



Maryland Department of Environment
Water and Science Administration
Compliance Program
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Inspector: Samantha Coffman
AI ID: 8449

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

Start Date/Time: June 14, 2023 08:30 AM
End Date /Time: June 14, 2023 02:30 PM

Media Type(s): NPDES Municipal Major Surface Water

Contact(s): Christopher Lepadatu, Regulatory Compliance Engineer, MDE
Andrea Buie-Branam, Chief of ERCS, Baltimore City DPW
Michael Hallmen, Chief of Wastewater Facilities Division, Baltimore City DPW
Betty Jacobs, Back River WWTP
Ronald Turner, Back River WWTP
Timothy Simmons, Back River WWTP
Rayford McEachern, Back River WWTP
Herbert Bell, Atkins
Mahmudul Hasan, Back River WWTP

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, Record Review, Visual Observation

Delivery Method: Email

Weather: Overcast & Drizzle, Then Partly Cloudy

Inspection Findings:

The Back River Wastewater Treatment Plant (WWTP) is an activated sludge process sewage treatment plant with biological nutrient removal by Modified Ludzack-Ettinger process, ferric chloride for phosphorus removal, denitrification filters for enhance nutrient removal (ENR), polishing sand filters, chlorination, and dechlorination. The flow is split at a junction box and the larger portion of the flow (up to 130.0 MGD) goes to Outfall 001 to the Back River via a step cascading aeration system and the remaining portion (up to 50.0 MGD) goes to Outfall 002, and sent to Tradepoint Atlantic. The effluent from Outfall 002 is further chlorinated and sent to a storage reservoir

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known as the High Head Reservoir. The water was once used by International Steel Group (ISG), formerly Bethlehem Steel Corp., for industrial cooling water. The steel mill is closed and Tradepoint Atlantic purchased the steel mill property and portions of this water discharges through 3 outfalls on the Tradepoint Atlantic property. Tradepoint Atlantic discharges the wastewater from High Head Lake through outfalls 012, 013 and 014, under the authorization of their NPDES permit.

Coordinates and receiving waters for the Tradepoint Atlantic outfalls:

Outfall Number	Receiving Water Name	Latitude	Longitude
012	Patapsco River	39.00° 12.00' 48.00''	76.00° 29.00' 39.00''
013	Patapsco River	39.00° 13.00' 12.53''	76.00° 29.00' 43.32''
014	Bear Creek	39.00° 13.00' 39.00''	76.00° 29.00' 29.00''

The facility's activity code or standard industrial classification (SIC) is 4952 and the North American Industry Classification System (NAICS) is 2213. The receiving water is the Back River for Outfall 001, which is protected for Use II, water contact recreation and the protection of marine/estuarine aquatic life and Outfall 002 discharges to the Bear Creek and the Patapsco River also protected for Use II waters.

On June 14, 2023, I conducted a follow-up compliance evaluation inspection at the Back River WWTP. I was accompanied by Christopher Lepadatu, Regulatory Compliance Engineer with the Compliance Program, Water and Science Administration at the Maryland Department of the Environment (MDE/Department).

On-site we met Andrea Buie-Branam, Michael Hallmen, Betty Jacobs, Ronald Turner, Timothy Simmons, and Rayford McEachern representing the Back River WWTP. In addition, we met Herbert Bell, consultant from Atkins Engineering. I began the inspection with an opening conference where I discussed follow-up items from previous evaluations with Back River WWTP representatives. Specific details regarding the treatment processes and plant operations listed below:

- Headworks (fine and coarse screening and grit removal system)
- Primary settling tanks (PST)
- Activated Sludge Plants
- Secondary clarifiers
- Denitrification filters (DNF)
- Operations and Maintenance (O&M)
- PCB Minimization Plan (PMP)

Below is a summary of the discussions that occurred during the opening conference and information that I gathered during the progression of the inspection:

Headworks

An independent contractor, ProStart, is currently operating and maintaining the headworks.

During the 12/14/2022 inspection, Ronald Wicks requested that the Back River WWTP provide to the Department the results for ambient air monitoring at the headworks for lower explosive limits (LEL), oxygen (O₂) and H₂S for the 4th quarters of 2022. The Department received the requested data on 1/30/23.

During my discussion with Ronald Turner today 6/14/23, Mr. Turner confirmed that the programmable logic controller (PLC) cards have been done [replaced]. Michael Hallmen stated that he will confirm the calibration procedures for preventative maintenance with ProStart.

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As a reminder:

- The Back River WWTP should ensure that the TSS concentration of the flushing water is maintained at an acceptable concentration.
- The Back River WWTP should ensure that the H₂S sensors are operative and reliable by checking the accuracy through routine frequent calibration checks.

PSTs

According to Back River WWTP staff today 6/14/23, PSTs #1, 7, 8, and 11 are fully in service. According to Ronald Turner, the scrapers and skimming arms on the operational PSTs are functioning as designed.

During the site review today 6/14/23, Timothy Simmons informed me that: PSTs #6 and 9 require rehab work. PSTs #5 and 10 are flow throughs. PST #9 will likely be back in service next month. Repairs will start on PST #10 after work on #9 is done. Re-balancing adjustments will be done on PST #7 after work on #2 is done.

