September 9, 2020

MAYOR BRIAN HATCH
CITY OF KNOXVILLE
305 S THIRD ST
KNOXVILLE, IA 50138

SUBJECT: Letter of Non-Compliance: Violation of Final Effluent Limits [567 IAC 63.7]
NPDES Permit #: 6342001

Dear Honorable Mayor Hatch and Council:

Enclosed is the report of the recent inspection of the above facility conducted by Anne Hildebrand of the Field Office #5 staff.

We believe you will find the report self-explanatory and strongly encourage you to take action on the requirements and recommendations listed at the end of the report.

This letter of non-compliance pertains to the infrequent violations of the ammonia nitrogen daily maximum concentration limit specified in your NPDES permit.

If you have any comments or questions about the inspection or report, please contact Anne Hildebrand at 515-725-0273 or anne.hildebrand@dnr.iowa.gov.

The cooperation and assistance provided by Patrick Murphy during the inspection is appreciated.

Sincerely,

Ted Petersen
Supervisor, Field Office #5

cc: DNR Records (w/encl.)
Patrick Murphy, Knoxville WW Superintendent (via email)

Iowa Department of Natural Resources
Wastewater Treatment Facility Inspection Form

NPDES Permit #: 6342001

FACILITY INFORMATION

Facility:
Name: **Knoxville Water Reclamation Authority** Plant Grade: **WW/III**
Responsible Authority/Owner: **City of Knoxville**
Address: **1703 E Pleasant Street** Phone: **641-828-0587**
City: **Knoxville** State: **Iowa** Zip: **50138**

Responsible Operator:
Name: **Patrick Murphy** Grade: **WW4** Certification Number: **4182**

General Description:
Wastewater treatment is provided by a two-stage trickling filter/bio-tower treatment plant. Treatment units include screening with grit removal; three primary clarifiers, two trickling filters (w/domes); two intermediate clarifiers, a rotary screen for final humus and trickling filter recycle, plant pump station, two biotowers, two final clarifiers, a chlorine contact basin (not used), two anaerobic digesters and a 6 MG EQ basin for flows in excess of 4.5 MG.

Design Capacity:
Average MGD: **3.07** Maximum MGD: **5.42**
Pounds BOD/Day: **2.959, TKN=508** PE (BOD): **17,719**

Now Treating:
Average MGD: **1.4391** Maximum MGD: **11.786**
Pounds BOD/Day: **1516.6118; TKN=270.9572** PE (BOD): **9,082**
Period Reviewed: **01/01/2018 - 07/31/2020** Population Served: **7,313 (2010 census)**

Receiving Stream: **Competine Creek**

INSPECTION INFORMATION

Inspection:
Date and Time of Inspection: **08/07/2020 9:57 a.m.** Purpose: **Routine Compliance Inspection**
Date of Last Inspection: **01/18/2018**

Persons Interviewed:
Name: **Patrick Murphy** Title: **Wastewater Superintendent**
Name: Title:

NPDES PERMIT COMPLIANCE SUMMARY

Self-Monitoring Effluent Limitations:
Operation Reports Submitted: ☒ Sat. ☐ Marg.* ☐ Unsat.*
Required Data on Reports: ☒ Sat. ☐ Marg.* ☐ Unsat.*
Testing Adequacy: ☒ Sat. ☐ Marg.* ☐ Unsat.*
Self-Monitoring Results: ☐ Compliance ☒ Infrequent Non-Compliance* ☐ Significant Non Compliance*

Samples this Inspection:
Type: **No samples taken** Lab Data Attached? ☐ Yes ☐ No
Results: ☐ Sat. ☐ Marg.* ☐ Unsat.*

Visual Appearance of Effluent: **Clear**
Visual Appearance of Receiving Stream: **No adverse impact to stream, effluent dominated**

Compliance Schedule:
Compliance w/Schedule: ☒ Sat. ☐ Marg.* ☐ Unsat.* ☐ NA
Next Item Due: **Schedule Compliance Meeting - Chloride; Submit Facility Plan to Eliminate Bypassing & Comply with E. coli Final Effluent Limit - ACO; Submit Compliance Strategy - Copper; Submit Feasibility Study - NRS;**
Date Due: **11/01/2020 - Chloride; 12/31/2020 - ACO; 02/01/2021 - Copper; 02/01/2023 - NRS**

* Additional details in the narrative report

AUTHENTICATION

Inspector:
Name & Title: **Anne Hildebrand, Environmental Specialist** Date: **9/9/2020**

Reviewer:
Name & Title: **Tom Atkinson, Environmental Specialist Senior** Date: **9/9/2020**

FACILITY EVALUATION

Were deficiencies noted or significant observations made during the inspection?

