



Maryland Department of Environment
Water and Science Administration
Compliance Program
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Inspector: Ronald Wicks
AI ID: 8449

Site Name: Back River WWTP
Facility Address: 8201 Eastern Ave, Baltimore, MD 21224
County: Baltimore County

Start Date/Time: March 26, 2022 01:03 PM
End Date /Time: March 26, 2022 05:05 PM

Complaint Number:
Media Type(s): NPDES Municipal Major Surface Water

Contact(s):

Betty Jacobs,
Plant Manager
Ronald Turner Operations Engineer

NPDES Municipal Major Surface Water

Permit / Approval Numbers: 15DP0581
NPDES Numbers: MD0021555
Inspection Reason: Follow-up (Non-Compliance)
Site Status: Active
Compliance Status: Noncompliance
Site Condition: Noncompliance
Recommended Action: Additional Investigation Required
Evidence Collected: Photos or Videos Taken, Visual Observation
Delivery Method: Email
Weather:

Inspection Findings:

The Back River WWTP is a 180 MGD activated sludge process sewage treatment plant with BNR (MLE process), ferric chloride for phosphorous removal, Enhanced Nitrogen Removal (Denitrification filters), sand filters, chlorination and dechlorination. The flow is split at a junction box after the sand filters and the main portion of the flow goes to Outfall 001 to Back River and about 20 MGD of the flow goes to Outfall 002. The effluent from Outfall 002 is sent to Tradepoint Atlantic, where it flows to High Head Lake and then discharged to Bear Creek through outfalls at the Tradepoint Atlantic site. The facility's activity code or standard industrial classification (SIC) is 4952 and the North American Industry Classification System (NAICS) is 2213. The receiving

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water is Back River and a tributary named Bread and Cheese Creek. The Back River basin is protected for Use II, water contact recreation and the protection of aquatic life.

On March 26, 2022, I met Ms. Betty Jacobs and Mr. Ronald Turner representing the Back River WWTP for a follow up to an inspection conducted on March 22, 2022, to determine the status of the corrective action specified in the 3-22-2022 inspection report and to determine compliance with the Special Conditions A.1, A.2, H and General Conditions B of the above authorization.

I conducted a site review accompanied by Ms. Jacobs and Mr. Turner. The first stop was at the primary settling tanks (PST). There, I found that only two (#8 and #11 PST) of the eleven PSTs were in operation. Mr. Turner told me that PST #9 was being cleaned and the drive unit on PST #10 was not functioning.

During the previous inspection only two of the eleven PSTs were in operation. Today there were 2 PSTs in operation which is below the number of PSTs necessary to treat the primary wastewater entering the system as stated by operators during the 3/22/22 inspection. This problem is impacting the treatment plant's ability to properly remove solids, scum, and FOG in the primary treatment phase.

Next, I checked the wastewater traveling in the channels from the PSTs to the activated sludge plants. This wastewater was a dark grey color indicating a high concentration of solids in the waste stream. This is similar to my finding on 3/22/22. See pictures below:



Turbid dark grey wastewater flowing from the PST primary treatment to the biological reactors
3/26/22

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The wastewater leaving the PSTs flows to a series of biological reactors for nitrogen removal. The facility has two trains with six reactors in each train for a total of 12. Each reactor has a three-pass design designated A, B and C. During an inspection of the reactors, I found the reactors were in the same condition as described in the 3/22/22 inspection report.

Next, I inspected the reactors. There, I found the following problems listed below:

1. Some of the mixers in the A pass have vegetation growing on the blades which is hindering mixing capabilities. See picture below:
2. There is a heavy accumulation of solids with vegetation growing at the end of the reactor before going to the clarifiers. See pictures below:
3. The mixed liquor concentration (MLSS) in each reactor are ranging from 3190 – 6,500. Ideally the MLSS should be maintained approximately 3,000. The facility's target is between 2,600 – 2,800, however there is a wide range depending on the reactor. According to the plant engineer, Mr. Dan Latova due to the number of solids in the system they cannot meet that goal.



3/26/22 Vegetation growing in solids accumulated in one of the reactors

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3/26/22 vegetation growing in reactor



Vegetation growing in the reactor 3/26/22

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Solid's accumulation in the one of the reactors 3/26/22

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Mixer unable to turn properly due to solids in the reactor 3/26/22

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Floating solids in one of the reactors 3/26/22

After inspecting the reactors, I inspected the secondary clarifiers. During an inspection of the secondary clarifiers, I found conditions similar to what I found during the March 22 inspection. There were problems with maintenance that inhibited operations and ultimately performance of the clarifiers. There was evidence of algae growth within the clarifiers. There was an accumulation of solids within in the clarifiers and floating solids and scum in the center well. The conditions of the clarifiers were the same as I observed during the previous inspection. The reed grasses and other vegetation remain in the clarifiers causing operational problems. Pictures below show concerns over the operation of the secondary clarifiers.

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3/26/22 Secondary clarifier- vegetation and solids clogging the system and short-circuiting of the weirs.



