National Pollutant Discharge Elimination System (NPDES) Permit Program

F A C T S H E E T

Regarding an NPDES Permit to Discharge to Waters of the State of Ohio
for the Wilmington Wastewater Treatment Plant (WWTP)

Public Notice No.: 183881
Public Notice Date: May 19, 2023
Comment Period Ends: June 19, 2023

OEPA Permit No.: 1PD00013*QD
Application No.: OH0028134

Name and Address of Applicant:
City of Wilmington
69 North South Street
Wilmington, OH 45177

Name and Address of Facility Where Discharge Occurs:
Wilmington Wastewater Treatment Plant
475 South Nelson Avenue
Wilmington, OH 45177
Clinton County

Receiving Water: Lytle Creek

Subsequent Stream Network: Todd Fork, Little Miami River, Ohio River

Introduction

Development of a Fact Sheet for NPDES permits is mandated by Title 40 of the Code of Federal Regulations, Section 124.8 and 124.56. This document fulfills the requirements established in those regulations by providing the information necessary to inform the public of actions proposed by the Ohio Environmental Protection Agency, as well as the methods by which the public can participate in the process of finalizing those actions.

This Fact Sheet is prepared in order to document the technical basis and risk management decisions that are considered in the determination of water quality based NPDES Permit effluent limitations. The technical basis for the Fact Sheet may consist of evaluations of promulgated effluent guidelines, existing effluent quality, instream biological, chemical and physical conditions, and the relative risk of alternative effluent limitations. This Fact Sheet details the discretionary decision-making process empowered to the Director by the Clean Water Act and Ohio Water Pollution Control Law (ORC 6111). Decisions to award variances to Water Quality Standards or promulgated effluent guidelines for economic or technological reasons will also be justified in the Fact Sheet where necessary.

No antidegradation review was necessary.

Effluent limits based on available treatment technologies are required by Section 301(b) of the CWA. Many of these have already been established by the United States Environmental Protection Agency (U.S. EPA) in the effluent guideline regulations (a.k.a. categorical regulations) for industry categories in 40 CFR Parts 405-499. Technology-based regulations for publicly owned treatment works are listed in the Secondary Treatment Regulations (40 CFR Part 133). If regulations have not been established for a category of dischargers, the director may establish technology-based limits based on best professional judgment (BPJ).

Ohio EPA reviews the need for water-quality-based limits on a pollutant-by-pollutant basis. Wasteload allocations (WLAs) are used to develop these limits based on the pollutants that have been detected in the discharge, and the

receiving water's assimilative capacity. The assimilative capacity depends on the flow in the water receiving the discharge, and the concentration of the pollutant upstream. The greater the upstream flow, and the lower the upstream concentration, the greater the assimilative capacity is. Assimilative capacity may represent dilution (as in allocations for metals), or it may also incorporate the break-down of pollutants in the receiving water (as in allocations for oxygen-demanding materials).

The need for water-quality-based limits is determined by comparing the WLA for a pollutant to a measure of the effluent quality. The measure of effluent quality is called Projected Effluent Quality (PEQ). This is a statistical measure of the average and maximum effluent values for a pollutant. As with any statistical method, the more data that exists for a given pollutant, the more likely that PEQ will match the actual observed data. If there is a small data set for a given pollutant, the highest measured value is multiplied by a statistical factor to obtain a PEQ; for example, if only one sample exists, the factor is 6.2, for two samples - 3.8, for three samples - 3.0. The factors continue to decline as samples sizes increase. These factors are intended to account for effluent variability, but if the pollutant concentrations are fairly constant, these factors may make PEQ appear larger than it would be shown to be if more sample results existed.

Procedures for Participation in the Formulation of Final Determinations

The proposed modification is tentative but shall become final on the effective date unless (1) an adjudication hearing is requested, (2) the Director withdraws and revises the proposed modification after consideration of the record of a public meeting or written comments, or (3) upon disapproval by the Administrator of the U.S. Environmental Protection Agency.

