

**City of
Fitchburg**



**Department of
Public Works**

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February 28, 2023

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

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

Subject: Semi-Annual Progress Report
August 2022 – January 2023 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 2022 – January 2022 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.

GIS maps updates and figures, will be provided (electronically and hard copies) under separate cover, and will be provided via email and as printed full-size copy, via U.S. mail.

Semi-Annual Progress Report
August 2022 through January 2023 Reporting Period

A. SEWER SYSTEM

Staffing

There were one major staffing change during the reporting period. The Plant Superintendent has been appointed to Ryan Burns former Senior Operator of the Wastewater Treatment Facility. The GIS Engineer position will be mentioned in the next update (August 2023) for the individual selected will assume the duties after the reported period.

“Problem Area” Checks

The City has been more proactive in checking “problem areas” throughout the collections system that have a history of sewer system overflows. These areas have been checked on an approximate bi-weekly basis. The “Problem Area” list is continually updated based on both recent SSO events, and on improvements to a known “Problem Area” that would minimize future SSO occurrences.

Geographical Information Systems (GIS) Maps

Four maps were updated for this semi-annual report.

- 1.) “Base Map (Map 1 of 4): The City’s parcel and roadway data is shown on this map along with municipal boundaries. The map has been updated with the latest parcel data from the City’s Assessor and Engineering Offices.
- 2.) “Combined and Separate Sewers” (Map 2 of 4): 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 close to completion of sewer rim elevations with its GPS unit. The few remaining manholes are newly constructed or cannot be located due to signal obstructions. The City raised 1 buried manholes to grade during the reporting period, and repaired 28 manhole covers. These locations are shown.
- 3.) “Storm Drainage” (Map 3 of 4): 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 GPS survey program for storm system assets location is ongoing, and is headed by the Fitchburg DPW - Engineering Division, with assistance from the Wastewater Division.

4.) "Extraneous Flow Investigation, Remediation, and Capital Projects" (Map 4 of 4): 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 replaced, raised, and reset numerous manhole frames and covers. Manhole castings found in fair condition with fewer than 3 vent holes in the cover, or within a combined sewer area, or in an off-road easement, then the City did not replace the casting with a new vent-less casting. The City also: (1.) separated thirty (30) additional combination manholes, (2.) completed four sewer repairs throughout the system, (3.) Separated CSO 048 and (4.) continued the ongoing construction of the "**CSO 007, 011, 039, 048 Separation/Rehabilitation Project**". An engineering services contract for the pre-design investigations, and engineering design services of the next combined sewer separation project, termed the "**Downtown Separation Project**" for CSO Regulators 010, 032, 045 and 083 was also executed. The locations of these improvements are noted on the map.

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 38,923 feet, or approximately 7.37 miles.

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

The collection operators continue to make progress with CCTV inspections and condition coding all 143.9 miles (approximate length) of sewer pipe within the City. By the close of the reporting period, the City had condition coded approximately 93.6% of its sewer system. The majority of pipes remaining to be coded are either located within difficult to access easements, egg-shaped pipes, 6-inch diameter pipes, or odd-shaped brick conduits. Some of the sewers are likely never to be inspected until they are replaced, as there are no access points. Some of the uninspected sewers are small diameter force mains where a CCTV camera is too large to fit in the pipe. The City has had great progress however using outside contractors to CCTV portions of its remaining sewers through SSes or combined sewer separation work. Many of the remaining sections will be televised within the next 2-years as part of the Downtown Separation Project (**CSOs 010, 032, 045, and 083**). Since many of the remaining sewers to be televised are beyond in-house capabilities, the City has begun a second round of CCTV of the entire system, with 9.4% having been CCTV'd under the second round.

As the majority of remaining sewers to be inspected are outside the City's capabilities to inspect, the City has actively been outsourcing this work. The City completed the inspection of sewers in the "**Downtown Separation Project**" (**CSO 010, 032, 045, and 083 Separation/Rehabilitation Project**) during a previous reporting period. The City's engineering consultant completed their review of the inspections during this reporting period, which included the review of 68,800 LF of sewer/drain CCTV and CCTV/Laser/Sonar inspections. A draft report of the CSO 010, 032, 045, and 083 Separation/Rehabilitation Project was provided to the City in October 2022 and the report is expected to be finalized during the next reporting period.

