CITY OF WALTHAM
Engineering Department

Robert S. Winn, P.E.
City Engineer

January 29, 2021

Mr. Todd Borci
Office of Environmental Stewardship
US EPA New England
5 Post Office Square, Suite 100
Boston, MA 02109-3912

RE: City of Waltham
EPA Clean Water Act Administrative Docket No. 05-06
IDDE Program – Semi-Annual Report No. 25

Dear Mr. Borci:

Included in this package is the City of Waltham's IDDE Program Report No. 25 for your review. This package describes our progress with the IDDE over the past six (6) months.

In addition to the summary report, this package contains a project schedule for the next six (6) months.

Should you have any questions, please contact me at (781) 314-3831 or rwinn@city.waltham.ma.us.

Sincerely,

Robert S. Winn, P.E.
City Engineer

cc: Honorable Jeannette A. McCarthy, Mayor
Patricia A. Azadi, Assistant City Solicitor

Engineering Department
119 School Street
Waltham MA 02451
TEL: (781) 314-3830 FX: (781) 314-3844
rwinn@city.waltham.ma.us

City of Waltham, MA

Illicit Discharge Detection and Elimination (IDDE) Program

EPA IDDE Program Progress Report No. 25

January 29, 2021

Prepared by:

Robert S. Winn, PE

City Engineer

City of Waltham

Illicit Discharge Detection and Elimination Program

IDDE Program Progress Report No. 25

January 29, 2021

1. Introduction and Program Approach

This document serves as the City of Waltham's Semi-Annual IDDE Progress Report of January, 2021. It contains a description of program achievements since submission of the Semi-Annual IDDE Progress Report #24 dated July 2020.

The City of Waltham is under a United States Environmental Protection Agency (EPA) Administrative Order (dated November 9, 2004) to implement an Illicit Discharge Detection and Elimination (IDDE) Program. The IDDE Program's main goal is to progressively eliminate illicit connections or flows into the City's stormwater system in order to minimize contamination in the receiving water bodies within the City of Waltham. This is being accomplished through systematic water quality sampling and detailed investigations of the outfalls and contributing areas to locate the sources of illicit connections and eliminate by sewer repair or discharge removal.

Our new program consultant Pare Engineering is implementing the IDDE Program using a phased approach to investigate prioritized outfalls from the June 2019 IDDE Plan.

IDDE Program Tasks are further described below:

2. Completed and On-Going Work

Work completed between July 31, 2020 and January 30, 2021 is presented below.

2.1. Work Completed to Date

2.1.1 Outfall Inspections and Sampling

- Pare has visually inspected a total of 192 outfalls and sampled 54 priority outfalls for parameters specified by the EPA and outlined in the June 2019 IDDE report.
- 70 additional outfalls were visually inspected as part of an MVP Grant program.
- The City updated the GIS system to include outfall inspection attribute data.
- A draft of the Outfall and Inspection Memorandum is included in Attachment A.

2.2. On-Going Work

2.2.1 Jennings Road Sewer Replacement and Drain Replacement Project

- The bidding of this project was delayed while waiting for National Grid to complete gas main relocations in the area. National Grid completed the gas main relocations in December 2020.

- The City is waiting for as-built information from National Grid. Once we receive as-built information, we will update the contract drawings and bid the project. Bidding is expecting to take place in March 2021.

3. Work Scheduled to be Completed over the Next Six Months

3.1 See Schedule – Attachment B

3.1.1 Manhole sampling and investigations in the Cedarwood Ave and Virginia Road areas of the City. Complete memorandum describing activity and recommended next steps for detection and/or elimination.

3.1.2 Begin additional investigations and elimination activities as recommended in the final Outfall and Sampling Memorandum.

3.1.3 Jennings Road – Sewer/Drain Separation Project

The City will bid this project and construction is expected to start during the Summer of 2021.

MEMORANDUM

DATE: January 29, 2021

TO: Robert Winn, P.E, City of Waltham

FROM: Sunny Lakshminarayanan, P.E., Pare Corporation

CC: Timothy P. Thies, P.E., Pare Corporation

RE: **City of Waltham – IDDE Program**
Inspection and Sampling of Outfalls and Intermunicipal Connections
Pare Project No.: 20104.00

Background

This Illicit Discharge Detection and Elimination (IDDE) Plan was developed for The City of Waltham to address the requirements of the United States Environmental Protection Agency's (USEPA's) 2016 National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4) in Massachusetts, hereafter referred to as the "2016 Massachusetts MS4 Permit" or "MS4 Permit."
The 2016 Massachusetts MS4 Permit requires that each permittee, or regulated community, address six Minimum Control Measures. These measures include the following:

- Public Education and Outreach
- Public Involvement and Participation
- Illicit Discharge Detection and Elimination Program
- Construction Site Stormwater Runoff Control
- Stormwater Management in New Development and Redevelopment (Post Construction Stormwater Management); and
- Good Housekeeping and Pollution Prevention for Permittee Owned Operations.

Under Minimum Control Measure 3, the permittee is required to implement an IDDE program to systematically find and eliminate sources of non-stormwater discharges to its municipal separate storm sewer system and implement procedures to prevent such discharges. The IDDE program must also be recorded in a written (hardcopy or electronic) document.

The City of Waltham has separate stormwater and sewer systems. However, previous sampling campaigns at manholes and outfalls within the city limits have shown the sanitary and wash waters are entering the stormwater collection network via illicit connections or overflows. These flows are subsequently discharged into various waterbodies or inter-municipal connections (IMC) which receive or discharge flow from/into the stormwater systems of surrounding towns. The discharge of undesired, untreated sewage in waterbodies are of environmental concern and are important contributors of phosphorus and pathogens as indicated in their respective TMDL reports for Charles River.

The City of Waltham is currently under a United States Environmental Protection Agency (EPA) Administrative Order (dated November 9, 2004) to implement an IDDE Program. Although the City has made significant progress since 2004, the City is continuing its IDDE program to further remove suspected illicit connections. This inspection and sampling program is part of the City's IDDE plan.

Dry Weather Outfall Sampling

Dry weather flow is a common indicator of potential illicit connections. The MS4 Permit requires all outfalls/interconnections (excluding Problem and excluded Outfalls) to be inspected for the presence of dry weather flow. Dry weather outfall screening and sampling may occur when no more than 0.1 inches of rainfall has occurred in the previous 24-hour period and no significant snow melt is occurring. For purposes of determining dry weather conditions, Pare staff used precipitation data from the North Waltham Weather Station (Station ID KMAWALTH41) and the Waltham MA Weather Station (Station ID KMAWALTHAM26).

The dry weather outfall inspection and sampling procedure consists of the following general steps:

1. Identified outfall(s) to be screened/sampled based on initial outfall inventory, priority ranking and site walk-through
2. Conducted the outfall inspection during dry weather as detailed below:
    a. Mark and photograph the outfall
    b. Record the inspection information and outfall characteristics
    c. Record visual/olfactory evidence of pollutants in flowing outfalls including odor, color, turbidity, and floatable matter (suds, bubbles, excrement, toilet paper or sanitary products). Observed outfalls for deposits and stains, vegetation, and damage to outfall structures.
3. When flow was observed, the water was sampled and tested
    a. Field testing was conducted for pH, temperature, and specific conductance
    b. Lab testing was conducted for Chlorine, Ammonia, Surfactants, Phosphorus and bacteria (E. coli)
4. Input results from screening and sampling into spreadsheet/database. Included pertinent information in the outfall/interconnection inventory and priority ranking.
5. Identified potential problem outfalls and developed summary data and GIS maps based on inspection and sampling results.

Project Study Area

The original Project Study Area consisted of a subset of 378 outfalls selected for follow-up dry weather inspections out of the existing 706 mapped outfalls within the City of Waltham. Of the 378 outfalls, rankings from Low, High, and Problem were assigned to each outfall based on the following screening criteria:

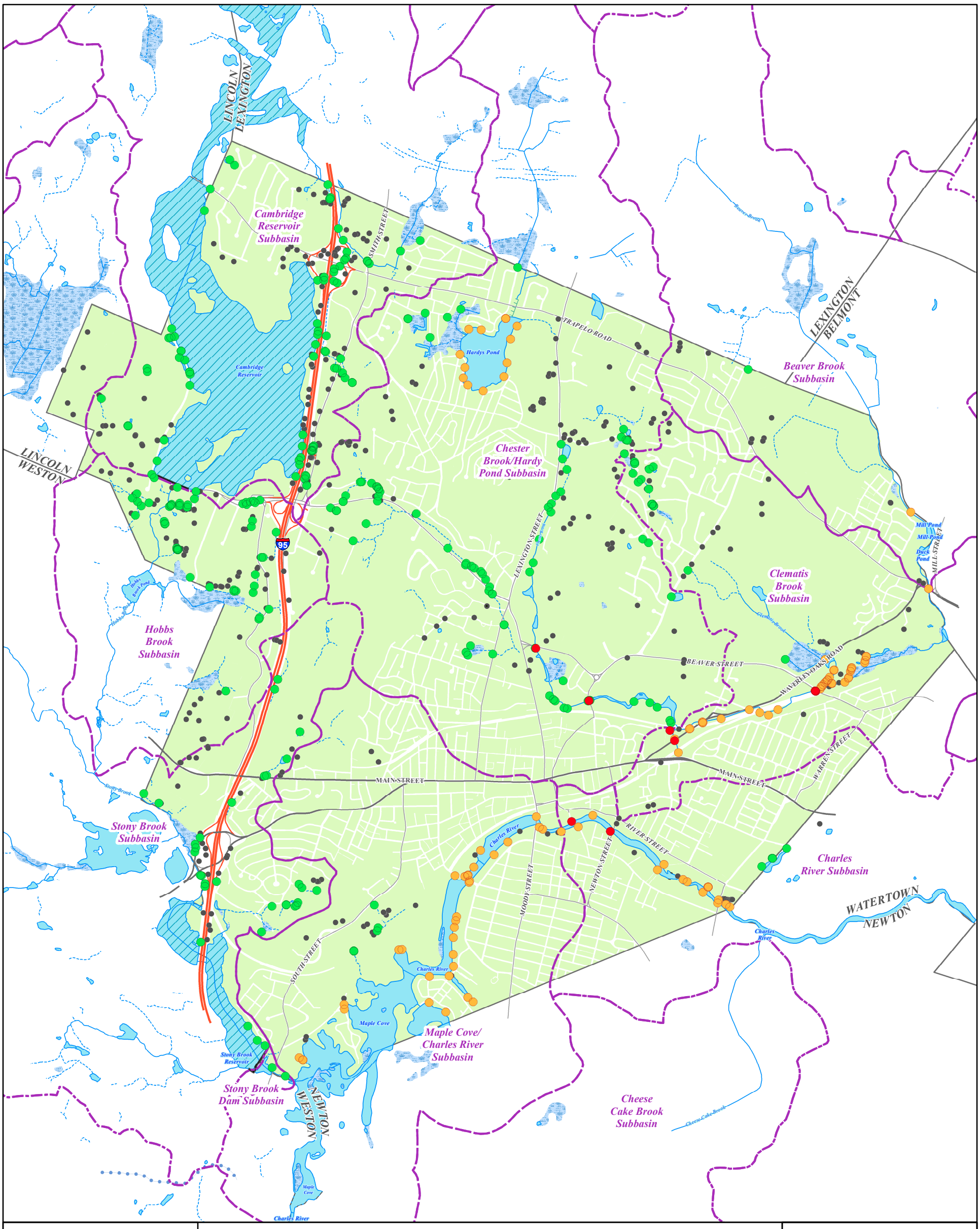
Screening Criteria	Available Rankings	Numeric Points
Prior outfall inspections and/or sampling have indicated a potential for sewer input, as defined by any of the following observations:		
• Olfactory or visual evidence of sewage;	Observed	2
• Ammonia concentrations ≥ 0.5 mg/L, surfactant concentrations ≥ 0.25 mg/L, and *E. coli* levels > the applicable water quality criteria; and/or	No Data Not Observed	1 0
• Ammonia concentrations ≥ 0.5 mg/L, surfactant concentrations ≥ 0.25 mg/L, and detectable levels of chlorine are present.		

Screening Criteria	Available Rankings	Numeric Points
Outfall discharges to an area of concern to public health, defined as public beaches, recreational areas, drinking water supplies, and/or shellfish beds.	Yes No Data No	2 1 0
The frequency of past discharge complaints for the outfall. Each outfall is unique in the type of discharge (continuous, intermittent, transitory) and the number of complaints related to independent discharge events, therefore the City determines what defines frequent complaints relative to outfall discharges for a particular outfall.	Frequent Occasional None	2 1 0
The quality of the receiving waterbody, as defined under Section 303(d) of the Clean Water Act. Only categories applicable to the City were ranked.	Category 4a Category 5 Others	2 1 0
The density of generating sites (municipal, commercial, and/or industrial sites with a potential to contribute illicit discharges) that contribute or may contribute to the outfall discharge.	High Medium Low	2 1 0
The age of developments that discharge to outfalls and the age of the stormwater infrastructure.	Older No Data Newer	2 1 0
The presence of aging/failing individual sewage disposal systems.	Present No Data Not Present	2 1 0
Outfalls connected to culverted streams.	Connected No Data Not Connected	2 1 0

Problem outfalls consisted of any outfalls that were found to be likely impacted by sewer input during prior inspection and/or sampling events, regardless of total score. A total of eight (8) outfalls were identified in the "Problem" rank. High rank outfalls were those that received a combined ranking score of greater than or equal to four (4) points and scored two (2) points on at least one (1) of the previously mentioned categories. Additionally, outfalls were prioritized as either "High" or "Low" rank regardless of their score if there were other outfalls within the same subcatchment and/or stemming from the same infrastructure. A total of 100 outfalls were considered "High" rank while 270 outfalls were considered "Low" rank.

This map was used as the basis for selecting the outfalls but was further refined as per field observations.

See Figure 1 for Project Study Area.


