

REPORT OF COMPLIANCE SAMPLING INSPECTION (CSI)

at

City of St. Marys Wastewater Treatment Plant (WWTP)

420 S 6th Street

St. Marys, KS 66536

NPDES No: KS0020974

April 10-13, 2023

by

U. S. ENVIRONMENTAL PROTECTION AGENCY

Region 7: Enforcement and Compliance Assurance Division (ECAD)

INTRODUCTION

I performed a Compliance Sampling Inspection (CSI) at the St. Marys WWTP in St. Marys, Kansas from April 10, 2023, through April 13, 2023. The inspection was authorized by Section 308(a) of the Federal Water Pollution Control Act, as amended. This inspection was conducted in accordance with the procedures described herein and followed all applicable EPA Region 7 Standard Operating Procedures. This narrative report presents the findings and observations of the inspection.

PARTICIPANTS

City of St. Marys

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U. S. Environmental Protection Agency (EPA)

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PROCEDURES

On April 10, 2023, I arrived at the WWTP unannounced. I introduced myself to Mr. Disipio, presented my credentials and explained the purpose and procedures of the inspection. These procedures included completing the Water Compliance Inspection Report (attachment 1), the Biosolids Inspection Form (attachment 2), a facility walk-through with photos (attachment 3), a check of the self-monitoring records, the collection of influent and effluent, and an exit meeting. A Notice of Preliminary Findings (NOPF) was given to Mr. Disipio during the exit meeting.

From April 11, 2023, through April 13, 2023, I collected grab samples of the influent prior to any screening using a sample pole. I poured each grab sample into clean, pre-labeled polyethylene containers for the analysis of ammonia, biological oxygen demand (BOD), total

phosphorus (TP), total kjeldahl nitrogen (TKN), Nitrate+Nitrite (NO₃+NO₂), and non-filterable solids (NFS). The NFS parameter reported in attachment 6 is equivalent to total suspended solids (TSS) parameter required in the National Pollutant Discharge Elimination System (NPDES) permit. The samples collected for the analysis of ammonia, TP, TKN, and NO₃+NO₂ were preserved using sulfuric acid. Each day I collected a grab sample from the same location to measure the pH using a field meter. The analyses using the field meter were conducted within 15 minutes of collecting the sample. I also gathered flow values daily from the operator.

From April 11, 2023, through April 13, 2023, I collected grab samples using a sample pole from the effluent channel after the ultraviolet (UV) disinfection system. The grab samples were poured into clean, pre-labeled polyethylene containers for the analysis of ammonia, biological oxygen demand (BOD), total phosphorus (TP), total kjeldahl nitrogen (TKN), Nitrate+Nitrite (NO₃+NO₂), and non-filterable solids (NFS). The samples collected for the analysis of ammonia, TP, TKN, and NO₃+NO₂ were preserved using sulfuric acid. Each day I collected a grab sample from the same location to measure the pH and temperature using a field meter. The analyses using the field meter were conducted within 15 minutes of collecting the sample. I also gathered flow values daily from the operator.

Each day I placed the samples I collected on ice in an ice chest, sealed the container, and shipped it overnight to the EPA Region 7 Science and Technology Center (STC) for analysis. Samples collected on April 13, 2023, were hand delivered by me to the STC. I followed Region 7 LSASD standard operating procedures in the collection, packaging, transportation, and handling of the samples. Field Sheets and Chain of Custody forms were electronically submitted each day following Region 7 procedures. As noted in attachment 6, not all the samples arrived at the STC within the maximum hold time. Also, STC personnel noted the seal on the ice chest had been broken prior to arrival.

FACILITY DESCRIPTION

The St. Marys WWTP is owned by the City of St. Marys, Kansas. The physical address for the WWTP is 420 S 6th Street, St. Marys, Kansas. The legal description is the SE ¼, NE ¼, SW ¼, Section 9, Township 10 South, Range 12 East within Pottawatomie County. The mailing address for the City of St. Marys is P.O. Box 130, St. Marys, Kansas 66536. The WWTF treats domestic wastewater from the City of St. Marys. Final effluent from the WWTP is discharged to Doyle Creek at Outfall 001A1 (photos 19, 20).