Within thirty (30) days of publication of this notice, any person may submit written comments, a statement as to why the proposed modification should be changed, a request for a public meeting on the proposed modification and/or a request for notice of further actions concerning the modification. All communications timely received will be considered in the final formulation of the modification. If significant public interest is shown a public meeting will be held prior to finalization of the modification.

Within thirty (30) days of the issuance of the proposed modification any officer of an agency of the state or of a political subdivision, acting in his representative capacity or any person aggrieved or adversely affected by issuance of it may request an adjudication hearing by submitting a written objection in accordance with Ohio Revised Code Section 3745.07. Since all other conditions of the permit remain in effect, a hearing may not be requested on any issues other than the proposed modification. If an adjudication hearing is requested, the existing NPDES permit will remain in effect until the hearing is resolved. Following the finalization of the modification by the Director, any person who was a party to an adjudication hearing may appeal to the Environmental Review Appeals Commission.

Requests for public meetings shall be in writing and shall state the action of the Director objected to, the questions to be considered, and the reasons the action is contested. Such requests should be addressed to:

Legal Records Section
Ohio Environmental Protection Agency
Lazarus Government Center
P.O. Box 1049
Columbus, Ohio 43216-1049

Interested persons are invited to submit written comments upon the proposed modification. Comments should be submitted in person or by mail no later than 30 days after the date of this Public Notice. Deliver or mail all comments to:

Ohio Environmental Protection Agency
Attention: Division of Surface Water

Permits and Compliance Section
Lazarus Government Center
P.O. Box 1049
Columbus, Ohio 43216-1049

The OEPA permit number and Public Notice numbers should appear on each page of any submitted comments. All comments received no later than 30 days after the date of the Public Notice will be considered.

Citizens may conduct file reviews regarding specific companies or sites. Appointments are necessary to conduct file reviews because requests to review files have increased dramatically in recent years. The first 250 pages copied are free. For requests to copy more than 250 pages, there is a five-cent charge for each page copied. Payment is required by check or money order, made payable to Treasurer State of Ohio.

Location of Discharge/Receiving Water Use Classification

The Wilmington wastewater treatment plant (WWTP) discharges to Lytle Creek at River Mile 6.83. Figure 1 shows the approximate location of the facility.

This segment of Lytle Creek is described by Ohio EPA River Code: 11-212-000, Hydrologic Unit Code: 05090202-06-03, County: Clinton, Ecoregion: Eastern Corn Belt Plains. Lytle Creek is designated for the following uses under Ohio's WQS (OAC 3745-1-18): Warmwater Habitat (WWH), General High Quality Water, Agricultural Water Supply, Industrial Water Supply, and Primary Contact Recreation.

Use designations define the goals and expectations of a waterbody. These goals are set for aquatic life protection, recreation use and water supply use, and are defined in the Ohio WQS (OAC 3745-1-07). The use designations for individual waterbodies are listed in rules -08 through -32 of the Ohio WQS. Once the goals are set, numeric WQS are developed to protect these uses. Different uses have different water quality criteria.

Use designations for aquatic life protection include habitats for coldwater fish and macroinvertebrates, warmwater aquatic life and waters with exceptional communities of warmwater organisms. These uses all meet the goals of the federal CWA. Ohio WQS also include aquatic life use designations for waterbodies which cannot meet the CWA goals because of human-caused conditions that cannot be remedied without causing fundamental changes to land use and widespread economic impact. The dredging and clearing of some small streams to support agricultural or urban drainage is the most common of these conditions. These streams are given Modified Warmwater or Limited Resource Water designations.

Recreation uses are defined by the depth of the waterbody and the potential for wading or swimming. Uses are defined for bathing waters, swimming/canoeing (Primary Contact Recreation) and wading only (Secondary Contact which are generally waters too shallow for swimming or canoeing).

Water supply uses are defined by the actual or potential use of the waterbody. Public Water Supply designations apply near existing water intakes so that waters are safe to drink with standard treatment. Most other waters are designated for agricultural water supply and industrial water supply.