LINCOLN
LEXINGTON
Cambridge Reservoir Subbasin
SMITH STREET
TRAPELO ROAD
Hardys Pond
Cambridge Reservoir
LEXINGTON
BELMONT
Beaver Brook Subbasin
LINCOLN
WESTON
Chester Brook/Hardy Pond Subbasin
LEXINGTON STREET
Mill Pond
Mill Pond
Duck Pond
MILL STREET
Clematis Brook Subbasin
Hobbs Brook Pond
Hobbs Brook
Hobbs Brook Subbasin
BEAVER STREET
WAVERLEY OAKS ROAD
MAIN STREET
MAIN STREET
WARREN STREET
Stony Brook
Stony Brook Subbasin
Charles River
RIVER STREET
MOODY STREET
NEWTON STREET
Charles River Subbasin
WATERTOWN
NEWTON
Charles River
SOUTH STREET
Charles River
Maple Cove
Maple Cove/ Charles River Subbasin
Stony Brook Reservoir
Stony Brook Dam Subbasin
NEWTON
WESTON
Maple Cove
Charles River
Cheese Cake Brook Subbasin
Cheese Cake Brook
PARE CORPORATION
CELEBRATING 50 YEARS
ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401-334-4100
CITY OF WALTHAM, MASSACHUSETTS
ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM
DEPARTMENT OF PUBLIC WORKS
WALTHAM, MA 02451
FIGURE NO. 1
GENERAL STUDY AREA
PROJECT NO.: 20104.00
DATE: 01/07/2021
SCALE: 1:32,000
Legend
Outfall Locations
Low Rank
High Rank
Problem Rank
All Geolocated Outfalls
Subbasins
Highway
Main Road
Arterial Roads
Traffic Ramps
Perennial Stream
Intermittent Stream
Manmade Shoreline
Ditch/Canal
Aqueduct
Dam
Pond, Lake, Ocean
Reservoir
Wetland
Salt Wetland
0 625 1,250 2,500 3,750 5,000 Feet
N
W
E
S
Site Location
Statewide datalayers used in preparation of this plan are maintained by the Massachusetts Bureau of Geographic Information (MassGIS). City-specific datalayers used in preparation of this plan are maintained by the City of Waltham and its contractors. This document is provided for convenience and informational purposes only and may contain outdated or inaccurate data. The City of Waltham makes no claims, no representations, and no warranties, express or implied, concerning the validity (express or implied), the reliability or the accuracy of the information provided herein, including the implied validity of any uses of such data.

Analytical Methods, Detection Limits, Hold Times, and Preservatives

Analytical methods were selected during the City of Waltham's prior development of the Illicit Discharge Detection and Elimination Program and are based on the requirements of City's National Pollutant Discharge Elimination System (NPDES) permit, most recently renewed in 2016. The table below provides a summary of the analytical methods, hold time and preservative requirements, and the maximum allowable laboratory detection limits.

Analyte or Parameter	Analytical Method	Detection Limit	Max. Hold Time	Preservative
Surfactants	**SM**: 5540-C	0.01 mg/L	48 hours	Cool ≤6°C
Chlorine	**SM**: 4500-Cl G	0.02 mg/L	Analyze within15 minutes	None Required
Temperature	**SM**: 2550B	*NA*	Immediate	None Required
Specific Conductance	**EPA**: 120.1, **SM**: 2510B	0.2 µs/cm	28 days	Cool ≤6°C
Salinity	**SM**: 2520	-	28 days	Cool ≤6°C
Biochemical OxygenDemand (BOD)	**EPA:** 360.1	**EPA:** 3 mg/L	48 hours	Cool ≤6°C
Dissolved Oxygen	**EPA:** 365.1	**EPA:** 1 mg/L	Immediate	Cool ≤6°C
Turbidity	**EPA:** 160.2	**EPA:** 1 NTU	48 hours	Cool ≤6°C
Indicator Bacteria: *E.coli* *Enterococcus* *Fecal Coliform*	*E.coli* **EPA**: 1603 **SM**: 9221B, 9221F , 9223 B **Other**: Colilert ®, Colilert-18® *Enterococcus* **EPA**: 1600 **SM**: 9230 C **Other**: Enterolert®*Fecal Coliform* **EPA:** 1680	*E.coli* **EPA**: 1 cfu/100mL **SM**: 2 MPN/100mL **Other**: 1 MPN/100mL *Enterococcus* **EPA**: 1 cfu/100mL **SM**: 1 MPN/100mL **Other**: 1 MPN/100mL *Fecal Coliform* **EPA:** 1 ctu	8 hours	Cool ≤10°C, 0.0008% Na2S2O3
Total Phosphorus	**EPA**: Manual-365.3, Automated Ascorbic acid digestion-365.1 Rev. 2, ICP/AES4-200.7 Rev. 4.4 **SM**: 4500-P E-F	**EPA**: 0.01 mg/L **SM:** 0.01 mg/L	28 days	Cool ≤6°C, H2SO4 to pH <2

Analyte or Parameter	Analytical Method	Detection Limit	Max. Hold Time	Preservative
Ammonia	**EPA**: 350.2, **SM**: 4500-NH3C	0.05 mg/L	28 days	Cool ≤6°C, H2SO4 to pH <2, No preservative required if analyzed immediately
Total Nitrogen (Ammonia + Nitrate/Nitrite, methods are for Nitrate-Nitrite and need to be combined with Ammonialisted above.)	**EPA**: Cadmium reduction(automated)-353.2 Rev. 2.0, **SM**: 4500-NO3 E-F	**EPA**: 0.05 mg/L **SM:** 0.05 mg/L	28 days	Cool ≤6°C, H2SO4 to pH <2

Benchmark Field Measurements for Select Parameters

Analyte or Parameter	Benchmark
Ammonia	>0.5 mg/L
Conductivity	>2,000 µS/cm
Surfactants	>0.25 mg/L
Chlorine	>0.02 mg/L (detectable levels per the 2016 MS4 Permit)
Indicator Bacteria[1]: *E. coli Enterococcus*	*E. coli*: the geometric mean of the five most recent samples taken during the same bathing season shall not exceed 126 colonies per 100 ml and no single sample taken during the bathing season shall exceed 235 colonies per 100 ml *Enterococcus:* the geometric mean of the five most recent samples taken during the same bathing season shall not exceed 33 colonies per 100 ml and no single sample taken during the bathing season shall exceed 61 colonies per 100 ml

Summary of Findings

Pare representatives visited the City over the course of several days beginning on August 14, 2020 through September 23, 2020 to inspect a minimum of 170 of the ranked outfalls depicted on Figure 1, prioritizing high ranked outfalls and outfalls in relative proximity to each other. Dry weather inspections were performed to determine whether illicit discharges were occurring at the time of outfall inspection, with follow-up sampling beginning on September 21, 2020.

A total of 192 outfalls (17 Inter-Municipal Connections and 175 outfalls) were inspected during the course of dry weather investigations, including all 8 "Problem" rank outfalls, 68 "High" ranked outfalls, 45 "Low" ranked outfalls, and 71 non-ranked outfalls that were within the general vicinity of ranked outfalls or were newly identified in the field. The following table summarizes notable field observations during dry weather inspections, and the locations of inspected outfalls are depicted on Figure 2.

Notable Field Condition	Comments
Ranked outfalls not found in the field	Seven (7) High rank outfalls were not found during the dry weather inspections; Four (4) of these outfalls were reportedly located along Hardys Pond, and three (3) outfalls were reportedly located along the Charles River. Seven (7) Low rank outfalls were not found during the dry weather inspections, all of which were reportedly located along an unnamed tributary to Lyman Pond. Eight (8) non-ranked outfalls were not found during the dry weather inspections, two (2) reportedly located along the Charles River, two (2) reportedly located near the Cambridge Reservoir, and the remaining four (4) reportedly located along an unnamed tributary to Lyman Pond.
Outfall or suspected outfall found a significant distance from the geospatial data	A total of four (4) outfalls were found a significant distance from their geospatially referenced points: One (1) High rank outfall, located along Hardys Pond, was found approximately 11.5' to the southwest of the mapped location. One (1) High rank outfall, located along the Charles River, was found approximately 75' west of the mapped location. One (1) Low rank outfall, located along Bacon Street near Lyman Pond, was found roughly 175' northwest of the mapped location. One (1) non-ranked outfall, located near the I-95 corridor, was found approximately 195' northeast of the mapped location.

Notable Field Condition	Comments
Non-mapped outfalls observed in the field	During travel between proximally located ranked outfalls, a total of 17 unmapped outfalls were observed, which were documented and inspected when found: Six (6) unmapped outfalls were observed along the southern bank of the Charles River near the former Waltham Watch factory. Information reviewed through the Massachusetts Department of Environmental Protection (MassDEP) Searchable Sites database, and a Sanborn Fire Insurance Map from 1918 obtained through the Library of Congress's online database depict the outfalls observed in the field, as well as additional outfalls that were not observed by Pare in the field. Plans obtained through this research are included as Attachment 1 for the City's reference. One (1) unmapped outfall was observed off Rumford Avenue near a small reservoir between Maple Cove and the Charles River. One (1) mapped outfall was present in this area, which was observed during dry weather inspections, however a partially buried steel cylindrical structure roughly 12-inches in diameter was observed roughly 1-foot west of the mapped outfall which appeared to be a second outfall. One (1) unmapped outfall was observed on the northern bank of the Charles River, along the Charles River Greenway to the west of the Moody Street bridge. The outfall was observed downgradient of a dam, along the retaining wall on the north side of the Charles River, and may be a weep hole as opposed to an outfall, however additional investigation may be necessary to confirm this. Two (2) unmapped outfalls were observed along the southern bank of the Charles River to the southeast of the Newton Street bridge. One (1) was observed beneath the bridge overpass, adjacent to a mapped and ranked outfall being inspected. The second unmapped outfall was found roughly 830-feet southwest of the Newton Street bridge. Five (5) unmapped outfalls were observed in an area discharging to Lyman Pond. Two (2) of these outfalls were located along Totten Pond Road, where several mapped outfalls were not found, and it is possible that the geospatial references were inaccurate, and the outfalls were previously mapped. A similar scenario was observed along Lexington Street to the east, where an unmapped outfall was observed roughly 65-feet north of a mapped outfall that was not found in the field. One (1) unmapped outfall was observed along Bacon Street to southeast of an existing outfall that was observed in the field, and one (1) unmapped outfall was observed off Lexington Street near three (3) mapped outfalls that were also observed. One (1) unmapped outfall was observed off Stearns Hill Road near Hardys Pond, which discharges into an intermittent stream that enters Hardys Pond from the northeast. One (1) unmapped outfall was observed in addition to mapped outfalls located near the exit ramp from I-95 South onto Trapelo Road.
Intermunicipal Connections identified as outfalls and other discrepancies identified in geospatial data	As discussed with representatives of the City previously, a prior consultant determined the scores of the outfalls using geospatial data and provided this information to the City, who in turn provided the information to Pare to perform the inspections. Upon reviewing the data, Pare noted discrepancies in the data such as several intermunicipal connections being classified as outfalls despite not being classified as such by the City. Several minor discrepancies in outfall nomenclature and rankings were also observed which resulted in several non-ranked outfalls being inspected, however Pare is of the opinion that these discrepancies did not negatively affect the inspections as suspect illicit discharges were encountered during inspections of several non-ranked outfalls.

Notable Field Condition	Comments
Flowing outfalls observed during dry weather inspections	24 outfalls were observed to be flowing during dry weather inspections. Of these outfalls, two (2) were "Problem" rank, ten (10) were "High" rank, one (1) was "Low" rank, and eleven (11) were non-ranked outfalls. Two (2) of the non-ranked outfalls were previously unmapped outfalls, and four (4) of the non-ranked outfalls were later determined to be intermunicipal connections. Flows ranged from trickling (a narrow stream and/or inconsistent stream of effluent from the edge of the outfall pipe) to substantial (consistent and forceful stream of effluent). Evidence of anthropogenic impacts were observed in several discharging outfalls, however some outfalls displayed visually clear and odorless discharge that may have been associated with groundwater seepage. Outfall inspection logs providing details on the flow and other water quality indicators are provided in Attachment 1_, and a plan depicting the general flow conditions observed during initial dry weather screening is provided as Figure 3.
Submerged and partially submerged outfalls observed during dry weather inspections	44 outfalls were observed to be submerged or partially submerged during dry weather inspections. Of these outfalls, two (2) were "Problem" rank, 16 were "High" rank, 11 were "Low" rank, and 19 were non-ranked outfalls. Four (4) of the non-ranked outfalls were previously unmapped outfalls, and two (2) of the outfalls were later determined to be intermunicipal connections. Most of the submerged or partially submerged outfalls had evidence of anthropogenic impacts such as excessive nutrients, odor, cloudy appearance, and discarded municipal waste. Outfall inspections logs providing details on the water quality indicators observed in the field are provided in Attachment 1, and a plan depicting the general flow conditions observed during initial dry weather screening is provided as Figure 3.
Apparent intermittent discharges	Six (6) outfalls that were observed during initial dry weather inspections to be either submerged/partially submerged or flowing were subsequently found to be dry when revisited for sample collection. One explanation for this observation is that the discharge observed during initial inspections was occurring intermittently and the process(es) contributing to the discharge were not occurring when Pare revisited the outfall to collect a sample. However, the region was undergoing a severe drought during throughout the majority of the summer and fall of 2020, which may have contributed to reduced flow of continuous discharges, reduced groundwater infiltration into outfall discharges, and/or process changes as a result of water bans. Drought conditions may have also affected analytical results obtained from outfalls that were able to be sampled during September 2020.

Of the outfalls inspected, samples from 54 outfalls were able to be collected. Field measurements of pH, specific conductivity, total dissolved solids, and temperature were taken at the time of sample collection, and the samples were subsequently picked up in the field by Alpha Analytical of Westborough, Massachusetts for the following analysis:

- E. coli *via* Standard Method (SM)-9321-D;
- Total residual chlorine *via* SM-4500CL-D;
- Nitrogen, Ammonia *via* SM-4500NH3-BH;
- Total Phosphorus *via* SM-4500P-E; and
- Methylene blue activated anionic surfactants (MBAS) *via* SM-5540-C.

Results of field water quality and laboratory analysis are provided in the table below, and Figures 4A through 4G depict the results of laboratory analysis for each outfall sampled, including intermunicipal connections.

Recommendations

Most outfalls investigated during this field effort had no evidence of a direct or indirect sanitary wastewater condition. The outfalls which have shown exceedances can be categorized into five groups:

Group I – Outfalls that have exceedances on multiple parameters
Group II – Outfalls that have high Chlorine residuals
Group III – Outfalls that have high Phosphorus exceedances
Group IV- Outfalls that have high Nitrogen exceedances
Group V – Outfalls that have high E. coli exceedances

Group I outfalls which have exceeded allowable limits on multiple parameters are prone to cross connection risk. These outfalls are: OF 145, OF 203, OF 731, OF 9 and IMC 10. These would be categorized as high priority outfalls for further upstream testing to identify the source of cross-connection. Once further sampling is done, smoke testing and/or dye testing shall be used to isolate the point-sources.

