



## Department of Environmental Protection

Western Regional Office • 436 Dwight Street, Springfield MA 01103 • 413-784-1100

Charles D. Baker  
Governor

Karyn E. Polito  
Lieutenant Governor

Kathleen A. Theohandes  
Secretary

Martin Suuberg  
Commissioner

*SENT VIA ELECTRONIC MAIL*

Mr. James Mercer, Treasurer  
Housatonic Water Works  
80 Maple Ave Ste 1  
Great Barrington, MA 01230

November 6, 2020

Re: Great Barrington-DWP  
Housatonic Water Works  
PWS ID#: 1113003  
Sanitary Survey

Dear Mr. Mercer,

On September 16, 2020, Douglas Paine and Michael McGrath of the Massachusetts Department of Environmental Protection (MassDEP), Drinking Water Program (DWP) conducted a Sanitary Survey of the Housatonic Water Works (“HWW”, “Housatonic”, or the “Water Company”) public water system. A sanitary survey is an on-site review of the water sources, facilities, equipment, operation and maintenance of a public water system for the purpose of evaluating the system’s ability to produce and distribute safe drinking water. The enclosed report includes the system description, findings and compliance plan.

Subsequent to the completion of this inspection report, Housatonic submitted a copy of a Study Report, prepared by the Cornwell Engineering Group. That report is currently under review.

During the course of the survey, MassDEP identified areas in which improvements in the administration, and operation and maintenance of the system could be made. This report contains time sensitive requirements, which are summarized in the Compliance Plan Tables. Please review the items noted in the report and Compliance Plan Tables A, B, and C and return the signature page to MassDEP by **December 6, 2020**. Specifically, MassDEP requires the following actions to remedy items noted in the inspection:

An assessment of this public water system’s capacity was conducted by MassDEP for the last sanitary survey report, dated **February 9, 2018**. Based on the results of this Sanitary Survey inspection, MassDEP has determined that the capacity rating for the HWW public water system should remain as **Conditional**. Please refer to the Findings section of this report for more details on public water system capacity.

Housatonic has a sufficient number of licensed operators to provide both primary and secondary distribution and treatment operation. Jim Mercer is sufficiently licensed to provide primary distribution and primary treatment coverage, while Peter Marks is sufficiently licensed to provide secondary distribution and treatment operator coverage. The following issues relate to operation of the water system:

- The Massachusetts Drinking Water Regulations at 310 CMR 22.11B(3) requires 7-day notification of a change in the status of either a primary or secondary water operator and the

Electronic File Location: Y:\DWP Archive\WERO\Great Barrington-1113003-SS-2020-11-06

The signature on this cover letter indicates formal issuance of the attached document.

This information is available in alternate format. Call the MassDEP Diversity Office at 617-556-1139. TTY# MassRelay Service 1-800-439-2370

MassDEP Website: [www.mass.gov/dep](http://www.mass.gov/dep)

Printed on Recycled Paper

submittal of a new Staffing and Comprehensive operations Plan within 30-days of a change. **Housatonic last submitted a Staffing and Comprehensive operations Plan in September 2016, and has made changes to its secondary water operators since that submittal. Failure to provide notification of a change in a secondary water operator is a violation and will be addressed within a separate document.**

- The Massachusetts Drinking Water Regulations at 310 CMR 22.11B(5)(h) requires a minimum of 2-hours of daily treatment operation. **If more time is required to complete operation, maintenance and other activities, Housatonic must ensure sufficient operator time occurs. As Housatonic's primary treatment operator, Mr. Mercer must be spending at least two hours on site at the treatment plant and must develop and maintain a log sheet demonstrating compliance with this requirement.**

Adequate operation of the water treatment plant relies on the ability to identify and respond to critical conditions that may result in a treatment failure, a chemical overfeed or underfeed, or a risk to public health. In order for the water treatment plant to continue to be staffed on a part-time basis (a minimum of 2-hours/day), **MassDEP's requires that by January 31, 2021, Housatonic provide written notice that the following issues related to monitoring and alarms have been addressed:**

- The regulatory requirements of the Surface Water Treatment Rule (310 CMR 22.20A) is to report turbidity results that represent a combined filter effluent, and not solely turbidity from individual filters. The treatment plant is not equipped with a turbidimeter that will monitor combined filtered turbidity. **MassDEP requires that a combined filter turbidimeter be installed prior to the addition of any chemical treatment and that Housatonic's SCADA system monitor and alarm the combined filtered turbidity. Beginning in February 2021, Housatonic's monthly SWTR reporting sheets submitted to MassDEP must include turbidity data representing the combined filter turbidity.** This issue was identified within MassDEP 2018 inspection report, and Housatonic's failure to address this problem is a violation of 310 CMR 22.04(12).
- The Surface Water Treatment Rule requires that the residual disinfectant concentration of water entering the distribution system cannot be less than 0.2 mg/l for more than 4-hours. Although Housatonic has a continuous chlorine residual analyzer monitoring residual levels at its point-of-entry to its distribution system, that analyzer is not alarmed, and the operator will not be timely notified if residual levels fall below the regulatory threshold. **MassDEP requires that Housatonic's SCADA system be equipped with a Point-of-Entry chlorine residual alarm.**
- The slow sand filtration technology used by Housatonic will not perform well under extreme fluctuations in raw water quality or deteriorating raw water quality. Although Long Pond is generally not subject to wide variations in raw water turbidity, the long-range effects of increasingly severe weather may have an impact. Housatonic's raw water turbidimeter is not equipped with a high turbidity alarm. This type of alarm is intended to alert the operator to critical conditions that may "blind" the filters and make them unusable. **MassDEP requires that Housatonic's SCADA system be equipped with a high raw water turbidity alarm.**
- Chlorine residual levels at the end of Housatonic's first disinfection segment are widely variable, with levels ranging from less than 1.0 mg/l to over 3.0 mg/l each month. The cause of this variation is unknown and may involve the accuracy of the chlorine analyzer. Although MassDEP has previously required Housatonic to maintain logs of all equipment calibration no calibration logs were available during the inspection. **Housatonic must immediately maintain a log of all equipment calibration, whether by the operator, the manufacturer or other consulting personnel. Housatonic must demonstrate compliance with this immediate requirement by submitting December 2020 and January 2021 records with the monthly Chemical Addition reports by the 10<sup>th</sup> day of the following month.**

- Massachusetts Drinking Water Regulation 310 CMR 22.15(4) requires that Public Water Systems provide a monthly report on the amount of chemical added to the water system. Housatonic's two chlorine disinfection chemical feed tanks are of a size (400-gallons each) to prevent an accurate measurement of the amount of sodium hypochlorite added to the water each day. The tanks are not graduated and are opaque making an accurate measurement impossible. By using the settings on the chemical feed pump and the amount of water provided each day, Housatonic has historically provided an estimate of the amount of chemical pumped. **MassDEP requires that Housatonic install a smaller graduated solution tank to allow for the accurate daily measurement of all chemical added to the water system.**
- Housatonic's chlorine disinfection system and SCADA incorporate high and low residual level alarms. Standard protocol is to test these alarms once per month as a standard operation and maintenance task, and to maintain a log of those alarm tests. No alarm testing log was available during the inspection. **If it is not testing the alarms on a monthly basis, Housatonic must immediately begin maintaining those alarms on a monthly basis and it shall immediately begin to maintain a log of all monthly alarm tests. Housatonic must demonstrate compliance with this immediate requirement by submitting December 2020 and January 2021 records with the monthly Chemical Addition reports by the 10<sup>th</sup> day of the following month.**
- Housatonic stores approximately 250 gallons of chlorine on site and uses approximately 2 gallons per day. Chlorine generally begins to degrade in strength after 30-days, and chemical feed adjustments must be made to compensate for that degradation. This degradation and the resulting adjustments may play a role in the wide variation of chlorine residual levels at the end of the first disinfection segment. **Consideration should be given to using a chlorine purchasing system that would allow for more frequent delivery of lesser volumes.**

The Water Management Act (WMA) unaccounted water (UAW) conservation goal is 10%. Housatonic's reported UAW during the last three years on record ranged between 35% - 42%, with the most recent Annual Statistics Report indicating a 35.4% UAW. Although Housatonic has a WMA registration, which does not include enforceable restrictions on UAW percentages, excess unaccounted water indicates an inadequately maintained distribution system and service connections. This inadequate utility management results in higher costs for the utility and its customers, lost revenues that could be used to make needed system repairs, excessive electrical costs and chemical use, and may contribute to its distribution water quality problems. Housatonic reports that it last completed a full system leak detection in 2016. **By January 31, 2020 MassDEP requires that Housatonic submit a detailed UAW Plan which identifies its plan of action to reduce its unaccounted water.**

Housatonic has water quality problems within its distribution system, as discussed elsewhere in this report, and the age and operation of its water filtration plant may be contributing. Housatonic's water filtration plant dates to 1939, and although certain upgrades have been made over the years, the filtration component itself remains in the basic form as when it was constructed. Many of the characteristics of the treatment plant's two filters do not meet MassDEP current design requirements as specified within Chapter 5 of its Guidelines for Public Water System's (Guidelines), and Housatonic's 2016 Master Plan notes that the filtration galleries are beyond their useful life expectancy. **MassDEP requires that by December 31, 2021, Housatonic provide a written report evaluating the current filtration components, prepared by a third-party consultant. The report must specifically address each of the deficiencies identified below, and the report's conclusions must discuss the impact of these deficiencies on the water quality observed within the distribution system:**

- Section 5.3.5.8 of the Guidelines requires that a thin layer of sand be removed when a headloss threshold is met, as a method of cleaning the filters. Housatonic uses a unique hydrorake system

with a short duration waste discharge in lieu of removing a sand layer. Although this cleaning process may reduce headloss through the filter, it may not be adequately removing contaminants such as manganese or organics that result in color which are then being washed through the filters and appear in the distribution system under certain conditions. **Housatonic must develop a method of cleaning and re-sanding the filters in a manner described within the Guidelines. As a short-term analytical check, MassDEP is additionally requiring that samples for iron, manganese, and color be collected off of each filter as part of Housatonic's current weekly sampling regiment.**

- Section 5.3.5.5 of the Guidelines requires that the slow sand filters be re-sanded when the remaining sand layer reached 19-inches in depth. Slow sand filters are generally re-sanded every 10-15 years based on the cleaning frequency. Housatonic has not re-sanded its two filters in the last 20-years. Due to the use of an unconventional cleaning method, contaminants such as iron and manganese resulting in elevated color may now be imbedded within the filters. **MassDEP requires that these filters be re-sanded, and that a strategy for completing this task be included within the consultant's report required within this section.**
- Cleaning and resanding the filters using conventional methods is dependent on Housatonic's ability to filter water to waste, and Section 5.3.5.9 of the Guidelines requires that slow sand filters be equipped with filter to waste capabilities. Water is filtered to waste following a conventional cleaning until certain water quality threshold are met. Housatonic's filters are reportedly equipped with the equipment that would allow water to be filtered to waste, however that equipment is not in use. **The consultant's report, required within this section, must evaluate the filtration system's ability to effectively filter to waste and, if needed, propose a means to do so.**
- Housatonic's ability to operate its slow sand filters in a more conventional mode is dependent on its ability to take one filter off-line for a period of time for cleaning. Section 5.3.5.1 of the Guidelines requires that when two filters are provided, each filter shall be capable of meeting the plant design capacity (normally the projected maximum daily demand) at the approved filtration rate. Generally slow sand filter loading rates fall within a range of 45-150 gallons/day/sq ft. Because of the age of Housatonic's filters MassDEP has not approved a specific filter loading rate. Housatonic's maximum day water use in 2019 was identified at approximately 211,000, with greater maximum day uses reported in prior years. A loading rate of approximately 100 gallons/day/sq ft would be necessary for Housatonic to meet the loading rate requirements to allow for only two filters. **Housatonic's report required within this section must establish a filter loading rate and provide justification for that determination.**

Section 5 of the Guidelines for Public Water Systems states that slow sand filtration shall be limited to water with turbidity levels less than 10 units and color of less than 15 units. Limited raw water sampling data indicates that Housatonic may not meet the color threshold of 15 units. A raw water sample collected on August 19, 2020 had a color level of 20 units.