The following table (*Table No. 1*, on Page 5) summarizes manhole inspections to date:

TABLE No. 1			
CITY & CONSULTANTS SEWER MANHOLE INSPECTION TOTALS			
Inspected by	Total Inspected	Total Manholes	Percent of Inspections Completed
City of Fitchburg	714	3619	19.93%
Overlap (manholes inspected by both City and Consultant)	46	3619	1.27%
Consultant	1,277	3,575	35.78%
Inspection Totals	2,037	3619	56.78%

Table No. 1 above includes both City-inspected manholes, as well as past inspections performed by the City's consultant engineers that were conducted in conjunction with past and current projects, including CSS 4D, the CSO-039, 048, 011, 007 Project, SSES Phases I, II, and IV, and the Beech and Hazel Streets Sewer Separation Project. Between both the City's Engineer, and the City's in-house forces, 56.98% of manholes have been inspected. Hundreds of manholes will be inspected in the coming year as part of the upcoming Downtown Separation Project.

Global Positioning Satellite (GPS) System Update

The City is continuing to locate all of its sewer manholes, drain manholes and catch basins with its GPS unit. To date the City has located the following assets:

- 3,609 publicly-owned sewer manholes out of 3,619 (99.6% completed), which leaves 10 manholes to be located.
- 2,520 drain manholes (out of an unknown total).
- 4,048 catch basins (out of an unknown total).
- 369 sewer laterals
- 24 sewer clean-outs
- 1,459 other asset types. Other asset types typically include other types of utility manholes, services, or locations of dig-safe mark-outs.

Asset Management -

During the past reporting period, the Wastewater Division executed a contract with Utility Cloud, a CMMS web-based software. Wastewater Collections is nearing the completion of training and has used the software to log, track and report on all sewer service calls this past reporting period. In this past reporting period the City has also began to track CSO inspections, manhole inspections, pump station inspections, and service calls, among other day-to-day activities..

Intermittent Stream Connections to Sewer

No intermittent streams were removed from the sanitary system during the reporting period.

Meter Maintenance

The City has been maintaining its 8 flow meters located at regulator manholes throughout the reporting period. ADS long-range ultrasonic depth sensors are also maintained at CSOs-10, 41, 45, and 76 to provide additional monitoring redundancy and accuracy at the regulators.

The table below (*Table No. 2*) includes the reporting period's summary of CSO overflows. In accordance with Paragraph 70, Subparagraph d. of the Consent Decree, *Table No. 2* includes notes on whether or not the meter was malfunctioning for a time during the reporting period. During the reporting period, the City generally had good meter coverage..

TABLE No. 2

OVERFLOW DATA FOR REPORTING PERIOD July 31, 2022 TO January 31, 2023

Meter	Location	Events	Volume (Gallons)	Notes:
CSO-004	Cleghorn St. at Oak Hill Rd.	1	--	Weir wall raised 6-inches on 5/12/21 Volume for event on August 9, 2022 was unknown
CSO-007	Cushing St. at Riverfront Park	0	0	Regulator closed on May 3, 2021
CSO-010	Main St. at River St.	3	120,770	Will be closed as part of Downtown Separation Project in 2025. Raised weir wall from 20" to 30" above sensor on 5/12/21.
CSO-032	#543 Main St. at Post Office	22	280,900	Will be closed as part of Downtown Separation Project in 2025. Weir wall raised on May 12, 2021

CSO-039	Water St. at Walnut St.	-	-	Regulator closed on August 24, 2021.
CSO-041	Benson Rd. near Falulah St.	0	1,269	Upsizing of pipe downstream and upstream I/I work necessary for closure. 5 catch basins upstream connected to sanitary sewer
CSO-045	Main St. at Oliver/Putnam St.	22	0	Down-looking sensor used to estimate overflows. Modified calculations by using Francis Formula weir equation for increased overflow estimation. Will be closed as part of Downtown Separation Project in 2025.
CSO-048	#85 Water St.	-	-	Regulator 48 was closed on May 24, 2022.
CSO-064	Water St. Easement near former "Halloween World"	6	1,044,000	Regulator on main interceptor sewer. Inflow removal upstream and sewer upsizing likely
CSO-076	Birch St. at Heywood St.	3	11,000	Downstream pipe undersized. No known combined sewers upstream.
CSO-83	Main St. at Prichard St.	10	94,300	Will be closed as part of Downtown Separation Project in 2025. Meter did not record any Overflow Event, however visual aid was activated. Possible cause could have been vermin.
Totals		52	2,479,970	

The City has been servicing the meters on a roughly 3-month frequency to help maintain high data quality. During the reporting period, the meter manufacturer (ADS Environmental Services, or 'ADS') conducted multiple visits to all of the City's flow meters to ensure they were functioning as designed.

