

Model General Bylaws for Water Conservation and Irrigation System Regulation

The following model General Bylaws were developed for the North and South Rivers Watershed Association (NSRWA) by Horsley Witten Group, Inc. (HW), with legal assistance provided by Rubin and Rudman, LLP. The project was funded by the Massachusetts Environmental Trust. These particular bylaws are designed to address irrigation concerns, in particular the potential for impacts to a community's water resources, including, but not limited to: 1) the regulation of irrigation systems using public water supply; 2) the regulation of irrigation using private systems; and 3) technical specifications for irrigation systems. These model bylaws are part of a larger project in which a model Zoning Bylaw for sustainable landscaping was also developed as well as public outreach materials regarding fertilizer and pesticide applications. These regulatory and outreach documents are designed to bring several different aspects of landscape design and maintenance into a single body of work that can be used as a reference for Massachusetts communities. The over-arching goal is to provide specific regulatory structures and technical standards that can be easily adapted for local use toward the continued development of more sustainable landscapes.

As with any model bylaws or ordinances, the language provided here will need to be tailored to specific communities with different permitting and administrative frameworks. For example, research in the area of water use restriction demonstrates that a wide variety of approaches can be implemented within a community dependent upon the existence and capacity of different agencies and their regulations. Accordingly, some communities rely heavily on the Board of Health to be the administering agency over water-based restrictions, while others look to the district water supply to promulgate restrictions.

This bylaw uses a General Bylaw as the platform for regulation for three basic reasons. First, the function of the General Bylaw is such that a wide variety of water use restrictions can more easily be grouped into a cohesive document. Second, there is considerable precedence for the use of the General Bylaw in Massachusetts for water use standards. Third, any technical standards that a community would rather have in an existing set of Rules and Regulations can be easily extracted from this model and placed under the appropriate agency's jurisdiction.

As with any model bylaw or ordinance, it is important that each community looking to implement any of these regulations closely examines their existing regulatory documents and administrative structure before adoption. Any proposed bylaw amendments should be closely examined by a variety of local agents, including Town or City Counsel, to ensure consistency with local needs. Where issues are likely to arise that will require specific local considerations, this model provides "*Commentary*" on the critical questions that each community will need to answer in order to properly adjust this language to suit its needs.

The following model is divided into two basic bylaws:

- 1) Water Use Restrictions
- 2) Irrigation System Requirements

The first section establishes a community's authority to declare a local state of water conservation in response to periods of hydrologic stress. The bylaw also establishes several basic water use restrictions that apply to the community on a year round basis. In general, this first bylaw is well established in Massachusetts and uses the general format and language provided by the Department of Environmental Protection's (DEP) model ordinance. A critical addition to this bylaw, however, includes establishing jurisdiction over irrigation supplied by private wells.

The second bylaw establishes the process by which new irrigation systems must be registered with a community and how these systems should be designed. This irrigation bylaw is concretely linked to the first water use bylaw in two ways:

- 1) Registration requires a property owner to note in the system documentation from which major basin he or she is drawing water. This formally establishes a link between water restrictions that are declared as part of a stressed condition on a basin and the use of any irrigation system within that basin, whether they are using public or private water.
- 2) The potential restrictions listed in the first water use bylaw serve as design criteria for irrigation systems permitted in the second bylaw. For example, automated irrigation systems shall be designed to accommodate alternating day schedules as may be required during drought conditions.

Although the documents are formatted and referred to as "bylaws" for use by towns, they may also be formatted and promulgated as "ordinances" by a city.

CHAPTER 1: MODEL WATER USE RESTRICTION BYLAW/ORDINANCE

Section 1: Authority

This Bylaw is adopted by the Town under authority granted by the Home Rule amendment to the Massachusetts Constitution and under its police powers to protect public health and welfare and its powers under M.G.L. c.40, §21 et seq. and implements the Town's authority to regulate water use pursuant to M.G.L. c. 41, §69B. This bylaw also implements the Town's authority under M.G.L. c. 40, §41A, conditioned upon a declaration of water supply emergency issued by the Department of Environmental Protection.

Section 2: Purposes

The purposes of this bylaw are:

- a) To protect, preserve and maintain the public health, safety and welfare whenever there is in force a State of Water Supply Conservation or State of Water Supply Emergency by providing for enforcement of any duly imposed restrictions, requirements, provisions or conditions imposed by the Town or by the Department of Environmental Protection;
- b) To protect the quantity and quality of water available both in surface waters and aquifers within the watersheds that lie within the Town and to avoid undue hydrologic stress to these resources.