The Guidelines also state that microscopic examination of the raw water must be made to determine the nature and extent of algae growths and their potential adverse impact on filter operations. Housatonic has operated slow sand treatment for decades, with records indicating algae treatment occurred years ago. Housatonic's intake is located in a shallow section of the reservoir and is reported to be at a depth of approximately four feet. Substantial vegetation was evident in the shallow section of the reservoir around the intake, which has reportedly increased in the last several years. The vegetation growth appears to be correlated to a rise in reservoir water temperatures. In addition to elevated color, Housatonic was measuring raw water temperatures of greater than 80-degrees in August 2020. MassDEP requires:

- **By December 31, 2020, Housatonic shall have collected raw water samples for microscopic evaluation of algae with results be provided to MassDEP.**

- **By January 31, 2021, Housatonic submit a report, prepared by a third party consultant to address vegetation, algae, and color levels within Long Pond or to propose extending the intake to a location away from the vegetation and to a lower depth in the reservoir which may avoid color associated with vegetation as documented by water quality data for the alternate intake location. Drawing water from a lower depth may also result in more consistent, and overall lower, water temperatures.**

A substantial number of complaints of poor water quality have occurred both in 2018 and 2020 from customers within Housatonic's distribution system. The discolored water impacting customers appear to coincide with elevated water temperatures in the reservoir. Targeted water quality monitoring for iron, manganese, pH, color, turbidity, total dissolved solids, chlorine residual, and other parameters from the point-of-entry sample tap as well as locations within the distribution system has revealed inconsistent water quality. Elevated levels of manganese and color have been detected in some, but not all, point-of-entry and distribution samples from a time period extending through the warmer months of 2020. The following requirements relate to distribution and water quality within the distribution:

- **Housatonic shall continue with the current weekly water quality monitoring program at sampling locations representing its raw water, point-of-entry, and agreed upon distribution sites. Elsewhere in this report, MassDEP has added a requirement to test individual filtered water weekly for color and manganese.**
- Housatonic has been working with a consultant to review water quality conditions from the source through the distribution system with a goal of addressing distribution water quality complaints. A draft report was anticipated by the end of September 2020. **MassDEP requires that a final copy of the consultant's study report be provided by December 31, 2020. If MassDEP agrees with the report's recommendations, all necessary permitting and equipment installation recommended within that report must be completed by June 1, 2021.**
- Housatonic does not have a current hydraulic study of its distribution system. **By December 31, 2021, Housatonic shall provide written notification that a new hydraulic study of its entire distribution system has been completed and submit a copy of that report to the MassDEP.**
- Certain areas of the distribution system reportedly have inadequate pressure for fire protection, and may not meet ISO standards, but the associated fire hydrants are not coded related to water main size or pressure. **Within 90-days of the completion of the hydraulic study, Housatonic shall provide written notice that it has coded all hydrants in a manner that depicts the size of the water main and the associated water pressure and shared that coding with local fire officials.**
- Housatonic reports that its distribution system includes undersized water mains which are connected to the water system but are not owned by the Water Company. These mains typically result in dead-ends and do not have a means of being flushed. The water quality within these mains is frequently poor. **By March 31, 2021, Housatonic shall submit a copy of its distribution map identifying the location of all water mains not owned by the Water Company, and a bylaw (or appropriate equivalent) which requires that these mains be maintained by the owners of the properties that they serve. Written notification to all customers served by a privately owned water main must be completed by the March 31, 2021 date, alerting them to the creation of the bylaw (or equivalent) and providing notice as to where the public water supply ends and the private water main begins.**
- Housatonic's distribution system includes pipe constructed of cast iron, galvanized iron, and transite pipe, much of it undersized and some of it installed in the 1800s. **By December 31, 2021, submit an amendment to the current Capital Improvement Plan, which prioritizes water main replacement projects, anticipated cost, and a five-year and ten-year schedule for the priority projects, specific to water main replacement.**

Housatonic has completed substantial piping changes at its treatment plant and water storage tank since MassDEP's 2017 inspection, with the result being longer detention time of all water prior to being delivered to the distribution system. All treated water now passes through the storage tank, which has an approximate 5-day detention period. The following issues relate to water storage:

- Housatonic has not inspected and cleaned its storage tank since the piping changes were made. The piping changes and longer detention time may have resulted in a greater amount of sediment accumulating at the bottom of the tank. That sediment may be contributing to the elevated manganese and color detected within the distribution system. MassDEP requires that water storage tanks be inspected and cleaned every three to five years, and Housatonic last cleaned its tank in 2016. **MassDEP requires that by to June 30, 2021, Housatonic submit a tank inspection and cleaning report.**
- MassDEP requires yearly rooftop inspections of atmospheric water storage tanks. **Housatonic must conduct a formal rooftop inspection annually. Pictures of hatches and vents should be taken and kept with an inspection report.**
- The storage tank overflow is protected with a flapper valve, but does not have any additional screening to provide protection should the valve remain open. **By December 31, 2020, provide written notification that appropriate screening has been installed on the overflow line.**

Raw water and point-of-entry sampling taps must be unthreaded to help protect the sanitary condition of the tap. Housatonic's raw water and point-of-entry sample taps are threaded. **By December 31, 2020, provide written notice that both taps have either been replaced or adapted in a manner that results in a dedicated unthreaded tap for sample collection only.**

Housatonic has made physical changes to the water system as well as staffing changes since it last updated its Emergency Response Plan (ERP) in 2015. In addition to a yearly training exercise using the ERP. The Plan should be reviewed each year and updated with any changes. **By June 30, 2021, Housatonic shall update its ERP, and submit to MassDEP with a new Emergency Response Plan Compliance Checklist.**

Housatonic's ability to deliver water from its treatment facility to its water storage tank relies on pumps and electricity, and the facility is not equipped with a working emergency generator. The large volume of storage resulting in multiple days of supply allows Housatonic to maintain service during shorter duration power outages, but may impact water availability for fire protection. The installation of a generator is on Housatonic's 20-year Master Plan list. **MassDEP recommends that Housatonic install the necessary electrical connection to allow for a portable generator to be installed until the installation of an on-site generator is completed.**

Housatonic exceeded the Action Levels for both lead and copper in previous monitoring, and in August 2018 signed an Administrative Consent Order which would result in the installation of a corrosion control treatment system. In a letter dated December 19, 2016, MassDEP required Housatonic to submit a Desktop Evaluation for Corrosion Control Treatment, a Basis of Design Report, and a Chemical Addition Retrofit BRP WS 34 permit application. The desktop evaluation recommended the addition of soda ash or potash to raise the pH and a blended phosphate as an inhibitor. The basis of design report recommended the addition of potassium hydroxide to raise the pH to an optimum range of 7.4 to 7.8 and the addition of a blended ortho/polyphosphate. MassDEP approved the installation of corrosion control equipment within a November 1, 2018 conditional permit approval letter. Although approved, that equipment has not been installed. Housatonic asserts that improved sampling procedures, a reduction in the application of chlorine for primary disinfection, and the effects of its storage tank re-piping, has sufficiently reduced lead and copper to below Action Levels. Lead and copper sampling conducted since

2018 has not resulted in Action Level exceedances of either lead or copper. Although Housatonic's failure to install corrosion control treatment leaves it in noncompliance with the 2018 ACO requirement for corrosion control treatment to address the Lead and Copper Action Level exceedances, subsequent lead and copper sampling showed lead and copper levels below the Lead and Copper Action Levels. **If the consultant's report looking at water quality discussed above recommends the installation of a phosphate blend as a means of controlling distribution water quality, MassDEP will require that the proposal for installation demonstrate that the pH within the water system is maintained within the appropriate range to allow the phosphate blend to consistently adhere to the water mains.**

Questions regarding this document, or other drinking water issues, should be directed to Douglas Paine at (413) 755 2281 or [douglas.paine@mass.gov](mailto:douglas.paine@mass.gov).

Respectfully,

This final document copy is being provided to you electronically by the Department of Environmental Protection. A signed copy of this document is on file at the DEP office listed on the letterhead.

Deirdre Doherty, Section Chief  
Drinking Water Program  
Bureau of Water Resources

Attachments: Sanitary Survey Report

cc: Board of Health – Great Barrington, Boston – DWP, Michael McGrath, Doug Paine MassDEP WERO, James Mercer  
WERO File W:\BRP\WS\CCE-SS\Great Barrington\1113003 - Housatonic Water Works\Housatonic Water Works-dpaine-Sanitary Survey-2020.docx

# SANITARY SURVEY REPORT

## *Housatonic Water Works*

November 6, 2020

### GENERAL DESCRIPTION

The description of the water system is updated from that reported within MassDEP's February 9, 2018 sanitary survey report.

#### **General:**

The Housatonic Water Works Company was incorporated under Chapter 229 of the Acts of 1897, and supplies water to most of the village of Housatonic which is located in the northern section of the town of Great Barrington. The Mercer family purchased the water company in 1984 and has owned it since. The water system provides water to 824 services and serves a population of approximately 1,400 residents in three towns; Great Barrington (Village of Housatonic), Stockbridge and West Stockbridge.

#### **Source:**

The sole source of supply for the Housatonic Water Works Company is the Long Pond [Reservoir] (01S).

Long Pond is situated southwest of the village of Housatonic at the foot of Tom Ball Mountain. The Reservoir has a surface area of about 115 acres. There are no brooks or streams which feed Long Pond, as it derives its water solely from snow melt, surface runoff, precipitation and likely bottom springs. The computed drainage area upstream of the pond outlet is approximately 563 acres.

The outlet from Long Pond is a spillway which discharges to Long Pond Brook which eventually discharges to the Green River. Long Pond and a good percentage of its tributary drainage area is located within the municipal boundaries of the Town of Great Barrington.

Long Pond is a natural pond except for the southern-most section of the source (approximately 6 acres) which was excavated for the construction of an earthen dam and spillway to provide a means of controlling the discharge from the pond. This man-made section is approximately 2 to 5 feet deep and contains the intake structure to the treatment plant. The Housatonic Water Works Company owns approximately 35 acres on the east, west and south sides of the pond.

Housatonic Water Works Company owns the dam and is responsible for its maintenance and inspection. Housatonic Water Works Company also possesses water rights to the water in Long Pond and has a right-of-way to the pond through all abutting lands for the Water Company purposes.

The usable storage of Long Pond has previously been computed to be approximately 263 Million Gallons, although the amount of usable water in storage, per square mile of drainage area with a full reservoir is about 299 Million Gallons. Although calculations made as far back as 1939 indicate that its yield is likely significantly higher, and the basis of the safe yield is not known since much of the inflow to the pond is groundwater seepage which is not readily measured, the safe yield of the Long Pond source is 600,000 gallons per day.

Although Housatonic Water Works previously used copper sulfate and pre-chlorination as a means of controlling algae blooms (typically observed in the late summer months), this practice has been discontinued, and has not been used since the mid 1990's.