The City has been maintaining its ECHO down-looking sensors to keep abreast of potential problems in the collection system. In addition, the ECHO meters are also deployed at the City's four (4) major siphons, to determine if the siphon cleaning started during this reporting period will have a noticeable effect on sewer surcharging in the siphon head chambers. The ECHO deployment locations are shown on Map 4 of 4 ("*Extraneous Flow Investigation, Remediation, and Capital Projects*"). On Map 4 of 4, the ECHOs are designated by an "LS" symbol (for "level sensor"), and are described in the legend as "wireless ultrasonic level sensors".

During previous reporting periods, The City's wastewater engineering consultant assisted the City with implementing their public notification system for CSO events in accordance with MassDEP regulation 314 CMR 16.00, and submitted the final CSO Public Notification Plan on January 2023. During the next reporting period, the City plans to continue adjusting the public notification system as needed.

CSO Weir Wall Adjustments

No weir wall adjustments were made.

Post-Construction Monitoring Plan & Post-Construction Monitoring Report

In late May 2016, the City was approved to proceed with the Post-Construction Monitoring Plan (PCMP) field sampling program. The City requested and received an extension from MassDEP and EPA 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, and the Post-Construction Monitoring Report (PCMR) was submitted for review and approval at the end of February 2018. To date, we have not received a response from either the MassDEP or EPA most recently updated and submitted to the MassDEP and the EPA in March 2017.

The City's ongoing CSO 007, 011, 039, 048 Separation/Rehabilitation Project is expected to be completed during the next reporting period. Following the conclusion of the construction, the City plans to commence the post construction monitoring for the project, which includes flow metering and outfall sampling to evaluate the effectiveness of the sewer separation work. The post construction monitoring is expected to be conducted for a period of one year.

Hydraulic Model & Hydraulic Capacity Assessment

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 conditional approval of its Hydraulic Model. The model was approved based on the understanding that additional model runs and analyses would be conducted under the Capacity Assessment Report which was submitted (under separate cover) at the end of August 2018. To date, we have not received a response from either the MassDEP or EPA on the Capacity Assessment Report.

The City, in discussions with its Consultant, have determined that the most appropriate time for a full hydraulic model update of the system will be after the Downtown Separation Project in the 2025 time frame. Updating the model before this time seems ill advised, due to the drastic changes that will occur to the collection system after this project.

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, 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 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. 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 that EPA may have. Investigative work for Phase 2 of the SSES has been completed, with the report likely to be submitted to the MassDEP and EPA in the next reporting period.

As a strategic deviation, largely due to the criticality of the trunk line sewer asset, the City has prioritized 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). As part of the project, approximately 30,150 LF of interceptor sewers ranging from 18 to 48-inches in diameter were inspected using a combination of CCTV, laser, sonar, and hydrogen sulfide monitoring. Additionally, 138 manholes were inspected along the interceptor, including manholes along the interceptor not inspected during Phase 1 of the SSES. The project also included 69 successful building inspections and approximately 18,500 LF of smoke testing.

In the past reporting period, the City's engineering consultant completed all supplemental inspections and provided the updated SSES Phase IV report to the City for review. During the next reporting period, the City expects to submit the report to MassDEP and EPA.

Combination Manholes Program

There were one (1) qualifying rain events during the reporting period that met the criteria (2 or more inches of rainfall, within a 24-hour period) necessary to perform combination manhole (CMH) inspections. Rainfall data is recorded at the City's primary rain gage at the Department of Public Works Building (at #301 Broad Street, Fitchburg). An additional rain gauge is also maintained at the east end of the City, at the Summer Street Fire Station. The City often inspects all the combination manholes after a large rain less than 2-inches, as seen in the attached table.

