

MANCHESTER BOARD OF HEALTH  
DRINKING WATER PROTECTION REGULATION  
*(July 1 Draft for Review by SB and BOH)*

1.0 AUTHORITY

This Regulation is adopted under M.G.L. Chapter 111, Section 31, which gives the Board of Health (hereafter designated as "the Board") authority to make reasonable health regulations, violations for which shall be punished as specified below in Section 7.0 Violations and Penalties. This Regulation is also adopted under M.G.L. Chapter 111, Section 122, which directs the Board of Health to examine into all nuisances, sources of filth, and causes of sickness within its town, which may, in its opinion, be injurious to the public health and to destroy, remove, or prevent the same as case may require. This regulation is also adopted under M.G.L. Chapter 111, Section 143. This Regulation is also adopted in accordance with applicable provisions of the State Environmental Code and under the authority of Chapter 111, Section 31 of the General Laws and any other powers enabling the Town of Manchester Board of Health to adopt regulations as a supplement to Title 5 of the State Environmental Code of the Commonwealth of Massachusetts, and from time to time, in force and effect, amend and restate any previous supplementary Rules and Regulations in their entirety pursuant to unanimous vote of the Board.

2.0 FINDINGS AND PURPOSE

The purpose of this Regulation is to protect the quality of the Town of Manchester's drinking water by further protecting the quality of the Town's Protected Water Bodies, actual or potential sources of potable water, surface waters, Groundwaters and/or Aquifers.

An additional goal of this Regulation is to bring clarity and applicable protection in applying State Environmental Code Title 5 Regulations in Manchester, in ways that take into account the local environmental conditions and administrative processes that are specific to the Town of Manchester.

The Board of Health makes the following findings in support of the adoption of this Regulation:

- (1) The Town of Manchester currently relies upon the Gravelly Pond Reservoir, the Round Pond wells, and the Lincoln Street Well as its sole public sources of drinking water. The town has also identified the Cedar Swamp wells for potential future water supply. These wells are associated with the Cedar Swamp aquifer, Sawmill Brook and adjacent wetlands.
- (2) The Lincoln Street well derives its water from Groundwater recharge from surrounding land areas (Zone 2), from induced infiltration from Sawmill Brook, and from the watershed and contributing areas to Sawmill Brook and its tributaries (Zone 3).
- (3) Gravelly Pond is a surface water supply, with defined protection areas (Zones A, B and C) and a Groundwater recharge contribution area (Zone 2) associated with the Round Pond wells. Wells located around the adjacent Round Pond augment water levels in Gravelly Pond. Gravelly Pond and Round Pond are located in Hamilton, and the Zone 2 for these resources extends into Manchester.

- (4) ZONE A: represents a) the land area between the surface water source and the upper boundary of the bank; b) the land area within a four hundred (400) foot lateral distance from the upper boundary of the bank of a Class A surface water source, as defined in 314 CMR 4.05(3)(a); and c) the land area within a two hundred (200) foot lateral distance from the upper boundary of the bank of a tributary or associated surface water body.
- (5) ZONE B: represents the land area within one-half mile of the upper boundary of the bank of a Class A surface water source, as defined in 314 CMR 4.05(3)(a), or edge of watershed, whichever is less. Zone B always includes the land area within a four hundred (400) ft lateral distance from the upper boundary of the bank of a Class A surface water source.
- (6) ZONE C: represents the land area not designated as Zone A or B within the watershed of a Class A surface water source, as defined in 314 CMR 4.05(3)(a).
- (7) Surface waters including Sawmill Brook, Cat Brook, Causeway Brook and associated tributaries provide critical habitat to fish and other species as well as recreational opportunities (including primary and secondary contact). Sawmill Brook is classified as a Coldwater Fishery Resource by the Massachusetts Division of Fisheries and Wildlife.
- (8) Excess nutrients (nitrogen and phosphorus) cause eutrophication of surface waters including the growth of harmful algal blooms (HABs) that represent public health threats.
- (9) Recent research documents that Wastewater contains both conventional pollutants (bacteria, viruses, nitrate-nitrogen, and phosphorus) and an increasing number of contaminants of emerging concern (CECs) including 1,4-dioxane, pharmaceuticals, flame retardants, PFAs, and any contaminants identified in the future).
- (10) There are several other public supply wells within the town of Manchester that are regulated as public water supplies and have Zone 2 protection areas.
- (11) There are private on-site wells that provide a drinking water source to residents.
- (12) Wastewater contains traditional pollutants including nitrogen, phosphorus, biological oxygen demand (BOD), bacteria, viruses (including COVID), and other compounds and materials of varying temperatures.
- (13) Recent studies show that concentrations below the current national maximum contaminant level (MCL) for nitrate-nitrogen of 10 mg/liter, as low as of 3-4 mg/liter in drinking water may cause rectal colon cancer in humans (Hansen, et al, 2018). Elevated nitrate-nitrogen concentrations are indicative of other Wastewater-derived pollutants (including contaminants of emerging concern).
- (14) Wastewater contains significant concentrations of phosphorus (six to eight milligrams per liter). Recent studies have demonstrated that phosphorus will migrate through soils and Groundwater. While some phosphorus is bound with soil particles, as these binding sites are exhausted additional phosphorus loads will move through Groundwater and discharge to surface waters.
- (15) Concentrations of phosphorus of twenty-four thousandths (0.024) milligrams per liter can cause eutrophication of surface waters and harmful algae blooms (HABs) including cyanobacteria.
- (16) The EPA is preparing national drinking water regulations for various PFAs in current use as well as some that have been discontinued but remain in the environment. Its health advisories from June 2022 set health risk thresholds near zero for two widely-used PFAs (PFOA and PFOS), which are being phased out voluntarily. EPA's prior 2016 standards set health risk thresholds at seventy (70) parts per trillion.
- (17) The toxicological impacts of CECs are not fully assessed prior to the use of these chemicals in the manufacturing process for household products such as cookware, clothing, cleaning products, packaging, etc.

