



Maryland

Department of the Environment

Wes Moore, Governor
Aruna Miller, Lt. Governor

Serena McIlwain, Secretary
Suzanne E. Dorsey, Deputy Secretary
Adam Ortiz, Deputy Secretary

June 18, 2026

To: Mr. Will Shreve, Plant Manager
Back River Wastewater Treatment Plant
8201 Eastern Avenue
Dundalk, Maryland 21224

From: Joint Inspection Team (Maryland Department of the Environment)

Subject: Summary of Findings and Corrective Actions from May 15, 2026 Multimedia Inspection

Dear Mr. Shreve:

This letter provides a summary of the findings, including violations, operational failures, ongoing odor issues and required corrective actions, resulting from the joint inspection conducted at the Back River Wastewater Treatment Plant on May 15, 2026. The inspection was carried out by representatives from the Maryland Department of the Environment's Water and Science Administration (WSA), Air and Radiation Administration (ARA), and Land and Materials Administration (LMA).

Violations Identified:

The WSA identified the following violations of Environment Article 9 related to facility operations and effluent quality:

- **Malfunctioning Equipment:** Primary Settling Tank (PST) 4 was operating with a skimmer arm that was failing to collect scum into the trough as intended, violating requirements to operate the facility in a manner that minimizes upsets.
- **Effluent Exceedances:** A review of February 2026 records revealed exceedances of maximum effluent limitations at two outfalls. Outfall 001A exceeded the maximum limit for Total Residual Chlorine (reported 0.22 mg/L against a 0.1 mg/L limit) and Total Phosphorus (reported 390 lbs/day against a 330 lbs/day limit). Outfall 002A exceeded the weekly average limit for Total Phosphorus (reported 0.85 mg/l against a 0.3 mg/l limit). The facility's faulty operations caused the upsets that resulted in these unauthorized final effluent exceedances.

Ongoing Odor Issues and Causes:

Noticeable and sometimes severe odors were detected at several stages of the treatment process, indicating that the processes are a source of odors reported in the surrounding communities. The primary areas of concern and their identified causes include:

- **Headworks:** Very strong odors were detected inside the Fine Screen Building, which is vented under negative pressure to the BioAir odor scrubbers, and at the Grit Removal

Facility, which is open to the atmosphere and has vents to the BioAir scrubbers. There appear to be failures in the equipment or hydrogen sulfide (H₂S) sensors within the headworks odor scrubbers.

- Gravity Sludge Thickeners (GSTs) and Thickened Sludge Holding Tanks (TSHTs): Strong sewage and earthy odors were detected in this area. This is exacerbated by the fact that the GSTs and TSHTs are currently uncovered and open to the atmosphere. Plant staff have reported that covers and odor control systems previously used for these tanks fell into disrepair and were removed after accumulating H₂S gas caused severe corrosion.
- Sludge Storage Lagoons: Pungent and highly earthy odors were observed in the proximity of the sludge storage lagoons. This is caused by excess sludge being stored in the lagoons, as it currently cannot be properly processed due to the non-operational status of the sludge drying pelletizers.

Corrective Actions:

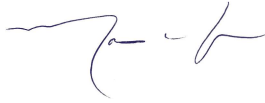
To address the odors, operational deficiencies, and permit violations, the facility must implement the following corrective actions:

- Equipment Repair: Investigate the cause of the PST 4 skimmer arm malfunction and perform the necessary maintenance to restore its full operation.
- Effluent Compliance: Investigate the root causes of the final effluent parameter exceedances from February 2026 and implement the necessary operational changes to return effluent quality to compliance and minimize future upsets.
- Plant Maintenance: Immediately remove the buildup of waste material observed collecting on a platform over an active passway in the Activated Sludge Plant to maintain accessibility and quality control.
- Headworks Odor Control Systems: Complete the ongoing assessment and tune-up of the headworks odor scrubbers (including replacing the faulty H₂S sensors) and provide the BioAir evaluation to MDE.
- Tank Covers: Complete engineering assessment for covering the GSTs and Sludge Holding Tanks, as well as the weirs of the Primary Settling Tanks, and ventilating them through odor scrubbers, and begin work to establish those controls.
- Facility-wide Odor Control Plan: Develop a comprehensive plan for odor control throughout the facility and submit to MDE upon completion. For each odor source throughout the facility, evaluate existing odor control procedures and practices, and identify any additional odor control technologies and methods based on best control technologies and best industry practices. The plan should include any administrative controls, such as staff training, recordkeeping, and maintenance, testing, and audit procedures to ensure control equipment is functioning properly.
- Sewage Sludge Removal from Lagoons: Start removal of sewage sludge by July 1, 2026. Remove all sewage sludge from the lagoons by September 1, 2026.
- Vegetation: Remove all vegetation from the sewage sludge storage lagoons after the sewage sludge has been removed. Additionally, provide a detailed engineering review on the integrity of the lagoon's liner. Submit a maintenance plan describing how the lagoons will be maintained, including preventing the growth of vegetation.

A follow-up inspection will be conducted by WSA to verify that these corrections have been made.

Please contact our offices with any questions regarding your timeline for the implementation of these actions.

Sincerely,



Matthew Rowe, Deputy Director
Water and Science Administration



[Angelo Bianca \(Jun 18, 2026 14:42:37 EDT\)](#)

Angelo Bianca, Deputy Director
Air and Radiation Administration



Stephanie Cobb Williams, Deputy Director
Land and Materials Administration

Cc: Michael Hallmen
Adam Ortiz
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Inspector: DeSean Hunter
AI ID: 8449

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

Start Date/Time: May 15, 2026, 12:00 AM
End Date /Time: May 15, 2026, 05:00 PM

Media Type(s): NPDES Municipal Major Surface Water

Contact(s): Timothy Simmons – Operations Engineer, Back River WWTP
Rayford McEachern – Operations Engineer, Back River, WWTP
Mpoyo George Mulenda – Operations Engineer, Back River WWTP
Robert Hindt – Chief, Wastewater Facility Division, Baltimore City DPW
Michael Hallman – Deputy Bureau Head, Back River WWTP
Scott Moffat – Policy Analyst, Baltimore City DPW
Lakia Franklin – Policy Analyst, Baltimore City DPW
Chris Hoagland – Administrator ARA, MDE
Hannah Ashenafi – Deputy Program Manager ARA Compliance, MDE
Nick Bratton – Compliance Inspector ARA, MDE
Lee Currey – Director WSA, MDE
Andrew Gosden – Program Manager WSA Compliance, MDE
Bradley Baker – Program Manager LMA, MDE
Emad Rezk – Inspector LMA, MDE

NPDES Municipal Major Surface Water

Permit / Approval Numbers: 15-DP-0581

NPDES Numbers: MD0021555

Inspection Reason: Follow-up

Site Status: Active

Compliance Status: Noncompliance

Recommended Action: Continue Routine Inspection

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

Delivery Method: Email

Weather: Good

Inspection Findings:

Introduction:

Back River Wastewater Treatment Plant (WWTP) is operated by Baltimore City DPW. Some areas/systems of the WWTP are operated by subcontractors including the Headworks, Denitrification Building, and Centrifuges. The facility

Inspection Date: September 25, 2025
 Site Name: Back River WWTP
 Facility Address: 8201 Eastern Ave, Baltimore, MD 21224

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 discharges via 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 effluent discharge at Back River WWTP is split at a junction box and a large 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 (#22DP0581) 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 individual(s) listed above for an opening conference followed by a site walk and closing conference.

