Office of the Board of Public Health

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REGULATIONS FOR PRIVATE WELLS

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I. PURPOSE

These regulations are intended to protect the public health and general welfare by ensuring that private wells are constructed in a manner that protect the quality of the groundwater derived from private wells.

II. AUTHORITY

These regulations are adopted by the Sutton Board of Health, as authorized by Massachusetts General Laws, Chapter 111, Section 31. These regulations supersede all previous regulations adopted by the Board of Health pursuant to the construction of private wells.

A TRUE COPY
ATTEST:
TOWN CLERK

III. DEFINITIONS

Agent: Any person designated and authorized by the Board to execute these regulations. The agent shall have all the authority of the appointing Board and shall be directly responsible to the Board and under its direction and control.

Applicant: Any person who intends to have a private well constructed.

Aquifer: A water bearing geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

Bentonite Grout: A mixture of bentonite (API Standard 13A) and water in a ratio of not less than one pound of bentonite per gallon of water.

Board: The Board of Health, Town of Sutton, Massachusetts or its authorized agent.

Business of Digging or Drilling: A person who charges a fee for digging or drilling a well, or a person who advertises for hire the availability to dig or drill wells within the Commonwealth of Massachusetts.

Casing: Impervious durable pipe placed in a boring to prevent the walls from caving and to serve as a vertical conduit for water in a well.

Certified Laboratory: Any laboratory currently certified by the Department of Environmental Protection for drinking water. Provisional certification shall also qualify.

Concrete: A mixture consisting of Portland cement (ASTM Standard C150, type I or API Standard 10, Class A), sand, gravel, and water in a proportion of not more than five parts of sand plus gravel to one part cement, by volume, and not more than six gallons of water. One part cement, two parts sand, and three parts gravel are commonly used with up to six gallons of water.

Geothermal Well: Wells used as a heat source with MassDEP approval of Underground Injection control

Irrigation Well: Wells installed for non-human consumption purposes. MUST follow well testing procedures.

Neat Cement Grout: A mixture consisting of one bag (94 pounds) of Portland cement (ASTM Standard C150, Type I or API Standard 10, Class A) to not more than six gallons of clean water. Bentonite (API Standard 13A), up to two percent by weight of cement, shall be added to reduce shrinkage. Other additives, as described in ASTM Standard C494, may be used to increase fluidity and/or control setting time.

Person: An individual, corporation, company, association, trust, or partnership.

Private Well: Any dug, driven, or drilled hole, with a depth greater than its largest surface diameter developed to supply water intended and/or used for human consumption and not subject to regulation by 310CMR22.00

Pumping Test: A procedure used to determine the characteristics of a well and adjacent aquifer by installing and operating a pump.

Registered Well Driller: Any person registered with the Department of Environmental Management/Office of Water Resources to dig or drill wells in the Commonwealth of Massachusetts pursuant to 313 CMR 3.00. Who signs and submits the well completion report to the State and the Sutton Board of Health

Sand Cement Grout: A mixture consisting of Portland cement (ASTM Standard C150, Type I or API Standard 10, Class A), sand, and water in the proportion of one part cement to three or four parts sand, by volume, and not more than six gallons of water per bag (94 pounds) of cement. Up to five percent, by weight of bentonite (API Standard 13A) shall be added to reduce shrinkage.

Static Water Level: The level of water in a well under non-pumping conditions.

Structure: A combination of materials assembled at a fixed location to give support or shelter, such as a building, framework, retaining wall, fence, or the like.

IV. WELL CONSTRUCTION PERMIT

1. The Licensed Well Driller shall obtain a permit from the Board of Health prior to the commencement of construction, alteration, repair, or decommissioning of a private well. The applicant will also be required to sign the permit.

2. Wells and irrigation wells from which the water is not intended for human or animal consumption or for the irrigation of foods or food ingredients are not exempt from the permitting process and must meet the same requirements as the drinking water well.

3. All applicable building, plumbing or electrical permits must be obtained by the licensed professional performing the job, a copy of which shall be submitted to the Board of Health.

4. If applicable submission to the Sutton Conservation Commission is the responsibly of the owner or his/her representative.

Each permit application to construct a well shall include the following:

1) The property owner's name and address
2) The well driller's name and proof of valid state registration
3) 3 copies of a plan signed and stamped by a Massachusetts Registered Professional Engineer or Registered Sanitarian. The scale of the plan shall not be smaller than one inch in forty feet. The plan will show the

location of the proposed well in relation to existing or proposed above or below ground structures and property lines. The plan shall include a statement "No SAS's exist within 100' of proposed Well"

4) A description of visible prior and current land uses within two-hundred (200) feet of the proposed well location, which represent a potential source of contamination, including but not limited to the following:

   a) existing and proposed structures
   b) subsurface sewage disposal systems
   c) subsurface fuel storage tanks
   d) public ways
   e) utility rights-of-way
   f) any other potential sources of pollution.