- (18) Concentrated discharges of Wastewater create plumes of contaminated Groundwater that change the biochemistry (including dissolved oxygen and temperature) of the Groundwater and are shown to increase the transport and mobility of contaminants.
- (19) The Zone 2 and Zone 3 areas that contribute to the Lincoln Street well and Gravelly Pond were mapped in 1990 by Horsley Witten Hegemann, Inc. based upon best available data (including surficial geology and hydrologic conditions) at that time.
- (20) New hydrogeologic data may become available to expand the areas that contribute to the Town's Protected Water Bodies, actual or potential sources of potable water, surface waters, Groundwaters and/or Aquifers, as well as potential pollutants to those supplies.

This Regulation is intended to protect the Town's Protected Water Bodies, actual or potential sources of potable water, surface waters, Groundwaters and/or Aquifers, through an environmental and public health impact review process.

These Regulations are also intended to make certain that land development projects will (a) maintain a depth to Groundwater which is adequate for the operation of subsurface Wastewater disposal systems under both local regulations, the State Environmental Code (310 CMR 15.00), and the Groundwater Discharge Permit Regulations (314 CMR 5.00), (b) not be injurious Protected Water Bodies, actual or potential sources of potable water, surface waters (314 CMR 4.00), Groundwaters and/or Aquifers, or wetlands (310 CMR 10.00), and (c) will be carried out so as to provide adequate protection against flooding, siltation, and other drainage problems.

### 3.0 DEFINITIONS

Capitalized terms shall have the meanings defined herein or in Title 5 of the State Environmental Code (310 CMR 15.000 et seq.) ("Title 5"). Other words used in these Regulations shall have their normal meaning.

**Activity:** Includes temporary work and ongoing operation associated with any Significant Development or SWTP.

**Agency:** An agency, department, board, commission or authority of the Commonwealth or of the federal government and any authority of any political subdivision, which is specifically created as an authority under special or general law.

**Applicant:** The owner of the Lot together with any other person authorized by the owner who applies for any of a Sewage Disposal System Construction Permit, Environmental Health Permit or a SWTP Operations Permit.

**Aquifer:** A geologic formation composed of rock, sand or gravel that contains significant amounts of potentially recoverable water.

**Bedrock:** Solid rock exposed at the surface or overlain by unconsolidated gravel, sand, silt and/or clay. Bedrock includes weathered or saprolitic components thereof. Bedrock types are defined and most of their areal extent described in the "Bedrock Geologic Map of Massachusetts" published by the Massachusetts Department of Public Works (1983).

**Board:** The Manchester Board of Health.

**Certificate of Compliance:** A certificate issued by the Board for the operation of a Sewage Disposal System.

**Environmental Health Impact Report (“EHIR”):** as described in Section 5.1 infra.

**Environmental Health Permit:** as described in Section 5.2 infra.

**Groundwater:** Water found in cracks, fissures and pore spaces in the saturated zone below the ground surface including but not limited to perched Groundwater.

**Ground and Surface Water Resource Overlay Protection District (“GSWROPD”):** As defined in the Manchester Zoning Bylaw.

**Lot:** An area of land in one ownership, with definite boundaries.

**Mean Sea Level:** the average height of the sea for all stages of the tide.

**Maximum Groundwater Elevation:** The elevation determined by the Board to be the level at which Groundwater is or has been closest to the surface of a Lot. Among the evidence the Board may consider in determining Maximum Groundwater Elevation are actual observed Groundwater Elevations occurring during the Wettest Period, indirect evidence such as oxide layers or soil mottling and historical Maximum Groundwater Elevation data in the vicinity of the Soil Absorption Area. In years of abnormally small amounts of precipitation the Board may make uniform upward adjustments to observed Groundwater Elevations to account for an abnormally low Groundwater table.

**SWTP Operations Permit:** A Permit issued by the Board for the operation of a SWTP.

**Protected Water Body:** Any actual or potential sources of potable water, including any surface waters, any Groundwaters (including surface water influenced Groundwater supply) and/or any Aquifers. Includes Gravelly Pond, Round Pond, Sawmill Brook and Cedar Swamp and their proximal tributaries, and any other nitrogen sensitive areas designated by the Board via public process per 310 CMR 15.215. Also includes any existing drinking water supplies and potential drinking water sources and Aquifers contributing to those water supplies now and in the future.

**Regulation:** The Manchester Board of Health's Drinking Water Protection Regulation.

**Sewage:** The water-carried human or animal wastes from any Structure together with such Groundwater infiltration and surface water as may be present.

**Sewage Disposal System:** A system or facility that is designed and constructed for the purpose of disposing of Wastewater from any Structure and which is not part of or connected to a common collection system of sanitary sewers under the jurisdiction of the Manchester Department of Public Works. A Sewage Disposal System includes, without limitation, all piping from the exterior Foundation Wall of the Structure connecting to all various parts of the system.

**Significant Developments:** Defined to be any project above the thresholds, which are:

- (1) Any construction with new impervious surfaces greater than two thousand (2,000) square feet
- (2) Any construction with new sewage flows greater than two thousand (2,000) gallons per day
- (3) Any construction with earth disturbance or removal greater than three hundred fifty (350) cubic yards of material

**Small Wastewater Treatment Plant ("SWTP"):** Any Sewage Disposal System with a design flow greater than ten thousand (10,000) gallons per day.

**Structure:** Anything constructed or erected at a fixed location on the ground typically supported by a Foundation Wall to give support or provide shelter for any common use and occupancy.

**Wastewater:** Sewage, industrial waste, other wastes or any combination of the three (3).

**Wettest Period:** That period of time during each calendar year deemed by the Board in its reasonable discretion to be the time when the Groundwater table is closest to the surface of the ground.

#### 4.0 APPLICABILITY

These Regulations apply to any Activity within the GSWROPD or within four hundred (400) feet of any of the Town's Protected Water Bodies, actual or potential sources of potable water, surface waters, Groundwaters and/or Aquifers.

#### 5.0 PUBLIC AND ENVIRONMENTAL HEALTH REVIEW PROCEDURES AND STANDARDS FOR SIGNIFICANT DEVELOPMENTS

##### 5.1 Environmental Health Impact Report

The Applicant for any proposed Significant Development shall submit prior to initiating any activity not specifically permitted in preparation for an application under this Regulation (e.g., required test holes or soil samples) an ENVIRONMENTAL HEALTH IMPACT REPORT (EHIR) to the Board. The report shall meet the criteria required by this and all other applicable Board regulations and shall provide specific information concerning the stormwater management systems, including soil conditions, surface drainage calculations, hydrogeologic descriptions of Groundwater resources and movement, and effects of precipitation. Any project within four hundred (400) feet of any Protected Water Bodies, actual or potential sources of potable water, surface waters, Groundwaters and/or Aquifers, or within the GSWROPD, which proposes onsite Wastewater disposal at or above the threshold of two thousand (2,000) gallons per day shall provide specific information describing the methodology and operation of the proposed Sewage Disposal System.