Consent Decree:

As of November 2023, Baltimore City and the Department signed a Consent Decree, Case No. 24-C-22-00386, which establishes specific goals and objectives related to the operation and maintenance of the Patapsco WWTP. As a result, maintenance items observed during the site inspection will be notated in the relevant areas of the inspection report and not itemized in the Violation(s) section as in previous inspection reports. The goals and objectives in the Consent Decree are noted below for monitoring and tracking progress. My updates during this inspection are indicated in red text. The table below has been updated with the information included in the Consent Decree Report provided on August 15, 2024. Requests for deadline extensions have been received. Deadlines in the table will be updated if and when extensions are granted.

Back River WWTP Consent Decree (CD) Overall Progress Tracking Summary				
CD Paragraph Reference	Activity	CD Deadline	Actual Date Completed	Compliance Status (05/15/26)
132-BR	Replace H2S Sensors	12/15/2023	5/16/2023	Complete
133(a)-BR	Clean and complete repairs on at least 8 PSTs to ensure they are fully functional and capable to operate as designed.	1/1/2024	3/1/2024	Complete
133(b)-BR	Clean and complete repairs to all 11 PSTs to ensure they are fully functional and available for use.	12/31/2025	12/31/2025	Complete
134-BR	Baltimore City to have and maintain an adequate supply of Dissolved Oxygen ("D.O.") probes.	12/1/2023	11/7/2023	Complete
135-BR	Baltimore City shall maintain Activated Sludge Plants No. 2 & 3 as well as their associated clarifiers.	Ongoing		Compliant
135(a)-BR	Submit for review and Department approval the standard operating procedure (SOP) for removal of vegetative growth in the final clarifiers.	1/15/2024	12/15/2023	Complete
135(b)-BR	Implement vegetative growth plan.	Upon approval of 135(a)-BR		Awaiting Approval
135(c)-BR	Maintain average sludge blanket depth of 2 to 4 feet in final clarifiers.	Ongoing		Compliant
135(d)-BR	Maintain manual operations until Activated Sludge PLCs are updated and set up for automatic operation.	Ongoing		Compliant
136(a)-BR	Complete evaluation of sand filters. Within 10 days of sand filter evaluation, request approval for change of use of the approved sand filter, OR	4/30/2024	4/30/2024	Complete
136(b)-BR	Submit plan and schedule for implementation of sand filter improvements (Sand Filter Improvement Plan). Immediately upon approval City shall implement the approved Sand Filter Improvement Plan.	5/10/2024	5/10/2024	Complete
137-BR	Repair all Gravity Belt Thickeners (GBTs) to operate as designed.	6/30/2024	7/2/2024	Complete
138-BR	Repair and install one of the three non-operational Dissolved Air Flotation (DAF) systems and thickened sludge pumps.	12/31/2023	12/5/2023	Complete
139-BR	Issue Notice to Proceed (NTP) with contract for rehabilitation of the egg-shaped digesters. Complete rehabilitation of egg-shaped digesters.	8/16/2023 (NTP) 9/16/2027 (Rehab)		Issued 75%

Inspection Date: September 25, 2025
 Site Name: Back River WWTP
 Facility Address: 8201 Eastern Ave, Baltimore, MD 21224

140-BR	Create and submit a Centrifuge Maintenance Plan to the Plaintiffs for review and the Department's approval.	12/15/2023	12/15/2023	Complete
141-BR	Complete repairs and installation of Centrifuge #4 to operate as designed.	7/31/2024	10/17/2024	Complete
142-BR	Submit Staffing Plan	12/31/2023	12/22/2023	Complete
143-BR	City to have, maintain, and make available to the Department the formal written operation and maintenance procedures (Back River WWTP SOP)	6/30/2024	6/28/2024	Complete
144-BR	City to submit a report that identifies what processes are currently automated and conduct a feasibility study for automation of additional processes, with a plan and schedule for future automation.	5/13/2024	5/13/2024	Complete
145-BR	Baltimore City shall have, maintain, and update a Computerized Maintenance Management System (CMMS) as a functional work order system to ensure that the plant and its equipment operate as designed.	Ongoing		Compliant
146-BR	Complete a condition assessment and inventory of existing assets in order to develop an asset management program. Complete development and begin implementation of asset management program within 90 days of assessment and inventory.	11/15/2024 (Assessment) 2/12/2025 (Commence Implementation)		100% Not Started

Opening Conference:

During the pre-conference for the inspection of Back River WWTP, we began looking at the overall status of the plant, including Capital Improvement Projects, areas of concern and non-compliance reports. Along with the Water and Science Administration, we were accompanied by the Land and Materials Administration and Air and Radiation Administration.

The status of Capital Improvement Projects (CIP) was discussed. The CIP for the Sand filters is reported to be in the design phase at the moment. The CIP for the Activated Sludge Plants (ASP) has been underway for some time, rehabilitating each section out of the three. It has been reported that ASP 2 and ASP 4 are complete, ASP 3 will be the last one, reported to be complete by next year. The CIP for the digesters is underway as well. There are two (2) out of six (6) inground digesters reported to be completed at the time of the inspection. Also it is reported that one of the egg shaped digesters could be back in service by the end of the year.

There have been concerns with the Denitrification filter being bypassed frequently since February of 2026 and up to April 2026. We asked about the use of the Equalization tanks (EQ) at Back River in response to the bypasses. Back River stated that they have been implementing more use of the EQ tanks for the high flows; these tanks will relieve pressure off the flow into the plant. They report that they have increased use since Late February/Early March.

Another concern is the increase in solid material at the site. Back River has had an influx of solids recently, along with the high flow events, resulting in the increased diversion of solids to the Storage Lagoons. It was reported that the company, Denali, will be providing more trucks to remove solids from the plant.

The Gravity Sludge Thickeners (GSTs) were also an area of concern made aware by the Water and Science Administration, in regards to odor release in the area. We noticed that there were covers implemented in the early 2000s and began to be removed in increments up to 2023, when the last covers were removed. Now they only have covers over the weirs of the GSTs. We asked why the covers were removed and if there is any wording in the sludge utilization permit about the GST covers. At the conference it was determined ultimately that there is no documented reason for the removal of the covers. Some have a theory that the hydrogen sulfide gas (H₂S) building up in the units could have been corroding the covers, which led to the removal, but it is not confirmed yet.

Non-compliances will be recorded in the records and review.

Site Walkthrough:

Headworks

Raw sewage enters the mechanical screen building where there are four (4) coarse screening units. Each unit is rated for flows up to 200 million gallons per day (MGD). The screens were paired with a flow channel, Coarse screen 1 and 2 are paired with channel 1, and Coarse screens 3 and 4 are paired with channel 2. In general, they rotate which channel and

Inspection Date: September 25, 2025
Site Name: Back River WWTP
Facility Address: 8201 Eastern Ave, Baltimore, MD 21224

coarse screening units are in operation every week. During the visit coarse screens 1 and 2, for channel 1, were being used for the daily flow. No violations were observed or reported in the Coarse screens.

