

City of
Fitchburg



Department of
Public Works

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February 28, 2018

U. S. Environmental Protection Agency, Region 1
5 Post Office Square, Suite 100
Mail code OES04-04
Boston, Massachusetts 02109-3912
Attn: Neil Handler

Massachusetts D.E.P., CERO
8 New Bond Street
Worcester, MA 01606
Attn: David Boyer

Subject: Semi-Annual Progress Report
August 2017 – January 2018 Reporting Period
Consent Decree, IX. REPORTING, Paragraph 70

Dear Mr. Handler and Mr. Boyer,

In accordance with Section VII, paragraph 70 of the Remedial Measures of the Consent Decree (Decree) signed by Fitchburg's Mayor on June 1, 2012, this submission provides EPA and the MassDEP with a report on the City's compliance with Section VII during the preceding six months (August 2017 thru January 2018 Reporting Period) as described by Paragraph 70.

The report organization structure is formatted to separately address each relevant section, as it appears in the decree, and includes all pertinent attachments.

As requested in the February 2013 thru July 2013 Reporting Period, the City is not including a GIS map of water resources and topographic features, as the data contained therein has not changed from the original GIS mapping submission and will not likely change in the foreseeable future. In the event there are significant changes in either water resources or topography, the City shall provide GIS mapping submission reflecting those changes in that reporting period's submission with narrative explanation of said changes. In this Semi-Annual Progress Report, the City is including an updated "Base Map" GIS map (Map 1 of 4) of parcel & roadways data and municipal boundaries. In the event there are significant changes in either property parcels divisions or roadways data (most likely due to property subdivision and development), the City shall provide GIS mapping submission reflecting those changes in that reporting period's submission with narrative explanation of said changes.

GIS maps updates, hard copies will be provided together with a printed copy of this report, via U.S. mail. GIS maps updates will also be provided with the electronic submissions (via email) of this report.

Semi-Annual Progress Report August 2017 through January 2018 Reporting Period

A. SEWER SYSTEM

Staffing

During the reporting period, the Collection System Team was operating at a reduced capacity, with a team of four operators, instead of the full complement of six operators. The team has been operating in this reduced capacity since February 2017. During the 6-month reporting period, no changes to the team have occurred. Operating in this reduced capacity, one team is typically fielded each day to conduct CMOM work, structural improvements to the system, or sewer meter maintenance. The City is expected to settle and approve a collective bargaining contract with the Local 39 Laborer's union, of which the Collection System Team are members of that labor bargaining unit. The City expects to fill the two vacant positions on the Collection System Team as the Summer season approaches.

Within the reporting period the DPW Business Manager left the City, vacating the position. This important position, who provides support to the DPW Wastewater Division on accounting, finance, and planning matters, and with improved operational efficiencies, was advertised by the City at the end of the reporting period, and the City will be interviewing applicants in March 2018. Additionally, this position assists in pursuing and securing alternative financing opportunities to help mitigate cost burden and impacts to the Wastewater Enterprise's rate payers.

Long-Term Sewer System Preventative Maintenance Plan

The City's Long-Term Sewer System Preventative Maintenance Plan, submitted in January 2012, has been distributed to all collection system operators and copies are maintained in each vehicle for quick reference. This document is a "living/breathing document", and was most recently updated and submitted to the MassDEP and the EPA in March 2017.

Priority Cleaning Plan

The City's Priority Cleaning Plan, submitted in January 2012, has been distributed to all collection system operators and copies are maintained in each vehicle for quick reference. This document is a "living/breathing document", and was most recently updated and submitted to the MassDEP and the EPA in March 2017.

Routine Cleaning Plan

The City's Routine Cleaning Plan, submitted in January 2012, has been distributed to all collection system operators and copies are maintained in each vehicle for quick reference. This document is a "living/breathing document", and was most recently updated and submitted to the MassDEP and the EPA in March 2017.

Geographical Information Systems (GIS) Maps

Three maps were updated for this semi-annual report.

- 1.) Base Map: The base map is not included in this submission, as it has not changed since the map was previously submitted in the August 2017 Reporting Period.
- 2.) Infrastructure – 1: The City’s sewer system is shown including combined and separated sewers along with pipe sizes and materials. Regulator manholes, combination manholes, and standard sewer manholes are also shown. Lastly, the City is continuing to acquire sewer rim elevations with its Leica GPS unit. To date we have located 98.55-percent of all sewer manholes. These locations are shown. The next reporting period will include updated locations for the Beech Street/Hazel Street Sewer Separation Project.
- 3.) Infrastructure – 2: This map depicts record drawing storm drain data including the City’s current GPS shots of catch basins and drain manholes. We will continue to locate drain structures but the Wastewater Division’s main concentration will be to locate all sewer related infrastructure. As part of the City’s MS4 Program, a more aggressive location program will be conducted by the Engineering Division.
- 4.) Extraneous Flow Investigation, Remediation, and Capital Improvement Projects: This map includes sewer projects that have been accomplished within the reporting period and projects that are planned following the reporting period. During the reporting period the City completed all field work on Phase II of its Sewer System Evaluation Survey except for 15 manhole inspections, completed the Beech and Hazel Street Area Sewer Separation Project, and additional 15 combination manhole separations. The locations of the manhole separations are noted on the map.

The “Base Map”, Map 1 of 4, which has been omitted from this submission, has been reserved for future updating, as required, and Maps 2 thru 4 (Infrastructure – 1 thru Extraneous Flow Investigation, Remediation, and Capital Improvement Projects) have retained their prior sheet enumeration.

Other activities include numerous sewer repair projects. Also, contained on this “Extraneous Flow Investigation, Remediation, and Capital Improvement Projects” map (Map 4 of 4) is the City’s current status of its sewer cleaning and CCTV program. Pipes are color coded based on their condition rating.

The City is working diligently to separate its combined sewers. In early 2013 the City reported 71,097 feet of combined sewer pipe in its system. As of the close of this reporting period, the City has a total remaining combined sewer length of approximately 44,724 feet.

Capacity, Management, Operation & Maintenance (CMOM) Related Activities, and GIS Maps

The collection operators continue to make progress with CCTV inspections and condition coding all 142 miles (approximate length) of sewer pipe within the City. By the close of the reporting period, the City had condition coded 85.1% of its sewer system. Production has slowed somewhat on CCTV operations, as the vast majority of pipes remaining to be coded are difficult to access easements, egg shaped pipes, 6-inch diameter pipes, the main interceptor sewer, or odd shaped brick pipes. Numerous manholes were also inspected during this reporting period. During spot repair operations CCTV operations are suspended, due to the staffing need for more crew members to conduct the repairs.

As the majority of the remaining sewers to be inspected are outside of the City's capabilities to inspect, the City is in the process of outsourcing this work. During the reporting period, the City inspected 10,878 feet of its 37,000 foot trunk sewer using multi-sensor inspection, starting at the West WWTF. The multi-sensor inspection included TV, Sonar, and Radar, in order to assess pipe ovality, concrete loss, and sediment depth. Data from the inspection is being post-processed by the City's engineer, and will be provided this spring with improvement recommendations. The City plans to conduct additional inspection of its trunk sewer in the next reporting period. In addition to the below tabulation of sewers cleaned and CCTV'd to date, a graphical representation of the progress on this effort is attached to this report.

The following includes the cleaning and CCTV status of the City's 24 sub-watershed areas.