Activated Sludge Plants

Per the 1/26/23 inspection report: The DO monitoring probes used to continuously monitor the DO in the biological reactors are not functional. According to Back River WWTP staff, there is a DPW purchase request for 60 ChemScan stainless steel DO probes, controllers, and converters/expansion boxes and associated equipment to automatically monitor and control the DO at the activated sludge plants.

According to Michael Hallmen today 6/14/23, the DO equipment is expected to arrive in August 2023 and will be installed upon arrival.

Secondary Clarifiers

Inspection today 6/14/23 found that the vegetation and algae has not been removed from all of the clarifiers and weirs. Of the 7 secondary clarifiers observed today, 4 were observed to have algae/vegetation growth along/past the weir and the other 3 were observed to have varying grass or other vegetation growth. During inspection today, 6 out of the 7 secondary clarifiers observed were observed to have clogged scum troughs. Further details noted in the site review section of this report.

DNF

Per inspection on 2/24/23: According to Michael Hallmen, they are planning to have Eney Electric connect a permanent power supply for Quad 2. According to Ronald Turner, Calmi Electric has also been contracted to do other electrical work around the plant. According to Mr. Turner, parts have been ordered to repair the air valve for filter #11 on Quad 3.

According to Timothy Simmons today 6/14/23, Quad 2 has a permanent power line going to it. Mr. Simmons further stated that it currently has a flex line and they will be putting in a conduit. According to Mr. Simmons, all 52 filters are online and fully functional.

Equipment and Maintenance Projects

I discussed the status of various operations and maintenance projects requiring attention.

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- Assets Management

- Per the 1/26/23 inspection report: The Department determined that there was insufficient accountability for inventory and specified that inventory control must be included in the revised O&M program. According to Mr. Turner, both Atkins Inc. and Hazen and Sawyer are conducting plant-wide assets evaluations. Mr. Turner further stated that DPW has been working on an assets management plan since October of 2022, but he is unsure when the plan will be complete.
- Per inspection on 4/26/23 and today 6/14/23: According to Back River WWTP representatives, the status of the assets management plan is the same and it is still in progress.

- Wasting and Sludge Management Plan

- Per inspection on 2/24/23: According to Ronald Turner, the wasting and sludge management plan is still in progress and part of it will be done by Atkins. According to Mahmudul Hasan, Back River staff and Atkins are working on determining mass balance modeling with an approximate timeline of a couple weeks. According to Mr. Turner, there is a legal issue (they are waiting on legal work with an approximate timeline of April or May) with Jacobs Engineering. According to Mr. Turner, once legal work is done, they anticipate Jacobs Engineering will be doing/overseeing operations and maintenance on the sludge line (everything except the headworks and scale works) for about 5 years.
- According to Michael Hallmen today 6/14/23: The status of the wasting and sludge management plan is the same and it is still in progress. They are still in discussions with Jacobs and it will possibly be at least 3 months before Jacobs comes in.

- Gravity Sludge Thickener (GST)

There are six GSTs. Two units are needed for designed capacity and one for current flow conditions.

- According to Michael Hallmen today 6/14/23, GSTs #1, 3, and 5 are operational/available for use. GSTs #2 and #4 are holding tanks. GSTs #6, #7, and #8 have drive and gear box issues, and parts have been ordered for them according to Ronald Turner during previous inspection on 2/24/23.

- Gravity Belt Thickener (GBT)

There are eight GBTs. Six GBTs are needed for current flows and seven for design capacity.

- According to Ronald Turner today 6/14/23, GBT #2 is the only one out of service currently. According to Michael Hallmen, GBT #2 requires a full replacement.

- Dissolved Air Flotation (DAF) Tanks

There are four DAF tanks on site. Two units are needed for designed capacity and one for current flow conditions.

- According to Timothy Simmons today 6/14/23, DAF #1 is in service. According to Mr. Simmons, the DAF #2 pump issues have been fixed, but it is not in service (the current status is unknown

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and there is possibly something else needed for repair). According to Michael Hallmen, DAF #3 and #4 are slated for rehab.

- Centrifuge Maintenance Plan

There are 4 centrifuges in the City Dewatering Facility. During usual/functional operating conditions of the City Dewatering Facility (and when accompanied by usual/functional operating conditions of the Synagro Facility), three centrifuges are needed to achieve required redundancy/reliability and a minimum of two centrifuges are required to meet current average conditions.

- Per previous inspections: According to Ronald Turner, Jacobs Engineering will be responsible for preparing the Centrifuge Maintenance Plan.
- According to Michael Hallmen today 6/14/23, the status of the Centrifuge Maintenance Plan is the same. According to Timothy Simmons, there have been 2 portable centrifuges in use onsite and a third portable centrifuge has been brought in to the site. The third portable centrifuge is located by the GSTs. I asked if containment measures are in place for the portable centrifuge. According to Michael Hallmen, there is a requirement of the operator to have containment and yes, they do have containment installed. According to Mr. Hallmen, ProStart is operating the centrifuge area. According to Mr. Hallmen, centrifuges #1, 2, and 3 are operational/available for use. According to Mr. Hallmen, they have to ship the bowl and screw for centrifuge #4 to Kentucky.