Commentary: The language in this section is different from the DEP model in that it expands the intended protection to the major basins that lie within a Town. This is a critical addition to the bylaw and lays the foundation for a hydrologic approach that will include regulation of both public and private water supply.

Section 3: Definitions

Person shall mean any individual, corporation trust, partnership or association, or other entity.

Supplemental Water shall mean any irrigation water applied in addition to effective rainfall.

State of Water Supply Conservation shall mean a State of Water Supply Conservation declared by the Town pursuant to Section 5 of this bylaw.

State of Water Supply Emergency shall mean a State of Water Supply Emergency declared by the Department of Environmental Protection under M.G.L. c.21G, §15-17.

Water Users or Water Consumers shall mean all public and private users of the Town's public water system, irrespective of any person's responsibility for billing purposes for water used at any particular facility, and any resident of the Town who uses water from a private well or source of water within the [INSERT NAME(S)] watershed(s).

Section 4: General Water Use Regulations

The following water use restrictions shall apply to all water users or water customers at all times. These Use Regulations shall be superseded by any restriction imposed as part of a State of Water Supply Conservation as described in Section 5 of this bylaw or by any State of Water Supply Emergency as described in Section 9 of this bylaw.

- a) Irrigation systems shall not operate between the hours of 8 AM and 8 PM.
- b) Irrigation systems shall not be programmed to run for any duration of time that will result in more than 1.0 inch of supplemental water per week being supplied in an individual zone or on an individual property unless irrigation is being provided for new plantings.
- c) All hoses shall be fitted with pistol-grip-type nozzles for any outdoor watering or washing activities.

Commentary: This section of the bylaw is designed to provide some basic "common sense" restrictions that a Town can enforce year round without seasonal considerations related to drought. These three restrictions represent simple "best practices" that are easy to comply with irrespective of any climatic considerations. Communities that are not comfortable with blanket restrictions may wish to include these three items as part of Section 6 below, which provides potential restrictions in response to a declared State of Water Conservation.

Section 5: Declaration of a State of Water Supply Conservation

The Town, through its [Board of Selectmen], may declare a State of Water Supply Conservation upon a determination by a majority vote of a quorum of the Board that a shortage of water exists and conservation measures are appropriate to ensure an adequate supply of water to all water users and consumers. Public notice of a State of Water Conservation shall be given under Section 7 of this bylaw before it may be enforced.

Commentary: This model bylaw identifies the Board of Selectmen as the agency for declaring a State of Water Conservation. Communities may choose to vest this power in another agency, such as a Board of Water Commissioners or a local Water District, depending on which agencies are most involved in the regulation of water use in the community.

Commentary: The criteria that may be used by the Board of Selectmen or other applicable authority for declaring a State of Water Conservation may vary. To the

greatest extent possible, communities should attempt to identify specific hydrologic stresses for declaring a State of Water Conservation. For example, basins such as the Ipswich River Basin and the Neponset River Basin have real-time stream gauging operations used by the Department of Environmental Protection to enforce conditions of existing Water Management Act Permits. As another example, the Topsfield Water Management Act Permit identifies stressed flow conditions for the Ipswich River Basin that will trigger state-level restrictions on these larger wells. Communities could use these same flows to enforce restrictions on smaller irrigation systems.

Other criteria that may exist in a community may include existing observation wells that could be monitored on a weekly basis for depth to groundwater or existing stream gages that can be periodically monitored during typical periods of hydrologic stress.

Section 6: Restricted Water Uses During a State of Water Supply Conservation

A declaration of a State of Water Supply Conservation shall include one or more of the following restrictions, conditions, or requirements limiting the use of water as necessary to protect the water supply. The applicable restrictions, conditions or requirements shall be included in the public notice required under Section 7.

- a) Outdoor watering by water users with odd numbered addresses may be restricted to odd numbered days. Outdoor watering by water users with even numbered addresses may be restricted to even numbered days.

Commentary: Although this is a common water use conservation measure across the country, communities may want to consider more restrictive possibilities. Watering one's lawn every other day could result in a situation where the 1.0 inch of supplemental irrigation could be exceeded (Section 4.2 above). Other restrictions could include no more than twice each week. However, enforcing this level of use may be more difficult than the "every other day" model.