In accordance with the objectives of this Regulation, the Applicant shall undertake a hydrogeological investigation to assess the impact of Significant Developments on all potentially impacted Protected Water Bodies, actual or potential sources of potable water, surface waters, Groundwaters and/or Aquifers to determine whether the proposed discharge will cause or contribute to a violation of 314 CMR 4.00 (Massachusetts Surface Water Quality Standards), an alteration to wetlands (310 CMR 10.00), impair the

actual or potential use of the Groundwater as a source of potable water, or degrade any Protected Water Bodies, actual or potential sources of potable water, surface waters, Groundwaters and/or Aquifers. If a Sewage Disposal System is proposed, impact estimation shall be performed by employing a site-specific mass balance analysis of the area of impact (in accordance with MassDEP's Guidelines for Title 5 Aggregation of Flow and Nitrogen Loading (as revised 2/22/2016 or any subsequent revision) associated with 310 CMR 15.216 and Mass DEP's Nutrient Loading Approach to Wastewater Permitting and Disposal (Policy BRP/DWM/PeP-P99-7), or a comparable approach approved by the Board. The impacts of other septic effluent contaminants shall also be assessed; calculated nutrient (nitrogen and phosphorus) impacts may be used as a proxy, with appropriate adjustments. Phosphorus loading assessment for Wastewater discharges in excess of two thousand (2,000) gallons per day should assume steady-state, long term conditions that assume the saturation of phosphorus binding capacity of soils. Quality parameters beyond those regulated by MA drinking water standards (e.g., emerging contaminants of concern) may be required for consideration at the discretion of the Board based upon specific circumstances of the project, such as anticipated Sewage or Wastewater characteristics.

In accordance with 314 CMR 510(3), conditions shall be established to assure that no pollutants shall be discharged in an amount or concentration that would impair the use of the Groundwater as an actual or potential source of potable water, or that negatively impact Protected Water Bodies, actual or potential sources of potable water, surface waters, Groundwaters and/or Aquifers for their existing and designated uses or maintenance of 314 CMR 4.00 (Massachusetts Surface Water Quality Standards). The EHIR and other project information shall be used by the Board to establish additional effluent limitations and/or require the implementation of additional measures to protect the Groundwater. Such additional effluent limitations and methods may include, but are not limited to, limitations on the total pounds of particular contaminants discharged to the site per calendar year, limitations on parameters in addition to nitrate nitrogen, best management practices, and tight-tank requirements for selected waste streams.

## 5.2 Environmental Health Permit

The Board shall grant an ENVIRONMENTAL HEALTH PERMIT only upon finding that the application and proposed project meets the criteria and performance standards set forth herein.

Any Applicant required to file an EHIR with the Board shall have the burden of proving by submission of clear and convincing evidence that the proposed work:

- (a) meets the intent of this Regulation and will not, during construction or thereafter, have an adverse impact on any Protected Water Body (i) within any Zone 1, Zone 2, Zone 3, Zone A, Zone B or Zone C, or (ii) within the GSWROPD, or (iii) within four hundred (400) feet of any proposed Activity;
- (b) will not cause the quality of Groundwater recharged on the site to violate Class I drinking water standards promulgated by the state Department of Environmental Protection ("DEP");
- (c) will not cause the average concentration of nitrate-nitrogen in Groundwater recharged on the site to exceed five (5) milligrams per liter; and
- (d) for properties that contain or abut land that that contributes to streams and other fresh water bodies, the loading of phosphorus in Groundwater recharged on the site shall not exceed twenty-four thousandths (0.024) milligrams per liter within the stream (in conjunction with other phosphorus sources within the stream's watershed).

### 5.3 Applications for Permits

Written application shall be filed with the Board for all Activities that come under the jurisdiction of this Regulation. The application shall include such information and plans as are necessary to describe the proposed Activities and their effects upon the public health and the environment.

The EHIR shall be filed with the Board within 24 hours of any other filings or applications to any municipal boards or commissions. (See Section 6.2)

### 5.4 Fees

At the time of application, the Applicant shall pay a filing fee as may be set from time to time by the Board.

In addition to the filing fee, the Board may require the applicant to pay reasonable costs and expenses borne by the Board for specific expert engineering and consultant services deemed necessary by the Board to review the application. Said services may include, but are not necessarily restricted to general engineering analysis, hydrogeologic and drainage analysis, and legal advice including public health and environmental land use law.

### 5.5 Application Contents

The EHIR shall include the following documentation, unless waived by the Board:

(a) Data from a sufficient number of test holes, soil logs, Maximum Groundwater Elevations, and properly conducted percolation tests to demonstrate clearly that the soil conditions are generally suitable for subsurface sewage disposal and will meet the needs of the project and to determine the pattern of ground water flow. In the case of a subdivision, each and every Lot shall be shown to be suitable for such purpose.

b) A topographical map of the property, with contours referring to Mean Sea Level, showing the location and elevation of all test holes, how the surface drainage is to be handled, including nearby affected areas, and all pertinent physical features, including ponds, swamps, wetlands, public and/or private water supplies, seasonal watercourses, swales, areas of ledge and rock. Also, wherever applicable, an overlay of Flood Plain, Drainage Watershed areas, USDA Soil Map Characterization for soil type and hydrologic group, USDA Soil Limitations for Septic Tank Sewage Disposal, and Aquifer Designation.

(c) Sufficient data to demonstrate no deleterious individual or cumulative impact of subsurface Sewage disposal or stormwater runoff upon Groundwater and surface water quality. This shall include hydrologic and hydraulic calculations and data to support the proposed design for the stormwater drainage system. Both volume and flow rate of runoff, before and after development, must be clearly stated and shall be in accordance with the specifications designated herein. Calculations shall be performed using the most recent procedures of the U.S.D.A. Soil Conservation Service such as are described in TR-20 "Computer Program for Project Formulation-Hydrology" (SCS 1983), National Engineering Handbook-Section 4-Hydrology (SCS 1985), and Technical Release No. 55 "Urban Hydrology for Small Watersheds" (SCS 1986).

