Maryland
Department of the Environment

Back River Wastewater Treatment Plant (WWTP) Progress Report

November - December 2023

Consent Decree

- MDE, Baltimore City, and Blue Water Baltimore entered into a consent decree on October 31, 2023. This consent decree creates a legally enforceable schedule to address the remaining outstanding maintenance projects at the plant.

Treatment Plant Overview

- One of the primary concerns at the WWTP is the processing and management of biosolids and the removal of solids from process equipment. The efficacious removal of biosolids is essential to maintaining total nitrogen (TN) and phosphorus (P) effluent concentrations within permit limitations. In addition to the solids that are generated on a daily basis, any buildup of solids within the treatment system must be removed.
- Back River WWTP is currently meeting all of its permit limits.

Primary Treatment

- The primary settling tanks (PSTs) allow the solid material within the wastewater to be easily separated by settling to the bottom or floating to the surface for removal.
    - Currently, 5 PSTs (#5, #7, #8, #9, and #11) of the 11 PSTs are functioning as designed.
        - PST #1 is undergoing weir replacement and is expected to be complete in spring 2024
        - For PST #3, construction is continuing. The estimated date to complete the project is the end November 2023. Status will be confirmed during the December inspection.
        - With regards to PST #4, construction is continuing. PST #4 is estimated to be operational by January 2024.
        - PST #5 has been cleaned and the necessary parts to get the unit back online have been ordered. Once the parts have been received, a timeline for getting this PST back online can be determined. However, the estimated time frame is Fall 2023. PST #5 is currently being used as a flow through.
        - PST #6 cleaning is being delayed until the odor masking system is received.
        - PST #10 is undergoing repairs and is expected to be in service before the end of the year.

Secondary Treatment

- There are 3 activated Biological Treatment sludge plants to reduce organic material and solids.
- Newly constructed Activated Sludge Plant #4 is online and all reactors and clarifiers are online.
    - The facility is sending 50-60% of the flow through Activator #4 due to better treatment performance and efficacy.
    - Baltimore City Department of Public Works (DPW) has plans in the near future to take the older activator plants offline - one at a time - to remove the accumulation of solids from the tanks and perform maintenance and equipment repairs.
    - DO probes for biological reactors are being installed.

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Secondary Clarifiers

- Each Activated Sludge Plant #2, #3, and #4 has 12 secondary clarifiers, with a total of 36 secondary clarifiers.
    - A third-party engineering assessment determined that the Return Activated Sludge (RAS) pumps and wasting pumps require replacement. RAS pump failure would cause poor performance of the biological reactors and wasting pump failure would cause a buildup of solids in the treatment system.
    - RAS and sludge pumps are being evaluated and repaired in the Activated Sludge Plant #3, and two pumps are on order.
- The secondary clarifiers #5B, #7A, #16A, and #16B associated with Activated Sludge Plant #2 are not in service.
- Secondary clarifiers #11A and #12B associated with Activated Sludge Plant #3 are not in service.
- A third-party contractor is cleaning and removing the vegetation from the secondary clarifiers and affected reactors. The vegetation was removed from all secondary clarifiers as of 6/14/2023
    - The sludge blankets on the secondary clarifiers have gone from 10 to 2 feet, which signifies a reduction in the amount of solids within the secondary treatment phase.
- Clarifiers #11A, #12B, #13A, #16A,and #16B are out of service
- Maintenance issues regarding algae/vegetation growth of 4 secondary clarifiers were observed.

Tertiary Treatment

- The facility has 52 Denitrification Filters designed to achieve effluent nitrogen concentrations at or below 3 milligrams per liter (mg/l) TN. At this time, all 52 of 52 filters are in, or available for, service.

Sand Filters

- The November 20 inspection identified 36 sand filters in service out of 48.

Biosolids Management

- The Back River WWTP has four (4) centrifuges.
    - #2 and #3 are operating.
    - #1 is on standby.
    - #4 is being rebuilt.
- Two (2) portable centrifuges are in place, on standby, not currently in operation.
- The repair of #4 and a centrifuge maintenance plan are addressed in the Consent Decree.

Gravity Belt Thickeners

- There are 8 GBTs and currently there are 5 in service (#3, #5, #6, #7, and #8).
- GBT #1 and #4 are on standby.
- GBT #2 is out of service in the process of being rebuilt - no timeline on completion due to the availability of parts.
- 6 GBTs are needed for current flows and 7 for design capacity.
- Repair of the GBTs is due by 6/30/24 per the Consent Decree.