FACILITY DESCRIPTION

The Wilmington WWTP was constructed in 1936 and last upgraded in 1989. The average design flow is 3.0 million gallons per day (MGD), with a peak hydraulic capacity of 6.25 MGD. Wilmington WWTP serves the city of Wilmington and the surrounding area. Wilmington WWTP has the following treatment processes which are shown on Figure 2:

- Screening
- Grit removal
- Primary clarification
- Trickling filters
- Aerated contact tanks
- Chemical addition
- Secondary clarification
- Ultraviolet disinfection

Wilmington WWTP has a secondary treatment bypass. Flow bypasses the trickling filters, aerated contact tanks and secondary clarification and is combined with fully treated flow prior to disinfection. In the NPDES permit, it is designated as station 1PD00013602 and has monitoring and reporting requirements. Discharge through this station is prohibited except under emergency conditions as authorized by federal regulation at 40 CFR 122.41(m) and provisions in Part III of the permit.

The city of Wilmington has 100% separate sanitary sewers in the collection system.

The city of Wilmington has an approved pretreatment program. Two, categorical industrial users discharge approximately 0.11 MGD average daily flow into the sanitary sewer system. Three significant, non-categorical industrial users discharge 0.24 MGD average daily flow as well.

The City's potable water comes from reservoirs.

Wilmington WWTP utilizes the following sewage sludge treatment processes:

- Gravity thickening
- Sludge stabilization using aerobic digestion

Treated sludge is either land applied at agronomic rates or disposed in a municipal landfill.

Basis of the Modification

The City of Wilmington has applied for a Permit to Install (PTI #1543170) to make improvements to their wastewater treatment plant and expand capacity from 3.0 to 4.5 MGD for average daily design flow. The new peak hydraulic capacity will be 9.0 MGD and the bypass at station 602 will be eliminated. The specific improvements involve replacement of the existing treatment plant with an influent pump station equipped with influent screens and grit removal, a four basin sequencing batch reactor, chemical feed system, tertiary disc filtration, ultraviolet radiation disinfection, and a cascade aerator (see figure 3). A new sludge dewatering building for preparing sludge for disposal to a landfill is also included. The new plant effluent outfall will move approximately 1,100 feet east (upstream) of the existing outfall on Lytle Creek.

Table 1 shows the proposed final limits for outfall 001. The new limits are proposed to become effective on March 1, 2026, with the completion of the proposed facility expansion. A schedule of compliance is included to meet the new final effluent limits discussed below.

Ammonia (summer), CBOD5, Dissolved Oxygen, and TSS

The proposed limits for ammonia (summer), 5-day carbonaceous biochemical oxygen demand (CBOD5), dissolved oxygen, and total suspended solids (TSS) are technology based treatment standards included in OAC 3745-1-05, Best Available Demonstrated Control Technology (BADCT). The proposed loading limits are more restrictive than those in the current permit. The summer ammonia limits required by BADCT were evaluated and determined to be protective of water quality standards for ammonia toxicity.

Ammonia (winter)

The proposed limits for ammonia (winter) are based on plant design associated with PTI 1543170. The permittee has not requested an increase in load, therefore loading limits are proposed to remain the same as in the current permit but concentration limits are proposed to be lowered to account for the additional flow. The proposed limits are more restrictive than BADCT and have been evaluated using the WLA procedure and determined to be protective of water quality standards for ammonia toxicity.

Total Phosphorus

The proposed limits for total phosphorus are based on plant design associated with PTI 1543170. The permittee has not requested an increase in load, therefore loading limits are proposed to remain the same as in the current permit but concentration limits are proposed to be lowered to account for the additional flow.