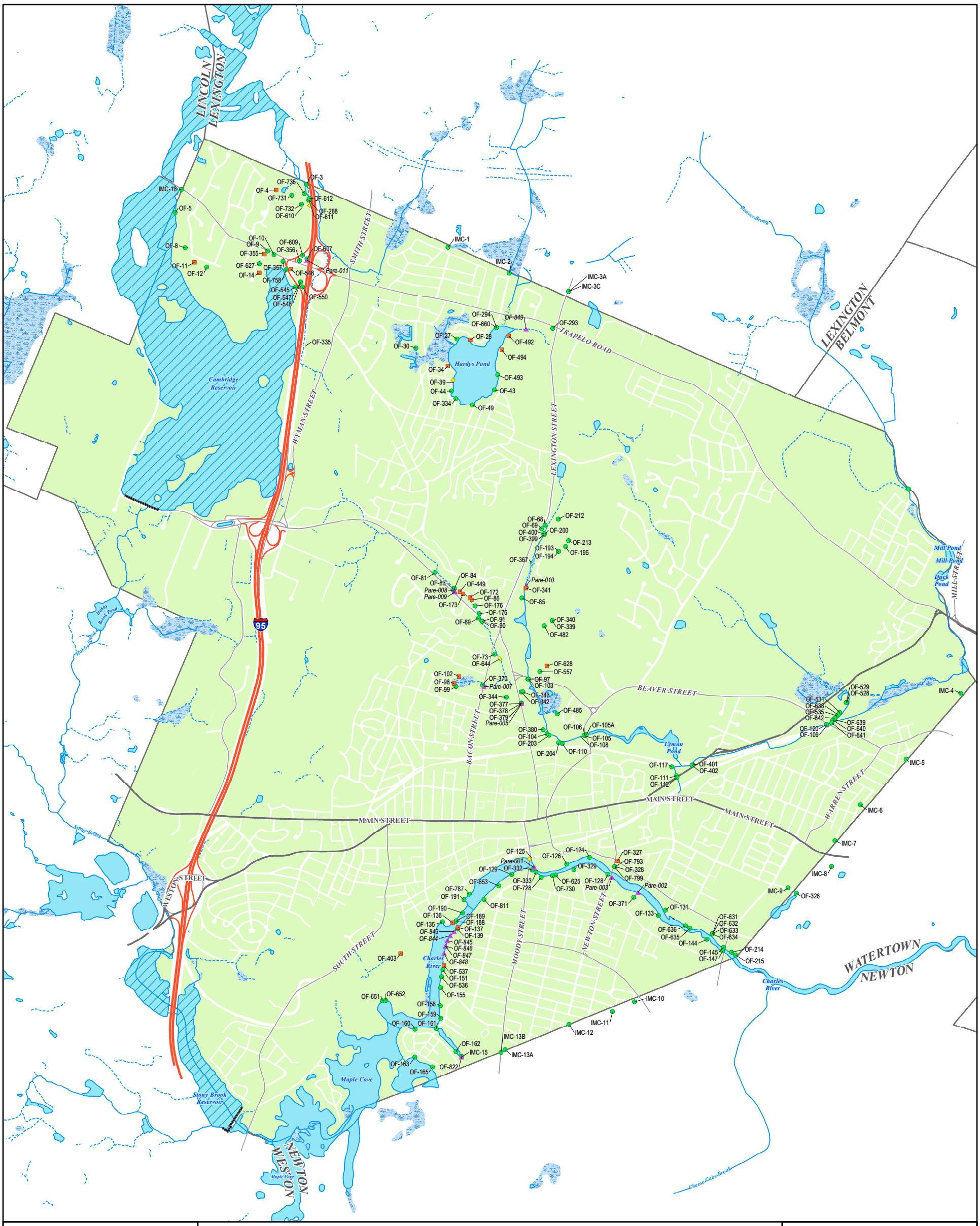
Group II outfalls which contain higher residual chlorine would indicate potential leaks in the water system which may end up in the storm sewer. The outfalls are: OF 128, OF 155 and OF 190. Leak detection testing of the adjacent water distribution networks shall be performed to evaluate the condition of the infrastructure.

Group III outfalls that have high Phosphorus exceedances would indicate runoffs from neighboring areas and households. Higher Phosphorus would indicate fertilizer particulates and residuals ending up in the stormwater from runoff associated with properties abutting the storm drain network. The outfalls are: IMC 3A, OF 7, OF 111, OF 112, OF 332, OF 34 and OF 378. To realize Phosphorus reductions, the City will have to implement multiple management strategies simultaneously. The City will have to consider reducing phosphorus use in the storm shed, such as curbing fertilize and pesticide use. City is recommended to conduct public outreach and education programs initially and then follow up with non-structured BMPs such as increased road and storm drain management practices (street sweeping/catch basin cleaning), vegetative buffers and the like. The effects of these activities shall be measured by conducting a semi-annual sampling of the outfalls. If these measures are not adequate, then structural BMPs shall be adopted such as Infiltration Practices, Filtering Systems and Green Roofs.

Group IV outfalls that have high Nitrogen exceedances would indicate animal waste. The outfalls are: IMC 15, OF 332, OF 529, OF 732, OF 735. To mitigate these effects, dog waste stations along the impacted area would be recommended.

Group V outfall have exhibited bacterial (E.Coli) concentrations higher than the thresholds is recommended that upstream flow tracking be conducted to identify the source of contamination. The outfalls are: OF -111, OF-126, OF-145, OF-159, OF-528, OF-176, OF-625, OF-652, OF -73, OF-732, OF-735, OF-793, OF-799, OF-81 will fall under the high priority list. IMC-8 sampling indicates E. coli concentrations which are way above tolerance. Tests such as dye-testing and/or smoke testing shall be conducted to isolate the source.

Overall, it is recommended that the City continues to perform dry weather sampling at six-month intervals. If evidence of contamination is identified, perform upstream tracking to isolate the source. If evidence of contamination is not found on three consecutive investigations, the sampling frequency can be reduced. If the source is identified, the City would have to take actions to remove the illicit connection from the system.



PARE CORPORATION
CELEBRATING 50 YEARS

ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401-334-4100

CITY OF WALTHAM, MASSACHUSETTS
ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

DEPARTMENT OF PUBLIC WORKS
WALTHAM, MA 02451

FIGURE NO. 2

LOCATIONS OF INSPECTED OUTFALLS FALL 2020

PROJECT NO.:	20104.00
DATE:	01/07/2021
SCALE:	1:30,000

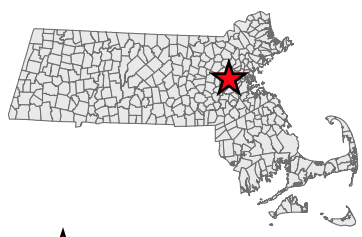
Legend

Outfalls Inspected by Pare
- Found
- Not Found
- Found significantly far from GIS location
- Unmapped outfall observed

- Highway
- Main Road
- Arterial Roads
- Traffic Ramps
- Perennial Stream
- Intermittent Stream
- Manmade Shoreline
- Ditch/Canal
- Dam
- Pond, Lake, Ocean
- Reservoir
- Wetland
- Salt Wetland

0 625 1,250 2,500 3,750 5,000 Feet

N W E S



★ Site Location

Statewide datalayers used in preparation of this plan are maintained by the Massachusetts Bureau of Geographic Information (MassGIS). City-specific datalayers used in preparation of this plan are maintained by the City of Waltham and its contractors. This document is provided for convenience and informational purposes only and may contain outdated or inaccurate data. The City of Waltham makes no claims, no representations, and no warranties, express or implied, concerning the validity (express or implied), the reliability or the accuracy of the information provided herein, including the implied validity of any uses of such data.

			Analytical Method	Field Parameters								E. Coli	Total Residual Chlorine	Nitrogen Ammonia	Total Phosphorus	Surfactants, MBAS
			Units	pH S.U.		Conductivity mS/cm		Total Dissolved Solids mg/l		Temperature °C		colonies/100ml	mg/l	mg/l	mg/l	mg/l
			Benchmark	6.5 - 8.3		≥ 2		500 [1]		≤ 20		61	0.02	0.5	0.1 [2]	0.25
Outfall ID	**Receiving Waterbody**	**Date Inspected**	**Date Sampled**	**1st Grab**	**2nd Grab**	**1st Grab**	**2nd Grab**	**1st Grab**	**2nd Grab**	**1st Grab**	**2nd Grab**					
IMC-10	Charles River	17-Sep-2020	23-Sep-2020	6.62	6.64	1.041	1.020	0.520	0.510	**21.10**	**21.00**	10.89	ND (<0.02)	0.242	**0.186**	**2.1**
IMC-15	Charles River	21-Aug-2020	22-Sep-2020	6.69	6.69	1.344	1.319	0.672	0.659	17.00	16.60	**166.95**	ND (<0.02)	**7.31**	0.057	0.13
IMC-3A	Unnamed Tributary to Hardy Pond	17-Sep-2020	23-Sep-2020	6.76	6.80	1.985	1.991	0.993	0.995	19.00	17.80	50.39	ND (<0.02)	0.239	**0.7**	ND (<0.05)
IMC-3C	Unnamed Tributary to Hardy Pond	17-Sep-2020	23-Sep-2020	6.83	6.92	1.861	1.789	0.930	0.894	18.80	18.80	2.02	ND (<0.02)	0.386	0.014	ND (<0.05)
IMC-7	Unnamed Pond	17-Sep-2020	23-Sep-2020	6.71	6.69	1.202	1.161	0.601	0.581	18.80	18.50	11.87	ND (<0.02)	0.091	**0.786**	ND (<0.05)
IMC-8	Unnamed Pond	17-Sep-2020	23-Sep-2020	7.04	7.07	0.766	0.744	0.383	0.372	18.70	18.20	**1986.29**	ND (<0.02)	0.084	0.052	ND (<0.05)
OF-104	Unnamed Tributary to Lyman Pond	8-Sep-2020	21-Sep-2020	7.20	7.20	0.799	0.801	0.399	0.401	16.30	16.10	**64**	ND (<0.02)	0.278	0.038	0.05
OF-109	Beaver Brook	17-Sep-2020	23-Sep-2020	6.75	6.80	1.093	1.104	0.546	0.522	17.00	16.60	**517.21**	ND (<0.02)	0.075	0.025	ND (<0.05)
OF-110	Unnamed Tributary to Lyman Pond	8-Sep-2020	21-Sep-2020	7.12	7.13	0.561	0.560	0.281	0.280	12.70	12.60	**330**	ND (<0.02)	0.202	0.051	ND (<0.05)
OF-111	Beaver Brook	17-Sep-2020	23-Sep-2020	6.95	6.98	0.618	0.626	0.309	0.313	16.00	15.80	**770.1**	ND (<0.02)	0.226	**0.174**	ND (<0.05)
OF-112	Beaver Brook	17-Sep-2020	23-Sep-2020	6.89	6.92	0.701	0.686	0.350	0.343	17.10	16.80	**365.4**	ND (<0.02)	0.336	**0.143**	0.05
OF-126	Charles River	7-Sep-2020	22-Sep-2020	7.76	7.80	1.401	1.375	0.700	0.687	17.80	17.40	**920.84**	ND (<0.02)	0.113	0.024	ND (<0.05)
OF-128	Charles River	7-Sep-2020	22-Sep-2020	8.27	**8.33**	0.303	0.265	0.151	0.133	16.80	16.30	35.92	**0.87**	0.32	0.016	ND (<0.05)
OF-133	Charles River	17-Sep-2020	21-Sep-2020	7.63	7.66	0.298	0.293	0.146	0.146	15.90	15.50	2	ND (<0.02)	0.176	ND (<0.01)	ND (<0.05)
OF-139	Charles River	14-Aug-2020	22-Sep-2020	7.55	7.62	0.369	0.351	0.185	0.176	16.70	17.00	**162.42**	ND (<0.02)	ND (<0.075)	0.059	ND (<0.05)
OF-144	Charles River	17-Sep-2020	22-Sep-2020	7.74	7.76	0.688	0.690	0.344	0.345	16.40	15.90	**770.1**	ND (<0.02)	ND (<0.075)	0.032	ND (<0.05)
OF-145	Charles River	17-Sep-2020	22-Sep-2020	7.51	7.50	**> 3.999**	**> 3.999**	> 2	> 2	18.20	18.00	**579.43**	ND (<0.02)	0.125	**0.114**	0.08
OF-155	Charles River	7-Sep-2020	22-Sep-2020	7.48	7.55	0.303	0.286	0.152	0.143	15.30	15.00	9.69	**0.77**	0.453	ND (<0.01)	ND (<0.05)
OF-158	Charles River	21-Aug-2020	22-Sep-2020	7.16	7.14	0.802	0.792	0.401	0.396	11.10	11.00	**88.41**	ND (<0.02)	0.076	0.066	0.07
OF-159	Charles River	21-Aug-2020	22-Sep-2020	7.20	7.24	0.843	0.826	0.421	0.413	11.60	11.30	**980.39**	ND (<0.02)	0.159	0.039	0.09
OF-176	Unnamed Tributary to Lyman Pond	8-Sep-2020	21-Sep-2020	7.46	7.45	1.215	1.213	0.608	0.606	13.40	13.10	**7800**	ND (<0.02)	ND (<0.075)	0.049	ND (<0.05)
OF-188 [a]	Charles River	14-Aug-2020	22-Sep-2020	7.27	7.31	0.838	0.818	0.419	0.409	17.20	16.90	**165.76**	ND (<0.02)	ND (<0.075)	0.023	0.08
OF-189 [a]	Charles River	14-Aug-2020	22-Sep-2020	7.40	7.43	0.800	0.791	0.400	0.396	17.00	16.70	**98.76**	ND (<0.02)	ND (<0.075)	0.018	0.1
OF-190	Charles River	14-Aug-2020	22-Sep-2020	7.40	7.39	0.451	0.434	0.226	0.217	17.60	17.10	39.31	**0.25**	0.139	0.053	0.05
OF-203	Unnamed Tributary to Lyman Pond	8-Sep-2020	23-Sep-2020	7.31	7.38	0.429	0.434	0.214	0.217	**22.30**	**21.90**	**3738**	ND (<0.02)	0.382	**1.23**	**0.32**
OF-215	Charles River	17-Sep-2020	22-Sep-2020	7.79	7.84	0.344	**15.500**	0.172	0.337	16.00	0.17	**72.73**	ND (<0.02)	ND (<0.075)	0.046	0.05
OF-288	Unnamed Tributary to Cambridge Reservoir	7-Sep-2020	23-Sep-2020	6.93	6.87	1.420	1.431	0.710	0.716	18.70	18.80	47.11	ND (<0.02)	0.25	0.041	0.07
OF-293	Unnamed Tributary to Hardy Pond	14-Aug-2020	22-Sep-2020	7.02	7.07	1.757	1.752	0.880	0.876	18.10	17.80	**67.66**	ND (<0.02)	0.487	0.071	0.05
OF-332	Charles River	21-Aug-2020	22-Sep-2020	6.90	6.96	1.079	1.078	0.540	0.539	17.40	17.40	6.32	ND (<0.02)	**0.577**	**0.124**	ND (<0.05)
OF-333	Charles River	21-Aug-2020	22-Sep-2020	7.10	7.08	1.146	1.132	0.573	0.566	16.10	16.00	3.04	ND (<0.02)	ND (<0.075)	ND (<0.01)	ND (<0.05)
OF-342	Chester Brook	8-Sep-2020	21-Sep-2020	7.38	7.37	1.125	1.105	0.562	0.552	14.20	14.40	**66**	ND (<0.02)	0.08	**0.151**	ND (<0.05)
OF-343	Chester Brook	8-Sep-2020	21-Sep-2020	6.61	6.56	1.774	1.763	0.887	0.882	17.00	16.90	25	ND (<0.02)	0.11	0.025	ND (<0.05)
OF-378	Chester Brook	8-Sep-2020	21-Sep-2020	6.71	6.70	0.928	0.923	0.464	0.462	13.50	13.90	**230**	ND (<0.02)	0.123	**0.228**	ND (<0.05)
OF-379	Chester Brook	8-Sep-2020	21-Sep-2020	6.59	6.61	0.872	0.873	0.436	0.437	14.60	14.60	**200**	ND (<0.02)	0.109	0.061	0.05
OF-380	Unnamed Tributary to Lyman Pond	8-Sep-2020	21-Sep-2020	7.64	7.63	0.493	0.491	0.246	0.245	17.50	17.30	**250**	ND (<0.02)	0.209	0.043	**0.43**
OF-528	Beaver Brook	17-Sep-2020	23-Sep-2020	6.60	6.63	1.364	1.370	0.682	0.685	**20.20**	19.70	**13390**	ND (<0.02)	**2.88**	**0.163**	0.16
OF-529	Beaver Brook	17-Sep-2020	23-Sep-2020	7.00	6.99	0.383	0.378	0.192	0.189	19.50	19.30	18.9	ND (<0.02)	**2**	0.09	0.18
OF-536	Charles River	14-Aug-2020	22-Sep-2020	7.11	7.16	0.822	0.814	0.411	0.407	15.90	16.10	27.18	ND (<0.02)	ND (<0.075)	0.025	0.05
OF-625	Charles River	7-Sep-2020	22-Sep-2020	7.73	7.72	0.550	0.548	0.275	0.274	18.10	17.80	**1203.33**	ND (<0.02)	ND (<0.075)	**0.306**	0.05
OF-652	Charles River	7-Sep-2020	22-Sep-2020	7.12	7.13	0.836	0.815	0.418	0.407	13.10	12.70	**8206**	ND (<0.02)	0.112	0.094	0.08
OF-73	Unnamed Tributary to Lyman Pond	8-Sep-2020	21-Sep-2020	7.49	7.53	1.125	1.120	0.562	0.560	13.00	12.80	**510**	ND (<0.02)	ND (<0.075)	0.04	ND (<0.05)
OF-731	Unnamed Tributary to Hardy Pond	7-Sep-2020	23-Sep-2020	**6.19**	**6.21**	1.288	1.292	0.644	0.646	**21.30**	**21.00**	15.79	ND (<0.02)	**2.34**	**0.117**	0.12
OF-732	Unnamed Tributary to Hardy Pond	7-Sep-2020	23-Sep-2020	6.80	6.79	0.292	0.296	0.146	0.148	17.70	17.00	**726.99**	ND (<0.02)	**0.609**	**0.282**	**0.32**
OF-735	Unnamed Tributary to Hardy Pond	7-Sep-2020	23-Sep-2020	7.62	7.69	0.872	0.860	0.436	0.430	17.10	16.60	**980.39**	ND (<0.02)	**1.06**	**4.51**	0.09
OF-793	Charles River	7-Sep-2020	22-Sep-2020	7.64	7.60	0.700	0.689	0.350	0.345	14.70	14.50	**387.32**	ND (<0.02)	0.091	0.053	0.07
OF-799	Charles River	7-Sep-2020	22-Sep-2020	7.47	7.47	0.711	0.706	0.355	0.353	14.60	14.40	**260.25**	ND (<0.02)	0.147	0.052	ND (<0.05)
OF-81	Unnamed Tributary to Lyman Pond	8-Sep-2020	21-Sep-2020	7.60	7.64	1.368	1.366	0.684	0.683	14.00	13.90	**1000**	ND (<0.02)	0.078	0.01	0.05
OF-811	Charles River	21-Aug-2020	22-Sep-2020	7.28	7.31	0.733	0.728	0.367	0.364	16.20	16.10	**81.97**	ND (<0.02)	ND (<0.075)	0.026	0.05
OF-83	Unnamed Tributary to Lyman Pond	8-Sep-2020	21-Sep-2020	7.35	7.38	1.168	1.165	0.564	0.583	16.60	16.80	5	ND (<0.02)	ND (<0.075)	ND (<0.01)	ND (<0.05)
OF-848	Charles River	14-Aug-2020	22-Sep-2020	7.18	7.21	0.802	0.780	0.406	0.390	16.00	15.80	21.82	ND (<0.02)	0.086	0.024	0.08
OF-9	Cambridge Reservoir	2-Sep-2020	23-Sep-2020	7.63	7.67	**2.888**	**2.893**	1.444	1.446	**22.20**	**21.50**	4.13	**0.23**	0.164	**0.147**	0.06
Pare-005	Chester Brook	8-Sep-2020	21-Sep-2020	6.76	6.78	0.899	0.902	0.444	0.451	15.30	15.00	**260**	ND (<0.02)	0.184	0.029	ND (<0.05)
Pare-008	Unnamed Tributary to Chester Brook	8-Sep-2020	21-Sep-2020	7.39	7.39	1.110	1.130	0.555	0.565	16.50	16.50	44	ND (<0.02)	ND (<0.075)	0.017	ND (<0.05)
Pare-009	Unnamed Tributary to Chester Brook	8-Sep-2020	21-Sep-2020	7.38	7.38	1.118	1.122	0.559	0.561	16.60	16.60	7	ND (<0.02)	ND (<0.075)	ND (<0.01)	ND (<0.05)