5) Any proposed well location that does not comply with the State Sanitary Code (Title 5) or local regulations will not be issued a permit to construct until the owner has secured approval from the Board of Health or its agent. In cases where an abutters property is a concern, a public hearing must be held.
6) The Board may require that the well be staked prior to drilling and an as-built plan signed by a Massachusetts Professional Registered Land Surveyor be submitted.
7) A permit fee (see fee schedule)

5. The permit shall be on site at all times that work is taking place. Each permit shall expire one (1) year from the date of issuance unless revoked for cause. Permits may be extended for one additional six (6) months period provided that a written request is received by the Board prior to the one year expiration date. No additional fee shall be charged for a permit extension, provided there is no change in the plans for the proposed well.

6. Well Construction Permits are not transferable.

7. The Board may require additional information pertaining to the location of waste sites, underground storage tanks, agricultural land uses, and/or utility rights-of-way that are within 500-1000 feet of the well site.

8. The Board of Health may refuse to issue a permit if it deems that the locations of the proposed well will unreasonably interfere with the probable future installation or repair of a septic system on a neighboring lot of land, or for any reason which may be contrary to sound public health policy as determined by the Board.

9. No wells shall be constructed, altered, or repaired without an approved permit application from the Board of Health in any instances. That included a change in ownership, driller, or location. If there is a change in driller, the new driller is responsible for signing an authorization of this change with the Board.

10. No person or firm shall engage in the construction, alteration, or repair of any private drilled wells unless currently licensed by the Water Resource Division of the Department of Environmental Management, Commonwealth of Massachusetts.

11. New dug wells for human consumption are not allowed.

12. Geothermal wells are allowed for dual use. In the event that the Geothermal well is to be separate from the drinking water well, a 100' offset to the soils absorption system is required.

13. The Board reserves the right to require decommissioning of any well installed in violation of these regulations.

14. In the event of an emergency where a well runs dry, the well construction procedures still apply, including the submittal of a plan. The owner/occupant will be required to supply themselves with domestic water including but not limited to, bottles water, temporary water supply etc. until the permit is approved.

V. WATER SUPPLY CERTIFICATE

1. The issuance of a Water Supply Certificate by the Board shall certify that the private well may be used as a drinking water supply. A Water Supply Certificate must be issued for the use of a private well prior to the issuance of an occupancy permit for an existing structure or prior to the issuance of a building permit for new construction which is to be served by the well.

2. The following shall be submitted to the Board of Health to obtain a Water Supply Certificate:
(a) a well construction permit
(b) a copy of the Water Well Completion Report as required by the DEP Office of Water Resources (313 CMR 3.00)
(c) a copy of the Pumping Test Report required pursuant to Section VII of these regulations
(d) a copy of the Water Quality Report required pursuant to Section VIII of these regulations

3. Upon the receipt and review of the above documents, the Board shall make a final decision on the application for a Water Supply Certificate. A final decision shall be in writing and shall comprise one of the following actions:
(a) Issue a Water Supply Certificate
(b) Deny the applicant a Water Supply Certificate and specify the reasons for the denial.
(c) Issue a conditional Water Supply Certificate with those conditions which the Board deems necessary to ensure fitness, purity, and quantity of the water derived from that private well. Said conditions may include but not be limited to requiring treatment or additional testing of the water.

Permit #_____ Date : _____

TOWN OF SUTTON
BOARD OF HEALTH
WATER SUPPLY CERTIFICATE

In accordance with the provisions of Section V. of the Town of Sutton Board of Health Regulations for Private Wells, The Board hereby certifies that the private well located at

_____Sutton, Ma.

complies with said regulations and may be used as a drinking water supply. This certificate is based on the following documentation which have been submitted to the and are on file with the Sutton Board of Health:
1. A well Construction permit
2. A copy of the well completion report as required
3. A copy of the pump test report
4. A copy of the Water Quantity Requirements
5. A copy of the Water Quality Testing Requirements

Issuance of this certificate indicates that the private well has been installed and the water there from currently meets the water quality standards now in effect, this certificate is not and should not be taken as a guarantee that the private water supply will continue to provide suitable quantity or quality of water

_____ Board of Health

Conditions of use: _____

VI. WELL LOCATION AND USE REQUIREMENTS

In locating a well, the applicant shall identify all potential sources of contamination which exist or are proposed within two hundred (200) feet of the site. When possible, the well shall be located upgradient of all potential sources of contamination and shall be as far removed from potential sources of contamination as possible, given the layout of the premises.

Each private well shall be accessible for repair, maintenance, testing, and inspection. The well shall be completed in a water bearing formation that will produce the required quantity of water under normal operating conditions.