Wastewater from coarse screening flows into two (2) 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. During periods of high flow, screened wastewater can be pumped to two (2) above ground storage tanks, or EQ 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. Both EQ tanks have a flushing system to wash out the tanks after use. During the visit two (2) Raw influent pumps were being used, pumps 1 and 4, with six (6) of them on standby. All pumps were reported in service.

The Fine Screening System features six (6) fine screening units rated for flows up to 100 MGD each. No issues were reported with the fine screening units. Back River uses the same fine screen numbers that correspond with the Raw Influent pumps that are running. Therefore two (2) screens were operating for the plant at the time of the visit, with the rest on standby.

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. Each grit channel and traveling bridge has an 80 MGD capacity. Under normal flow conditions, two grit channels are necessary for satisfactory grit removal. There are also four (4) Blowers for this section of the plant, one is run at a time. The traveling bridges move 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 classifiers for further dewatering. The classified grit is then dried and transported off-site for disposal. It was reported that the grit channels were all in service. No issues were reported with the grit removal system.

No issues were reported with the odor control system. All three systems were reported to be in service. Odors were still detectable in the headworks area of the plant.

Primary Settling

Wastewater from the Grit Removal System flows to a junction box then to the Primary Settling 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, PSTs 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:

- Units 3, 4, 5, 6, 8, 9 and 11 are in service.
- It was reported that PST 10 is out of service for maintenance
- Unit 7 is under maintenance for a valve issue
- Unit 2 is under maintenance
- Unit 1 is offline for maintenance, also a valve and stem issue.

PST 4 was reported to be in service. However, upon observation during the inspection, it was noticed that the scraper arm was not collecting the scum into the trough as intended for the unit. It is recommended that this issue is assessed and corrected to maintain quality control in the facilities operations.

Inspection Date: September 25, 2025
Site Name: Back River WWTP
Facility Address: 8201 Eastern Ave, Baltimore, MD 21224



Image 03: PST 4, with a buildup of scum on top of Settling tank

Sludge Handling / Processing

Observations made for the GST's; GST's 1, 3, 5, 6 and 7 are in service. GST 4 is reported to be in service but not operating currently. To process excess sludge in the contracted digester, GST 2 is used as a holding tank, receiving processed sludge from the DAFs, GBTs and GSTs, which will be distributed to the operating in-ground, High-Rate Digesters (HRDs). GST 8 is out of service for long-term maintenance.

The WWTP has four (4) Dissolved Air Flotation Units (DAFs) installed. A DAF unit is designed to remove TSS, FOG, and BOD from wastewater. DAFs are ideal for processing particles and floc that are of neutral density, slow-settling, or buoyant. The Capital Improvement Plan (CIP) was reported to be in effect as of now, this led to the report that there are no DAF units in online or in service, but one is being used as a holding tank.

There are six (6) High-Rated Digesters. These units would normally come into the treatment process after the Acid Phase Reactor (APR) and the egg-shaped digesters, but the egg-digesters are currently undergoing rehabilitation. The purpose of the digesters is to break down organic matter in the wastewater which creates biogas as a byproduct. This section is currently under a CIP as well, two of the six have been seeded with activated sludge, while the others are awaiting rehabilitation. It is expected that the biological processes for the seeded digesters will be fully operational this summer. It is further expected that providing fully digested sludge to Synagro will allow Synagro to restart the pelletizer, which will improve the overall solids removal from the plant.

This area of the plant had noticeable odors.



Image 04: GST 3.

Inspection Date: September 25, 2025
Site Name: Back River WWTP
Facility Address: 8201 Eastern Ave, Baltimore, MD 21224

Activated Sludge Plants (ASPs)

Effluent from 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.

It was reported during a previous site inspection that efforts were focused on maintaining ASPs 2 and 4. The capital improvement project (CIP) has ASP 3 completely offline for replacements and repairs. It was reported earlier in the inspection that this could be completed by next year.

During the inspection we walked along the side of ASP4 reactors and then the Adjacent Clarifiers. It was noticed that there was a buildup of wastewater or sludge from some of the reactor passes, getting outside of the passes themselves. It is recommended that these are sprayed to maintain accessibility to the units and for quality control for the facility's operations.

The reported status of the different ASP facilities at the time of the site inspection were as follows:

- ASP2: 6 Reactors, 11 out of 12 Secondary Clarifiers fully operational and in service
- ASP3: OFFLINE
- ASP4: 6 Reactors, 12 Secondary Clarifiers operational and in service



Image 05: Activated Sludge Plant 4, Pass with mixer

Denitrification Filters (DNFs)

Denitrification Filters facilitate a biological system with filter media and a carbon source, to reduce the nitrates to nitrogen gas in the effluent. At the DNF building, there are four filter quads with each quad containing thirteen (13) Tetra Denitrification Filters with a total of fifty-two (52) filters. It was reported that all fifty-two filters were in service at the time of the site inspection.

This area is the section where the frequent bypasses are usually initiated, during the inspection a demonstration was made, explaining exactly what happens when a bypass incident begins. There are millions of gallons of water needed to fill up all filters and then fill up and flow over the mud well, which is between the filters and the effluent channel. Once that happens then a partial bypass is initiated. A partial bypass is the term used, because the water still goes through the filters, but some particles may pass or get picked up from the mud well as it goes on to the next part of the process. No section of the treatment process is skipped and any particulates in the water that may get past the DNF facility are sent through the sand filters for removal.

No violations were reported or observed with the DNF facility at this time.

Inspection Date: September 25, 2025
Site Name: Back River WWTP
Facility Address: 8201 Eastern Ave, Baltimore, MD 21224

Sand Filters

The sand filters at the facility are used to polish the wastewater coming from the DNF building, with a fine media filtration system. There are forty-eight (48) total filters. A capital improvement project is currently finishing up in the design phase for replacing the media in fourteen (14) filters with a new media, "Diamond Cloth". The project is reported to be 100% in the design phase and will undergo bidding within the near future. Out of forty-eight (48) filters, eleven (11) were observed to be out of service. No issues were reported with the sand filter system.

Chlorination / De-chlorination Facility and Final Outfalls

I walked along the chlorine contact area, no cloudiness was observed in the contact chamber. The composite sampler for Outfall 001 was observed next. The temperature was observed to be about 5°C. Before the inspection, it was reported that Back River WWTP has begun distributing their effluent to Trade Point Atlantic, through Outfall 002 again. Since that is in place, the Composite sampler for Outfall 002 was observed as well. The temperature in the thermometer read 4.5°C.

The final effluent was then observed. There were no areas with persistent or discolored foam build up along the flow path of the discharging outfall. Effluent was observed to be clear of solids.



Image 06: Cascading steps with final effluent flow

Records Review:

I reviewed Log documents on site, at the Chlorination / De-chlorination Facility. I reviewed the chlorination kit calibration logs, the sample sheet which shows pH and Dissolved Oxygen calibration results and outfall sample results, and the daily operating logs for the three shifts at the facility. No violations were observed with the logbooks and calibrations.