During the reporting period, there were a total of 42 flow transferences to either the drain side or sewer side of the CMHs during the six events that the manholes were inspected. These overflows are taking place in a total of 102 remaining combination manholes. The City reported 262 total combination manholes existing in the system in 2008.

The NPDES permit states that the City has two years to separate 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, in the past the City has first prioritized those manholes that show evidence of transference to the drain side of a manhole. In the past 5 plus 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. Due to the aforementioned reasons, the City has been prioritizing separation of manholes based on a number of factors including road paving locations, frequency of flow

transference, and locations within a combined sewer separation project area. The City has been concentrating separation in specific areas to receive better pricing, but also to drastically reduce the chance for transference from a specific area or street.

Due to an on-call contract expiration, there were no combination manholes separated during this past reporting period. The City has currently budgeted over \$360,000 for each of the next two fiscal years for combination manhole separation.

In Spring 2019, the City executed an agreement with Weston & Sampson to develop contract documents for bidding with design plans for the separation of 150 combination manholes that have shown signs of transference. The City is currently evaluating the feasibility of placing a project out to bid to separate a significant portion of the combination manholes included in the Combination Manhole Separation Program.

In December 2020, The City submitted their Wastewater Management Plan Phase II Report. As identified in the report, the City plans to integrate the combination manhole separation program with the remaining combined sewer separation program to achieve an accelerated, cost-effective separation of combination manholes upstream of combined sewers. The remaining combination manholes that are not upstream of combined sewers that have shown signs of transference will be separated as funding is available and in advance of the completion of the remaining combined sewer separation projects.

As part of the CSO 007, 011, 039, 048 Separation/Rehabilitation Project, the City has separated 17 combination manholes to date. As part of the City's next sewer separation project in the downtown area (**CSO 010, 032, 045, 083 Separation/Rehabilitation Project**), the City plans to separate 9 combination manholes. Due to the size of this project, the City has decided to perform the construction in 2 phases. During the first phase, 7 of the 9 combination manholes will be separated, and the remaining 2 will be separated in the second phase. Construction for the first phase is expected to commence in Spring 2023.

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. During the reporting period, the City was much occupied raising failing sewer manhole covers, which minimized additional in-house progress on separating combination manholes.

During construction of the in-progress 'CSO-007, 011, 039, 048 Project Sewer Separation/Rehabilitation Project', 16 combination manholes have been separated to date.

During the coming reporting period, the City also will complete a hydraulic model analysis on 6 combination manholes on Lunenburg Street that have a history of major transference. The purpose of the analysis is to determine whether redirecting storm water down an adjacent street will free enough capacity in the existing drain on Lunenburg Street to prevent manhole surcharging. The study is being completed at the request of MassDOT, as the combination manholes are located within a state road (Route 2A).

Status of Regulators and Outfalls

During the last reporting period, The City continued construction of the 'CSO 007, 011, 039, 048 Separation/Rehabilitation Project'. This project involves the closure of CSO Regulators 007, 039, and 048. In addition, combined sewers upstream of the previously closed CSO 011 will be separated on Clarendon Street. In total, approximately 4,800 linear of combined sewers will be separated through the installation of 4,850 linear feet of PVC sewers and 2,700 linear feet of HDPE drains. 2,100 linear feet of existing sewers will be replaced, and 20,000 linear feet of sewers will be rehabilitated to repair structural defects and reduce infiltration/inflow in the project area. In addition, the project (as bid) will permanently separate 17 combination manholes. Construction commenced in November 2020 and is currently expected to conclude during the next reporting period. Necessary change orders have also resulted in the additional separation of 2,100 LF of combined sewers. As part of the project, CSO Regulator 007 was permanently closed on May 3, 2021, and CSO Regulator 039 was closed on August 26, 2021. During the last reporting period, CSO 048 was successfully closed on May 24th, 2022. This project is funded through the State Revolving Fund (SRF).



