REPORT OF COMPLIANCE SAMPLING INSPECTION (CSI)

AT
City of North Bend Wastewater Treatment Facility (WWTF)
810 Hwy 30
North Bend, NE 68649
NPDES No: NE0040924

April 18-21, 2022

BY
U. S. ENVIRONMENTAL PROTECTION AGENCY
Region 7
Enforcement and Compliance Assurance Division (ECAD)

INTRODUCTION

I performed a Compliance Sampling Inspection (CSI) at the North Bend WWTF in North Bend, Nebraska, from April 18, 2022, through April 21, 2022. 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

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PROCEDURES

On April 18, 2022, I contacted Mr. Knapp and stated that I would be conducting a CSI at the North Bend WWTF starting that day. I arrived at the North Bend WWTF at 12:30 p.m. on April

18, 2022. I introduced myself to Mr. Knapp, presented my credentials, and explained the purpose and procedures of the inspection. These procedures included completing the Water Compliance Inspection Report (attachment 1), a facility walk-through with photos (attachment 2), a check of the self-monitoring records, the collection of influent, effluent, and sludge samples, and an exit meeting. Jason Windhorst and Charlie deShazer with NDEE joined the inspection from April 19, 2022, through April 21, 2022.

While setting up EPA's ISCO composite samplers on April 18, 2022, Mr. Knapp was collecting a composite effluent sample from the facility's ISCO composite sampler. I noticed Mr. Knapp did not implement a method for cooling the samples during collection.

From April 18, 2022, through April 21, 2022, I used an ISCO model 3710 automatic composite sampler to collect a 24-hour composite sample of the influent before the comminuter. I suspended a weighted length of new Tygon tubing into the influent channel. I connected the other end to the sampler pump and programmed it to collect evenly spaced aliquots every 30 minutes into a clean Nalgene bottle, which was packed in ice. I returned each day to service the sampler. I removed the bottle, agitated its contents, and poured them into clean, pre-labeled containers for the analysis of Carbonaceous Biochemical Oxygen Demand (CBOD) and Non-Filterable Solids (NFS). The NFS parameter reported in attachment 5 is equivalent to total suspended solids (TSS) parameter required in the NPDES permit. I measured the pH in a separate grab sample using a field meter.

I used an ISCO model 3710 automatic composite sampler to collect a 24-hour composite sample of the effluent from the effluent channel from April 18, 2022, through April 21, 2022. The ultraviolet (UV) disinfection system was not being utilized at the time of the inspection. I suspended a weighted length of new Tygon tubing into the channel and connected the other end to the sampler pump and programmed it to collect evenly spaced aliquots every 30 minutes into a clean Nalgene bottle, which was packed in ice. I returned each day to service the sampler. I removed the collection bottle, agitated its contents, and poured them into clean, pre-labeled containers for the analysis of CBOD, NFS, Ammonia, TKN, Nitrate + Nitrite (NO2+NO3), and Total Phosphorus (TP). I measured the pH and temperature in a separate grab sample using a field meter. I also collected flow values daily from the operator.

On April 19, 2022, I collected grab samples from the north aerobic digester for the analysis of total metals, Ammonia, NO2+NO3, pH and percent solids. Results for the sludge analyses are presented in attachment 5.

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 21, 2022, were delivered to the STC by me, not shipped. 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. All samples arrived at the STC within proper holding times.

FACILITY DESCRIPTION

The North Bend WWTF is owned by the City of North Bend, Nebraska; however, People Service Inc. has been contracted to operate and maintain the WWTF and collection system. The physical address for the WWTF is 810 Hwy 30, North Bend, NE 68649. The legal description is the SW ¼, NW ¼, Section 8, Township 17 North, Range 6 East within Dodge County. The mailing address for the City of North Bend, Nebraska, is PO Box 196, North Bend, NE 68649. The WWTF treats domestic wastewater from the City of North Bend. According to Mr. Knapp, there are no significant industrial users connected to the sanitary collection system. Final effluent from the WWTF is discharged to the Platte River at outfall 001 which is located approximately 0.40 miles south of the WWTF (photo 18).