- Updated Written Operations and Maintenance (O&M) Manual

- Per the 2/24/23 inspection report: According to Ronald Turner, Atkins is overseeing the gap analysis and preparing a plan. The timeframe for completion of the plan is still 3 months. Mr. Turner further stated that Atkins is taking care of asset management, training, safety, and performance optimization.
- According to Michael Hallmen today 6/14/23: The status of the O&M Manual is the same and Atkins is overseeing the plan's preparation.

- Evaluation of Current Staffing and Staffing Plan

- Per the 2/24/23 inspection report: According to Ronald Turner, Atkins is overseeing work on the staffing plan. Mr. Turner stated that when Jacobs comes in, all the personnel currently working on sludge line will be moving to the other side of the plant.
- According to Michael Hallmen today 6/14/23: The status of the staffing plan is the same and it is still in progress.

PCB Minimization Plan (PMP)

- Per inspection on 2/24/23: According to Ronald Wicks (Administrator, MDE WSA Compliance), the PCB Minimization Plan (PMP) was submitted to the Department on 2/17/23.

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Site Review

After the opening conference, I conducted a site review beginning at the headworks. I was accompanied by Chris Lepadatu, Timothy Simmons, Andrea Buie-Branam, and Herbert Bell.

Sewage enters the plant at the mechanical screen building where there are four Coarse Screening Units, and each unit can treat flows up to 200 million gallons per day (MGD). Therefore, during normal flows one coarse screening unit is sufficient to treat the average daily flow. After coarse screening the sewage flows to the deep wet wells. There are two deep wet wells that are over 50 feet deep that receive wastewater from the Coarse Screening Units. Wastewater travels from the deep wet wells through suction pipes that draw water into the Headworks Influent Pumping Station. The Headworks Influent Pumping Station has 8 lift pumps. The lift pumps are used to pump the screened sewage from the wet wells to the Fine Screening System.

During this inspection, no problems were observed at the Coarse Screening Units area. The floor by the Coarse Screening Units was observed to be free of debris/rags.

The next stop was at the fine screening building. The headworks is equipped with six Fine Screening Units with a processing flow rate of up to 100 MGD each. The fine screened sewage then travels to the Grit Removal System.

During this inspection, no problems were observed at the Fine Screening Units area. The floor by the Fine Screening Units was observed to be free of debris/rags.

Travelling bridges remove grit from the waste stream, and this is done at the rectangular tanks. Each traveling bridge has an 80 MGD capacity and, under current flow conditions, 2 bridges are required for satisfactory grit removal. There are 8 traveling bridges and each is connected to a grit unit. The bridges travel back and forth using submersible pump/suction plate systems, that continuously removes settled grit from the tanks and transfers the grit to the grit dewatering processes consisting of spinning classifiers. The classified grit is dried and then sent off-site for disposal. The sewage flows from the Grit Removal System to a junction box and then to the PSTs.

During this inspection, the floor of the grit removal area was observed to be free of debris.

The next area of evaluation was at the PSTs. The PST #8 skimming arm was observed to be intact with no issues. Vegetation/other debris was observed along/past the weir of PST#8 at the visible opening near the scum trough and requires routine maintenance. The PST #11 skimming arm was observed to be functioning, but should be adjusted as needed to function as designed. The scum trough at PST #1 was observed to be clogged with scum and requires routine maintenance. The PST #1 skimming arm was observed to be intact with no issues. The PST #7 skimming arm was observed to be functioning, but should be adjusted as needed to function as designed. According to Timothy Simmons, PST #7 requires re-balancing adjustments due to issues resulting from previous contractor work done.

Be Advised: Vegetation/other debris along/past the PST weirs should be removed as needed to ensure the PSTs are functioning as designed for optimal and efficient wastewater treatment.

During the site review today 6/14/23, Timothy Simmons informed me that: PSTs #6 and 9 require rehab work. PSTs #5 and 10 are flow throughs. PST #9 will likely be back in service next month. Repairs will start on PST #10 after work on #9 is done. Re-balancing adjustments will be done on PST #7 after work on #2 is done.

The primary settling is the first stage of treatment after the removal of trash and grit in the headworks building. The PSTs are designed to settle and remove the solids or sewage sludge from the wastewater by gravity and remove the floating scum and fats, oil and grease (FOG). Typically, PSTs are designed to remove a large percentage of the total suspended solids (TSS) and reduce the biochemical oxygen demand (BOD₅) of the wastewater. Therefore, it is important to maintain the PSTs in good condition at all times.

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Picture 1: 6/14/23 – Vegetation/other debris was observed along/past the weir of PST#8 at the visible opening near the scum trough.



Picture 2: 6/14/23 – The PST #11 skimming arm was observed to be functioning, but should be adjusted as needed to function as designed.

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Picture 3: 6/14/23 – The scum trough at PST #1 was observed to be clogged with scum.



Picture 4: 6/14/23 – The PST #7 skimming arm was observed to be functioning, but should be adjusted as needed to function as designed.

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After primary settling, the wastewater flows to the flow distribution building and from there the wastewater flows to the Activated Sludge Plants #2, #3 and #4 which contain a series of biological reactors for nitrogen removal. Each Activated Sludge Plant has six reactors. Activated Sludge Plants #2 and #3 have a three-pass train designated A, B and C for each reactor and #4 is a two-pass system. There are a total of 36 secondary clarifiers. Each Activated Sludge Plant has 12 secondary clarifiers.

