Maryland Department of Environment
Water and Science Administration
Compliance Program
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Inspector: Christopher Lepadatu
AI ID: 3076

Site Name: Patapsco WWTP
Facility Address: 3501 Asiatic Ave, Curtis Bay, MD 21226
County: Baltimore City County

Start Date/Time: July 26, 2023 11:00 AM
End Date /Time: July 26, 2023 03:30 PM

Media Type(s): NPDES Industrial Major Surface Water

Contact(s): Andrea Buie-Branam – Environmental Compliance Manager of Baltimore City
Eric Johnson – Wastewater Operations Supervisor of Patapsco WWTP
Anthony Marrow – Operation Supervisor II of Patapsco WWTP
Kevin McFadden – Operation Supervisor II of Patapsco WWTP
Wendy Huang – MDE Environmental Compliance Specialist
Peter Gatesman – MDE Environmental Compliance Specialist

NPDES Industrial Major Surface Water

Permit / Approval Numbers: 15DP0580
NPDES Numbers: MD0021601
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: Clear, Good

Inspection Findings:

An inspection was conducted on this day at the Patapsco Wastewater Treatment Plant (WWTP). The receiving water body is the Patapsco River and is designated as Use II waters protected for estuarine and marine aquatic life. MDE representatives met with the above-listed contacts during the time of this inspection. The Patapsco WWTP features advanced treatment processes to achieve enhanced nutrient removal (ENR), chlorination and de-chlorination. The Patapsco WWTP is rated to treat an average daily flow of up to 73 MGD.

The treatment system includes preliminary treatment (grit removal and fine screening), primary treatment (primary settling tanks), secondary treatment (biological nutrient removal activated sludge process and additional filter nitrification), tertiary treatment (denitrification filters for enhanced nutrient removal) and disinfection (chlorination).

Primary sludge (PS) and waste activated sludge (WAS) produced by the primary treatment and secondary treatment process is thickened on-site. The solids thickening process consists of gravity sludge thickeners and dissolved air flotation tanks. The thickened sludge is stored in a sludge blend tank and then conveyed to the drying facility on-site which is operated by a third-party, Synagro.

On this day, Neal Jackson – Plant Manager of Patapsco WWTP, and Chris Saunders – Senior Associate of Hazen & Sawyers, were not at the plant and were unable to attend the site inspection. Neal Jackson was present via phone during the post-inspection conference. Andrea Buie-Branam accompanied MDE inspectors through the site with Anthony Marrow guiding us through the preliminary and primary treatment systems, and Kevin McFadden guiding us through the secondary, tertiary, and disinfection systems.

Preliminary Treatment:

The Industrial Plant Influent (IPI) contains two (2) fine screens and four (4) pumps for conveying flow to the primary clarifiers. The IPI building has approximately 2-3 MGD capacity for industrial influent. Bar screen #1 was off during the time of this inspection. Eric Johnson had reported during the pre-site walk briefing that the two (2) fine screens in the IPI building receive flow by means of a diverter gate. The gate is not functional at this time and needs maintenance (needs oiled and greased – per Neal Jackson) to allow flow to be diverted to Bar screen #1. Screened material is discharged into rolling dumpsters, one for each fine screen. The dumpsters rest in a concrete channel where they can be winched to the exterior of the IPI building for waste collection.

Bar screen #2 was observed as having greasy rags and BAF filter media lying on one side and clinging to the metal cladding of the bar screen. Greasy rags and BAF filter media were also observed in the concrete channel in the interior of the IPI building as well as the exterior of the IPI building particularly on the west side of the building. **See Violation #1.**

The Fine Screen facility contains eight (8) fine screens divided into two sets of four. Each set of screens has a conveyor and compactor associated with it to carry screen material and compact it before discharging to waste dumpsters. At the time of the site visit, it was reported that all eight (8) fine screens are operational. Two (2) fine screens (#1 and #6) were not on during the site visit, six (6) were in operation. Eric Johnson reported that repairs are planned for the Fine Screen facility which include new compactors for both sides.

