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: September 28, 2023 09:30 AM
End Date /Time: September 28, 2023 01:30 PM

Media Type(s): NPDES Municipal Major Surface Water

Contact(s): Andrea Buie-Branam – Environmental Compliance Manager, Baltimore City
Scott Moffatt – Policy Analyst, Environmental Compliance, Baltimore City
Neal Jackson – Plant Manager, Patapsco WWTP
Chris Saunders – Senior Associate of Hazen & Sawyers

NPDES Municipal Major Surface Water

Permit / Approval Numbers: 15DP0580
NPDES Numbers: MD0021601
Inspection Reason: Follow-up (Non-Compliance)
Site Status: Active
Compliance Status: Noncompliance
Site Condition: Additional Investigation Required
Recommended Action: Additional Investigation Required
Evidence Collected: Photos or Videos Taken, Record Review, Visual Observation
Delivery Method: Email
Weather: Calm, Good

Inspection Findings:

Introduction:

The Patapsco Wastewater Treatment Plant (WWTP) is permitted to discharge to the Patapsco River which is designated as Use II waters protected for estuarine and marine aquatic life. The Patapsco WWTP features advanced treatment processes to achieve enhanced nutrient removal (ENR), chlorination and dechlorination. 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 (PSTs)), 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 (GSTs) 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, I inspected the WWTP with the contacts listed above.

Site Walkthrough:

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 not in use during the time of the inspection. The two (2) fine screens in the IPI building receive flow by means of individual channels and gates for flow control. The gate for Bar screen #1 is not functional and needs maintenance. Bar screen #2 was observed to be in operation. Screened and raked 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 lying on one side and clinging to the metal cladding of the bar screen.

Image 1: IPI Building, Screen 2.

The Fine Screen facility contains eight (8) fine screens divided into two groups of four. Each group of screens has a conveyor and compactor associated with it to carry screened material to the compactor before discharging it to waste dumpsters. At the time of the site visit, it was reported that all eight (8) fine screens were in operation. A project for replacing the compactors and conveyor belts for both groups of screens was in process at the time of the site visit.

Fats, oils, and grease (FOG) is an ongoing issue for the facility. Andrea reported that Baltimore City had previously discussed and shared a plan to investigate and study the major sewer flows to the Patapsco WWTP in an effort to identify the source of the FOG which is causing issues for the plant. Such a study may be beneficial to the operations of the plant if the source of the FOG can be identified and properly regulated and treated at the source before discharging to the sewer.

Transfer Station:

The transfer station has a roof, low wall on three sides, and trench drains in its concrete floor. 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 waste and grit are taken to the Quaratine Road Municipal Landfill for disposal. Through the process of operating trucks and equipment in the transfer station, heavy grease tracks were observed outside of the covered area of the transfer station on the asphalt surface.

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. Currently, staff spray water on the surface of GST #1 and #2 in order to manually remove surface scum. Repairs for the skimming arms are reportedly planned and a vendor has been selected to complete the repairs.

Image 2: GST #1, Broken & missing skimmer flaps.

At the time of the site inspection, GSTs #1 and #2 had significant amounts of floating sludge outside of the V-notch weirs. The scum troughs on GST #1 and GST #2 were clear and operational. Synagro was reportedly down at the time of the inspection. GST #4 was empty and not in service.

Primary Treatment:

The primary treatment system consists of six (6) large, rectangular Primary Settling Tanks (PSTs), each equipped with a chain and flight sludge conveyance mechanism, scum logs, and screw sludge collector.

Image 3: PST # 6, Effluent.

At the time of the site inspection, PSTs #1, #2, and #6 were in service. PST #3 is down for maintenance and the installation of new troughs and actuators. PSTs #4 and #5 were down for routine maintenance.

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. The High Purity Oxygen Aeration facility has six (6) pure oxygen reactors. The reactors are enclosed, rectangular tanks where the inside cannot be observed.

Reactors #2, #3, #5, and #6 were in service at the time of the inspection. Reactor #1 is in standby as a backup reactor and reactor #4 is down for repairs.

Between the High Purity Oxygen Aeration Reactors and Secondary Treatment Clarifier #3, the adsorbent material from the United Rental pump noted in the last inspection report was removed.

Image 4: United Rental Pump area.

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.

BAF filter media was observed on the ground around the entrance stairs to access walkway for clarifier #1. The scum trough for secondary clarifier #1 was clear and operational.

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 (BAF). Wastewater from secondary clarifier #3 is pumped back to the PST influent via the temporary pump from United Rental.

