

March 8, 2022

Permits Section

Sent via email: to EPA.PermtSpecCondtns@illinois.gov

Subject: Glenbard Wastewater Authority – NPDES Permit No. IL0021547

Special Condition 18.E Phosphorus Discharge Optimization Plan

Dear Permit Section:

Glenbard Wastewater Authority (GWA) operates under NPDES Permit No. IL0021547, which was renewed with additional regulations effective on February 1, 2022 requires that GWA submit, by March 31 of each year, an annual progress report on the Phosphorus Discharge Optimization Plan on the existing treatment facilities The plan must include the following:

- a. Wastewater Treatment Facility (WWTF) influent reduction measures
 - i. Evaluate the phosphorus reduction potential of users.
 - ii. Determine which sources have the greatest opportunity for reducing phosphorus (e.g. industrial, commercial, institutional, municipal, and others).
 1. Determine whether known sources (e.g. restaurant and food preparation) can adopt phosphorus minimization and water conservation plans.
 2. Evaluate implementation of local limits on influent sources of excessive phosphorus.
- b. WWTF effluent reduction measures
 - i. Reduce phosphorus discharges by optimizing existing treatment processes without causing non-compliance with permit effluent limitations or adversely impacting stream health.
 1. Adjust the solids retention time for biological phosphorus removal.
 2. Adjust aeration rates to reduce DO and promote biological phosphorus removal.
 3. Change aeration settings in plug flow basins by turning off air or mixers at the inlet side of the basin system.

4. Minimize impact on recycle streams by improving aeration within holding tanks.
5. Adjust flow through existing basins to enhance biological nutrient removal.
6. Increase volatile fatty acids for biological phosphorus removal.

Influent Reduction Measures

Evaluation of WWTP Phosphorous Loadings

The first step in determining the need for phosphorous influent reduction measures is to monitor the influent concentrations of total phosphorous into the WWTP and compare loadings to typical domestic background loading values. If the observed loadings are greater than domestic background, then it would indicate non-domestic total phosphorous sources in the collection system. GWA processes wastewater for the Villages of Lombard and Glen Ellyn. In addition, there is some influent from small pockets of unincorporated areas, mainly residential. Lombard has three small to medium sized industrial parks, while there are no industrial parks in Glen Ellyn.

GWA has monitored influent total phosphorous and provided historical data from 2016-2019. The following table shows the annual average total phosphorous concentrations for the years provided:

Year	Average Influent Total Phosphorus (mg/L)
2018	5.07
2019	4.94
2020	5.80
2021	7.15

Historical data for the GWA treatment plant influent indicates a total phosphorus concentration range of 4.94 to 7.15 mg/L (annual averages). This is consistent with typical background residential total phosphorous concentration range of 4-7 mg/L. The GWA influent total phosphorus data indicates that industrial contributions to influent total phosphorus are minimal at the treatment plant.

Water Billing Evaluation

The GWA has researched sources of non-domestic wastewater in the service areas. In order to identify sources of non-domestic wastewater, potable water billings were examined to provide insight into potential wastewater sources. The Village of Glen Ellyn provided a water consumption report for 2016. Based on the billing records, approximately 5.4% of total wastewater is discharged from non-residential accounts.

The Village of Lombard provided a listing of their water-sewer accounts for 2016 and 8.5% are non-residential. The Village of Lombard also provided 25 largest water consumption accounts for 2016. The majority of the users on the list are either hotels, office complexes, nursing facilities and multi-family dwellings. There is one restaurant on the list but it does not discharge to GWA. It discharges to Flag Creek Water Reclamation District.

Industrial User Site Inspection Results

The GWA Environmental Resources Coordinator has performed walk through inspections of most of GWA's industrial areas. There is some light industry such as machines shops and printers, but the tenants in these areas tend to be warehouses, storage for building/service contractors and offices.

Industrial User Phosphorous Monitoring

GWA permits five (5) Categorical Industrial Users (CIU's). All of the CIUs are classified as metal finishers (40 CFR 433) and two of them are zero-discharge CIU. The largest CIU, E/M, has a full-scale line of zinc phosphate coating with pretreatment to remove metals from the discharge. The discharge flowrate from E/M is approximately 3,000 gpd or less. Monitoring E/M for total phosphorous (TP) revealed the discharge accounts for approximately 0.17 lb/day-TP. E/M.

The second largest CIU is Overton Chicago Gear (OCG), which has a small-scale nitrile etch line used to highlight imperfections on gears. The only pretreatment is pH adjustment. OCG discharges approximately 2,400 gpd and have a low total phosphorus concentration average of 0.4 mg/L. The last metal finisher is an industry that repairs tools for its customers. There is a very small plating line in order to strip and then re-plate the tool as part of the repair. The plating line only runs a few times a week and typically does not run all day. The estimated discharge on process days is 480 gallons. There is no pretreatment. No testing for phosphorus has been done but levels of all other pollutants is extremely low.