SEWER MAIN INSPECTION TOTAL LENGTH INSPECTED TO JANUARY 31, 2018			
Area Number	Total Cleaned and CCTV'd (LF)	Total Sewer Pipe (LF)	Area Percent Completed
1	28,174	54,411	51.78%
2	17,944	20,606	87.08%
3	37,515	48,603	77.19%
4	32,594	42,970	75.85%
5	24,047	31,017	77.53%
6	13,823	18,713	73.87%
7	15,083	17,423	86.57%
8	23,165	23,916	96.86%
9	21,038	25,065	83.93%
10	12,231	19,429	62.95%
11	26,204	28,321	92.52%
12	19,392	20,328	95.40%
13	32,674	40,656	80.37%
14	31,382	32,367	96.96%
15	30,300	31,520	96.13%
16	29,304	30,896	94.85%
17	27,492	39,640	69.35%
18	49,216	51,201	96.12%
19	18,444	19,892	92.72%
20	43,391	45,389	95.60%
21	24,975	25,222	99.02%
22	44,172	44,497	99.27%
23	16,439	17,492	93.98%
24	17,394	18,656	93.24%
Totals in Feet	636,393	748,230	85.1%
Totals in Miles	120.5	141.7	85.1%

The following table summarizes manhole inspections to date:

CITY & WRIGHT-PIERCE SEWER MANHOLE INSPECTION TOTALS			
Inspected by	Total Inspected	Total Manholes	Percent of Inspections Completed
City of Fitchburg	432	3,586	12.05%
Overlap (manholes inspected by both City and Wright-Pierce)	92	3,586	2.57%
Wright-Pierce	1,533	3,585	42.76%
Inspection Totals	2,011	3,585	56.1%

The table above includes both City-inspected manholes, as well as past inspections performed by the City's engineer (Wright-Pierce), that was conducted in conjunction with past projects, including CSS 4D, the field investigative work associated with the hydraulic model development and the SSES Phases I and II, and with the Beech and Hazel Streets Sewer Separation Project. Between both the City's Engineer, and the City's in-house forces, 56.1% of manholes have been inspected.

During the previous reporting period, the City upgraded its CCTV/Condition coding software from GraniteXP to GraniteNET. With the purchase of the new camera van system, the City was eligible to upgrade to the newest CCTV software provided by CUES for a few thousand dollars. The City also purchased a tablet and GraniteNET Manhole Module package, to inspect sewer manholes, logging manholes inspection data with a tablet mobile device.

As stated above, the City's Engineering Consultant (Wright-Pierce) has inspected hundreds of manholes for various projects and SSES work. The City and its consultant have encountered some difficulty transferring the manhole inspection data from the Consultant's software to the City's GraniteNET system, however it is anticipated that during the next reporting period this will be completed. In the interim, the City has all the paper manhole inspections in electronic format. The City is also requiring that all additional manhole inspections and pipe inspection work conducted in the City are in GraniteNET format, to enable seamless data transfer to the City's database.

Global Positioning Satellite (GPS) System Update

Among other assets, the City is locating all of its sewer manhole, drain manholes and catch basins with its Leica GPS unit. To date the City has located the following assets:

- 3,534 sewer manholes out of 3,586 (From record drawings) – 98.55% completed.
- 1,833 drain manholes (out of an unknown total).
- 3,520 catch basins (out of an unknown total).
- 110 Sewer Laterals
- 474 other asset types.

The City's gas company, Unitil, has been CCTV'ing sewer laterals in natural gas project areas, in order to reduce damage to private sewer laterals. As part of these investigations, Unitil marks out the locations of the sewer laterals. The City has been following Unitil and locating the service laterals with the City's GPS, in order to update and improve the City's sewer system map. During

the last reporting period no additional laterals were marked out, however with the upcoming construction season additional laterals will be marked out.

Service Call Activities

The Collection Operators have been performing service calls for system users with blocked service laterals. Often the problem is a private matter, as sewer service laterals are private ownership (not City-owned) and the City is not responsible for blockages in private sewer laterals. Nonetheless, the City responds to all calls to determine the cause for the blockage because the cause of a problem for a service call is unknown until the City can investigate the call. Manholes in the street are inspected for surcharging. Inspection frequently includes cleaning the line where the private lateral enters blindly into the public sewer and occasionally includes CCTV'ing the line to look up the private lateral for blockages. If the issue is a private ownership issue, the City will inform the customer that a private infrastructure issue exists and the customer should call a private sewer service or plumbing company.

Following a response to a service call, the collection operators fill out a Service Call Inspection Form which is then inputted in to the City's call-logging software, "See-Click-Fix". SeeClickFix creates a record of the service call including the issue, the date and time, the name and address of the customer, the details of the request and notes on how the matter was handled. If work was performed at the site, SeeClickFix allows entry of who performed the work, and what time the work was completed. The major benefit of SeeClickFix is the ability for residents and business owners to interact with City officials. Constituents can initiate an issue, can see that the City has responded to an issue, and see when an issue is resolved. Also included is a commenting feature which allows residents to express additional information on an issue.

To date, our experience with the SeeClickFix system has been useful in creating an electronic tracking system of service calls.

Asset Management

Recently, the DPW Wastewater Division adopted the "Asset Management" philosophy and approach to sustain levels of service, while minimizing risk of failure and the corresponding consequence of failure that could result from the failure of a City wastewater infrastructure asset. This methodology will go hand-in-hand with capital planning and financial sustainability of the Wastewater Enterprise, and will help to prioritize and focus the financial resources towards the renewal of assets.

At the end of the reporting period, the City received its final asset management model, built on the InfoMaster platform by Innovyze. The model will be a focal point for the City going forward in prioritizing its management and rehabilitation of the collection system.

Beech and Hazel Streets Sewer Separation Project

The Hazel Street Separation Project was conceptualized as the result of the closure of CSO-036 at 98 Laurel Street, and possibly CSO-007 at Riverfront Park. When the Contractor closed CSO-036 during the Summer of 2013, as part of the CSS 2B, 3C and CSO 038 Modifications Project, the City experienced an SSO at this site shortly thereafter. The City investigated this matter and discovered 13 additional catch basins in the Hazel Street area, upstream and tributary to CSO-036, tied into the

system. The 12-inch pipe at the CSO regulator did not have the capacity to convey the combined flow.

Due to time availability constraints of in-house staff, the City contracted Wright-Pierce to design, bid, and provide construction phase services for sewer separation within the Hazel Street area and Beech Street area. Upon Wright-Pierce's initial investigations in the previous reporting period, they identified the Hazel Street area separation might be larger than initially assumed. Wright-Pierce determined that numerous additional areas of combined sewer contributed to the CSO-036 catchment area. These areas consisted of combined sewer on Wilson Street, Pratt Road, and Hazel Street.

During the current reporting period, the Contractor completed the project in its entirety. Regulator 036 was closed on May 25, 2017. The combined sewer separation on Beech Street was completed at the end of August 2017.

Intermittent Stream Connections to Sewer

The Hazel Street Separation Project was conceptualized as the result of the closure of CSO-036 at 98 Laurel Street. When the Contractor closed CSO-036 during the Summer of 2013, as part of the CSS 2B, 3C and CSO 038 Modifications Project, the City experienced an SSO at this site shortly thereafter. The City investigated this matter and discovered 13 additional catch basins in the Hazel Street area, upstream and tributary to CSO-036, tied into the system. The 12-inch pipe at the CSO regulator did not have the capacity to convey the combined flow.

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During the current reporting period, the Contractor completed the project in its entirety. Regulator 036 was closed on May 25, 2017. The combined sewer separation on Beech Street was completed at the end of August 2017.

Meter Maintenance

The City has been maintaining its 13 flow meters located at regulator manholes throughout the reporting period. Current meters include 13 ADS Triton Flow meters. The two tables below include the reporting period's summary of overflows. The reporting period is from August 1, 2017 to January 31, 2018. In accordance with Paragraph 70, Subparagraph d. of the Consent Decree, the City recorded 74 CSO events and total overflow volume of 5,757,759 total gallons. At the risk of penalty, the City certifies that it has performed all calculations in good faith. Additional data shown in Table 1 includes notes on whether or not the meter was malfunctioning for a time during the reporting period. During the reporting period, the City had good meter coverage, with some meters experiencing 100% uptime.

Table 1 - Overflow Data for Reporting Period August 1, 2017 to January 31, 2018

Meter	Location	Events	Volume (Gallons)	Notes:
CSO-004	Cleghorn St. at Oak Hill Road	3	20,000	Meter data quality issues during second half of reporting period
CSO-007	Cushing St. at Riverfront Park	0	0	Possible closure during next reporting period. No known combined sewer upstream.
CSO-010	Main St. at River St.	12	906,000	
CSO-032	543 Main St. at Post Office	15	759,000	
CSO-039	Water St. at Walnut St.	10	679,000	Next combined sewer area to be targeted for separation due to bridge replacement at regulator. Meter failed during large rain event.
CSO-041	Benson Rd. near Falulah St.	2	Unknown	Meter depth levels do not appear to correspond to overflow events, will change configuration of meter sensor
CSO-45	Main St. at Oliver/Putnam St.	13	1,348,000	Only partial volume captured during first half of period due to one meter malfunctioning.
CSO-048	85 Water St.	1	525	No known combined sewer upstream. Cleaning of upstream combination manhole may have reduced CSOs.
CSO-064	Water St. Easement at former "Halloween World"	10	1,451,579	Regulator on main interceptor sewer. Inflow removal upstream necessary for closure. Data drop-out during largest rain event.
CSO-076	Birch St. at Heywood St.	5	439,000	Pipe undersized, and suspected high I/I in contributory area. No known combined sewer upstream.
CSO-83	Main St. at Prichard St.	3	154,655	Intermittent data quality issues
Totals		74	5,757,759	

The City has also been servicing the meters on a roughly 1-month frequency to help in maintaining high data quality. At times the meter manufacturer (ADS Environmental Services) has conducted visits to the City to troubleshoot problematic meters.