Gravity Sludge Thickeners

- There are six Gravity Sludge Thickeners (GSTs). At the current design with the average flow of 130 million gallons per day, only one GST is required.

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- Three GSTs are fully operational. (#1, #3, and #5)
- The remaining GST's can feed flow and draw solids, but the gravity thickening mechanism is not functional.
  - DPW should achieve reliability and redundancy on GST operation in conjunction with the PSTs brought online.

Staffing

- DPW reviewed staff roles and stressed the necessity for communication, teamwork, and cooperation between Contractors and DPW.
  - DPW is in the process of hiring additional maintenance technicians.
  - The consent decree requires Baltimore City to submit a Staffing Plan by December 31, 2023.

Monitoring Results

- Back River WWTP is currently meeting all of the effluent limits in its permit.
- The plant is operating at better than ENR performance levels for nitrogen, phosphorus, and total suspended solids (TSS).

Note: The Department receives previous month's data at the end of every month.

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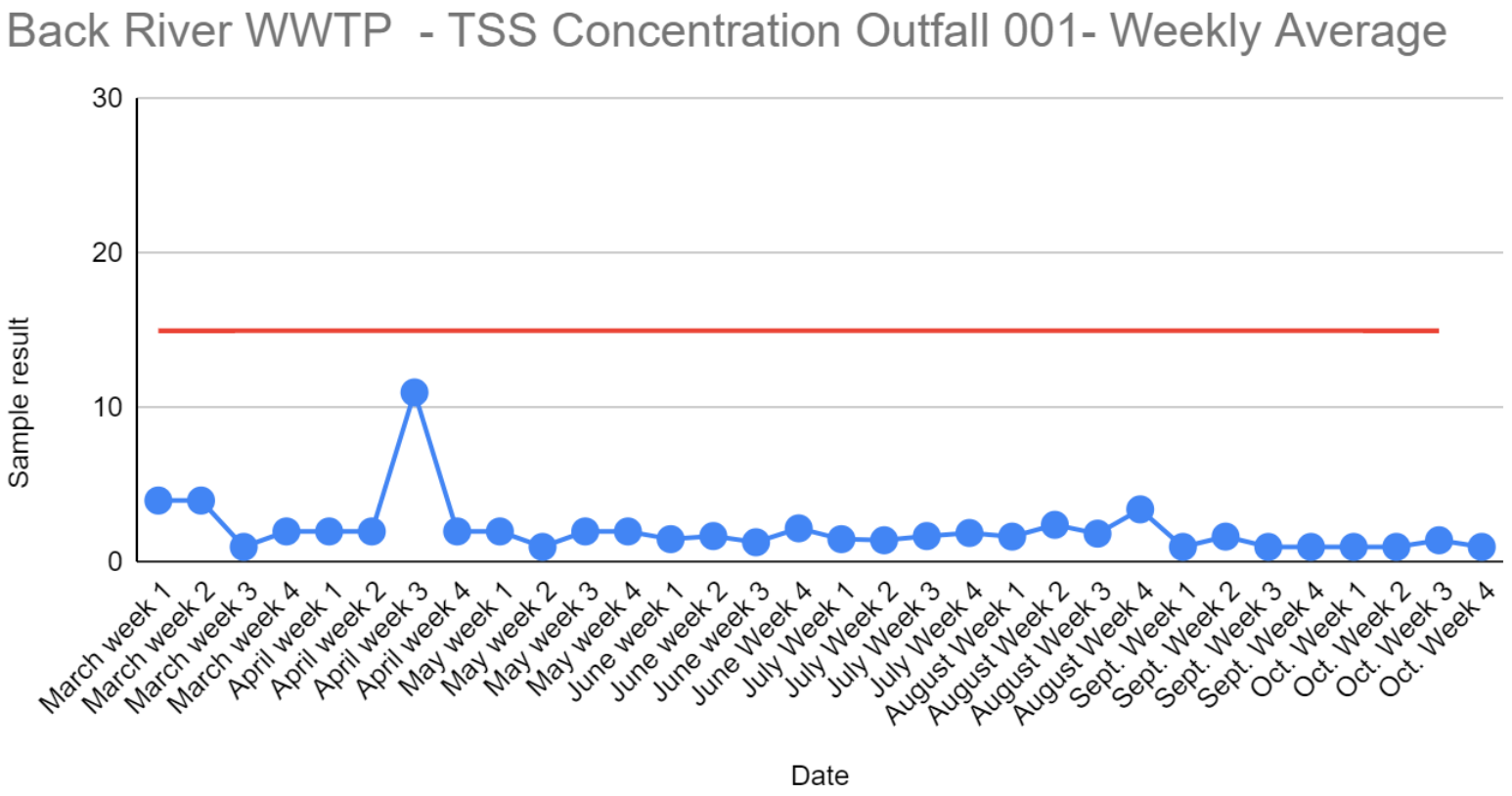
Graphs Showing Reported Final Effluent Concentrations and Loading Performance