During the next phase of this evaluation, Activated Sludge Plant #2 was observed. At ASP #2, vegetation was observed around one of the mixers at the reactor labeled 8A PASS. According to Timothy Simmons, the contractor Badger is having difficulties getting to the area with vegetation and they are working on another contingency plan to remove the vegetation.



Picture 5: 6/14/23 – At ASP #2, vegetation was observed around one of the mixers at the reactor labeled 8A PASS.

Secondary clarifiers 5A, 7A, 7B, 5B, 6A, 13B, and 14B were observed during inspection. The scum troughs at secondary clarifiers 5A, 7A, 7B, 5B, 6A, and 13B were observed to be clogged with scum and require routine maintenance. Secondary clarifiers 5A, 7A, 7B, and 5B were observed to have algae/vegetation growth along/past the weir. Secondary clarifier 5B was observed to have solids/trash debris leaving past the weir. Secondary clarifier 6A was observed to have grass/vegetation growth along the weir. Secondary clarifier 13B was observed to have grass/vegetation growth near the center of the clarifier and along the weir. Secondary clarifier 14B was observed to have grass/vegetation growth near the center of the clarifier and along the weir. The skimming arms at secondary clarifiers 5A, 7A, 7B, 5B, 6A, and 13B were observed to be intact with no issues. The skimming arm on secondary clarifier 14B was observed to be missing a skimming flap.

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During inspection of the secondary clarifiers, Back River staff measured the sludge blanket depth of secondary clarifiers 7B, 5B, 13B, and 14B. The sludge blanket depth of secondary clarifier 7B was measured to be 6 feet. The sludge blanket depth of secondary clarifier 5B was measured to be 0.5 feet. The sludge blanket depth of secondary clarifier 13B was measured to be 7.5 feet. The sludge blanket depth of secondary clarifier 14B was measured to be 1.5 feet. Normal operating sludge blanket depth is 2 to 4 feet.



Picture 6: 6/14/23 – The scum trough at secondary clarifier 5A was observed to be clogged with scum.

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Picture 7: 6/14/23 – Secondary clarifier 5A was observed to have algae/vegetation growth along/past the weir.



Picture 8: 6/14/23 – Secondary clarifier 5A was observed to have algae/vegetation growth along/past the weir.

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Picture 9: 6/14/23 – The scum trough at secondary clarifier 7A was observed to be clogged with scum.



Picture 10: 6/14/23 – Secondary clarifier 7A was observed to have algae/vegetation growth along/past the weir.

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Picture 11: 6/14/23 – Secondary clarifier 7A was observed to have algae/vegetation growth along/past the weir.



Picture 12: 6/14/23 – The scum trough at secondary clarifier 7B was observed to be clogged with scum.

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Picture 13: 6/14/23 – Secondary clarifier 7B was observed to have algae/vegetation growth along/past the weir.



Picture 14: 6/14/23 – The scum trough at secondary clarifier 5B was observed to be clogged with scum.

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Picture 15: 6/14/23 – Secondary clarifier 5B was observed to have solids/trash debris leaving past the weir.



Picture 16: 6/14/23 – Secondary clarifier 5B was observed to have algae/vegetation growth along/past the weir.

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Picture 17: 6/14/23 – The scum trough at secondary clarifier 6A was observed to be clogged with scum.



Picture 18: 6/14/23 – Secondary clarifier 6A was observed to have grass/vegetation growth along the weir.

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Picture 19: 6/14/23 – Secondary clarifier 6A was observed to have grass/vegetation growth along the weir (yellow arrow pointing to this).



Picture 20: 6/14/23 – The scum trough at secondary clarifier 13B was observed to be clogged with scum.

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Picture 21: 6/14/23 – Secondary clarifier 13B was observed to have grass/vegetation growth near the center of the clarifier.



Picture 22: 6/14/23 – Secondary clarifier 13B was observed to have grass/vegetation growth along the weir.

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Picture 23: 6/14/23 – Secondary clarifier 14B was observed to have grass/vegetation growth near the center of the clarifier.



Picture 24: 6/14/23 – Secondary clarifier 14B was observed to have grass/vegetation growth along the weir.

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The next stop was at the DNF building. There are four filter quads, and each quad contains 13 Tetra Denitrification Filters with 52 total filters. 50 units are needed for designed capacity and 39 for current flow conditions. Baltimore City has a contract with ProStart to operate and maintain the DNF treatment process.

During an inspection of the filters in quads #1 and #2, there were still floating solids observed in the filter at the end of the quad (also observed during inspection on 1/26/23, 2/24/23, and 4/26/23). On 6/14/23, Michael Hallmen provided (via email) to MDE the TSS data for the DNF influent and effluent from 4/1/23 to 6/12/23. The DNF effluent data showed TSS greater than 10 mg/L on 4/28/23, 4/29/23, 5/3/23, and 5/19/23.



Picture 25: 6/14/23 – Solids and trash observed to be floating on water surface in the DNFs.

After inspection at the DNF building and filter quads, Andrea Buie-Branam left the site review/tour group.

We then traveled to the Sand Filters. The functioning sand filters are used to polish the wastewater coming from the DNF. I observed no problems during inspection of the functioning sand filters.

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Next, I inspected the final effluent at the step aeration system. During an evaluation of the final effluent, I observed that the effluent was clear with no visible particulates.



Picture 26: 6/14/23 – Final Effluent at the step aeration system.