During the next reporting period, the City will be working with ADS in an effort to provide better public notification for CSO Events. The technology to provide accurate and instant notification of CSOs is in its infancy, leading the City to explore multiple options for better notification.

Sewer Structural Repairs

During the reporting period, the City conducted numerous spot repairs to strengthen the structural integrity of its sewer system. The spot repairs conducted were:

- Replacement of 10-linear feet of a severely deteriorated 6-inch diameter line on Woodworth Street.

- Replacement of 8-linear feet of an 8-inch diameter clay pipe on Jerry Street to prevent SSOs.
- Replacement of 50-linear feet of a 24-inch diameter clay pipe on Daniels Street due to a collapse of the pipe.
- Replacement of 20-linear feet of an 8-inch diameter line on Bond Street due to a pipe collapse from new water main installation. A new manhole was also added to allow access to the line on Crescent Heights.
- Installation of a new manhole on a stub line on Olin Drive to provide access to the line, and prevent SSOs.

Other collection system repair improvements performed in the period include:

- Replacement of 18 frames and covers that were defected or contained vent holes.
- Removal of one catch basin on Orange Street that was entering the sanitary system.

Post Construction Monitoring Plan

In late May 2016, the City was approved to proceed with the Post-Construction Monitoring Plan (PCMP) field sampling program. The requested and received an extension from MassDEP and EOA to extend the performance of PCMP sampling, as working hours, lab hours, and timeliness of events limits the time available to sample a wet weather event to only 4 or 5 hours a day. The City finished the final wet weather sampling within calendar 2017, such that the Post-Construction Monitoring Report (PCMR) will be submitted for review and approval (under separate cover) at the end of February 2018.

Emergency Response Plan

The City's Emergency Response Plan, submitted in August 2011, and last revised in January 2012, has been distributed to all collection system operators and copies are maintained in each vehicle for quick reference. This document is a "living/breathing document", and was most recently updated and submitted to the MassDEP and the EPA in March 2017.

Hydraulic Model

As required under Paragraphs 41 through 46 of the Consent Decree, the City is required to develop a hydraulic model for all pipes in the City 12-inches and larger, and for all CSOs. During the previous reporting period, the City received and responded to comments from both MassDEP and the EPA on its draft Hydraulic Model report. During the next reporting period, the City's consultant plans to conduct additional model analysis, based off comments from the EPA on the draft report. It is anticipated that the final model report will be submitted within the next reporting period for full approval from MassDEP and the EPA, and allow the City to continue with commencing the *Capacity Assessment* (Paragraph 47) requirement in the Consent Decree.

Sewer System Evaluation Survey

As required under Paragraphs 26 and 27 of the Consent Decree, the City was required to submit a SSES Scope of Work (SOW) for approval, to conduct an SSES in accordance with the approved SSES SOW, and to submit a SSES report for approval by EPA and MassDEP. The City submitted the draft SSES SOW before the December 31, 2015 deadline. The final SSES SOW was submitted to the MassDEP and EPA on August 12, 2016 (the previous reporting period), and there was subsequent electronic correspondence between the City, Wright-Pierce and MassDEP later in the month of

August 2016. However, to date, the City has not received neither a formal approval, nor a conditional approval of the SSES Scope of Work. The City has proceeded forward with the phased SSES investigative work entailed in the SSES Scope of Work. As a strategic deviation, largely due to the criticality of the trunk line sewer asset, the City is prioritizing the investigative work associated with the trunk sewer line ("Phase 4" in the Scope of Work), ahead of the Phase 3 SSES work (meter basins M06, M14, and M18). This trunk line sewer investigative work commenced in during this reporting period as mentioned under the "CMOM" section on Page 3. In addition to being a high priority for the City, the MassDEP requested a portion of the trunk sewer be inspected as part of their SSES Phase 1 comments.

The SSES Phase 1 report was submitted at the end of 2016. Comments from the MassDEP have been received and will be responded to concurrently with any comments the EPA may have.

The SSES Phase 2 work started during the previous reporting period, and is currently on-going. The Phase 2 work is concentrated in meter basins M13, M6, M14, and M20. The draft report will be submitted in the next reporting period. A small number of manhole inspections remain to be completed.

Combination Manholes Program

There was four rain events during the reporting period that has met the criteria necessary to perform combination manholes inspections (2-inches in a 24-hour period). One of the rain events (10/26/17) fell on a Wednesday, and the following rain event fell over the weekend. The short duration between the two events did not allow for two city-wide checking of transference, so the two events were combined into one event for transference purposes.

During the reporting period, there were a total of **140 flow transferences** to either the drain side, or sewer side of the manholes. These overflows are taking place in a total of **202 remaining combination manholes**. Attachment 1 includes all combination sewer manhole checks in the remaining combination manholes.

The NPDES permit states that the City has two years to fix CMHs if they show evidence of transference. In the past, the City has prioritized CMHs that transfer sanitary water to the storm drain over CMHs that transfer storm drain water to the sanitary sewer. As a result, the City will first prioritized those manholes that show evidence of transference to the drain side of a manhole. In the past three years however, the City has received multiple prices for separating combination manholes. It has been determined that pricing is very unfavorable when mobilizing and demobilizing multiple times throughout the City to separate manholes. In addition, separating one manhole on a street does not solve transference issues if other combination manholes remain on the same street. In the future, the City plans on prioritizing manholes based on location and concentrating in specific areas to receive better pricing, but also drastically reduce the chance for transference from a specific area. All the remaining manholes have displayed transference and thus have to be separated.

During the reporting period, good progress has been made on separating combination manholes throughout the City. Fifteen manholes have been separated during the reporting period via in-house forces, the City's paving contractor, and the City's On-Call and "Combination Manhole Separation Project" contractor. All manholes separated during the reporting period, and also all manholes planned to be separated during the next reporting period are noted on the "*Extraneous*

Flow Investigation, Remediation, and Capital Improvement Projects” map (Map 4 of 4). Additional manholes are likely to be separated during the next reporting period that are not shown on the map. During the reporting period, the following combination manholes were separated:

CMH No.	Sewer Sub-Area	Location
154	1	Romano/Belmont
19	3	Belmont Street/Capone Street Intersection
54	22	70 Elmwood
305	22	53 England Street
341	21	40 Chabot Drive
342	22	70 England Street
137	22	Oak Hill Road/Elmwood Ave Intersection
188	18	South/Old South
234	3	South St/Fairbanks St Intersection
120	22	57 Maryland Avenue
45	14	18 Charlton Drive
208	15	45 Townsend Street
206	15	Townsend Street /J.F. Highway Intersection
213	15	162 Townsend Street
205	15	Townsend Street /Pearl Street Intersection

The City is in internal discussions of possibly reorganizing its approach to combination manhole separation during the next years. The City has received very favorable pricing under its Chapter 90 Paving Contract, with costs about 50% less, on average, than the current Combination Manhole Separation Contract. In the coming reporting period, the City will likely plan additional separations under this contract this spring if combination manholes are located on roads that will be paved.

The City is also continuing in permit negotiations with the MassDOT Highway Division, as the City is pursuing separating an additional 6 combination manholes on Lunenburg Street (Route 2A) prior to paving of the road by the state. The City planned to conduct these combination manhole separations in this reporting period, however a prolonged review process by MassDOT has delayed this project. MassDOT was not conducive to the City’s method for separation. MassDOT is also considering increasing the drain line size in this area to prevent transference to the sanitary system at a future date. The City anticipates installing temporary measures at the 6 Lunenburg Street manholes to prevent transferences in the interim.