Overall, records and review were conducted for compliance with the above referenced NPDES Discharge Permit. I reviewed NetDMR records since February of 2026. Also, the Daily Operating logs, Calibration logs, MOR, and noncompliance reports. No violations were observed with the Logs or MORs. Noncompliance reports were filed for effluent exceedances in the month of February 2026

Outfall 001A

February 2026

- Total residual Chlorine excursion
 - o Concentration:
 - Permit Limit: 0.1 mg/L Max.
 - Reported: 0.22 mg/L
- Total Phosphorus excursion
 - o Loading

Inspection Date: September 25, 2025
Site Name: Back River WWTP
Facility Address: 8201 Eastern Ave, Baltimore, MD 21224

- Permit Limit: 330 pounds per day (lbs/day)
- Reported: 390 pounds per day (lbs/day)

Outfall 002A

February 2026

- Total Phosphorus excursion
 - o Concentration
 - Permit Limit: 0.3 mg/l Wkly. Avg.
 - Reported: 0.85 mg/l Wkly. Avg.

As of November 2023, Baltimore City and the Department have signed a Consent Decree – Case No. 24-C-22-00386 which establishes specific goals and objectives related to the operations and maintenance of the Back River WWTP. As a result, maintenance items observed during the site inspection will be notated in the relevant areas above and not itemized in the Violation(s) section as in previous inspection reports.

Corrective Action(s):

On this day, the following conditions were observed with corrective actions needed immediately:

- 1) During the site visit, in the Activated Sludge Plant, it was observed that a buildup of waste material from the reactor was collecting on one of the platforms over an active passway. NPDES permit; III. General Conditions, B.3., “Facility Operation and Quality Control,” **Ensure that any build up on the units does not affect the operation of the treatment process, and if so ensure that maintenance is implemented to remove waste material.**

Violation(s):

With respect to the above MDE authorization, the following violations of Environment Article 9 by Back River WWTP were observed for the dates listed, with corrections needed:

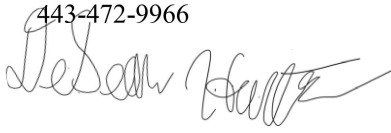
- 1) During the inspection PST 4 was observed to have a skimmer arm not operating as intended for a unit in service [Primary Settling]. NPDES permit; III. General Conditions, B.3., “Facility Operation and Quality Control,” requires the facility to be operated in a manner to minimize upsets. **Facilities should investigate the cause of the unit's malfunction and make the necessary actions or maintenance to keep the facilities treatment units in operation.**
- 2) In the month of February 2026, the facility had an exceedance of the maximum effluent limitation for the above listed parameters [Records Review]. NPDES permit; II. Special Conditions, A.1 “Effluent Limitations, Outfall 001A” states, “The quality of the effluent discharged by the facility at a discharge point location- 001A shall be limited at all times as shown...” **Investigate final effluent parameter results, if not done by this time, and make the necessary changes to keep effluent in compliance.**
- 3) In the month of February 2026, the facility had an exceedance of the maximum effluent limitation for the above listed parameters [Records Review]. NPDES permit; II. Special Conditions, A.2 “Effluent Limitations, Outfall 002A” states, “The quality of the effluent discharged by the facility at a discharge point location- 002A shall be limited at all times as shown...” **Investigate final effluent parameter results, if not done by this time, and make the necessary changes to keep effluent in compliance**
- 4) Facility operations caused upsets in the final effluent, exceedances in February 2026 [Records Review]. NPDES permit; III. General Conditions, B.3., “Facility Operation and Quality Control,” requires the facility to be operated in a manner to minimize upsets and unauthorized discharges. **Investigate effluent limitation exceedances and make the necessary changes to minimize upsets to the effluent water quality.**

A follow-up inspection will be conducted.

Inspection Date: September 25, 2025
Site Name: Back River WWTP
Facility Address: 8201 Eastern Ave, Baltimore, MD 21224

Inspector: _____ 05/22/26 Received by: _____

DeSean Hunter /Date
desean.hunter@maryland.gov
443-472-9966



Signature/Date

Print Name

**BACK RIVER WASTEWATER TREATMENT PLANT (BACK RIVER)
8201 EASTERN AVENUE
DUNDALK, MARYLAND 21224
BALTIMORE COUNTY (AREA III)**

Facility Contacts: Thomas George (Engineer II) – Permitting and Compliance
Timothy Simmons (Operations Engineer) – Operations and Odor Control
Will Shreve (Plant Manager) – Responsible Official
Inspector: Nicholas Bratton – Maryland Department of the Environment (MDE)
Premises ID: 005-0812
AI #: 8449
Inspection Date: May 15, 2026
Report Date: June 11, 2026

EXECUTIVE SUMMARY

I arrived at Back River (facility) and met with Will Shreve, Tim Simmons, and other stakeholders in the administration building conference room, where we held a pre-inspection meeting and discussed the expectations for the joint inspection. I was joined by Chris Hoagland and Hannah Ashenafi of the MDE Air and Radiation Administration (ARA). We accompanied inspectors and leadership from the MDE Water and Science Administration (WSA) as well as the MDE Land and Materials Administration (LMA). The primary purpose of the inspection was to fulfill a periodic announced inspection requirement for WSA, but LMA and ARA representatives were invited to join as each administration has overlapping concerns regarding odors. The ARA goal was to identify or confirm suspected odor sources, inspect the odor control systems currently in place, and to identify potential areas of improvement for odor control.

After the pre-inspection meeting, we took a tour of the entire facility to review the waste treatment process from influent to effluent. Brief visible emissions evaluations were performed on operational fuel burning units, and no visible emissions were observed. After the Back River tour, we inspected the Synagro facility in search of additional potential odor sources. A detailed inspection walkthrough is provided below.

ARA did not identify any permit violations during the inspection. However, odors were observed at several stages of the process, and hydrogen sulfide (H₂S) monitoring values in the Headworks BioAir odor scrubbers were indicating failures of the scrubber equipment, the sensors, or both.

ARA recommends that Baltimore City implement the following measures to improve odor control:

1. Complete the ongoing assessment and tune-up of the Headworks odor scrubbers and provide the BioAir evaluation to MDE upon completion; and
2. Re-establish the odor control practices previously employed for many of the open tanks, including:
 - a. Covering the Gravity Sludge Thickeners and Sludge Holding Tanks, and ventilating them through odor scrubbers; and
 - b. Covering, at minimum, the weirs of the Primary Settling Tanks with ventilation through odor scrubbers.
3. Review the facility's existing odor control systems and Standard Operating Procedures (SOPs), identify any operational changes needed, and provide to MDE upon completion.

FACILITY OVERVIEW

Back River Wastewater Treatment Plant (Back River) is a wastewater treatment facility owned and operated by Baltimore City. Back River is rated to process up to 180 million gallons per day (MGD), but typically treats approximately 150 MGD. The influent treated at Back River is predominantly domestic wastewater, and the facility produces approximately 95 dry tons of biosolids per day. During normal operation, the biosolids are anaerobically digested, dewatered, and then either composted or heat-dried and pelletized. The composting and pelletizing facilities are separate, private operations. The digestion and onsite drying and pelletizing processes are not currently operational.

The treatment units include screening, grit removal, primary sedimentation, secondary treatment by activated sludge, sand filtration, disinfection by addition of hypochlorous acid, dichlorination with sodium bisulfite, and reaeration prior to discharge to the Back River waterbody. Nutrients in the wastewater are controlled by a combination of biological nitrogen removal and chemical precipitation for phosphorous removal.