The WWTF consists of a comminutor near the influent wet well, high-flow bar screen, rotoscreen, aerated grit chamber, and an activated sludge treatment system consisting of two aeration basins. Wastewater from the aeration basins flows to one of two clarifiers. Lastly, the wastewater flows from the clarifiers through an UV disinfection system that is utilized from November through April. When the UV system is not operational, the UV banks are removed from the channel (photo 14). Sludge from the clarifiers is regularly returned to the aeration basins for further treatment via a trough located between the two clarifiers (photo 10). Sludge is manually wasted from the clarifiers as needed to one of two aerobic digesters by lifting a weir gate (photo 11).

The WWTF's National Pollutant Discharge Elimination System (NPDES) Permit NE0040924 was renewed as effective on April 1, 2022 (attachment 4). The permit expires on March 31, 2027. The most recent inspection of the facility was conducted by NDEE on February 25, 2020. The inspection report includes the following issues: effluent limit violations; process control sampling was not conducted; flow measurements were not recorded; flow measurement recorder was not operational; inflow and infiltration (I&I) concerns; pH meter calibrations were not recorded; clarifier skimmers were not operating properly; aeration was not even within the two aeration basins; based upon recorded flow values, the plant was hydraulically overloaded; and UV system was not fully functional.

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 for the North Bend WWTF from March 2017 through December 2021 and reviewed the data. During the inspection, I obtained an electronic copy of the facility's DMRs for the years 2019 – 2021. The collected data includes laboratory sheets and chain of custody forms from the contract laboratory and the

WWTF. Three data entry errors for the flow parameter were found during the DMR data review. Mr. Adair emailed the corrected data and notified NDEE. 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 reported violations for CBOD, E. coli, Ammonia, TSS, pH, and dissolved oxygen (DO) from March 2017 to September 2021 (NOPF 1). Some violations were for both concentration and mass-based limits. The effluent samples during monitoring periods in July, September, October, and November of 2021 were not analyzed for DO. Also, the September 2021 effluent sample was not analyzed for pH. Mr. Adair provided NDEE Noncompliance Reports which detail some of the exceedances were due to a broken blower, return sludge line plugged, high influent flow, or potential lab error. The cause of the remaining exceedances was unknown by either Mr. Knapp or Mr. Adair.

The permit requires the WWTF to achieve 85% removal of CBOD and TSS. The DMR data reveals that influent and effluent samples are collected are different days thus was noted as NOPF 6. After further consideration of the permit language and associated regulations, NOPF 6 is no longer considered a compliance finding. However, to obtain the most accurate and representative plant performance data, the influent and effluent samples should be collected within the same 24-hour period.

The NPDES permit effluent limits are based, in part, on the daily design flow of the WWTF which is 0.195 MGD according to NDEE's Fact Sheet for the North Bend WWTF. While reviewing the DMR data, I noted the daily maximum flow reported for the months January 2017 through December 2021 was greater than 0.195 MGD during 58 of those 60 months (NOPF 8). Also, the monthly average flow reported was greater than 0.195 MGD during 46 of 60 months (January 2017-December 2021). This information indicates that the WWTF is hydraulically overloaded.

Sample Results

The analytical results from the inspection were received on May 19, 2022, from the Region 7 STC laboratory. This data was not discussed during the exit meeting. The analytical results for CBOD, NFS, TKN, NO2+NO3, Ammonia, Total Phosphorus, pH, and temperature of the samples I collected are presented in Tables 1 and 2 below. See attachment 5 for the analytical data packet.

Table 1: Analytical Results for Influent

Parameter	April 19	April 20	April 21
CBOD5[4] (mg/L)[1]	171	191	246
NFS (mg/L)[1]	154	226	499 J[3]
pH[2]	7.87	7.88	7.75

[1]mg/L = milligrams per liter
[2] pH is not to be averaged; pH was measured in the field.
[3]Although the analyte in question has been positively identified in the sample, the quantitation is an estimate (J-coded) due to poor precision obtained for this analyte in the laboratory duplicate sample.
[4]CBOD = carbonaceous biochemical oxygen demand (five-day).