Structure design shall comply with the standards of USDA SCS Publication TR-60 for containments for detention and retention areas. Additional design guidelines may be on file with the Board.

(d) Evidence to demonstrate clearly to the Board that water supply shall be adequate.

(e) Evidence to demonstrate clearly to the Board that the effect on Protected Water Bodies, actual or potential sources of potable water, surface waters, Groundwaters and/or Aquifers shall be in accordance with the specifications designated herein.

In order for a EHIR subject to these regulations to be considered Complete, it shall include all items required by these regulations, including the fee described above. Incomplete submittals shall be returned as incomplete forthwith to the applicant, following a vote of disapproval by the Board, without review. The plan must then be resubmitted and be subject to Board review. Failure to submit adequate or correct data or information as required will constitute grounds for Board's denial of the permit for the project site as a whole or of individual Lots or portions therein.

## 5.6 Performance Standards

### 5.6.1 Water Supply

In the case of sites to be served by on-site wells or which are hydrologically upgradient from areas served by private wells, a hydrogeological evaluation showing Groundwater flow directions and the proposed placement of wells and septic systems. Zones of Contribution to wells shall be delineated.

### 5.6.2 Sewage Disposal (if an onsite Sewage Disposal System is proposed)

(a) The proposed location of the project shall have soil conditions suitable for the subsurface disposal of sanitary or other applicable types of Wastewaters in accordance with the Regulations of the Board along with all applicable state and federal regulations.

(b) Wastewater disposal shall meet the minimum water quality standards of current Commonwealth of Massachusetts or Federal regulations of surface or Groundwaters. This will include a maximum phosphorus concentration of twenty-four thousandths (0.024) milligrams per liter in fresh surface waters.

(c) For any development having ten (10) or more dwelling lots or a design Wastewater flow of two thousand (2,000) gallons per day or more, the applicant shall submit to the Board a hydrogeological evaluation performed by a qualified engineer or hydrogeologist, to be reviewed by the Board. In addition to the specifications in Section 5.1 above, hydrogeological evaluations under this Section shall include determination of geologic stratigraphy, determination of Groundwater flow directions, determination of Maximum Groundwater Elevation, determination of minimum Groundwater elevation when relevant, evaluation of water table mounding, and prediction of down-gradient water quality impacts. Maximum Groundwater Elevation shall be determined by direct observation during the season of the year when the water table is high as determined by the Board and as adjusted by the method described in "U.S. Geological Survey, Water Resources Investigations, Open File Report 80-1205 - Probable High

Groundwater Levels in Massachusetts", or subsequent revisions thereof.

### 5.6.3 Bedrock Disruption

Bedrock disruption means any activity performed upon ledge or bedrock, including, but not limited to, hammering, drilling, blasting and any other activity that breaks up and/or removes portions of ledge or Bedrock; Bedrock disruption shall not include water well drilling. The following additional requirements shall apply to bedrock disruption in excess of ten (10)-cubic-yards:

- (a) The Applicant shall notify all owners of any property within a quarter of a mile (0.25 miles), including properties outside the Town of Manchester, if applicable, by certified mail, return receipt requested, at his/her own expense at least ten (10) days before the Board meeting at which the EHIR and permit application will be on the Board's agenda.
- (b) If blasting is to be performed, the applicant shall provide information regarding the composition of the blasting agent to be used. A Safety Data Sheet for the blasting agent shall be acceptable if all ingredients are disclosed. Blasting agents containing perchlorate shall not be permitted.
- (c) Post-blasting monitoring of Groundwater shall be performed according to standards and at times established by the Board under this Regulation.

### 5.6.4 Drainage

- (a) The proposed drainage system for the project shall not cause an increase of more than ten percent (10%) nor a decrease of more than ten percent (10%) in (i) the total volume of runoff discharged offsite, (ii) the total rate of runoff discharged offsite, or (iii) the temperature of runoff discharged offsite as compared with the respective discharge offsite prior to the development. Such condition shall be required for storms of 2-, 10-, and 100-year frequency events.
- (b) No channelization of surface runoff shall be allowed offsite without the written consent of the owner of the land affected, in the form of a permanent grant of easement, recorded at the Registry of Deeds.
- (c) In cases where runoff infiltration cannot, in the opinion of the Board, be appropriately implemented because of the possibility of contamination of water supply, or because of extremely poor infiltrative and permeability characteristics of the soil, the volume requirement volume may be waived by the Board, provided the applicant provides such additional preventive measures to prevent any increase in elevation or duration of downstream flood elevations. Such additional measures may be, but are not restricted to, the construction of compensatory flood storage facilities and/or the creation of additional wetlands (after appropriate applications, reviews and permitting by the Conservation Commission)
- (d) If detention or retention ponds are utilized, slopes shall be no steeper than four (4) horizontal to one (1) vertical, and design water depth shall not exceed three (3) feet. Minimum bottom slope for "dry" detention areas shall be two (2) percent. The Board shall require

permanent fencing to provide safety, according to standards to be established by the Board under this Regulation.

(e) Poor infiltrative and permeability conditions are defined as a soil permeability of less than  $1 \times 10^{-4}$  (0.0001) centimeters per second. Unless, in the opinion of the Board, such testing is not applicable for a particular site, all permeability tests shall be in-situ field bore hole tests for permeabilities in the acceptable range as specified above. If permeability testing is desired to be performed in soils of lesser permeability, laboratory tests for hydraulic conductivity shall be performed on undisturbed samples by the Falling Head Permeability Test using flexible membrane triaxial test cells with back pressure (Army Corps of Engineering Manual EM 1110-2-1906 Appendix VII).

(f) The stormwater management design shall include a control strategy and plan for Best Management Practice (BMP) for any particular development or project and shall accomplish the following goals.

(i) Reproduce, as nearly as possible, the hydrological conditions in the ground and surface waters prior to development.