The WWTP is an AeroMod extended aeration activated sludge treatment system. The facility includes a mechanical bar screen, grit removal, selector tank, aeration tanks, aerobic digesters, two clarifiers, and UV disinfection system (photos 7-15). A belt press is utilized for dewatering sludge (photo 16). The belt press was inoperable due to a sheared bolt which was discovered on April 11, 2023. Biosolids are stored under cover on site before being transported to a landfill (photo 17).

The WWTP's NPDES Permit KS0020974 was reissued as effective on January 1, 2021 and

expires on December 31, 2025 (attachment 5). The most recent inspection of the facility was conducted by KDHE on September 22, 2022. The inspection report noted effluent exceedances in 2021 and 2022 for BOD and ammonia.

FINDINGS AND OBSERVATIONS

The following findings were noted during the plant and record review. A complete summary is given in the NPDES Compliance Inspection Report (attachment 1). These findings were discussed with all the participants during the exit meeting.

Self-Monitoring Data Review

I obtained a spreadsheet of the discharge monitoring report (DMR) data from the Region 7 Data Team for the St. Marys WWTP from January 2018 through January 2023 and reviewed the data. During the inspection, I obtained an electronic copy of the laboratory analytical results from March 2020 through March 2023. The collected data also includes laboratory sheets and chain of custody forms from the contract laboratory. After the completion of the inspection, all data obtained from the facility has been stored as electronic records on EPA's secure server.

While reviewing the data, I noted the facility had exceeded the BOD and Ammonia permit limits (NOPF 1). The BOD limit was exceeded in March 2022. The ammonia limits were exceeded in December 2021, January-March 2022, October 2022-January 2023. Mr. Disipio explained the exceedances occurred when he and the city's consulting engineer were modifying plant operations for better phosphorus removal in anticipation of lower permit limits (attachment 8).

The NPDES Permit requires the facility to collect grab samples of the influent and effluent once per month. The facility discharges through Outfall 001A1 continuously every day of the year. The quality of the influent and effluent is likely to vary over a 24-hour period and even more likely over a month. Thus, the required sampling frequency may not be representative.

Laboratory

The facility personnel analyze permit-required samples for pH within 15 minutes of sample collection. The facility is certified by KDHE to conduct this analysis. The pH buffer solutions present during the inspection were current. The meter calibration logs were also present and complete.

For the remaining permit-required monitoring, a contract laboratory (Pace Analytical) is utilized. Samples are analyzed at either Pace's laboratory in Salina, Kansas or Lenexa, Kansas. All sample handling and analyses appear to have met the requirements included in 40 CFR Part 136.

Sample Results

The analytical results from the inspection were received on May 11, 2023, from the Region 7 STC laboratory. This data was not discussed during the exit meeting. The analytical results for BOD, NFS, TKN, NO₂+NO₃, Ammonia, TP, pH, and temperature of the samples I collected are presented in Tables 1 and 2 below. As mentioned previously, the samples collected on April 11 were delayed during shipping which caused the hold time for BOD to be exceeded. See attachment 6 for the analytical data packet.

Table 1: Analytical Results for Influent Samples Collected During the Inspection

Parameter	April 11 2300124-01	April 12 2300125-01	April 13 2300126-01
BOD ₅ ⁴ (mg/L) ¹	393 J ³	240	352 J ³
NFS (mg/L) ¹	530	547	463
Ammonia	51.2	59.8	50.3
Total Phosphorus (mg/L) ¹	11.0	9.76	9.72
TKN (mg/L) ¹	81.6	79.4	75.6
NO ₂ +NO ₃ (mg/L) ¹	0.248	0.302	0.268
Flow (gpm) ²	104.3	102.6	103.5

¹mg/L = milligrams per liter.

²gpm = gallons per minute

³Although the analyte in question has been positively identified in the sample, the quantitation is an estimate (J-coded) due to poor precision in the laboratory.

⁴BOD = biological oxygen demand (five-day)

Table 2: Analytical Results for Effluent Samples Collected During the Inspection

Parameter	April 11 2300124-02	April 12 2300125-02	April 13 2400126-02	Concentration Permit Limits ³
BOD ₅ (mg/L) ¹	2.77 J ⁴	3.84	3.56 J ⁴	30/45
NFS (mg/L) ¹	18.3	16.7	10.4	30/45
Ammonia (mg/L) ¹	0.541	0.974	1.04	Varies monthly 2.8/8.5 for Apr
TKN (mg/L) ¹	1.99	2.53	2.38	N/A
NO ₂ +NO ₃ (mg/L) ¹	0.126	0.051	0.055	N/A
Total Phosphorus (mg/L) ¹	3.11 J ⁴	3.49	3.82	N/A
pH ²	7.28	7.35	7.08	6.0-9.0
Temperature (°C)	17.7	17.6	18	N/A

¹mg/L = milligrams per liter.