[1] Standard derived from the Massachusetts Drinking Water Regulations, Secondary Maximum Contaminant Level (SMCL), 310 CMR 22.00

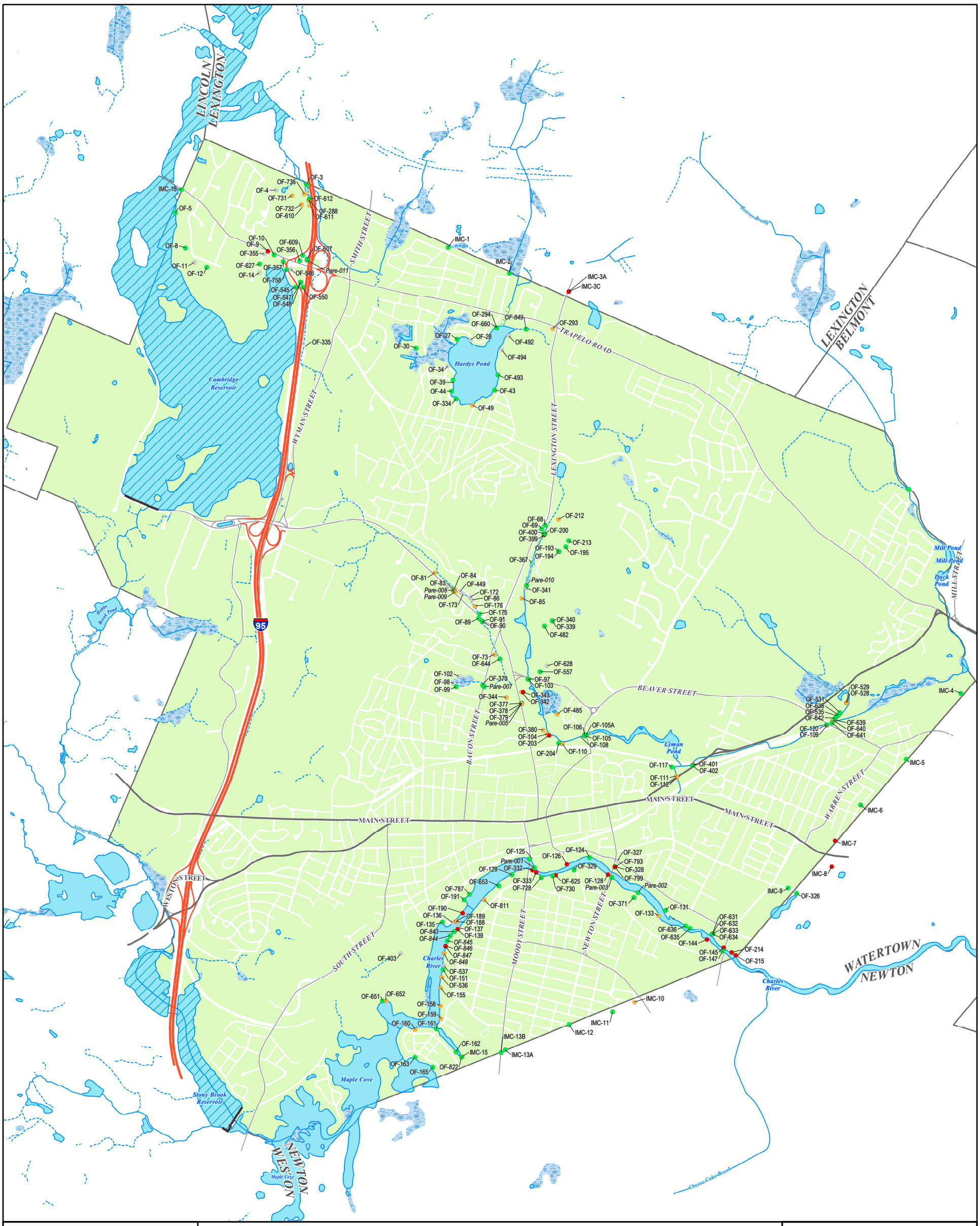
[2] A benchmark was not specified in the Waltham IDDE Plan for total phosphorus, however the benchmark for total phosphorus from the Charles River Watershed's Total Maximum Daily Load (TMDL) for this compound entering waterbody tributaries was used in place

[a] Outfalls OF-188 and OF-189 were identified on the laboratory chain of custody as OF-784 and OF-785, respectively, due to duplicate features in GIS.

= Concentration exceeds waterbody-specific Total Maximum Daily Load (TMDL)

= Concentration exceeds Benchmark Value identified in the City of Waltham's IDDE Plan

= Surface waters at these outfall locations are Class A under 314 CMR 4.00



PARE CORPORATION
CELEBRATING 50 YEARS

ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401-334-4100

CITY OF WALTHAM, MASSACHUSETTS
ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

DEPARTMENT OF PUBLIC WORKS
WALTHAM, MA 02451

FIGURE NO. 3

DRY WEATHER INSPECTION OBSERVATIONS FALL 2020

PROJECT NO.:	20104.00
DATE:	01/07/2021
SCALE:	1:30,000

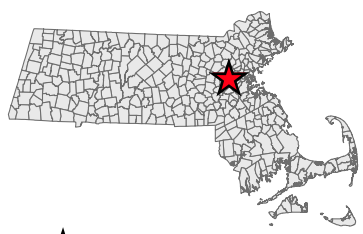
Legend

Outfalls Inspected by Pare
- Not Found
- Dry
- Submerged
- Flowing

- Highway
- Main Road
- Arterial Roads
- Traffic Ramps
- Perennial Stream
- Intermittent Stream
- Manmade Shoreline
- Ditch/Canal
- Dam
- Pond, Lake, Ocean
- Reservoir
- Wetland
- Salt Wetland

0 625 1,250 2,500 3,750 5,000 Feet

N W E S



★ Site Location

Statewide datalayers used in preparation of this plan are maintained by the Massachusetts Bureau of Geographic Information (MassGIS). City-specific datalayers used in preparation of this plan are maintained by the City of Waltham and its contractors. This document is provided for convenience and informational purposes only and may contain outdated or inaccurate data. The City of Waltham makes no claims, no representations, and no warranties, express or implied, concerning the validity (express or implied), the reliability or the accuracy of the information provided herein, including the implied validity of any uses of such data.