### **Interconnections:**

There are currently no hard-piped interconnections with any other water supplier in the area (Stockbridge, West Stockbridge or the Great Barrington Fire District). The closest interconnection is with the Great Barrington Fire District and would require a hydrant to hydrant connection. Housatonic's 2016 Master Plan identifies a hard-piped interconnection with Great Barrington as a project to be completed within 20-years.

### **Storage:**

After a Sanitary Survey in the late 1980's, the Department noted numerous low-pressure areas in the Housatonic Water Works Company distribution system. In response, a consultant was retained, and after hydraulic modeling of the system was completed in 1990 and 1991, the remedy to the low pressure areas involved pipeline replacement, higher head high lift pumps as well as the installation of a water storage tank. Housatonic Water Works has a 1.0 Million Gallon prestressed concrete water storage tank located approximately 650-feet northeast of the filter plant. Installed in 1997 with the major upgrades to the distribution system, the tank is a circular prestressed concrete tank that measures 40-feet in height and 65 1/2-feet in diameter. It has an operating range of 10-feet (high lift pumps on at 30-feet and off at 40-feet). Tank design incorporates flow equalization and fire flow.

Permitted modification to the piping between the treatment plant and the water storage tank in 2018 results in all treated water being delivered to the water storage tank prior to delivery to the distribution system. Detention time within the tank, under average flow conditions, is approximately 5-days.

### **Distribution:**

Comprised of 87,570 feet of pipe, the Housatonic Water Works distribution system serves the Housatonic Village of Great Barrington (759 services), and facilities in Stockbridge (23 services) and West Stockbridge (66 services).

Major upgrades to the distribution system commenced in the early 1990's and was completed in 1997. Improvements to the distribution system at that time included the following water main replacements:

- Installation of 2,000-feet of 8-inch DI main in Van Deusenville Road;
- Installation of 830-feet of 8-inch DI main in Prospect Street (North);
- Installation of 1,240-feet of 8-inch DI main in Kirk Street;
- Installation of 250-feet of 8-inch DI water main between Fairview Road and Kirk Street;
- Installation of 1,800-feet of 8-inch DI main in High Street;
- Installation of pipe loops to loop the distribution system.

After installation of the 1.0 MG storage tank project in 1997, a pump station at the intersection of Prospect Street and High Street (aka Filton Building Station) was decommissioned and disconnected from the system and a 5,000 gallon storage tank on High Street was demolished.

Other than the work referenced above, (approximately 14,140-feet of pipe or ~16% of the distribution system), a majority of the piping is what remains from what was installed over the years from the late 1800's to present. The system consists of older pit cast iron pipe, with steel galvanized iron and transite pipe making

up the balance of the system. Approximately 46% of the piping in the system is between 4 and 6-inch in diameter; approximately 5,000-feet of transite main remains in the system. Pipe sizes range from 2 1/2-inch to 14-inch. There are some blow offs on the dead ends of the system which are flushed two times per year.

The distribution system includes certain undersized pipe which Housatonic reports is not owned by the Water Company. These privately owned pipes tend to result in dead-ends and are not equipped with a mechanism for flushing.

### **Treatment:**

The Long Pond Water Treatment Plant is a slow sand filtration facility constructed in 1939. Modifications to the plant (installation of chlorine contact basin, piping and instrumentation changes, and construction of 1.0 MG storage tank) were made in 1997.

Normally, water flows by gravity from Long Pond to the filters. The difference in head, however, is minimal, and when the pond level drops and/or the filters get dirty and the water level above the sand rises, a small lift pump is used to increase flow to the filters. There are two pumps, although only one pump is operated at a time, with one pump acting as stand-by. Each pump is equipped with a 5-horsepower motor.

The filters are operated off the contact basin water level, and depending on demand, may not operate 24 hours per day. Normal operation is to run the plant with both filters in use, except when one unit is off-line for cleaning. Each filter is 48 feet wide by 48 feet long, with 2,300 square feet of surface area each. The depth of sand is 36 inches installed over 12 inches of support gravel. Typically, the filters are cleaned every 6 to 8 weeks, based primarily on the metered flow rate through the filter. Prior to cleaning, the filter is isolated and the water level drained to just below the sand level. Rather than scraping the top of the sand and removing it, as is typically done with slow sand filters, a form of wet harrowing is employed to clean the sand. A specially designed rake with jet nozzles is connected to a high- pressure water line. The rake is then scraped over the top of the sand, with the pressure wash forcing the accumulated dirt to free itself from the sand and to be flushed out with the water. An ejector pump is used to transport the water out of the filters and over the bank behind the building. The cleaning operation usually takes one hour per filter, and there is no ripening period as not all organics are removed. The plant has filter-to-waste capability, but because of the use of the filter cleaning operation described above, rather than conventional scraping, it is not used.

Filtered water flows by gravity to a two-cell, baffled contact basin located to the east of the filters. Just prior to exiting the operations building, the filtered water is disinfected by injecting sodium hypochlorite into the common header pipe. Hypochlorite is flow paced and pumped directly from a 400-gallon tank with no dilution at a dosage of approximately 1 mg/L. The dimensions of each cell of the contact basin are 46 feet by 15 feet for a total capacity of 125,000 gallons at the overflow elevation. Each cell has the identical configuration. A 38-foot long baffle wall is installed in each compartment, from floor to ceiling, creating a 7-foot wide channel. The filtered water pipe enters the contact basin 4-feet above the finished floor elevation. Six (6) feet away from the inlet pipe is a portal wall with 2-inch diameter holes drilled approximately 2 feet on center to a height of 6 feet. An identical portal wall is installed at the end of the other channel, located 6 feet from the end of the channel. The outlet pipe is installed 2 feet above the finished floor. There is no chemical addition for corrosion control. All piping that identifies direction of flow, raw water, filtered water and finished water has been marked.

Treated water flows by gravity back to the operations building where the high lift pumps discharge the treated water to the 1.0 MG storage tank installed to the east and above Long Pond. The two pumps (10 HP each) operate in duty/stand-by mode and are controlled by the level in the storage tank. There is a third 20 HP pump that is not used and is locked out.

All of the plant equipment can be operated manually or automatically based on tank levels. The storage tank has both a high and low-level alarm. There is a continuous turbidity monitor installed on each filter effluent line, and in-line chlorine analyzers record the chlorine concentration leaving the CT basin (segment 1), and at the point-of-entry to the distribution system (segment 2). In 2016, a continuously recording pH analyzer (Hach Model SC 1000) and continuously recording alkalinity analyzer (Hach Model APA 6000) were installed on the line downstream of the finished water pumps. There is no emergency generator. In the event of a power failure, there is no flow from the plant and all flow will come from the 1.0 MG storage tank only, which provides approximately 6 days storage. It was noted that Housatonic Water Works formerly had a bypass at the filter plant which was used during periods of high demand. Water would bypass the filters during emergencies from the increase demand. Department records indicate that upon completion of the work in 1997, the by-pass was eliminated.

| <b>WTP ID</b> | <b>WTP Name</b>        | <b>Class</b> | <b>Treatment Description</b>                |
|---------------|------------------------|--------------|---|
| 1113003-01T   | Long Pond Filter Plant | I-T          | Slow Sand Filtration, Post Hypochlorination |



Long Pond Reservoir



Intake structure evident in the shallows of the reservoir



Water Treatment Plant



Treatment Plant Pipe Gallery



Chlorine disinfection storage tanks



1 MG Water Storage Tank

# SANITARY SURVEY REPORT

## *Housatonic Water Works*

November 6, 2020

## FINDINGS

### SECTION 1: ADMINISTRATION, MANAGEMENT, AND STAFFING

#### Conditional Capacity:

“Capacity” refers to the ability of a public water system to assess, achieve, and maintain financial, managerial and technical compliance with applicable federal and state drinking water standards for the foreseeable future by demonstrating effective controls in all these areas. After conducting the sanitary survey and reviewing its managerial and financial status, MassDEP has determined that Housatonic Water Works (HWW) has **Conditional Capacity**. Systems with conditional capacity are currently complying with the majority of the National Primary Drinking Water Standards and MassDEP drinking water regulations, but have deficiencies that must be adequately addressed, or have Inadequate Capacity and signed a Compliance Plan. HWW should address and/or correct the items listed in the attached compliance plan by the required completion date(s). Failure to address these items as required, may result in HWW being rated ineligible to receive Drinking Water State Revolving Fund financing.

#### System Classification:

Housatonic is classified as a Community (COM) public water system (PWS) because the system regularly serves at least 25 year-round residents.

MassDEP has reviewed the classification status of the HWW distribution system and has determined that the distribution system should be rated as a **Class I-D** system because it serves a population of 1,391 residents. Based on its treatment system components, the HWW is rated a **Class I-T** treatment system.

Housatonic has a sufficient number of licensed operators to provide both primary and secondary distribution and treatment operation. Jim Mercer is sufficiently licensed to provide primary distribution and primary treatment coverage, while Peter Marks is sufficiently licensed to provide secondary distribution and treatment operator coverage. The following issues relate to operation of the water system:

- The Massachusetts Drinking Water Regulations at 310 CMR 22.11B(3) requires 7-day notification of a change in the status of either a primary or secondary water operator and the submittal of a new Staffing and Comprehensive operations Plan within 30-days of a change. **Housatonic last submitted a Staffing and Comprehensive operations Plan in September 2016, and has made changes to its secondary water operators since that submittal. Failure to provide notification of a change in a secondary water operator is a violation and will be addressed within a separate document.**
- The Massachusetts Drinking Water Regulations at 310 CMR 22.11B(5)(h) requires a minimum of 2-hours of daily treatment operation. **If more time is required to complete operation, maintenance and other activities, Housatonic must ensure sufficient operator time occurs. As Housatonic’s primary treatment operator, Mr. Mercer must be spending at least two**

**hours on site at the treatment plant and must develop and maintain a log sheet demonstrating compliance with this requirement.**

The following Table lists the personnel employed by Housatonic Water Works for the operation of its PWS.

| <b>Operator Name</b> | <b>Grade</b> | <b>License #</b> | <b>Primary Distribution</b> | <b>Primary Treatment</b> | <b>Secondary Distribution</b> | <b>Secondary Treatment</b> |
|----------------------|--------------|------------------|-----------------------------|--------------------------|-------------------------------|----------------------------|
| James Mercer         | D1/T1        | 2875/11634       | X                           | X                        |                               |                            |
| Peter Marks          | D1/T1        | 11968/26918      |                             |                          | X                             | X                          |

**Housatonic Water Works Operators**

Administration

Water rates are set by the Housatonic Water Works Company but are overseen and approved by the Massachusetts Department of Public Utilities (MDPU). There are currently 5 services in the distribution system with steel service lines with no shut-offs, that are not metered and are billed on a flat rate. The customer is responsible from the corporation on the water main to the house; HWW owns the water meter. A revised schedule of water rates, which went into effect in 2018 was approved by MDPU. Water meters are read and customers are billed monthly. The minimum monthly charge is \$44.73 up to and including 2,500 gallons. Any water usage beyond 2,500 gallons is billed at a rate of \$1.057 per 1,000 gallons. Housatonic Water Works also charges fees for hook up, water service turn on and shut off and frozen meters.

As required in the August 21, 2014 sanitary survey report, Lenard Engineering completed a Master Plan on behalf of the HWW in January 2016. The Master Plan includes a Capital Improvement Plan for recommended large equipment purchases and construction needed in the next 20 years. The Master Plan also includes an inventory of all HWW assets. The inventory includes the diameter, material and length of the pipes, the number of valves by diameter, the number of hydrants and pumps, and the number of meters by size in the HWW system.

