



**U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION III
CLEAN WATER ACT
COMPLIANCE INSPECTION REPORT**

for

Name of Facility: Dutoy Creek Wastewater Treatment Plant
Facility Address: 2040 Anderson Highway, Powhatan, VA 23139
Mailing Address: 2040 Anderson Highway, Powhatan, VA 23139

Report Prepared on: July 29, 2021
Date

By: KH Dupnik, PG
Environmental Scientist (PG Environmental)
Signature

Report Final as of: _____ By: _____, EPA
Date *Signature*

General Information

Type of Inspection:	Wastewater Treatment Facility CEI
Owner:	County of Powhatan
Operator:	County of Powhatan
Permittee:	County of Powhatan
NPDES Permit No:	VA0090727
NPDES Permit Effective Date:	November 1, 2018
NPDES Permit Expiration Date:	October 31, 2023
Receiving Water and/or MS4:	Dutoy Creek, a tributary of the James River
Latitude and Longitude:	37.517806N, 77.778684W

On-Site Facility Inspection Overview

On June 30, 2021, an EPA inspector and a contract inspector (from PG Environmental) (hereinafter, "EPA Inspection Team") conducted a Compliance Evaluation Inspection (CEI) of the County of Powhatan's (Permittee's) Dutoy Creek Wastewater Treatment Facility (hereinafter, "the Facility"). The purpose of the inspection was to observe compliance with the Clean Water Act (CWA) and to verify compliance with the Facility's Virginia Pollutant Discharge Elimination System (VPDES) Permit No. VA0090727 (hereinafter, the "Permit") and applicable State and Federal regulations. A staff member from the Virginia Department of Environmental Quality (VADEQ) attended the inspection.

Approximate Entry Time: 10:00 AM (EDT) **Approximate Exit Time:** 1:00 PM (EDT)

Unique Project Identifier (UPI): 3E21WN053A

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Attachment A: Photograph Log

Attachment B: VPDES Permit No. VA0090727

Attachment C: Documents Associated with High Influent Zinc

I. INTRODUCTION

On June 30, 2021, an inspector from U.S. Environmental Protection Agency (EPA) Region III and a contract inspector from PG Environmental (hereinafter, EPA Inspection Team) conducted a compliance evaluation inspection (CEI) of the Dutoy Creek Wastewater Treatment Plant facility (Facility). The purpose of the inspection was to observe the Facility's compliance with the Clean Water Act (CWA) and the accuracy and reliability of the County of Powhatan's (Permittee's) self-monitoring and reporting program. A staff member from the Virginia Department of Environmental Quality (VADEQ) also participated in the inspection.

The Facility provides secondary wastewater treatment for Powhatan County prior to discharging to Dutoy Creek, which is within the Middle James River watershed and ultimately discharges to the Chesapeake Bay.

Activities at the Facility are regulated under Virginia Pollutant Discharge Elimination System (VPDES) Permit No. VA0090727 (hereinafter, Permit), which became effective on November 1, 2018, and is scheduled to expire on October 31, 2023 (refer to [Attachment B](#) for a copy of the Permit).

II. INSPECTION PROCESS

Inspection Opening Conference

The EPA Inspection Team arrived at the Facility at 10:00 a.m. (EDT) for the inspection and displayed CWA inspector credentials to the Facility representative at the outset of the inspection. The EPA Inspection Team explained that the purpose of the inspection was to observe compliance with the Permit. The EPA Inspection Team explained that any information that the Facility deemed to be confidential business information ("CBI") should be identified to the EPA Inspection Team during the inspection and it would be handled as CBI according to EPA's CBI procedures. Table 1 describes the individuals that participated in the inspection.

Table 1: Inspection Attendee List

Name	Affiliation	Telephone	Email
EPA Region III			
Erin Trouba	EPA Region III	(215) 814-2023	trouba.erin@epa.gov
EPA Region III Contractor			
Kettie Rupnik	PG Environmental	(720) 789-8035	kettie.rupnik@pgenv.com
Virginia Department of Environmental Quality			
Heather Weimer	Virginia DEQ	(804) 527-5069	heather.weimer@deq.virginia.gov
Facility Representative			
Timothy Glidewell	Powhatan County	(804) 598-5740 ext. 3203	tglidewell@powhatanva.gov

Weather and Precipitation Conditions

During the inspection, weather was sunny and clear. National Oceanic and Atmospheric Administration (NOAA) National Weather Service precipitation data for the date of the inspection and 5 days prior are provided in Table 2.