(ii) Provide the best level (BMPs) of removal for urban pollutants, including but not limited to oil, grease and toxic chemicals from motor vehicles, pesticides and nutrient from lawns and gardens, viruses, bacteria and nutrients from pet waste, heavy metals from roof shingles and other materials, road salt and other de-icing chemicals, and thermal pollution from impervious surfaces). See EPA Technical Guidance on Polluted Run-off from Nonpoint Source (NPS) Pollution, at <https://www.epa.gov/nps/nonpoint-source-urban-areas>.

(iii) Have an acceptable future maintenance burden.

(iv) Have a neutral effect on the natural and human environment.

(v) Be appropriate for the site, given physical constraints.

(vi) Provide a sufficient level of health and environmental protection during the construction phase.

(g) Design of BMPs and Infiltration and Detention structures shall be according to procedures acceptable to the Board such as are described in the publications entitled:

"Controlling Urban Runoff - A Practical Manual for Planning and Designing Urban BMP's" - Department of Environmental Programs - Metropolitan Washington Council of Governments

"Massachusetts Stormwater Handbook", Volumes 1, 2, and 3 – Massachusetts Department of Environmental Protection.

"Underground Disposal of Storm Water Runoff - Design Guidelines Manual", February 1980, Federal Highway Administration - Department of Transportation, similar to:

"Recharge Basins for Disposal of Highway Storm Drainage", Research report 69-2, of the New York Department of Transportation

American Society of Civil Engineers Publication entitled "Design of Urban Runoff Quality Controls" - ISBN 0-87262-695-4

American Society of Civil Engineers Publication entitled "Urban Runoff Quality - Impact and Quality Enhancement Technology" - ISBN 0-87262-577-X, 1986

"Erosion and Sediment Control in Site Development- Massachusetts Conservation Guide - Volume 1"

#### 5.7 Special Industrial and Commercial Requirements

This Regulation shall apply to any and all projects for industrial or commercial developments or for any other non-residential development. This Regulation shall also apply to industrial or commercial operations conducted on residential property of any size, and also to any hobbyist operation that utilizes materials on the Massachusetts Substance List.

Septic tanks serving any commercial or industrial facility shall have the contents of the septic tank serving the facility sampled and tested on an annual basis for volatile organic compounds (EPA 624) and pH, as well as any other parameters required by the Board on a case-by-case basis. The sample shall be taken in the time period of March, April, or May of each year and the results submitted to the Board prior to July 1st., without having to be requested by the Board.

All floor drains, except as serving only sanitary facilities, shall be discharged to a tight collection tank and taken away by a licensed waste hauler. Such floor drains shall not be discharged to a septic system, storm drain, dry well, or other surface or subsurface discharge point.

The Board may, on a case-by-case basis, require that each tenant of a multi-use facility shall have a separate discharge point to the septic system. Each such discharge shall be equipped with a flow meter. Where water usage records will accurately reflect the Wastewater discharge, a water usage meter may be acceptable. Otherwise, it will be required to install an effluent or discharge meter.

All facilities that store, use, manufacture, or discharge any materials, compounds, or chemicals that are on the Massachusetts Substance List shall file a contingency plan with the Board. It shall be updated on an annual basis or when any changes are made in such items.

## 5.8 Earth Removal or Disturbance Standards

### 5.8.1 EARTH REMOVAL AND RESTORATION PLAN: Submittal Requirements

Plans for any proposed project including earth removal or disturbance exceeding three hundred fifty (350) cubic yards of material per lot or one thousand (1,000) cubic yards per project, shall be filed with the Board and shall include an EARTH REMOVAL AND RESTORATION PLAN, prepared and signed by a Massachusetts licensed Professional Engineer or Registered Land Surveyor, at a scale of eighty feet to the inch or larger, containing all information necessary to evaluate the site, the proposed earth removal operation, and the proposed restoration of the site after the operation is complete, including the following:

- (a) Location of the perimeter of the proposed excavation, property lines, abutting owners of record, and buildings or other structures on the property or within two hundred feet of the site boundaries or within five hundred feet of the earth removal operation site;
- (b) Private wells within one thousand (1,000) feet and public wells within two thousand six hundred forty (2640) feet of the earth removal operation site;
- (c) Location of walls, fences, test pits, test borings, observation wells with logs, streams and pools, and wetlands on the site;
- (d) At least three permanent benchmarks, with elevations thereon, used in topographical surveying, and referenced to the N.G.V.D. datum;
- (e) Adjacent public streets, private ways, and service roads;
- (f) The perimeter and topography of any existing excavation as of the date of the application;
- (g) Depth of removal within the area, shown by five-foot contours or other contour interval found to be appropriate by the Board, and final spot elevations;
- (h) Proposed lateral support to all adjacent property;
- (i) Proper provision for safe and adequate water supply and sanitary sewage disposal, and for temporary and permanent drainage on the site;
- (j) Topography shown by five-foot contours or other contour interval found to be appropriate by the Board, and spot elevations of the area of removal as restored and to at least two hundred feet beyond the perimeter of that area;
- (k) The location and method to be used in providing permanent drainage and erosion and sediment control;
- (l) Location of proposed lot lines, if any, as shown on a preliminary or definitive subdivision plan filed with the Planning Board of the Town; and

(m) Evidence that health and safety concerns have been adequately addressed with provisions that shall be maintained throughout the proposed operation.

#### 5.8.2 Performance Standards

(a) In order to provide for potential subsurface sewage disposal systems, no excavation shall occur closer than ten feet from the Maximum Groundwater Elevation, as determined by the procedure described in Section VIII of this regulation.

(b) Drainage arrangement shall conform to Section 5.6.4 above.

(c) There shall be no adverse effect on public health or safety, or the health or safety of persons living, working, or otherwise present in the neighborhood, due to excessive noise, dust, or any other condition that may result from the proposed operation.

(d) There shall be no actual or potential adverse impact on Protected Water Bodies, actual or potential sources of potable water, surface waters, Groundwaters, Aquifers, and/or public or private wells, as a result of the proposed operation.

(e) Lateral support shall be maintained for all adjacent properties, and no banks shall be left after completion of operations with a slope that exceeds one-foot vertical rise in four feet of horizontal distance.

(f) Any access to an excavated area or areas shall be adequately posted with "Keep Out" and "Danger" signs during operations, any excavation, quarry, bank, or work face having a depth of ten feet or more and/or creating a slope of more than thirty degrees downward shall be fenced. Such fence shall be located ten feet or more from the upper edge of the excavation and shall be at least six feet in height.