Projects in the 20-year Capital Improvement Plan within the Master Plan include a redundant transmission main from the water treatment plant to Route 41, a permanent interconnection with the Great Barrington Fire District, a back-up generator at the water treatment plant, water treatment plant improvements, river crossing pipe line replacements, and abandonment of duplicate lines in the downtown area of Housatonic.

Housatonic exceeded the action levels for both lead and copper in previous monitoring, and in August 2018 signed an Administrative Consent Order which would result in the installation of a corrosion control treatment system. In a letter dated December 19, 2016, MassDEP required Housatonic to submit a Desktop Evaluation for Corrosion Control Treatment, a Basis of Design Report, and a Chemical Addition Retrofit BRP WS 34 permit application. The desktop evaluation recommended the addition of soda ash or potash to raise the pH and a blended phosphate as an inhibitor. The basis of design report recommended the addition of potassium hydroxide to raise the pH to an optimum range of 7.4 to 7.8 and the addition of a blended ortho/polyphosphate. MassDEP approved the installation of corrosion control equipment within a November 1, 2018 conditional permit approval letter. Although approved, that equipment has not been installed. Housatonic asserts that improved sampling procedures, a reduction in the application of chlorine for primary disinfection, and the effects of its storage tank re-piping, has sufficiently reduced lead and copper to below Action Levels. Lead and copper sampling conducted since

2018 has not resulted in Action Level exceedances of either lead or copper. Although Housatonic's failure to install corrosion control treatment leaves it in noncompliance with the 2018 ACO requirement for corrosion control treatment to address the Lead and Copper Action Level exceedances, subsequent lead and copper sampling showed lead and copper levels below the Lead and Copper Action Levels. **If the consultant's report looking at water quality discussed earlier in this report recommends the installation of a phosphate blend as a means of controlling distribution, MassDEP will require that the proposal for installation demonstrate that the pH within the water system is maintained within the appropriate range to allow the phosphate blend to consistently adhere to the water mains.**

### **Emergency Response Plan**

Housatonic has made changes to both physical changes to the water system as well as staffing changes since it last updated its Emergency Response Plan (ERP). In addition to a yearly training exercise using the ERP. The Plan should be reviewed each year and updated with any changes. **By June 30, 2021, Housatonic shall update its ERP, and submit to MassDEP with a new Emergency Response Plan Compliance Checklist.**

### **Consumer Confidence Report:**

All Community Water Systems must prepare an annual Consumer Confidence Report (CCR) as specified in 310 CMR 22.16A. The CCR must be completed and delivered to consumers by July 1 of each year. MassDEP will complete CCR reviews on a selected number of systems each year.

MassDEP has prepared Source Water Assessment Reports for all Public Water Systems. Each system must include in the CCR Report, notification to customers of the availability of the report and the means to obtain it.

## **SECTION 2: OPERATIONS AND MAINTENANCE**

Adequate operation of the water treatment plant relies on the ability to identify and respond to critical conditions that may result in a treatment failure, a chemical overfeed or underfeed, or a risk to public health. In order for the water treatment plant to continue to be staffed on a part-time basis (a minimum of 2-hours/day), **MassDEP's requires that by January 31, 2021, Housatonic provide written notice that the following issues related to monitoring and alarms have be addressed:**

- The regulatory requirements of the Surface Water Treatment Rule (310 CMR 22.20A) is to report turbidity results that represent a combined filter effluent, and not solely turbidity from individual filters. The treatment plant is not equipped with a turbidimeter that will monitor combined filtered turbidity. **MassDEP requires that a combined filter turbidimeter be installed prior to the addition of any chemical treatment and that Housatonic's SCADA system monitor and alarm the combined filtered turbidity. Beginning in February 2021, Housatonic's monthly SWTR reporting sheets submitted to MassDEP must include turbidity data representing the combined filter turbidity.** This issue was identified within MassDEP 2018 inspection report, and Housatonic's failure to address this problem is a violation of 310 CMR 22.04(12).
- The Surface Water Treatment Rule requires that the residual disinfectant concentration of water entering the distribution system cannot be less than 0.2 mg/l for more than 4-hours. Although Housatonic has a continuous chlorine residual analyzer monitoring residual levels at its point-of-entry to its distribution system, that analyzer is not alarmed, and the operator will not be timely notified if residual levels fall below the regulatory threshold. **MassDEP requires that Housatonic's SCADA system be equipped with a Point-of-entry chlorine residual alarm.**

- The slow sand filtration technology used by Housatonic will not perform well under extreme fluctuations in raw water quality or deteriorating raw water quality. Although Long Pond is generally not subject to wide variations in raw water turbidity, the long-range effects of increasingly severe weather may have an impact. Housatonic's raw water turbidimeter is not equipped with a high turbidity alarm. This type of alarm is intended to alert the operator to critical conditions that may "blind" the filters and make them unusable. **MassDEP requires that Housatonic's SCADA system be equipped with a high raw water turbidity alarm.**
- Chlorine residual levels at the end of Housatonic's first disinfection segment are widely variable, with levels ranging from less than 1.0 mg/l to over 3.0 mg/l each month. The cause of this variation is unknown and may involve the accuracy of the chlorine analyzer. Although MassDEP has previously required Housatonic to maintain logs of all equipment calibration no calibration logs were available during the inspection. **Housatonic must immediately maintain a log of all equipment calibration, whether by the operator, the manufacturer or other consulting personnel. Housatonic must demonstrate compliance with this immediate requirement by submitting December 2020 and January 2021 records with the monthly Chemical Addition reports by the 10<sup>th</sup> day of the following month.**
- Massachusetts Drinking Water Regulation 310 CMR 22.15(4) requires that Public Water Systems provide a monthly report on the amount of chemical added to the water system. Housatonic's two chlorine disinfection chemical feed tanks are of a size (400-gallons each) to prevent an accurate measurement of the amount of sodium hypochlorite added to the water each day. The tanks are not graduated and are opaque making an accurate measurement impossible. By using the settings on the chemical feed pump and the amount of water provided each day, Housatonic has historically provided an estimate of the amount of chemical pumped. **MassDEP requires that Housatonic install a smaller graduated solution tank to allow for the accurate daily measurement of all chemical added to the water system.**
- Housatonic's chlorine disinfection system and SCADA incorporate high and low residual level alarms. Standard protocol is to test these alarms once per month as a standard operation and maintenance task, and to maintain a log of those alarm tests. No alarm testing log was available during the inspection. **If it is not testing the alarms on a monthly basis, Housatonic must immediately begin maintaining those alarms on a monthly basis and it shall immediately begin to maintain a log of all monthly alarm tests. Housatonic must demonstrate compliance with this immediate requirement by submitting December 2020 and January 2021 records with the monthly Chemical Addition reports by the 10<sup>th</sup> day of the following month.**
- Housatonic stores approximately 250 gallons of chlorine on site and uses approximately 2 gallons per day. Chlorine generally begins to degrade in strength after 30-days, and chemical feed adjustments must be made to compensate for that degradation. This degradation and the resulting adjustments may play a role in the wide variation of chlorine residual levels at the end of the first disinfection segment. **Consideration should be given to using a chlorine purchasing system that would allow for more frequent delivery of lesser volumes.**

Section 5 of the Guidelines for Public Water Systems states that slow sand filtration shall be limited to water with turbidity levels less than 10 units and color of less than 15 units. Limited raw water sampling data indicates that Housatonic may not meet the color threshold of 15 units. A raw water sample collected on August 19, 2020 had a color level of 20 units.

The Guidelines also state that microscopic examination of the raw water must be made to determine the nature and extent of algae growths and their potential adverse impact on filter operations. Housatonic has operated slow sand treatment for decades, with records indicating algae treatment occurred years ago. Housatonic's intake is located in a shallow section of the reservoir and is reported to be at a depth of

approximately four feet. Substantial vegetation was evident in the shallow section of the reservoir around the intake, which has reportedly increased in the last several years. The vegetation growth appears to be correlated to a rise in reservoir water temperatures. In addition to elevated color, Housatonic was measuring raw water temperatures of greater than 80-degrees in August 2020. MassDEP requires:

- **By December 31, 2020 Housatonic collect raw water samples for microscopic evaluation of algae, and that the results be provided to MassDEP.**
- **By January 31, 2021, Housatonic submit a report, prepared by a third party consultant to address vegetation, algae, and color levels within Long Pond or to propose extending the intake to a location away from the vegetation and to a lower depth in the reservoir which may avoid color associated with vegetation as documented by water quality data for the alternate intake location. Drawing water from a lower depth may also result in more consistent, and overall lower, water temperatures.**

Housatonic has completed substantial piping changes at its treatment plant and water storage tank since MassDEP's 2017 inspection, with the result being longer detention time of all water prior to being delivered to the distribution system. All treated water now passes through the storage tank, which has an approximate 5-day detention period. The following issues relate to water storage:

- Housatonic has not inspected and cleaned its storage tank since the piping changes were made. The piping changes and longer detention time may have resulted in a greater amount of sediment accumulating at the bottom of the tank. That sediment may be contributing to the elevated manganese and color detected within the distribution system. MassDEP requires that water storage tanks be inspected and cleaned every three to five years, and Housatonic last cleaned its tank in 2016. **MassDEP requires that prior to June 30, 2021, Housatonic submit a tank inspection and cleaning report.**
- MassDEP requires yearly rooftop inspections of atmospheric water storage tanks. **Housatonic must conduct a formal rooftop inspection annually. Pictures of hatches and vents should be taken and kept with an inspection report.**
- The storage tank overflow is protected with a flapper valve but does not have any additional screening to provide protection should the valve remain open. **By December 31, 2020, provide written notification that appropriate screening has been installed on the overflow line.**

Housatonic's ability to deliver water from its treatment facility to its water storage tank relies on pumps and electricity, and the facility is not equipped with a working emergency generator. The large volume of storage resulting in multiple days of supply allows Housatonic to maintain service during shorter duration power outages, but may impact water availability for fire protection. The installation of a generator is on Housatonic's 20-year Master Plan list. **MassDEP recommends that Housatonic install the necessary electrical connection to allow for a portable generator to be installed until the installation of an on-site generator is completed.**

### **SECTION 3: TREATMENT**

Housatonic has water quality problems within its distribution system, as discussed elsewhere in this report, and the age and operation of its water filtration plant may be contributing. Housatonic's water filtration plant dates to 1939, and although certain upgrades have been made over the years, the filtration component itself remains in the basic form as when it was constructed. Many of the characteristics of the treatment plant's two filters do not meet MassDEP current design requirements as specified within Chapter 5 of its Guidelines for Public Water System's (Guidelines), and Housatonic's 2016 Master Plan notes that the filtration galleries are beyond their useful life expectancy. **MassDEP requires that by**

**December 31, 2021, Housatonic provide a written report evaluating the current filtration components, prepared by a third-party consultant. The report must specifically address each of these deficiencies identified below, and the report's conclusions must discuss the impact of these deficiencies on the water quality observed within the distribution system:**