The City was included on MassDEP's 2021 SRF Intended Use Plan for the investigation phase of the CSO 010, 032, 045, 083 Separation/Rehabilitation Project. This project will include the separation of approximately 27,600 LF of combined sewers and the rehabilitation of 37,600 LF of sanitary sewers in the downtown area of the City. The project will result in the closure of CSO regulators 010, 032, 045, and 083. During this reporting period, the City commenced the investigation and design phases of the project, and completed the following tasks:

- 871 attempted manhole/catch basin inspections
- Around 63,400 LF of smoke testing
- 68,800 LF of CCTV and Multi-Sensor Inspections
- 43 dye tests
- 913 attempted building inspections (553 successful)

The City expects to receive the final SSEs report during the next reporting period.

Due to the size of the separation project, the City has elected to conduct the project in two construction phases. During the first phase, the City will close CSO 010 through the separation of 5,800 LF of combined sewers and rehabilitation of 7,240 LF of sanitary sewers. During the second phase, the City will close CSO 032, 045, and 083 through the separation of 21,800 LF of combined sewers and the rehabilitation of 30,400 LF of sanitary sewers. The construction for the first phase of the project is expected to commence in Spring 2023, and the project will be bid in March 2023. In August 2022, the City submitted a SRF Project Evaluation Form for the second phase of the project, and the City was included on the 2023 Draft Intended Use Plan during the last reporting period. During the next reporting period, the City plans to continue the design of the 2nd phase of the project area.

Sewer Connection Summary

Table No. 4 below is a report of all new sewer connections to the sewer system in Calendar Year 2021, which includes the type of connection and the estimated average daily flow for each connection. A list of any I/I work conducted to offset the new flows is also listed, or if an I/I fee was assessed instead, if the additional flow was greater than 15,000 GPD.

Table No. 4					
New Sewer Connections - 2022 Calendar Year					
Date Issued	House #	Street	Occupancy Type	Work Description	Estimated Flow (GPD)
12/20/22	70	Benson St.	Commercial	New sewer connection	235
12/01/22	80	South St.	Residential	New sewer connection	550
11/16/22	115	Damon Rd.	Residential	New sewer connection	330
11/16/22	123	Damon Rd.	Residential	New sewer connection	330
11/09/22	1005	Rindge Rd.	Residential	New sewer connection	220
11/01/22	158	Airport Rd.	Commercial	New sewer connection	300
10/06/22	93	Lunenburg St.	Residential	New sewer connection	440
10/05/22	1341	Rindge Rd.	Residential	New sewer connection	220
10/05/22	1341	Rindge Rd.	Residential	New sewer connection	220
10/05/22	1341	Rindge Rd.	Residential	New sewer connection	220
09/20/22	545-557	Fifth Mass Tpk.	Residential	New sewer connection	660
07/26/22	47	East Prospect St.	Residential	New sewer connection	440
07/18/22	1341	Rindge Rd.	Residential	New sewer connection	220
07/08/22	1341	Rindge Rd.	Residential	New sewer connection	220
07/08/22	1341	Rindge Rd.	Residential	New sewer connection	220
06/27/22	122	Swan Av.	Residential	New sewer connection	330
06/27/22	105	Swan Av.	Residential	New sewer connection	330
06/01/22	63	Beech St.	Residential	New sewer connection	440
05/27/22	9	Arcadia Av.	Residential	New sewer connection	220
05/25/22	1341	Rindge Rd.	Residential	New sewer connection	220
05/25/22	1341	Rindge Rd.	Residential	New sewer connection	220
06/03/22	85	Swan Av.	Residential	New sewer connection	330
05/20/22	17	Woodworth Wy.	Residential	New sewer connection	330
06/02/22	77	Swan Av.	Residential	New sewer connection	330
05/02/22	1151	Main St.	Commercial	New sewer connection	300
04/20/22	843	Mt Elm Rd.	Residential	New sewer connection	330
04/19/22	366	Fisher Rd Fisher Rd.	Residential	New sewer connection	330
03/07/22	51	Fairlawn St.	Residential	New sewer connection	330
03/07/22	8	Lyman Av.	Residential	New sewer connection	330
03/03/22	358	Fisher Rd.	Residential	New sewer connection	330
03/03/22	374	Fisher Rd.	Residential	New sewer connection	440
02/03/22	50	Frankfort St.	Residential	New sewer connection	3520
02/02/22	370	Lunenburg St.	Commercial	New sewer connection	300
Total Estimated Added Average Daily Flow (ADF):					13785

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. 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.