During an inspection of the chlorine contact chambers, I observed no problems. At the request of the Department, the Back River WWTP installed floating booms upstream of the final overflow to preventing floating scum and solids observed during previous inspections from discharging to the surface waters of the State. These booms were in place and functioning satisfactorily. There was no evidence of floating material breaching the final booms during this evaluation.

Next, I inspected the monitoring point for Outfall 002 and checked the automatic sampler. According to Timothy Simmons, the pump for Outfall 002 was replaced on 4/27/23, which resolved the issue with sending flow to Outfall 002. The refrigerator door of the automatic sampler was observed to be broken and not properly sealed when shut. At the time of inspection, the refrigerator verification thermometer was observed to have a temperature reading of 7 degrees Celsius, which exceeds the maximum 6 degrees Celsius holding temperature for samples.

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Picture 27: 6/14/23 – The refrigerator door of the automatic sampler (at monitoring point for Outfall 002) was observed to be broken and not properly sealed when shut.



Picture 28: 6/14/23 – At the automatic sampler refrigerator (at monitoring point for Outfall 002), the refrigerator verification thermometer was observed to have a temperature reading of 7 degrees Celsius.

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I then inspected the monitoring point for Outfall 001 and checked the automatic sampler. No issues were observed during inspection of the monitoring point for Outfall 001 and the automatic sampler. The refrigerator verification thermometer was observed to have a temperature reading of 4 degrees Celsius at the time of inspection.

After the site review, we went back to the administration building for an exit conference to discuss my findings with Christopher Lepadatu, Timothy Simmons, and Mahmudul Hasan.

Only well-trained, dedicated plant operators can be expected to perform adequate physical inspections, repairs, and preventive maintenance. The Back River WWTP should ensure that all staff are adequately trained and committed to the satisfactory operations of the treatment plant. Optimal maintenance activities at the Back River WWTP can be multifaceted and requires a variety of operator skills to be effective. Therefore, adequate staff and ongoing staff training are necessary. There has not been adequate long-term planning for staff replacement and system upgrades and changes at the Back River WWTP. Many of the skills necessary for routine and preventive maintenance at the site are not readily available and goes beyond the routine wastewater apprenticeship training programs. The Back River WWTP should develop a plan to ensure that there are sufficient staff that are qualified for assigned tasks. A staffing plan should be developed to assess current staffing levels, required staffing needs and a projection of future staffing requirements in order to evaluate and identify staffing needs at the WWTP. This should be done to ensure that the WWTP functions efficiently and complies with General Condition B3a and b of the NPDES permit.

Records Review

A records review was conducted for compliance with the above referenced NPDES Discharge Permit. DMR submissions to NetDMR were reviewed for October 2022 through May 2023.

MDE received the following letters from City of Baltimore Department of Public Works regarding Permit Number 15-DP-0581:

- The letter dated March 31, 2023 and signed by Rayford F. McEachern, Jr. states: “The Back River WWTP experienced a non-permit related spillage event at our facility on Saturday, March 25, 2023 at the rear of the egg-shaped digesters. The required phone call to MDE to report the event was made on March 31, 2023 at 1:40pm and received by Ms. Nichelle B. Back River operations are having issues due to discharge restrictions to our sludge centrifuge facility. We are dealing with high pressures within the system aided by the shutdown of Synagro and operational issues at the centrifuge building. The exact location of the spill was not identified, but sludge escaped through the doorway of the foam separating building and rested in the immediate grass area. When the event was discovered, plant personnel immediately limed the area. Crews later removed the excess sludge from the area. It is estimated that 300 gallons of sludge escaped from the building. Sludge did not reach [any] area waterways or drainage systems on the plant. Efforts to control pressure within the system are being reviewed to reduce the obstacles this problem is causing.”
- The letter dated April 6, 2023 and signed by Rayford F. McEachern, Jr. states: “The Back River WWTP experienced a non-permit related spillage event at our facility on Thursday, April 6, 2023 at 7:00am, at the centrifuge facility. The required phone call to MDE to report the event was made on April 6, 2023 at 4:00pm and received by Ms. Nichelle B. During plant operations, two of the three centrate return pumps experienced electrical failures. Pump #1 had a ground fault and pump #3 had an overcurrent fault. Pump #2 is out awaiting repair for a bad motor. When the pumps failed, it caused the centrate to completely fill the sludge tank, which is never filled high enough to have weir overflow and spilled onto the ground. All sources that were feeding into the centrate tank were stopped. In the process of placing the sandbags around the storm drain, the sludge tank began to overflow onto the ground, allowing approximately 50 gallons to

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enter the storm drain and an estimated 50 gallons settled in the grassy area (100 gallons total estimate). Electricians were able to reset centrate return pump #3 and place it back in service. Centrate Pump #1 motor and electrical feed were tested. Contractors will be in on Monday to repair or replace the pumps. They are unable to start tomorrow because of the holiday. Operators are instructed to monitor the pumps every 2 hours.”

