

I. Purpose

The purpose of this article is to establish a protocol by which the District shall abide to protect areas subject to its jurisdiction, including its wells, from activity which may present a potential or actual source of contamination into a public water supply.

II. Protection of the Public Water Supply

Per 310 CMR 22.01(1) and directive of MassDEP, the District shall secure the sanitary protection of its public water supply by investigating and preventing potential or actual sources of contamination from proposed, ongoing, and/or previous activities from potentially or actually impacting the public water supply.

III. Communication with the Town Board of Health

1. If the Town Board of Health, under the provisions of Chapter 201, Board of Health Article VII (“Groundwater Protection Zone”), requests that the District review a site located in the “Groundwater Protection Zone,” then the District shall:
 - a. Review the site application, plans, materials, and any relevant documentation.
 - b. Determine any and all required action(s), including hydrogeologic investigations, to verify whether the public water supply may potentially or actually be contaminated from any proposed, ongoing, or prior activity.
 - c. Submit its review to the Town Board of Health upon receipt of the required study provided that the District deems the study to be in compliance with this article.
 - i. If the study is not in compliance with this article, the District shall require the customer to ensure that the study is corrected accordingly.
2. The Board of Commissioners reserves the right to request more information and to waive any and all of the above requirements, so long as the Superintendent determines with reasonable certainty that the District’s public water supply will not be impacted.

IV. Hydrogeologic Investigations

1. Should the District require the completion of a hydrogeologic investigation for a project, the customer shall be responsible for its execution.
 - a. The investigation shall cover the Groundwater Protection Zone extending from the site to the District’s wells.
 - b. The final scope of work shall be developed in consultation with the District and approved by the District prior to commencing work.
 - c. All work conducted for the purpose of a hydrogeologic investigation shall be at the customer’s expense.
2. The requirements for observation wells shall be as follows:
 - a. The observation wells shall be installed so as to extend from the ground to the bedrock surface.
 - b. The exact number and location of observation wells shall be determined in the final scope of work by the District.
 - c. The location of each observation well shall be determined to the nearest 1-foot and the elevation of the top of the PVC well pipe shall be determined to the nearest 0.01-foot and marked on the observation well. Ground surface elevation shall be determined to the nearest 0.1-foot.
 - d. Observation wells shall be pumped free-of-sand upon installation to ensure their proper functioning.

- e. The observation wells shall be made of 2-inch diameter PVC pipe and a well screen shall be installed in a minimum 4.5-inch diameter borehole.
- f. A steel guard pipe or road box shall be installed to protect the PVC observation well.
- 3. The requirements for water levels shall be as follows:
 - a. Water levels shall be measured upon installation, under static (non-pumping) conditions, and under pumping conditions.
 - i. These measurements shall be made at all observation wells installed by the proponent as well as pre-existing observation wells identified by the District.
- 4. The requirements for soil analysis shall be as follows:
 - a. Completion of a log, in a format acceptable to the District, of the type(s) of soil(s) encountered in the borings and geologic information completed by a qualified geologist or hydrogeologist.
 - b. Performance of grain-size analysis on selected soil samples obtained during drilling.
- 5. The requirements for groundwater flow mapping shall be as follows:
 - a. Groundwater flow patterns shall be mapped by first converting water-level depth to water-level elevation and under both static and non-pumping conditions.
 - b. Groundwater flow mapping shall be prepared at a scale acceptable to the District.
- 6. All survey work shall be performed by a Land Surveyor certified to perform work in Massachusetts.
- 7. Groundwater quality testing shall be performed per the following parameters:
 - a. Observation wells shall be pumped for one (1) hour each at a rate of flow that exceeds 10 GPM before sampling.
 - b. The exact number of observation wells to be sampled for water-quality testing shall be determined in consultation with the District.
 - c. Observation wells shall be sampled on one (1) occasion unless conditions call for additional sampling events or per the District's request.
 - d. The analyses specified herein shall be performed by an analytical laboratory certified for those analytes. Samples to be tested for dissolved iron and manganese shall be filtered in the laboratory.
 - e. The following drinking water analytes shall be tested for each observation well:
 - i. pH
 - ii. Specific conductance
 - iii. TDS
 - iv. Turbidity
 - v. Color
 - vi. Total alkalinity
 - vii. Chloride
 - viii. Nitrate
 - ix. Nitrite
 - x. Sulfate
 - xi. Total calcium
 - xii. Total magnesium
 - xiii. Total potassium
 - xiv. Total sodium
 - xv. Total silica
 - xvi. Iron (total and dissolved)
 - xvii. Manganese (total and dissolved)
 - xviii. Total hardness
 - xix. VOCs by EPA 524.2