The following shall be the minimum separation distances allowed in the construction of a well: (includes irrigation and geothermal)

COMPONENT	DISTANCE (in feet)
Septic System (SAS)	100
Septic Tank	50
Cesspool	100
Sewer Line	50
Driveway	10
Street	25
Buildings	20
Property Line	10
Easements or Right-of-Way	10
Pond or Watercourse	25
Geothermal wells (both single & dual purpose)	100

Water supply lines shall be installed at least 10 feet from and 18 inches above any sewer line. Whenever water supply lines must cross sewer lines, both pipes shall be constructed of class 150 pressure pipe and shall be pressure tested to assure water tightness. Both lines shall be sleeved in SCH 40 PVC for ten (10') feet either side of the crossing.

The Board reserves the right to impose minimum lateral distance requirements from other potential sources of contamination not listed above. All such special well location requirements shall be listed, in writing, as a condition of the well construction permit.

No private well, or its associated distribution system, shall be connected to either the distribution system of a public water supply system or any type of waste distribution system.

VII. WATER QUANTITY REQUIREMENTS

The applicant shall submit to the Board for review and approval a Pumping Test Report. The Pumping Test Report shall include the name and address of the well owner, well location referenced to at least two permanent structures or landmarks, date the pumping test was performed, depth at which the pump was set for the test, location for the discharge line, static water level immediately before pumping commenced, discharge rate and, if applicable, the time the discharge rate changed, pumping water levels and respective times after pumping commenced, maximum drawdown during the test, duration of the test, including both the

pumping time and the recovery time during which measurements were taken, recovery water levels and respective times after cessation of pumping, and reference point used for all measurements.

In order to demonstrate the capacity of the well to provide the Required Volume of water, a pumping test shall be conducted in the following manner:

1) The volume of water necessary to support the household's daily need shall be determined using the following equation: (number of bedrooms plus one bedroom) x (110 gallons per bedroom) x (a safety factor of 2) = number of gallons needed daily.
2) The storage capacity of the well shall be determined using the measured static water level and the depth and radius of the drillhole or casing.
3) The Required Volume shall be calculated by adding the volumes of water in (1) and (2) above. It is this volume of water that must be pumped from the well within a 24 hour period.

The pumping test may be performed at whatever rate is desired. Following the pumping test, the water level in the well must be shown to recover to within eighty-five (85) percent of the prepumped static water level within a twenty-four (24) hour period.

Example 1: a one bedroom house with a well six (6) inches in diameter and contains 200 ft. of standing water:

1) *1 bedroom + 1 bedroom = (2 bedrooms) x (110 gallons per bedroom) x (safety factor of 2) = 440 gallons needed daily.*
2) *the volume of a 6 inch well is 1.5 gallons for every foot of water column length. Therefore, (200 ft. of standing water) x (1.5 gal/ft.) = 300 gallons.*
3) *440 gallons + 300 gallons = 740 gallons that must be pumped from the well in 24 hours or less to demonstrate suitable capacity. Recovery up to 85% of the static water level must also occur within 24 hours after cessation of pumping.*

Example 2: For a 4 bedroom house with a well that is six (6) inches in diameter and contains 100 ft. of standing water:

1) *4 bedroom house + 1 bedroom = (5 bedrooms) x (110 gallons per bedroom) x (safety factor of 2) = 1,100 gallons needed daily.*
2) *the volume of a 6 inch well is 1.5 gallons for every foot or water column length. Therefore, (100 ft. of standing water) x (1.5 gal/ft.) = 150 gallons.*
3) *1,100 gallons + 150 gallons = 1250 gallons that must be pumped from the well in 24 hours or less to demonstrate suitable capacity. Recovery up to 85% of the static water level must also occur within 24 hours after cessation of pumping.*

VIII. WATER QUALITY TESTING REQUIREMENTS

After the well has been completed and disinfected, and prior to using it as a drinking water supply, *[or irrigation],* a water quality test shall be conducted. The sample shall only be taken by the lab conducting the test.

All new constructed wells, shall be tested along with all existing wells that are drilled deeper, All wells that have been "fracked" regardless if a new or existing well shall be retested in full

compliance with the regulation. Any well that has been stagnant for two (2) or more years shall be re-tested in full compliance with this regulation.

A water sample shall be collected either after purging three well volumes or following the stabilization of the pH, temperature and specific conductance in the pumped well. The water sample to be tested shall be collected at the pump discharge or from a disinfected tap in the pump discharge line. In no event shall a water treatment device be installed prior to sampling.