- The letter dated May 5, 2023 and signed by Rayford F. McEachern, Jr. states: “The Back River WWTP experienced a non-permit related spillage event at our facility on Monday, May 1, 2023 around 2:30am, at the gravity belt thickener facility. The required phone call to MDE to report the event was made on May 1, 2023 at 3:55pm and received by Ms. Katie Baker. An unexpected noise was heard in the GBT area near the GST tanks. When it was investigated, it was determined that a pressure buildup in the sludge area caused a manhole cover to eject and allow waste activated sludge to escape from the system. It is estimated that 500 gallons rested on the immediate grassy area. The affected area was burned off and lime was applied to the area where the waste activated sludge rested. The spill was restricted and did not reach any sewer lines or receiving waters. Operator[s] were instructed to watch the line pressure more frequently and make needed adjustments to the process to prevent any further events.”
- The letter dated May 23, 2023 and signed by Rayford F. McEachern, Jr. states: “The Back River WWTP experienced a non-permit related spillage event at our facility on Sunday, May 21, 2023 between 4:00am and 5:00am, at the #2 centrate tank behind the centrifuge building. The required phone call to MDE to report the event was made on May 22, 2023 at 7:35 am and received by Amanda. An employee from private contractors operating the centrifuge facility noticed sludge escaping from the #2 centrate tank. Flow to the tank was immediately shut down. The cause of this event was a clogged effluent trough which prevented flow from discharging the tank in a controlled manner. The clogging increased the tank level until it overflowed onto the ground. Work crews responded the morning of May 21, to clean the area and remove the estimated 5,000 gallons of sludge that escaped the tank. It is estimated that 500 gallons of sludge reached a nearby manhole. Efforts were made to clean the sludge that entered the manhole. Operators were instructed to make more frequent visual checks of plant operations to prevent reoccurrence.”
- The letter dated May 24, 2023 and signed by Paul Sayan, P.E. states:
 - “This letter details our root cause analysis and resulting City of Baltimore (the City) mitigation efforts regarding the Back River Treatment Plant Outfall 002 total phosphorous (TP) noncompliance for the month of April. As noted in the City’s acknowledgement of permit noncompliance letter, dated May 18, 2023 and submitted to your office, the monthly Total Phosphorous (TP) concentration at the Back River Treatment Plant Outfall 002 for April was 0.22 mg/L, which is slightly above the regulatory limit of 0.20 mg/L. Operational and maintenance reviews indicate that the noncompliance was primarily due to:”
 - “1. Heavy/long-duration rainfall that occurred on April 28, 2023”
 - “2. Excess sludge in the plant’s various treatment trains”
 - “As shown in the graph [included in the letter], total phosphorous at Outfall 002 were well below the permitted level since June 2022 and have remained below the limit since the April 28th storm event.”
 - “The April 28th storm did not have high-rainfall intensity; however, the long rainfall duration disturbed the sludge that settled at the bottom of the plant’s activated reactors and secondary clarifiers thus resulting in a TP concentration of 2.20 mg/l on April 29th and skewing the monthly TP concentration to noncompliance. Excluding the total phosphorous effluent from the April 28th

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- storm, the plants monthly TP average is 0.16 mg/l, which indicates that the 2.20 mg/l TP concentration on April 29th was an anomalous event.”
- “After learning of the daily sampling results from the City’s internal laboratory, the City immediately began efforts to mitigate any future noncompliance including:”
 - “1. Continued equipment repairs and preventative maintenance to increase sludge processing.”
 - “2. Directed City vendors to provide additional operators, where needed.”
 - “3. Directing one of the City’s vendors (Synagro) to immediately install and start up a temporary press filter at the primary settling tank to reduce sludge buildup. The City is waiting for the vendor to provide a second temporary press filter to increase sludge removal production rates.”
 - “4. Utilizing Synagro’s rail cars to haul increased sludge removal.”
 - “5. Emptying aeration tanks and clarifiers to allow more settlement capacity.”
 - “6. Cleaned contact chambers to remove any settled sludge.”
 - “Additionally, the City’s vendor (ProStart) is replacing the polymer system to increase sludge dewatering efforts. We anticipate the replacement work to be completed shortly.”
 - “A series of post-storm operational reviews indicated some previous incidents and oversights that contributed to the noncompliance:”
 - “1. Reduced sludge processing by Synagro due to the March 15, 2023 explosion at their dewatering/pelletizing facility. While the treatment plant remained in operation during and after the storm, sludge processing was at a reduced production rate, which resulted in sludge buildup in the plant’s various treatment trains. Synagro is now processing approximately 100 dry tons/day of sludge, which is slightly above the pre-explosion production rate.”
 - “2. Unavailable temporary storage space at the plant’s Transfer Pad due to Maryland Environmental Services’ (MES’) delays to complete cleaning of the plant’s In-Ground Digesters 1 and 4. Sludge hauling rates was significantly reduced due to the unavailability of the Transfer Pad. As detailed in the attached letter, the City accommodated MES’ request for additional staging area by providing MES with access to the Transfer Pad and then being informed by MES that the total sludge to be removed was double MES’ estimated amount, thus resulting in over 100% cost overrun. To date, the sludge has not been removed from the Transfer Pad.”
 - “3. Continuous monitoring by City staff of the sludge blankets in the activated digesters.”
 - “We believe that the April noncompliance at Back River Treatment Plant Outfall 2 is an outlier event that does not indicate systematic or recurring issues. Thus far in May 2023, the plant has been performing below regulatory limits. Additionally, this one event should not overshadow the remarkable progress the City has made over the past 11 months. We believe our lessons learned with this unique event and resulting mitigation strategy will ensure treatment plant compliance.”
- The letter dated May 25, 2023 and signed by Rayford F. McEachern, Jr. states: “The Back River WWTP experienced a non-permit related spillage event at our facility on Monday, May 22, 2023 around 8:00am, at the temporary centrifuge sludge processing area near the centrifuge building. The required phone call to MDE to report the event was made on May 23, 2023 at 1:30pm and received by Ms. Katie Baker. Private contractors operating in the temporary sludge centrifuge area experienced an equipment failure which allowed sludge to overflow a holding tank (frat tank). The overflow happened when the shut-off float in the tank malfunctioned due to heavy material in the tank. The float did not rise to a height to signal the influent pump to stop flow. It is estimated that 500 gallons of digested sludge escaped the tank and overflowed onto the ground. Work crews responded May 22, with a VAC haul truck to clean the area and remove the