OF-126
22-Sep-2020
920.84
ND (<0.02)
0.113
0.024
ND (<0.05)

OF-625
22-Sep-2020
1203.33
ND (<0.02)
ND (<0.075)
0.306
0.05

OF-332	OF-333
22-Sep-2020	22-Sep-2020
6.32	3.04
ND (<0.02)	ND (<0.02)
0.577	ND (<0.075)
0.124	ND (<0.01)
ND (<0.05)	ND (<0.05)

OF-811
22-Sep-2020
81.97
ND (<0.02)
ND (<0.075)
0.026
0.05

OF-190
22-Sep-2020
39.31
0.25
0.139
0.053
0.05

OF-188	OF-189
22-Sep-2020	22-Sep-2020
165.76	98.76
ND (<0.02)	ND (<0.02)
ND (<0.075)	ND (<0.075)
0.023	0.018
0.08	0.1

OF-139
22-Sep-2020
162.42
ND (<0.02)
ND (<0.075)
0.059
ND (<0.05)

OF-848
22-Sep-2020
21.82
ND (<0.02)
0.086
0.024
0.08

OF-536
22-Sep-2020
27.18
ND (<0.02)
ND (<0.075)
0.025
0.05

OF-652
22-Sep-2020
8206
ND (<0.02)
0.112
0.094
0.08

OF-155
22-Sep-2020
9.69
0.77
0.453
ND (<0.01)
ND (<0.05)

OF-158
22-Sep-2020
88.41
ND (<0.02)
0.076
0.066
0.07

OF-159
22-Sep-2020
980.39
ND (<0.02)
0.159
0.039
0.09

IMC-15
22-Sep-2020
166.95
ND (<0.02)
7.31
0.057
0.13

CITY OF WALTHAM, MASSACHUSETTS
ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

DEPARTMENT OF PUBLIC WORKS
WALTHAM, MA 02451

PARE CORPORATION
CELEBRATING 50 YEARS
ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401-334-4100

FIGURE NO. 4A

DRY WEATHER INSPECTION OBSERVATIONS FALL 2020

PROJECT NO.: 20104.00
DATE: 01/07/2021
SCALE: 1:6,000

Legend

Outfalls Inspected by Pare
- Not Found
- Dry
- Submerged
- Flowing

Stormwater Infrastructure
- Drain Manholes
- Stormwater Catch Basins
- Galley
- Leaching Pit
- Outfalls
- Oil/Water Separator
- Treatment
- Cleanouts

Stormwater Infrastructure
- Catch Basin Lateral
- Foundation Drain
- Gravity Main
- Perforated Pipe
- Roof Drain
- Trench Drain
- Culverts
- Header
- Treated Water Discharge
- Unknown Pipe Type
- Detention Basins

Hydrologic Features
- Perennial Stream
- Intermittent Stream
- Dam
- Pond, Lake, Ocean
- Wetland

Analytical Key:

Analytical Method	Outfall ID	OF-9
	Sample Date	23-Sep-2020
E. coli (col/100ml)		4.13
Tot. Res. Chlorine (mg/l)		0.23
Nitrogen Ammonia (mg/l)		0.164
Total Phosphorus (mg/l)		0.147
MBAS (mg/l)		0.06

Class of receiving waterbody
Blue = Class A
Not Highlighted = All other classes

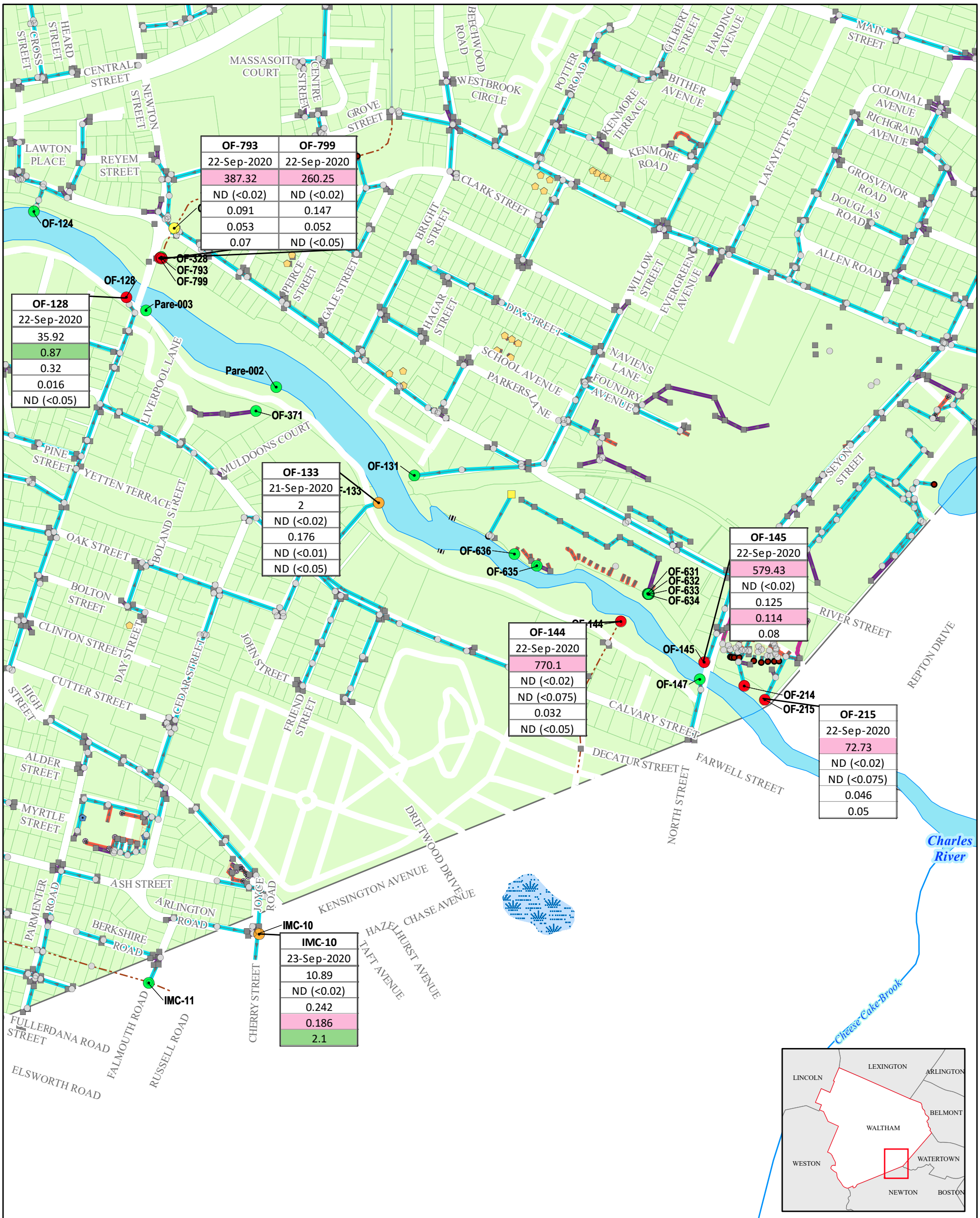
Exceeds benchmark value

Exceeds TMDL

0 125 250 500 750 1,000 Feet

Site Location

Statewide datalayers used in preparation of this plan are maintained by the Massachusetts Bureau of Geographic Information (MassGIS). City-specific datalayers used in preparation of this plan are maintained by the City of Waltham and its contractors. This document is provided for convenience and informational purposes only and may contain outdated or inaccurate data. The City of Waltham makes no claims, no representations, and no warranties, express or implied, concerning the validity (express or implied), the reliability or the accuracy of the information provided herein, including the implied validity of any uses of such data.



PARE CORPORATION
CELEBRATING 50 YEARS

ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401-334-4100

CITY OF WALTHAM, MASSACHUSETTS
ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

DEPARTMENT OF PUBLIC WORKS
WALTHAM, MA 02451

FIGURE NO. 4B

DRY WEATHER INSPECTION OBSERVATIONS FALL 2020

PROJECT NO.: 20104.00
DATE: 01/07/2021
SCALE: 1:6,000

Legend

Outfalls Inspected by Pare
- Not Found
- Dry
- Submerged
- Flowing

Stormwater Infrastructure
- Drain Manholes
- Stormwater Catch Basins
- Leaching Pit
- Outfalls
- Oil/Water Separator
- Outlet Control Structure
- Cleanouts

Stormwater Infrastructure
- Catch Basin Lateral
- Gravity Main
- Roof Drain
- Under Drain
- Culverts
- Conduit
- Detention Basins

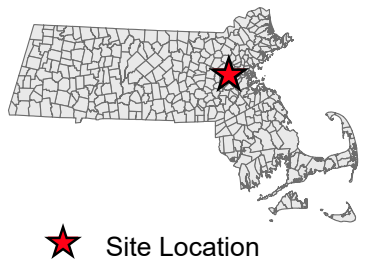
Hydrologic Features
- Perennial Stream
- Dam
- Pond, Lake, Ocean
- Wetland

0 125 250 500 750 1,000 Feet

Analytical Key:

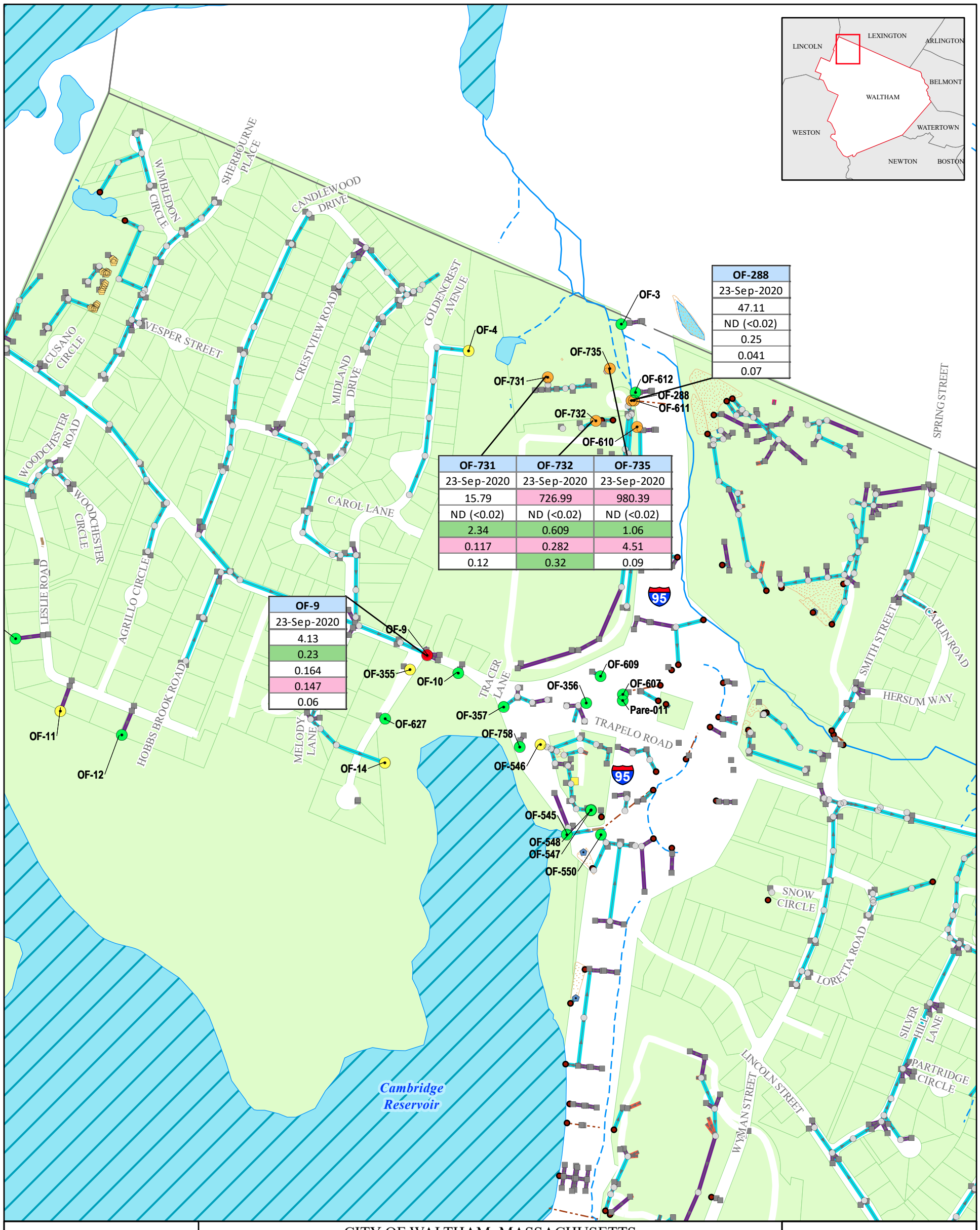
Analytical Method	Outfall ID	OF-9	
	Sample Date	23-Sep-2020	
E. coli (col/100ml)		4.13	
Tot. Res. Chlorine (mg/l)		0.23	← Exceeds benchmark value
Nitrogen Ammonia (mg/l)		0.164	
Total Phosphorus (mg/l)		0.147	← Exceeds TMDL
MBAS (mg/l)		0.06	

← Class of receiving waterbody
Blue = Class A
Not Highlighted = All other classes



★ Site Location

Statewide datalayers used in preparation of this plan are maintained by the Massachusetts Bureau of Geographic Information (MassGIS). City-specific datalayers used in preparation of this plan are maintained by the City of Waltham and its contractors. This document is provided for convenience and informational purposes only and may contain outdated or inaccurate data. The City of Waltham makes no claims, no representations, and no warranties, express or implied, concerning the validity (express or implied), the reliability or the accuracy of the information provided herein, including the implied validity of any uses of such data.



OF-288
23-Sep-2020
47.11
ND (<0.02)
0.25
0.041
0.07

OF-731	OF-732	OF-735
23-Sep-2020	23-Sep-2020	23-Sep-2020
15.79	726.99	980.39
ND (<0.02)	ND (<0.02)	ND (<0.02)
2.34	0.609	1.06
0.117	0.282	4.51
0.12	0.32	0.09

OF-9
23-Sep-2020
4.13
0.23
0.164
0.147
0.06

CITY OF WALTHAM, MASSACHUSETTS
ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

DEPARTMENT OF PUBLIC WORKS
WALTHAM, MA 02451

PARE CORPORATION
CELEBRATING 50 YEARS
ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401-334-4100

FIGURE NO. 4C

DRY WEATHER INSPECTION OBSERVATIONS FALL 2020

PROJECT NO.:	20104.00
DATE:	01/07/2021
SCALE:	1:6,000

Legend

Outfalls Inspected by Pare
- Not Found
- Dry
- Submerged
- Flowing

Stormwater Infrastructure
- Drain Manholes
- Stormwater Catch Basins
- Leaching Pit
- Outfalls
- Oil/Water Separator
- Outlet Control Structure

Stormwater Infrastructure
- Catch Basin Lateral
- Force Main
- Gravity Main
- Roof Drain
- Trench Drain
- Under Drain
- Swales
- Culverts
- Bypass
- Detention Basins

Hydrologic Features
- Perennial Stream
- Intermittent Stream
- Pond, Lake, Ocean
- Reservoir

0 125 250 500 750 1,000 Feet

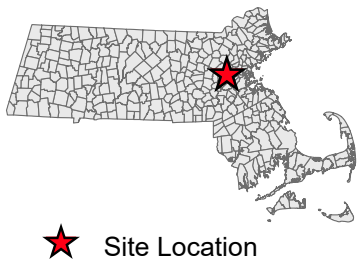
Analytical Key:

Analytical Method	Outfall ID	OF-9
	Sample Date	23-Sep-2020
E. coli (col/100ml)		4.13
Tot. Res. Chlorine (mg/l)		0.23
Nitrogen Ammonia (mg/l)		0.164
Total Phosphorus (mg/l)		0.147
MBAS (mg/l)		0.06