Additionally, a new seasonal loading limit is proposed based on best technical judgement for an adaptive management approach for implementation of the 2011 *Total Maximum Daily load for the Lower Little Miami River* report (TMDL). The maximum limit is proposed to be applied to the average daily load for the critical season (June through October) and is proposed to be reported once per year in the October Discharge Monitoring Report. The seasonal average daily load is proposed to be calculated according to this equation:

$$Load = Q_M \times C_M \times CF$$

Where:

Q_M = median daily flow rate (MGD)
C_M = median total phosphorus effluent concentration
CF = unit conversion factor = 3.7854

The TMDL is available on the Ohio EPA, Division of Surface Water website at:
https://epa.ohio.gov/divisions-and-offices/surface-water/reports-data/little-miami-river-watershed

Whole Effluent Toxicity

A lower effluent limit for chronic whole effluent toxicity (WET) in *Ceriodaphnia dubia* is proposed to account for the additional flow.

Other Requirements

Monitoring for all other parameters required by the current permit is proposed to continue in the modified permit. A reasonable potential analysis showed that parameters other than those discussed above would not exceed the water quality standards for the receiving stream.

A new station (1PD00013586) is proposed to be added for monitoring sludge disposal via hauling to a landfill.

Compliance Schedule

New Effluent Limits – a compliance schedule is proposed for the permittee to complete construction of the proposed facility expansion and attain compliance with the new effluent limits by March 1, 2026. See Part I, C for details.

The permittee completed several schedule of compliance items under the current permit. In Part I,C, items A, B.2, D.2 and E.1.a have been marked complete.

Figure 1. Location of Wilmington WWTP.

