



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST REGIONAL OFFICE

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July 27, 2010

Wayland Water Department
Town Office Bldg./41 Cochituate Road
Wayland, MA 01778

RE: Town: **WAYLAND**
PWS: Wayland Water Department
PWS ID#: 3315000
Program: Water Quality
Action: Approval 4-log Virus
Inactivation at Wayland
Water Filtration Facility

Attention: Donald Millette
Superintendent

Dear Mr. Millette:

Please find attached the Department's approval of 4-log virus inactivation for your groundwater treatment plant.

Please note that the signature on this cover letter indicates formal issuance of the attached document. If you have any questions regarding this letter, please contact James Dillon at (978)-694-3231.

Very truly yours,

Thomas Mahin
Drinking Water Section Chief
Northeast Regional Office

CC: DWP/Boston Office

File Name: Y:\DWP Archive\NERO\Wayland-3315000 -Water Quality-2010-07-27

The Wayland Water Department (Wayland) operates a single ground water treatment plant which treats water from Baldwin Pond Wells 1A, 2, and 3.

This approval for 4-log certification for the inactivation of viruses is only for the Baldwin Pond Wells which are being treated at the new Wayland Filtration Facility.

On or about June 6, 2010, the Massachusetts Department of Environmental Protection (the "Department" or "MassDEP") received Wayland submittal (GWR A Form) for their compliance plan for the Ground Water Rule from their engineering consultant Tata & Howard, Inc.

The facts are as follows:

WTP Facts	
Clear well Baffle Factor	0.7
Clear well Volume	$[20 * 96 * 6] \text{ft}^3 * 7.48 \text{ gallons/ft}^3 = 86170 \text{ gallons}$
Baffled Clear well volume gallons	$86170 \text{ gallons} * 0.7 = 60319 \text{ gallons}$
Minimum Water temperature degrees centigrade	12
Peak hourly flow gpm	1,041
Pipe Volume	587 gallons
Minimum free chlorine residual ppm	0.2
Total volume for CT	$60319 + 587 = 60906 \text{ gallons}$
CT calculated *	$= 60906 \text{ gallons} * 1 \text{ minute}/1041 \text{ gallons} * 0.2 \text{ ppm} = 12 \text{ (mg*min)/L}$
CT required **	5.2
Ratio CT calculated/CT required	2.3
Virus log removal	9.2

The units of both CT calculated and CT required are (mg-minute)/liter.

- CT calculated = [(clear well volume) * 0.7 + pipe volume]/peak hourly flow * free chlorine residual
- CT required is taken from a EPA chart

If the ratio of the CT calculated for 99.99% viral inactivation to CT required for 99.99% viral inactivation is equal to or greater than 1.0, the public water supplier is in compliance.

The above calculations show that Wayland water treatment plant meet 4-log log inactivation of viruses down to a water temperature of 4 degrees centigrade.

The Department herein grants Wayland 4-log virus inactivation for their ground water filtration facility.

Certification is granted upon Wayland meeting the conditions outlined in this letter. Beginning August 1, 2010 Wayland must conduct GWR compliance monitoring per 310 CMR 22.26(4)(b) to prove that the disinfection process is meeting 4-log treatment at all times. Monthly GWR compliance monitoring forms must be submitted. The required reporting form has been enclosed for you. The first form is due on September 10, 2010. Compliance monitoring forms must be completed for each chlorination application point. *NOTE: Use form labeled GWR CT1 if you wish to show compliance by determining daily CT or form labeled GRW CT2 if you wish to show compliance by maintaining a free chlorine residual of at least 0.2 ppm at all times.*

The chlorination facility identified as the Wayland Water filtration Facility treating the above mentioned sources, must meet the following requirements: Chlorine residual must be measured continuously at the 100 hundred foot sampling tap.

- The person responsible for taking chlorine residual measurements for reporting to the state and calibrating residual monitoring equipment must be trained and under the supervision of the certified operator.
- 4-log inactivation must be provided at all times.
- Clear well operated at a depth of 6 feet.

Wayland must provide continuous chlorine residual monitoring. Equipment and methods used must meet the requirements of 310 CMR 22.26. If there is a failure in the continuous monitoring equipment, you must conduct grab sampling every four hours until the continuous monitoring equipment is returned to service. The system must resume continuous residual disinfectant monitoring within 14 days.

Wayland cannot make any changes to the chlorination application and monitoring processes used to achieve compliance with the GWR 4-log treatment requires without obtaining prior written approval from the MassDEP.

NOTE: The Department recommends that Wayland's membrane supplier contact the Boston Office of DEP and apply for New Technology Approval to obtain 4-log filtration removal for viruses, Cryptosporidium, and Giardia for use on any surface water supply within the Commonwealth as well as 4-log filtration removal for viruses for use on any ground water source within the Commonwealth.