



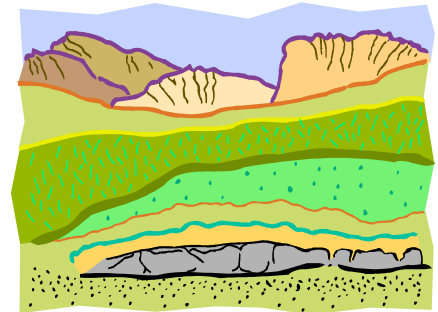
Cape Cod Cranberry Growers' Association

GROWER ADVISORY

Zone II Delineation and The Appeals Process

Introduction

Zone IIs and IWPA's have received a lot of attention by the CCCGA, its partners in the cranberry industry and our grower-members over the past several years. Since the inception of the Zone II concept these delineated areas have grown and not surprisingly they have grown to overlap many bogs and supporting uplands. Reservoirs and the wetland environment necessary for cranberry production have inarguably contributed to the higher water tables consistent with public drinking water supplies of Southeastern Massachusetts. Thus, as the cranberry growing areas of Southeastern Massachusetts become increasingly urbanized, demand for ground water will increase, and additional sources may be put on-line resulting in additional areas to be protected by Zone II delineations, limiting the tools available for pest control on the bog. Previous advisories have been distributed addressing how to comply with the Zone-II regulations, which are enforced by the Massachusetts Department of Agricultural Resources. This advisory will focus on how the Department of Environmental Protection goes about delineating a Zone II, including their tools and justification. More importantly however, this advisory can be used to assist in understanding the appeals process presenting the grower with the opportunity to either remove his/her land from the delineated area if the landowner believes his/her land not to be part of groundwater recharge area. In addition, this advisory will review how a landowner can be on the lookout for new proposed wells which could result in new Zone IIs or IWPA's.



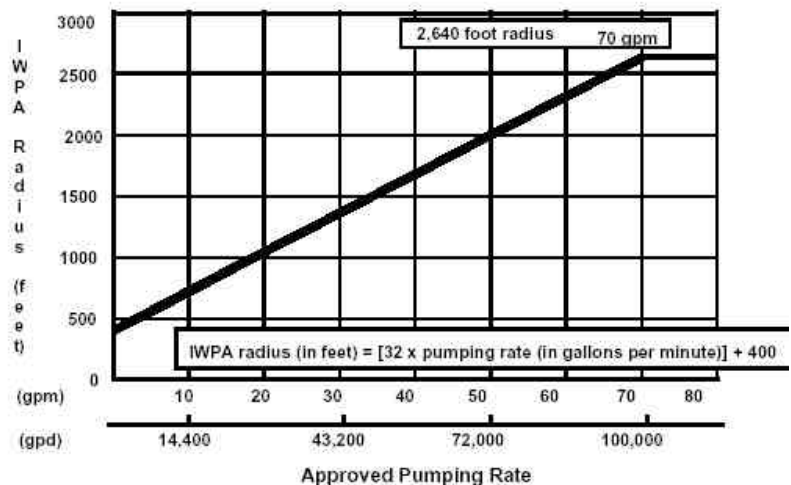
What is the Difference Between a Zone II and an IWPA?

Zone IIs and Interim Wellhead Protection Areas represent a very similar concept, the delineation of an area to protect drinking water. Both are focused on protection of ground water resources. Zone IIs are either numerically modeled based on in-depth testing of sub-surface geology and water table elevations, or are conceptually modeled using regional geology and historic pumping rates, and are used to protect wells with a pumping capacity greater than or equal to 100,000 gallons per day. IWPA's on the other hand are delineated more abstractly by using a scale relating IWPA radius to pumping rate, resulting in a perfect circle around the well. Contrary to what the name suggests Interim Wellhead Protection Areas are not meant to be interim delineations, rather they serve as a permanent delineation for wells pumping less than 100,000 gallons per day. They were given the moniker IWPA when undelineated areas pumping at least 100,000 gpd were given a radius of 1/2 mile until such time as a Zone II was delineated. MDAR enforces Zone II restrictions on all wells with pumping capacity of over 100,000 gallons per day.

When and How are Zone IIs and IWPA's Delineated?

New Zone IIs are delineated when new wells are dug. Conversely they are removed when wells are no longer used and are abandoned. Delineations representing new and old/abandoned wells are updated periodically, generally on a quarterly basis by the DEP. The CCCGA updates its GIS database to reflect these changes. This database is available to CCCGA members. The development of a public groundwater resource in Massachusetts is governed by the source approval process. Regulations governing this process are set forth in the Groundwater Supplies section of the Massachusetts Drinking Water Regulations (310 CMR 22.21). The process for developing these wells differs for wells with planned yields of less than 100,000 gallons per day and those with planned yields of 100,000 gallons per day and greater. The process also differs for wells

IWPA Radius vs. Pumping Rate
Pump Rate, in gallons/minute x 1440 minutes/day = gallons per day



constructed in bedrock or confined aquifers versus those constructed in unconfined sand and gravel aquifers. IWPA's are used for wells pumping less than 100,000 gallons per day and are delineated as perfect circle around the well with the radius tied to pumping capacity.