Table 2. Precipitation Data

Station Name	Date	Precipitation Amount (inches) ¹
Powhatan 3.2 SW, VA US US1VAPH0005	6/25/21	0.00
Powhatan 3.2 SW, VA US US1VAPH0005	6/26/21	0.00
Powhatan 3.2 SW, VA US US1VAPH0005	6/27/21	0.00
Powhatan 3.2 SW, VA US US1VAPH0005	6/28/21	0.00
Powhatan 3.2 SW, VA US US1VAPH0005	6/29/21	0.00
Powhatan 3.2 SW, VA US US1VAPH0005	6/30/21	0.00

Facility Site Walk

As part of the process, the EPA Inspection Team visually observed the treatment train and Facility conditions in the presence of Facility representative. The treatment train consists of:

- Headworks (screening and grit removal)
- Pre-equalization basin
- Sequence Batch Reactors (SBRs)
- Post-equalization basin
- Aquadisk Cloth filter
- Ultra-violet (UV) light disinfection
- Effluent flow meter channel
- Outfall 001 to Dutoy Creek

Solids Processing

- Sludge digesters
- Sludge holding tank

The Facility accepts domestic and commercial wastewater for treatment. The Facility representative explained that the service area receives commercial wastewater and a small source of residential wastewater. Sources of commercial wastewater include schools, grocery stores, and food service establishments. The Facility currently has a design dry-weather capacity of 0.050 million gallons per day (MGD) and receives an average flow of 0.040MGD during dry weather conditions. The Facility can accommodate additional flows, as the Permit includes tiered flows and discharge limits for operations at 0.050 MGD, 0.125 MGD, and 0.250 MGD if the area expands its service network.

Wastewater enters the influent pump station where flow is measured by the ABB Warminster. Wastewater is pumped to headworks where solids screening and removal occurs prior to the wastewater entering the pre-equalization basin. Wastewater is then treated through one of two SBRs which cycle through five phases (mix/fill for 38 minutes; react/fill for 192 minutes; react for 139 minutes; settle for 57 minutes; and decant for 52 minutes). After the SBRs, wastewater is pumped to the aerated post-equalization basin and then to the filter building. Within the filter building, wastewater is treated by cloth filters and then goes through UV disinfection. Final treated effluent is conveyed through a Parshall flume and ultimately discharged through Outfall 001 to Dutoy Creek. The Facility had open basins that could be used for expanding the treatment capacity in the future.

¹ Source: NOAA National Climatic Data Center (<http://www.ncdc.noaa.gov/>).

Records Review

The EPA Inspection Team conducted a records review to further evaluate the Permittee's compliance with the Permit. Most of the records and reports required by the Permit were reviewed offsite. The Facility's discharge monitoring reports (DMRs) were provided electronically and reviewed offsite after the onsite inspection. The following documents were reviewed:

- Bench sheets and DMRs (January 2020 through April 2021)
- A summary of effluent exceedances (May 2016 to May 2021)
- Notices of Noncompliance (2020 and 2021)
- Operation and Maintenance (O&M) Manual (2018)
- List and date of maintenance activities (2012 – 2021)
- pH measurement SOPs
- Calibration records (2018 – 2020)
- Sludge Management Plan
- List of commercial entities
- Correspondence regarding high influent zinc concentrations

III. SUMMARY OF OBSERVATIONS

The following section summarizes the EPA Inspection Team's observations relative to the Permittee's Permit requirements, including the status of certain treatment units, operation and maintenance practices, and monitoring and reporting documentation.

Effluent Exceedances

Part I.A of the Permit includes discharge limitations and monitoring requirements.