The City also has plans to separate additional combination manholes using DPW crews, many of the combination manholes are shallow in depth, and relatively simple for separation. In the coming reporting period the City expects to make additional progress in separating manholes.

Status of Regulators and Outfalls

The City hopes to be able to close Regulator CSO-007 during the next reporting period, as there are no known combined sewers upstream of Regulator CSO-007, and there was no events during the reporting period.

With the hopeful final completion and acceptance of the sewer system hydraulic model next reporting period, the City intends to utilize the model and upcoming Capacity Assessment Report as

tools in determining how much combined sewer separation and inflow removal work is necessary for closure of each of the remaining regulators.

The next sewer separation area to be targeted is CSO-039, as the Water Street bridge adjacent to the regulator over the Nashua River is being replaced by MassDOT in 2021. The pipe under the bridge is also in poor condition, and CSO-039 is one of the City's most active and troublesome regulators due to its tendency to become clogged with debris and grit.

Sewer Rate Increase

During the current reporting period, the City has developed a rate study model which incorporated estimated expenses in order to further the City's goals in regard to Consent Decree, NPDES Permit and Clean Water Act Compliance. The rate is expected to increase approximately 42% over five years, and be close to (but under) the 2% Medium Household Income threshold for the City.

B. POTW TREATMENT PLANT

Chemically Enhanced Primary Treatment (CEPT) Upgrade Project

As noted in the City's February 2017 Semi-Annual Remedial Measures reporting on this Consent Decree project, we herein and henceforth limit reporting to operational comment updates, as noted in the following paragraph.

Plant operations have maintained a continuous CEPT mode for the plant process (2nd stage) which has not yet gone through the Secondary Systems Upgrades (SSU) Project selector zone installation. For the process that has undergone selector zone installation (1st stage), CEPT has been discontinued as the new selector zone treatment process has been able to maintain significantly greater nutrient removal and has not needed the addition of the CEPT chemicals (Ferric Chloride and Polymer). We are also primarily using polymer to enhance the removal rates at all times. Wet-weather CEPT operations appear to be increasingly effective, and operations staff appear to have addressed process issues that relate to low pH. The overall compliance of the treatment operation appears to be significantly improved but the SSU Project which began on March 3, 2017 requires us to take a portion of our treatment process offline. The reduced treatment process has lowered our treatment capacity but the plant effluent quality this period remains in compliance with the interim 0.5 ppm phosphorus limit.

Secondary Systems Upgrades (SSU) Project

The SSU Project commenced in the previous reporting period, in February 2017.

The City procured the renewal flood insurance policies certificates, as required by the MassDEP - Division of Municipal Services. The policies effective dates run from January 4, 2018 thru January 4, 2019. The policies were through the National Flood Insurance Program, and were for the following buildings within the Easterly Wastewater Treatment Facility:

Chlorination Building Policy No. 8705863123
Blower Building Policy No. 8705863124
Process Building & Primary Gallery Policy No. 8705863125

Through the end of the current reporting period, the SSU Project has progressed to approximately 43% of Substantial Completion (and 36% of Final Completion), and the work completed represents approximately 47% of the construction contract price.

By the SSU Contract's Contract Days, the Project is to be substantially complete within 822 consecutive calendar days, on or before May 15, 2019, and is to be final complete within 974 consecutive calendar days, on or before October 14, 2019.

Long-Term Preventative Maintenance Plan

The Long Term Preventative Maintenance Plan has been implemented and practices and protocols contained therein are being carried out. The system is continually being populated with new systems and equipment as work is being performed in an effort to build a completed history of maintenance procedures.

The plan is also reviewed with any new employees to insure they are familiar with the practice and procedures in the plan.

Preventative maintenance work completed between August 1, 2017 and January 31, 2018 included:

August 2017

- Wet Well Pump – replaced motor bearings and pump rotating element
- #3 Fournier press flocculator – repair poly leak
- 2nd Stage Aeration Basin side 2 – replaced section of broken weir, repair broken diffusers, patch holes in step gates.
- Grit Classifier demo- completed
- Pure air odor Control Tank – painted
- CEPT Hypo Transfer Pump – Sethco Pump failed replaced with diaphragm pump.
- Emergency Generators East and West – serviced.
- High Speed Internet project – Started.
- #1 Vulcan Wash Press – repaired water leak #1 solenoid.
- Manich Polymer Tank – Replaced level probe.
- #8 Aeration Blower – Replaced VFD cooling fan.
- #2 Fournier Press – Replaced air spring #4 cell.
- Gas Trane - Painted
- Sodium Bisulfite pump – replaced motor brushes.
- SSU Upgrade project - ongoing
- Completed 63 Preventative Maintenance work orders and 23 Demand work orders.

September 2017

- #2 Penn Valley Pump – replaced blown gasket in pump.
- #2 Manich Polymer Pump – cleaned check valve on pump, replaced stator, cleared suction line.
- Facility Transformers – Annual oil sampling.
- Main Gas line – Unitil Gas replaced Meter.
- Sludge Galley Sump Pump – clear debris from check valve.
- Wet Well Pump – open pump clear debris.
- #2 Twas Tank – replaced Vaughn pump.
- #2 Caustic Tank CEPT Building – replaced outlet valve.
- CEPT Scissor lift – sandblast and painted.

- High Speed Internet – cable, modem and CAT5 installed.
- Interior Office Lighting – Started LED upgrade.
- Completed 58 preventative maintenance work orders and 27 demand work orders.

October 2017

- Hi-Tech Clarifier – replaced rubber wipers inside and outside skimmer arm, shimmed skimmer support beam.
- Septage dumping station – Cleaned and power washed.
- #1 sampler – moved to head works.
- #3 Primary Basin – changed flight wear shoes, pm clutches, trialng wooden flight.
- #1 GBT Penn Valley Pump – replaced Drive unit.
- Network Phone system upgrade - CAT 5 cabling to offices.
- 2nd Stage Hypo Transfer line – repair leak.
- #1 Vulcan Wash Press – replaced #3 wash valve.
- SSU Weekly & Monthly Meetings
- Headworks Grit Chamber Area – replaced water valve.
- Grit Classifier room – removed concrete bases.
- Completed 60 preventative maintenance work orders and 21 demand work orders.

November 2017

- Main Galley – remove old pump bases, cement room installed new storage rack system for SSU Project Spare parts.
- #1 Primary Basin – replaced wear shoes.
- #2 Primary Basin – replaced wear shoes.
- #2 sludge grinder -replaced cutter pack.
- #3 sampler- replaced pump assembly.
- Fire hydrants front yard – repair broken water line.
- Du-All Odor control system – repaired hypo and caustic leaks.
- Grit Chamber Crane and Plant Hoists – Annual inspections performed.
- 2nd Stage Aeration side #1 Wasting pump – replaced coupling.
- Wet Well Pump – fabricate and install mag clutch base.
- West Plant #1 floc tank – replaced DP cell (level indicating)
- #3 Primary Basin Skimmer – replaced actuator key, realign skimming trough.
- Chemical Building Hypo Tank- replaced leaking fitting (tank outlet)
- SSU Project & Meetings - ongoing
- Completed 57 preventative maintenance work orders and 22 demand work orders.

December 2017

- High Speed Internet – Completed.
- LED Office Lighting 1st Floor Complete.
- Du-All Odor Control System – replaced fan motor bearings.
- 1st Stage #1 RAS Pump – re-enforced pump base.
- Boiler #2 – replaced draft fan motor.
- SSU Project Meetings – (ongoing).
- Completed 57 preventative maintenance work orders and 8 demand work orders.

January 2018

- North East Air Handler – replaced Steam coil
- Hydrotherm Boiler Headworks – replaced Draft Fan, ice cube relay, and Belimo Actuator for fresh air vent.