The water quality test, utilizing an applicable US EPA approved method for drinking water testing shall be conducted by an EPA or Massachusetts certified laboratory and shall include analysis for the following parameters and the results shall not exceed Massachusetts drinking water standards for public water supplies: *** M.C.L (Maximum Contaminant Limit)

PARAMETERS	**M.C.L**
Total Coliform Bacteria	Absent

Inorganic Compounds

Antimony	0.006	mg/l
Arsenic	0.010	mg/l
Barium	2	mg/l
Beryllium	0.004	mg/l
Cadium	0.005	mg/l
Chromium (total)	0.1	mg/l
Cyanide	0.2	mg/l
Fluoride*	4	mg/l
Lead (action level)	0.015	mg/l
Copper (action level)	1.3	mg/l
Mercury	0.002	mg/l
Nitrate (N)	10	mg/l
Nitrite (N)	1	mg/l
Selenium	0.05	mg/l
Thallium	0.002	mg/l
Sodium (guideline)	20	mg/l

Synthetic Organic Compounds (SOC's)

Alachlor	2	ug/l
Atrazine	3	ug/l
Benzo(a)pyrene	0.2	ug/l
Carbofuran	40	ug/l
Chlordane	2	ug/l
Dalapon	200	ug/l
Di(2-ethylhexyl) adipate	400	ug/l
Di(2-ethylhexyl) phthalate	6	ug/l
2,4-D	70	ug/l
Endrin	2	ug/l
Ethylene Dibromide (EDB)	0.02	ug/l
Heptachlor	0.4	ug/l
Heptachlor epoxide	0.2	ug/l
Hexachlorobenzene	1	ug/l
Hexachlorocyclopentadiene	50	ug/l
Lindane	0.2	ug/l
Methoxychlor	40	ug/l
Oxamyl (Vydate)	200	ug/l
Polychlorinated biphenyis (PCBs)	0.5	ug/l
Pentachlorophenol	1	ug/l
Picloram	500	ug/l
Simazine	4	ug/l
Toxaphene	3	ug/l
2,4,5 - TP (Silvex)	50	ug/l

SOC's are only to be tested in the areas shown on the map " SOC Testing Areas - Town of Sutton"

Benzene	5	ug/l
Carbon Tetrachloride	5	ug/l
Dicholoromethane	5	ug/l
o-Dichlorobenzene	600	ug/l
para-Dichlorobenzene	5	ug/l
1,2-Dichloroethane	5	ug/l
cis-1,2-Dichloroethylene	70	ug/l
trans-1,2-Dichloroethylene	100	ug/l
1,1-Dichloroethylene	7	ug/l
1,2-Dichloropropane	5	ug/l
Ethylbenzene	700	ug/l
Monochlorobenzene	100	ug/l
Styrene	100	ug/l
Tetrachloroethylene	5	ug/l
Toluene	1,000	ug/l
Trichloroethylene	5	ug/l
1,1,1-Trichloroethylene	200	ug/l
1,2,4-Trichlorobenzene	70	ug/l
1,1,2-Trichloroethane	5	ug/l
Vinyl Chloride	2	ug/l
Xylenes (total)	10,000	ug/l
MTBE (guideline)	70	ug/l
Total Trihalomethanes (THMs)*	100	ug/l
Nickel	0.1	mg/L
Thallium	0.002	mg/L

* Trihaloethanes are by-products of disinfection procedures and may be present at low levels in newly drilled wells. These Volatile contaminants are dissipated as they are exposed to air and should not be detected after the well is properly flushed and utilized.

Massachusetts Secondary Standards

ALUMINUM	0.05 TO 0.2
CHLORIDE	250
COLOR	15 color units
COPPER	1
FLUORIDE	2
IRON	0.3
MANGANESE	0.05
ODOR	3 threshold unit numbers
pH	6.5 - 8.5 units
SILVER	0.1
SULFATE	250
TOTAL DISSOLVED SOLIDS	500
ZINC	5

Natural Radioactivity Standards

Radionuclide	Standard or MCL
Adjusted Gross Alpha	15 pCi/L
Radium - 226 plus Radium - 228	5 pCi/L
Uranium	30 ug/L or ppb (=20 pCi/L)
Radon	10,000 pCi/L

INTERPRETING TEST RESULTS

Initially test water for gross alpha particle activity and radon:

1. If gross alpha is 5 pCi/L or less, result OK, no further tests.
2. If gross alpha is greater than 5 pCi/L, but equal to or less than 15 pCi/L, then test for radium-226 and radium-228.
   a. If radium-226 plus radium-228 is > 5 pCi/L, then the combined radium MCL has been exceeded. Water treatment is recommended to reduce the level below the standard.
   b. If radium-226 plus radium-228 is ≤ 5 pCi/L, then the result is OK and no further tests are needed.
3. If gross alpha is greater than 15 pCi/L, test for radium-226, radium-228 and uranium*.
   a. If radium-226 plus radium-228 is > 5 pCi/L, then the combined radium MCL has been exceeded. Water treatment is recommended to reduce the level below the standard.
   b. If gross alpha minus uranium (known as "adjusted gross alpha") is >15 pCi/L then the gross alpha MCL has been exceeded. Water treatment is recommended to reduce the level below the standard.
   c. If uranium is above 20 pCi/L (or 30 ug/L) then the uranium MCL has been exceeded. Water treatment is recommended to reduce the level below the standard.
4. If the radon in water result is > 10,000 pCi/L, it is suggested to sample radon in air.