Class of receiving waterbody
Blue = Class A
Not Highlighted = All other classes

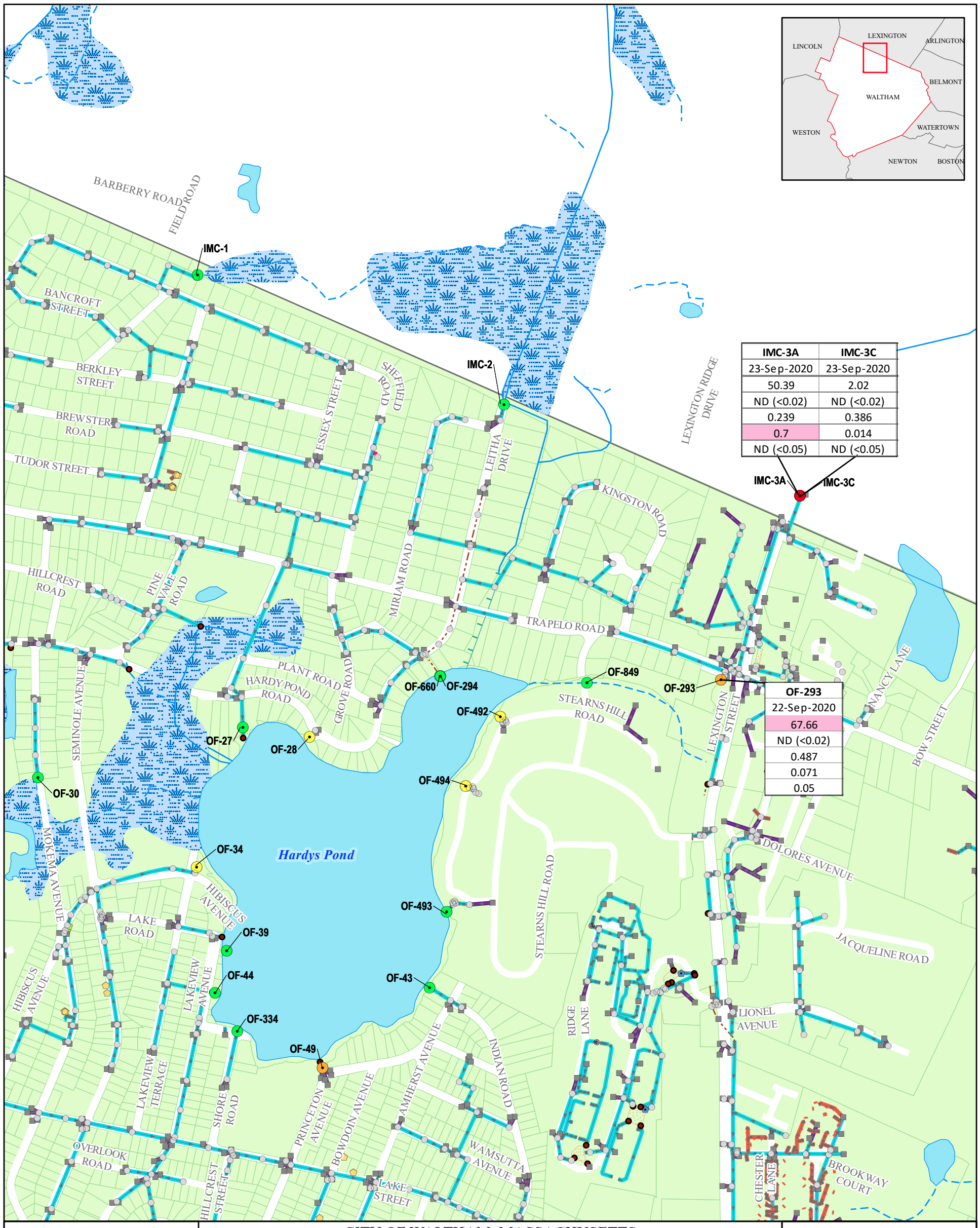
← Exceeds benchmark value

← Exceeds TMDL



★ Site Location

Statewide datalayers used in preparation of this plan are maintained by the Massachusetts Bureau of Geographic Information (MassGIS). City-specific datalayers used in preparation of this plan are maintained by the City of Waltham and its contractors. This document is provided for convenience and informational purposes only and may contain outdated or inaccurate data. The City of Waltham makes no claims, no representations, and no warranties, express or implied, concerning the validity (express or implied), the reliability or the accuracy of the information provided herein, including the implied validity of any uses of such data.



IMC-3A	IMC-3C
23-Sep-2020	23-Sep-2020
50.39	2.02
ND (<0.02)	ND (<0.02)
0.239	0.386
0.7	0.014
ND (<0.05)	ND (<0.05)

OF-293
22-Sep-2020
67.66
ND (<0.02)
0.487
0.071
0.05

PARE CORPORATION
CELEBRATING 50 YEARS
ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401-334-4100

CITY OF WALTHAM, MASSACHUSETTS
ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

DEPARTMENT OF PUBLIC WORKS
WALTHAM, MA 02451

FIGURE NO. 4D

DRY WEATHER INSPECTION OBSERVATIONS FALL 2020

PROJECT NO.: 20104.00
DATE: 01/07/2021
SCALE: 1:6,000

Legend

Outfalls Inspected by Pare
- Not Found
- Dry
- Submerged
- Flowing

Stormwater Infrastructure
- Drain Manholes
- Stormwater Catch Basins
- Leaching Pit
- Outfalls
- Outlet Control Structure
- Outlet Manhole
- Cleanouts

Stormwater Infrastructure
- Catch Basin Lateral
- Gravity Main
- Roof Drain
- Trench Drain
- Culverts
- Detention Basins

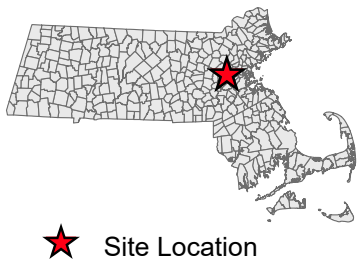
Hydrologic Features
- Perennial Stream
- Intermittent Stream
- Ditch/Canal
- Pond, Lake, Ocean
- Wetland

Analytical Key:

Analytical Method	Outfall ID	OF-9	
	Sample Date	23-Sep-2020	
E. coli (col/100ml)		4.13	
Tot. Res. Chlorine (mg/l)		0.23	Exceeds benchmark value
Nitrogen Ammonia (mg/l)		0.164	
Total Phosphorus (mg/l)		0.147	Exceeds TMDL
MBAS (mg/l)		0.06	

Class of receiving waterbody
Blue = Class A
Not Highlighted = All other classes

0 125 250 500 750 1,000 Feet



★ Site Location

Statewide datalayers used in preparation of this plan are maintained by the Massachusetts Bureau of Geographic Information (MassGIS). City-specific datalayers used in preparation of this plan are maintained by the City of Waltham and its contractors. This document is provided for convenience and informational purposes only and may contain outdated or inaccurate data. The City of Waltham makes no claims, no representations, and no warranties, express or implied, concerning the validity (express or implied), the reliability or the accuracy of the information provided herein, including the implied validity of any uses of such data.

OF-81
21-Sep-2020
1000
ND (<0.02)
0.078
0.01
0.05

OF-83
21-Sep-2020
5
ND (<0.02)
ND (<0.075)
ND (<0.01)
ND (<0.05)

Pare-008	Pare-009
21-Sep-2020	21-Sep-2020
44	7
ND (<0.02)	ND (<0.02)
ND (<0.075)	ND (<0.075)
0.017	ND (<0.01)
ND (<0.05)	ND (<0.05)

OF-176
21-Sep-2020
7800
ND (<0.02)
ND (<0.075)
0.049
ND (<0.05)

OF-73
21-Sep-2020
510
ND (<0.02)
ND (<0.075)
0.04
ND (<0.05)

OF-342	OF-343
21-Sep-2020	21-Sep-2020
66	25
ND (<0.02)	ND (<0.02)
0.08	0.11
0.151	0.025
ND (<0.05)	ND (<0.05)

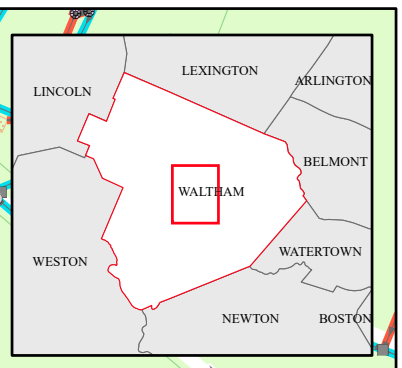
OF-378	OF-379	Pare-005
21-Sep-2020	21-Sep-2020	21-Sep-2020
230	200	260
ND (<0.02)	ND (<0.02)	ND (<0.02)
0.123	0.109	0.184
0.228	0.061	0.029
ND (<0.05)	0.05	ND (<0.05)

OF-380
21-Sep-2020
250
ND (<0.02)
0.209
0.043
0.43

OF-104
21-Sep-2020
64
ND (<0.02)
0.278
0.038
0.05

OF-203
23-Sep-2020
3738
ND (<0.02)
0.382
1.23
0.32

OF-110
21-Sep-2020
330
ND (<0.02)
0.202
0.051
ND (<0.05)



PARE CORPORATION
CELEBRATING 50 YEARS

ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401-334-4100

CITY OF WALTHAM, MASSACHUSETTS
ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

DEPARTMENT OF PUBLIC WORKS
WALTHAM, MA 02451

FIGURE NO. 4E

DRY WEATHER INSPECTION OBSERVATIONS FALL 2020

PROJECT NO.: 20104.00
DATE: 01/07/2021
SCALE: 1:6,000

Legend

Outfalls Inspected by Pare
- Not Found
- Dry
- Submerged
- Flowing

Stormwater Infrastructure
- Drain Manholes
- Stormwater Catch Basins
- Drywell
- Leaching Pit
- Outfalls
- Oil/Water Separator
- Outlet Control Structure
- Cleanouts

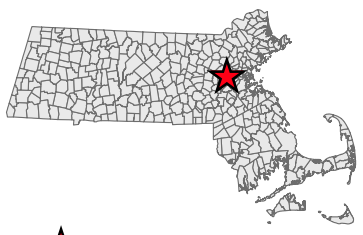
Stormwater Infrastructure
- Catch Basin Lateral
- Force Main
- Gravity Main
- Roof Drain
- Trench Drain
- Under Drain
- Culverts
- Detention Basins

Hydrologic Features
- Perennial Stream
- Intermittent Stream
- Pond, Lake, Ocean
- Wetland

Analytical Key:

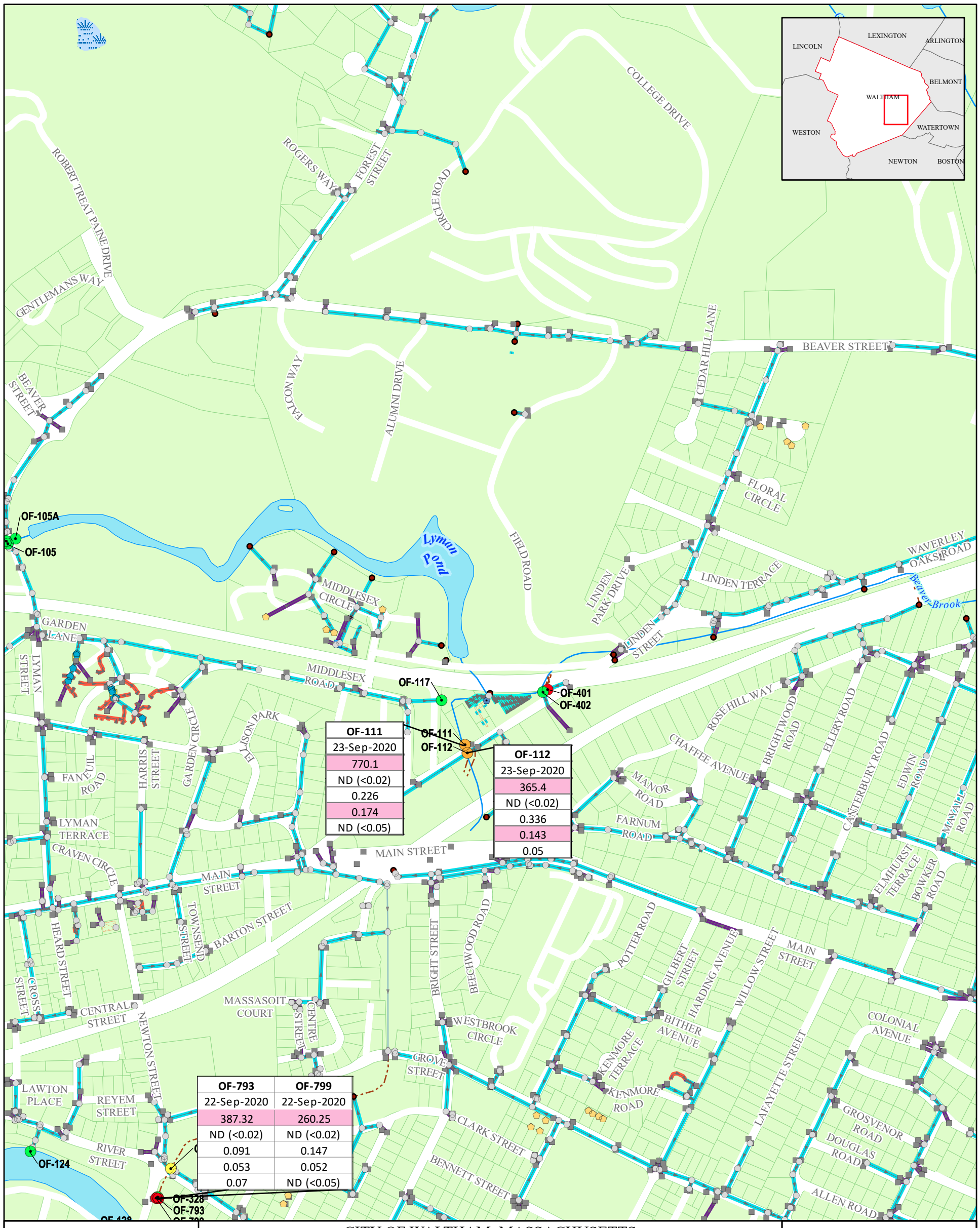
Analytical	Outfall ID	OF-9	
Method	Sample Date	23-Sep-2020	Class of receiving waterbody: Blue = Class A; Not Highlighted = All other classes
E. coli (col/100ml)		4.13	
Tot. Res. Chlorine (mg/l)		0.23	Exceeds benchmark value
Nitrogen Ammonia (mg/l)		0.164	
Total Phosphorus (mg/l)		0.147	Exceeds TMDL
MBAS (mg/l)		0.06	

0 125 250 500 750 1,000 Feet



★ Site Location

Statewide datalayers used in preparation of this plan are maintained by the Massachusetts Bureau of Geographic Information (MassGIS). City-specific datalayers used in preparation of this plan are maintained by the City of Waltham and its contractors. This document is provided for convenience and informational purposes only and may contain outdated or inaccurate data. The City of Waltham makes no claims, no representations, and no warranties, express or implied, concerning the validity (express or implied), the reliability or the accuracy of the information provided herein, including the implied validity of any uses of such data.