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sludge. Operators were instructed to make more frequent visual checks of plant operations. A detailed cleaning of the tank is scheduled for Saturday, May 27, to help prevent this from recurring.”

- One letter dated May 31, 2023 and signed by Rayford F. McEachern, Jr. states: “The Back River WWTP experienced a non-permit related spillage event at our facility on Friday, May 26, 2023 around 3:30am, at the #2 centrate tank behind the centrifuge building. The required phone call to MDE to report the event was made on May 26, 2023 at 4:15pm and received by Ms. Carol Hasselberger. Recent operation of this facility has resulted in clogs at the effluent discharge trough of the #2 centrate tank. This area of the plant is operated by private contractors who are learning the characteristics of how the process respond[s] to adjustments during the shift. Operating this area also require[s] frequent visual checks of tanks, pumps and associated equipment to ensure proper operating responsibility. After investigation, it was determined that a valve which should be closed was in the open position. This allowed sludge to enter the tank and escaped onto the ground. Work crews responded the morning of May 26, to clean the area and remove the estimated 2,500 gallons of sludge that escaped the tank. Sludge did not reach any manhole or nearby waters. Operators were instructed to make more frequent visual checks of plant operations to prevent reoccurrence.”
- A second letter dated May 31, 2023 and signed by Rayford F. McEachern, Jr. states: “The Back River WWTP experienced a non-permit related spillage event at our facility on Saturday, May 27, 2023 around 2:30am, at the #1 centrate tank behind the centrifuge building. The required phone call to MDE to report the event was made on May 27, 2023 at 5:42pm and received by Joanne (report #145729). #1 centrate tank at the rear of the centrifuge facility experienced a sludge overflow from the tank around 2:30am. The private contractor operating this area of the plant notified City of Baltimore employees and began the procedures to isolate and investigate this event. It was determined that a valve malfunction happened which allowed sludge to enter the tank and escaped onto the ground. A VAC-haul truck and crews responded to the affected area on May 27, to clean the area and remove the estimated 3,000 gallons of sludge that escaped the tank. It is estimated that 300 gallons of sludge reached a nearby manhole, but it was removed from the manhole during the cleanup procedures. Efforts are underway to check area equipment for proper functionality.”
- The letter dated June 2, 2023 and signed by Rayford F. McEachern, Jr. states: “The Back River WWTP experienced a non-permit related spillage event at our facility on Monday, May 29, 2023 from 2:30am to 2:00pm, at the #2 centrate tank behind the centrifuge building. The required phone call to MDE to report the event was made on May 30, 2023 at 8:05am and received by Nichelle. The #2 centrate tank overflowed at the centrifuge facility. The cause of this event was a pump malfunction and a clogged effluent trough which prevented flow from discharging out of the tank. The clogging increased the tank level until it overflowed onto the ground. Work crews responded with a VAC-haul truck to clean up the area and remove the estimated 2,000 gallons of sludge that escaped the tank. It is estimated that 500 gallons of sludge reached a nearby manhole. The sludge was removed from the manhole during the clean-up process. Continued efforts are being made to ensure proper operational knowledge is provided to the operators of the area. Operators were instructed to make more frequent visual checks of plant operations to prevent reoccurrence.”

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The following violations were observed under Environment Article Title 9 for the Back River WWTP:

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. In addition, there is a list of equipment requiring maintenance listed under Equipment and Maintenance Projects 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.
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.
3. The DO monitoring probes used to continuously monitor the DO in the biological reactors are not functional. According to Ronald Turner, the DO monitoring and other associated equipment have been ordered and Back River WWTP staff are waiting for parts.
4. The scum trough on PST #1 is clogged with scum and requires routine maintenance. This is a violation of General Condition B3 of the NPDES permit.
5. At ASP #2, there is vegetation around one of the mixers at the reactor labeled 8A PASS. This is a violation of General Condition B3 of the NPDES permit.
6. The scum troughs on secondary clarifiers 5A, 7A, 7B, 5B, 6A, and 13B are clogged with scum and require routine maintenance. Secondary clarifier 5B was observed to have solids/trash debris leaving past the weir. The sludge blanket depth in secondary clarifiers 7B and 13B is too high. The skimming arm on secondary clarifier 14B is missing a skimming flap. This is a violation of General Condition B3 of the NPDES permit.
 - a. During inspection today 6/14/23, 6 out of the 7 secondary clarifiers observed were observed to have clogged scum troughs.
 - b. During inspection today 6/14/23: The sludge blanket depth of secondary clarifier 7B was measured to be 6 feet. The sludge blanket depth of secondary clarifier 13B was measured to be 7.5 feet.
7. An independent contractor has cleared vegetation and algae from some of the secondary clarifiers, but the vegetation has not been removed from all of the clarifiers and weirs. Therefore, not all of the secondary clarifiers are functioning as designed for optimal and efficient wastewater treatment. Additionally, varying grass and other vegetation growth was observed. This is a violation of General Condition B3 of the NPDES permit.
 - a. Of the 7 secondary clarifiers observed today 6/14/23, 4 were observed to have algae/vegetation growth along/past the weir and the other 3 were observed to have varying grass or other vegetation growth. Secondary clarifiers 5A, 7A, 7B, and 5B were observed to have algae/vegetation growth along/past the weir. Secondary clarifier 6A was observed to have grass/vegetation growth along the weir. Secondary clarifier 13B was observed to have grass/vegetation growth near the center of the clarifier and along the weir. Secondary clarifier 14B was observed to have grass/vegetation