(g) No boulders in excess of a cumulative volume of twenty (20) cubic yards and no trees or stumps or demolition or construction waste materials shall be buried on-site.

(h) Notwithstanding any standard otherwise required in this regulation, the operation and restoration shall comply with the standards contained in the Massachusetts Conservation Guide, Volumes I and II, United States Department of Agriculture, Soil Conservation Service.

(i) At the time of restoration, the areas subject to this regulation shall be covered with a minimum of four (4) inches of compacted topsoil and seeded with an appropriate grass or legume.

## 6.0 DISTANCE (SETBACK) REQUIREMENTS

No detention or retention basin, flood storage facility, leach line, seepage pit or other means of subsurface disposal or infiltration shall be placed closer than a distance determined by a two hundred (200)-day travel time (at locally documented Groundwater flow velocities) from any private well or other private source of water supply to be used for drinking purposes or culinary uses.

The setback from a well to a sewage disposal system shall be as follows:

- (a) No leaching area shall be less than distance determined by a two hundred (200)-day travel time (using locally documented Groundwater flow velocities) from any well located downgradient from such leaching area.
- (b) When the soil percolation rate is less than three (3) minutes per inch, the distances noted in this Section 6.0 above shall be increased by a minimum of twenty-five (25) feet.
- (c) All proposed subsurface sewage disposal areas and expansion areas shall be not less than ten (10) feet from any solid subsurface drainpipe if that drain invert is above the invert of the closest leaching trench, line, or bed, and twenty-five (25) feet from any solid subsurface drainpipe if the invert of that solid subsurface drainpipe is at or below the invert of the closest leaching trench, line, or bed.
- (d) All subsurface sewage disposal areas and expansion areas shall no less than twenty-five (25) feet from any property line and one hundred twenty-five (125) feet from any open surface drain or any watercourse, including streams, brooks, ponds, swamps or other wetlands (as defined in Chapter 131, Section 40 of the Massachusetts General Laws).

## 7.0 SPECIAL REQUIREMENTS FOR SMALL WASTEWATER TREATMENT FACILITIES

### 7.1 Permit Required

No system or facility with a design flow greater than ten thousand (10,000) gallons per day that is to be used for treating, neutralizing, stabilizing, or disposing of Wastewater from homes, public buildings, commercial or industrial buildings or any types of establishments shall be located, constructed, installed, operated, altered or repaired until a SWTP CONSTRUCTION PERMIT has been issued by the Board, in addition to an ENVIRONMENTAL HEALTH PERMIT. No construction of any building or facility that relies upon such Wastewater system or facility shall be allowed until a SWTP PERMIT has been issued by the Board.

Such system or facility as regulated herein shall include, but not be restricted to, sewers serving such facility, Wastewater pumping stations, Wastewater treatment works, all Wastewater treatment operations, sludge treatment and management, disinfection, advanced waste treatment, subsurface disposal and land treatment, Wastewater recycling and re-use.

Such system or facility as regulated herein shall be referenced as SMALL WASTEWATER TREATMENT PLANT ("SWTP").

## 7.2 Certificate of Compliance and SWTP Operations Permit

No SWTP as permitted herein shall be placed in service, nor shall new buildings or facilities or additions to existing buildings or facilities which rely upon such SWTP be occupied or used until the Board has issued a Certificate of Compliance and SWTP Operations Permit.

## 7.3 Service Area and Limitations

The SWTP shall not serve a volume of sewage flow from any subject project in excess of the aggregate volume that could have constructed upon it a septic system installed and operated in full compliance with Title 5, the State Environmental Code and the regulations of the Board.

## 7.4 Submittals - Applications, Reports, Plans, Data, Documents

A copy of all applications, reports, plans, specifications, data and supporting documents required by these regulations and by the regulations of any other Agency in connection with the approval or operation and maintenance of the subject facility shall be submitted to the Board. In the case of submittals to other agencies, all material shall be submitted to the Board at the time of submittal to that Agency.

## 7.5 Hydrogeological Investigation

The applicant shall submit a hydrogeological survey report, prepared by a qualified geotechnical engineer or hydrogeologist, to show the impact of the subsurface discharge of the SWTP on ground water. The report shall include a determination of the flow direction, contaminant levels, extent of Wastewater discharge plume, ground and surface waters affected, and any interaction with water supply, public or private. This analysis shall be performed for the SWTP design plan and also for any other viable Wastewater treatment or disposal strategy for the project to be served.

## 7.6 General Performance Standards and Criteria

- (a) The plans for the proposed system or facility shall take into account all aspects of public health and environmental quality protection. Efforts shall be taken to preserve water supply, private property, wetlands, wildlife habitat, recreational sites, historic sites, and natural beauty.
- (b) The design shall be prepared to comply with applicable water quality standards, criteria, or guidance.
- (c) No discharge from a SWTP shall result in degradation of Protected Water Bodies, actual or potential sources of potable water, surface waters, Groundwaters or Aquifers, as set forth under Section 5.2. There shall be compliance with all applicable water quality standards. The existing characteristics of the receiving waters must be considered to ensure compliance. There shall be no discharge into any wetland, stagnant waters, lakes or streams.
- (d) No portion of the SWTP shall be within one hundred (100) feet of wetlands or the "100-year" Flood Plain. No portion of the subsurface disposal works for a SWTP shall be located less than two hundred (200) feet from a wetland or the 100-year "Flood Plain". No component of the

treatment plant, except for underground piping, shall be constructed less than two (2) feet above the high-water level in any area subject to flooding. Such distances are considered "minimum" and may be increased by the Board if site-specific conditions warrant.

(e) The SWTP design shall include attenuation of odor or noise problems, and shall satisfactorily address the general aesthetic appearance, to both protect the operator and to satisfy neighborhood environmental requirements.

#### 7.7 Distances

No portion of the SWTP shall be located less than the following distances stated to the components listed as follows:

COMPONENT	Plant Buildings	Pumping Station	Subsurface Tank	Leaching Area	Sewer or Force Main
Well*	100 feet	100 feet	100 feet	400 feet**	50 feet
Water Supply Line	-	10	10	25	10
Dwelling Unit	100	50	50	100	-
Subsurface Drain	-	25	25	50*	5
Property Boundary	150	50	50	100	10
Surface Water*	100	100	100	200	50
Wetland*	100	100	100	200	50

\*This distance may be required to be greater if the hydrogeological evaluation indicates that contamination will occur at the stated distance.