²pH is not to be averaged; pH was measured in the field.

³Permit limits for BOD and NFS are Monthly followed by 7-day Averages. Permit limits for Ammonia are Monthly Averages followed by Daily Maximum.

⁴J = Although the analyte in question has been positively identified in the sample, the quantitation is an estimate (J-coded) due to poor precision in the laboratory.

⁵BOD = biological oxygen demand (five-day).

Results from sampling conducted during the inspection indicate that the facility was in compliance with the permit effluent limits.

Biosolids

As mentioned above, the facility utilizes two aerobic digester tanks to further treat biosolids (Photo 15). Biosolids are dewatered through a belt press before being hauled to a landfill (Photo 16). A total of 287.68 tons of biosolids were hauled from the facility in 2022 and 282.08 tons in 2021. A biosolids sample was collected during the inspection, and the results are included in attachment 6.

Collection System

During the inspection, I discussed the city's sanitary sewer collection system with Mr. Disipio. He estimated the average age of the collection system to be 40-50 years old. There are approximately 12 miles of sanitary sewer lines leading to the WWTP. No bypasses have been reported in recent years. According to Mr. Disipio, one-third of the sewer lines are jetted each year, while ten percent of the lines are scoped using closed circuit television each year. The city does not have funds allocated specifically to the upgrade and repair of the collection system; instead, they are as needed.

I visited four lift stations in the collection system (photos 1-5). A fifth lift station, located adjacent to the WWTP office, receives flow from all four stations in the collection system. The lift stations had normal debris accumulations and maintained floats. On-site generators are installed at two of the lift stations and at the WWTP. The city has one portable generator for the remaining lift stations. The city should consider obtaining additional generators to operate the lift stations during emergencies.

I also discussed customers in the collection system with Mr. Disipio that could have an impact on the WWTP's performance. He mentioned a car wash and Custom Wood Products. The city should contact these facilities to obtain a better understanding of their current processes as well as the quality and quantity of their discharges to the WWTP.

Operational Issues and Observations

I observed all areas of the WWTP during the inspection (photos 1-20). The facility was well maintained and organized. At the time of the inspection, the belt press was inoperable as of April 11, 2023, due to a sheared bolt. Mr. Disipio was in the process of obtaining a replacement bolt during the inspection. The remaining components of the facility were in operation. He later notified me that the belt press was repaired on April 15, 2023.

Mr. Disipio had been testing different operational configurations under the supervision of the city's consulting engineer, B & G Engineers, in 2021 and 2022 to optimize the plant for phosphorus removal. During those trials, the ammonia levels in the effluent often exceeded the permit limits. Mr. Disipio notified KDHE of his trials and his exceedances. At the time of the inspection, the facility was being operated using dissolved oxygen set points, sludge blanket levels, settleometer results, and evaluations of microorganism population.

Summary

Mr. Disipio explained his extensive efforts to optimize the WWTP operations to meet current permit goals and anticipated lower limits. The city should allocate funds for treatment upgrades to achieve future effluent limits and address aging infrastructure.

The city should allocate funds for a collection system maintenance, repair, and improvement budget.

Monthly grab samples are required by the NPDES permit. The facility discharges continuously every day of the year. The quality of the effluent is likely to vary across a 24-hour period and even more likely over a month. The required frequency of sampling may not be representative of the effluent because of these factors.

The city should investigate facilities connected to the collection system that could impact the WWTP's operations.

During the exit meeting, a NOPF was given to Mr. Disipio with the following finding (attachment 7). A written response to the NOPF has not been received.

1. Effluent limit exceedances – NPDES permit Part A

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Hannah Lewis
Life Scientist

Moran, Nicole Digitally signed
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Nicole Moran
Section Chief

Attachments:

1. Water Compliance Inspection Report, Form 3560-3 (4 pages)
2. Biosolids Inspection Form
3. Digital Image Log (22 pages)
4. Facility Layout Map (1 page)
5. NPDES permit (8 pages)
6. Laboratory Analytical Report for Project HML2307 (28 pages)
7. NOPF (1 page)
8. Permit Limit Exceedance Explanations (4 pages)