Fats, oils, and grease (FOG) is an ongoing issue for the facility. Eric Johnson reported that the facility is hit with significant FOG influent at random times during the week. He stated that this intermittent loading of FOG overwhelms the bar screens resulting in the presence of greasy rags and oily residue present on the conveyor belt support structures and surrounding area, including the floors. During the site inspection, greasy rags and oily residue were observed on the conveyor belt support structures along with BAF filter media. The floors near the Fine Screen conveyors were slick with an oily residue. BAF media, rags, and grease were observed in the steel channels embedded in the concrete in the areas where the compactors discharge to the waste dumpsters in the interior and at the exterior of the building. Additionally, grease, rags, and BAF media were observed at the south side of the building on the concrete and asphalt surface away from the dumpster channels and outside of the building cover. **See Violation #2.**

Transfer Station:

The transfer station has a roof, walls on three sides, and trench drains on the ground. Grease and grit from the preliminary treatment systems (screening) are stored in the transfer station. Liquid that drains into the trench drains of the transfer station is pumped back into the gravity sludge thickeners (GSTs). Dried grit will be taken to the Quarantine Road Municipal Landfill for disposal.

On this day, BAF media was observed in the grates of the trench drains in the transfer station. Grease tracks and some media were also observed outside of the transfer station on the asphalt surface. **See Violation #2.**

Gravity Sludge Thickeners (GSTs):

There are three (3) 65-ft diameter gravity sludge thickeners (GSTs) in the sludge handling area of the plant. The GSTs are numbered #1, #2, and #4. GSTs #1 and #2 are built on grade and GST #4 is elevated above grade. The skimming arms of GST #1 and #2 are missing significant portions of the rubber flaps which should extend down to the liquid surface to effectively remove surface scum. Staff currently spray water on the surface of GST #1 and #2 in order to manually remove surface scum. GST #4 is operational and serves as a backup to GST #1 and #2. Eric Johnson reported that repairs to GST #1 and #2 are planned and a vendor has been selected to complete the repairs. **See Violation #3.**

At the time of the site inspection, GSTs #1 and #2 had an accumulation of sludge at the surface of the GSTs and outside of the V-notch weirs. Anthony Marrow stated that Synagro has equipment issues and is down often causing delays in sludge processing and backing up the system.

Primary Treatment:

The primary clarifiers consist of six (6) tanks, each equipped with a chain and flight sludge conveyance mechanism, scum logs, and screw sludge collector.

At the time of the site inspection, primary clarifiers #2, #3, and #4 were in service. Primary clarifiers #1, #5, and #6 are out for repairs. Primary clarifier #6 was observed as having broken flights. Eric Johnson reported that a contractor has been selected to make necessary repairs including repairs to scum troughs and actuators on primary clarifiers #1, #5, and #6. Clarifiers #2, #3, and #4 were observed as having an accumulation of scum and debris on the surface including some visible BAF filter media.

High Purity Oxygen Aeration Reactors and Liquid Oxygen Plant (LOX Plant):

The LOX Plant converts air to 95% liquid oxygen. Liquid oxygen is used for the pure oxygen reactors for BOD removal. The main system at the LOX Plant is currently running. Eric Johnson stated that routine maintenance is planned for the back-up compressor at the LOX Plant.

The facility has six (6) pure oxygen reactors. The inside of each reactor cannot be observed. Kevin McFadden reported that reactors #2, #3, #5, and #6 are running at the time of the inspection. Four (4) reactors are necessary for design average daily flow. Reactors #1 and #4 are not running. Reactor #1 is functional, but in standby as backup. Reactor #4 is out for repairs to its aerators and purge blower.

