



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

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June 30, 2023

Mark McNamara, Deputy Commissioner of Wastewater
Fitchburg DPW - Wastewater Division
301 Broad Street
Fitchburg, MA 01420

Re: Fitchburg – BWR - MA0100986
314 CMR 12.00, Operations
Compliance Inspection Report

Dear Mr. McNamara:

On April 25, 2023, the Massachusetts Department of Environmental Protection (“MassDEP”) conducted a compliance inspection of the Fitchburg Municipal Wastewater Treatment Facility (MA0100986). At the time of the inspection, all treatment units were in operation. Facility Superintendent Ryan Burns and Maintenance Engineer Kenneth Letourneau were in attendance during this inspection.

A copy of the inspection report is enclosed for your review and files. The city has completed the required secondary systems upgrades (SSU) at the facility in 2020 and works on separating the combined sewers and removing I/I within the collection system. All treatment units were operational during the inspection.

If you have any questions or comments please feel free to contact James Laughlin at 617-939-4736.

Sincerely,

Xiaoning Chen, P.E.
Acting Section Chief
Wastewater Program

ma0100986 inspect 2023 (Fitchburg)-097

FITCHBURG-BWR
2023 compliance inspection
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cc: Douglas Koopman, US EPA Region I
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Ryan Burns, Plant Supt.
Fitchburg Easterly WWTF
Lanides Lane
Fitchburg, MA 01420

WWTF INSPECTION REPORT

SECTION I. GENERAL INFORMATION

DATE: April 25, 2023

INSPECTOR: James Laughlin

REGION: CERO

PERMIT #: MA0100986

WWTF GRADE: 7

REC'G WATER: Nashua River

PERMITEE

East Fitchburg WWTF

(Name)

Lanides Lane

(Street)

Fitchburg, MA 01420

(City/Town) (zip)

(978)345-9626

(telephone #)

OPERATOR

Ryan Burns, Plant Superintendent

(Name / cert #/ grade)

718 Main Street

(Company)

City Hall

(Street)

Fitchburg, MA 01420

(City/Town, State) (zip)

SECTION II. SUMMARY

Plant superintendent Ryan Burns and maintenance engineering Kenneth Letourneau were present for the inspection. Ryan Burns took over as plant superintendent in October 2022. At the time of the inspection the facility had completed all construction associated with secondary treatment system upgrade (SSU) and all treatment units were operational. The effluent looked clear.

The plant is operated under the surface water discharge permit (NPDES #MA0100986) and the DOJ Consent Decree (CD) signed in October 2012. Since the plant's secondary systems upgrades (SSU) required under the CD was completed in 2020, the city has focus on separating the combined sewers and removing I/I within the collection system.

For the months of March 2022 through February 2023, the plant treated a yearly average flow of 8.40 mgd, below the flow limit (12.4 mgd) with peak flows remaining under 39 mgd (historical high over 40 mgd). These reductions in peak flows may indicate a tighter sewer reflecting the City's collection system improvement works (combined sewer separation, I/I removal). There have also been a reduced number of bypass events with none so far during 2023.

The City has had various effluent E. coli, TSS and BOD violations over the last year but the completion of the secondary treatment upgrades has greatly increased the facilities ability to meet permit compliance.

INSPECTION CHECKLIST

O = Operating P = Operating with problems N = Not operating

SECTION III <input type="checkbox"/> UNIT PROCESS RATING			
UNIT DESCRIPTION	# UNITS OP'G	RATIN G (O,P,N)	COMMENTS
1. PRELIMINARY TREATMENT			
SEPTAGE RECEIVING	0 of 2	O	The facility dropped to 35,000 gpd of septage due to loading issues. A light at the building entrance tells haulers if the facility is currently accepting septage. The septage receiving station is equipped to take RV waste from city residents as well. Hauled septage enters the system before grit chamber. Septage haulers submit sample using cup container provided at the plant. The samples are tested for pH and kept in refrigerator for a week with identification written on cup (hauler name, time, pH). A back up septage receiving area is located inside next to the primary receiving station.
GRIT REMOVAL	2 of 2	O	Two covered and aerated grit chambers, both online. Off-gassing is treated. Gas detector is provided. The unit works well. Operator checks grit accumulation (pole stick) periodically, especially after heavy rain. The chambers are emptied annually for maintenance and cleaning. 3 Arzen blows provide aeration to the grit chambers. Grit removed from the unit is hauled to the Fitchburg/Westminster municipal landfill, along with screenings and dewatered sludge.
BAR SCREEN	2 of 2	O	Two mechanically cleaned bar screens (3/8 in space) with wash press, both were in operation. Flow is split 50/50 between the two units. The units run auto on timer and differential. The room was clean. Screenings is disposed together with dewatered sludge to the landfill. Maintenance is performed on a schedule.