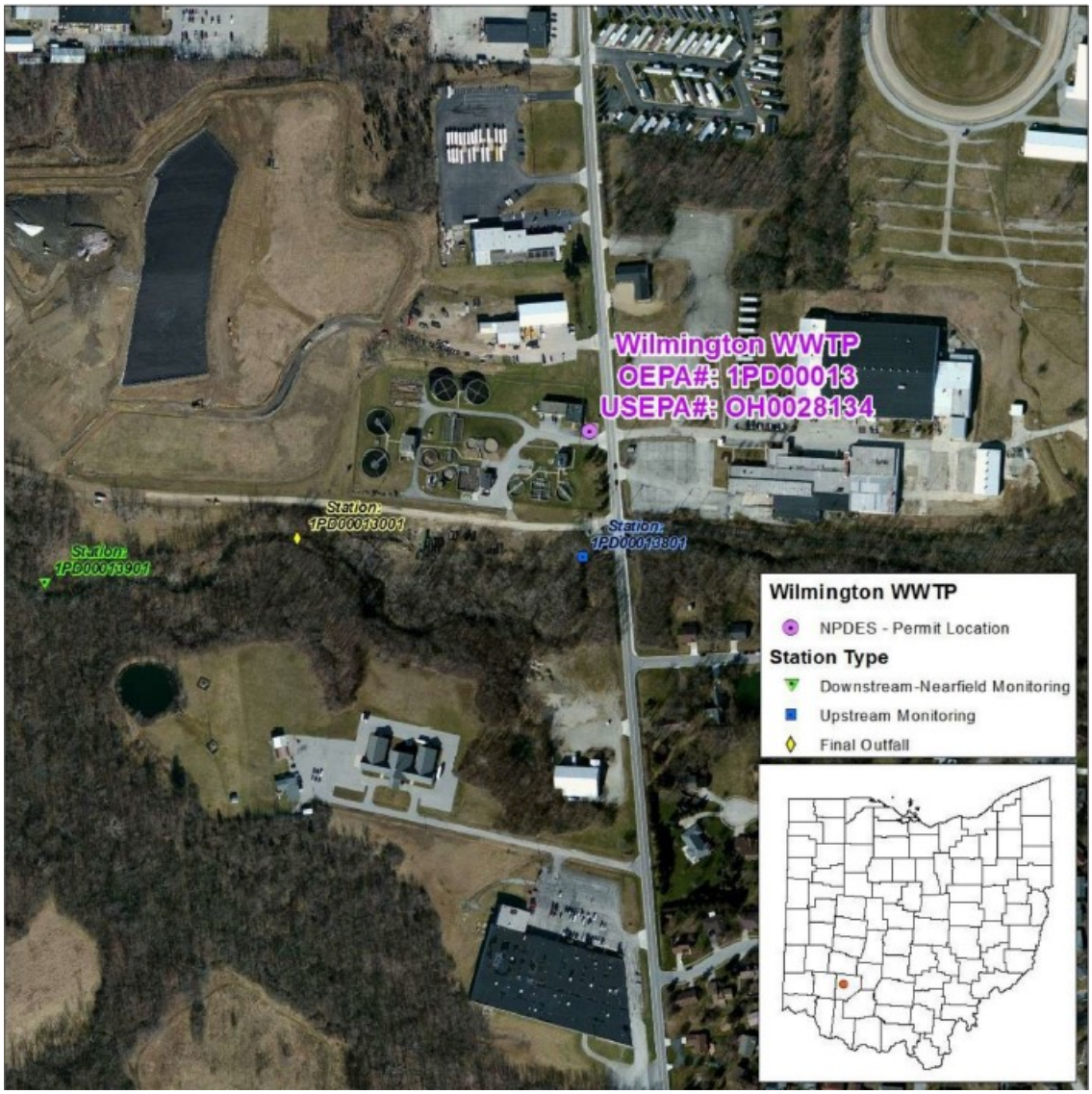

Figure 2. Diagram of Wilmington WWTP.

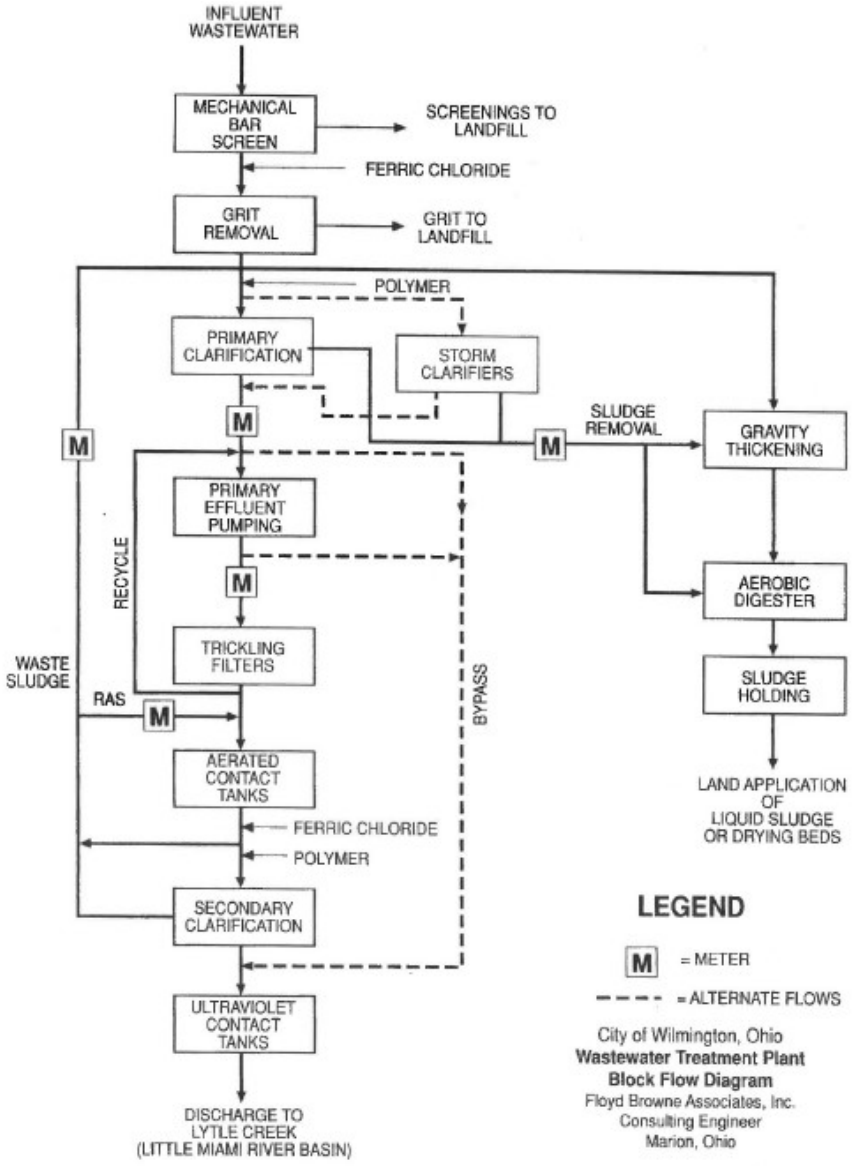

Figure 3. Diagram of proposed Wilmington WWTP.