- b) Watering may only be allowed one day each week as specified by the [Board of Selectmen].
- c) Outdoor watering may be prohibited.

Commentary: This is an extreme measure and should be used with caution. Although it is not advisable for people to be planting during times of typical drought periods, it may occur in the course of normally scheduled development. These properties would be particularly vulnerable to widespread prohibitions on outdoor watering.

- d) Filling of swimming pools may be prohibited.
- e) The use of automatic sprinkler systems may be prohibited.
- f) Restrictions may be placed on commercial or industrial users including, but not including to car wash operations;
- g) Washing of sidewalks, driveways, decks, and patios may be prohibited;

- h) Washing of cars by residents may be prohibited;
- i) Other measures may be imposed by the Board of Selectmen that may be necessary or appropriate to protect the water supply.

Section 7: Public Notification of a State of Water Supply Conservation; Notification of DEP

Notification of any provision, restriction, requirement or condition imposed by the Town as part of a State of Water Supply Conservation shall be published in a newspaper of general circulation within the Town, or by such other means reasonably calculated to reach and inform all users of water of the State of Water Supply Conservation. Any restriction imposed under Section 6 shall not be effective until such notification is provided. Notification of the State of Water Supply Conservation shall also be simultaneously provided to the Massachusetts Department of Environmental Protection.

Section 8: Termination of a State of Water Supply Conservation; Notice

A State of Water Supply Conservation may be terminated by a majority vote of a quorum of the Board of Water Commissioners, upon a determination that the water supply shortage no longer exists. The effective date of the termination shall be the next calendar day following said vote or on such other date as the Board may determine. Public notification of the termination of a State of Water Supply Conservation shall be given in the same manner required by Section 7.

Section 9: State of Water Supply Emergency; Compliance with DEP Orders

Upon notification to the public that a declaration of a State of Water Supply Emergency has been issued by the Department of Environmental Protection, no person shall violate any provision, restriction, requirement, condition of any order approved or issued by the Department intended to bring about an end to the State of Emergency.

Section 10: Penalties and Enforcement

Anyone violating any portion of this bylaw or any notice or order issued under this bylaw shall be subject to a warning for the first offense, a civil penalty or criminal fine of one hundred and fifty dollars (\$150) for the second offense and a penalty or fine of three hundred dollars (\$300) for the third and subsequent offenses. Fines shall inure to the Town for such uses as the [Board of _____] may direct. Fines shall be recovered by indictment, or on complaint before the District Court, or by non-criminal disposition in accordance with section 21D of chapter 40 of the general laws. Every day or portion thereof that the offense continues shall constitute a separate offense. The remedies set forth herein are not exclusive and may include any other remedies available under applicable law.

Commentary: The maximum penalty amount allowed by statute is \$300 per offense.

Section 11: Exemptions

The requirements of this Bylaw shall not apply to:

- a) Water withdrawals from private wells subject to regulation by the Department of Environmental Protection under the Massachusetts Water Management Act,
- b) Commercial agriculture as defined in GL Ch. 128, s. 1A;
- c) Commercial car washing facilities;
- d) Commercial swimming pools or swimming pools used as a primary means of exercise, therapy or rehabilitation;

Commentary: These restrictions are provided to protect those withdrawals that are either already regulated by the state under the Water Management Act or those withdrawals that are essential to the sustained viability of specific commercial operations.

Section 12: Regulations

The Board may adopt, and amend, rules and regulations pertaining to the procedures and administration of this bylaw.

Section 13: Severability

The invalidity of any portion or provision of this bylaw shall not invalidate any other portion or provision thereof.

CHAPTER 2: MODEL IRRIGATION SYSTEM REQUIREMENTS BYLAW/ORDINANCE

Section 1: Purpose

The purpose of this bylaw is to ensure that irrigation systems installed within the Town are registered with the Town and constructed in a way that optimizes water use, protects surface and groundwater supplies within the Town's watersheds, and facilitates compliance with general irrigation regulations and/or any declared State of Water Supply Conservation or State of Water Supply Emergency as described in the Town's Water Use Restriction Bylaw.