Observation 1. Based on a summary review of the Facility's effluent data for May 1, 2016 through May 31, 2021, the Facility experienced several effluent concentration exceedances for nitrate, E.coli, zinc, and ammonia in addition to concentration and loading exceedances for Total Kjeldahl Nitrogen (TKN), biochemical oxygen demand (BOD), and total suspended solids (TSS), as highlighted in Table 3. The Permittee also submitted the August 2020 DMRs one week late (due on August 10, 2020, submitted on August 17, 2020) and experienced flow exceedances. According to EPA's Enforcement and Compliance History Online (ECHO) Database², the Facility was in a state of significant noncompliance (SNC) during the fourth quarter of 2020 and the first quarter of 2021.

Table 3. Summary of Effluent Exceedances (Outfall 001, May 1, 2016 through May 31, 2021)

Monitoring Period End Date	Parameter Name	DMR Value	Permit Limit	Units	Limit Type
8/31/2016	BOD	20	15	mg/L	Weekly Average
4/30/2017	TSS	11.5	10	mg/L	Monthly Average
4/30/2017	Ammonia, N	4.08	2.24	mg/L	Weekly Average
4/30/2017	TKN	6.2	3.0	mg/L	Monthly Average
4/30/2017	TKN	1.241	0.57	kg/d	Monthly Average

² EPA ECHO Detailed Facility Report: <https://echo.epa.gov/detailed-facility-report?fid=110015314284>

4/30/2017	TKN	2.895	0.85	kg/d	Weekly Average
4/30/2017	TKN	13.6	4.5	mg/L	Weekly Average
4/30/2017	BOD	3.193	2.8	kg/d	Weekly Average
7/31/2017	TKN	4.9	4.5	mg/L	Weekly Average
8/31/2017	TKN	25.1	4.5	mg/L	Weekly Average
8/31/2017	TKN	6.3	3.0	mg/L	Monthly Average
8/31/2017	TKN	4.862	0.85	kg/d	Weekly Average
8/31/2017	TKN	1.211	0.57	kg/d	Monthly Average
8/31/2017	E.coli	186	126	#/100mL	Geometric Mean
8/31/2017	BOD	8.077	2.8	kg/d	Weekly Average
8/31/2017	BOD	2.005	1.9	kg/d	Monthly Average
8/31/2017	BOD	42	15	mg/L	Weekly Average
10/31/2017	Nitrate, Nitrogen	22	14	mg/L	Monthly Average and Weekly Average
10/31/2017	E.coli	130	126	#/100mL	Geometric Mean
2/28/2018	TSS	2.218	1.9	kg/d	Monthly Average
4/30/2018	TSS	3.316	2.8	kg/d	Weekly Average
4/30/2018	TSS	27	15	mg/L	Weekly Average
4/30/2018	TSS	27	10	mg/L	Monthly Average
4/30/2018	TSS	3.316	1.9	kg/d	Monthly Average
4/30/2018	TKN	7.3	4.5	mg/L	Weekly Average
4/30/2018	TKN	1.433	0.85	kg/d	Weekly Average
5/31/2018	TKN	3.1	3.0	mg/L	Monthly Average
5/31/2018	TKN	5.3	4.5	mg/L	Weekly Average
9/30/2018	TKN	1.341	0.85	kg/d	Weekly Average
9/30/2018	TKN	0.577	0.57	kg/d	Monthly Average
12/31/2018	Nitrate, Nitrogen	15	14	mg/L	Monthly Average and Weekly Average
3/31/2019	TKN	3.2	3.0	mg/L	Monthly Average
3/31/2019	TKN	5.5	4.5	mg/L	Weekly Average
9/30/2019	Nitrate, Nitrogen	18	14	mg/L	Monthly Average and Weekly Average
10/31/2019	BOD	23	15	mg/L	Weekly Average
10/31/2019	BOD	4.736	2.8	kg/d	Weekly Average
11/30/2019	BOD	4.155	2.8	kg/d	Weekly Average
12/31/2019	E.coli	149	126	#/100mL	Geometric Mean
2/29/2020	TKN	0.984	0.850	kg/d	Weekly Average
2/29/2020	TKN	4.9	4.5	mg/L	Weekly Average
3/31/20	Nitrate, Nitrogen	21	14	mg/L	Monthly Average and Weekly Average
7/31/2020	Nitrate, Nitrogen	32	14	mg/L	Monthly Average and Weekly Average
7/31/2020	Zinc	181	91	µg/L	Monthly Average and Weekly Average
9/30/2020	Nitrate, Nitrogen	18	14	mg/L	Monthly Average and Weekly Average
9/30/2020	TKN	3.2	3.0	mg/L	Monthly Average
11/30/2020	Zinc	163	91	µg/L	Monthly Average and Weekly Average