CHEM ADD'N & CEPT		O	<p>Ferric chloride is added at the influent manhole before septage receiving for P removal. The chemical is also added to the aeration tank effluent. It is stored in two 7+ kgal storage tanks. Six smaller dosing pumps for dry weather (2 for inf and 4 for AT eff) and two larger wet weather dosing pumps. Automatic flow paced dosing control.</p> <p>Magnesium hydroxide is added at the head of grit chambers, manual control, for pH/Alk adjustment (one 7200 gal storage tank). It is dosed at approximately 200 gal/day.</p> <p>Also stored inside of the CEPT (chemically-enhanced primary treatment) chemical building:</p> <p>Sodium hydroxide - stored in two 8 kgal storage tanks (get 50% then dilute to 25%) for sludge handling process odor control (transfer pump used to fill the day tank in odor control room) and for pH control (add to primary effluent, not used).</p> <p>Polymers – in totes, for improving primary treatment during wet weather high flow conditions (anionic, was not in use) and improving secondary settling.</p> <p>Sodium hypochlorite – one 6 kgal storage tank which can be backup supply to the 5 kgal storage in the disinfection chemical building. The chemical is used for odor control (supply to the 30 gal day tank), gravity thickener for improving settling and odor control.</p>
TRUCKED SLUDGE		N	The City is no longer accepting commercial sludge operation.
ODOR CONTROL	1 of 1	O	Activated carbon unit outside grit removal building treats exhaust air from aerated grit and mechanical bar screen.
INFLUENT SAMPLING	1 of 1	O	Influent Wave composite sampler is located inside of building before bar screens. Samples are now taken from grit removal effluent and are flow paced.

2. PRIMARY TREATMENT			
PRIMARY CLARIFIER	3 of 3	O	Three covered primary clarifiers, all was online. Off-gassing goes to aeration tank via blowers for odor control. Skimming is pumped to TWAS tank for thickening and solids are pumped to gravity thickeners. Primary effluent flow is measured and samples are taken for process control. There are a total of 6 pumps, 1 solids and 1 skimmer pump for each tank. Pumps are run on a timer. A parshall flume influent flow meter is installed after the clarifiers.
BYPASS (biological treatment)		N	No secondary treatment bypass occurred during this inspection. During peak flow conditions, portions of the primary effluent are sent directly to the chlorine contact chamber, bypassing the secondary treatment system. Staff uses State Point Analysis customized by consulting engineer (W-P) to determine the set point flow to initiate bypass operation. A Parshall flume is used to determine the bypass flows.
CHEM ADD'N			Add polymer for improving primary treatment during wet weather high flow conditions (anionic, was not in use).
3. BIOLOGICAL TREATMENT			
AERATION (formerly FIRST STAGE)	2 of 2	O	Two newly upgraded bioreactor units, both were online. As part of the upgrade, the original aeration tanks are now divided with anaerobic selectors placed upstream of aeration, no longer allow step feeding. Influent ORP, TSS and pH as well as effluent DO had been constantly monitored (DO ~2 mg/l during inspection). Anoxic zones were added to the influent side of each basin, each of which included 3 mixers. 5 blowers provide aeration to the basins.

INTERMEDIATE CLARIFIER (IC)	2 of 2	O	Two clarifiers, both were online. Previous issues with the units skimmer arms have been resolved. There was also seal issue with the new draft tube (side 1) causing short circulation. Sludge blanket in the units are monitored by staff at least once a day using sludge judge. Algae growth is removed regularly. Skimming goes to skimming pit then pumped to the sludge holding tank (TWAS tank) after decanting. 3 WAS and 3 RAS pumps are located in the basement of a separate building are connected to SCADA.
AERATION (formally SECOND STAGE)	2 of 2	O	Two units, both online. Same process as the first stage, however, these tanks are larger.
FINAL CLARIFIERS (FC)	2 of 2	O	Two units, dedicated to the “second stage” AT, one online and one offline for upgrade construction. Ducks in water. Upgrade installations in the pump/equipment gallery was about 50% completion. New LED lights and RAS flow meter have been installed.
BLOWER			4 new Arzen blows have been installed. The set up is the same as the 1 st stage except these blowers are larger. The blowers are automated and run based on the DO probes.
CHEM ADD'N		O	Ferric chloride and polymer were added to the bioreactor effluent for P removal. The chemical additions to the first stage units was stopped for a few month after SSU then resumed in the summer after sample tests indicate beneficial to P reduction (2 decimal point).