Back River has a number of stationary air pollution sources which consist of flares, boilers, space heaters, gasoline storage tanks, odor scrubbers, and digester gas-fired engine powered generators. The facility is subject to the Title V Operating Permit Program (COMAR 26.11.03). A Full Compliance Evaluation (FCE) was last conducted for the facility on December 23, 2025. No violations were identified during the most recent FCE.

The facility's current State Permit to Operate lists the odor control equipment in Table 1 below. These scrubbers have all been removed from service, though exact dates of removal are unknown. The ARA Permits Program is working with the facility to update the equipment listed in the renewal permit.

Table 1 – State-Only Registered Equipment

MDE Registration Number	Emissions Unit Name and Description	Date of Installation
005-0812-9-0105M	Six (6) scrubbers: four (4) single stage wet scrubbers to control odors from the Influent Conduit Sludge Loading Facility, Influent Meter Flumes, Dissolved Air Floatation Thickening (DAFT) Units 1 & 2, and DAFT units 3 & 4 and two (2) two-stage wet scrubbers, which control odors from the Head Chamber, Primary Settling Tank (PST) #2, and Gravity Sludge Thickeners (GST).	1984, 1990, 1992, 1992, 1991, 1998, respectively
005-0812-9-0105	One (1) two-stage packed tower scrubber to control hydrogen sulfide gas from Gravity Belt Thickener.	May 1996
005-0812-9-1036	Three (3) two-stage scrubbers to control hydrogen sulfide gas from Primary Settling Tanks.	January 1998

PRE-INSPECTION MEETING

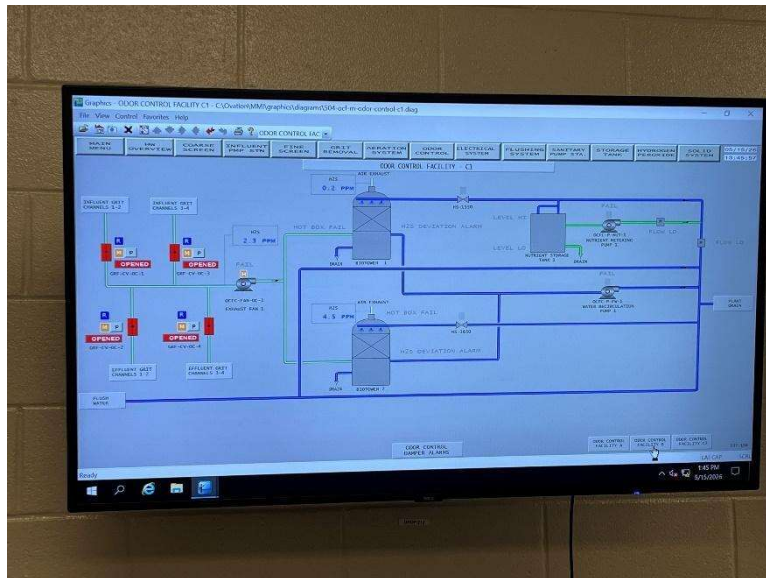
During the pre-inspection meeting, Back River personnel indicated that the use of the two eighteen million gallon equalization tanks has increased in recent months, starting in late February. Additionally, the sludge hauling company has increased the shipping rate from four to six trucks up to six to eight trucks per day, with a maximum of eleven trucks per day. Increasing the use of the equalization tanks and increasing sludge removal both reduce the risk of bypass events, but could increase the risk of odor events. Sludge not taken by the contractor (Denali) is dumped in the lagoon for storage. There is a plan to remove the solids from the lagoon in July 2026, but is pending final approval. There is a project to install two new sludge tanks associated with the dissolved air floatation thickeners (DAFT). Back River is implementing a new system for rotating and cleaning the PSTs to increase the cleaning frequency.

INSPECTION DETAILS

The inspection started at Headworks, specifically in the influent pump station. Wastewater influent is pumped into the facility here. At this point, the wastewater is completely untreated except for injection of hydrogen peroxide and a proprietary organic catalyst known as STX. The STX and hydrogen peroxide generates a reduction/oxidation (redox) reaction, removing sulfide and other sulfonated organic compounds from the influent. The pump station is maintained under negative pressure, and room air is drawn out of the building through the exhaust fans on the ceiling and treated through the BioAir odor control system. Also located in this building is the Headworks control room, where ProStart, a contractor for Baltimore City, manages Headworks operations and the odor control system. Refer to the photo of the monitor screen for odor control facility C1, which displayed a higher concentration of H_2S exiting one unit (4.5 ppm) than the concentration entering the unit (2.3 ppm). A control operator from ProStart stated that they had recently identified an issue with the H_2S sensors in the BioAir filters and that they were planning to replace all of the sensors. Minor odors were detected in this building, but nothing particularly foul or offensive. Minor odors were also detected outside of this building but the odors dissipated quickly.



Headworks Pump Station

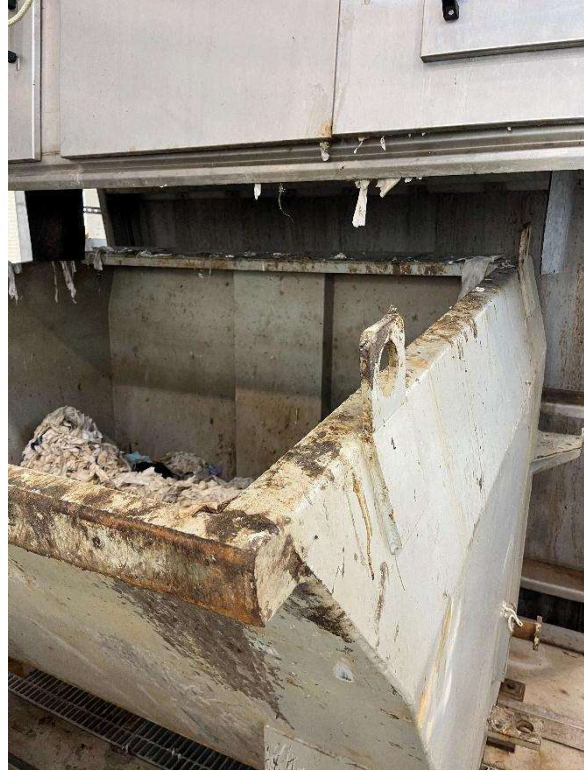


Sample Odor Control Monitor Screen (C1)



BioAir Odor Control Scrubbers

Next, the coarse screen building was inspected. The coarse screen building is also kept under negative pressure and room air is treated through the odor control system. The coarse screen is in place to remove hygiene products, wipes, and other large objects from the wastewater to avoid damaging equipment and to maintain flow throughout the process. The dumpsters with filtered material are collected regularly, waste trucks set up at the loading dock are filled with material from the dumpsters as needed; the doors are only open for a short period of time before the building returns to negative pressure. Noticeable odors were detected in this building, but not outside. It appears that the odors from this building were effectively controlled at the time of this inspection.