Between the High Purity Oxygen Aeration Reactors and Secondary Treatment Clarifier #3, adsorbent material and an oil stain was observed on an asphalt-paved drive appearing to originate at a United Rental temporary pump which is being used to convey backwash water from Clarifier #3 to the PST influent (see "Secondary Treatment:" section below). The adsorbent material and oil stain continued south down the drive away from the temporary pump for approximately 60 feet. Eric Johnson stated that the spill was the result of United Rental changing the temporary pump setup. He stated that, originally, there was a temporary pump installed which required an additional piece of equipment to prime the pump. The replacement temporary pump is self-priming. He stated that United Rental spilled approximately 1 gallon of diesel fuel from the temporary fuel tank while changing out the equipment. I asked him to follow-up with United Rental and confirm the reported volume of fuel spilled during the equipment change.

Secondary Treatment:

The facility is equipped with eight (8) secondary clarifiers. Inspection of all eight (8) clarifiers (#1-4, 5A, 5B, 6A, and 6B) was conducted on this day.

The scum trough for secondary clarifier #1 overflows to a sunken concrete-lined overflow pit adjacent to the clarifier. BAF media was observed in the basin of the overflow pit. BAF filter media was also observed on the ground around the entrance stairs to the clarifier access walkway. **See Violation #4.** The surface of secondary clarifier #1 was being sprayed with water to breakup surface scum. The scum trough for secondary clarifier #1 was observed to be clear and functional. Vegetation and BAF filter media was observed adjacent to the scum trough. **See Violation #5.**

Secondary clarifier #3 is not operational and is being used as a mudwell to contain backwash water from the denitrification filters and biological aeration filters (BAFs). Wastewater from secondary clarifier #3 flows back to the PST influent.

Secondary clarifier #2 is not operational and is empty. A contractor will be cleaning out the flow tubes and replacing the skimmers before clarifier #2 is put back into service.

Secondary clarifier #4 was observed in operation. The surface of secondary clarifier #4 was being sprayed with water to breakup surface scum. The scum trough for secondary clarifier #4 was observed to be clogged and not functional. Additionally, one of the skimmer arms of clarifier #4 is missing a section of its metal frame which is undermining its ability to skim and collect surface scum. **See Violation #5.**

Secondary clarifier #5b was observed in operation with water being applied to the surface to breakup surface scum. One arm of the skimmer for clarifier #5b was observed to be bent and nearly below the surface at the end. It does not appear to reach as far to the outside edge as it should and there is a section where surface scum is able to pass through and not be collected. Additionally, the scum trough for clarifier #5b was observed to be clogged. **See Violation #5.**

Secondary clarifier #6b was observed to be in operation with water being applied to the surface to breakup surface scum. One arm of the skimmer for clarifier #6b appears to be bent near the middle causing the top edge to drift below the surface allowing scum to pass over. The other arm of the skimmer is bent near the end causing the end of the skimmer to dip below the surface and allow scum to pass over and not be collected. The scum trough for clarifier #6b was observed to be clear. **See Violation #5.**

Secondary clarifier #6a was observed to be in operation with water being applied to the surface to breakup surface scum. One arm of the skimmer for clarifier #6a was observed to be bent near the end causing the end of the skimmer to dip below the surface and allow scum to pass over and not be collected. The scum trough for clarifier #6a was observed to be clear. Vegetation was observed near the scum trough at clarifier #6a. **See Violation #5.**

Secondary clarifier #5a was observed to be in operation with water being applied to the surface to breakup surface scum. Both arms of the skimmer on clarifier #5a appear to be functional. The scum trough for clarifier #5a was observed to be clear. An accumulation of trash and debris was observed near the scum trough of clarifier #5a on the other side of the first metal weir, before the v-notch weirs. **See Violation #5.**

<u>BAFs and Mud Wells:</u>

Inside the Biological Aeration Filter (BAF) facility there are 22 filter cells and associated blowers. Fourteen (14) filter cells are necessary for design average daily flow. All BAF cells were active at the time of the site inspection. No issues were reported with the BAF filter system. The effluent monitoring device was observed as having an ammonia concentration of 0.7 mg/L and a phosphate concentration of 0.27 mg/L.

Mud wells #1 and #2 were inspected. No foam was observed in either mud well. Solids were observed on the surface of both mud wells and appeared to consist primarily of BAF media. The walls and internal structure of the mud wells appears to have dried BAF media stuck to the surface in some areas.