5. POST TREATMENT			
CHLORINATION	2 of 2		<p>Sodium hypochlorite is added at mixing chamber at the head of the contact chamber, flow paced. Effluent TRC is continuously monitored at the effluent sampling shed and tested 3/day using grab samples taken 1/shift for reporting (required by permit). Inside the hypo storage and metering pump room, chlorine is continuously monitored at the mixing chamber and the end of the contact chamber for process control. Operation staff make adjustment to the chemical feed rate as needed based on the TRC monitoring (and bypass flow during bypass events).</p> <p>The units are cleaned once a week on Fridays (drained to wet well, then pumped to the splitter box before primary), weather permitting. Hypo stored at the CEPT chemical room can be used for effluent disinfection (pipe connected).</p>
DECHLORINATION			<p>Sodium bisulfate is added to the contact chamber effluent, flow paced. The previous issue related to a leaking pump has been resolved.</p>
PLANT WATER REUSE (settled effluent)			<p>Final clarifier effluent is reused at plant for hose down/cleaning. The city water supply at the plant is separated to domestic uses and process uses. The process water is protected from cross contamination.</p>
6. SOLIDS HANDLING			
GRAVITY THICKENING	2 of 2	2O	<p>Two covered gravity thickeners treat the plant's primary sludge, both were online. Supernatant goes to primary settling #3 tank. Thickened PS goes to the blending tank.</p>
GRAVITY BELT THICKENER (GBT)	2 of 2	2O	<p>Two GBTs located in the process building (covered for odor control) for WAS thickening, both online. The unit operation was set to run 60 gpm. It runs on an as needed basis. Filtrate goes to aeration influent structure. Thickened WAS (4-5% solids) goes to sludge holding tank.</p>

SLUDGE HOLDING TANK (aka TWAS tank)	1 of 2	2O	Two covered tanks for thickened WAS, ran one. The tanks are alternately used, once several months, and cleaned after use. Stored sludge goes to the blending tank
BLENDING TANK	1	O	Blends thickened primary and secondary sludge for dewatering using two mixers. The blending tank pumps up to the Fournier presses. Due to the gasses produced, the tank is located in a room with explosion proof electrical. Fresh air is pumped in and foul air pumped out.
DEWATERING (Fournier rotary presses)	3	O	The dewatering system (three Fournier rotary presses) was in operation. Two presses are typically run with one on standby. The presses alternate weekly. Dewatered sludge is dropped from the presses on the second floor into the dumpster on the first floor for final disposal. Staff collects sludge samples daily from the dewatered sludge (about 20% solids), blending take effluent (about 2%), a thickened WAS (4-5%) for process control. The samples are stored in a dedicated small refrigerator. Filtrate goes to aeration influent structure.
CHEM ADDITION		O	Add polymer before gravity belt press thickening and before rotary presses dewatering. Part of the GBT room is used for storage of other polymers used at the plant. New polymer chemical pumps have been installed and the tanks will be upgraded next year.
SLUDGE DISPOSAL		O	Dewatered sludge is hauled by contract hauler to Fitchburg-Westminster municipal landfill, three dumpsters per day, one in AM and one in PM. Plastic sheeting wraps the sludge before hauling.
ODOR CONTROLS			Wet Scrubber odor control unit (Du-All, use sodium hypochlorite and caustic soda) for the sludge process part of the process building works well. Odors escaped from the dumpster accepting dewatered sludge through the plastic coatings to adjacent building space seemed to be contained locally.