The Source Approval Process

The DEP aims to evaluate the impact to natural resources through the water supply development process. Through the source approval process and the Water Management Act (WMA) Withdrawal Permit application process, applicants are required to provide detailed information regarding potential withdrawal impacts. DEP coordinates WMA Withdrawal Permit application reviews with Source Approval reviews and solicits comments and recommendations from other state and environmental agencies.

Zone II Delineation Requirements

- a. Minimum information necessary for determining the Zone II area:
 - 1) Water table contour map representing condition typical of the pre-developed long-term average water table for an unconfined aquifer
 - 2) Hydraulic conductivity, saturated thickness, transmissivity and storage coefficient of the aquifer as obtained from the pumping test and boring logs
 - 3) Nature and characteristics of the aquifer's hydrogeologic boundaries
- b. DEP Recommended procedure for determining Zone II:
 - 1) Construct a water table contour map representative of pre-developed. Long-term average conditions in the aquifer. The map area should include, at a minimum, the preliminary estimate of the Zone II area.
 - 2) Using an appropriate analytical or numerical model, predict the drawdowns by imposing Zone II criteria (180 days of pumping approved yield, with no recharge from precipitation).
 - 3) Determine the Zone II water table contours by subtracting the predicted drawdowns from the long-term average water table contours.
 - 4) Construct a flow net based on the resulting Zone II water table contours.
 - 5) Identify the groundwater divide induced by pumping, which separates the area contributing water to the well (Zone II) from the aquifer area outside Zone II.
 - 6) Extend the groundwater divide upgradient to its point of intersection with prevailing hydrogeologic boundaries.
 - 7) The area defined in this manner is the Zone II for the pumping well
 - 8) In certain cases where streams or lakes act as recharge boundaries, the extent of Zone II will terminate at the nearest edge of this recharge feature relative to the pumping well.

Zone II Appeal and Commenting on Potential Impact of New Wells

If, as a grower, you think your property has been wrongly placed in a Zone II an appeal can be filed. If you would like to prevent the delineation of a new Zone II there are a number of avenues you can pursue, all with the common goal of trying to stop a new well from coming on line. Offering input on the environmental impact of a well and its recharge area **prior** to its approval and installation is always easier than trying to redelineate an existing Zone II.

Stoppage of a New Well or an Expanded Zone II

The following will explain the timeline for new source approval and where those with something at stake can offer input to the process. All of the steps in this process are required by the Department of Environmental Protection and the Massachusetts Environmental Policy Act office.

1. Town Exploratory Process

This is the very first stage of the process for finding a new well. The DEP is not involved at this stage in the process. During this first step the proponent, most frequently the town, will identify suitable areas, and probe and rate potential well sites.

To Whom the Source Approval Process Applies (For Public Water Supplies)

The Source Approval Process is applied by the DEP When Considering the Following:

- 1) A new public supply well
- 2) An increase in the approved yield of an existing public supply source.
- 3) The reactivation of a public supply that has been inactive per order of the DEP.
- 4) The reactivation of a public supply not in use for the last five years.
- 5) An approved source that was not developed within 5 years of the date of approval and for which the Zone I is not owned and controlled.

To Whom the Source Approval Process Does Not Apply

- 1) **Replacement Wells** – Replacement wells are sources located in unconsolidated deposits no farther than 50 feet from the wells they are replacing. They should not significantly alter the local groundwater hydraulics or Zone II boundaries. Proposals for replacement wells must be submitted to DEP for approval though they will generally be exempt from certain source approval requirements.

2. Request for Site Exam

When the city/town decides where it wants to dig the well its next step is to notify the DEP by submitting a **Request for Site Exam** form. The form can be accessed here:

<http://www.mass.gov/dep/brp/wtrm/files/ss020501.doc>

This form is meant to assess several factors:

- Demand Management
- Potential Environmental Impact
- Impact on Streamflow and Availability of Water in the River Basin
- Regulatory Review

In addition to the **Request for Site Exam** form, several other components must be submitted by the proponent at this step:

A) Alternatives Analysis -The Alternatives Analysis is a write-up done by the proponent meant to address all possibilities outside of drilling a new well in a particular location. This summary should offer compelling reason why a town needs a new well at all, and why the well must be dug in the proposed location. The analysis must address the following:

- 1)Cost Alternative
- 2)Leak Detection Alternative
- 3)Conservation and Demand Management Alternative
- 4)Withdrawal Points Alternative
- 5)No Action Alternative
- 6)Other Alternative

B) Water Conservation Questionnaire- The Water Conservation Questionnaire is meant to outline all efforts that have been made to conserve water and is applied to public water suppliers. The form can be found here: It consists of seven sections:

- 1) General Information, the demographics of the community and end water users
- 2) Unaccounted-for Water Use
- 3) Public Education Program
- 4)Leak Detection and Repair
- 5) Metering
- 6) Pricing
- 7) Demand Management and Emergency Planning

C) A Published Notice to the Environmental Monitor

If the proponent submits all necessary paperwork and the DEP approves the site screening than the process will proceed to step two without intervention from those concerned with the newly proposed well.