CITY OF WALTHAM, MASSACHUSETTS
ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

DEPARTMENT OF PUBLIC WORKS
WALTHAM, MA 02451

PARE CORPORATION
CELEBRATING 50 YEARS
ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401-334-4100

FIGURE NO. 4F

DRY WEATHER INSPECTION OBSERVATIONS FALL 2020

PROJECT NO.: 20104.00
DATE: 01/07/2021
SCALE: 1:6,000

Legend

Outfalls Inspected by Pare
- Not Found
- Dry
- Submerged
- Flowing

Stormwater Infrastructure
- Drain Manholes
- Stormwater Catch Basins
- Drywell
- Leaching Pit
- Outfalls
- Oil/Water Separator
- Treatment
- Outlet Control Structure
- Cleanouts

Stormwater Infrastructure
- Catch Basin Lateral
- Gravity Main
- Perforated Pipe
- Roof Drain
- Culverts
- Conduit
- Stub
- Detention Basins

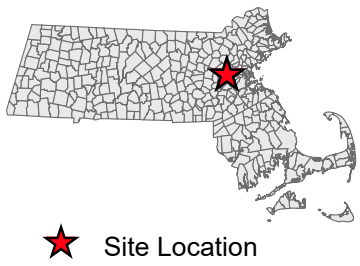
Hydrologic Features
- Perennial Stream
- Pond, Lake, Ocean
- Wetland

0 125 250 500 750 1,000 Feet

Analytical Key:

Analytical Method	Outfall ID	OF-9	
	Sample Date	23-Sep-2020	
E. coli (col/100ml)		4.13	
Tot. Res. Chlorine (mg/l)		0.23	Exceeds benchmark value
Nitrogen Ammonia (mg/l)		0.164	
Total Phosphorus (mg/l)		0.147	Exceeds TMDL
MBAS (mg/l)		0.06	

Class of receiving waterbody
Blue = Class A
Not Highlighted = All other classes



Site Location

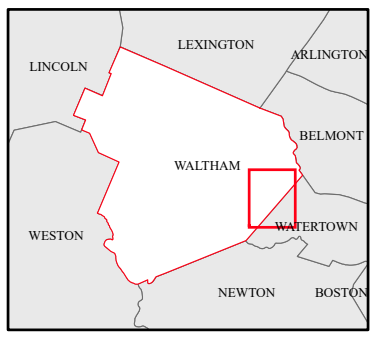
Statewide datalayers used in preparation of this plan are maintained by the Massachusetts Bureau of Geographic Information (MassGIS). City-specific datalayers used in preparation of this plan are maintained by the City of Waltham and its contractors. This document is provided for convenience and informational purposes only and may contain outdated or inaccurate data. The City of Waltham makes no claims, no representations, and no warranties, express or implied, concerning the validity (express or implied), the reliability or the accuracy of the information provided herein, including the implied validity of any uses of such data.

OF-528	OF-529
23-Sep-2020	23-Sep-2020
13390	18.9
ND (<0.02)	ND (<0.02)
2.88	2
0.163	0.09
0.16	0.18

OF-109
23-Sep-2020
517.21
ND (<0.02)
0.075
0.025
ND (<0.05)

IMC-7
23-Sep-2020
11.87
ND (<0.02)
0.091
0.786
ND (<0.05)

IMC-8
23-Sep-2020
1986.29
ND (<0.02)
0.084
0.052
ND (<0.05)



PARE CORPORATION
CELEBRATING 50 YEARS

ENGINEERS - SCIENTISTS - PLANNERS
8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02865
401-334-4100

CITY OF WALTHAM, MASSACHUSETTS
ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM

DEPARTMENT OF PUBLIC WORKS
WALTHAM, MA 02451

FIGURE NO. 4G

DRY WEATHER INSPECTION OBSERVATIONS FALL 2020

PROJECT NO.: 20104.00
DATE: 01/07/2021
SCALE: 1:6,000

Legend

Outfalls Inspected by Pare
- Dry
- Submerged
- Flowing

Stormwater Infrastructure
- Drain Manholes
- Stormwater Catch Basins
- Drywell
- Leaching Pit
- Outfalls
- Oil/Water Separator
- Water Quality Indicator
- Outlet Control Structure
- Cleanouts

Stormwater Infrastructure
- Catch Basin Lateral
- Foundation Drain
- Gravity Main
- Roof Drain
- Trench Drain
- Under Drain
- Culverts
- Detention Basins

Hydrologic Features
- Perennial Stream
- Intermittent Stream
- Pond, Lake, Ocean
- Wetland
- Salt Wetland

0 125 250 500 750 1,000 Feet

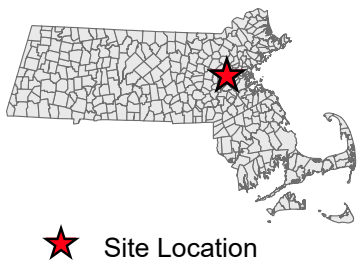
Analytical Key:

Analytical Method	Outfall ID	OF-9
	Sample Date	23-Sep-2020
E. coli (col/100ml)		4.13
Tot. Res. Chlorine (mg/l)		0.23
Nitrogen Ammonia (mg/l)		0.164
Total Phosphorus (mg/l)		0.147
MBAS (mg/l)		0.06

Class of receiving waterbody
Blue = Class A
Not Highlighted = All other classes

← Exceeds benchmark value

← Exceeds TMDL

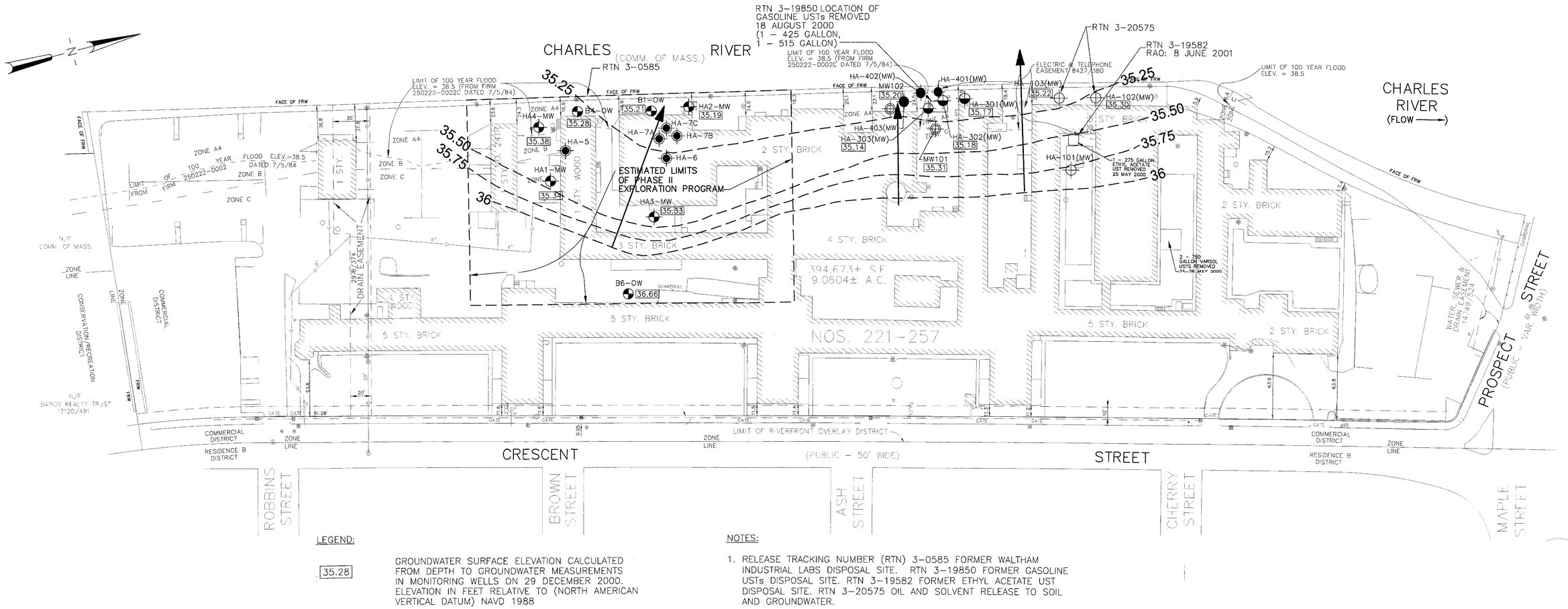


★ Site Location

Statewide datalayers used in preparation of this plan are maintained by the Massachusetts Bureau of Geographic Information (MassGIS). City-specific datalayers used in preparation of this plan are maintained by the City of Waltham and its contractors. This document is provided for convenience and informational purposes only and may contain outdated or inaccurate data. The City of Waltham makes no claims, no representations, and no warranties, express or implied, concerning the validity (express or implied), the reliability or the accuracy of the information provided herein, including the implied validity of any uses of such data.

ATTACHMENT 1

HISTORICAL SITE PLANS OF WALTHAM WATCH FACTORY



LEGEND:

FRW FIELDSTONE RETAINING WALL
CATCH BASIN
DRAIN MANHOLE
MISC. MANHOLE
EXISTING MONITORING WELL
SEWER MANHOLE
WATER GATE

UNDERGROUND UTILITIES

-D- DRAIN LINE (UNDERGROUND)
-G- GAS LINE (UNDERGROUND)

RECORD OWNER:
THE FIRST REPUBLIC CORPORATION OF AMERICA
DEED BOOK 9924 PAGE 502

REFERENCES:
MIDDLESEX SOUTH REGISTRY OF DEEDS
PLAN BOOK II PLAN 49 PLAN BOOK 164 PLAN 33
PLAN BOOK III PLAN 24 PLAN 169 OF 1898
CITY OF WALTHAM
ASSESSORS MAP 68 & 76

NOTE:
ALL ELEVATIONS REFER TO NAVD OF 1988
BENCH MARK USED CR71 ELEV. = 47.74

35.28 GROUNDWATER SURFACE ELEVATION CALCULATED FROM DEPTH TO GROUNDWATER MEASUREMENTS IN MONITORING WELLS ON 29 DECEMBER 2000. ELEVATION IN FEET RELATIVE TO (NORTH AMERICAN VERTICAL DATUM) NAVD 1988

35.50 ESTIMATED GROUNDWATER SURFACE ELEVATION CONTOUR, 29 DECEMBER 2000

APPROXIMATE DIRECTION OF GROUNDWATER FLOW

B1-OW DESIGNATION AND LOCATION OF MONITORING WELL INSTALLED AT FORMER WALTHAM INDUSTRIAL LABS DISPOSAL SITE BY GUILD DRILLING CO. AUGUST 1984 (RTN 3-0585)

HA1-MW DESIGNATION AND LOCATION OF MONITORING WELL INSTALLED AT FORMER WALTHAM INDUSTRIAL LABS DISPOSAL SITE BY NEW HAMPSHIRE BORING 17-18 JULY 2000 (RTN 3-0585)

HA-101(MW) DESIGNATION AND LOCATION OF MONITORING WELL INSTALLED DURING ASSESSMENT-ONLY IMMEDIATE RESPONSE ACTION (IRA) FOR ETHYL ACETATE UST DISPOSAL SITE (RTN 3-19582) BY NEW HAMPSHIRE BORING DURING PERIOD 15-18 DECEMBER 2000

MW101 DESIGNATION AND LOCATION OF MONITORING WELL INSTALLED FOR OTHERS (RANSOM ENVIRONMENTAL) BY GEOLOGIC, INC. AUGUST 1994. TO BE UTILIZED DURING ASSESSMENT OF RTN 3-19850

HA-6 DESIGNATION AND LOCATION OF SUBSURFACE EXPLORATION (TEST BORING ONLY) CONDUCTED INDOORS ON 21, 22 OCTOBER 2000 BY GUILD DRILLING COMPANY

HA-301(MW) DESIGNATION AND LOCATION OF MONITORING WELL INSTALLED DURING ASSESSMENT-ONLY IMMEDIATE RESPONSE ACTION (IRA) FOR GASOLINE UST DISPOSAL SITE (RTN 3-19850) BY NEW HAMPSHIRE BORING DURING PERIOD 15-18 DECEMBER 2000

HA-403(MW) DESIGNATION AND PROPOSED LOCATION OF SUBSURFACE EXPLORATION AND MONITORING WELL TO BE INSTALLED DURING PHASE II-COMPREHENSIVE SITE ASSESSMENT RTN 3-19850

NOTES:

1. RELEASE TRACKING NUMBER (RTN) 3-0585 FORMER WALTHAM INDUSTRIAL LABS DISPOSAL SITE. RTN 3-19850 FORMER GASOLINE USTs DISPOSAL SITE. RTN 3-19582 FORMER ETHYL ACETATE UST DISPOSAL SITE. RTN 3-20575 OIL AND SOLVENT RELEASE TO SOIL AND GROUNDWATER.
2. BASE PLAN ADAPTED FROM "PLAN OF LAND NOS. 221-259 CRESCENT STREET, WALTHAM, MASS." PREPARED BY THE BSC GROUP, INC. 425 SUMMER STREET, BOSTON, DATED 20 MARCH 2000, REVISED 4 MAY 2000.
3. LEVEL OF CHARLES RIVER AT THIS LOCATION IS CONTROLLED BY THE MOODY STREET DAM. GROUNDWATER FLOW DIRECTION MAY VARY WITH RIVER LEVEL.