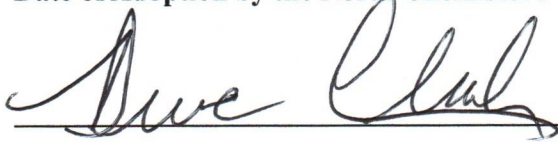
- xx. PFAS (PFOA, PFOS, PFHxS, PFNA, HFPO-DA, PFBS, PFHpA, and PFDA)
 - xxi. Additional analytes requested by the District
8. A Conceptual Site Model (CSM) shall be developed as follows:
- a. At least three (3) geologic cross-sections shall be constructed using newly acquired and pre-existing geologic data obtained from borings or other sources.
 - b. The lines of geologic section shall be displayed on a map that also shows the boundary between exposed glacial till/bedrock and the sand-and-gravel aquifer and other relevant features.
 - c. The CSM shall be presented as a brief narrative, in tabulated form, or a combination of both. Hydrogeologic information of interest includes:
 - i. Approximate range of aquifer hydraulic conductivity (based on grain-size analysis, pumping tests performed by the District and published values)
 - ii. Approximate aquifer storage coefficient
 - iii. Aquifer thickness
 - iv. Approximate hydraulic gradient
 - v. Generalized stratigraphy and boundary conditions (including streams and wetlands)
 - vi. Approximate annual rainfall recharge (inches or feet)
 - vii. Description of recharge areas
 - d. The CSM shall include hydrogeologic information available for the District's well(s).
9. The District may require development of an analytical or numerical Groundwater Flow Model or modification of the District's existing model using the CSM (combination of District's CSM and new proponent's CSM) as a starting point. The following requirements shall apply:
- a. The modeling software shall be acceptable to the District.
 - b. The model shall be calibrated to observed groundwater flow patterns under non-pumping (static) conditions.
 - c. The model shall be verified using observed groundwater flow patterns under pumping conditions.
 - d. Model simulations shall be performed to predict impacts of the proposed development on the District's wells.
 - e. Performance of particle-tracking analysis and, if necessary, contaminant transport modeling.
10. A Hydrogeologic Investigation Report shall be prepared for the District that includes the following in accordance with the descriptions set forth in this article:
- a. A brief description of the regional bedrock and surficial geology with appropriate mapping.
 - b. A description of groundwater flow under pumping and non-pumping conditions with appropriate maps.
 - c. A summary of groundwater quality testing.
 - d. A description of the CSM.
 - e. A description of sensitive environments, habitat, streams, and wetlands along with appropriate mapping.
 - f. A description of the groundwater modeling approach, model design, model calibration, sensitivity analysis, model verification and model limitations.
 - g. A brief description of the activities at the proposed site, including activities, products and uses that could affect groundwater quality.
 - h. A description of proposed mitigation activities intended to prevent damage to groundwater quality.

V. Septic Systems

No septic system or any of its components shall be installed/exist within or discharge to Zone I of a public water supply, on parcels and/or properties abutting Zone I of a public water supply, in violation of governing regulations (including 310 CMR 15.000, 310 CMR 22.00, and 310 CMR 10.00), and/or by discretion of the District if the system and/or its components can be reasonably predicted to constitute a potential source of contamination to the public water supply or areas subject to its authority. The District shall reserve final jurisdiction with regard to areas subject to its authority.

Adopted by the undersigned as part of the Rules, Regulations, and Rates of the North Chelmsford Water District.

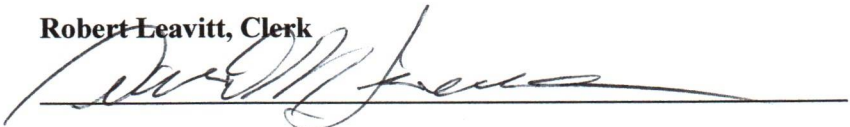
Date of Adoption by the North Chelmsford Water District: May 6th, 2024



Bruce Clark, Chairman



Robert Leavitt, Clerk



David Irvine, Commissioner