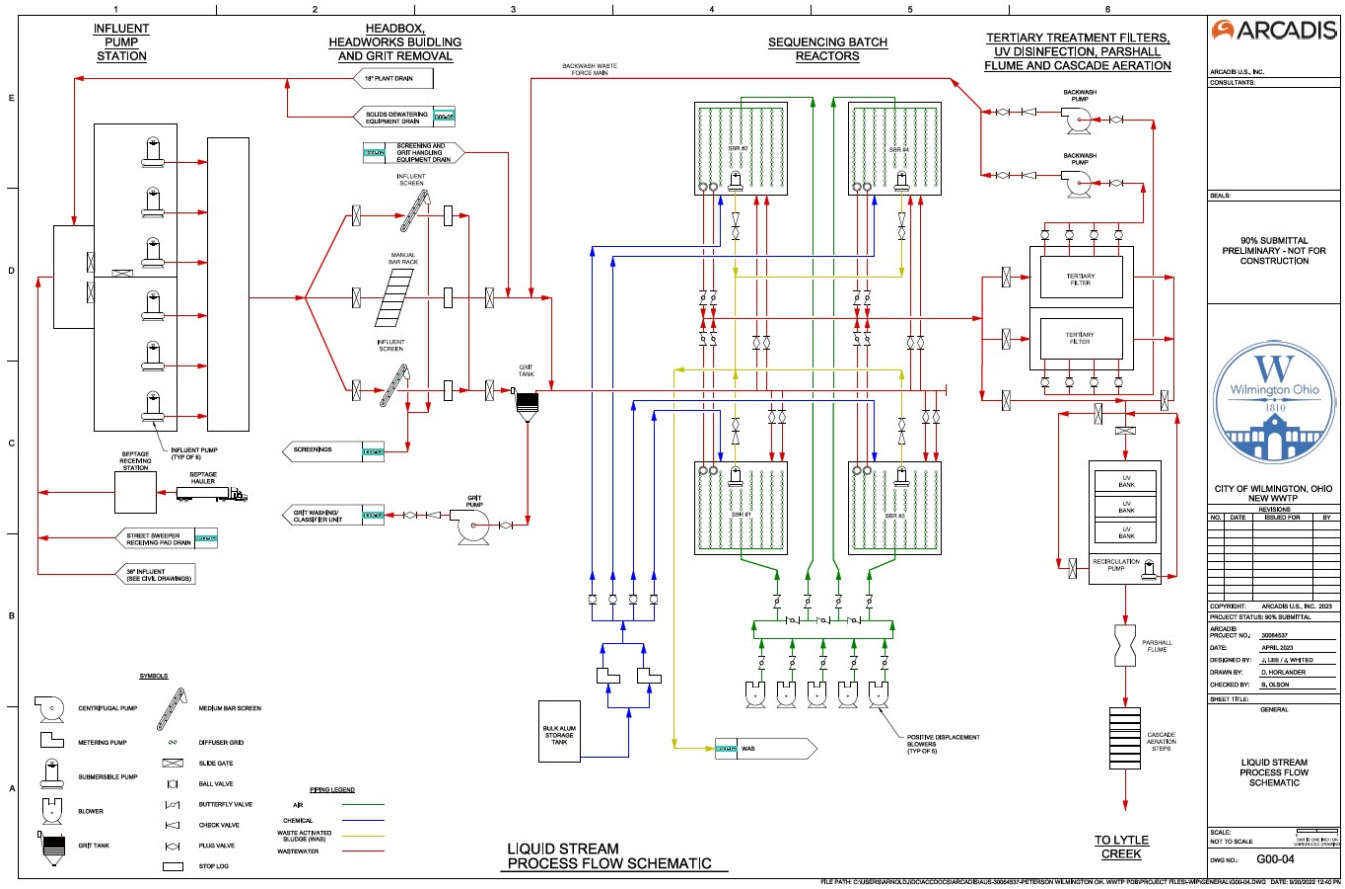

Table 1. Modified Effluent Limits for Outfall 001 – Final

Parameter	Units	Concentration		Loading (kg/day)[a]		Basis[b]
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Water Temperature	°C	- - - - - - - - - - - Monitor - - - - - - - - - - -				M[c]
Dissolved Oxygen	mg/L	-	6.0[e]	-	-	BADCT
Total Suspended Solids	mg/L	12	18[d]	204	306[d]	BADCT
Oil & Grease	mg/L	-	10	-	-	WQS
Ammonia, Summer	mg/L	1.0	1.5[d]	17	25.5[d]	BADCT
Ammonia, Winter	mg/L	1.53	2.35[d]	26	40[d]	PD
Total Kjeldahl Nitrogen	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Nitrate+Nitrite	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Phosphorus, Seasonal[f]	mg/L	0.67	1.0[d]	11.4	17[d]	PD
Orthophosphate, Dissolved	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				PMR
Iron	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Selenium	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Zinc	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Thallium	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				RP
Barium	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Nickel	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Silver	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Zinc	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Cadmium	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Lead	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Chromium	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Copper	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Hex. Chromium (dissolved)	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
E. coli	#/100 ml	126	284[d]	-	-	WQS
Flow Rate	MGD	- - - - - - - - - - - Monitor - - - - - - - - - - -				M[c]
Mercury	ng/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Cyanide, Free	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Phosphorus, T. Seasonal[f]	kg/day	-	8.5[g]	-	-	TMDL/BTJ