Yes = See Comments Section for details

No = No deficiencies or significant observations were noted

Lack of Entry = Item not applicable or not observed

Item	Yes	No
1. Collection System		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Dry Weather Capacity	☐	☒
d. Infiltration/Inflow	☒	☐
e. Bypass(es)	☒	☐
2. Lift Station(s) (Collection System)		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Reliability/Emergency Operation	☐	☒
3. Industrial Waste Pre-Treatment		
a. Significant Industrial Users	☒	☐
b. Waste Toxicity/ Compatibility	☐	☒
c. Strength Reduction	☐	☒
d. Effect on Treatment Plant	☐	☒
4. Preliminary Treatment		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Effectiveness	☐	☒
5. Primary Treatment		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Sludge/Scum Removal	☐	☒
e. Effectiveness	☐	☒
6. Secondary Treatment		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Recirculation	☐	☒
e. Freezing	☐	☒
f. Effectiveness	☐	☒
7. Final Settling		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Effectiveness	☐	☒
8. Supplementary Treatment		
a. Operation and Maintenance	☐	☐
b. Physical Condition	☐	☐
c. Capacity	☐	☐
d. Effectiveness	☐	☐

Item	Yes	No
9. Sludge Handling and Disposal		
a. Operation and Maintenance	☒	☐
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Effectiveness	☐	☒
e. Final Disposal, Solids	☐	☒
f. Final Disposal, Liquids	☐	☒
10. Lagoon Structures		
a. Maintenance	☐	☒
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Cell Configuration	☐	☒
e. Storage/Drawdown Management	☐	☒
11. Flow Measurement		
a. Operation and Maintenance	☒	☐
b. Capacity	☐	☒
c. Continuity	☐	☒
d. Location, Method/ Effectiveness	☐	☒
12. Pumping		
a. Operation and Maintenance	☐	☒
b. Physical Condition	☐	☒
c. Capacity	☐	☒
d. Reliability/ Emergency Operation	☐	☒
13. Miscellaneous		
a. Location	☐	☒
b. Odors	☐	☒
c. Emergency Operation	☐	☒
d. Bypass(es)	☒	☐
e. Equipment	☐	☒
f. Buildings & Grounds	☐	☒
g. Lab Certification	☐	☒
h. Other Backflow Prevention	☒	☐
14. Staffing, Operator Certification		
a. Operator, Direct Responsibility	☐	☒
b. Shift Operator(s)	☐	☒
c. General Staffing	☐	☒
15. Supplementary		
a. Permit Availability	☒	☐
b. Operation Reports Availability	☐	☒
c. Equipment Records Maintenance	☐	☒
d. Previously Noted Deficiencies	☐	☒
e. Improvements	☒	☐
f. Domestic/Industrial Growth	☐	☒
g. Recommendations	☒	☐
h. Required Actions	☒	☐

INTRODUCTION

A routine compliance inspection was conducted at the Knoxville Water Reclamation Facility (WRF) on August 7, 2020. The inspection involved a review of the facility records, discussions with the staff identified above, and a walk through of the treatment facility.

NPDES PERMIT COMPLIANCE SUMMARY

The discharge monitoring reports (DMRs) were reviewed for the reporting period from January 2018 through July 2020.

Self-Monitoring: All DMRs were submitted regularly and on time during the reporting period.

The City calibrates the pH meter at least prior to each use with the three calibration buffers (e.g. pH 4.01, pH 7.00 and pH 10.01) and records the calibrations.

The City's NPDES permit renewal was issued on August 1, 2020. The NPDES permit specifies dissolved oxygen (DO) monitoring with an associated limit. The City shall measure DO on-site.

Design Capacity: During the above mentioned reporting period the City exceeded the design AWW flow of 3.07 MGD in June 2019 and the design MWW flow of 5.42 MGD 15 days.

The facility is reminded that waste in such volumes or quantities that exceed design capacity of the treatment plant or reduce the effluent quality below that specified in the operation permit are considered to be wastes that interfere with the operation or performance of the treatment system and are prohibited by rule IAC 567 62.1(7).

Effluent Limitations: During the review period the City infrequently violated the ammonia nitrogen daily maximum concentration limit. This violation is detailed in the attached Facility Compliance Report.

The facility is reminded that the wastewater treatment facility is prohibited from discharging pollutants except in compliance with the effluent limitations specified in the NPDES permit issued August 1, 2020.

In accordance with Standard Condition #13, any violation of the maximum ammonia nitrogen limitations must be reported to the DNR within 24 hours of discovery of the violation. Additionally, in accordance with Standard Condition #14, any violations that occur but aren't required to be reported under Standard Condition #13 must be reported with the DMR.