<u>Denitrification Filters:</u>

The denitrification filter (DNF) facility contains 34 gravity filters and support systems such as backwash pumps and blowers. Mr. Bernard Williams provided the operation status of all DNF filters during the time of the inspection. 28 filters are in service while filters #1, #6, #20, #27, #33, and #34 are out of service for mechanical repairs. 24 filters are necessary for design average daily flow. Water surface was observed above the top of the concrete weir walls at filters #4, #8, #9, #10, #11, #12, #13, #14, #26, #28, #30, and #31. The filters are preparing to be backwashed as part of the automatic backwashing system. The DNF filters are automatically backwashed every four hours for approximately 46 minutes. Algae growth observed in the filters is consistent with normal operation. Operators are controlling algae growth by completely draining a filter and allowing the algae to bake and dry in the sun.

Chlorine Contact Chambers:

The wastewater treatment plant has four (4) chlorine contact chambers with scum troughs and mixers. All four (4) chlorine contact chambers were operating at the time of the site inspection. Contact chamber #2 has a mixer out of service which is causing excessive foam to develop on the surface. The foam is being collected by the scum trough installed in chamber #2. Surface scum and some BAF media was observed in the corners and along the edges of the chlorine contact chambers.

In the previous site inspection report, there was a discussion about containment booms that were put in place in the chlorine contact chambers at the recommendation of Mr. Ron Wicks, former Regulatory & Compliance Engineer with MDE. The recommendation following the site visit dated June 15, 2023, was to move the booms behind the troughs within the chlorine contact chambers instead of having them installed in front of the troughs allowing them to serve as extra protection to prevent potential media and FOGs that cannot be entirely captured by the troughs from leaving the site. Discussions with Eric Johnson and Andrea Buie-Branam during this site inspection indicated that plastic baffles were also installed at the recommendation of Mr. Ron Wicks and some of those are broken and floating in the contact chambers or are below the water surface and not serving their purpose as a barrier to floating debris. They would like to remove these plastic baffles from each contact chamber. With regard to the floating booms as extra protection, they feel moving them to the backside of the scum troughs is no more effective than having them installed in front of the scum troughs.

Foam was observed on the surface of the final discharge channel which appeared to disperse rapidly. BAF media and FOGs were not observed to be leaving the site via the effluent channel.

Self-Monitoring / In-House Lab:

The following records were reviewed:

- Daily pH calibration records for 6/16/23 to 7/26/23
- Daily zero oxygen verification / dissolved oxygen (DO) calibration for 6/16/23 to 7/26/23
- Daily composite samplers' temperatures for 6/16/23 to 7/26/23
- Total residual chlorine standards reading / verification for 6/16/23 to 7/26/23

Hard copies of the daily pH calibration records, DO calibration records, daily composite samplers' temperatures records, and total residual chlorine standards verification from 6/16/23 to 7/26/23 were provided by Mr. Eric Johnson.

pH calibrations are conducted 5 times per shift per day. Calibration details for the 6 to 2 shift on 6/28/23 were not completed. A zero-oxygen standard is used each time for DO calibrations. The DO concentration for 6/30/23 and 7/7/23 is missing for the zero-oxygen verification log. During the above reference time period for the zero-oxygen verification, the DO concentration for the standard was less than 0.5 mg/L, which is acceptable.

The facility's operator lab for the outfall has two composite samplers and a spare refrigerator to store samples. The temperatures of composite samplers #1 and #2 were 4.5°C and 5°C, respectively. The temperature of the spare refrigerator was 2°C. The composite samplers and spare refrigerator were less than 6°C and were within the temperature requirement for sample holding / preservation, according to Table II in CFR 136.3.