Section 2: Applicability

Any irrigation system that is installed and is designed to periodically or regularly provide irrigation through the use of water conveyed through pipes and/or hoses and dispersed through sprinkler heads or a similar device shall be subject to the provisions of this bylaw, except for those users specifically exempted under Section 7 of this bylaw. These systems shall be registered and permitted through the processes described herein with the [Building Inspector].

Commentary: Recognizing that water is a vital public resource, and that all withdrawals affect the environment regardless of whether the source is public or private, this model bylaw applies to any non-agricultural irrigation system regardless of whether it uses municipal water or water from a private well.

Commentary: This model bylaw identifies the Building Inspector as the local permitting and enforcement agent. Other potential candidates may include the local Board of Health Agent or a Water District Commissioner. Recognizing that irrigation systems represent a specialized technical field, the bylaw uses a Certified Irrigation Auditor to provide technical documentation for compliance with the standards set forth in the bylaw. Therefore, the agent chosen by the Town to issue the permit and hold the records will not need to be trained in irrigation system installation and operation.

Section 3: Registration and Permitting of Irrigation Systems

Irrigation systems under the jurisdiction of this bylaw shall be registered and approved by application to the [Building Inspector] using application forms available through the [Building Inspector]. No new irrigation system shall be constructed until the application for said irrigation system is approved by the [Building Inspector]. Irrigation systems that were already installed at the time this Bylaw was adopted shall be registered within twelve (12) months of the adoption of this Bylaw and shall conform to the System Specifications listed in Section 6 of this Bylaw within three (3) years of its adoption. If ownership of a property with an irrigation system that was installed at the time this bylaw

was adopted is transferred within the three (3) year timeline, said system shall be upgraded to meet the System Specifications at the time of the transferal, unless weather prevents an upgrade at transfer, in which case the upgrade shall be performed as soon as the weather permits.

Section 4: Registration Requirements

Applications to the [Building Inspector] for the registration of an irrigation system that is subject to this Bylaw as described in Section 2 shall demonstrate compliance with the System Performance and Design Standards listed in Section 5 of this bylaw and shall provide the following information or materials where applicable:

- 1) Registration fee;
- 2) Property address and property owner's name;
- 3) Where an on-site well shall be used for the irrigation system, any records associated with the establishment of said well as required by the Board of Health;
- 4) Any record of plumbing permits associated with the use of an outdoor irrigation system connected to the public water supply;

Commentary: Plumbing permits are required for the connection spigot between outdoor irrigation systems and a Town's or District's public water supply. These records should be readily available through the Building Inspector.

- 5) The name, address and telephone number of the company that installed or is proposing to install the irrigation system;
- 6) The approximate square footage of area that is or will be irrigated by the system;
- 7) The estimated amount of time required to apply one (1) inch of water to the entirety of the irrigated area or to each individual zone based on the system specifications;
- 8) Description of methods to regulate the timing, duration, frequency or volume of irrigation;
- 9) Description of methods to demonstrate compliance with the Performance and Design Standards in Section 5;
- 10) Where connected to a public water supply, the name of the surface water body, well or well field that supplies the water;
- 11) The name of the watershed from which water is being withdrawn;
- 12) Documentation from a Certified Landscape Irrigation Auditor that the system complies with the specifications of this Bylaw; and
- 13) Other information that the Town may require.

Commentary: These requirements are designed to provide basic information to the Town and to simultaneously educate the property owner regarding the proper use of the system. For example, these requirements will establish how long the system should run to provide an inch of irrigation, which is the maximum weekly allowance under the Bylaw. The requirements also alert the property owner to which basin he or she is potentially

impacting. This documentation will make it easier to enforce restrictions that may be based on observed hydrologic stress within a particular basin.

Section 5: Irrigation System Performance and Design Standards

The following performance and design standards shall apply to all newly installed irrigation systems. Irrigation systems that were installed at the time this bylaw was adopted shall comply with these specifications within three (3) years of the adoption of this Bylaw. If ownership of a property with an existing irrigation system is transferred within said three (3) year timeline, the existing system shall be upgraded to meet the System Specifications at the time of the transferal, unless adverse weather prevents an upgrade at transfer, in which case the upgrade shall be performed as soon as the weather permits.