\*\*Setbacks from leaching areas and drinking water wells will be four hundred (400) feet or two hundred (200) days I time (whichever is greater) in the direction of flow.

#### 7.8 Ultimate Disposal of Sludge and Solids

Provision for final or ultimate disposal of sludge and solids shall be clearly indicated and established. The estimated quantity must be stated. If sludge and solids are to be disposed of off-site, the final destination must be established prior to the issuance of any permit. The applicant must demonstrate, to the satisfaction of the Board, that the destination for the sludge and solids complies with all applicable federal, state and local regulations and also that it will reliably be available for such purpose for the length of time that its use is required for the SWTP.

#### 7.9 Treatment Plant Reliability

The SWTP shall be planned and designed so as to provide for maximum reliability at all times. The facility shall be capable of operating satisfactorily during power failures, flooding, peak loads, equipment failure and maintenance shutdowns. Such reliability shall be obtained by using various design techniques that will result in a facility that is virtually "Fail-Safe."

Multiple units or dual compartments with unit drains shall be provided for all processes, including disinfection facilities, so that draining, cleaning, repairing or replacing and other maintenance can be provided without omitting any treatment processes.

#### 7.10 By-Passes and Overflows

No bypasses, either upstream of or at the SWTP shall be permitted.

#### 7.11 Disinfection

Disinfection of the SWTP effluent by ultraviolet irradiation or ozonation shall be required.

#### 7.12 Subsurface Leaching Facilities

(a) GROUNDWATER. The bottom interface of any subsurface disposal or leaching facilities shall be located a minimum of five (5) feet above the maximum elevation of the Groundwater or saturated soil zone. This elevation shall include consideration of the Groundwater mounding effect caused by the discharge of the SWTP effluent and cumulative impacts associated with other subsurface discharge systems such as stormwater infiltration. Such analysis shall be calculated using generally acceptable analytical or numerical methods. When geologic conditions permit, the "Hantush" formula and procedure may be used. When the assumptions of that procedure cannot be met to derive a reliable result, it shall be required to utilize such method as finite difference equations for ground water flow and elevation (such as the USGS model MODFLOW).

(b) DISTANCE TO BEDROCK. The bottom interface of any subsurface disposal or leaching facilities shall be located a minimum of ten (10) feet above the elevation of bedrock or impervious soil layer. Impervious soil shall be defined as having a percolation rate of greater than twenty (20) minutes per inch.

(c) THICKNESS OF PERMEABLE SOIL. At least five (5) feet of naturally occurring permeable soil shall be maintained below the bottom of the leaching area. To be considered permeable, the soil shall have a percolation rate of twenty (20) minutes per inch or less.

#### 7.13 Sewers

The lateral sewer system serving the SWTP shall be of a design and construction in accordance with Water Pollution Control Federation Manual of Practice #9. Adequate capacity shall be provided for peak flow rates and shall provide for a cleansing velocity of at least two (2) feet per second at seventy-five (75) percent of the estimated peak discharge. For low service connection areas, peak flow rate shall be calculated by the fixture unit method as described in MOP #9. The minimum pipe size allowed shall be eight (8) inches in diameter.

#### 7.14 Ground Water Monitoring

The Applicant shall install, at a minimum, ground water monitoring wells in accordance with the following:

- (a) One up-gradient cluster of three monitoring wells;
- (b) Two down-gradient clusters of three monitoring wells;

(c) One monitoring well for ground water level only near the center of the leaching works;

(d) Screen depths for the cluster wells shall be set at elevations such that at least two screen depths will yield samples at time of seasonal low ground water (e.g., September sampling period).

Such locations shall be as approved by the Board and as indicated appropriate from the results of the hydrogeological investigation. Monitoring wells shall be installed and in place prior to issuance of the Certificate of Compliance and SWTP Operations Permit.

The Applicant shall determine and provide the Board with elevations of the water table to the nearest one-hundredth of a foot in all monitor wells on a monthly basis.

Monitor well testing in the up-gradient and down-gradient wells shall be performed semi-annually in the months of April and September for all parameters designated below as semi-annually or more often. Testing for other parameters shall be at the stated frequency, either annually or every five (5) years during the month of April. On an annual basis, the Board, either on its own motion or upon written request from the Applicant, may review the sampling frequency and the tested parameters and may modify either or both if it deems it necessary.

#### 7.15 Effluent Limits and Testing Requirements

Effluent limitations shall be as required by DEP regulations for Class I and Class II ground by the waters. All ground waters are considered to be within this classification unless proved to be otherwise following procedures set forth by Massachusetts Department of Environmental Protection (MADEP).

#### 7.16 Wastewater

(a) TREATMENT PLANT INFLUENT. The influent to the treatment plant shall be sampled and tested weekly for 5-Day Biochemical Oxygen Demand (B.O.D.) and Total Suspended Solids (T.S.S.) and the results sent to the Board on a quarterly basis.

(b) TREATMENT PLANT EFFLUENT. The effluent from the treatment plant shall be sampled and tested as follows:

DAILY:           Flow  
                      Specific Conductance pH

WEEKLY:        5-day Biochemical Oxygen Demand (BOD) Total Suspended Solids (TSS)  
                      Coliform Bacteria Fecal Coliform bacteria

MONTHLY:       Total Kjeldahl Nitrogen  
                      Ammonia Nitrogen  
                      Nitrate Nitrogen  
                      Total Dissolved Solids Sodium  
                      Total Phosphorus  
                      Ortho-Phosphorus

SEMI-ANNUALLY: Oil and Grease  
Volatile Organic Compounds (USEPA Procedure #624)

ANNUALLY: Arsenic, Copper, Barium, Zinc, Cadmium, Mercury, Chromium, Total  
Trihalomethanes, Fluoride, Selenium, Lead, Silver.

5-YEARS: Pesticides  
Radioactivity

All sampling and analyses, except for the daily and weekly frequency tests which will commence at the time of plant start-up, shall be performed initially at 60 days after plant start-up and at the stated frequency thereafter, and the results sent to the Board on a quarterly basis.