- Section 5.3.5.8 of the Guidelines requires that a thin layer of sand be removed when a headloss threshold is met, as a method of cleaning the filters. Housatonic uses a unique hydrorake system with a short duration waste discharge in lieu of removing a sand layer. Although this cleaning process may reduce headloss through the filter, it may not be adequately removing contaminants such as manganese or organics that result in color which are then being washed through the filters and appear in the distribution system under certain conditions. **Housatonic must develop a method of cleaning and re-sanding the filters in a manner described within the Guidelines. As a short-term analytical check, MassDEP is additionally requiring that samples for iron, manganese, and color be collected off of each filter as part of Housatonic's current weekly sampling regiment.**
- Section 5.3.5.5 of the Guidelines requires that the slow sand filters be re-sanded when the remaining sand layer reached 19-inches in depth. Slow sand filters are generally re-sanded every 10-15 years based on the cleaning frequency. Housatonic has not re-sanded its two filters in the last 20-years. Due to the use of an unconventional cleaning method, contaminants such as iron and manganese resulting in elevated color may now be impeded within the filters. **MassDEP requires that these filters be re-sanded, and that a strategy for completing this task be included within the consultant's report required within this section.**
- Cleaning and resanding the filters using conventional methods is dependent on Housatonic's ability to filter water to waste, and Section 5.3.5.9 of the Guidelines requires that slow sand filters be equipped with filter to waste capabilities. Water is filtered to waste following a conventional cleaning until certain water quality threshold are met. Housatonic's filters are reportedly equipped with the equipment that would allow water to be filtered to waste, however that equipment is not in use. **The consultant's report, required within this section, must evaluate the filtration system's ability to effectively filter to waste and, if needed, propose a means to do so.**
- Housatonic's ability to operate its slow sand filters in a more conventional mode is dependent on its ability to take one filter off-line for a period of time for cleaning. Section 5.3.5.1 of the Guidelines requires that when two filters are provided, each filter shall be capable of meeting the plant design capacity (normally the projected maximum daily demand) at the approved filtration rate. Generally slow sand filter loading rates fall within a range of 45-150 gallons/day/sq ft. Because of the age of Housatonic's filters MassDEP has not approved a specific filter loading rate. Housatonic's maximum day water use in 2019 was identified at approximately 211,000, with greater maximum day uses reported in prior years. A loading rate of approximately 100 gallons/day/sq ft would be necessary for Housatonic to meet the loading rate requirements to allow for only two filters. **Housatonic's report required within this section must establish a filter loading rate and provide justification for that determination.**

#### **SECTION 4: DISTRIBUTION, STORAGE, AND PUMPING FACILITIES**

A substantial number of complaints of poor water quality have occurred both in 2018 and 2020 from customers within Housatonic's distribution system. The discolored water impacting customers appear to coincide with elevated water temperatures in the reservoir. Targeted water quality monitoring for iron, manganese, pH, color, turbidity, total dissolved solids, chlorine residual, and other parameters from the point-of-entry sample tap as well as locations within the distribution system has revealed inconsistent water quality. Elevated levels of manganese and color have been detected in some, but not all, point-of-

entry and distribution samples from a time period extending through the warmer months of 2020. The following requirements relate to distribution and water quality within the distribution:

- **Housatonic shall continue with the current water quality monitoring program at sampling locations representing its raw water, point-of-entry, and agreed upon distribution sites. Elsewhere in this report, MassDEP has added a requirement to test individual filtered water weekly for color and manganese.**
- Housatonic has been working with a consultant to review water quality conditions from the source through the distribution system with a goal of addressing distribution water quality complaints. A draft report was anticipated by the end of September 2020. **MassDEP requires that a final copy of the consultant's study report be provided by December 31, 2020. If MassDEP agrees with the report's recommendations, all necessary permitting and equipment installation recommended within that report must be completed by June 1, 2021 and submit a copy of that report to the Department.**
- Housatonic does not have a current hydraulic study of its distribution system. **By December 31, 2021, Housatonic shall provide written notification that a new hydraulic study of its entire distribution system has been completed.**
- Certain areas of the distribution system reportedly have inadequate pressure for fire protection, and may not meet ISO standards, but the associated fire hydrants are not coded related to water main size or pressure. **Within 90-days of the completion of the hydraulic study, Housatonic shall provide written notice that it has coded all hydrants in a manner that depicts the size of the water main and the associated water pressure and shared that coding with local fire officials.**
- Housatonic reports that its distribution system includes undersized water mains which are connected to the water system but are not owned by the Water Company. These mains typically result in dead-ends and do not have a means of being flushed. The water quality within these mains is frequently poor. **By March 31, 2021, Housatonic shall submit a copy of its distribution map identifying the location of all water mains not owned by the Water Company, and a bylaw (or appropriate equivalent) which requires that these mains be maintained by the owners of the properties that they serve. Written notification to all customers served by a privately owned water main must be completed by the March 31, 2021 date, alerting them to the creation of the bylaw (or equivalent) and providing notice as to where the public water supply ends and the private water main begins.**
- Housatonic's distribution system includes pipe constructed of cast iron, galvanized iron, and transite pipe, much of it undersized and some of it installed in the 1800s. **By December 31, 2021, submit an amendment to the current Capital Improvement Plan, which prioritizes water main replacement projects, anticipated cost, and a five-year and ten-year schedule for the priority projects, specific to water main replacement.**

Raw water and point-of-entry sampling taps must be unthreaded to help protect the sanitary condition of the tap. Housatonic's raw water and point-of-entry sample taps are threaded. **By December 31, 2020, provide written notice that both taps have either been replaced or adapted in a manner that results in a dedicated unthreaded tap for sample collection only.**

All systems may be subject to a cross connection audit by MassDEP, to ascertain whether the water system is in compliance with the cross-connection regulations as outlined in Section 22.22 (16)(e) of the Massachusetts Drinking Water Regulations. Housatonic has an active cross connection control program with eight reduced pressure control devices and thirteen testable double check valves located in the system. MassDEP verified that all device tests have been completed and that the testing records were available during the inspection.

## **SECTION 5: WATER QUANTITY**

The average daily demand for HWW was 151,797 gallons per day based on the 2019 Annual Statistical Report. The average daily withdrawal for HWW exceeds the Water Management Act (WMA) permitting threshold and therefore requires MassDEP approval for its withdrawal. MassDEP issues two types of approvals, for water withdrawals in excess of 100,000 gallons per day, WMA registrations and permits. Water Management Act withdrawal registrations are based on a system's water withdrawal from 1981 to 1985 and are reviewed for renewal every 10 years., although the State's Permit Extension Act has extended this current 10-year period by 4-years. Housatonic's WMA registration was last reviewed and renewed in 2008.

WMA registration and permit volumes are additive. The permit volume is authorized for withdrawals above any withdrawal volume registered to the PWS. Housatonic's authorized WMA registration and/or permit volume(s) are as follows:

|   |                 |
|---|-----------------|
| <b>Registered Withdrawal Volume:</b>  | <u>0.27</u> mgd |
| <b>Permitted Withdrawal Volume:</b>   | <u>0.00</u> mgd |
| <b>Total Approved Withdrawal Volume:</b>                                    | <u>0.27</u> mgd |
| <b>Actual System Withdrawal based on the 2019 Annual Statistics Report:</b> | <u>0.15</u> mgd |

**HWW is therefore in compliance with the WMA water withdrawal volume requirements.**

The Water Management Act (WMA) unaccounted water (UAW) conservation goal is 10%. Housatonic's reported UAW during the last three years on record ranged between 35% - 42%, with the most recent Annual Statistics Report indicating a 35.4% UAW. Although Housatonic has a WMA registration, which does not include enforceable restrictions on UAW percentages, excess unaccounted water indicates an inadequately maintained distribution system and service connections. This inadequate utility management results in higher costs for the utility and its customers, lost revenues that could be used to make needed system repairs, excessive electrical costs and chemical use, and may contribute to its distribution water quality problems. Housatonic reports that it last completed a full system leak detection in 2016. **By January 31, 2021, MassDEP requires that Housatonic submit a detailed UAW Plan which identifies its plan of action to reduce its unaccounted water.**

## **SECTION 6: WATER QUALITY MONITORING AND REPORTING**

MassDEP reviewed the most recent Housatonic Water Quality Sampling Schedule (WQSS) dated January 16, 2020. Housatonic is required to collect water quality samples according to that schedule. The most current WQSS is available on-line at:

<http://www.mass.gov/eea/agencies/massdep/water/drinking/pws-documents-search-tool.html>.

### **Bacteriological Monitoring Under the Revised Total Coliform Rule**

The required number of total routine monthly coliform samples is based primarily on population and system characteristics. Under the Revised Total Coliform Rule, monthly routine sampling locations representative of entry points and storage must also be provided in the Coliform Sampling Plan. If the HWW population changes such that it exceeds or falls below a threshold listed in Table I of 310 CMR 22.05 HWW must contact the MassDEP regional office to update its Coliform Sampling Plan. System characteristics such as storage, treatment facilities, source water quality, and the number of sources also

affect the total number of required coliform sampling locations. For those systems that treat the source water, the Coliform Sampling Plan must include an additional routine monthly sample collected from the raw water source(s) per 310 CMR 22.05(1)(a). The Coliform Sampling Plan must also list all groundwater sources to be sampled to meet the requirements of the Groundwater Rule.

Housatonic's current Coliform Sampling Plan includes the following sites:

- Site(s) representative of the water throughout the distribution system: Post Office, Brookside School
- Site(s) representative of raw water prior to treatment: Long Pond Raw Water Tap
- Site(s) representative of treated water: Entry Point
- Site(s) representative of storage: Entry Point

MassDEP is in the process of updating all Coliform Sampling Plans to make them compliant with the Revised Total Coliform Rule. Changes made to these plans will be reflected in the WQSSs. **MassDEP advises GBFD that the Revised Total Coliform Rule was implemented on April 1, 2016 (see Section 8 for Revised Total Coliform Rule (RTCR) highlights). All Coliform Sampling Plans will be updated to incorporate RTCR provisions and will be issued to PWSs when they are completed.**

**See Section 8 for Revised Total Coliform Rule (RTCR) highlights.**

### **Chemical Monitoring**

The current monitoring period for 2020-22 represents the first period of a 9-year monitoring cycle. All monitoring waiver decisions are under review. Your Water Quality Sample Schedule (WQSS) for 2020-2022 will be updated to reflect those decisions. The schedules reflect changes to the Iron and Manganese requirements and Disinfection Byproduct monitoring that include sampling in specific months and particular weeks of those specific months. Some Community and Non-transient Non-community systems that monitor disinfection by-products, e.g., Trihalomethanes (THMs) and Haloacetic Acids (HAA5s), during the "month of warmest water temperature" must take these samples in August. The schedule will show "AUG" for those systems. Other systems will have specific months specified in a given quarter (e.g., June, September, December, etc.). The particular week of the month in which sampling must occur is included on the schedule if required.

### **Radiological Monitoring**

Monitoring waivers are not considered for radiological monitoring. Monitoring frequencies for radionuclides are pre-determined by the Standardized Monitoring Framework and have been incorporated into the WQSS by MassDEP/DWP/WERO. These frequencies are based on either the grandfathered results of samples collected before December 8, 2003 or from results collected since that date.

### **Lead and Copper**

A review of MassDEP records indicates that HWW is required to collect **20** samples every six months for Lead and Copper Monitoring. HWW is required to collect the next round of **20** samples during the period between July to December of 2020.

The following tips may be useful in complying with the Lead and Copper regulations in the future:

- All samples must be collected within the required time frame. Late sample data submitted will not be accepted.
- Once a sample bottle has been accepted by the water system and delivered to the laboratory, the results cannot be invalidated due to sampling practices.
- HWW must collect 2 samples from two schools/daycares served by the water system during each sampling round. School/daycare results are not included in the 90th percentile calculation. Samples from schools are to be 250 milliliters in volume, not 1 liter.

MassDEP has recently released a web-based water quality data submission feature in its electronic submission website (eDEP). eDEP now allows certified labs to submit water quality data electronically. PWS users have the ability to view their data on-line. To start using eDEP or to learn more about electronic submission of water quality data, please visit: <https://edep.dep.mass.gov/DEPHome.aspx> on the world-wide web.