3/26/22 Secondary clarifier

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From the secondary clarifiers I traveled to the denitrification filter building. During this inspection, I found conditions similar to what I found during the last two inspections. Many of the filters were not functioning as designed. Quads #1, #2 and #4 were all submerged under water due to clogging during my last inspection. This condition has improved and not all of the filters are submerged as observed during the 3/22/22 inspection. However, some of the filters were submerged and not functioning as designed. The control stats show that 40 of the 52 are functioning and many of the filters had a floating layer of scum as described during the 3/22/22 inspection.



3/26/22 submerged DN filter

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Submerged DN filters 3/26/22

Next, I inspected the effluent from the DN filters entering the sand filters. The water appeared dark grey. See picture below. I continued this inspection with an inspection of the sand filters. The facility has 48 sand filters and according to Mr. Turner, 15 of the 48 are functioning. During an inspection of the sand filters, the traveling bridges appeared to be not functioning.

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Effluent from the DN filters going to the sand filters. 3/26/22

The effluent from the sand filters flows to the chlorine contact chamber. The effluent appeared dark grey. See picture below:

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Effluent from the sand filters 3/26/22 has a dark grey color.

During an inspection of the contact chambers, I found conditions similar to the last inspection. The wastewater in the contact chambers was a dark grey color with intermittent small black clumps of floating solids flowing to the final discharge point. Next, I inspected the final effluent at the step post aeration system. The final effluent was grey in color with some turbidity. Next, I traveled to the end of the pier that goes 1200 feet from shore to the point where the effluent mixes with the Back River. I also checked the shoreline. Below are pictures of the river at that point.

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3/26/22 Shoreline near discharge point shows heavy dark sediments along the shoreline.

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Back River above the submerged discharge point to the river at the end of the pier 3/26/22

The Back River WWTP has not complied with the corrective actions listed in the March 22, 2022, inspection and the following problems still exist:

1. Only 2 of the 11 primary settling tanks (“PSTs”) were in service, and 1 of the 2 operating PSTs requires maintenance to function properly. The Back River WWTP does not have sufficient PST capacity to treat its primary waste stream.
2. Denitrification filters (“DN Filters”) are not functioning as designed because of the presence of a high solids’ concentration in the DN Filter influent. At least 12 of the 52 DN filters were not functioning.
3. January 2022 concentrations of TSS in DN Filter influent ranged between 31 and 292 mg/L. This indicates that the solids settling processes are failing as substantiated by the clogging of the DN Filters and turbidity of the final effluent. These high concentrations are causing intermittent and chronic clogging of the DN Filter system.

4. Significant algal and vegetation are still present on the weirs of the secondary clarifiers. This has caused the short circuiting of the system and likely negatively impacts TSS concentration in the Plant’s treatment train wastewater.
5. Significant amounts of solids are still present in the secondary clarifiers. This accumulation is decreasing the quality of the Plant’s final effluent.
6. A significant amount of reed grasses and other vegetation are established in the secondary clarifiers. This is preventing the proper functioning of these clarifiers
7. Significant amounts of vegetation (*e.g.*, reed grasses) have grown and are established in the biological reactors and on the mixers in the reactors. This is preventing the proper functioning of these reactors.

Total suspended solids concentrations of the waste stream going into the denitrification filters or influent has increased considerably compared to past operational data. The facility is experiencing BOD, total phosphorous violations due to the high concentrations of TSS throughout the processes and in the final effluent. These high TSS concentrations are also a violation of the above authorization. Table 1 below show the reported violations reported to date for the month of February. A complete report will be available by March 28.

Table 1

Date	Parameter	Result	Permit Violation	Permit Limitation
February, 2022	BOD5	11 mg/L /Monthly Average concentration	Exceeded Monthly Average concentration	10 mg/L Monthly Average Concentration
February, 2022	Total Suspended Solids	19,165 lbs./Day Average Loading	Exceeded Monthly Average Loading	11,000 lbs./ Day Average Loading
February 2022 Week 4	Total Suspended Solids	19,063 lbs./ Weekly Average loading	Exceeded Weekly Average loading	16,000 lbs./Weekly Average
February, 2022	Total Suspended Solids	19 mg/L Max. Monthly Average concentration	Exceeded Monthly Average concentration	10 mg/L Monthly Average
February 2022 Week 4	Total Suspended Solids	18 mg/L Weekly Average Concentration	Exceeded Weekly Average Concentration	15 mg/L Weekly Average
February 2022 Week 4	Total Suspended Solids Outfall 002	32 mg/L/ Monthly Average Concentration	Exceeded Monthly Average concentration	30 mg/L/ Monthly Average Concentration

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February, 2022	Total Phosphorous	1,055 Lbs./Day	Exceeded Monthly Average loading	220 lbs./Month
February 2022	Total Phosphorous	1.07 mg/L/ Monthly Average Concentration	Exceeded Monthly Average concentration	0.2 mg/L/ Monthly Average Concentration
February 2022 Week 4	Total Phosphorous	884/ Lbs. Day Weekly Average Loading	Exceeded weekly average loading	330 lbs./ Weekly Average Loading
February 2022 Week 4	Total Phosphorous	0.87 mg/L Weekly Average Concentration	Exceeded weekly average concentration	0.3 mg/L Weekly Average Concentration
February 2022	Total Phosphorous Outfall 002	242 Lbs./day Monthly Average loading	Exceeded Monthly Average loading	83/Lbs. Day Monthly Average loading
February 2022	Total Phosphorous Outfall 002	1.57 mg/L Monthly Average Concentration	Exceeded Monthly average concentration	0.2 mg/L monthly Average Concentration

To bring this site into compliance with Environment Article Title 9, the Back River WWTP must address the problems listed above.