   It is commonly interpreted that 10,000 pCi/L of radon in water is equivalent to 1 pCi/L of radon in air. If the radon in the air test result is above the recommended EPA level of 4 pCi/L, water may be a suspected significant contributor and treatment may be recommended for both water and air radon removal.

**Most data for uranium uses the units of picocuries per liter (pCi/L). In order to convert and compare units of measure appropriately to the health standards, use the following equations:*

1 ug/L = 1 ppb = 0.001 ppm

To convert pCi/L uranium to ug/L or ppb:	To convert ug/L uranium to pCi/L:
X pCi/L uranium x 1.49 = X ug/L or (ppb) uranium	X ug/L uranium x 0.67 = X pCi/L uranium
Ex. 20 pCi/L uranium x 1.49 = 30 ug/L or (30 ppb) of uranium	Ex. 30 ug/L uranium x 0.67 = 20 pCi/L uranium

*IF THE GROSS ALPHA IS GREATER THAN 5pCi/L then you must test for Radium 226 & Radium 228.IF THE RADIUM 226 plus RADIUM 228 TOTALS 5 OR MORE, YOU MUST PUT A FILTER ON. If the GOSS ALPHA IS GREATER THAN 15 then you must test for Uranium. IF the Urnanium comes back at 30 ug/l or greater you must filter.

Installation of a filter system for secondary contaminants is at the discretion of the homeowner. ALL primary contaminants above the MCL must be filtered out and the well retested once. A whole house filter is required.

The Board of Health reserves the right to require monitoring for Pesticides & PCB's and Herbicides in certain situations.

Following a receipt of the water quality test results, the applicant shall submit a Water Quality Report to the Board which includes:

1) a copy of the certified laboratory's test results
2) the name of the individual (lab representative) who performed the sampling
3) where in the system the water sample was obtained
4) Chain of Custody

The Board reserves the right to require retesting of the above parameters, or testing for additional parameters when, in the opinion of the Board, it is necessary due to local conditions or for the protection of the public health, safety, and welfare. All costs and laboratory arrangements for the water testing are the responsibility of the applicant.

An employee of the certified lab performing the analyses is required to collect the water sample.

Following the initial water quality test for a new well, the Board may require or recommend that the applicant or owner of the property on which the well is located to have the water tested periodically.

The Board may choose to require that a water quality test be conducted prior to any time the property on which the well is located changes ownership.

IX. WELL CONSTRUCTION REQUIREMENTS

Pursuant to 313 CMR 3.00, no person in the business of digging or drilling shall construct a well unless registered with the Department of Environmental Management/Office of Water Resources.

Any work involving the connection of the private well to the distribution system of the residence must conform to the local plumbing code. All electrical connections between the well and the pump controls and all piping between the well and the storage and/or pressure tank in the house must be made by a pump installer or registered well driller, including the installation of the pump and appurtenance in the well or house.

A physical connection is not permitted between a water supply which satisfies the requirements of these regulations and another water supply that does not meet the requirements of these regulations without prior approval of the Board.

A. General Well Design and Construction

All private water supply wells shall be designed such that:

1) the materials used for the permanent construction are durable in the specific hydrogeologic environment that occurs at the well site.
2) no unsealed opening will be left around the well that could conduct surface water or contaminated groundwater vertically to the intake portion of the well or transfer water from one formation to another.

Permanent construction materials shall not impart toxic substances taste, odors, or bacterial contamination to the water in the well.
The driller shall operate all equipment according to generally accepted standards in the industry and shall take appropriate precautions to prevent damage, injury or other loss to persons and property at the drilling site.
Well construction design shall insure that surface water does not enter the well through the opening or by seepage through the ground surface. Construction site waste and materials

shall be disposed of in such a way as to avoid contamination of the well and the aquifer.
During any time that the well is unattended, the contractor shall secure the well in a way as to prevent either tampering with the well or the introduction of foreign material into the well.

Well yield shall be measure and recorded at least every fifty (50) feet during drilling.

All water used for drilling, well development, or to mix a drilling fluid shall be obtained from a source which will not result in contamination of the well or the water bearing zones penetrated by the well. Water shall be conveyed in clear sanitary containers or water lines and shall be chlorinated to an initial concentration between 50 mg/1 and 100 mg/1.

A free-chlorine residual of 10 mg/1 shall be maintained in any water used at the drill site.
Water from wetlands, swamps, ponds and other similar surface features shall not be used.

All drilling equipment, including pumps and down hole tools, shall be cleaned and disinfected prior to drilling each new well or test hole.