Samples this Inspection: No samples taken.

SIGNIFICANT INDUSTRIAL USER: TREATMENT AGREEMENT COMPLIANCE

The City has identified three Significant Industrial Users (SIUs) as defined by Iowa Administrative Code [567 IAC 60.2 (455B)]. Those industries are George A. Hormel & Co., 3M Company and Weiler Products. Treatment Agreements (TAs) have been established with those industries in accordance with 567 IAC 64.3(5). The TAs have been incorporated into the NPDES Permit issued to the City of Knoxville to include monitoring, reporting and effluent limitations. City staff visit and conduct the sampling for the SIUs.

Exceedances of the TA limits are identified by the City and addressed by issuing a written warning letter. Subsequent violations during a rolling twelve month period result in escalating surcharges/penalties to the responsible contributing industry.

The City implements a Fats, Oil and Grease (FOG) program for food service establishments, including semi-annual inspections of the establishments with the exception of the racetrack and Cone Corner, which are seasonal and inspected annually. The City charges the establishments an annual fee for the inspections, but when the grease traps/interceptors are cleaned, the City will accept grease for no charge. The grease is deposited into the digester.

The City also accepts portable toilet waste, mostly from the racetrack during the summer.

Due to Covid-19 guidelines, the SIUs were not visited during the inspection.

George A. Hormel Company – This facility produces smoked and cured meat products. Pretreatment consists of pH adjustment, equalization and a Dissolved Air Flotation (DAF) unit. Grease and skimmings from the DAF unit are collected in a tank and hauled to the Wastewater Reclamation Facility in Des Moines. Continuous pH monitoring equipment is operated and maintained by the facility and is utilized to determine compliance with pH limitations.

The City collects a 24-hour composite sample to determine compliance with the other limitations. The automatic sampler is located outside next to the equalization tank.

During the review period, George A. Hormel was in infrequent non-compliance with the BOD5, TKN and oil and grease pretreatment limits.

The industry and the City are negotiating changes to the TA to include limits for chloride. The changes to the TA will result in additional pretreatment at the industry. Any changes to the TA must be submitted to the DNR NPDES Section for incorporation in the NPDES permit.

3M Company – This facility manufactures various adhesive products. The discharge consists of domestic wastes and clean-up water, with occasional cooling tower blowdown blowdown when authorized by the City. The facility is classified as an SIU due to the volume of wastewater discharged.

A Parshall flume, flow meter and composite sampler are located outside the production facility near the guard shack along North Godfrey Lane. City staff visit weekly and maintain flow calibration records.

During the review period, 3M was in infrequent non-compliance with the daily max flow pretreatment limit. The daily max flow was exceeded six days in February 2020.

Weiler Products – This facility manufactures equipment for the agriculture and construction industries. Two parts washing spray booths prior to powder coating employ a conversion coating process subject to the Metal Finishing Pretreatment Standards for New Sources found in 40 CFR 433.17.

Process wastewater collected in the floor troughs is pumped to an equalization tank in the pretreatment area. Finished products are washed with detergent before shipping. This cleaning process is also subject to the Metal Finishing Pretreatment Standards and is treated with the other process wastewater in the pretreatment system.

A MoonStone® bentonite adsorption process was installed in 2017. Equalized process wastewater is blended with a bentonite slurry and the solids are recovered with a belt filter press process. Toxic Characteristic Leaching Procedure (TCLP) analyses were conducted to demonstrate that the solids would not be considered hazardous wastes. As non-hazardous waste, the solid waste is disposed of at the landfill. The wastewater from the belt filter press equipment is metered and discharged to the sanitary sewer.

During the review period, Weiler was in infrequent non-compliance with the daily max flow pretreatment limit for seven days.

FACILITY EVALUATION

1.a & d: COLLECTION SYSTEM: Operation and Maintenance & Infiltration/Inflow

The collection system rehabilitation of Area 5 was completed by December 1, 2019 as required in the AOC. The collection system rehabilitation of Area 5 was approved through the issuance of Iowa DNR Construction permit # 2014-0397-S on June 18, 2014.

1.e: COLLECTION SYSTEM: Bypass

One bypass event from Manhole 116A was reported during the review period (September 5, 2018). The bypass was the result of a blockage in a dead-end line. The bypass was reported verbally by the City to the Department within 24 hours as required by 567 IAC 63.6(455B).

2.a: LIFT STATIONS: Operation and Maintenance

The City has one lift station. The City uses a portable generator to provide emergency power to the lift station. The lift station is equipped with an autodialer to notify wastewater staff of issues at the lift station.