The facility changed from the Lamotte 1200 CL2 Colorimeter for residual chlorine to a HACH DR300 CL2 Colorimeter. The change in device also results in a change in calibration method. The HACH DR300 CL2 Colorimeter uses pillow standards for calibration. The Lamotte 1200 CL2 Colorimeter was in use until 6/21/23. The total residual chlorine concentrations of the standards for the Lamotte 1200 were out of range when compared to the total residual chlorine numbers noted on the standards' labels for multiple days between 6/16/23 and 6/21/23. The calibration records for the HACH DR300 were out of range when compared to the standards between 7/2/2023 and 7/5/2023. See the table below.

Lamotte 1200 CL2			
Date	Standard Concentration	Meter Concentration	Difference
6/16/23	0.2 ± 0.02 mg/L	0.08 mg/L	-0.12 mg/L
6/16/23	1.0 ± 0.03 mg/L	0.77 mg/L	-0.23 mg/L
6/16/23	2.5 ± 0.1 mg/L	2.06 mg/L	-0.44 mg/L
6/17/23	0.2 ± 0.02 mg/L	0.09 mg/L	-0.11 mg/L
6/17/23	1.0 ± 0.03 mg/L	0.82 mg/L	-0.18 mg/L
6/17/23	2.5 ± 0.1 mg/L	1.97 mg/L	-0.53 mg/L
6/18/23	0.2 ± 0.02 mg/L	0.06 mg/L	-0.14 mg/L
6/18/23	1.0 ± 0.03 mg/L	0.87 mg/L	-0.13 mg/L
6/18/23	2.5 ± 0.1 mg/L	2.01 mg/L	-0.49 mg/L
6/19/23	0.2 ± 0.02 mg/L	0.13 mg/L	-0.07 mg/L
6/19/23	1.0 ± 0.03 mg/L	0.80 mg/L	-0.2 mg/L
6/19/23	1.0 ± 0.03 mg/L	0.94 mg/L	-0.06 mg/L
6/19/23	2.5 ± 0.1 mg/L	2.80 mg/L	+0.3 mg/L
6/20/23	1.0 ± 0.03 mg/L	0.95 mg/L	-0.05 mg/L
6/20/23	2.5 ± 0.1 mg/L	2.83 mg/L	+0.33 mg/L
6/20/23	1.0 ± 0.03 mg/L	0.93 mg/L	-0.07 mg/L
6/20/23	2.5 ± 0.1 mg/L	2.79 mg/L	+0.29 mg/L
6/20/23	1.0 ± 0.03 mg/L	0.95 mg/L	-0.05 mg/L
6/20/23	2.5 ± 0.1 mg/L	2.80 mg/L	+0.3 mg/L
6/21/23	1.0 ± 0.03 mg/L	0.94 mg/L	-0.06 mg/L
6/21/23	2.5 ± 0.1 mg/L	2.8 mg/L	+0.3 mg/L
6/22/23	1.0 ± 0.03 mg/L	0.95 mg/L	-0.05 mg/L
6/22/23	2.5 ± 0.1 mg/L	2.8 mg/L	+0.3 mg/L
6/22/23	0.2 ± 0.02 mg/L	0.16 mg/L	-0.04 mg/L
6/22/23	1.0 ± 0.03 mg/L	1.54 mg/L	+0.54 mg/L
HACH DR300 CL2			
Date	Standard Concentration	Meter Concentration	Difference
7/2/23	0.19 ± 0.09 mg/L	0.07 mg/L	-0.12 mg/L
7/2/23	1.55 ± 0.14 mg/L	1.38 mg/L	-0.17 mg/L
7/2/23	0.19 ± 0.09 mg/L	0.09 mg/L	-0.1 mg/L
7/2/23	1.55 ± 0.14 mg/L	1.37 mg/L	-0.18 mg/L
7/3/23	0.19 ± 0.09 mg/L	0.09 mg/L	-0.1 mg/L
7/3/23	1.55 ± 0.14 mg/L	1.39 mg/L	-0.16 mg/L
7/3/23	0.19 ± 0.09 mg/L	0.08 mg/L	-0.11 mg/L
7/3/23	1.55 ± 0.14 mg/L	1.34 mg/L	-0.21 mg/L
7/4/23	1.55 ± 0.14 mg/L	1.40 mg/L	-0.15 mg/L
7/4/23	1.55 ± 0.14 mg/L	1.40 mg/L	-0.15 mg/L
7/5/23	0.19 ± 0.09 mg/L	0.09 mg/L	-0.1 mg/L
7/5/23	1.55 ± 0.14 mg/L	1.40 mg/L	-0.15 mg/L

The remaining HACH DR300 calibration logs were more consistent and fell within the range of the standard concentration.