7. MONITORING		
PROCESS CONTROLS		Various (Daily TSS, BOD, settleable solids, ammonia, MLSS, VOC, E. coli. Weekly TS and phosphorus).
LABORATORY	O	Plant staff tests all parameters required by the permit except metal and toxicity. All lab equipment is calibrated twice per year by Global Scientific. The lab has its own budget and replaces equipment as it breaks. The lab will be upgraded as part of the proposed construction going on in 2024. A chemist is on site during the weekdays and the senior operator runs the lab on the weekends.
SAMPLING PROCEDURES		<p>Composite samples are taken daily for the plant influent, primary effluent, secondary effluent and final effluent. The influent sample location collects from aerated grit chamber effluent instead of primary influent to avoid internal recycle flows such as drain water. The effluent samples are taken from the discharge conduit at the manhole behind the effluent sample shed where TRC is continuously monitored. A Wave refrigerated composite sampler is used for influent sampling and standard mini fridge with a pump was converted to collect effluent samples.</p> <p>Grab samples are taken from the plant effluent, not influent, for required monitoring (E. coli, TRC, pH, DO...). Grab samples are all taken from the small chamber downstream of the dechlor mixing chamber.</p>
FLOW MEASUREMENT		<p>Plant flow is monitored after primary clarifier for process control and before chlorine contact chamber effluent weirs for reporting. Hauled septage and secondary bypass flows are also monitored separately.</p> <p>Effluent flow is measured by an ultrasonic level sensor measuring the height of water over the effluent weir at the end of the chlorine contact chamber.</p>
ALARMS		Staff checks alarms. All alarms are connected to the SCADA system. The plant is staffed 24/7.
RECORDS		Use bench sheets, log book, computer. Will add temperature to E. Coli sheet.
IPP		Eight SIUs in the City, 5 categorical, 2/yr self-monitoring, 1/yr City sample and inspection. Wachusett Brewery is required to submit monthly reports since they have had issues in the past. Will go back to quarterly once more compliant.
INSTRUMENTATION	O	Calibration up to date - done 2/yr by professional contract.

8. GENERAL / ADMINISTRATION		
HOUSEKEEPING	O	
STAND BY POWER	O	Two new 800 KW diesel powered generators have been installed and connected (\$1M, with 1300 diesel storage). The old generator remains connected. In case of power failure, all three units can be used to provide backup power. The generators are tested manually once a week and are maintained by Milton.
RECORD KEEPING	O	Hard copy and computer.
SAFETY PROGRAM		Emergency eye washes and showers are tested once a week and the tests are logged for record. Gas monitor (LEL, O ₂ , CO) is provided at HWs.
STAFFING PLAN		The plant is maned 24/7 (3 shifts on weekdays, 2 shifts on weekend days), operated by a total of 20 FT staff members.
SPARE PARTS INVENTORY		Keep critical parts for equipment.
USER CHARGE RATE		Septage rate unchanged (8.5¢/gallon, since 2012). The City last increased sewer rates in 2018.
CAPITAL IMPROVEMENT ACCT		
ENTERPRISE ACCT.		Yes, separate account for wastewater.
BUDGET		About the same level funded as previous years (\$11.46M, covers WWTF and collection system, debt service...). ~\$350,000 is allocated for maintenance.
9. PUMP STATION		3 pumping stations in the City, staff monitors the operation of the station located at the formal westerly WWTF through SCADA but they are manned by collections system staff.



Massachusetts Department of Environmental Protection Wastewater Facility Inspection Form

Type of Inspection:

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



☒ NPDES ☐ Groundwater ☐ SSO ☐ CSO ☐ Other

Nashua

Receiving waters

Nashua

River Basin

CERO

Region

33 permitted outlets

of CSOs

Permitted?

☒ Yes ☐ No

Is facility in compliance?

☐ Yes ☒ No

Fitchburg East POTW

Facility Name (if SSO or CSO inspection, provide location here)

Lanides Lane

Street Address

Fitchburg

City

978-353-2304

Telephone Number

MA

State

01420

Zip Code

978-345-5938

Fax Number

MA0100986

Permit Number

8/31/2015

Permit Expiration Date

in renewal process

Status

7C

Plant Grade

Ryan Burns

Chief Operator

7C

Operator Grade

Contract Operation?

☐ Yes ☒ No

If yes:

Company Name

Street Address

City

State

Zip Code

Telephone Number

Telephone Number

James Laughlin

Inspector Name

4/15/23

Date of inspection

Comments:

All construction at the facility associated with the secondary treatment unit upgrades have been completed. Some additional construction is expected at the facility not associated with the STU. All treatment units were operational. The effluent looked clear. The upgrade was required under the 2012 Consent Decree. Some ammonia and phosphorus violations last spring but there have been no issues lately.