Coarse Screen Unit and Associated Dumpster



Coarse Screen Waste Loading Dock

After coarse screening is the fine screen building, which is also kept under negative pressure and room air is treated through the odor control system. The air pressure in this building was noticeably closer to atmospheric pressure as compared to the other Headworks buildings. Fine screen serves the same purpose as coarse screen, but for smaller materials. These waste materials are removed in a similar fashion to coarse screen but less frequently and on a smaller scale. Very strong odors were detected inside this building, and minor odors were noticed just outside of the building, but dissipated quickly.



Fine Screen Facility



Internal Fine Screen

Next is the grit removal facility. Grit removal is the final physical filtering step in the Headworks process, and it removes smaller particles like sand, eggshells, metal fragments, pharmaceuticals, and other fine particles that settle out of the wastewater. Unlike the other two buildings, the grit removal facility is open to the atmosphere, so no odor controls are in place for this building. Plant staff stated that this is common practice for a wastewater treatment plant, as there is no way to safely enclose a grit removal facility. The grit removal facility uses cyclones to remove small particles, and in the process also releases several naturally occurring gases present in the wastewater such as hydrogen sulfide (H_2S), methane (CH_4), and volatile organic compounds (VOCs). If these vapors are allowed to concentrate in an enclosed space, there is significant risk of explosion. Additionally, H_2S is highly corrosive so the possibility of concentrating H_2S inside a building risks significant corrosion to infrastructure. Because the grit removal building is open to the atmosphere, it is a likely source of H_2S and odors at the facility. A small amount of wastewater as well as the grit and gases that are removed from the wastewater are exposed at this stage. The bulk of the wastewater passes through internally. Strong odors were detected in the area near the grit belt, but only minor odors were detected in the wastewater return area or in the area surrounding the grit removal building.



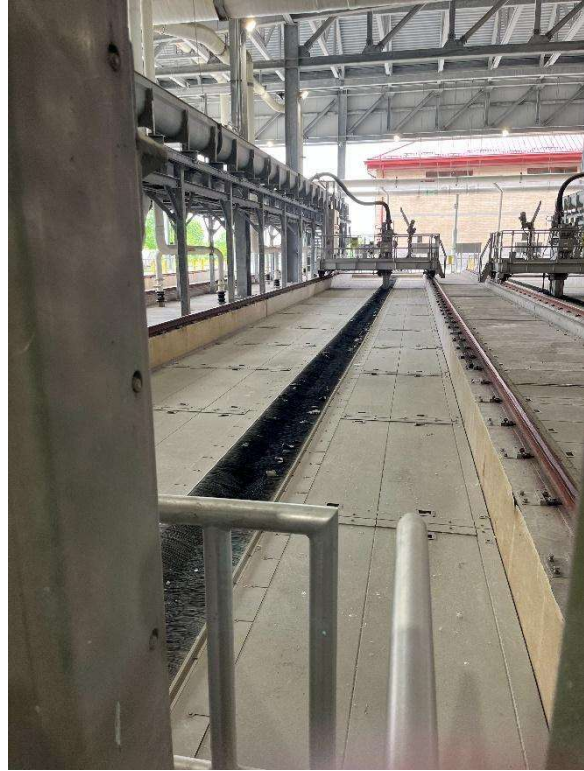
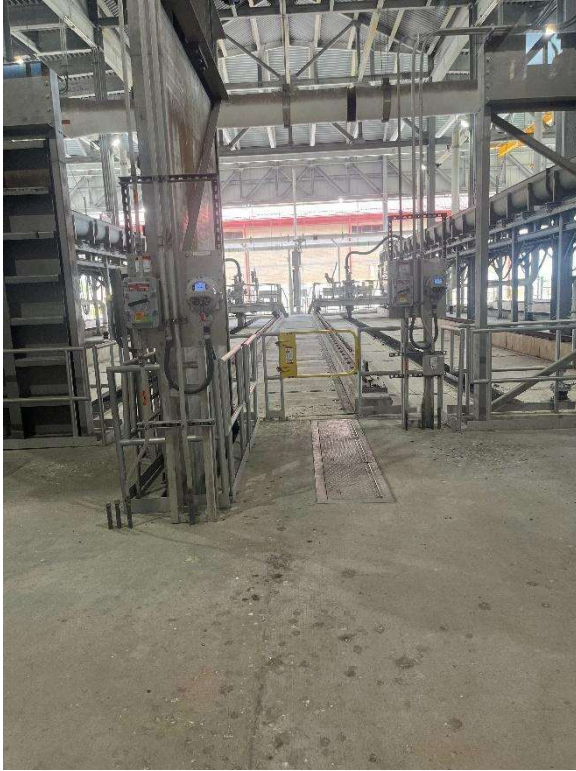
Grit Removal Facility Grit Belt



Grit Removal Cyclone



Grit Dumpster



Grit Removal Wastewater Return

After the Headworks facility, we inspected the various tanks throughout the facility, starting with the primary settling tanks (PSTs). The PSTs are suspected odor sources based on the H_2S pathways determined using the onsite monitoring system. Some odors were noticeable in this area, but no foul or sewage odors were detected. The PSTs have a weir system that collects and conveys surface wastewater and floating materials away from the tank for the next phase of the process. When the odor control systems were active, the PST weirs were enclosed and under negative pressure, and the air in this weir headspace was drawn out to the old odor control scrubbers. Note that the scrubbers in the current permit are not the same as the BioAir scrubbers currently operational at Headworks. When functioning properly, solids and other heavy materials should sink to the bottom of the PST, where the sludge can be pumped out to another phase of the process. The PSTs are cone-shaped, forcing solids to the bottom center of the tank near the pump. During normal operation, these solids should be completely covered by the water and there should be no odor concerns from the solids. Some of the PSTs had floating materials, primarily fats, oils, and greases (FOG) that are present in wastewater. Some PSTs were not currently in service, but the in-service PSTs all appeared to be functioning properly. Refer to the WSA report for additional information regarding the status and functionality of each PST.



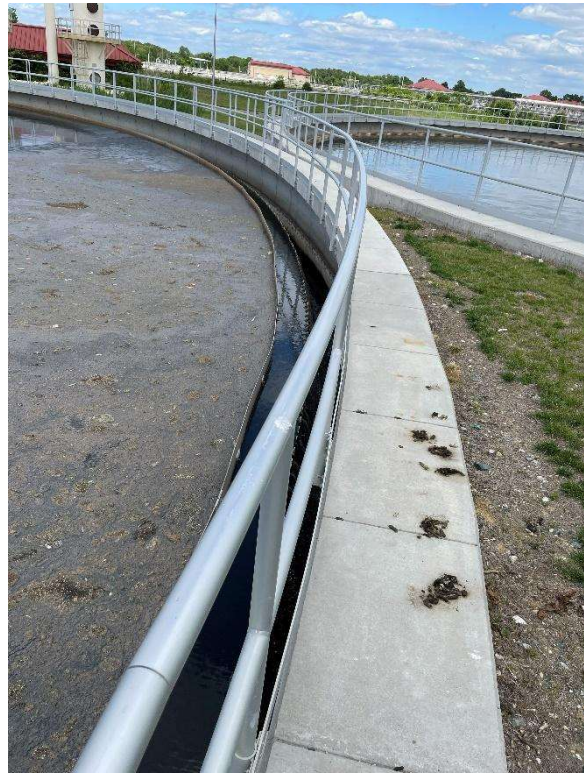
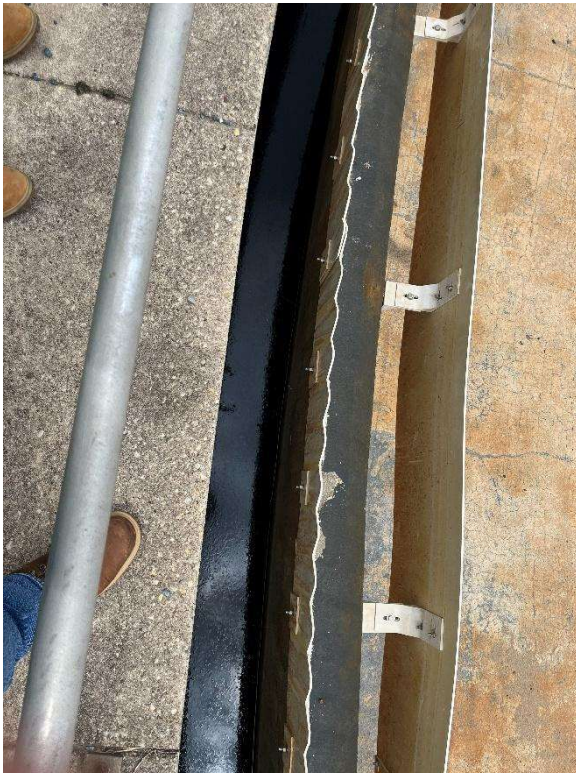
Out of Service PST