Secondary Systems Upgrades (SSU) Project

The SSU Project commenced in February 2017 and commenced in August 2020.

With the SSU Project completion, we have seen substantial treatment process improvements as the new *Selector Zones* have become operational. The addition of selector zones has:

- enabled us to reduce our chemical addition of Ferric Chloride to the process trains,
- promoted better settling in the secondary clarifiers; and
- improved our nutrient removal of Phosphorus and Nitrogen in the plant's final effluent.

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 2022 and January 31 2023 included:

August 2022

- Dual All Oder Control – replaced Sodium Hydroxide & Sodium Hypochlorite valves and piping.
- 2-1 Clarifier – replace spray nozzles with new style.
- Primary Basin No. 3. – Replaced shear pin cross collector.
- #2 Grit Chamber Blower – Faulted VFD troubleshoot and repaired.
- Blower Building – relocated Phone.
- Vehicles – 2017 F – 350 serviced, 2015 Transit connect repaired right front tire.

- *Completed 81 Preventative Maintenance Work Orders and 14 Demand Work Orders.*

September 2022

- #1 Primary Basin Skimmer – repositioned Drive shaft and aligned key.
- Aerzen Blower 2AB2 – performed motor service code W13.
- West plant sewer Ejector Pump – replaced belt
- #2 Primary basin – replaced longitudinal flight shear pin.
- 2-1 Clarifier – reset RAS Box Seal
- #2 Fournier Quincy Compressor – replaced drain
- #1 Gravity Thickener – Drained, clean for engineer inspection for replacement project.

- *Completed 70 Preventative Maintenance Work Orders and 13 Demand Work Orders.*

October 2022

- #3 Primary Basin – Drained, cleaned and inspected. Replaced all wear shoes.
- RKI Eagle 2 gas monitor – Replaced O2 sensor.
- #1 Blended Sludge Pump – reprogrammed VFD Drive.
- Aeration Air Filtering System – Cleaned intake box, lubed shutters replaced roll Filtering elements.
- CEPT Sodium Hypochlorite Pumps, - replaced Load-sure tubing's.
- Primary Basin Skimmers – replaced oil in all skimming actuators.
- Septage Sump Pump Pit – replaced faulty level sensor.

- *Completed 83 Preventative Maintenance Work Orders and 9 Demand Work Orders.*

November 2022

- **#2 Franklin Miller Grinder – cleaned grinder removed chunk of metal**
- Aerzen Blower 2AB-3 – performed motor service W 13 code
- Aerzen Blower 2AB-4 – performed motor service W 13 code
- Southwest air handler – replaced belt
- East Plant Freight Elevator – Replaced Hydraulic hoses
- 1-2 Clarifier – reposition RAS Box seal
- #2 Fournier Press – replaced 3-way valve to press
- Quarterly building Inspection performed
- Polymer System 2nd stage – cleared plugged lines
- Vehicles – 1997 Bucket truck new battery, 2015 Transit charge battery, 2017 F-350 state inspection

- *Completed 70 Preventative Maintenance Work Orders and 14 Demand Work Orders.*

December 2022

- West Plant Boiler – replaced boiler feed pump
- Primary Skimming's Manhole – Cleared Manhole of debris
- Primary Line to Gravity thickeners – removed rag ball at pinch valve to #1 Gravity thickener, Clear #2 line also.

- CEPT hot Water Tank - replaced relief valve.
- #3 Primary Basin Cross Collector - shear pin keeps breaking found worn chain, chain due to arrive in February.
- Bay #4 Screw conveyor - replaced bolts on drive attachment plate.
- Side 2 Chlorine Contact Chamber - replaced failed flow sensor.
- 1st Stage Skimming Line - cleared
- #2 Plant Air Compressor - replaced compressor head with spare.
- Vehicles serviced - Case Farmall Tractor replaced hydraulic line to loader

