National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

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

Public Notice No.: 21-03-049
Public Notice Date: March 31, 2021
Comment Period Ends: May 1, 2021

Ohio EPA Permit No.: 2PC00001*OD
Application No.: OH0020125

Name and Address of Applicant:
Board of Commissioners
Erie County
P.O. Box 370
Huron, OH 44839

Name and Address of Facility Where Discharge Occurs:
Huron Basin WWTP
554 River Road
Huron, OH 44839
Erie County

Receiving Water: Huron River

Subsequent Stream Network: Lake Erie

INTRODUCTION

Development of a Fact Sheet for NPDES permits is mandated by Title 40 of the Code of Federal Regulations (CFR), 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 (Ohio EPA), 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 (CWA) and Ohio Water Pollution Control Law (Ohio Revised Code [ORC] 6111). Decisions to award variances to Water Quality Standards (WQS) 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.

SUMMARY OF PERMIT CONDITIONS

The effluent limits and monitoring requirements proposed for the following parameters are the same as in the previous permit, although some monitoring frequencies have changed: water temperature, dissolved oxygen, total suspended solids (TSS), oil and grease (O&G), ammonia, nitrate plus nitrite, total phosphorus, nickel, zinc, cadmium, lead, chromium, copper, *Escherichia coli(E. coli)*, flow rate, total chlorine residual, pH, total filterable residue, five-day carbonaceous biochemical oxygen demand ($CBOD_5$).

New water-quality-based limits are needed for free cyanide because this parameter falls into group 5 of the Parameter Assessment in the WLA for Huron Basin WWTP and has the reasonable potential to contribute to exceedances of WQS. Monthly and daily maximum limits to protect numeric water quality criteria are proposed for free cyanide.

Lower water quality based effluent limits are proposed for summer ammonia-nitrogen based on the wasteload allocation results.

In accordance with OAC 3745-33-07, it has been determined that the effluent from Huron Basin WWTP shows chronic toxicity for *P. promelas*. A limit of 1.43 TUc is proposed for *P. promelas*. Based on past data and best technical judgement, it is expected that the facility is able to comply with limits immediately. Chronic toxicity monitoring with the determination of acute endpoint for *P. promelas* is proposed at an increased frequency of twice annually.

The effluent from Huron Basin WWTP shows no acute toxicity and no chronic toxicity for *Ceriodaphnia dubia*. Annual monitoring is proposed for the life of the permit for *C. dubia*. This satisfies the minimum testing requirements of Ohio Administrative Code (OAC) 3754-33-07(B)(11).

Monitoring for E. coli at upstream monitoring station 801 and downstream monitoring station 901 is proposed to change from summer to June-August and from monthly to once every two weeks. The higher frequency over a shorter period will facilitate impairment assessments in the receiving stream.

New monitoring is proposed for selenium because of reasonable potential to exceed water quality standards.

New monitoring is proposed for total kjeldahl nitrogen to maintain a nutrient dataset for future total maximum daily load studies.

A mercury variance renewal is being granted that includes a pollution minimization program (PMP) and a proposed lower monthly limit of 1.8 ng/L.

A schedule of compliance for connecting Mittawanga-Ruggle Beach sewer improvements will be carried over from the previous permit compliance schedule and will be included in Part I.C of the permit.

This permit no longer authorizes the use of method 4500 CN-I from Standard Methods for free cyanide testing. Currently there are three approved methods for free cyanide listed in 40 CFR 136 that have a quantification level lower than any water quality-based effluent limits: ASTM D7237-10, OIA-1677-09, and ASTM D4282-02. (Note: The use of ASTM D4282-02 requires supporting documentation that it meets the requirement of a "sufficiently sensitive" test procedure as defined in 40 CFR 122.44(i)(1)(iv)).

The frequency of biomonitoring for *P. promelas* at station 801 is proposed to increase to match the frequency of whole effluent testing for *P. promelas* at Outfall 001.

To ensure that data is obtained that allows Ohio EPA to make water quality-related decisions regarding cadmium and lead, a special condition is proposed in Part II of the permit that provides guidance on the analytical method detection limits (MDLs) the permittee should use in analyzing for these contaminants.

In Part II of the permit, special conditions are included that address sanitary sewer overflow (SSO) reporting; operator certification, minimum staffing and operator of record; whole effluent toxicity (WET) testing; storm water compliance; tracking language; mercury variance; and outfall signage.

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PROCEDURES FOR PARTICIPATION IN THE FORMULATION OF FINAL DETERMINATIONS

The draft action shall be issued as a final action unless the Director revises the draft after consideration of the record of a public meeting or written comments, or upon disapproval by the Administrator of the U.S. Environmental Protection Agency.

Within thirty days of the date of the Public Notice, any person may request or petition for a public meeting for presentation of evidence, statements or opinions. The purpose of the public meeting is to obtain additional evidence. Statements concerning the issues raised by the party requesting the meeting are invited. Evidence may be presented by the applicant, the state, and other parties, and following presentation of such evidence other interested persons may present testimony of facts or statements of opinion.

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
P.O. Box 1049
Columbus, Ohio 43216-1049

Interested persons are invited to submit written comments upon the discharge permit. 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 Processing Unit
P.O. Box 1049
Columbus, Ohio 43216-1049

The Ohio EPA 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.

For additional information about this fact sheet or the draft permit, contact Justin Williams, (419) 373–3022, Justin.Williams@epa.ohio.gov.