0 40 80 120 160 200
SCALE IN FEET

HALEY & ALDRICH

UNDERGROUND ENGINEERING & ENVIRONMENTAL SOLUTIONS

PHASE II-COMPREHENSIVE SITE ASSESSMENT
SUPPLEMENTAL SCOPE OF WORK
WALTHAM INDUSTRIAL LABS
225 CRESCENT STREET
WALTHAM, MASSACHUSETTS
RTN 3-0585

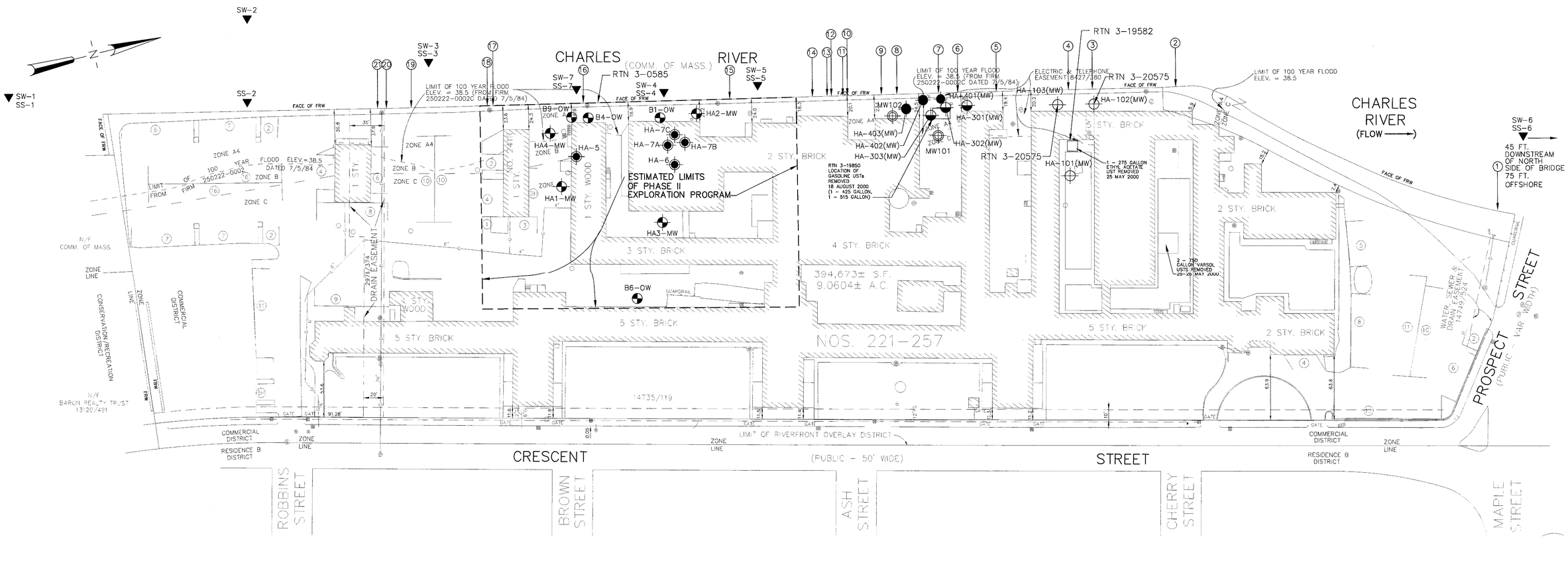
GROUNDWATER SURFACE ELEVATION CONTOUR PLAN

SCALE: AS SHOWN

OCTOBER 2001

FIGURE 4

05750-102 E40



LEGEND:

FRW FIELDSTONE RETAINING WALL
CB CATCH BASIN
DM DRAIN MANHOLE
MH MISC. MANHOLE
EMW EXISTING MONITORING WELL
SMH SEWER MANHOLE
WG WATER GATE

UNDERGROUND UTILITIES
-D- DRAIN LINE (UNDERGROUND)
-G- GAS LINE (UNDERGROUND)

RECORD OWNER:
THE FIRST REPUBLIC CORPORATION OF AMERICA
DEED BOOK 9924 PAGE 502

REFERENCES:
MIDDLESEX SOUTH REGISTRY OF DEEDS
PLAN BOOK II PLAN 49 PLAN BOOK 164 PLAN 33
PLAN BOOK III PLAN 24 PLAN 169 OF 1898
CITY OF WALTHAM
ASSESSORS MAP 68 & 76

NOTE:
ALL ELEVATIONS REFER TO NAVD OF 1988
BENCH MARK USED CR71 ELEV. = 47.74

LEGEND:

B1-OW DESIGNATION AND LOCATION OF MONITORING WELL INSTALLED AT FORMER WALTHAM INDUSTRIAL LABS DISPOSAL SITE BY GUILD DRILLING CO. AUGUST 1984 (RTN 3-0585)

HA1-MW DESIGNATION AND LOCATION OF MONITORING WELL INSTALLED AT FORMER WALTHAM INDUSTRIAL LABS DISPOSAL SITE BY NEW HAMPSHIRE BORING 17-18 JULY 2000 (RTN 3-0585)

HA-101(MW) DESIGNATION AND LOCATION OF MONITORING WELL INSTALLED DURING ASSESSMENT-ONLY IMMEDIATE RESPONSE ACTION (IRA) FOR ETHYL ACETATE UST DISPOSAL SITE (RTN 3-19582) BY NEW HAMPSHIRE BORING DURING PERIOD 15-18 DECEMBER 2000

MW101 DESIGNATION AND LOCATION OF MONITORING WELL INSTALLED FOR OTHERS (RANSOM ENVIRONMENTAL) BY GEOLOGIC, INC. AUGUST 1994. TO BE UTILIZED DURING ASSESSMENT OF RTN 3-19850

HA-6 DESIGNATION AND LOCATION OF SUBSURFACE EXPLORATION (TEST BORING ONLY) CONDUCTED INDOORS ON 21, 22 OCTOBER 2000 BY GUILD DRILLING COMPANY

HA-301(MW) DESIGNATION AND LOCATION OF MONITORING WELL INSTALLED DURING ASSESSMENT-ONLY IMMEDIATE RESPONSE ACTION (IRA) FOR GASOLINE UST DISPOSAL SITE (RTN 3-19850) BY NEW HAMPSHIRE BORING DURING PERIOD 18-19 DECEMBER 2000

HA-403(MW) DESIGNATION AND PROPOSED LOCATION OF SUBSURFACE EXPLORATION AND MONITORING WELL TO BE INSTALLED DURING PHASE II-COMPREHENSIVE SITE ASSESSMENT RTN 3-19850

APPROXIMATE LOCATION OF OUTFALL IDENTIFIED IN FIELDSTONE RETAINING WALL FROM BOAT OCTOBER 2000. NUMBER DESIGNATION REFERS TO DESCRIPTION OF OUTFALLS PROVIDED IN TABLE IX OF THE PHASE II-COMPREHENSIVE SITE ASSESSMENT SUPPLEMENTAL SCOPE OF WORK. (ARROW POINTS TO LOCATION OF OUTFALL FLUSH WITH FIELDSTONE RETAINING WALL FACE)

DESIGNATION AND LOCATION OF SURFACE WATER (SW) AND SEDIMENT (SS) SAMPLES COLLECTED FROM CHARLES RIVER BY HALEY & ALDRICH, INC. ON 12-16 OCTOBER 2000

NOTES:

1. RELEASE TRACKING NUMBER (RTN) 3-0585 FORMER WALTHAM INDUSTRIAL LABS DISPOSAL SITE. RTN 3-19850 FORMER GASOLINE USTs DISPOSAL SITE. RTN 3-19582 FORMER ETHYL ACETATE UST DISPOSAL SITE. RTN 3-20575 OIL AND SOLVENT RELEASE TO SOIL AND GROUNDWATER.
2. BASE PLAN ADAPTED FROM "PLAN OF LAND NOS. 221-259 CRESCENT STREET, WALTHAM, MASS." PREPARED BY THE BSC GROUP, INC. 425 SUMMER STREET, BOSTON, DATED 20 MARCH 2000, REVISED 4 MAY 2000.

HALEY & ALDRICH

PHASE II-COMPREHENSIVE SITE ASSESSMENT
SUPPLEMENTAL SCOPE OF WORK
WALTHAM ENGINEERING CENTER
225 CRESCENT STREET
WALTHAM, MASSACHUSETTS
RELEASE TRACKING NO. 3-0585

SEDIMENT AND SURFACE WATER SAMPLE LOCATION PLAN

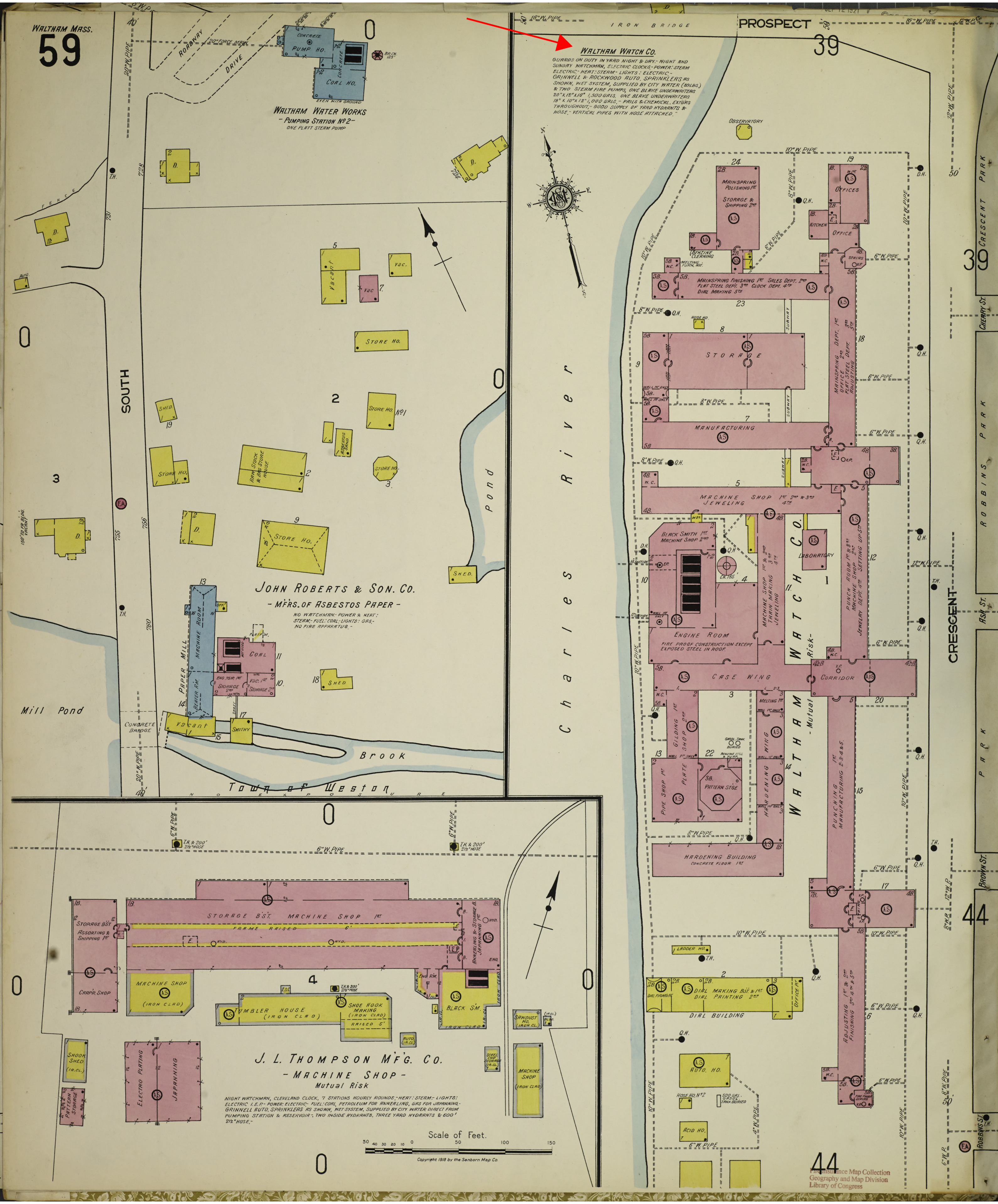
UNDERGROUND ENGINEERING & ENVIRONMENTAL SOLUTIONS

SCALE: AS SHOWN

OCTOBER 2001

FIGURE 5

05750-103 E33



Waltham Mass.
59
Waltham Water Works
- Pumping Station No 2 -
One Platt Steam Pump
Pump Ho.
Coal Ho.
Roadway
Drive
South
Iron Bridge
Prospect
39
Waltham Watch Co.
Guards on duty in yard night & day.- Night and Sunday watchman, electric clocks.- Power: steam electric.- Heat: steam.- Lights: electric.- Grinnell & Rockwood auto. sprinklers as shown, wet system, supplied by city water (89 lbs.) & two steam fire pumps, one Blake Underwriters 20"x12"x16" 1,500 gals. one Blake Underwriters 18"x10"x12" 1,000 gals.- Pails & chemical. extgrs throughout.- Good supply of yard hydrants & hose.- Vertical pipes with hose attached.-
Observatory
Offices
Mainspring Polishing 1st
Storage & Shipping 2nd
Mainspring Finishing 1st Sales Dept. 2nd Flat Steel Dept. 3rd Clock Dept. 4th Dial Making 5th
Storage
Manufacturing
Machine Shop 1st 2nd & 3rd Jewelling 4th
Black Smith 1st Machine Shop 2nd
Engine Room
Fire proof construction except exposed steel in roof
Laboratory
Case Wing
Corridor
Pattern Stge
Hardening Building
Concrete floor 1st
Punching 1st Manufacturing 2.3.4.&5.
Adjusting 1st & 2nd Finishing 3rd 4th & 5th
Dial Making Bst & 1st Dial Painting 2nd
Dial Building
Auto. Ho.
Acid Ho.
Ladder Ho.
Waltham Watch Co. - Mutual Risk -
Charles River
Crescent
Robbins Park
Crescent Park
Cherry St.
Ash St.
Brown St.
Robbins St.
44
John Roberts & Son. Co.
- M'f'rs. of Asbestos Paper -
No watchman.- Power & heat: steam.- Fuel: coal.- Lights: gas.- No fire apparatus.-
Paper Mill
Machine Room
Store Ho.
Shed
Smithy
Vacant
Pond
Mill Pond
Brook
Concrete Bridge
Town of Weston
J. L. Thompson M'f'g. Co.
- Machine Shop -
Mutual Risk
Night watchman, Cleveland clock, 7 stations hourly rounds.- Heat: steam.- Lights: electric I.E.P.- Power: electric.- Fuel: coal, petroleum for annealing, gas for japanning.- Grinnell auto. sprinklers as shown, wet system, supplied by city water direct from pumping station & reservoir.- Two inside hydrants, three yard hydrants & 600' 2½" hose.-
Storage B'st. Machine Shop 1st
Storage Assorting & Shipping 1st
Carpin Shop
Machine Shop (Iron Clad)
Tumbler House (Iron Clad)
Shoe Hook Making (Iron Clad)
Black Sm.
Electro Plating
Japanning
Shook Shed
Sawdust Ho.
Scale of Feet.
50 40 30 20 10 0 50 100 150
Copyright 1918 by the Sanborn Map Co.
Sanborn Fire Insurance Map Collection
Geography and Map Division
Library of Congress

City of Waltham, MA
EPA IDDE Program Six Month Look-Ahead Schedule
January 2021

Construction Work Packages	January	February	March	April	May	June
Construction Jennings Road 100% Design Plans Completed - Estimated to Begin Spring 2021			ADVERTISE	FUNDING		CONSTRUCTION
IDDE Program Coordinator	**January**	**February**	**March**	**April**	**May**	**June**
Task 1-Junction Manhole Sampling						
Task 2-Investigation of Priority Outfall Tirbutary Areas			Develop Scope of Work and Contract Finalization			IDDE Work to Begin
Task 3-DEP/EPA Reporting						

Notes: Follow-up sampling will continue as needed to identify IDDE sources