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growth near the center of the clarifier and along the weir.

8. At the automatic sampler refrigerator (at the monitoring point for Outfall 002), the refrigerator door of the automatic sampler was observed to be broken and not properly sealed when shut. At the time of inspection today 6/14/23, the refrigerator verification thermometer was observed to have a temperature reading of 7 degrees Celsius, which exceeds the maximum 6 degrees Celsius holding temperature for samples. This is a violation of General Condition A3 of the NPDES permit.
9. Sewage sludge discharge from the site to a storm drain on 4/6/23 and a manhole on 5/21/23, 5/27/23, and 5/29/23.
10. The facility failed to meet the final effluent limits and/or reporting requirements detailed in the permit as outlined below:
 - a. The April 2023 DMR for Outfall 002 reports that the Total Phosphorous monthly average concentration was 0.22 mg/L (permit limit is 0.20 mg/L).
 - b. The March 2023 DMR (submitted on 4/28/23 and re-submitted on 5/18/23) for Outfall 002 reports "P - Laboratory Error or Invalid Test" for quarterly average loading and quarterly average concentration of Polychlorinated biphenyls [PCB].
 - i. The cover letter (dated April 28, 2023 and signed by Ronald Turner) states: "At the time of this reporting period, samples collected by an independent laboratory on February 14, 2023 for tPCBs congeners has not provided results for submission. When the reports are provided, a resubmitted report will be forwarded."
 - c. The December 2022 DMR for Outfall 001 reports that the Total Phosphorous annual total loading was 132,198 lbs/year (permit limit is 79,277 lbs/year).
 - d. The November 2022 DMR for Outfall 001 reports that the Total Phosphorous annual total loading was 131,749 lbs/year (permit limit is 79,277 lbs/year).
 - e. The October 2022 DMR for Outfall 001 reports that the Total Phosphorous annual total loading was 131,564 lbs/year (permit limit is 79,277 lbs/year).

To bring this site into compliance with Environment Article Title 9, the Back River WWTP should make the following corrections:

- A. With respect to item #1 above, 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.
- B. With respect to item #2 above, 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.
- C. With respect to item #3 above, 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 the 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.

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- D. With respect to item #4 above, the Back River WWTP should maintain the PSTs as required to keep them functioning properly to comply with the requirements under General Condition B3 of the NPDES permit. The scum pit should be pumped out as necessary and the scum trough should be cleaned. Going forward, the scum troughs on the PSTs should be routinely inspected and the scum pits pumped out as necessary to keep the scum trough openings clear.
- E. With respect to item #5 above, the vegetation should be removed from the reactor and routine maintenance should be performed to prevent the recurrence of the problem to minimize upsets and discharges of excessive pollutants as required under General Condition B3 a and b of the permit.
- F. With respect to item #6 above, the Back River WWTP should maintain the secondary clarifiers as required to keep them functioning properly to comply with the requirements under General Condition B3 of the NPDES permit. The scum pits should be pumped out as necessary and the scum troughs should be cleaned. The sludge blanket depth of the secondary clarifiers should be managed to 2 to 4 feet and sludge should be wasted as necessary. The skimming flap for the skimming arm on secondary clarifier 14B should be installed. Going forward, the scum troughs on the secondary clarifiers should be routinely inspected and the scum pits pumped out as necessary to keep the scum trough openings clear.
- G. With respect to item #7 above, all vegetation should be removed from the secondary clarifiers and routine maintenance should be performed to prevent the recurrence of the problem to minimize upsets and discharges of excessive pollutants as required under General Condition B3 a and b of the permit. The Back River WWTP should continue to provide 30-day updates on the progress in achieving the goal of removing all vegetation from the secondary clarifiers and reactors.
- H. With respect to item #8 above, the Back River WWTP should ensure that analytical and sampling methods conform to test procedures for the analysis of pollutants as identified in 40 CFR Part 136 - "Guidelines Establishing Test Procedures for the Analysis of Pollutants." The automatic sampler refrigerator should be repaired as needed to ensure the holding temperature for samples complies with the requirements under General Condition A3 of the NPDES Permit.

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

Inspector: Samantha Coffman 8/2/23 Received by: _____
Samantha Coffman /Date Signature/Date
samantha.coffman1@maryland.gov
410-537-4188

Print Name