repaired to meet the applicable design, treatment and best management requirements in Section 7 at the time that any permit or system inspection is required by Title 5 (310 CMR 15.00).

## **7. Design and Treatment Standards**

For septic systems located within 300 feet upgradient of a lake or pond, the property owner may elect to upgrade their system using either the leaching facility design standards in Section 7.1 or the effluent treatment standards in Section 7.2. Property owners for all systems within 300 feet upgradient of a lake or pond whose lot includes direct lake or pond frontage of 20 feet or more must also comply with the vegetated buffer standards in Section 7.3.

For septic systems located within 100 feet downgradient of a lake or pond, the property owner may elect to upgrade their system using either the leaching facility design standards in Section 7.1 or the effluent treatment standards in Section 7.2, or the vegetated buffer standards in Section 7.3 if their lot includes direct lake or pond frontage of 20 feet or more.

#### 7.1. Leaching Facility Design Standards

If a property owner elects to follow the leaching facility design standards they must comply with the following design requirements.

- (a) A five-foot separation between the bottom of the leaching facility and the estimated seasonal high groundwater table shall be maintained.
- (b) The leaching facility shall be comprised of either pressure-dosed narrow trenches or drip irrigation lines. In either case, the leaching facility will be designed such that the soil B horizon will accept effluent from the leaching facility.
- (c) Trenches and irrigation drip lines will be aligned perpendicular to the general direction of groundwater flow. Groundwater flow may be determined by referencing map XXXXX dated XXXX. A copy of this map is on file at the Brewster Board of Health Office at 2198 Main Street, Brewster, Massachusetts and can be found at [www.brewster-ma.gov/--](http://www.brewster-ma.gov/--).
- (d) The leaching facility will be positioned on the property such that is as far from the lake or pond's edge as possible.
- (e) If the bottom of the leaching facility is between ten or twenty feet above the estimated seasonal high water table, the property owner may claim a 15-foot buffer zone credit (e.g., if the leaching facility is 290 feet from the pond shore the property owner may claim this is equivalent to 305 feet from the shore and no upgrade under these regulations is required).
- (f) If the bottom of the leaching facility is more than twenty feet above the estimated seasonal high water table, the property owner may claim a 30-foot buffer zone credit (e.g., if the leaching facility is 280 feet from the pond shore the property owner may claim this is equivalent to 310 feet from the shore and no upgrade under these regulations is required).

#### 7.2. Effluent Treatment Standards

If a property owner chooses to comply with the effluent treatment standards they must incorporate a phosphorus treatment system approved for use by the Massachusetts Department of Environmental Protection that will treat septic system effluent to a standard of 1 mg/L of total phosphorus or below. Compliance with the 1 mg/L standard must be measured at a point between the septic tank and the leaching facility. Monitoring must be conducted according to the



requirements for the treatment system as approved by the Massachusetts Department of Environmental Protection

*NOTE TO BOARD OF HEALTH: Do we want to incorporate specific monitoring requirements beyond any imposed by DEP?*

### 7.3. Vegetated Buffers

Property owners within the 300 foot upgradient buffer whose lot includes direct lake or pond frontage of 20 feet or more must install a vegetated buffer strip of native plantings to prevent phosphorus from entering the lake or pond as either contaminated runoff or leaf litter.

Property owners within 100 feet downgradient of a lake or pond whose lot includes direct lake or pond frontage of 20 feet may choose to install a vegetated buffer strip of native instead of complying with the design standards in Sections 7.1 or 7.2.

Vegetated buffer strips shall be:

- (a) Installed between the edge of the yard and the highpoint of the sandy beach, or, between the edge of the yard and the lake or pond's edge.
- (b) A minimum width of 50 feet. However, it may not be possible to install a 50-foot wide vegetated buffer on all water front lots. Therefore, a sewage disposal system owner may install a vegetated buffer of a width appropriate to the siting of the facility served by the sewage disposal system in relation to the lake or pond's edge. Nevertheless, no vegetated buffer shall be less than eight feet in width.
- (c) Of sufficient length to extend across the entire area of lake or pond frontage, property boundary to property boundary.
- (d) Planted with native plants in accordance with the Brewster Conservation Commission's *Acceptable Plantings for Buffers to Resource Areas*.
- (e) Linked with vegetated buffers planted on neighboring lots whenever possible.
- (f) Maintained by watering, pruning, and weeding only; no pesticides, herbicides, or fertilizers shall be applied.

It is not intended that vegetated buffer strips installed in conformance with this regulation block the view or access to the lake or pond. Therefore, pruning and cutting within a buffer strip installed to satisfy this regulation is permissible, and a winding path with a maximum width of five feet may be maintained through the vegetated buffer. Any such path shall not follow a straight line and shall have at least two changes in arc or bearing along its course.

## **10. Composting**

All outdoor composting for those properties subject to this regulation must occur at a distance of within ten to 15 feet from the property boundary furthest from the lake or pond.

## **11. Variances**

Variances and the variance approval process shall be governed by the Board of Health Regulation Regarding Variance Requests.

## **12. Appeal**

Any person aggrieved by an order, variance, issuance or denial by the Board of Health may appeal to any court of competent jurisdiction as provided for by the laws of the Commonwealth of Massachusetts.

## **13. Enforcement**

13.1 The Board of Health, its agents, officers and employees shall have the authority to enter upon privately owned land for the purpose of performing their duties for the administration and review of this regulation and may make or cause to be made such examination, surveys or sampling as the Board deems necessary.

13.2 The Board of Health shall have the authority to enforce these regulations by violation notices, administrative order and civil and criminal court actions.

13.3 Any person who shall violate any provision of this regulation for which a penalty is not otherwise provided shall be subject to a fine of not more than \$200. Each day or portion thereof during which a violation occurs or continues shall constitute a separate offense.

## **14. Severability**

Each section of these rules and regulations shall be construed as separate and to the end that if any section, item, sentence, clause or phrase shall be held invalid for any reason, the remainder of these rules and regulations shall continue in full force and effect.

## **15. Effective Date**

This regulation shall take effect on XXXX.