➤ *Completed 68 Preventative Maintenance Work Orders and 13 Demand Work Orders.*

January 2023

- Settled Effluent Strainer – Installed replacement backup power supply troubleshoot program tighten packing glands
 - Main Galley Basement - cleared drains in front of Penn Valley Pumps.
 - #2 Sludge Grinder - removed rag ball from grinder.
 - #1 Grit Chamber - repaired hydraulic leaks on cover system.
 - 1st Stage #2 Aeration Blower - replaced rear motor bearing.
 - Headworks - replaced Unit heater fan.
 - #2 Gravity Thickener - Replaced Drive Chain.
 - Bay 4 Screw conveyor - replacing front support. (hit by driver) in progress
 - CEPT Caustic system and Hypo system - repaired leaks in piping.
 - East & West Plant - Boiler and compressors inspected by insurance company

➤ *Completed 67 Preventative Maintenance Work Orders and 12 Demand Work Orders.*

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

East Plant

- Garage Bays No. 4 & 5; Replace roll up doors Included in Next year budget
- Lab and Control Room Upgrade Design: near 100%
- Aerated Grit Chamber Stairwell; Replace floor coating system.
- Build new caged storeroom in old generator room
- Purchase new Truck
- Swap Manlift From 1997 Ford bucket truck to our 2012 Chevy

City Sewer Ordinance Revisions

In the reporting period, on December 15th, 2020, the final, updated City Ordinances (Fitchburg City Code, Chapter 147 – Sewers) received its third and final hearing reading in City Council session, and was voted by City Council to be “enrolled and ordained”. On December 18th, 2020, the Mayor of Fitchburg signed off on the Council-approved Sewer Ordinance changes. The Sewer Ordinance changes included updated “Technically-Based Local Limits” and also included other provisions required to comply with the National Pretreatment Program (40 CFR 403) “Pretreatment Streamlining Rule”.

Notice correspondences were transmitted to both the Town of Westminster and the Town of Lunenburg (both correspondences were dated January 4, 2021) informing both communities (who each have an "Intermunicipal Agreement" ('IMA') with the City of Fitchburg, for providing sewage collection and treatment services), informing same of their IMA requirements to update their own Sewer Ordinances so as to be as stringent (or more stringent) than Fitchburg's Sewer Ordinance.

Fitchburg has received (for review and approval) the draft updated Sewer Ordinances of the Town of Westminster (date of April 27, 2021), and the Town of Lunenburg (date of January 25, 2022), and each Town has formally adopted and implemented the new updated Sewer Ordinances to reflect those of the City of Fitchburg.

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. 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.

- Presently our current Monthly Total Phosphorus average is 0.25 mg/L for the period of September 1, 2022 to December 31, 2022.

Comparing (pre- SSU Project) October 2016 plant performance with October 2020 and October 2022 performance:

Metric	October 2016	October 2020	October 2022
Total Flow, MG (month)	175.3 MG	300.0 MG	207.6 MG
Max. Daily Flow, MG	10.4 MG	20.6 MG	10.4 MG
Total Rain, inches (month)	5.3"	5.6"	5.7"
Max. Daily Rain, inches	2.6"	1.6"	1.3"
Rain Events >1.0"	8	3	8
Total Bypass, MG (month)	11.168 MG	.628 MG	.000 MG
Max. Daily Bypass, MG	8.728 MG	.381 MG	.000 MG
BOD ₅ In (Pounds)	740,267	682,503	647,053
BOD ₅ Out (Pounds)	9,716	14,856	15,377
BOD ₅ Removal Efficiency	97.3%	97.8%	97.6%
TSS In (Pounds)	667,896	779,325	975,036
TSS Out (Pounds)	26,619	19,401	7,285
TSS Removal Efficiency	96.0%	97.8%	99.25%

Plant performance metrics (post- SSU Project), considering that the newly completed plant upgrades will continue to improve treatment performance, together with the continuing combined sewers separation program, combination manholes separation, and infiltration and inflow removal program, will all further assist and improve (reduce) effects on the plant from wet-weather, and

gives the City an expectation for improved plant performance and continuing improved Permit compliance.

Since the implementation of the State Point Analysis system, developed by Wright-Pierce, plant operations have seen reductions in the length of time (duration) 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) was submitted to the EPA and the MassDEP on May 15, 2019, for review and approval. This plan lays the framework for the City to come into compliance with the Federal Clean Water Act and the terms of the Consent Decree. To date, we have not received a response from either the MassDEP or EPA on the Wastewater Management Plan, Deliverable No. 1.