Table 2: Analytical Results for Effluent Samples Collected During Inspection

Parameter	April 19 (2200088)	April 20 (2200089)	April 21 (2200090)	Concentration Permit Limits[3]
CBOD5[5] (mg/L)[1]	ND	ND	ND	25/40
NFS (mg/L)[1]	4.35	ND	ND	30/45
Ammonia (mg/L)[1]	ND	0.274	0.250	Seasonal 18.81/37.74 for April
TKN (mg/L)[1]	1.19	2.32	1.46	N/A
NO2+NO3 (mg/L)[1]	15.3	11.2	12.1	N/A
Total Phosphorus (mg/L)[1]	1.73	2.08	1.89	N/A
Temperature (°C)[2]	9.2	10.6	10.0	N/A
pH[2]	7.57	7.13	6.96	6.0-9.0
Flow in MGD[4]	0.091	0.092	0.095	N/A

[1]mg/L = milligrams per liter.
[2] °C = degrees Celsius, pH is not to be averaged, pH was measured in the field.
[3]Permit limits for CBOD and NFS are Monthly followed by 7-day Averages. Permit limits for Ammonia are Monthly averages followed by Daily Maximum.
[4]MGD = Million gallons per day.
[5]CBOD = carbonaceous biochemical oxygen demand (five-day).

Results from sampling conducted during the inspection indicate that the facility was in compliance with the concentration limits (mg/L) set forth in the permit.

Sludge

As mentioned above, the facility utilizes two aerobic digesters to treat sludge (Photos 12, 13). The facility was unable to provide documentation from the last sludge hauling event but is

suspected to be more than 5 years ago. Mr. Knapp stated his understanding is that sludge would have been hauled to a nearby landfill. The city is currently exploring options to haul sludge from the digesters.

Laboratory

The facility personnel analyze permit-required samples for pH and temperature within 15 minutes of sample collection. Under the requirements of the previous permit, facility personnel also analyzed for dissolved oxygen which is not required under the current permit. The pH buffer solutions present during the inspection appeared to be of good quality with a future expiration date. While reviewing the pH meter calibration logs, I noted that the logs were incomplete: missing information such as the steps of calibration, instrument information, date of calibration, and buffer solution information (NOPF 5). Standard Condition 13 of the NPDES permit states that "the permittee shall retain records of all monitoring information, including all calibration and maintenance records..." and includes a list of required details.

For the remaining permit-required monitoring, a contract laboratory (Midwest Laboratories, Omaha, Nebraska) is utilized. During the inspection, I reviewed laboratory records to ensure that all analyses complied with requirements of 40 CFR part 136. I noted that all holding times were met; however, the sample preservation requirement for temperature included in 40 CFR part 136 was not always met for CBOD and E. coli (NOPF 7). As stated earlier, Mr. Knapp had a composite sampler on-site collecting effluent samples on April 18, 2022, but the samples were not being cooled during the 24-hour composite period as required by 40 CFR part 136. While reviewing historical chain of custody documents included with the analytical results, I noticed numerous instances where the temperature of the sample upon arrival at the laboratory was high (range of 7-19^{o}C) indicating the samples had not been cooled while sample compositing. Also, some samples in transit over two hours to the laboratory had high temperature readings when received by the laboratory which indicates they were not cooled during transport.

Collection System

During the inspection, I discussed the city's collection system with Mr. Knapp and Mr. Adair. The average age of the collection system is 60 years old with most of the system being clay tile. There are approximately 40,803 linear feet of sanitary sewers in the city. Flowmeter values at the WWTF increase during rain events indicating inflow and infiltration issues. Mr. Knapp stated that the city does not routinely clean or inspect the collection system (NOPF 5). Instead, the city uses a contractor on an as-needed basis to clear blockages. According to NPDES permit Standard Condition 7, the permittee shall properly operate and maintain all facilities and systems of treatment and controls. Mr. Adair provided a map showing the city's efforts to locate and map the sewer system which was 50% complete at the time of the inspection. During the Fall of 2021, approximately 1,460 linear feet of sanitary sewer line replacement was completed. The city also completed a manhole repair project in January 2021 to address damage caused by a major flood event in March of 2019.

Mr. Knapp could not recall when the last sanitary overflow had occurred; however, the WWTF and City of North Bend did flood in March of 2019. Evidence of at least one high flow event was present in the below ground area where the influent screening (comminutor and bar screen) occurs. Debris and rags were hanging from suspended cables in this area (photo 1). Mr. Knapp also stated that he was not aware of any basement back-up complaints during the last year.