*TSS and TP concentrations elevated due to heavy rainfall of 1.73” on 4/29/23

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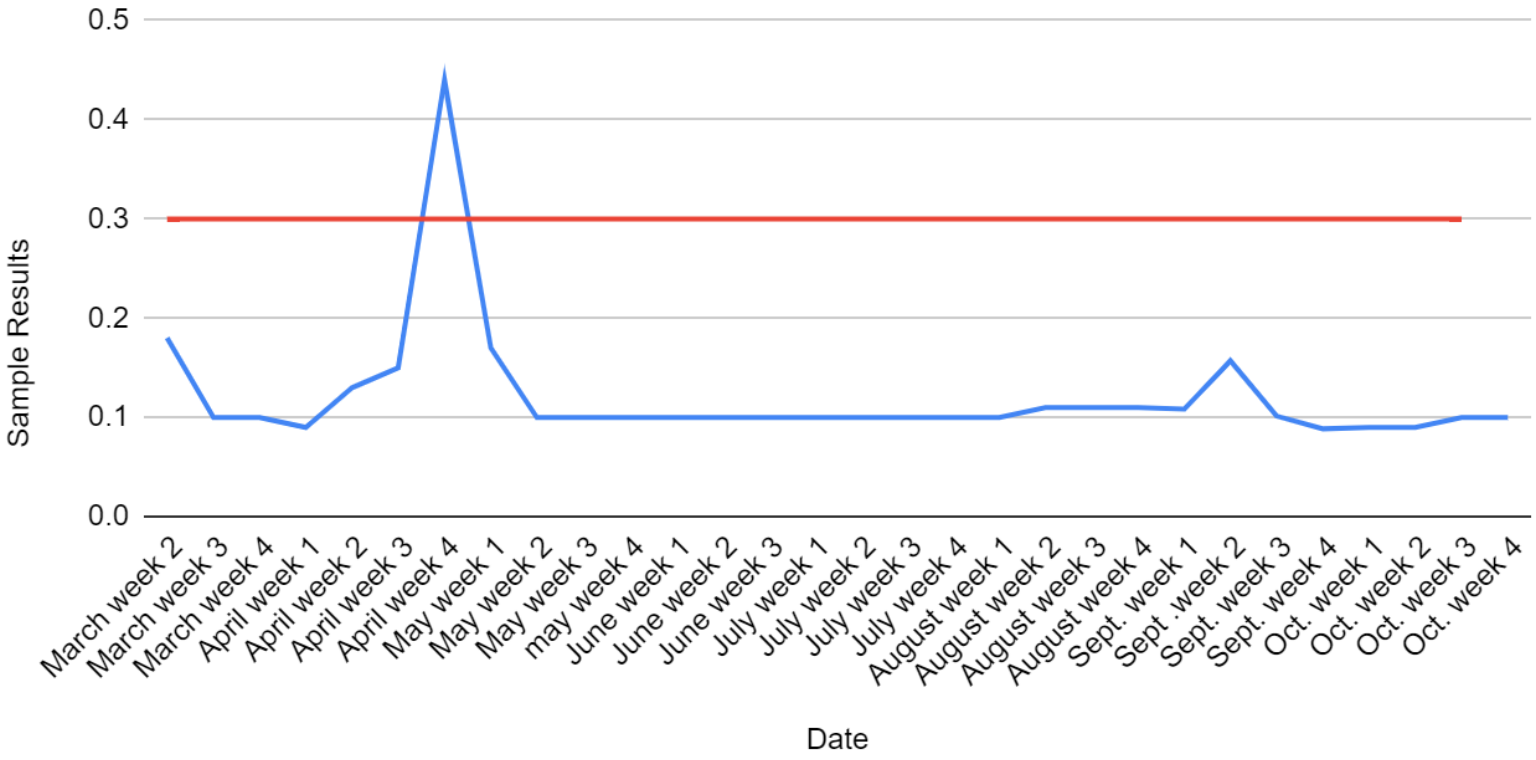
Back River WWTP TP Concentration Outfall 001 - Weekly Average