The WWMP is required by the Consent Decree to include facility upgrades required to meet seasonal total phosphorus concentration-based limits and collection system upgrades necessary to meet federal water quality standards for combined sewer overflows (CSOs). As part of the WWMP, a CSO Long-Term Control Plan (LTCP) was created in accordance with EPA's *Combined Sewer Overflows Guidance for Long-Term Control Plan*, EPA's *Coordinating CSO Long-Term Planning with Water Quality Standards Reviews*, MassDEP's *Guidance for Abatement of Pollution from CSO Discharges*, and other relevant state and federal CSO guidance reports.

Estimated costs for sewer separation projects and CSO Control Alternatives were analyzed to determine their extent of social and economic impact on the community. Based on the findings of these steps, recommendations were formulated for the City's approach for future CSO mitigation. In addition, recommendations for improvements to the Easterly WWTF were created based on current loads and projected requirements of the City's next NPDES Permit. These tasks were incorporated into the CSO LTCP.

The Consent Decree's WWMP Remedial Measure also stipulates (via Para. 55.a) that, in developing the WWMP, the City is encouraged to consider evaluating potential Best Management Practices, including the use of all appropriate "green infrastructure" and "low-impact development" techniques currently available to reduce inflow.

In December 2020, the City submitted the WWMP Phase II Report to MassDEP and EPA. As required under the CD, the report included the following:

- A description of all infrastructure improvements and programs that have been implemented during the previous period to comply with the conditions of the CD and meet limits and other conditions of the City's NPDES Permit.
- The cost of the above listed efforts to date.
- A description of efforts planned for the next 3-year period.
- An assessment of the abatement anticipated to be achieved from the efforts for the next 3-year period.

In addition, the report included a preliminary performance review of the SSU upgrades. Limited SSU data was available for the report since the improvements were not fully complete until August 2020. The preliminary performance results indicated improvements in BOD, TSS, and Ammonia treatment, although further analysis is required with a larger and more substantive set of data. The City will provide a more detailed analysis of the treatment improvements under the SSU in the next submittal of the WWMP in 2023.

During this reporting period, the City received a scope of work to complete the next submittal of the WWMP.

D. ILLICIT CONNECTIONS

The Wastewater Division has continued coordinating with the Building Department to halt acceptance of any Building Permits/Occupancy Permits at properties until the any discovered inflow source is removed. 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. In addition, the City plans to incorporate all building inspection data gathered as a result of SSES work conducted by its Consultant, into the City's GIS, for tracking purposes.

Eight (8) properties had private inflow sources (roof leaders/sump pumps) redirected from the sanitary system in the CSO 007, 011, 039, 048 Separation/Rehabilitation Project area. The connections were removed under the City's Financial Assistance Program for removing private I/I sources. Under this program, the City has been reimbursing homeowners up to 50% of the cost to remove an I/I source within the CSO 007, 011, 039, 048 Separation/Rehabilitation Project area. During the next reporting period, more sources are expected to be removed, and the program is planned to be extended to the 'Downtown Separation Project' area.

E. INTERIM PHOSPHORUS LIMITS

The City has been complying with the interim phosphorus limits contained in Attachment 9b of the Consent Decree. The Treatment Facility is presently maintaining a rolling average of .5 ppm. The City attributes the sustained compliance, 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.

If there are any comments or questions regarding the above subject please contact the undersigned at (978) 829 - 1930.

Sincerely,

FITCHBURG DPW, WASTEWATER DIVISION



Mark McNamara
Fitchburg DPW Deputy Commissioner of Wastewater

Electronic & Hard Copy: Beth Kudarauskas, USEPA, Region 1 Office
 David Boyer, MassDEP, Central Region Office

Electronic copy:
(Transmittal letter only) Chief, Environmental Enforcement Section, DOJ
 Anu Balakrishna, Assistant U.S. Attorney
 Jeff Kopf, Senior Enforcement Counsel, EPA Region 1
 Louis Dundin, Assistant Attorney General, Massachusetts AG

Electronic copy: Vincent Pusateri, II, Fitchburg City Solicitor
 Nicholas J. Ericson, P.E., Fitchburg Assistant City 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."



Mark McNamara, DPW Deputy Commissioner Wastewater