- Headworks – repaired frozen water lines.
- #2 Boiler – replaced broken pipe nipple to draft sensor.
- #1 boiler – replaced motor contactor.
- #1 Primary Basin – Longitudinal flight and cross collector gear reducer failed due to age and ice buildup- Basin off line until parts arrive.
- High speed Internet and Phone & paging system project – completed and on line.
- Headworks #1 Grit Chamber – Drained and removed grit.
- #1 Fournier Press – Started rebuilding press.
- #5 Transformer – Purge head space.
- Headworks – replaced unit heater motor.
- #4 Penn Valley Pump – replaced lower pump gasket.
- Spare Franklin Miller Cutter pack – rebuild.
- Process wing Hall – replaced wall heater motor
- SSU Project & Meetings – (ongoing).
- Completed 64 preventative maintenance work orders and 19 demand work orders.

Other accomplishments of note include:

Looking forward to the coming six months, the City plans to:

East Plant

- Replace Primary Basin Gear Reducers
- Boilers – replace Gas burners and controls with new energy efficient burners.
- Domestic Hot water system - upgrade
- Secondary Systems Upgrades (SSU) Project started in February 2017 Completion date fall 2019.

Anaerobic Digestion Facility Feasibility Study, for Siting at the Westerly Wastewater Treatment Facility.

To date, Wastewater has continued to be unable to attain a decision consensus from the City, concerning willingness to pursue this long-term treatment sludge residuals management alternative, and the initiative has been “back-burnered”. However, there has been sustained interest in the prospective project within the City, and from energy service performance contractor representatives and private development investors interested in exploring Fitchburg as a location to site an anaerobic digestion facility.

On a related front, the City and the Town of Westminster are seeking to pursue an expansion of the jointly owned “Fitchburg/Westminster Landfill”. An expansion of the landfill’s volumetric capacity will correspondingly also extend the landfill’s useful life, however such an expansion will only allow a finite term extension, and will not be a long-term, sustainable management practice for the disposal of wastewater treatment sludge residuals. As a result, the DPW – Wastewater Division continues to work with the Mayor’s Office, the City’s Community Development Office, and the Purchasing Department Office to pursue opportunities for a long-term, sustainable solution for the wastewater treatment sludge residuals and useful repurposing and revitalizing the underutilized Westerly Wastewater Treatment Plant property.

City Ordinance Revisions.

In the reporting period, DPW Wastewater has continued with updating of City Code (“ordinance”). With assistance from consulting engineers, the City has undertaken the process of updating technically-based Local Limits to address loads allocations to high-strength producing industrial sewer customers. In the next reporting period, the City anticipates that the Local Limits Study Report will be submitted to MassDEP and the Office of the EPA Region 1 Industrial Pretreatment Coordinator.

Additional, the City has also contracted with a consulting engineer to provide a comprehensive assessment review and recommendations to update the sewer ordinance. The comprehensive update will include provision to address fats, oils and grease (FOG) regulation, infiltration and inflow regulation, and coordination with stormwater ordinances which will help facilitate the advancement and utilization of Green Infrastructure and Low-Impact Development best management practices.

Wet-Weather Operations

The City has not introduced any septage or other high strength side streams not associated with plant operations during times that any portion of the flow was bypassing the secondary treatment system, or during times when a secondary system bypass was likely to occur within two hours. The Secondary System Upgrade (SSU) Project began on March 3, 2017. The project requires us to take a portion of our treatment process offline for construction upgrades. This first phase of this project began with taking off half of the 1st stage treatment process. First Stage, Side 2 aeration tank and clarifier were taken offline on March 10, 2017 and were placed back online on October 11, 2017. The second phase of the project required us to take 1st Stage, Side 1 aeration tank and clarifier offline, and this was accomplished on August 25, 2017, and presently remains offline. The reduced treatment process has also lowered our treatment capacity. We are continuing this practice as required and will conduct periodic review sessions with plant staff to ensure all personnel are aware of wet weather operational procedures.

Since the implementation of the State Point Analysis system, developed by Wright-Pierce, plant operations have seen reductions in the length of time of secondary system bypasses, reduction in E. Coli violations, and reductions in both BOD and TSS violations of the NPDES permit.

C. WASTEWATER MANAGEMENT PLAN

In accordance with the Consent Decree, a first draft of the *City’s Wastewater Management Plan* (WWMP) is to be submitted to the EPA and the MassDEP for review in approval. This plan will lay the framework for the City to come into compliance with the Federal Clean Water Act and the terms of the Consent Decree. Within this reporting period, the City has held a kick-off meeting with its new engineering consultant (Weston & Sampson Engineers) to begin the project.

As a consequence of the Hydraulic Model being one of the key tools in developing the WWMP, in discussions with the EPA on the Hydraulic Model and the subsequent Hydraulic Capacity Assessment, the City expressed a possible need for an extension on the initial WWMP submission,

due to a prolonged process of Hydraulic Model approval review discussions, and supplementary modeling analyses.

D. ILLICIT CONNECTIONS

Within the reporting period, there were no discovered and confirmed illicit connections during the Beech and Hazel Street Sewer Separation Project to be redirected.

Going forward, in the course of ongoing and periodic repeat CCTV work, any suspected illicit connections will be identified for further investigation, to confirm or rule out as an illicit connection. If determined to be illicit connections, the area infrastructure will be reviewed and evaluated for the feasibility of redirecting confirmed illicit connections.

E. INTERIM PHOSPHORUS LIMITS

The City has been complying with the interim phosphorus limits contained in Attachment 9b of the Consent Decree and have had a 12-month rolling phosphorus average of 0.44 ppm, which is below the interim phosphorus limit of 0.5 ppm. The City attributes the sustained compliance during our reduced treatment capacity, with respect to interim phosphorus limits compliance, to contributions from the CEPT primary treatment improvements, the State Point system, and the hard work of the plant operations and maintenance personnel.

VIII. SUPPLEMENTAL ENVIRONMENTAL PROJECT (SEP)

No SEP activities took place during the reporting period. Grow-in environmental conditions of the Spring and early Summer months of the reporting period have been favorable, and the stream bank dormant-live stake plantings have had a good survival rate, and are showing growth. Wastewater asserts the project has been a success, and is seeking to closeout the Order of Conditions with the Fitchburg Conservation Commission.



View of Stake Plantings in the Slope
(Mixture of Black & Purple Willow Species)
Showing Growth, After Installed as Dormant,
Live Rooted Woody Cuttings.



Stabilized Brook Bank, Facing South.

If there are any comments or questions regarding the above subject please contact the undersigned at (978) 345-9622.

Sincerely,

FITCHBURG DPW, WASTEWATER DIVISION



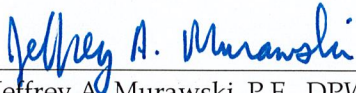
Jeffrey A. Murawski, P.E.
Fitchburg DPW Deputy Commissioner of Wastewater

Electronic & Hard Copy: Neil Handler, USEPA, Region 1 Office
David Boyer, MassDEP, Central Region Office

Electronic copy:
(Transmittal letter only) Chief, Environmental Enforcement Section, DOJ
Susan M. Poswistilo, Assistant U.S. Attorney
Michael Wagner, U.S.E.P.A.
Louis Dundin, Assistant Attorney General, Massachusetts AG