GWA also accepts a large volume of leachate from two closed landfills. The landfills were primarily used for residential refuse. GWA has been sampling them for local limit pollutants and typically the level of all pollutants is very low, except for the occasional arsenic violation. In December 2014, GWA began to collect some background data by adding phosphorus to the sampling of random incoming loads. The average total phosphorus concentration in random loads from 1/5/16 to 6/22/16 was 0.45 mg/L. The average concentration from the date range above was used to estimate the 2015 mass-loading of TP based on the volume of leachate accepted in 2015, and the loading was estimated to be 0.07 lb TP/day. The data collected so far shows this is a minimal source of GWA's influent phosphorus loading.

Collection System Monitoring

The GWA has performed monitoring for total phosphorous in the collection system and the results are shown in the table below:

Location	Location Type	Sample Date	Total Phosphorus (mg/L)
Yorkbrook, Lombard	Industrial	10/26/2016	4.40
Fairview, Lombard	Residential	4/25/2017	9.88
Lake St, Glen Ellyn	Residential	4/12/2017	3.97
Ellyn St.	Residential	2/8/2017	1.51
Main St, Lombard	Industrial	6/30/2017	3.57

It appears from collection system monitoring that some of the residential areas have higher background total phosphorous than the industrial areas.

Potential for Implementation of Local Limits

GWA's updated local limits will contain a surcharge level for phosphorus of 10mg/L, but at this time, no identified source would be over this level.

Phosphorus Reduction Potential of Service Area Users

The loading appears to be coming mainly from residential discharge and will be difficult to minimize. If GWA finds in the future that larger commercial facilities are contributing to the load, GWA and the Villages can try a campaign to encourage them to switch to products without phosphates voluntarily, and potentially try the same approach with residents.

Effluent Reduction Measures

As outlined in the attached BNR Operations Letter (Exhibit A), GWA operates a high-purity oxygen aeration system that does not allow for control of oxidation states whatsoever. Any changes to the SRT, recirculation rates, or otherwise will not support reductions in the phosphorus discharge. All measures to reduce effluent total phosphorus require significant capital improvements.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Streicher", with a long horizontal flourish extending to the right.

Matt Streicher, P.E., BCEE
Glenbard Wastewater Authority
Executive Director

Enc.

March 23, 2016

Mr. Kaushal Desai
Environmental Protection Engineer III
Division of Water Pollution Control
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794-9276

***Subject: Glenbard Wastewater Authority – NPDES Permit No. IL0021547
Biological Nutrient Removal Operation for Special Condition 15***

Dear Mr. Desai:

Special Condition 15 of permit IL0021547 indicates that the Glenbard Wastewater Authority (GWA) must operate facilities designed for biological nutrient removal (BNR). The Authority is unable to operate facilities for BNR. This letter serves as a request for exemption to the BNR Operations outlined in Special Condition 15, which we are submitting on behalf of Glenbard Wastewater Authority for Agency approval.

Glenbard Wastewater Authority operates a wastewater treatment facility with the following processes: screening, grit removal, first stage activated sludge, intermediate clarifiers, second stage activated sludge, secondary clarifiers, tertiary filtration, ultraviolet disinfection, and sludge handling with anaerobic digesters. High-purity oxygen is generated on-site with a Cryogenic Oxygen Plant that removes nitrogen out of the air and distributes 96% pure oxygen into the covered first-stage and second-stage activated sludge tanks.

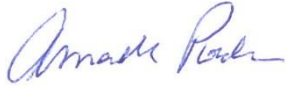
Typical BNR operation for wastewater treatment facilities consists of modifying oxygen flow and aeration states to various zones of the activated sludge tanks to achieve anaerobic and/or anoxic operation in those respective zones. Because of the nature of a high-purity oxygen facility, the Authority is unable to “turn down” air flows to different locations within the activated sludge system. Typical dissolved oxygen concentrations within the activated sludge tanks exceed saturation; therefore, BNR operations are not feasible without major modifications to the treatment process.

Although the Authority is unable to operate the facility for BNR, the Authority will monitor the effluent for Total Nitrogen once per month as a composite sample and submit results on the Discharge Monitoring Report, as required for the effluent permit and also for Special Condition 15.

If you have any questions, please contact me at 815.444.3212.

Sincerely,

BAXTER & WOODMAN, INC.
CONSULTING ENGINEERS



Amanda L. Poole, P.E.
Sustainability Department Manager

ALP:dds

C: Erik Lanphier, Executive Director

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