1/31/2021	Ammonia, N	2.44	2.24	mg/L	Weekly Average
1/31/2021	Zinc	119	91	µg/L	Monthly Average and Weekly Average
2/28/21	TKN	4.98	4.5	mg/L	Weekly Average
2/28/21	TKN	0.921	0.85	kg/d	Weekly Average
2/28/21	Flow	0.062	0.050	MGD	Monthly average
3/31/21	Flow	0.060	0.050	MGD	Monthly average

The Facility representative explained that the zinc exceedances were due to high influent zinc concentrations, which were first identified during 2011. Based on a survey conducted by the Permittee during 2012, the zinc was attributed to discharges from schools and Food Lion, specifically due to the use and disposal of a certain chemical for stripping and waxing floors. During 2012, the Permittee began sampling the influent and effluent twice weekly for zinc. Zinc samples were also gathered throughout the collection system. According to a letter from the Permittee to VADEQ, the results of the collection system monitoring were largely inconclusive. The Permittee held meetings with the schools and Food Lion during 2012 to discuss the issues with floor wax chemical disposal methods. The Permittee requested that the entities utilize zinc-free cleaning products and avoid disposing of chemical waste to the sewer system. The schools reported that they modified language in their cleaning contracts to prohibit cleaning products containing zinc and required that cleaning wastes be disposed of off-site. The Facility representative stated that influent zinc levels have decreased since the meetings with schools, but influent zinc is still experienced at the Facility.

The Permittee also attributes high influent zinc levels to the sludge digesting and decanting process. The Facility representative stated that the zinc settles from the SBRs and is wasted to the digester and pumped to the sludge tank. As the sludge in the sludge holding tank thickens, the waste becomes more concentrated with zinc. During the decanting process, supernatant is directed to the headworks of the Facility and re-enters the treatment process. Refer to Attachment C for the letter from the Permittee to VADEQ regarding high influent zinc and list of commercial entities within the service area.

The Facility representative also stated that the Permittee has not identified the source of the TKN exceedances although the Permittee believes that the TKN exceedances correspond with the beginning of the school year. The Facility representative explained that during the summer, the Facility typically experiences low influent flow. When schools open in the fall, there is an increase in influent flows to the Facility by approximately 15,000 gallons per day (gpd) and the Facility struggles to adjust to the changes in increased flow. The Facility representative stated that to maintain bacteria levels during the lower flow summer months, 0.5-pound bags of accelerator formula (whey protein-based powder) are added daily during the summer so the system can accommodate the increased flows when school is in session.

The effluent exceedances during January and February 2021 were due to an improperly functioning actuator, causing a reduction in air supply to SBR 1. The Permittee replaced the actuator to correct the air flow to SBR 1.

According to Part I.B.2 of the Permit, if the influent flow to the Facility exceeds the Facility design capacity for three consecutive months, the Permittee is required to

provide a written plan of action to VADEQ. The Facility representative provided written notification to VADEQ on May 11, 2021 in regard to the flow exceedances occurring in February and March of 2021. The Permittee attributed the high influent flows to increased flow rates as a result of excessive rainfall. The Permittee continued to explain that, because the Facility has a tiered permit, the Facility can handle up to 0.125 MGD for phase II of the tiered structure without any plant upgrades. Thus, the Permittee did not foresee any issues with handling influent to the Facility.

Updating the Operation and Maintenance Manual

Part I.B.9 of the Permit requires that the O&M Manual contain specific elements (refer to [Attachment B](#) for the full permit requirement).

Observation 2. The Permittee's 2018 O&M Manual did not include all elements required by the Permit, including the following:

- The 2018 O&M Manual does not list the following chemicals, which were observed at the Facility during the inspection; magnesium oxide, soda ash, or "Spec 52" (polymer) (refer to [Attachment A, Photographs P1010959 and P1020003](#)).
- The 2018 O&M Manual does not detail the hours of operation or staffing requirements.