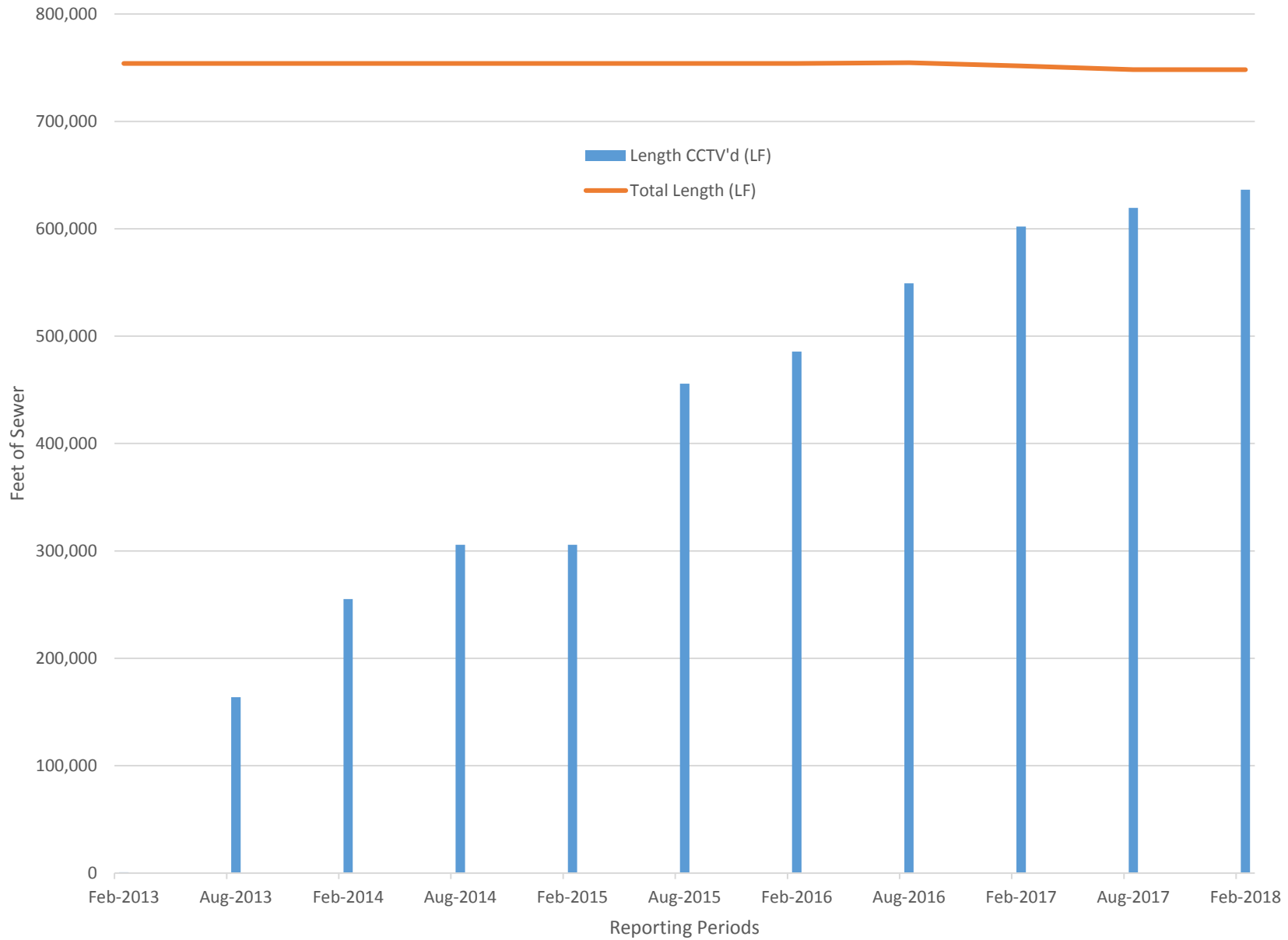
Electronic copy: Lenny R. Laakso, P.E., Fitchburg Commissioner of Public Works
Anthony Maressa, P.E., Sewer System Manager
Vincent Pusateri, II, Fitchburg City Solicitor
Mary A. Delaney, Fitchburg Chief Procurement Officer
Nicholas J. Ericson, P.E., Fitchburg DPW Civil Engineer