**SECTION 7: SOURCE AND SOURCE PROTECTION**

The protection of a surface water recharge area (watershed) is critical to maintaining a safe and ample supply of water to Housatonic. Activities throughout the watershed should be assessed and evaluated for the potential to impact water quality. Protection zones become more critical to water quality, and the allowable activities within the zones more restrictive, closer to the source water. Zone A is the most vulnerable and restrictive protection zone around a reservoir and tributary streams (source water). The Zone A is the area 400 feet from the edge of the reservoir and 200 feet from the edge of all tributaries draining into it. Zone B is the area ½ mile from the edge of the reservoirs but does not extend beyond the outer edge of the watershed. Zone C is the remaining area in the watershed not designated as Zone A or B.

HWW maintains 1 surface water source. Much of the source watershed is located in the Town of Great Barrington. HWW owns approximately 30 acres or 5.5% of the land area in the watershed according to the 2003 SWAP Report. HWW does not own or control the entire Zone A.

| PWSID       | Source Name     | Non-Conforming Activities in Zone A                               |
|-------------|-----------------|---|
| 1113003-01S | Long Pond (01S) | All items noted in the Department's February 11, 2003 SWAP Report |

**Nonconforming Activities within surface water protection areas.**

MassDEP conducted an assessment of the system for the Source Water Assessment and Protection Program (SWAP) and a report was sent on February 11, 2003.

**SECTION 8: CURRENT AND FUTURE REGULATORY REQUIREMENTS**

**Revised Total Coliform Rule (RTCR) Highlights**

Massachusetts incorporated EPAs' Revised Total Coliform Rule (RTCR) into its revised Drinking Water Regulations which became effective April, 2016. The RTCR contains the following provisions to increase public health protection by focusing on measures that will reduce potential pathways for the entry to fecal contamination into public water system (PWS) distribution systems. Under the RTCR, PWSs that are vulnerable to microbial contamination are required to conduct detailed investigations to identify and fix problems. The RTCR establishes an MCL for *E. coli*, since it is a more specific indicator of fecal contamination and a potentially more harmful pathogen than other coliform bacteria. The Total

Coliform Rule's previous MCL violation for total coliform bacteria has been replaced by a Treatment Technique trigger that requires a Level 1 Assessment.

### **Sampling**

The number of routine monthly samples is still population-based, but there are requirements for additional entry point and storage samples. All routine monthly samples must be collected, even if a Treatment Technique trigger has been exceeded or there is an *E. coli* MCL.

Three repeat samples are required for every total coliform positive (TC+) location, regardless of system size and even if the TC+ location is at the end of the distribution system. Additional rounds of repeats must be collected until a treatment technique trigger is exceeded or one clean round of samples has been obtained.

Only systems on quarterly monitoring are required to collect additional routine samples in a month following a TC+. All other systems collect their normal number of monthly routine samples.

### **Seasonal Systems**

Seasonal systems that are not operated as PWSs on a year-round basis and start up and shut down each operating season, must demonstrate completion of a state-approved Start-up Procedure and Certification prior to serving water to the public each season. The Certification must be submitted to MassDEP 7 days prior to serving water to the public. The approved procedure must demonstrate completion of the following activities, at a minimum:

- Notification to MassDEP and the Certified Operator of the planned date on which water will be served to the public;
- Inspection of all water system components (i.e., sources, treatment components, distribution lines and storage tanks) along with completion of any required repairs and maintenance;
- Activation of source(s);
- Flushing of the entire distribution system(s); and,
- Collection of seasonal start-up samples from all routine monthly locations, as well as any additional locations required within any re-activated portions of the distribution system.

Additional start-up activities may include chlorination of the tanks and distribution system, re-installation and maintenance of required disinfection equipment, and re-installation of water meters and backflow preventers, if applicable.

### **Treatment Technique Triggers and Assessments:**

PWSs must conduct Assessments after exceeding a Treatment Technique (TT) Trigger and must notify MassDEP no later than 5 days after the collection date of the sample that triggered the assessment.

#### **Level 1 Treatment Technique Triggers:**

- More than 5% of monthly samples are TC+ for a system collecting 40 or more samples per month (former TC MCL) - *NO PUBLIC NOTICE (PN) REQUIRED*;
- More than 2 TC+ samples per month for systems collecting fewer than 40 samples per month (former TC MCL) - *NO PN REQUIRED*; and,
- Failure to take every required **repeat sample** after any single **TC+** sample - *NO PN REQUIRED*.

#### **Level 2 Treatment Technique Triggers:**

➤ An *E. coli* MCL Violation (Requires TIER 1 PN and same day notification to MassDEP):

- **EC+ repeat** sample following a **TC+ routine** sample (former acute MCL);
- **TC+ repeat** sample following an **EC+ routine** sample (former acute MCL);

- Failure to take all required **repeats** following a **EC+ routine** sample; and,
- Failure to analyze for *E. coli* in a **TC+ repeat** sample.

➤ A second occurrence of a level 1 Trigger within a rolling 12-month period - unless MassDEP determines the reason for the TC+ detection related to the first Level 1 Trigger and the PWS has corrected that problem.

Level 1 and Level 2 Assessments are conducted to identify the possible presence of sanitary defects and defects in distribution system monitoring practices. The elements of a Level 2 Assessment are generally the same as those of a Level 1 Assessment, but each element is investigated in more detail.

At a minimum, both Level 1 and Level 2 Assessments must evaluate the following elements: atypical events, changes in distribution system maintenance and operation, condition of the source and treatment, and inadequacies in sample sites, sampling protocol and sample processing. Level 1 and Level 2 Assessments must describe any Sanitary Defects found, describe all completed Corrective Actions, and propose a timetable for completing any Corrective Actions that have not been completed by the time the Assessment Form is submitted (i.e., 30 days from the triggering event). MassDEP must be notified when each of these Corrective Actions has been completed.

### **RTCR Violations and Public Notice Requirements**

There are a number of new violations under the RTCR. All violations require some form of public notice. There is also new mandatory health effects language for public notices and Consumer Confidence Reports (CCRs). MCL, Monitoring and Treatment Technique Violations must be reported in CCRs along with appropriate health language. CCRs must also contain information on *E. coli* detections and Level 1 and Level 2 Assessments. All RTCR violations are listed below.

**E. coli MCL Violations** (individual types listed above) (Require TIER 1 PN within 24 hours and same day notification to MassDEP)

**Treatment Technique Violations** (Require TIER 2 PN within 30 DAYS and notification to MassDEP no later than end of next business day after learning of violation.):

- Failure to conduct a Level 1 or 2 Assessment or implement Corrective Actions within the specified timeframe.
- Failure of a Seasonal System to complete a MassDEP-approved Start-up Procedure and Certification prior to serving water to the public.

**Monitoring Violations** (Require TIER 3 PN within 1 YEAR and notification to MassDEP within 10 days of learning of violation):

- Failure to take every required **routine or additional routine sample** in a Compliance Period.
- Failure to analyze for *E. coli* in a **TC+ routine** sample.

**Reporting Violations** (Require TIER 3 PN within 1 YEAR):

- Failure to submit a monitoring report or Assessment Form by the required deadline, after completing timely monitoring or Assessment.
- Failure to notify MassDEP of an **EC+** result by the **end of the day** on which the PWS was notified of the result.
- Failure to notify MassDEP of an *E. coli* MCL violation by the end of the day on which PWS learns of the violation.
- Failure to submit Certification of completion of a MassDEP-approved Seasonal Start-up Procedure **7 days** prior to the date on which the PWS will begin serving water to the public.
- Failure to notify MassDEP of a Treatment Technique Trigger **within 5 days** of the collection date of the sample that triggered the Assessment.

- Failure to notify MassDEP of a coliform monitoring violation **within 10 days** of learning of the violation.

**Recordkeeping Violations (Require TIER 3 PN within 1 YEAR):**

- Failure to maintain Assessment Forms, Corrective Action documentation or other summary documentation of Sanitary Defects for **at least 5 years**.
- Failure to maintain a record of any repeat sample taken that meets state criteria for an extension of the 24-hour period for collecting repeat samples (per 310 CMR 22.05(2)(a)).

**Emergency Plans, Response and Reporting Requirements:**

On May 2, 2008, MassDEP issued revised regulations regarding emergency plans, response and reporting requirements. As of that date, Public Water Systems were required to have prepared an Emergency Response Plan, which includes appropriate response actions to potential or actual emergencies, including but not limited to:

1. Loss of water supply from a source;
2. Loss of water supply due to major component failure;
3. Damage to power supply equipment or loss of power;
4. Contamination of water in the distribution system from backflow or other causes;
5. Collapse of a reservoir, reservoir roof, or pump house structure;
6. Break in a transmission or distribution line that could result in a loss of service to customers for more than four hours;
7. Potential or imminent threat of chemical or microbiological contamination of the water supply over limits specified by MassDEP's Office of Research and Standards' as set forth in the *Standards and Guidelines for Contaminants in Massachusetts Drinking Waters*. (available on-line at <http://www.mass.gov/dep/water/laws/regulati.htm#chems>);
8. Potential or imminent threat of an overfeed of an approved drinking water treatment chemical into the system;
9. An act of vandalism or sabotage that has the potential to impact or impacts water quality or the quantity of water available to the system.
10. A shortage or lack of resources that could affect the operations of the system, such as:
  - a. Staffing shortages;
  - b. Receipt of notice from a power utility of lengthy power outages; or
  - c. Imminent depletion of treatment chemical inventory; and
11. Any other failure of part or all of the water supply system due to equipment failure, human acts (deliberate or accidental) or natural or human made disasters.

These requirements are described in sections 310 CMR 22.04(13) of the Regulations.

Section 310 CMR 22.15(9) of the regulations incorporates 2-hour and 24-hour emergency notification requirements to both MassDEP and the Board of Health, for specified emergency. Within 30-days of a reportable emergency, the water supplier must complete an Emergency Response Report and submit a copy of that Report to MassDEP for Level III, Level IV or Level V emergencies, Cross Connection incidents, and any of the emergency incidents listed in Items #1 through #11 above.

Every public water supplier was required to submit an Emergency Response (ERP) Compliance Checklist to MassDEP by December 31, 2009.

## **Lead & Copper Rule – Short Term Revisions**

MassDEP incorporated EPA's recent revisions to the Lead and Copper Rule into the State's Drinking Water Regulations on December 25, 2009. Key components of the revisions include the following:

1. The results from any samples collected during the compliance period, even if they are collected at unapproved sites, must be incorporated into the 90<sup>th</sup> percentile compliance calculation.
2. All community systems must include specific required informational language in their CCR regardless of whether the system detected lead in any of its samples. The required language can be found at: <http://www.mass.gov/dep/water/drinking/systems.htm#ccr>.
3. For systems that have exceeded the lead action level, the language in the required public education materials has been revised and can be found at <http://www.mass.gov/dep/water/drinking/leadlang.doc>
4. All homeowners that participated in the sampling must be sent their sample results within 30 days of when the system receives the results. The homeowner notification must contain certain required language which can be found at: <http://www.mass.gov/dep/water/approvals/dwsforms.htm#lead>.
5. Once a year all community water systems must submit a certification form to MassDEP to document that items No. 3 & 4 above have been completed.

