



Maryland Department of Environment
Water and Science Administration
Compliance Program
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Inspector: Christopher Lepadatu
AI ID: 8449

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

Start Date/Time: August 31, 2023 09:30 AM
End Date /Time: August 31, 2023 02:00 PM

Media Type(s): NPDES Municipal Major Surface Water

Contact(s): Betty Jacobs – Back River WWTP
Timothy Simmons – Back River WWTP
Ronald Turner – Back River WWTP
Rayford McEachern – Back River WWTP
Herbert Bell – Atkins
Andrea Buie – Chief of ERCS, Baltimore City DPW

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: Additional Investigation Required

Recommended Action: Additional Investigation Required

Evidence Collected: Photos or Videos Taken, Record Review, Visual Observation

Delivery Method: Email

Weather: Clear, Good

Inspection Findings:

Introduction:

Back River Wastewater Treatment Plant (WWTP) is operated by Baltimore City DPW. Parts of the WWTP are subcontracted and operated by ProStart. These areas include the Headworks, Denitrification Building, and Centrifuges. The facility is authorized to discharge treated effluent through outfalls 001 and 002. Outfall 001 discharges to Back River, a designated Use II waterway. Use II waterways support estuarine and aquatic life and shellfish harvesting. Outfall 002 discharges to Tradepoint Atlantic who then discharge three (3) outfalls under their industrial discharge permit (#05DP0064) to Bear Creek and the Patapsco River which is also designated as a Use II waterway. Final

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effluent discharge is split at a junction box and a larger portion of the flow (up to 130.0 MGD) goes to Outfall 001 via a step cascading aeration system and the remaining portion (up to 50.0 MGD) goes to Outfall 002.

The current permit has been administratively extended since it expired on April 30, 2023. A revised permit renewal application (#2DP0581) was received by MDE on May 26, 2023.

Back River WWTP is an activated sludge process sewage treatment plant with biological nutrient removal by Modified Ludzack-Ettinger process, ferric chloride for phosphorous removal, denitrification filters for enhanced nutrient removal (ENR), polishing sand filters, chlorination, and dechlorination.

On this day, I met with the individuals listed above for an opening conference followed by a site walk and closing conference.

Opening Conference:

- Status of various plans
 - Assets Management Plan – in progress, Atkins is handling.
 - Wasting & Sludge Management Plan – in progress, Jacobs is handling.
 - Centrifuge Maintenance Plan – in progress, Jacobs is handling.
 - Operations & Maintenance Manual – in progress.
 - Staffing Plan – in progress, Atkins is handling, Prelim plan shared internally in July.
 - PCB Minimization Plan – submitted to MDE on February 17, 2023.
- Headworks
 - Operated by ProStart.
 - No issues reported.
- Primary Settling Tanks (PSTs)
 - Eleven total – PSTs 1, 7, 8, & 11 working (sufficient for current flow).
 - PST #9 is operational and online but not in service.
 - PSTs 5 & 10 are being used as flowthrough.
 - PST #2 has been patched, expected to be ready by 9/30/23.
 - PST #7 skimmer arm has to be adjusted by MES. It is bent and off balance.
 - PST #3 concrete repairs are scheduled to be complete in September 2023. Parts & equipment repairs are scheduled for completion in November 2023.
 - PST #4 concrete repairs are scheduled to be complete in September 2023. Should be operational in January 2024.
- Activated Sludge Plants (ASP) 2, 3, & 4
 - ASP 2 –
 - Reactors 6 & 9 are out of service due to inoperable RAS pumps which they are working on.
 - Clarifier 5B is out of service while they install a new RAS pump.
 - Clarifier 10B is off-line and being used to backwash filters.
 - Reactor 8A PASS vegetation has yet to be removed. Safety issues with reaching the area. Working on a contingency plan to remove the vegetation.
 - ASP 3 –
 - Clarifier 12B is out of service due to a problem with bent rake arm.
 - Reactor 13 is off-line because two mixers are broken
 - Clarifier 13A has a bent rake arm.
 - Clarifier 14A the skimmer is missing.
 - Reactor 16 is down due to an issue with rake arms in Clarifiers 16A & 16B.
 - ASP 4 –
 - All reactors and clarifiers are on-line.

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- Denitrification (DNF) Building
 - Under the control of ProStart.
 - No issues reported. All equipment is on-line.
- Sand Filtration Building
 - 36 of the 48 sand filters are in operation.
 - Filters 6, 18, 22, 28, 30, 35, 37, 40, 44, 45, 46, and 47 were out of service.
- Chlorination / Dechlorination / Outfalls
 - No issues were reported.
- Gravity Sludge Thickeners (GSTs)
 - GSTs 2 & 4 are used as holding tanks.
 - GSTs 1, 3, & 5 are in service.
 - GST 6 and 8 are out of service with pump issues.
 - GST 8 is out of service needing a pump installed.
- Gravity Belt Thickeners (GBTs)
 - 8 GBTs in total.
 - 5 are currently in operation.
 - 2 are operational and on stand-by.
 - GBT #5 is out of service due to a gearbox issue.
- Dissolved Air Flotation Units (DAFs)
 - 1 & 2 have been repaired / refurbished.
 - 3&4 are out for repairs / refurbishment.
- Centrifuges
 - Back River WWTP has four (4) centrifuges.
 - Three (3) are online and operating.
 - #4 is being rebuilt after parts were used from it to get #2 and #3 back online.
 - Two portable centrifuges are in place on standby, not currently in operation.