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

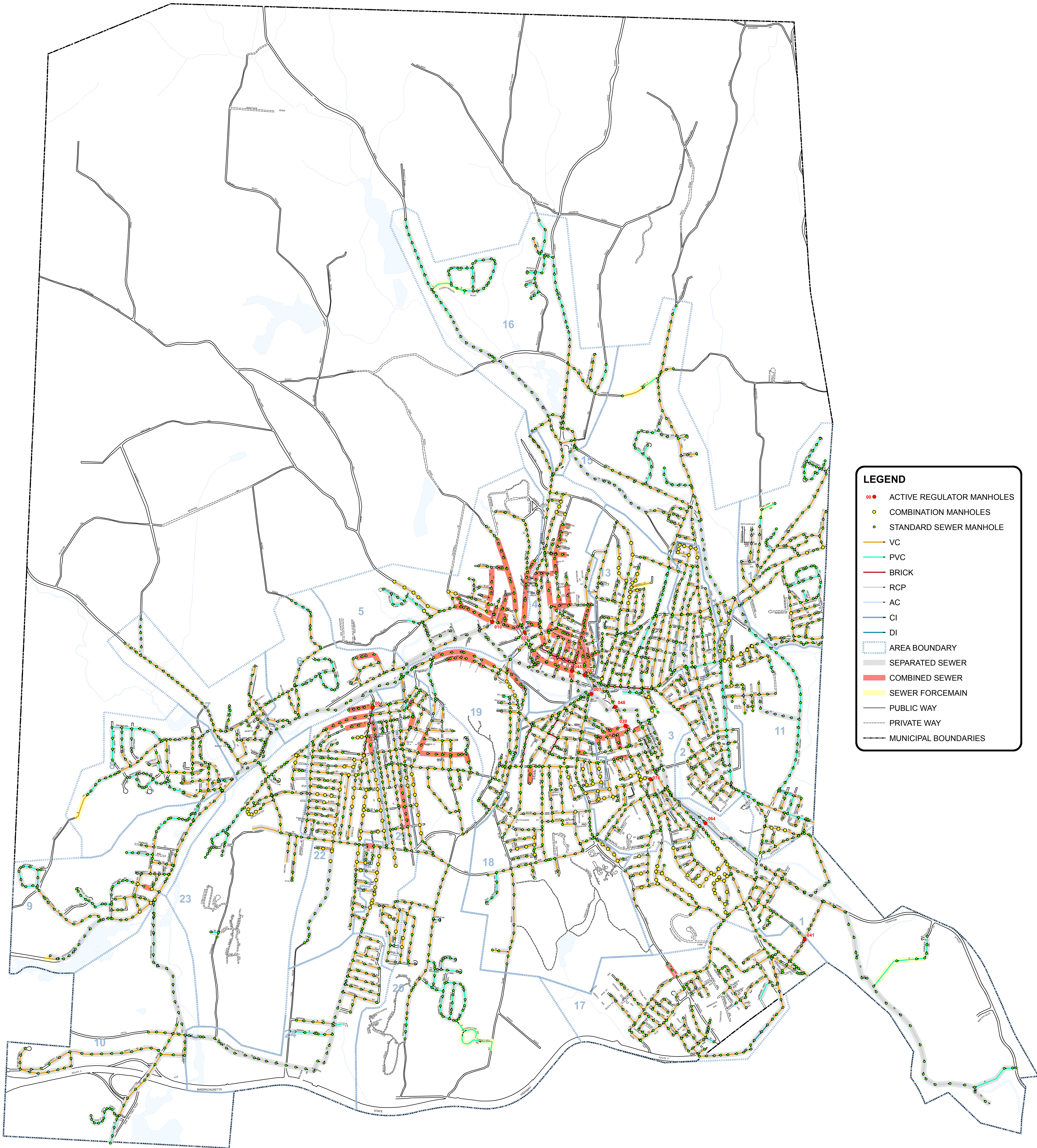


Jeffrey A. Murawski, P.E., DPW Deputy Commissioner Wastewater

Collection System Cleaning and CCTV'ing



ATTACHMENT 1 - COMBINATION SEWER MANHOLES CHECKS																							
			Fitchburg Checks		Fitchburg Checks		Fitchburg Checks		Fitchburg Checks		Fitchburg Checks		Fitchburg Checks		Fitchburg Checks		Fitchburg Checks		Stantec Checks		Stantec Checks		
			Rain Date:10/26 & 10/30/17 Rainfall: 3.45" & 4.03"		Rain Date: 9/7/17 Rainfall: 2.69 in.		Rain Date:5/26/17 Rainfall: 2 in.		Rain Date:10/21/2016 Rainfall: 3.17 in.		Rain Date:09/30/2015 Rainfall: 3.12 in.		Rain Date: 10/23/ 2014 Rainfall: 3.22 in.		Rain Date: August 9, 2013 Rainfall: 2.3 in.		Rain Date: April 20&21, 2012-12 Rainfall: 2.8 in.		January 1, 2008 1st Round		April 1, 2008 2nd Round		
Sub Watershed	CMH#	CMH Location	Drain to Sanitary	Sanitary to Drain	Drain to Sanitary	Sanitary to Drain	Drain to Sanitary	Sanitary to Drain	Drain to Sanitary	Sanitary to Drain	Drain to Sanitary	Sanitary to Drain	Drain to Sanitary	Sanitary to Drain	Drain to Sanitary	Sanitary to Drain	Drain to Sanitary	Sanitary to Drain	Drain to Sanitary	Sanitary to Drain	Drain to Sanitary	Sanitary to Drain	Total Overflows
22	135	Oak Hill/Mcdonald					1			1	1							1					4
22	136	Oak Hill Road/England Ave Intersection								1													1
22	138	Oak Hill/Daniels 30 feet uphill.								1													1
22	318	Oak Hill/Jeanette									1												2
22	139	541 Oak Hill Road			1		1			1													3
22	140	570 Oak Hill					1				1												2
22	157	43 Ronald Ave																					0
22	160	St. Joseph St/Pratt Rd Intersection								1													1
22	161	St Joseph/Delisle								1						1			1		1		4
22	162	St Joseph/St Andrew								1		1				1			1				4
22	163	St Joseph/Legros								1							1						2
22	164	153 St Joseph								1							1						1
22	165	210 St. Joseph St						1															1
22	166	282 St Joseph St									1												1
22	195	Theresa St/St. Andrew St Intersection			1		1			1		1				1		1		1		1	7
22	196	Theresa/Legros								1					1	1							2
22	197	Theresa/Deslisle			1		1			1		1	1		1		1				1		8
22	198	Theresa St/Hope St Intersection								1													1
22	199	51 Theresa St			1		1			1		1		1		1							6
22	200	21 Theresa St			1		1			1		1		1		1							6
22	201	80 Theresa St			1		1			1		1	1		1	1			1		1		8
22	203	143 Theresa								1													1
22	204	192 Theresa St					1			1					1								4
22	302	Newtonville/Oak Hill			1						1												2
22	335	24 York Avenue								1													1
22	336	44 York Avenue								1													1
22	337	61 York Avenue								1													1
23	9	97 Appleton Circle									1												1
23	10	79 Appleton Circle					1				1			1									3
23	11	97,105,108 Appleton					1			1													2
23	59	Fairmount/Leroy			1		1			1		1			1								5
23	89	Leroy St/Clearview Ave Intersection			1		1			1		1											4
23	90	Leroy St/Newtonville Ave Intersection			1						1				1			1					4
23	300	59 Appleton Circle								1													1
23	301	80 Appleton Circle						1		1				1									3
		Totals	12	14	13	26	36	39	78	70	54	30	19	9	31	5	11	4	23	8	28	11	495



LEGEND

- ACTIVE REGULATOR MANHOLES
- COMBINATION MANHOLES
- STANDARD SEWER MANHOLE
- VC
- PVC
- BRICK
- RCP
- AC
- CI
- DI
- AREA BOUNDARY
- SEPARATED SEWER
- COMBINED SEWER
- SEWER FORCEMAIN
- PUBLIC WAY
- PRIVATE WAY
- MUNICIPAL BOUNDARIES



City of Fitchburg, Massachusetts

INFRASTRUCTURE - 1

COMBINED AND SEPARATE SEWERS,
SEWER MATERIAL AND SIZE

MAP 2 OF 4

February 1, 2018

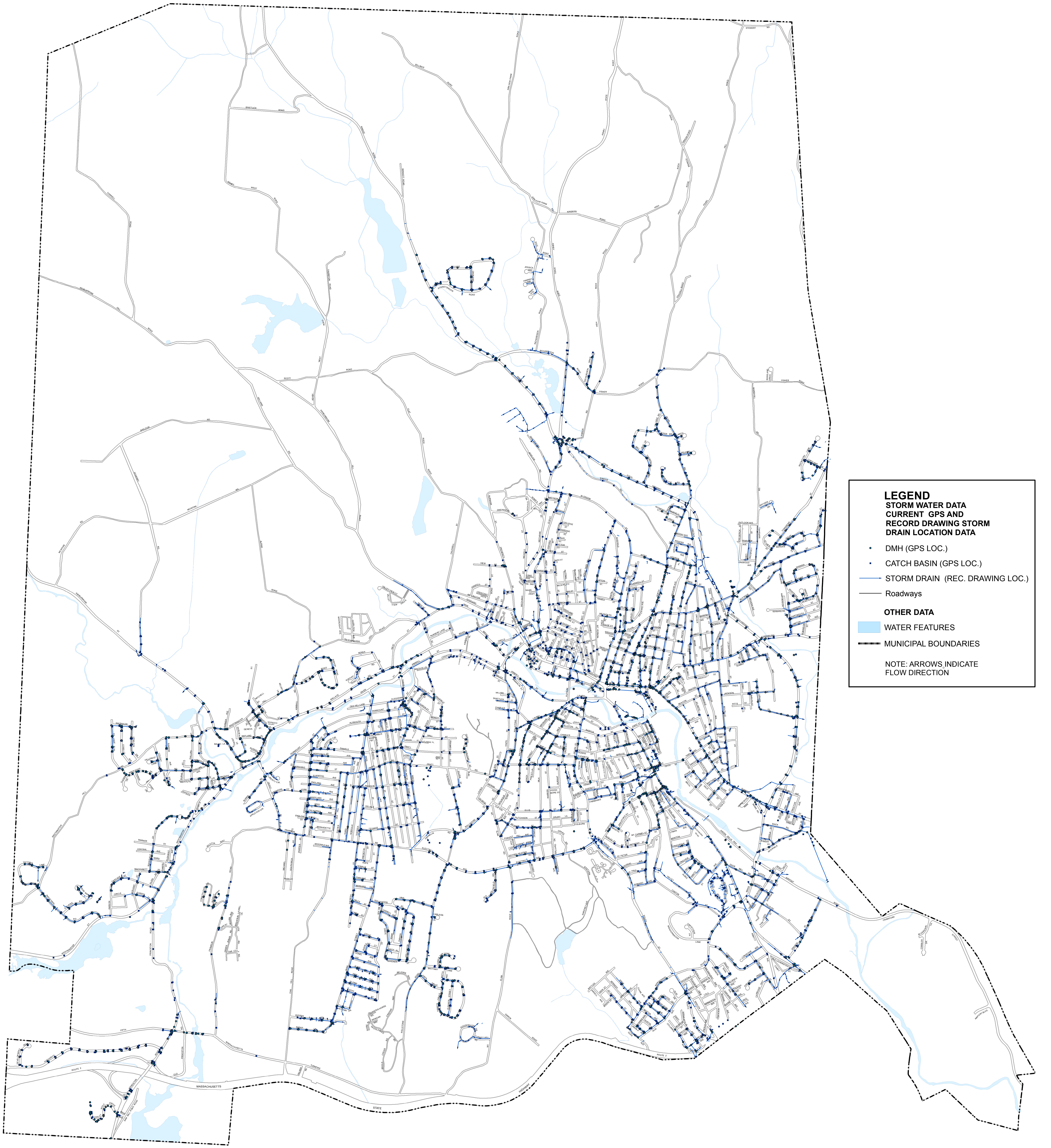


SCALE: 1 INCH = 1,000 FEET

Prepared by:
The City of Fitchburg, Massachusetts, Wastewater,
GIS Engineer.

Author: kdupont

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LEGEND
STORM WATER DATA
CURRENT GPS AND
RECORD DRAWING STORM
DRAIN LOCATION DATA