A complete description of the revisions can be found at:  
<http://www.mass.gov/dep/service/regulations/nrewregs.htm#gwrlcr>

## **UIC Issues**

The Underground Injection Control (UIC) Program regulates discharges to the ground via Class V wells such as dry wells, septic systems tied to industrial processes, leaching catch basins and other subsurface leaching systems. The UIC Regulations list authorized activities in 310 CMR 27.05, including heat exchanger return water, non-contact cooling water, storm water drainage, waste fluids other than sanitary waste, aquifer recharge wells, and salt water barrier intrusion wells. Prohibited activities are listed in 310 CMR 27.04, and generally, include the introduction of fluid containing any pollutant that would likely cause a violation of the Massachusetts Drinking Water Regulations, the groundwater discharge standards listed in 314 CMR 5.10 or adversely affect the health of persons. One common unpermitted UIC application is for floor drains in a boiler room piped to a drywell or septic systems in facilities that are unsewered. Contact Joe Cerutti at (617) 292-5859 if the PWS source area has any unregistered UICs.

## **Radionuclides Rule**

This rule applies to community water systems of all sizes and is currently in effect. This rule retains the existing MCLs for combined radium-226 and radium-228, and gross alpha particle radioactivity, and specifies an MCL of 30 ug/L for uranium. Please refer to the HWW Water Quality Sampling Schedule for specific testing requirements.

## **Disinfectant Byproduct Rules (Stage 1 & 2 DBPR)**

Both of these rules apply to all sizes of community water systems and non-transient, non-community PWSs that add a disinfectant (other than ultraviolet light) to the water. The rules are intended to reduce potential cancer and reproductive and developmental health risks from disinfection byproducts in drinking water that form when disinfectants are used to control microbial pathogens.

The Stage 1 rule has been in effect since 2000 and establishes MCLs for TTHMs, five haloacetic acids (HAA5s), bromate, and chlorite. The MCLs for TTHMs and HAA5s are 0.080 mg/L and 0.060 mg/L, respectively. The rule also establishes a maximum residual disinfectant level (MRDL) for chlorine of 4.0 mg/L.

The more recent Stage 2 rule (published January 4, 2006) does not change any of the MCLs, but does require that most water systems evaluate their distribution system (Interim Distribution System Evaluation- "IDSE") to determine if there are other locations with elevated disinfection byproduct concentrations that were not sampled under the Stage 1 Rule. These locations will then be used by the system as the sampling sites for Stage 2 DBPR compliance monitoring. Some systems, with historically low levels of TTHMs and HAA5s (below 0.040 mg/L and 0.030 mg/L respectively), were granted a waiver from having to do any additional samples/studies.

The sampling locations and frequencies were included in current sampling schedules that were to send to all Public Water Systems. Monitoring for Stage 2 has begun. Compliance under the Stage 2 rule is determined by using the running annual average at each sampling location instead of averaging the results from all sampling sites as one done under the Stage 1 rule. For systems that only sample once per year, or once every three years, compliance will be based upon that single sample result.

### **Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR)**

This rule applies to all public water systems that use surface water or ground water under the direct influence of surface water and serve less than 10,000 people and was made effective on January 14, 2005. This rule adds requirements for control of *Cryptosporidium* and sets a MCLG of zero for this pathogen. Systems must achieve at least a 2-log removal of *Cryptosporidium*, which is demonstrated by meeting new effluent turbidity limits specified below. Systems are still required to meet a 3-log removal/inactivation of *Giardia* and a 4-log removal/inactivation of viruses. The new turbidity requirements are stipulated as follows:

- Combined effluent performance requirements for plants using conventional filtration treatment or direct filtration:
- Combined filtered water effluent turbidity must be less than or equal to 0.3 NTU in at least 95% of the measurements taken each month, with measurements taken every four hours of operation.
- Combined filtered water effluent turbidity must not exceed 1.0 NTU at any time with measurements taken in four-hour intervals.
- Individual filter performance requirements for these systems.
- Individual filter effluent must be monitored continuously for turbidity.
- Any individual filter with a turbidity level greater than 1.0 NTU must be reported to MassDEP.
- Any individual filter with a turbidity level greater than 0.5 NTU at the end of the first four hours of filter operation (following backwash or when off-line filters are put on-line) must be reported to MassDEP.

Turbidity limits and monitoring requirements for slow sand systems will not change under this rule.

## **Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR)**

EPA published the LT2ESWTR on January 5, 2006, which will reduce illness linked with the contaminant *Cryptosporidium* and other pathogenic microorganisms in drinking water. Under this rule, systems monitored their water sources to determine treatment requirements. The monitoring included an initial two years of monthly sampling for *Cryptosporidium*. To reduce monitoring costs, small filtered water systems (those serving under 10,000) first monitored for *E. coli*, which is less expensive than *Cryptosporidium* analysis. These small systems monitored for *Cryptosporidium* only if their *E. coli* results exceed specified concentration levels.

Monitoring starting dates were staggered by system size, with smaller systems beginning monitoring after larger systems. The HWW conducted its first round of 12 months of *E.coli* monitoring in 2008 – 2009. Based on those results, *Cryptosporidium* monitoring or any additional treatment was not required. HWW started the required second round of 12 months of bi-weekly *E.coli* monitoring in October 2017 to determine if source water conditions have changed significantly. Systems could use (grandfathered) previously collected data in lieu of conducting new monitoring, and systems were not required to monitor if they provide the maximum level of treatment required under this rule.

In addition, systems must review their current level of microbial treatment before making a significant change in their disinfection practice. This review will assist systems in maintaining protection against microbial pathogens as they take steps to reduce the formation of disinfection byproducts under the Stage 2 DBPR.

In addition, before making a significant change in their disinfection practice, systems must review their current level of microbial treatment. This review will assist systems in maintaining protection against microbial pathogens as they take steps to reduce the formation of disinfection byproducts under the Stage 2 DBPR.

**SANITARY SURVEY COMPLIANCE PLAN  
RESPONSE FORM for TABLE A or B**

**Within 30 days of receipt of this inspection report, you must complete and submit this response form if your system has TABLE A –Violations and/or TABLE B-Deficiencies (see attached Compliance Tables). Attach a copy of the completed tables listing the date that the corrective action was or will be taken by your system and all other applicable documentation. (310 CMR 22.04(12))**

Please note that violations listed in TABLE A of the Compliance Plan are also a Notice of Noncompliance (NON) pursuant to M.G.L. c.21A, §16 and 310 C.M.R. 5.00 and may require the submission of quarterly written progress reports on the identified violations.

**The following corrective actions listed in the Sanitary Survey Compliance Plan(s) TABLE A and/or B has been taken by the public water system. (Please check all that apply).**

- My system has taken **ALL** of the corrective actions listed within the timeframes specified in the Sanitary Survey Compliance Plan(s).
  - For each item, I have listed the completion date of the corrective action within each table.
  - I have attached copies of supporting documentation as required.
  
- My system has taken **SOME BUT NOT ALL** of the corrective actions listed within the timeframes specified in the Sanitary Survey Compliance Plan(s). My system **HAS NOT** complied with **ALL** of the requirements set forth in the Sanitary Survey Compliance Plan(s).
  - For each item, I have listed the actual or anticipated completion date of the corrective action within each table.
  - I have attached copies of supporting documentation as required.
  - I have attached a revised corrective action schedule establishing timelines for my system to address outstanding items and I will submit a written progress report each quarter (every 3 months) until all items have been addressed. I understand that my system may be subject to further enforcement action.
  
- My system is **UNABLE** to comply with some or all of the corrective actions within the timeframes specified in the Sanitary Survey Compliance Plan(s). I understand that my system may be subject to further enforcement action.
  - An explanation is attached.

I hereby acknowledge receipt of the inspection findings and compliance plan table(s) of the sanitary survey conducted by the Department of Environmental Protection's Drinking Water Program. I certify that under penalty of law I am the person authorized to fill out this form and the information contained herein is true, accurate and complete to the best of my knowledge and belief.

Water Commissioner, Owner, Owner Representative or Other Responsible Party:

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Print Name: \_\_\_\_\_ Title: \_\_\_\_\_

Return this form, a copy of each Compliance Plan Table and all attachments to:  
**DEP-BWR Drinking Water Program, 436 Dwight Street, Springfield, MA 01103**  
**Attention: Douglas Paine**

## SANITARY SURVEY COMPLIANCE PLAN- TABLE A – VIOLATIONS

Requirements to improve the protection of drinking water and public health pursuant to M.G.L. 111§ 160. MassDEP/DWP will provide technical assistance to systems responding to these required actions. Please call your regional DWP office for referral to the appropriate staff person.

| Section   | Violations of Regulation or Statute | Corrective Actions  | Deadline for Taking Corrective Actions | Sig. Def.? | Completed Date |
|-----------|-------------------------------------|---|--|------------|----------------|
| Treatment | 310 CMR 22.11B(3)                   | The Massachusetts Drinking Water Regulations requires 7-day notification of a change in the status of either a primary or secondary water operator and the submittal of a new Staffing and Comprehensive operations Plan within 30-days of a change. <b>Housatonic last submitted a Staffing and Comprehensive operations Plan in September 2016, and has made changes to its secondary water operators since that submittal.</b> | Addressed in separate correspondence   | No         |                |
| Treatment | 310 CMR 22.15; 310 CMR 22.03(1)     | The treatment plant is not equipped with a turbidimeter that will monitor combined filtered turbidity.  | Addressed in Separate Correspondence   | No         |                |

*Sanitary survey items that are required to be corrected to improve the protection of drinking water and public health pursuant to M.G.L. 111§ 160. MassDEP/DWP will provide technical assistance to systems responding to these required actions. Please call your regional DWP office for referral to the appropriate staff person.*

## SANITARY SURVEY COMPLIANCE PLAN- SECTION B – REQUIREMENTS

Sanitary survey items that are required to be corrected to improve the protection of drinking water and public health pursuant to M.G.L. 111§ 160. MassDEP/DWP will provide technical assistance to systems responding to these deficiencies. Please call your regional DWP office for referral to the appropriate staff person.

| Section        | Deficiencies   | Corrective Actions   | Deadline for Taking Corrective Actions | Sig. Def.? | Completed Date |
|----------------|--|--|--|------------|----------------|
| Administration | Housatonic has a sufficient number of licensed operators to provide both primary and secondary distribution and treatment operation. Jim Mercer is sufficiently licensed to provide primary distribution and primary treatment coverage, while Peter Marks is sufficiently licensed to provide secondary distribution and treatment operator coverage. The Massachusetts Drinking Water Regulations at 310 CMR 22.11B(5)(h) requires 2-hours of daily treatment operation.   | If more time is required to complete operation, maintenance and other activities, Housatonic must ensure sufficient operator time occurs. As Housatonic's primary treatment operator, Mr. Mercer must be spending at least two hours on site at the treatment plant and must develop and maintain a log sheet demonstrating compliance with this requirement.  | Ongoing                                |            |                |
| Administration | Housatonic exceeded the action levels for both lead and copper in previous monitoring, and in August 2018 signed an Administrative Consent Order which would result in the installation of a corrosion control treatment system. In a letter dated December 19, 2016, MassDEP required Housatonic to submit a Desktop Evaluation for Corrosion Control Treatment, a Basis of Design Report, and a Chemical Addition Retrofit BRP WS 34 permit application. The desktop evaluation recommended the addition of soda ash or potash to raise the pH and a blended phosphate as an inhibitor. The basis of design report recommended the addition of potassium hydroxide to raise the pH to an optimum range of 7.4 to 7.8 and the addition of a blended ortho/polyphosphate. MassDEP approved the | If the consultant's report looking at water quality discussed earlier in this report recommends the installation of a phosphate blend as a means of controlling distribution, MassDEP will require that the proposal for installation demonstrate that the pH within the water system is maintained within the appropriate range to allow the phosphate blend to consistently adhere to the water mains. | Ongoing                                |            |                |