- 1) Irrigation systems shall be designed in a manner that makes it possible to comply with any potentially applicable restrictions listed in Section 6 of the Town's Water Use Restriction Bylaw;

Commentary: Although the applicable restrictions are listed below in these Design Standards, this first provision provides a blanket requirement that will ensure compliance with any subsequent changes that may be made to Section 6 of the Water Use Restriction Bylaw in the future.

- 2) Sprinkler heads shall not be located closer than six (6) inches to impervious surfaces;
- 3) Placement of sprinkler heads should be appropriate to the dimensions of the area to be irrigated in order to avoid water being sprayed on impervious surfaces;
- 4) The system shall include a mechanism such as a rain gage or irrigation gage for each zone or every 5,000 square feet that can accurately determine the amount of water that has been applied during a given irrigation session. Said gage(s) shall be able to measure at least one (1) inch of rain in increments of one-eighth (1/8) of an inch;
- 5) The system shall include a mechanism such as a rain gage that can accurately determine the amount of precipitation that has occurred in a given week. Said gage shall be able to measure at least one (1) inch of rain in increments of one-eighth (1/8) of an inch;

Commentary: The requirement for "at least one (1) inch" in numbers 3 and 4 above is meant to ensure that operators can comply with the maximum one inch of supplemental irrigation allowed in the Water Use Restriction Bylaw.

- 6) The system shall be designed with sprinkler heads matched to the size and shape of the area which they will service, in order to achieve a minimum distribution uniformity of sixty-five percent (65%) or better;

Commentary: A distribution uniformity (DU) is a standard measurement of irrigation efficiency often applied to turf irrigation. An ideal pattern would yield a DU of 100%. A DU of 65% represents an efficient sprinkler system, which should be readily available in today's market.

- 7) The system shall incorporate a master shutoff valve directly connected to the controller. This valve will automatically shut off water to the irrigation system while the system is in operation to preclude the possibility of leakage;
- 8) The system shall include a backflow prevention device;
- 9) An automated system shall be capable of functioning on even/odd days, one day each week, or at any other time interval that may be specified during a State of Water Supply Conservation as specified in the Water Use Restriction Bylaw;
- 10) An automated system shall be controlled by a rain sensor switch that will shut the system off after one-eighth (1/8) inch of rainfall within the preceding 72-hours;
- 11) The system shall be controlled by one or more soil moisture sensing devices that will prohibit operation of the system until measured soil moisture levels indicate a need for supplemental irrigation.

Section 6: Periodic Inspection

After initial confirmation that a new or upgraded irrigation system is in compliance with the guidelines and specifications of this Bylaw, The [Building Inspector] shall require each system to be inspected by a Certified Landscape Irrigation Auditor every [three (3)] years to confirm continued compliance. A letter of certification shall be submitted to the [Building Inspector] by the Certified Landscape Irrigation Auditor as documentation of compliance.

Commentary: This section is designed to ensure continued high performance of irrigation systems in the community, which can easily suffer significant wear and tear over a three year period due to seasonal freezing and thawing. Local authorities may wish to increase or decrease this timeline depending on the perceived burden to residents and other users.

Section 7: Exemptions

The requirements of this Bylaw shall not apply to water withdrawals from private wells that are regulated by and have received a permit from the Department of Environmental Protection under the Massachusetts Water Management Act, or to commercial agriculture as defined in GL Ch. 128, s. 1A.

Commentary: These restrictions are provided to protect those withdrawals that are either already regulated by the state under the Water Management Act or those withdrawals that are essential to the sustained viability of commercial agricultural operations.

Section 8: Penalties and Enforcement

Anyone violating any portion of this bylaw shall be subject to a warning for the first offense, a fine of one hundred and fifty dollars (\$150) for the second offense and a fine of three hundred dollars (\$300) for the third and subsequent offenses. Fines shall inure to the Town for such uses as the [Board of Water Commissioners] may direct. Fines shall be recovered by indictment, or on complaint before the District Court, or by non-criminal disposition in accordance with section 21D of chapter 40 of the general laws. Every day or portion thereof that the offense continues shall constitute a separate offense. The remedies set forth herein are not exclusive and may include any other remedies available under applicable law.

Commentary: The maximum penalty amount allowed by statute is \$300 per offense.

Section 9: Regulations

The Board may adopt, and amend, rules and regulations pertaining to the procedures and administration of this bylaw.

Section 10: Severability

The invalidity of any portion or provision of this bylaw shall not invalidate any other portion or provision thereof.