Lab Reports, MORs, and DMRs:

Lab reports and the MOR for May 2023 were provided via email by Wendy Huang, MDE, courtesy of Mr. Robert Lombardi (Wastewater Division Operations Engineer of Patapsco WWTP). Lab results for 5-day biological oxygen demand (BOD), total suspended solids (TSS), ammonia, nitrate plus nitrite, total phosphorus (TP), ortho-phosphate, Enterococci, cyanide, and metals were reviewed. Calculation discrepancies / reporting for nutrients, metals, Enterococci, TSS, BOD, pH, total residual chlorine, cyanide, and flow were not observed on the netDMR submission for May 2023.

In review of the lab reports, I observed the sample temperature is missing from the chain of custody for the nutrient lab reports dated 5/27/23 and 5/28/23. I also observed the chain of custody for the nutrient lab report dated 5/15/23 is missing a signature.

With respect to the above MDE authorization, the following violations of Environment Article 9 by the Patapsco WWTP were observed on this date, with corrections (in bold text) needed immediately:

1) BAF media was observed inside the IPI building in and around bar screen #2 as well as in the dumpster channel behind bar screen #2 and outside in the dumpster channel to the west of the building. **Remove all BAF media from the aforementioned areas and dispose of them accordingly.**
2) BAF media, rags, and grease were observed in the steel channels embedded in the concrete in the areas where the compactors discharge to the waste dumpsters in the interior and at the exterior of the building. Additionally, grease, rags, and BAF media were observed at the south side of the building on the concrete and asphalt surface away from the dumpster channels and outside of the building cover. Grease tracks and some BAF media were also observed outside of the transfer station on the asphalt surface. **Remove all BAF media from the ground. Implement controls to reduce the amount of grease and grit track out from the fine screen building and the transfer station.**
3) The GSTs are overloaded with sludge and solids and are not able to function as designed. Both skimmer arms in GST #1 are in need of repair. Both skimmer arms in GST #2 are in need of repair. The function of the GST is to allow for most of the biosolids to settle at the bottom and for a relatively solids-free supernatant to rise to the top. The high concentration of biosolids in GST effluent can negatively impact the pure oxygen reactors' ability to remove BOD and can cause nitrification issues within the plant. **Operate and process sludge in a manner consistent with the function and design of the equipment.**
4) BAF media was observed in the concrete overflow pit for Clarifier #1 and on the ground by the access walkway stairs at Secondary Clarifier #1. **Remove all BAF media from aforementioned areas and dispose of them accordingly.**
5) The secondary clarifiers are not being maintained in a condition to operate effectively. One of the two skimmer arms in Clarifiers #4, #5b, and #6a are not functioning as designed. Both skimmer arms observed in Clarifier #6b are not functioning as designed. Vegetation was observed growing in clarifier #1 and #6a. An accumulation of trash and debris was observed in Clarifier #5a. The scum trough in Clarifiers #4 and #5b were clogged and not functional. **Repair and maintain the secondary clarifiers to ensure that they are functioning per design. The skimmer arms should be fixed to ensure that the entire length of the skimmer arm is on the water surface and extending to the baffles, allowing for solids on the water surface to be skimmed into the scum troughs. Remove all vegetation, trash, and BAF media from the clarifiers. Implement routine maintenance to prevent the excessive buildup of sludge and solids in the scum troughs.**

Monthly inspections will continue.

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

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

Inspector: 8/9/23
Christopher Lepadatu /Date
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Received by: 10/30/2023
Signature/Date
Neal Jackson
Print Name