Site Walkthrough:

After the opening conference, we toured the facility beginning with the headworks.

Headworks

Raw sewage enters the plant at the mechanical screen building where there are four coarse screening units. Each unit is rated for flows up to 200 million gallons per day (MGD). Unit #2 was in service at the time of the inspection. During normal flows, one coarse screening unit is sufficient to treat the average daily flow. The area was observed to be clean and free of debris.

Effluent from the coarse screening flows into two (2) deep wet wells that are over 50 feet deep. The headworks influent pumping station has eight (8) lift pumps installed to pump the screened wastewater from the wet wells to the Fine Screening System. Two (2) pumps, #1 and #2, were in operation at the time of the inspection. During periods of high flow, screened wastewater can be pumped to two above ground storage tanks each with a capacity of 18 million gallons. The two tanks are connected by two 14- to 16-inch pipes near the top of the tanks to allow one to overflow into the other as needed.

The Fine Screening System features six (6) fine screening units rated for flows up to 100 MGD each. Units 1-4 were operating at the time of the site inspection and units 5 & 6 were in standby. No issues were observed or reported with the fine screening units.

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Image 1: Fine screens 2 & 3.

Effluent from the fine screening system travels to the Grit Removal System. Eight (8) grit channels equipped with traveling bridges remove grit from the fine-screened wastewater. Grit channels 5 and 7 were out for service. Grit channels 1, 2, and 3 were in service with channels 6 and 8 in standby. Each grit channel and traveling bridge has an 80 MGD capacity. Under normal flow conditions, two grit channels are necessary for satisfactory grit removal. The bridges travel back and forth along the grit channel using a submersible pump / suction plate system to remove settled grit from the channels and transfer the grit to grit classifiers for further dewatering. The classified grit is then dried and sent off-site for disposal. No issues were observed or reported with the grit removal system.

Primary Settling

Effluent from the Grit Removal System flows to a junction box then to the Primary Setting Tanks (PSTs). Primary Settling is the first stage of treatment where solids and sludge are allowed to settle by gravity and any floating scum or fats, oils, and grease (FOG) is removed. Generally, PST's are designed to remove a large percentage of the total suspended solids (TSS) and reduce the biochemical oxygen demand (BOD) of the wastewater.

There are eleven (11) PSTs at the facility. During the site inspection, the following observations were made on the PSTs:

- PST #1 is in operation. No issues observed or reported.
- PST #2 is out of service and under construction.
- PST #3 and #4 are out of service and under construction.
- PST #5 is operating as a flow through, there is an issue with the center ring which will be repaired after #2 is finished and back in service.
- PST #6 out of service. Needs cleaned out and a new center mount and catwalk installed, potentially next year.
- PST #7 is in operation. No issues observed or reported.
- PST #8 is in operation. No issues observed or reported.
- PST #9 currently testing pumps, should be in service by the end of September 2023.
- PST #10 is operating as a flow through, will be out of service for repairs once #9 is back in service.
- PST #11 is in operation. The scum trough was observed to be clogged and not functional.

Activated Sludge Plants (ASPs)

Effluent from the Primary Settling flows to a flow distribution building to one (1) of three (3) Activated Sludge Plants (ASPs) numbered #2, #3, and #4. The ASPs each contain six (6) biological reactors for nitrogen removal. ASPs #2 and #3 have a three-pass train designated A, B, and C for each reactor while ASP #4 is a two-pass system. There are twelve (12) secondary clarifiers associated with each ASP for a total of thirty-six (36) secondary clarifiers at the facility.

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Only ASP #3 was observed during this inspection. Trains 11, 12, 13, and 14 were in service. Reactor train 13 is out of service due to two mixers being down. Reactor train 16 is down due to mechanical issues in associated clarifiers 16A & 16B. No issues were observed or reported with the reactor trains that are in service.

The twelve (12) secondary clarifiers (#11A/B - #16A/B) associated with ASP #3 were observed during this inspection. The following observations were made on the clarifiers.

- 14A: Not in service.
- 14B: One skimmer arm missing rubber flap, significant vegetation growth, and clogged scum trough.
- 16A: Not in service, mechanical issues.
- 16B: Not in service, mechanical issues.
- 15A: Significant vegetation growth.
- 15B: One skimmer arm missing rubber flap.
- 13A: Not in service.
- 13B: Not in service.
- 12A: One skimmer arm missing rubber flap, significant vegetation growth, and clogged scum trough.
- 12B: Not in service.
- 11B: One skimmer arm dipping below surface and significant vegetation growth.
- 11A: Not in service.



Image 2: ASP #3, Clarifier #14B, clogged scum trough, significant vegetation.