Acute Toxicity						
Ceriodaphnia dubia	TU_a	- - - - - - - - - - - Monitor - - - - - - - - - - -				WET1
Pimephales promelas	TU_a	- - - - - - - - - - - Monitor - - - - - - - - - - -				WET1
Chronic Toxicity						
Ceriodaphnia dubia	TU_c	1.08	-	-	-	WET2
Pimephales promelas	TUc	- - - - - - - - - - - Monitor - - - - - - - - - - -				WET1
pH	SU	6.5 - 9.0		-	-	WQS
Total Filterable Residue	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Carbonaceous Biochemical Oxygen Demand (5 day)	mg/L	10	15[d]	170	255.5[d]	BADCT

[a] Effluent loadings based on average design discharge flow of 4.5 MGD.

[b] Definitions:

BADCT = Best Available Demonstrated Control Technology, 40 CFR Part 122.29, and OAC 3745-1-05
M = Division of Surface Water NPDES Permit Guidance 1: Monitoring frequency requirements for Sanitary Discharges
PD = Plant Design (OAC 3745-33-05(E))
PMR=Phosphorus Monitoring Requirements at OAC 6111.03
RP = Reasonable Potential for requiring monitoring requirements in permits (OAC 3745-33-07(A))
TMDL = Total Maximum Daily Load
WET1 = Minimum testing requirements for whole effluent toxicity [OAC 3745-33-07(B)(11)] toxicity in NPDES permits [OAC 3745-33-07(B)]
WET2 = Reasonable potential for requiring water quality-based effluent limits and monitoring requirements for whole effluent toxicity in NPDES permits [OAC 3745-33-07(B)]
WQS = Ohio Water Quality Standards (OAC 3745-1)

[c] Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.

[d] 7 day average limit.

[e] Minimum.

[f] Seasonal months are June 1 – October 31.

[g] Calculation for the seasonal loading in kg shall be as follows: [median daily effluent flow (MGD) for the seasonal months applicable] x [median total phosphorus concentration (mg/L) for the seasonal months applicable] x 3.7854.