Active PST



Active PST with FOG on Surface, Odor Control System in Background (Out of Service)



Open Weir System on PST



PST Odor Control System (Out of Service)

Next, the six gravity sludge thickeners (GSTs) and two thickened sludge holding tanks (TSHTs) were inspected. The GSTs thicken waste activated sludge and primary sludge, which then get mixed in the TSHTs. This area also contains the gravity belt thickeners (GBTs) and dissolved air floatation thickeners (DAFT). Typically, sludge is then moved to acid phase reactors then the digesters in the next phase of the process. Currently, minimal digestion is taking place at Back River, so there is a significantly higher rate of sludge production. The in-ground high-rate digesters (HRDs) and egg-shaped digesters are all out of service except for two operating HRDs (#1 and #4) that are producing a small amount of digester gas. The two HRDs were recently “seeded” with sludge to begin the digestion process. Plant staff estimated that it would take an additional 60 days before the two HRDs are fully digesting sludge. The facility expects that the other four HRDs will be commissioned by the end of summer 2026. Additionally, the facility expects to return one acid-phase reactor and one egg-shaped digester to service by the end of the year. At the time of this inspection, two GSTs are used for sludge storage, four or five are in service, one GST is online and empty for redundancy, and one TSHT is operational. The GSTs are uncovered and open to the atmosphere, but the weirs (where aeration and disruption occurs) are covered and vented away from the area. The TSHTs have no covers over the weirs. The GSTs and TSHTs used to be completely covered, but the covers were removed. The odor control system associated with the GSTs fell into disrepair, and the accumulating H_2S caused significant corrosion to the metal covers. Currently, fans and deodorant are used on the TSHTs to minimize odors. This area is a highly likely odor source. Strong sewage and earthy odors were detected in this area, but dissipated quickly at a distance.



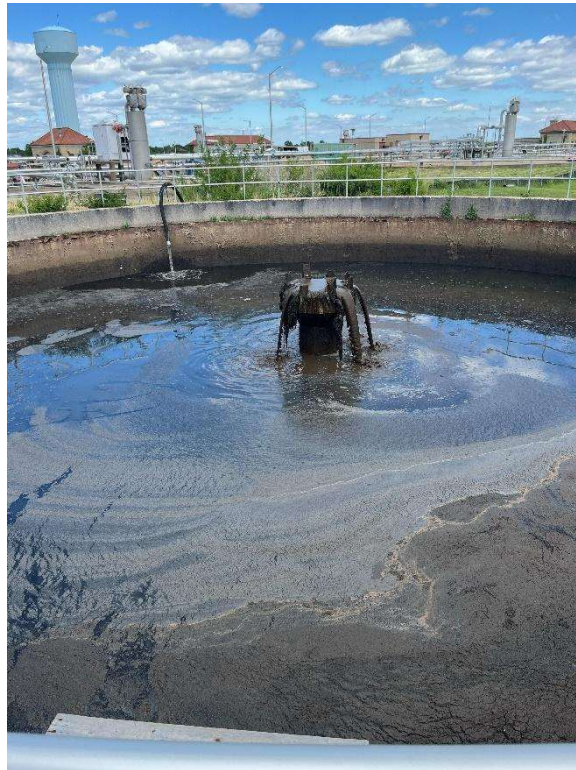
GST Odor Control System (Out of Service)



Covered Weir with Fresh Air Intake



Active GST



Active TSHT

Following the sludge processing area, the sludge drying and holding areas were inspected. This next phase of the inspection consisted of the sludge drying pad and the storage lagoon. As indicated previously, the

sludge storage lagoon is currently holding the sludge that cannot be processed or hauled away by Denali. The sludge is dewatered at the Synagro plant (through centrifuges), but it is not currently being dried due to contract disputes and issues with the sludge quality. Odors in the sludge storage area are pungent and foul, and are more earthy than other odors around the facility. There is still a hint of sewage odors, but it is mostly organic and earthy. The sludge drying pad (when in use) and the sludge storage lagoons are highly likely odor sources at the facility.



Sludge Storage Lagoon – West Side



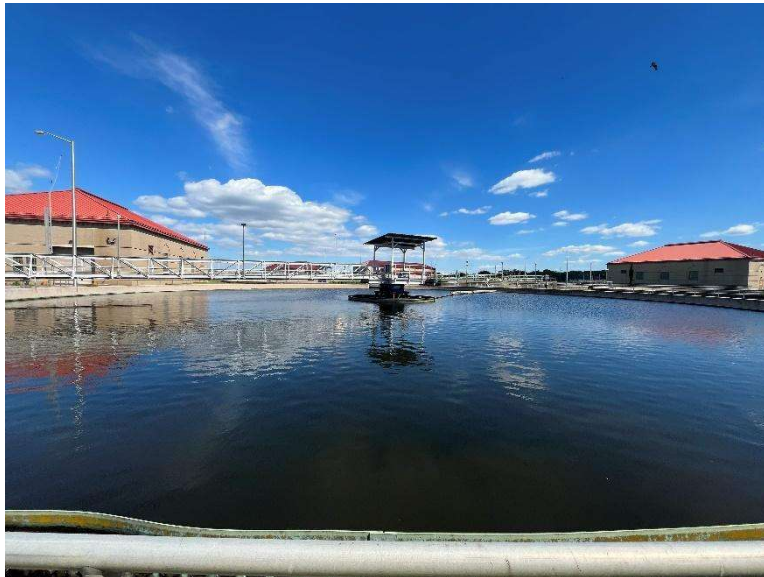
Sludge Storage Lagoon – East Side

The next area inspected consisted of the activated sludge reactors and secondary clarifiers. The activated sludge reactors use microorganisms to break down and remove organic matter from the primary treated water. The influent to this section is the surface water from the PSTs (primary sludge was removed), so there are less solids. The microorganisms are injected into the water with air to allow for aerobic digestion

to take place, the organisms remove nutrients from the water such as nitrogen, nitrates , nitrites, ammonia, orthophosphate, and phosphorus. The effluent from the activated sludge reactors goes to the secondary clarifiers. The solids removed from this stage are known collectively as activated sludge, and are removed through settling the in the secondary clarifiers. No odors were detected in this area.