Image 3: ASP #3, Clarifier #12A, skimmer missing flap, significant vegetation.

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Denitrification Filters (DNFs)

At the DNF building, there are four filter quads with each quad containing 13 Tetra Denitrification Filters with a total of 52 filters. All 52 filters were functional and in operation at the time of the site inspection.

Sand Filters

The sand filters are used to polish the wastewater coming from the DNF building. There are 48 total filters, and 36 filters were observed to be in service at the time of the site inspection.

Chlorination / Dichlorination Facility and Final Outfalls

The final effluent at the step aeration system was observed to be clear and without any noticeable foam, solids, or odor. The floating booms were still in place on the upstream side of the chlorine contact chambers final effluent. No visible floating scum or solids were observed in the chlorine contact chambers at the facility. The temperature of the composite sampler for Outfall 001 was observed to be 4°C. The temperature of the composite sampler for Outfall 002 was observed to be 3.5°C.



Image 4: Typical chlorine contact chamber on day of inspection.



Image 5: Outfall 001, final effluent.

I reviewed the lab located at the Chlorination / Dichlorination Facility. All pH buffers were current. The logbooks appeared to be in order. Copies of the pH and DO calibration records were provided to me for review.

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Closing Conference:

After the Chlorination / Dichlorination Facility, we returned to the administration building for an exit conference.

Records Review:

Following the site inspection, netDMRs, laboratory reports, and calibration records were reviewed. No violations were observed in the pH and DO calibration records. In the review of the netDMR submissions, Ammonia for Outfall 001 on 8/3/23 was excluded due to the sample being analyzed in an unpreserved container. No violations were observed in the netDMR submission for Outfall 002. No violations were observed in the laboratory analysis reports.

Violation(s):

With respect to the above authorization, the following violations of Environment Article Title 9 by Baltimore City DPW were observed on this date with corrections needed immediately:

1. Crucial equipment maintenance and repairs are not being performed by the Back River WWTP at the level necessary to efficiently operate and maintain the treatment works as detailed in this report. The Back River WWTP has failed to provide enough qualified staff to adequately operate and maintain the WWTP. This is a violation of General Condition B3a and b of the NPDES permit, which specifies the following:
 - a. Facilities shall be operated efficiently to minimize upsets and discharges of excessive pollutants.
 - b. The permittee shall provide an adequate operating staff qualified to carry out operation, maintenance, and testing functions required to ensure compliance with this permit.

CORRECTION: The Back River WWTP should immediately comply with the requirements under General Condition B3 of the NPDES permit and adequately operate and maintain the treatment works.

2. There has not been adequate long-term planning for staff replacement and system upgrades and changes at the Back River WWTP. A staffing plan is necessary to determine the gap between current staffing levels and required levels to comply with General Condition B3a and b of the NPDES permit. **CORRECTION: The Back River WWTP should immediately submit to the Department a comprehensive staffing plan. The plan should be implemented by the date of submission to the Department to ensure that there is sufficient staff to comply with the requirements of General Condition B3b of the NPDES permit.**
3. The DO monitoring probes used to continuously monitor the DO in the biological reactors are not functional. The DO monitoring probes and other associated equipment have been ordered and Back River WWTP staff are waiting on parts. Current scheduled delivery and installation is to occur in October 2023. **CORRECTION: The Back River WWTP should keep the Department informed monthly on the status of the replacement of the DO sensors and associated equipment necessary to automatically monitor and control DO in the reactors at the activated sludge plants. All equipment necessary for treatment should be kept in satisfactory condition in order to comply with the requirements of General Condition B3 of the NPDES permit.**
4. The scum troughs on PST #11, ASP #3 Clarifiers #12A and #14B are clogged with scum. This is a violation of General Condition B3 of the NPDES permit. **CORRECTION: The Back River WWTP should maintain the PSTs and Clarifiers as required to keep them functioning properly to comply with the requirements under General Condition B3 of the NPDES permit. The scum troughs should be cleared and the pumps repaired or replaced.**
5. Significant vegetation growth was observed in ASP #3 Clarifiers #11B, #12A, #14B, and #15A. Excessive vegetation growth can negatively affect a clarifier's performance and efficiency for wastewater treatment. This is a violation of General Condition B3 of the NPDES permit. **CORRECTION: All vegetation should be removed from the secondary clarifiers and routine maintenance should be performed to prevent the**



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recurrence of the problem to minimize upsets and discharges of excessive pollutants as required under General Condition B3 a and b of the permit.

Monthly inspections will continue.

Contact this Inspector upon implementation of the requested corrective actions, reasonably necessary to bring this site into compliance. If the corrective actions cannot be completed within the prescribed time frame above, you should continue to advise the Inspector, at least every 30 days, of the status of the measures taken to complete the corrective actions. If you have any questions, need assistance, or to request a re-inspection, please contact this Inspector by phone, 410-537-3521, or email, christopher.lepadatu@maryland.gov.

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.

Inspector:  9/21/23 Received by:  11/7/2023
Christopher Lepadatu /Date
christopher.lepadatu@maryland.gov
410-537-3521
Signature/Date
Michael Hallmen
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