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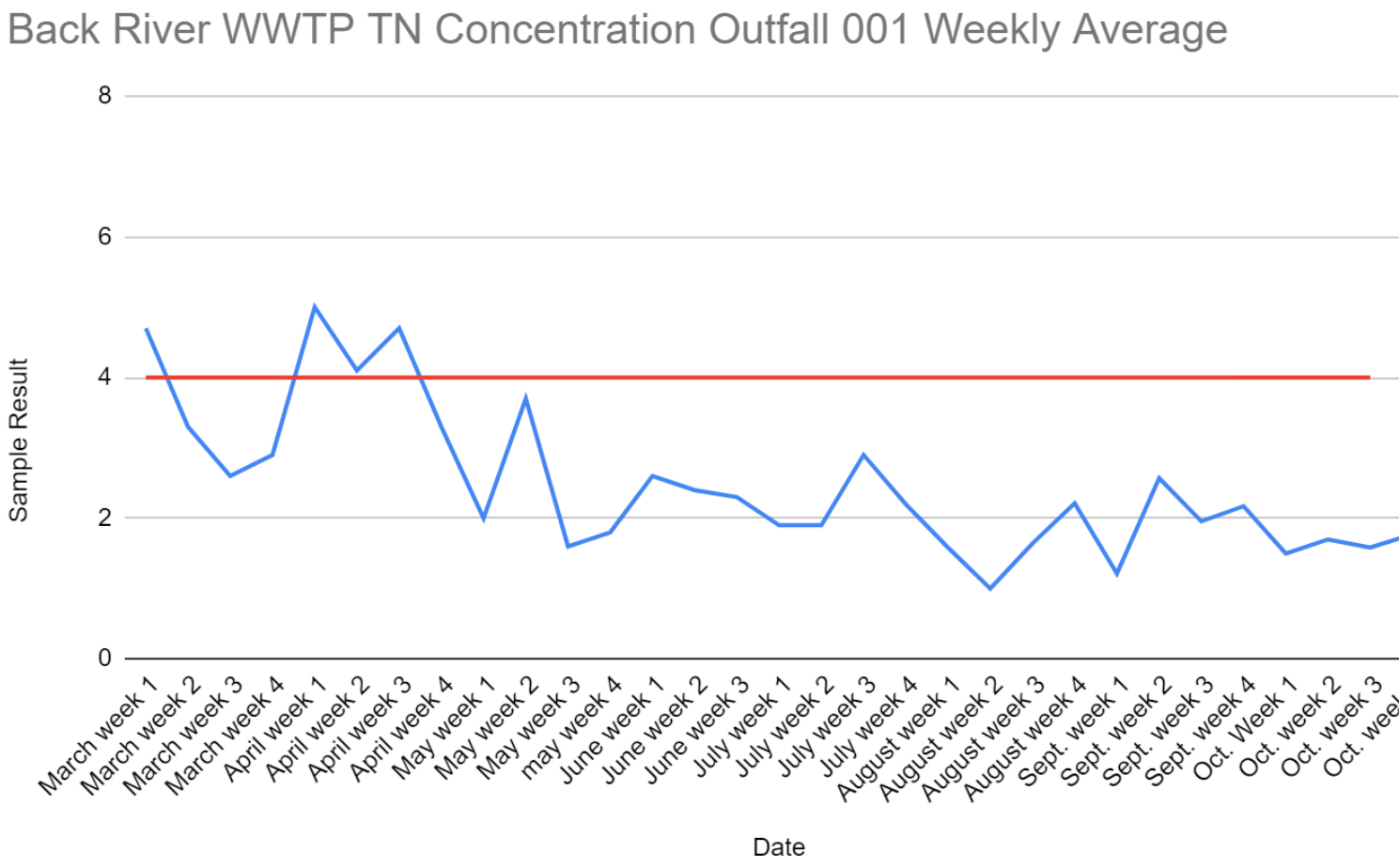

*4.0 mg/l Floating Cap is an ENR performance standard and not a permit limit.

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