|                |   |   |   |  |  |
|----------------|---|---|---|--|--|
|                | <p>installation of corrosion control equipment within a November 1, 2018 conditional permit approval letter. Although approved, that equipment has not been installed. Housatonic asserts that improved sampling procedures, a reduction in the application of chlorine for primary disinfection, and the effects of its storage tank re-piping, has sufficiently reduced lead and copper to below Action Levels. Lead and copper sampling conducted since 2018 has not resulted in Action Level exceedances of either lead or copper. Although Housatonic's failure to install corrosion control treatment leaves it in noncompliance with the 2018 ACO requirement for corrosion control treatment to address the Lead and Copper Action Level exceedances, subsequent lead and copper sampling showed lead and copper levels below the Lead and Copper Action Levels</p> |   |   |  |  |
| Administration | <p>Housatonic has made changes to both physical changes to the water system as well as staffing changes since it last updated its Emergency Response Plan (ERP). In addition to a yearly training exercise using the ERP. The Plan should be reviewed each year and updated with any changes.</p>   | <p>Update its ERP, and submit to MassDEP with a new Emergency Response Plan Compliance Checklist.</p>   | <p>June 30, 2021</p>  |  |  |
| O/M            | <p>Adequate operation of the water treatment plant relies on the ability to identify and respond to critical conditions that may result in a treatment failure, a chemical overfeed or underfeed, or a risk to public health. Continued staffing of the water treatment plant to on a part-time basis (a minimum of 2-hours/day) requires upgrades to equipment and operational practices.</p>  | <p>Provide written notice that the following issues related to monitoring and alarms have be addressed:</p> <ul style="list-style-type: none"> <li>• Installation of a combined filter turbidimeter prior to the addition of any chemical treatment and that Housatonic's SCADA system monitor and alarm the combined filtered turbidity. Beginning in February 2021, Housatonic's monthly SWTR reporting sheets submitted to MassDEP must include turbidity data representing the combined filter turbidity..</li> </ul> | <p>January 31, 2021 and submit monthly reports for December 2020 and January 2021</p> |  |  |

|     |  |   |  |  |  |
|-----|--|---|--|--|--|
|     |  | <ul style="list-style-type: none"> <li>• Equip the SCADA system with a Point-of-entry chlorine residual alarm.</li> <li>• Equip the SCADA system with a high raw water turbidity alarm.</li> <li>• Immediately maintain a log of all equipment calibration, both by the operator and by the manufacturer.</li> <li>• Install a smaller graduated solution tank to allow for the accurate daily measurement of all chemical added to the water system.</li> <li>• Immediately begin maintaining a log of all monthly alarm tests.</li> <li>• Demonstrate compliance with the above immediate requirements by submitting October, November and December 2020 records with the monthly Chemical Addition reports by the 10<sup>th</sup> day of the following month.</li> </ul> |  |  |  |
| O/M | <p>Section 5 of the Guidelines for Public Water Systems states that slow sand filtration shall be limited to water with turbidity levels less than 10 units and color of less than 15 units. Limited raw water sampling data indicates that Housatonic may not meet the color threshold of 15 units. A raw water sample collected on August 19, 2020 had a color level of 20 units. The Guidelines further state that microscopic examination of the raw water must be made to determine the nature and extent of algae growths and their potential adverse impact on filter operations. Housatonic's intake is located in a shallow section of the reservoir and is reported to be at a depth of approximately four feet. Substantial vegetation was evident in the shallow section of the reservoir around the intake, which has reportedly increased in the last several years. The vegetation growth appears to be correlated to a rise in reservoir</p> | <p>Collect raw water samples for microscopic evaluation of algae.</p> <p>Submit a report, prepared by a third party consultant to address vegetation, algae, and color levels within Long Pond or to propose extending the intake to a location away from the vegetation and to a lower depth in the reservoir which may avoid color associated with vegetation.</p>  | <p>Collect by December 31, 2020 and submit results</p> <p>January 31, 2021</p> |  |  |

|           |   |   |   |  |  |
|-----------|---|---|---|--|--|
|           | water temperatures. In addition to elevated color, Housatonic was measuring raw water temperatures of greater than 80-degrees in August 2020.   |   |   |  |  |
| O/M       | Housatonic has completed substantial piping changes at its treatment plant and water storage tank since MassDEP's 2017 inspection, with the result being longer detention time of all water prior to being delivered to the distribution system. All treated water now passes through the storage tank, which has an approximate 5-day detention period.  | <p>Submit a tank inspection and cleaning report.</p> <p>Conducted a formal rooftop inspection. Pictures of hatches and vents should be taken and kept with an inspection report.</p> <p>Provide written notification that appropriate screening has been installed on the overflow line.</p>  | <p>June 30, 2021</p> <p>Annually</p> <p>December 31, 2020</p> |  |  |
| Treatment | Housatonic has water quality problems within its distribution system, as discussed elsewhere in this report, and the age and operation of its water filtration plant may be contributing. Housatonic's water filtration plant dates to 1939, and although certain upgrades have been made over the years, the filtration component itself remains in the basic form as when it was constructed. Many of the characteristics of the treatment plant's two filters do not meet MassDEP current design requirements as specified within Chapter 5 of its Guidelines for Public Water System's (Guidelines), and Housatonic's 2016 Master Plan notes that the filtration galleries are beyond their useful life expectancy. | <p>Provide a written report evaluating the current filtration components, prepared by a third party consultant. The report must specifically address each of these deficiencies identified below, and the report's conclusions must discuss the impact of these deficiencies on the water quality observed within the distribution system:</p> <ul style="list-style-type: none"> <li>• Develop a method of cleaning and re-sanding the filters in a manner described within the Guidelines. As a short-term analytical check, MassDEP is additionally requiring that samples for iron, manganese, and color be collected off of each filter as part of Housatonic's current weekly sampling regiment.</li> <li>• The filters must be re-sanded, and that a strategy for completing this task be</li> </ul> | December 31, 2021   |  |  |

|                     |   |   |  |  |  |
|---------------------|---|---|--|--|--|
|                     |   | <p>included within the consultant's report required within this section.</p> <ul style="list-style-type: none"> <li>• The consultant's report must evaluate the filtration system's ability to effectively filter to waste and, if needed, propose a means to do so.</li> <li>• Establish a filter loading rate and provide justification for that determination.</li> </ul>  |  |  |  |
| <p>Distribution</p> | <p>A substantial number of complaints of poor water quality have occurred both in 2018 and 2020 from customers within Housatonic's distribution system. The discolored water impacting customers appear to coincide with elevated water temperatures in the reservoir. Elevated levels of manganese and color have been detected in some, but not all, point-of-entry and distribution samples from a time period extending through the warmer months of 2020. Water pressure, construction, location and condition of water mains throughout the system are a concern.</p> | <p>Continue with the current weekly water quality monitoring program at sampling locations representing its raw water, point-of-entry, and agreed upon distribution sites. Elsewhere in this report, MassDEP has added a requirement to test individual filtered water weekly for color and manganese.</p> <p>Housatonic has been working with a consultant to review water quality conditions from the source through the distribution system with a goal of addressing distribution water quality complaints. Submit a copy of the consultant's study report.</p> <p>Provide written notification that a new hydraulic study of Housatonic's entire distribution system has been completed, and submit a copy of that report.</p> <p>Provide written notice that it has coded all hydrants in a manner that depicts the size of the water main and the associated water pressure.</p> | <p>Ongoing</p> <p>Submit a copy of the report by December 31, 2020, and implement recommendations by June 1, 2021</p> <p>December 31, 2021</p> <p>Within 90-days of the completion of the hydraulic study.</p> |  |  |

|                 |   |   |   |  |  |
|-----------------|---|---|---|--|--|
|                 |   | <p>Submit a copy of its distribution map identifying the location of all water mains not owned by the Water Company, and a bylaw (or appropriate equivalent) which requires that these mains be maintained by the owners of the properties that they serve. Written notification to all customers served by a privately owned water main must be completed by the March 31, 2021 date, alerting them to the creation of the bylaw (or equivalent) and providing notice as to where the public water supply ends and the private water main begins.</p> <p>Submit an amendment to the current Capital Improvement Plan which prioritizes water main replacement projects, anticipated cost, and a 5-year &amp; 10-year schedule for the priority projects, specific to water main replacement.</p> | <p>March 31, 2021</p> <p>December 31, 2021,</p> |  |  |
| Distribution    | Raw water and point-of-entry sampling taps must be unthreaded to help protect the sanitary condition of the tap. Housatonic's raw water and point-of-entry sample taps are threaded.  | Provide written notice that both taps have either been replaced or adapted in a manner that results in a dedicated unthreaded tap for sample collection only.   | December 31, 2020                               |  |  |
| Waster Quantity | The Water Management Act (WMA) unaccounted water (UAW) conservation goal is 10%. Housatonic's reported UAW during the last three years on record ranged between 35% - 42%, with the most recent Annual Statistics Report indicating a 35.4% UAW. Although Housatonic has a WMA registration, which does not include enforceable restrictions on UAW percentages, excess unaccounted water indicates an inadequately maintained distribution system and service connections. This inadequate utility management results in higher costs for the utility and its customers, lost revenues that could be used to make needed | Submit a detailed UAW Plan which identifies its plan of action to reduce its unaccounted water  | January 31, 2021                                |  |  |

|  |   |  |  |  |  |
|--|---|--|--|--|--|
|  | system repairs, excessive electrical costs and chemical use, and may contribute to its distribution water quality problems. Housatonic reports that it last completed a full system leak detection in 2016. |  |  |  |  |
|--|---|--|--|--|--|

\* MassDEP reserves the right to exercise its Order authority under M.G.L. Chapter 111, Section 160, or to take other appropriate action as permitted by law, in order to prevent the pollution and to secure the sanitary protection of the water supply and to ensure the delivery of a fit and pure water supply to all consumers, including without limitation if sufficient progress to meeting a recommended deadline is not achieved.

\*\* MassDEP requests that periodic progress reports be submitted, *e.g.*, quarterly (each January 1<sup>st</sup>, April 1<sup>st</sup>, August 1<sup>st</sup>, December 1st, etc., for as long as necessary) or otherwise.

GWR SD = Ground Water Rule Significant Deficiency

# SANITARY SURVEY

## COMPLIANCE PLAN- SECTION C - RECOMMENDATIONS

Recommendations that are intended to improve the protection of drinking water and public health. DEP/DWP will provide technical assistance to systems responding to these recommendations. Please call your regional DWP office for referral to the appropriate staff person.

| Section   | Identified Concern  | Action  | Recommended Deadline for Taking Corrective Actions |
|-----------|---|---|--|
| O/M       | Housatonic's ability to deliver water from its treatment facility to its water storage tank relies on pumps and electricity, and the facility is not equipped with a working emergency generator. The large volume of storage resulting in multiple days of supply allows Housatonic to maintain service during shorter duration power outages, but may impact water availability for fire protection. The installation of a generator is on Housatonic's 20-year Master Plan list. | MassDEP recommends that Housatonic install the necessary electrical connection to allow for a portable generator to be installed until the installation of an on-site generator is completed. |  |
| Treatment | Housatonic stores approximately 250 gallons of chlorine on site, and uses approximately 2 gallons per day. Chlorine generally begins to degrade in strength after 30-days, and chemical feed adjustments must be made to compensate for that degradation. This degradation and the resulting adjustments may play a role in the wide variation of chlorine residual levels at the end of the first disinfection segment.  | Consideration should be given to using a chlorine purchasing system that would allow for more frequent delivery of lesser volumes.  |  |

«PWS\_NAME»  
INSPECTION DATE: «SurveyDate»

PWS ID#: «PWS\_ID»  
PAGE 34 OF 41