Secondary clarifier #2 is back in service and was reportedly back in service for a week. The skimmer arms are operational and functioning as designed. The scum trough on secondary clarifier #2 was observed to be clogged with material.

Image 5: Clarifier #2, Clogged scum trough.

Secondary clarifier #4 was out of service and empty for scheduled repairs to the skimmer arms.

Secondary clarifier #5a was observed in operation with water being applied to the surface to breakup surface scum. A large amount of duckweed was observed at the surface covering nearly half of the clarifier water surface. One arm of the skimmer for clarifier #5a was observed to be bent and nearly below the surface near the end. It does not appear to reach to the outside edge leaving an area open where surface scum is able to pass through and not be collected. The scum trough was observed to be clear and functional.

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 appears to be bent near the middle causing the top edge to drift below the surface allowing scum to pass over. The scum trough was observed to be clear. The debris noted during the last inspection was removed.

Image 6: Clarifier #5b, Bent skimmer arm.

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

Secondary clarifier #6a was observed to be in operation with water being applied to the surface to breakup surface scum. Both arms of the skimmer on clarifier #6a appear to be functional. The scum trough for clarifier #6a was observed to be clear.

BAFs and Mud Wells:

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 0.57 mg/L and a phosphate concentration of 0.05 mg/L. Effluent pH monitoring indicated a pH of 6.70. No issues were observed or reported with the BAF system or Mud Wells.

Denitrification Filters:

The denitrification filter (DNF) facility contains 34 gravity filters and support systems such as backwash pumps and blowers. 28 filters are in service while filters #20, #34, #6, and #1 are out of service for mechanical repairs. Filters #32 and #33 were out of service and drained in order to allow for the algae buildup to bake in the sun for ease of removal. 24 filters are necessary for design average daily flow. The DNF filters are automatically backwashed every four hours for approximately 46 minutes.

Image 7: DNF Filters.

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 chambers #2 and #3 have a mixer out of service which is causing some foam to develop on the surface. The foam is being collected by the scum troughs in each chamber.

Outfall 001:

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.

Image 8: Final effluent.

Self-Monitoring / In-House Lab:

The following records were reviewed:

- Daily pH calibration records from 9/1/23 to 9/28/23.
- Daily zero oxygen verification / dissolved oxygen (DO) calibration from 9/1/23 to 9/28/23.
- Daily composite samplers' temperatures from 9/1/23 to 9/28/23.
- Total residual chlorine standards reading / verification for 9/1/23 to 9/28/23.

pH calibrations are conducted 5 times per shift per day. No violations were observed with the pH calibration records. A zero-oxygen standard is used each time for DO calibrations. No violations were observed with the DO calibration records.

The facility's operator lab for the outfall has two composite samplers. The temperatures of the composite samplers #1 and #2 were 3.5°C and 3.0°C, respectively. The composite samplers were less than or equal to 6°C which is within the temperature requirement for sample holding / preservation, according to Table II in CFR 136.3.

Calibration records for the HACH DR300 CL2 Colorimeter were reviewed for the period from 9/1/23 to 9/28/23 and no violations were observed.

Lab Reports, MORs, and DMRs:

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

The DMR submission for July 2023 did not include free cyanide analysis results. A note was included in the DMR submission for July 2023 stating that the results for all four permit tests for cyanides, amenable to chlorination, were invalidated due to the contract lab exceeding the holding times for these samples. A letter from the contract lab indicated that the exceedance of the holding times was due to ongoing issues and repairs with instrumentation.

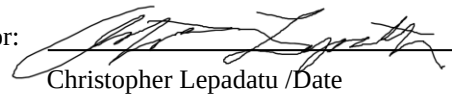
With respect to the above MDE authorization, the following violations of Environment Article 9 by the Patapsco WWTP were observed on this date, with corrections (in bold text) needed immediately:

1) Greasy rags and other debris were observed inside the IPI building piled next to bar screen #2. **Remove all greasy rags and other debris from the side and floor around bar screen #2 and dispose of them accordingly.**
2) The GSTs are overloaded with sludge and solids and are not able to function as designed. Both skimmer arms in GST #1 and 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.**
3) BAF media was observed on the ground by the access walkway stairs at Secondary Clarifier #1. **Remove all BAF media from the ground by the access walkway stairs at Secondary Clarifier #1 and dispose of it accordingly.**
4) The secondary clarifiers are not being maintained in a condition to operate effectively. One of the two skimmer arms in Secondary Clarifiers #5a, #5b, and #6b are not functioning as designed. The scum trough in Secondary Clarifiers #2 was 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. Implement routine maintenance to prevent the excessive building 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:  10/11/23

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Received by:  10/30/2023

Signature/Date

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Print Name