#### 7.17 Operation and SWTP OPERATIONS PERMIT

(a) OPERATOR. A Certified Wastewater Treatment Plant Operator having the Grade appropriate for the plant as determined by the regulations of the Board of Certification of Operators of Wastewater Treatment Facilities shall be retained by the Applicant. Such operator shall spend a minimum of three (3) hours per day at the plant. When conditions warrant, as may be determined by the Board, additional hours shall be required. Such operator shall be designated the Chief Operator and shall be responsible for the operation of the SWTP.

(b) BACK-UP OPERATOR. A second Certified Wastewater Treatment Plant Operator, having the same grade as the Chief Operator shall be available in the absence of the Chief Operator.

(c) OPERATIONAL GUARANTEE. Prior to the issuance of the Certificate of Compliance and SWTP OPERATIONS PERMIT, the Applicant shall provide security in an amount specified by the Board to guarantee the operation of the SWTP for a period of at least one (1) year. The security shall provide for salaries, operational costs and cost for immediate replacement, if necessary, of a major unit operation of the plant, or in the event of plant failure to operate, an amount sufficient to cover the costs of hauling one hundred percent (100%) of the Wastewater to another facility for disposal for a one (1) year period.

(d) SWTP OPERATIONS PERMIT: Before commencing operations of any Sewage Disposal System or SWTP which is included in a Significant Development, the Applicant must receive an SWTP OPERATIONS PERMIT from the Board based on an application which will be specified by the Board under this Regulation. At a minimum, the application for an SWTP OPERATIONS PERMIT must describe in adequate detail how the operations of the facility will comply with Sections 5.7, 7.8, 7.9, 7.10, 7.11, 7.14, 7.15 and 7.16 of this Regulation. SWTP OPERATIONS PERMITS must be renewed by the Board every 12 months, based upon a renewal application specified by the Board and a showing of compliance with all requirements of this Regulation.

#### 8.0 VIOLATIONS AND PENALTIES

It shall be a violation of these Regulations for any person (i) to begin or continue work on, or to own or operate any project that qualifies as a Significant Project under Section 3.0 of this Regulation without having received from the Board the permits applicable under this Regulation or (ii) for any owner of a Lot on which a SWTP exists to cause or suffer to be operated, a SWTP for which a validly issued and

unexpired SWTP Operations Permit is not currently in force.

Any person who violates this provision of these Regulations after notice of such violation shall be subject to a fine of Three Hundred Dollars (\$300.00) per day for each of the first seven (7) days of such violations and One Thousand Dollars (\$1,000.00) per day for each day in excess of seven days. Each day or portion thereof during such period of violation shall constitute a separate offense for purposes of computing fines.

The fines provided for in this section are in addition to, and not in limitation of, other rights or remedies the Board may have to enforce applicable laws, regulations, these Regulations, covenants and others' rights and powers.

The Board may issue a "Stop Work Order" until such time as a Significant Development or SWTP can be brought into compliance with this Regulation and other Board Regulations. Any person who violates a Stop Work Order shall be subject to a fine of One Thousand Dollars (\$1000.00) per day while unpermitted activity continues. This fine shall be in addition to and not in limitation of, other rights or remedies the Board may have.

#### 9.0 APPEAL

Appeal shall be made in accordance with applicable State statutes.

#### 10.0 DISCLAIMER

By the issuance of any Permit under these Regulations or approvals, pursuant to these Regulations, the Board of Health of the Town of Manchester or any agent, servant, or employee of it or any person acting for it, does not assume any responsibility for the successful operation of any Sewage Disposal System or SWTP. No liability is incurred by the Town by reason of approval for construction of individual Sewage Disposal System or SWTP. Approval by the Board of a Sewage Disposal System or SWTP is based on plans and specifications supplied by the Applicant. No guarantee is intended or implied by reason of any advice given by the Board or representative thereof.

#### 11.0 SEVERABILITY

Should any section, paragraph, sentence, clause or phrase of these Regulations be declared unconstitutional or invalid for any reason, the remainder of said Regulations shall not be affected thereby.

#### 12.0 EFFECTIVE DATE

These Supplementary Regulations were adopted by vote of the Town of Manchester Board of Health on **July XX, 2022 and are to be in full force and effective July XX, 2022.** A summary explanation of these Regulations shall be published in a newspaper of this Town and a copy thereof shall be deposited in the Office of the Town Clerk for posting on the Town website.

## APPENDIX A

### FEES FOR THE EMPLOYMENT OF OUTSIDE CONSULTANTS

The Manchester Board of Health may impose reasonable fees for the employment of outside consultants, engaged by the Board of Health, for review of any application submitted to the Board of Health pursuant to its regulations adopted under Chapter 111, Section 31 of the Massachusetts General Laws, the requirement of the Subdivision Control Law, the State Environmental Code, any of its regulations, or any other State or Town statute, by-law, or regulation, as they may be amended or enacted from time to time.

Funds received by the Board pursuant to this regulation shall be deposited with the Town Treasurer who shall establish a special account for this purpose. Expenditures from this special account may be made at the direction of the Board of Health without further appropriation as provided in Massachusetts General Laws Chapter 44, Section 53G. Expenditures from this special account shall be made only in connection with the review of a specific project or projects for which a review fee has been or will be collected from the applicant. Failure of an applicant to pay a review fee shall be grounds for denial of the permit application.

The Board of Health shall give written notice to the applicant of the selection of an outside consultant, which notice shall state the identity of the consultant and the amount of the fee to be charged to the applicant. Such notice shall be deemed to have been given on the date it is mailed or delivered.

The applicant may appeal the selection of the outside consultant to the Manchester Board of Selectmen, who may disqualify the outside consultant selected only on the grounds that the consultant has a conflict of interest or does not possess the minimum required qualifications. The minimum qualifications shall consist of an educational degree in or related to the field at issue, or three (3) or more years of practice in the field at issue or a related field. Such an appeal must be in writing and received by the Selectmen, and a copy received by the Board of Health, so as to be received within ten (10) days of the date of the notice of the selection of the consultant. The required time limits for action upon the application shall be extended by the duration of the administrative appeal.

FEE: The fee to be paid shall be based on a reasonable amount that shall be established by the Board of Health with the individual consultant on a case-by-case basis depending upon the complexity and scope of the project.