All drilling fluids shall be nontoxic. Drilling fluid additives shall be stored in clean containers and shall be free of material that may adversely affect the well, the aquifer, or the quality of the water to be pumped from the well, surfactants should be biodegradable. The use of biodegradable organic polymers shall, when possible, be avoided.

All wells, including those that have been hydrofractured, shall be developed in order to remove fine materials introduced into the pore spaces or fractures during construction. One or more of the following methods shall be used for development: overpumping, backwashing, surging, jetting, air-lift pumping.

The completed well shall be sufficiently straight so that there will be no interference with installation, alignment, operation or future removal of the permanent well pump.

B. Well casing

Private water supply wells shall be constructed using steel well casing. The casing shall be of adequate strength and durability to withstand anticipated formation and hydrostatic pressures,

the forces imposed on it during installation, and the corrosive effects of the local hydrogeologic environment.

Steel casing shall be used with cable tool drilling or when the casing is installed in an open drillhole in which formation materials may suddenly collapse against the casing.

All casing used in the construction of private water supply wells shall be free of pits, breaks, gouges, deep scratches and other defects. If previously used casing is installed, it shall be decontaminated and disinfected prior to installation.

Installation of water well casing shall be done in a manner that does not alter the shape, size, or strength of the casing and does not damage any of the joints or couplings connecting sections of the casing. A standard driveshoe shall be used when casing is installed. The drive shoe shall be either welded or threaded to the lower end of the string of casing and shall have a beveled metal cutting edge forged, cast, or fabricated for this specific purpose.

Upon completion of the installation procedure, the entire length of the casing above the intake shall be watertight.

For wells completed above grade, the casing shall extend at least 18 inches above the finished ground surface unless the well is located in a floodplain. For wells constructed in a floodplain, the casing shall extend at least two feet above the level of the highest recorded flood. The top of the casing shall be reasonably smooth and level.

Concrete casing may be used for dug wells provided a variance is approved by the Board of Health for a dug well.

1. Steel casing

   Steel casing shall consist of a pipe that complies with materials standards approved by the American Water Works Association.

   Segments of steel casing shall be coupled by using threaded casing, coupling, or by welding the joint. Recessed or reamed and drifted couplings shall be used on threaded casing and no threads shall be left exposed once the joint is completed. When welded casing joints are used, they shall conform to the most recent revision of AWWA C206, "Standard for Field Welding of Steel Water Pipe." The weld shall be at least as thick as the wall thickness of the well casing and shall be fully penetrating. When completed, a welded casing joint shall have a tensile strength equal to or greater than that of the casing.

2. Concrete casing

   Concrete water well casing consists of either precast concrete pipe or concrete which has been poured in-place. This type of casing shall be used only for the construction of dug wells.

   Precast concrete pipe shall be at least three (3) inches thick, meet or exceed ASTM C67 Class III specifications, and be free of blemishes. Joints between pipe segments shall be sealed with a continuous, solid ring rubber gasket having a circular cross section with

a diametrical tolerance of plus or minus one-sixty-fourth of an inch. Gaskets shall be of sufficient volume to substantially fill the recess provided when the pipe joint is assembled. A properly sized gasket will form a pressure tight seal when it is compressed between the pipe segments.

C. Well screen

A well screen is necessary for all drilled wells that are completed in unconsolidated formations. Wells completed in bedrock do not require a screen unless the bedrock formation is brittle in nature or has a potential for collapse. The well screen aperture openings, screen length, and diameter shall be selected so as not to limit the aquifers' water yielding characteristics while preventing access of soil particles that would detract from well efficiency and yield.

D. Grouting and sealing

When required, private wells drilled in bedrock shall be grouted from the top of the weathered rock interface to fifteen (15) feet into competent bedrock. Either neat cement grout or sand cement grout shall be used and it shall be emplaced using standard grouting techniques as described in the DEP Private Well Guidelines.

All wells completed with the casing extending above grade shall have a surface seal designed to eliminate the possibility of surface water flowing down the annular space between the well casing and the surrounding backfilled materials. The surface seal shall extend to a depth below the local frost line.

E. Pumps and pumping equipment

All pumps shall be installed either below the frost line with a pitless adaptor or in some other heated and protected sanitary location. Above ground pumps shall be installed in sheltered, dry, accessible locations and shall be protected from freezing.

Shallow-well pumps shall be installed as near the well or water source as possible to minimize suction lift.

Deep-well reciprocating pumps shall be installed directly over the well. Submersible and helical rotor pumps must be installed in the well. A deep-well jet pump may be offset from the well.

F. Wellhead completion

Well casing shall not be cut off below the land surface unless a pitless adapter or a pitless unit is installed or an abandoned well is being permanently plugged. Well casing terminating above-grade shall extend at least 18 inches above the predetermined ground surface at the wellhead except when the well is located in a floodplain. When a well is located in a floodplain, the well casing shall extend at least 2 feet above the level of the highest recorded flood. The top of the well casing shall be reasonably smooth and level.