- DMH (GPS LOC.)
- CATCH BASIN (GPS LOC.)
- STORM DRAIN (REC. DRAWING LOC.)
- Roadways

OTHER DATA

- WATER FEATURES
- MUNICIPAL BOUNDARIES

NOTE: ARROWS INDICATE
FLOW DIRECTION



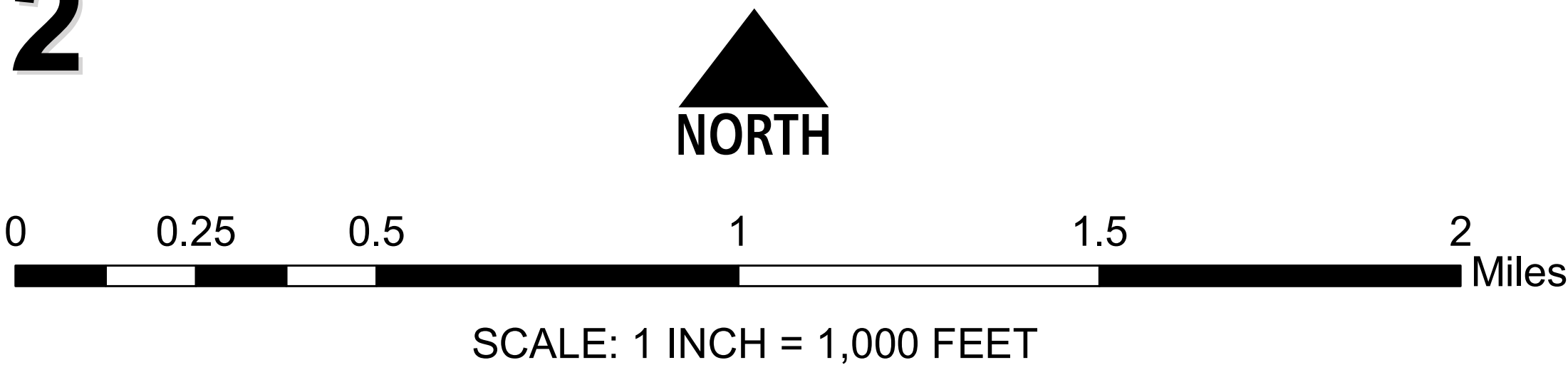
City of Fitchburg, Massachusetts

INFRASTRUCTURE - 2

STORM DRAINAGE

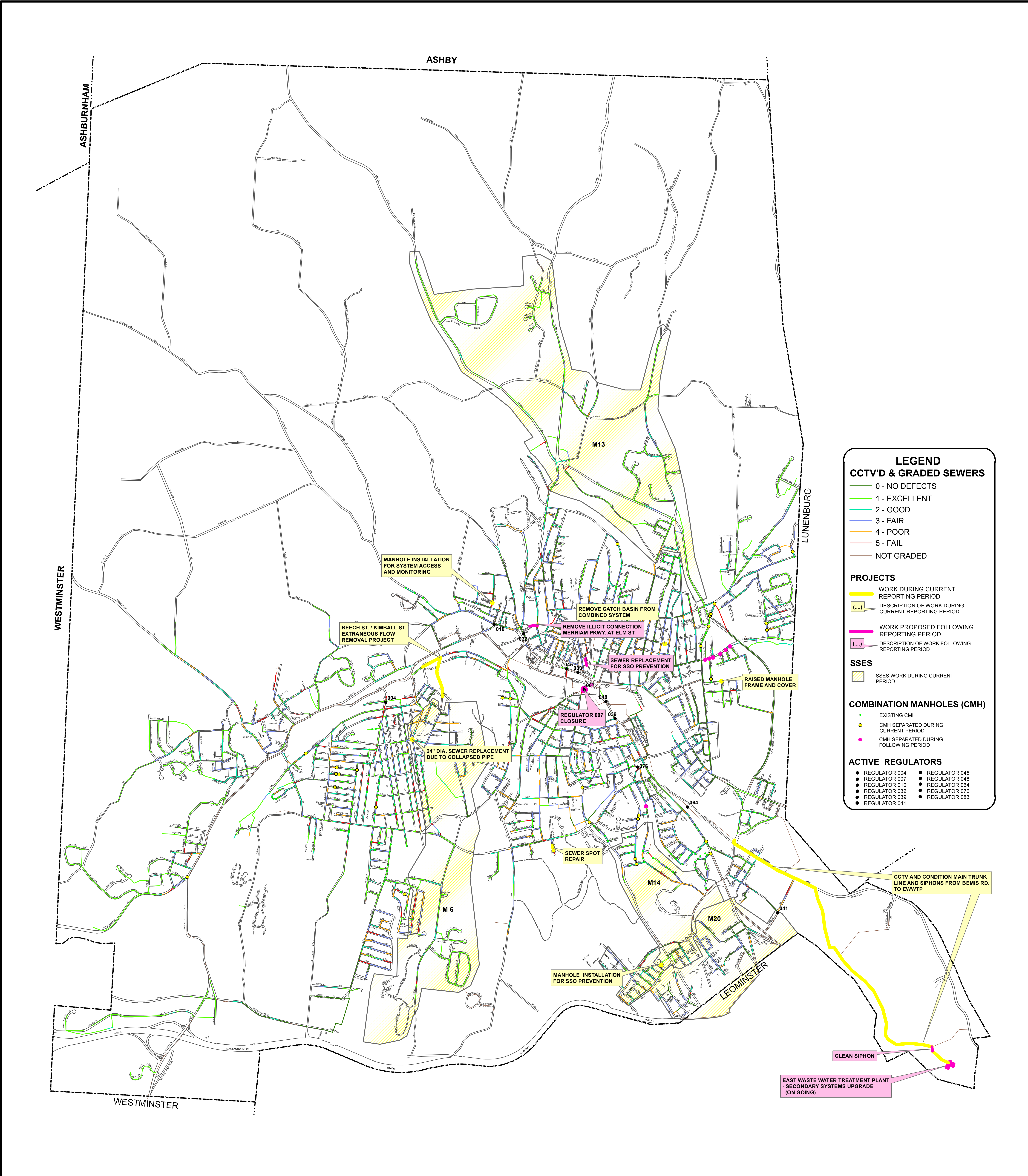
MAP 3 OF 4

February 1, 2018



Prepared by:
The City of Fitchburg Massachusetts, Wastewater,
GIS Engineer.

Author: kdupont
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LEGEND

CCTV'D & GRADED SEWERS

0 - NO DEFECTS

1 - EXCELLENT

2 - GOOD

3 - FAIR

4 - POOR

5 - FAIL

NOT GRADED

PROJECTS

WORK DURING CURRENT REPORTING PERIOD

DESCRIPTION OF WORK DURING CURRENT REPORTING PERIOD

WORK PROPOSED FOLLOWING REPORTING PERIOD

DESCRIPTION OF WORK FOLLOWING REPORTING PERIOD

SSES

SSES WORK DURING CURRENT PERIOD

COMBINATION MANHOLES (CMH)

EXISTING CMH

CMH SEPARATED DURING CURRENT PERIOD

CMH SEPARATED DURING FOLLOWING PERIOD

ACTIVE REGULATORS

REGULATOR 004

REGULATOR 007

REGULATOR 010

REGULATOR 032

REGULATOR 039

REGULATOR 041

REGULATOR 045

REGULATOR 048

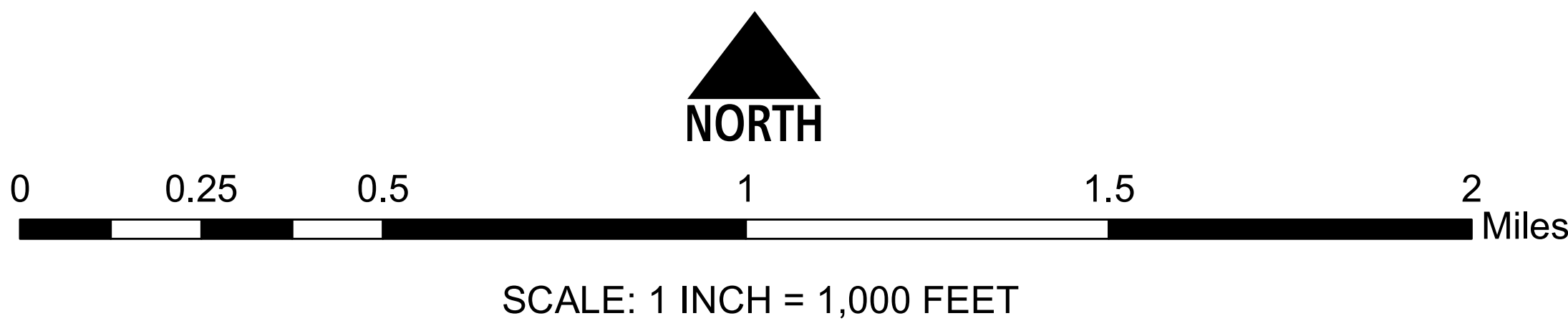
REGULATOR 064

REGULATOR 076

REGULATOR 083



City of Fitchburg, Massachusetts
**EXTRANEOUS FLOW
INVESTIGATION, REMEDIATION,
AND CAPITAL PROJECTS**
MAP 4 OF 4
February 1, 2018



Prepared by:
The City of Fitchburg Massachusetts, Wastewater,
GIS Engineer.

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Author: kdupont