Activated Sludge Reactor



Secondary Clarifier



Secondary Clarifier Weir System

The next stage of the inspection was the denitrification facility (DNF). Similar to Headworks, this facility is operated by ProStart. Residual nitrates and nitrites not removed by the activated sludge reactors are reduced in the DNF, which uses enhanced denitrifying bacteria on filters. The process uses methanol to aid decomposition of nitrogen and phosphorus under anaerobic conditions. There are four quads with thirteen filters each, and the facility does not use any weirs; water flows freely through the filters. Waste gases are emitted through the water, primarily nitrogen gas. There were no odors detected in this area.

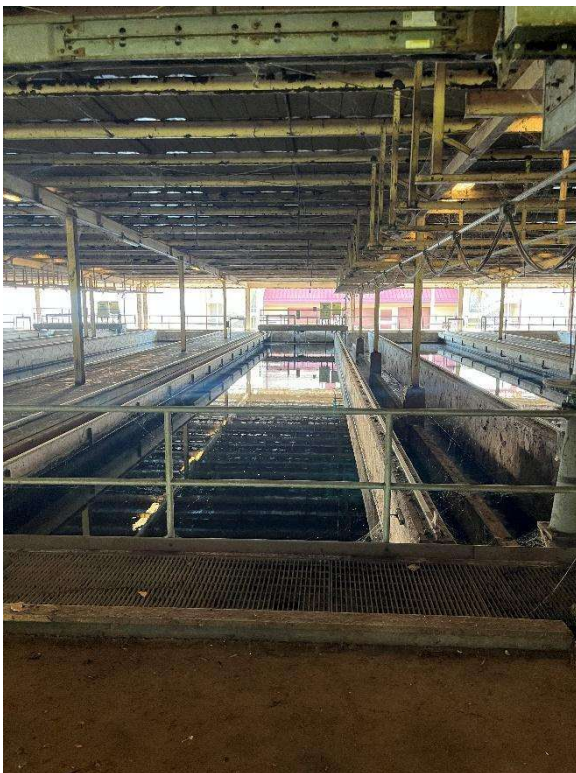


DNF Quad 1



DNF Quad 1 Influent

The next areas inspected were the sand filters and disinfection stages. The sand filters process the water further by capturing any remaining suspended particles and reduces turbidity levels before the disinfection phase. In the disinfection phase, sodium hypochlorite (bleach) is added to the water to disinfect and eliminate bacteria and viruses. The bleach is introduced in an amount relative to the flow rate of water in order to achieve the appropriate concentration and contact time to disinfect. The water is then neutralized with sodium bisulfate to dechlorinate for discharge. The water is disturbed after this step to further reduce chlorine levels and add oxygen before discharge. No odors were detected in any of these areas.



Sand Filter Facility



Chlorination/Dechlorination Effluent Aeration



Outfall 001 Sign and Bypass Light Description



Outfall 001 White Bypass Light

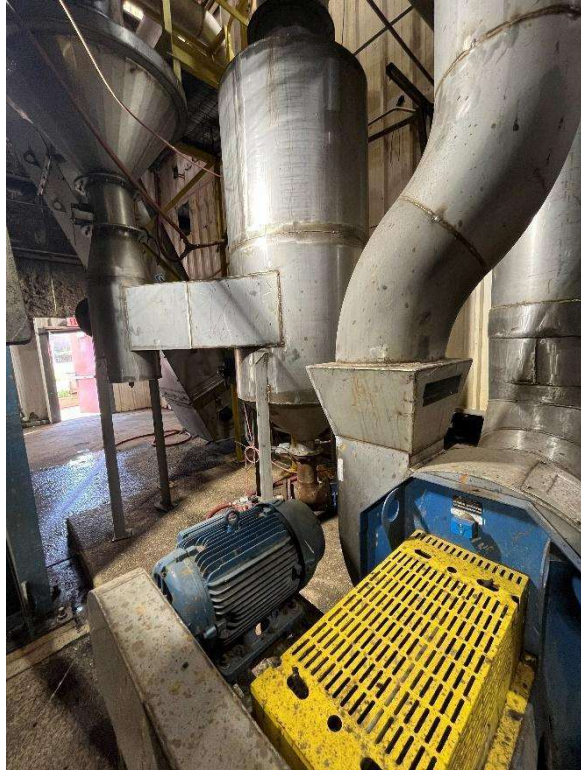
The final area inspected was the Synagro facility. Waste sludge (mostly secondary sludge) is dewatered using the centrifuges at the facility. As previously stated, there are sludge dryers at the facility, but they are not currently operational due to contract disputes and issues with the sludge quality. There have been multiple fires at the Synagro plant over the last year, possibly due to VOCs trapped in the sludge igniting in the dryers. The dewatered sludge is hauled offsite by Synagro and Denali. Approximately ten to twenty light trucks in total are shipped offsite each day. Sludge that is not hauled offsite is taken to the sludge storage lagoon via a Baltimore City dump truck. According to the operator onsite, the Synagro facility is equipped with a wet scrubber for odor control in the building. The building is not kept under negative pressure, but the exhaust from the building is vented through the scrubbers. There was a strong, earthy odor present in the building, but only minor odors were detected outside of the building.



Synagro Centrifuges



Synagro Exhaust Control



Synagro Wet Scrubber System



Dewatered Sludge Truck Loading



Excess Waste Dumpster Discharge



Excess Waste Dumpster

Back River WWTP Inspection

Land and Materials Administration-Resource Management Program, Biosolids Division

Baltimore City has provided updates and schedules on the following capital improvement projects.

Sludge Drying System The sludge drying system is not currently operating. The City is hoping to get the pelletizers back up and running this summer. This will be contingent on the anaerobic digesters coming back online. Sludge is being dewatered using centrifuges.

Rehabilitation of Activated Plant #3 expected to be complete design in quarter 1 of 2027 and to be ready for construction advertisement in quarter 4 of 2027.

Development of the 2 new sludge tanks Design documents to be completed 100% by end of 2026.

Rehabilitation of 2 DAF tanks Design documents to be completed 100% by end of 2026.



Sludge Storage Lagoons

There are 2 lagoons used for sewage sludge storage. Both lagoons contain sewage sludge, estimated to be roughly 22,300 wet tons which equates to 4,500 dry tons as of June 9, 2026. Both lagoons contain sump pumps to collect waste water the drains off the solid sludge or from rain. The waste water is pumped into a collection system that flows back the treatment process through the reactors and secondary clarifiers. The lagoon banks were overgrown with vegetation. The facility will check the lining for damage. The facility is awaiting a contract to proceed with the sludge removal process. Their plan is to start removing dewatered sewage sludge from the lagoons by July 1, 2026. It is expected to take 90 days after a contract is in place to remove all of the sewage sludge. New sewage sludge going into the lagoons has more or less stopped since Denali has been able to increase its daily truck loads to 6 to 8 loads.