Any well, except a dug well, that does not terminate at the ground surface in the base of a pump shall be equipped with a sanitary seal or watertight cap designed to prevent surface water and foreign matter from entering the well. A flowing artesian well shall be equipped with a shut-off valve and backflow preventer so that the flow of water can be stopped completely when the well is not in use.

All wells except flowing artesian and dug wells shall be vented. The opening of the vent pipe shall be covered with a 24 mesh corrosion resistant screen and shall be large enough to prevent water from being drawn into the well through electrical conduits or leaks in the seal around the pump when the pump is turned on. The vent pipe shall terminate in a downward position at or above the top of the casing

All connections to a well casing made below ground shall be protected by either a pitless adapter or a pitless unit that complies with the most recent revision of National Sanitation Foundation Standard Number 56, entitled "Pitless Well Adapters."

Above-grade connections into the top or side of a well casing shall be at least 12 inches above the established ground surface or two feet above the level of the highest known flood, whichever is higher. Above-grade connections shall be sealed so that they are watertight.

The ground immediately surrounding the well casing shall be sloped downward and away from the well in all directions to eliminate the possibility of surface water ponding.

G. Disinfection

Upon completion of well construction, the well contractor shall disinfect the well. If a pump is to be installed by the well contractor immediately upon completion of the well, the contractor shall disinfect the well and the pumping equipment after the pump has been installed.

If the pump is not installed upon completion of the well, the pump contractor shall, upon installation, disinfect the well and the pumping equipment. The pump contractor shall also disinfect the entire water supply system after any maintenance or repair work is done on the pump.

When a well is disinfected, the initial chlorine concentration shall be 100 mg/1 throughout the entire water column.

For newly constructed or altered wells in which the pump is not immediately installed, the chlorine concentration used to disinfect the well shall be 100 mg/1. Upon installation of the pump, disinfection of the well, the pumping equipment, and the distribution system, if connected, shall be accomplished with a chlorine concentration of 100 mg/1.

The disinfectant solution shall remain, undisturbed, in the well for a minimum of two (2) hours. After all the chlorine has been flushed from the water supply system, a water sample shall be collected and submitted to a state certified laboratory. For new wells, the sample shall be tested pursuant to Section VI of these regulations. For wells which have undergone repair, the sample shall be tested for coliform bacteria and any other parameters deemed appropriate by the Board.

X. DECOMMISSIONING REQUIREMENTS

Abandoned wells, test holes, and borings shall be decommissioned so as to prevent the well, including the annular space outside the casing, from being a channel allowing the vertical movement of water.

The owner of the private well shall decommission the well if the well meets any of the following criteria:

1) construction of the well is terminated prior to completion of the well
2) the well owner notifies the Board that the use of the well is to be permanently discontinued.
3) the well has been out of service for at least three years
4) the well is a potential hazard to public health or safety and the situation cannot be corrected
5) the well is in such a state of disrepair that its continued use is impractical
6) the well has the potential for transmitting contaminants from the land surface into an aquifer or from one aquifer to another and the situation cannot be corrected.

The property owner shall be responsible for ensuring that all abandoned wells and test holes or borings associated with private well installation are properly plugged. Only registered well drillers may plug abandoned wells, test holes, and borings.

In the case of new well construction, all test holes and borings shall be plugged before the well driller completes work at the site.

Abandoned wells or borings shall be completely filled with a grout which cures with a final permeability of less than $1x10^{-7}$ cm/sec. Wells shall be plugged with neat cement grout, sand cement grout, concrete, or bentonite grout.

Regardless of the type used, the grout:

1) shall be sufficiently fluid so that it can be applied through a tremie pipe from the bottom of the well upward
2) shall remain as a homogeneous fluid when applied to the subsurface rather than disaggregating by gravity into a two phase substance
3) shall be resistant to chemical or physical deterioration
4) shall not leach chemicals, either organic or inorganic, that will adversely affect the quality of the groundwater where it is applied

The plugging materials shall be introduced at the bottom of the well or boring and placed progressively upward to a level approximately four (4) feet below the ground surface. Sealing materials shall never be poured from the land surface into the well, borehole, or annular space being sealed.

The contractor shall emplace the surface seal no sooner than 24 hours after the well or boring has been plugged. Before the surface seal is placed, casing remaining in the hole shall be cut off. The remaining four feet at the top of the well or boring shall then be filled with concrete. The top of the seal shall comprise a concrete slab above the top of the plugged well or boring.

This concrete slab shall be at least six inches thick and shall be at least two feet greater in diameter than the well casing or borehole wall.

Prior to decommissioning a well a permit must be obtained from the Board of Health as described in Section IV, 1.