4.a: PRELIMINARY TREATMENT: Operation and Maintenance

Screening consists stair-step screen. Grit removal consists of a grit classifier. The grit and screenings are stabilized with hydrated lime prior to hauling to a landfill. During the inspection, chipping paint was observed on the overflow pipe from the grit classifier. It is recommended that the piping be painted to maintain the integrity and prolong the life of the equipment.

5.a: PRIMARY/INTERMEDIATE TREATMENT: Operation and Maintenance

The City has three primary clarifiers. Even flow over the weirs was observed from each primary clarifier during the inspection. The primary clarifiers are cleaned every Monday.

The City has two intermediate clarifiers. Even flow over the weirs was observed from each intermediate clarifier. The intermediate clarifiers are cleaned every Monday.

As part of the 2023 UV disinfection project, the City will be replacing the metal components with stainless steel and the drives in the primary and intermediate clarifiers.

6.a: SECONDARY TREATMENT: Operation and Maintenance

The City has two rock media trickling filters and two biotowers. At the time of inspection, the trickling filters were observed to have even flow over the rocks and the biotowers were observed to have even flow over the plastic.

7.a: FINAL SETTLING: Operation and Maintenance

The City has two final clarifiers. Even flow over the weirs was observed from each final clarifier during the inspection. The final clarifiers are cleaned every Monday.

As part of the 2023 UV disinfection project, the City will be replacing the metal components with stainless steel and the drives in the final clarifiers.

9.a: SLUDGE HANDLING AND DISPOSAL: Operation and Maintenance

The City has a land application program. As required by 567 IAC 67.4, the City maintains a five year long-range program for land application and updates the program annually.

11.a: FLOW MEASUREMENT: Operation and Maintenance

Influent flow is measured through a 12-inch Parshall flume with an ultrasonic flow meter. Final effluent flow is measured over a weir with an ultrasonic flow meter. The flow meters are calibrated every six months.

13.d: MISCELLANEOUS: Bypasses

Four bypass events were reported from the equalization basin overflow at the wastewater treatment facility (October 8, 2018 through October 12, 2018, March 13, 2019, June 21, 2019 and June 10, 2020). The bypasses were the result of excessive rainfall with the exception of March 13, 2019 which was the result of excessive snow melt. The bypasses were reported verbally by the City to the Department within 24 hours as required by 567 IAC 63.6(455B).

13.h: MISCELLANEOUS: Backflow Prevention

There is backflow prevention device installed on the potable water line for the entire facility. Annual testing is required of backflow prevention devices and assemblies at a minimum (Uniform Plumbers Code 603.2). The backflow prevention device is inspected annually.

15.a: SUPPLEMENTARY: Permit Availability

The City is required to obtain coverage under Iowa DNR NPDES General Permit No. 1 (Storm Water Discharge Associated with Industrial Activity) because the AWW design flow of the Knoxville wastewater treatment facility is greater than or equal to 1.0 MGD. The City was initially granted authorization to be covered under General Permit No. 1 on November 17, 2008 (Authorization No. 16600-16370). The City has maintained coverage and most recently renewed for five years with an expiration date of November 17, 2023.

The Storm Water Pollution Prevention Plan (SWPPP) was available at the time of inspection. Pictures are utilized to document storm water inspections and are included with the inspection records.

15 e: SUPPLEMENTARY: Improvements

Administrative Consent Order #2013-WW-13-A1 contains a schedule for completing the specified projects to eliminate bypassing and also a compliance schedule for complying with the new *E. coli* limit. The remaining milestones are for 1) submittal of a facility plan for any projects determined necessary to eliminate bypassing and comply with the final *E. coli* limitations by 12/31/2020 and 2) eliminate bypassing and comply with final limits by 3/15/2023.

The NPDES permit issued August 1, 2020 includes two compliance schedules and one construction schedule. The two compliance schedules are to meet new chloride and copper final effluent limits by July 1, 2025. The construction schedule is to meet the requirements of the Iowa Nutrient Reduction Strategy.

SUMMARY

During the review period the City infrequently exceeded the ammonia nitrogen daily maximum concentration limit. The City has made great strides to reduce I/I in their collection system but needs to plan for further improvements to prevent bypassing in the collection system and at the wastewater treatment facility.

REQUIREMENTS

1. Comply with the effluent limitations of the NPDES permit at all times [567 IAC 64.3(1)].

2. George A. Hormel Company, 3M Company and Weiler Products shall comply with the treatment agreement limits [567 IAC 62.1(6)].

3. Continue to eliminate sources of I/I within the collection system in order to ensure efficient operation of the collection system.

RECOMMENDATIONS

1. Paint the overflow pipe from the grit classifer in order to maintain the integrity and prolong the life of the equipment.