Part I.B.9 of the Permit requires the Permittee to maintain a current O&M manual for the treatment works. Any changes in the practices and procedures followed by the Permittee shall be documented in the O&M Manual within 90 days of the effective date of the changes.

Observation 3. The EPA Inspection Team observed inconsistencies between the operations identified in the Facility's 2018 O&M manual and what was occurring onsite. The following inconsistencies were observed:

- The amount of time for each phase of SBR operation provided in the 2018 O&M manual was inconsistent with the phase times reported during the inspection, as presented in Table 4.

Table 4. Comparison of Phase Times provided in 2018 O&M Manual and Reported Onsite.

SBR Phase	Phase Time (O&M Manual)	Phase Time (reported onsite)
Mix Fill	35 minutes	38 minutes
React Fill	109 minutes	192 minutes
React	35 minutes	139 minutes
Settle	45 minutes	57 minutes
Decant	64 minutes	52 minutes

Proper Operation and Maintenance

Part II.Q of the Permit requires the Permittee to at all times properly operate and maintain all facilities and systems of treatment and control.

Observation 4. The EPA Inspection Team observed several issues related to operation and maintenance at the Facility. The following conditions were observed during the inspection:

- Algae and moss were present on the auger at the headworks of the Facility (refer to [Attachment A, Photograph P1010946](#)).

- The Facility representative stated that the isolation valve at the influent pump station and at the post-aeration basin are not exercised to ensure proper operation (refer to [Attachment A, Photographs P1010932 and P1020016](#)).
- Vegetation was growing from the surface of the mixer of SBR 1 (refer to [Attachment A, Photograph P1010972](#)).
- White floating balls were present on the surface of the wastewater within the digester (refer to [Attachment A, Photographs P1010990 and P1010994](#)). The Facility representative stated that the balls had been present in the digester for the past few weeks and the Permittee had not taken steps to assess or identify the source and cause of the material. The EPA Inspection Team discussed the possibility that it might be grease. The Facility representative reported that no accumulated oils or greases had been observed within the collection system or at the headworks of the Facility.
- Algae growth was present on the sides of the post-equalization basin (refer to [Attachment A, Photograph P1020020](#)).
- The sludge holding tank had plugs in the southern wall of the unit (refer to [Attachment A, Photographs P1020023 and P1020026](#)). The Facility representative explained that in the past, grass mowing activities at the Facility resulted in rocks hitting and damaging the walls of the tank.
- Solids were accumulated inside the sludge trough and along the edges of the cloth filter system (refer to [Attachment A, Photograph P1020031](#)).
- The key to open the bypass valve for the cloth filter was engaged at the time of the inspection (refer to [Attachment A, Photograph P1020034](#)). The Permittee was not bypassing the filter at the time of the inspection. However, there was no signage or controls to prevent the bypass valve from being activated.
- The UV intensity meter output reading displayed an intensity of “0” (refer to [Attachment A, Photograph P1020039](#)). The indicator lights of trains 1 and 2 of the UV disinfection system were unilluminated, indicating that several of the UV bulbs were not operational (refer to [Attachment A, Photographs P10200051 and P10200054](#)). The EPA Inspection Team observed the neon UV glow from both ends of the banks, indicating that at least some of the lights were operational. The Facility representative explained that the bulbs of the UV disinfection system are replaced approximately once every six months. The Facility representative also explained that UV disinfection was operational (despite the indicator lights and reading of the UV intensity meter) and that he was aware that the indicator lights and UV intensity meter were reading incorrectly.
- Algae growth was present on the rocks immediately downstream of Outfall 001 within the receiving water of Dutoy Creek (refer to [Attachment A, Photographs P1020076](#)).

Closing Conference

After the Facility site walk, the EPA Inspection Team met with the Facility representative for a closing conference and shared preliminary observations. The EPA Inspection Team reiterated that all preliminary observations discussed were not compliance determinations. Any and all preliminary observations shared were subject to further investigation by EPA upon the additional review of records and documentation. Additional observations may be contained in this inspection report that were not identified at the time of the closing conference after the additional review of materials following the inspection.

The inspection concluded at approximately 1:00 PM (EDT).