I visited the two lift stations: Main Street and Cottonwood. The wet wells appeared to be clear of debris with minor fat deposits and to have maintained floats (photos 16, 17). Access to the wet wells was not secure to prevent unsupervised access (NOPF 3). The lift stations had received an upgrade two years ago which included new wiring for controls, alarms, and dialers. The city does not have a secondary power source, portable generator, or on-site generator to operate the lift stations during emergencies (NOPF 4). The lift stations also do not have the ability to receive power from a generator. Mr. Adair stated that a company would need to be contacted to pump the wastewater from the lift station during an emergency.

Operational Issues and Observations

I observed all areas of the WWTF during the inspection (photos 1-15). I noted that the north and south clarifier sweeper arms were not in operation. Mr. Knapp stated that the sweeper arms had broken on April 17, 2022. The sweeper arm on the south clarifier was repaired before the inspection concluded on April 21, 2022. The south aeration basin did not have uniform aeration patterns indicating a problem with the piping or diffusers. In September 2021, the north aerobic digester was out of service for repairs. During the inspection, the south aerobic digester was operating at a minimal level due to needed repairs. The UV system control panel is no longer fully functional, usage meter was broken (NOPF 5). The UV system also did not have a method for monitoring the UV intensity. Mr. Knapp stated that UV bulbs are replaced when they go out. The underground pipe gallery had significant corrosion on some of the piping. According to the NPDES permit Standard Condition 7, the permittee shall properly operate and maintain all facilities and systems of treatment and controls.

While discussing plant operations during the inspection, Mr. Knapp stated he had never seen an Operation and Maintenance Manual at the plant and that he does not conduct any process control activities (NOPF 2 and 5). Mr. Knapp also stated that sludge from the aerobic digesters had not been removed in over 5 years (NOPF 5). During the inspection, Mr. Windhorst informed Mr. Adair and Mr. Knapp that NDEE has an electronic copy of the 1978 Operation and Maintenance Manual located on their publicly accessible database. According to the 1978 Operation and Maintenance Manual, “it will be necessary to remove sludge from the aerobic digesters several times a year.” The Manual also includes methods for conducting and tracking process control activities. The NPDES permit Standard Condition 7 requires the permittee to properly operate and maintain all facilities and systems of treatment and controls and further includes adequate process controls and operator training.

Summary

During the inspection a Notice of Preliminary Findings was given to Mr. Adair with the following findings (attachment 6).

1. Permit limit exceedances and failure to sample.
2. No Operation and Maintenance Manual available for staff.
3. Lift stations are not secure with lock or fencing.
4. No emergency/backup power for lift stations.
5. Not operating and maintaining all facilities and systems of treatment and control: process control sampling not conducted; no sludge hauled in at least 5 years; hours on UV bulbs not tracked; UV system controls do not fully function as designed; pH meter calibration logs are incomplete; collection system maintenance is not conducted regularly to reduce inflow, infiltration, and clogs.
6. Sampling influent and effluent on separate days is not representative for calculating required 85% removal of BOD and TSS.
7. Composite samples are not refrigerated or iced during composite sample collections to meet preservation per 40 CFR Part 136.
8. Average monthly flow data shows the WWTF commonly exceeds the daily plant design of 0.195 MGD listed in the permit.

After further consideration of the permit language and associated regulations, NOPF 6 is no longer considered a compliance finding.

It is recommended that the City of North Bend increase efforts to reduce and eliminate I&I within the sanitary sewer collection system. Reported flows to the WWTF are currently above the average daily design flow for the facility. Also, the City does not have a plan for preventative maintenance of the collection system.

Mr. Adair provided responses to the NOPF (attachment 7).

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Hannah Lewis
Life Scientist

NICOLE MORAN Digitally signed by NICOLE MORAN Date: 2022.06.02 13:26:35 -05'00'

Nicole Moran
Section Chief

Attachments:

1. Water Compliance Inspection Report, Form 3560-3 (4 pages)
2. Digital Photographs with Photo Log (10 pages)
3. Facility Satellite Map (1 page)
4. NPDES permit effective on April 1, 2022 (28 pages)
5. Laboratory Analytical Report for Project HML2202 (25pages)
6. NOPF dated April 21, 2022 (1 page)
7. NOPF responses (3 pages)