Upon decommissioning any well, the well driller shall submit to the Board a "Report of Decommission" within ten days of completion. The report shall include the following:

1. name, address, and telephone number of the owner
2. name, address, and telephone number of the well driller
3. location of the well
4. reason for abandonment
5. all of the well characteristics
   depth, diameter, type casing
6. list of plugging materials used
7. plugging procedure used

XI. ENFORCEMENT

The Board shall investigate violations of these regulations and/or violations of any Water Supply Certificate conditions and may take such actions as the Board deems necessary for the protection of the public health and the enforcement of these regulations.

If any investigation reveals a violation of these regulations the Board shall order the private well owner to comply with the violated provision(s).

These orders shall be in writing and served in the following manner:

(a) personally, by any person authorized to serve civil process, or;
(b) by any person authorized to serve civic process by leaving a copy of the order at the well owner's last and usual place of abode, or;
(c) by sending the well owner a copy of the order by registered or certified mail, return receipt requested, if the well owner is within the Commonwealth, or
(d) if the well owner's last and usual place of abode is unknown or outside the Commonwealth, by posting a copy of the order in a conspicuous place on or about the premises and by advertising it for at least three out of five consecutive days in one or more newspapers of general circulation within the municipality wherein the private well affected is situated.

XII. HEARING

The private well owner to whom any order has been served may request a hearing before the Board by filing with the Board within 7 days after the day the order was served, a written petition requesting a hearing on the matter. Upon receipt of such petition, the Board shall set a

time and place for such hearing and shall inform the well owner thereof in writing. The hearing shall be commenced not later than 30 days after the day on which the order was served. The

Board, upon application of the well owner, may postpone the date of hearing for a reasonable time beyond such 30-day period if in the judgment of the Board the well owner has submitted a good and sufficient reason for such postponement. At the hearing the well owner shall be given an opportunity to be heard and to show why the order should be modified or withdrawn. After the hearing, the Board shall sustain, modify, or withdraw the order and shall inform the

well owner in writing of its decision. If the Board sustains or modifies the original order, it shall be carried out within the time period allotted in the original order or in the modification.

Every notice, order, or other record prepared by the Board in connection with the hearing shall be entered as a matter of public record in the office of the clerk of the city or town, or in the office of the Board.

In a written petition for a hearing is not filed with the Board within 7 days after the day an order has been served or if after a hearing, the order has been sustained in any part, each day's failure to comply with the order as issued or modified shall constitute an additional offense.

XIII. APPEAL

Any person aggrieved by the final decision of the Board may seek relief therefrom within thirty (30) days in any court of competent jurisdiction, as provided by the laws of this Commonwealth.

XIV. PENALTIES

Any person who violates any provision of these regulations, or who fails to comply with any order by the Board, for which a penalty is not otherwise provided in any of the General Laws shall upon conviction be fined not less then ten nor more than five hundred dollars. Each day's failure to comply with an Order shall constitute a separate violation.

XV. VARIANCE

The Board may, grant a variance to the application of these regulations when, in its opinion, the enforcement thereof would do manifest injustice, and the applicant has demonstrated that the equivalent degree of protection will still be provided to the private water supply without strict application to particular provisions of these regulations.

Every request for a variance shall be made in writing and shall state the specific variance sought and the reasons therefore. The writing shall contain all the information needed to assure the Board that, despite the issuance of a variance, the public health and environment will be protected.

Any variance may be subject to such qualification, revocation, suspension, condition, or expiration as is provided in these regulations or as the Board expresses in its grant of the variance. A variance may otherwise be revoked, modified or suspended, in whole or in part, only after the holder thereof has been notified in writing and has been given an opportunity to be heard, pursuant to Section XI of these regulations.

XVI. SEVERABILITY:

If any provision of these regulations or the application thereof is held to be invalid by a court of competent jurisdiction, the invalidity shall be limited to said provision(s) and the remainder of these regulations shall remain valid and effective. Any part of these regulations subsequently invalidated by a new state law or modification of an existing state law shall automatically be

brought into conformity with the new or amended law and shall be deemed to be effective immediately, without recourse to a public hearing and the customary procedures for amendment or repeal of such regulation.

XVII. EFFECTIVE DATE

These regulations were adopted by vote of the Sutton, Massachusetts Board of Health, at a **Public Hearing held on 5/25/2016** and are to be in full force **and effect on and after 7/1/2016.** Before said date, these regulations shall be published and a copy thereof be placed on file in the Board of Health Offices and filed with the Department of Environmental Protection.

These regulations or any portions thereof may be amended, supplemented or repealed from time to time by the Board, with notice as provided by law, on its own motion or by petition.

XVIII. DISCLAIMER

The issuance of a well permit shall not be construed as a guarantee by the Board or its agents that the water system will function satisfactorily nor that the water supply will be of sufficient quality or quantity for its intended use.

John Silverberg, Chairman

William Fredericks, Vice Chairman

Diane Miller, Member

Tammi Marois, Member

Kenneth Malo, Member