STATE LAW PROVIDES FOR PENALTIES FOR VIOLATIONS OF MARYLAND ENVIRONMENT ARTICLE TITLE 9 FOR EACH DAY THE VIOLATION CONTINUES. THE MARYLAND DEPARTMENT OF THE ENVIRONMENT MAY SEEK PENALTIES FOR THE AFOREMENTIONED VIOLATIONS OF TITLE 9 ON THIS SITE FOR EACH DAY THE VIOLATION CONTINUES

NPDES Municipal Major Surface Water - Inspection Checklist

Inspection Item	Status	Comments
Does the facility have a discharge permit?	No Violations Observed	
Is the discharge permit current?	No Violations Observed	
If the permit is not current, has facility applied for renewal?	No Violations Observed	
Does the facility operate as authorized by their current permit?	No Violations Observed	
Has the Permittee exceeded the permitted capacity of the WWTP?	No Violations Observed	
Is the number and location of discharge points as described in the discharge permit?	No Violations Observed	
Has permittee submitted correct name and address of receiving waters?	No Violations Observed	
Is the permittee meeting the compliance schedule per permit requirements?	4 - Not Evaluated	
Has the operator or superintendent been certified by the Board in the appropriate classification for the facility?	No Violations Observed	

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Inspection Item	Status	Comments
Are adequate records being maintained for the sampling date, time, and exact location; analysis dates and times; individual performing analysis; and analytical results?	4 - Not Evaluated	
Are adequate records being maintained for the analytical methods/techniques used?	4 - Not Evaluated	
Does the permittee retained a minimum of 3 years worth of monitoring records including raw data and original strip chart recordings; calibration and maintenance records; and reports?	No Violations Observed	
Do lab records reflect that lab and monitoring equipment are being properly calibrated and maintained?	4 - Not Evaluated	
Does the permittee/laboratory use suitable QA/QC procedures and operate a formal quality assurance (QA) program using appropriate controls?	4 - Not Evaluated	
Has the permittee submitted the monitoring results on the proper Discharge Monitoring Report form?	No Violations Observed	
Do the Discharge Monitoring Reports reflect permit conditions?	4 - Not Evaluated	
Has the permittee submitted these results within the allotted time electronically?	No Violations Observed	
Is the facility being properly operated and maintained including:(a) stand-by power or equivalent provisions available, (b) adequate alarm system for power or equipment failure available, (c) all treatments units are in service, .	Out of Compliance	See narrative
Is sewage sludge managed correctly per permit requirements?	Not Evaluated	
If a by-pass occurred since last inspection, has the permittee submitted notice of the by-pass within the allotted time?	4 - Not Evaluated	
If a non-complying discharge occurred since the last inspection, was the regulatory agency notified within the allotted time?	No Violations Observed	
If applicable, has the permittee complied with all special conditions of their permit?	Out of Compliance	See narrative
Have overflows occurred since the last inspection?	4 - Not Evaluated	
Have records of overflows been maintained at the facility for at least five years?	4 - Not Evaluated	
Are flow measuring devices properly installed and operated, calibration frequency of flow meter adequate, flow measurement equipment adequate to handle expected ranges of flow?	4 - Not Evaluated	
Are discharge monitoring points adequate for representative sampling?	No Violations Observed	
Do parameters and sampling frequency meet the minimum requirements?	No Violations Observed	
Does the permittee use the method of sample collection required by the permit?	No Violations Observed	
Are analytical testing procedures used approved by EPA?	4 - Not Evaluated	
If alternate analytical procedures are being used, has proper approval been obtained?	No Violations Observed	

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Inspection Item	Status	Comments
Has the permittee notified the Department of the name and address of the commercial laboratory?	No Violations Observed	
Were discharges observed at the authorized outfalls?	No Violations Observed	
If discharges were observed, do the discharges or receiving waters have any visible pollutants observed?	Out of Compliance	See narrative
Were discharge samples collected?	4 - Not Evaluated	
Does this facility have coverage under a a NPDES stormwater discharge permit?	4 - Not Evaluated	
If the permittee has coverage under a NPDES storm water permit, has a storm water pollution prevention plan been developed and implemented as required?	4 - Not Evaluated	
Are the permit conditions being met?	Out of Compliance	

Inspector: Ronald Wicks 3/26/22
 Ron Wicks /Date
 ron.wicks@maryland.gov
 410-537-3510

Received by: _____
 Signature/Date

 Print Name