3. The Pump Test, Zone II Delineation, and the Water Withdrawal Permit Application

The pump test, proposed Zone II delineation, and applying for the water withdrawal permit are the final steps when a town is trying to construct a new well. The pump test is designed to test to make sure that the proposed well will be able pump at the desired volume and that water from this well is of acceptable quality for safe drinking. The requirements for the test are fairly lengthy and can be found in section four of DEP's Drinking Water Guidelines. The

1st Opportunity for Comment

Early Notice Guidance

The early notice guidance is a required component of the Request for Site Exam Application. When siting or expanding a public water supply, the proponent, i.e. the one wanting the well, must publish a notice of the Request For Site Exam application in the Environmental Monitor prior to the application filing with DEP. A copy of the published notice, as it appeared in the Environmental Monitor, must be submitted with the Request For Site Exam application. The Early Notice publication in the Environmental Monitor is not to be confused with the MEPA/ENF notice required to be published in the Environmental Monitor at the time of the submittals for the Water Management Permit Application and the Drinking Water Permit Application.

Sample of an Early Notice

[Applicant name] has applied to DEP for a Request for Site Exam application for siting or expanding a public water supply source to withdraw up to approximately _____ gallons per day of water from the ground or surface water of the [basin name] River Basin, in [municipality]. The location(s) of the withdrawal point(s) is/are: [location] .

Written comments on the granting of a DEP permit to conduct additional testing of the site for a new or expanded water supply withdrawal are to be filed within thirty (30) days of publication of this notice in the Environmental Monitor. The written comments are to be submitted to the Drinking Water Program Section Chief at the DEP [Western, Central, Northeast, or Southeast] Regional Office [address].

The Environmental Monitor

The MEPA Office publishes **The Environmental Monitor** twice each month. *The Monitor* has information on projects under review, recent decisions of the Secretary of Environmental Affairs, and public notices from environmental agencies.

The MEPA Office maintains an electronic mailing list. All subscribers are informed via e-mail when each issue of *The Monitor* is posted on the Web. Requests to be placed on the electronic mailing list should be sent to mepa@state.ma.us. Include your e-mail address, your name and an alternative means of contacting you (phone number, address).

approval of the pump test report acknowledges and approves the proposed Zone II. In addition, the pump test is meant to ensure that there will not be a significant impact in water availability to these other potential receptors.

A final opportunity for comment to a proposed new public water supply is available when the town files their Water Management Act (WMA), Water Withdrawal Permit Application. Criteria for the WMA Water Withdrawal application are obviously significantly different than that of Water Withdrawal Permits for cranberries. What does not change, however, is the requirement that the proponent (i.e. the town) file an Environmental Notification Form with the Massachusetts Environmental Policy Act (MEPA) office.

4) Permit to Construct

Permits are issued and construction of a new well begins

Redelineation of Zone IIs (The Appeals Process)

The following describes the criteria and the process for the redelineation of a previously approved Zone II. Redelineations are considered by the DEP based on the submittal of new or improved geologic and hydrogeologic information. It is important to note that the data must be at least as thorough for the proposed delineation as the data used by DEP for the original Zone II delineation and that there are significant fees involved. For this reason trying to redelineate an existing Zone II can be prohibitively expensive and time consuming. In addition, the sub-surface geology of Plymouth and Barnstable Counties is generally uncomplicated consisting primarily of unconfined sand and gravel, meaning Zone II delineation should be, at least theoretically, very cut and dry. The specific procedure for the Zone II appeal can be accessed by contacting the CCCGA office or can be found directly in the regulations.

Presence of these receptors and affect to there water supply could limit a town ability to place a new well.

- Areas of Critical Environmental Concern
- Priority habitat for rare and endangered species
- Lakes and ponds (or other surface water features)
- Vernal pools
- Stocked trout streams
- Hazardous waste sites
- Wastewater treatment facilities
- CSOs or SSOs
- Landfills
- **Agricultural uses**
- Automobile graveyards and junkyards
- Industrial Park/plant
- Petroleum and oil bulk stations and terminals
- Other public water withdrawals
- Private wells

2nd Opportunity for Comment

Environmental Notification Form

The town is required to submit an Environmental Notification Form (ENF) to MEPA when they apply for their WMA Water Withdrawal Permit. In this role, MEPA acts as a forum for public comment on the project. The MEPA website, <http://www.mass.gov/envir/mepa/>, displays all projects currently under MEPA review. In addition to the ENF filing with MEPA, the town must file a notice with the local paper addressing the proposal.

On ENFs, any agency or person may comment on the project, its alternatives, its potential environmental impacts, mitigation measures, and whether to require an EIR (Environmental Impact Report) and, if so, what to require in the scope. Comments must be filed within 20 days following publication of the ENF in the Environmental Monitor unless the public comment period is extended.

The information in this guide is provided by the Cape Cod Cranberry Growers Association as a service to its members. The information represents our interpretation of the state requirements and by no means is intended to act as a substitute for reading and following the specific regulatory requirements.

Department of Environmental Protection
Massachusetts Drinking Water Regulations can be viewed at:
310 CMR 22

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