INFORMATION REGARDING CERTAIN WATER QUALITY BASED EFFLUENT LIMITS

This draft permit may contain proposed water-quality-based effluent limits (WQBELs) for parameters that **are not** priority pollutants. (See the following link for a list of the priority pollutants: http://epa.ohio.gov/portals/35/pretreatment/Pretreatment_Program_Priority_Pollutant_Detection_Limits.pdf .) In accordance with ORC 6111.03(J)(3), the Director established these WQBELs after considering, to the extent consistent with the Federal Water Pollution Control Act, evidence relating to the technical feasibility and economic reasonableness of removing the polluting properties from those wastes and to evidence relating to conditions calculated to result from that action and their relation to benefits to the people of the state and to accomplishment of the purposes of this chapter. This determination was made based on data and information

available at the time the permit was drafted, which included the contents of the timely submitted NPDES permit renewal application, along with any and all pertinent information available to the Director.

This public notice allows the permittee to provide to the Director for consideration during this public comment period additional site-specific pertinent and factual information with respect to the technical feasibility and economic reasonableness for achieving compliance with the proposed final effluent limitations for these parameters. The permittee shall deliver or mail this information to:

Ohio Environmental Protection Agency
Attention: Division of Surface Water
Permits Processing Unit
P.O. Box 1049
Columbus, Ohio 43216-1049

Should the applicant need additional time to review, obtain or develop site-specific pertinent and factual information with respect to the technical feasibility and economic reasonableness of achieving compliance with these limitations, a written request for any additional time shall be sent to the above address no later than 30 days after the Public Notice Date on Page 1.

Should the applicant determine that compliance with the proposed WQBELs for parameters other than the priority pollutants is technically and/or economically unattainable, the permittee may submit an application for a variance to the applicable WQS used to develop the proposed effluent limitation in accordance with the terms and conditions set forth in OAC 3745-1-38. The permittee shall submit this application to the above address no later than 30 days after the Public Notice Date.

Alternately, the applicant may propose the development of site-specific WQS pursuant to OAC 3745-1-39. The permittee shall submit written notification regarding their intent to develop site specific WQS for parameters that are not priority pollutants to the above address no later than 30 days after the Public Notice Date.

LOCATION OF DISCHARGE/RECEIVING WATER USE CLASSIFICATION

Huron Basin WWTP discharges to Huron River at River Mile 0.81. Figure 1 shows the approximate location of the facility.

This segment of the Huron River is described by Ohio EPA River Code: 12-001, Hydrologic Unit Code: 04100012-06-06 County: Erie, Ecoregion: Huron/Erie Lake Plain Ecoregion. The Huron River is designated for the following uses under Ohio's WQS (OAC 3745-1-19): Warmwater Habitat, Seasonal Salmonid Habitat, 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

Huron Basin WWTP was constructed in 1985 and last upgraded in 2005. The average design flow is 2.0 million gallons per day (MGD), and the peak hydraulic capacity is 5.5 MGD. Huron Basin WWTP serves the eastern two-thirds of the Huron Basin service area or approximately 5,000 people. Huron Basin WWTP has the following treatment processes which are shown on Figure 2:

- Bar Screens;
- Grit Removal;
- Communition;
- Pre-Aeration;
- Primary Sedimentation;
- Alum Addition;
- Rotating Biological Contactors (RBCs);
- Secondary Clarification;
- Chlorination; and
- Dechlorination.

The Huron Basin service area has 100% separated sewers in the collection system.

The Huron Basin service area does not have an approved pretreatment program. The Huron Basin service area has two categorical users. Both industrial users are monitored under indirect discharge permits. Both industrial users have the potential to discharge surfactants. Surfactants can cause foaming issues at WWTPs and the Huron Basin WWTP has experienced foaming issues, both within the WWTP and at its final outfall. The Huron Basin WWTP has been working with both industrial users to reduce the instances of foaming at the WWTP.

Huron Basin WWTP utilizes the following sewage sludge treatment processes:

- Anaerobic Digestion
- Digester Gas Utilization

Currently, treated sewage sludge is land applied as a Class B product or transferred to another NPDES permit holder as an emergency backup. Erie County plans to submit a Permit to Install application to install new sewage sludge dewatering equipment. Once the new sewage sludge dewatering equipment is installed and operational, Erie County will then dispose of its sewage sludge in a municipal landfill and plans to discontinue land application.

DESCRIPTION OF EXISTING DISCHARGE

Huron Basin WWTP had several effluent violations which are shown on Table 2 These violations were most likely caused by biosolids handling issues. These violations will be addressed with the installation and operation of the new biosolids centrifuge.

Huron Basin WWTP has an estimated infiltration/inflow (I/I) rate of 0.15 MGD and is monitoring flow rates at select locations throughout sewershed to investigate I/I problem areas. The average annual effluent flow rate for Huron Basin WWTP for the previous five years is presented on Table 3.

Huron Basin WWTP reports SSOs at station 300. No SSOs were reported over the past five years.

Table 5 presents chemical specific data compiled from data collected by Ohio EPA and from the NPDES application.

Table 6 presents a summary of unaltered Discharge Monitoring Report (DMR) data. Data are presented for the period June 2015 thru January 2020, and current permit limits are provided for comparison.

Table 7 summarizes the chemical specific data for outfall 001 by presenting the average and maximum PEQ values.

Table 8 summarizes the results of acute and chronic WET tests of the final effluent.

ASSESSMENT OF IMPACT ON RECEIVING WATERS

Pursuant to Section 303(d) of the Clean Water Act, each state is required to develop and submit a list to US EPA of its impaired and threatened waters (e.g. stream/river segments, lakes). For each water on the list, the state identifies the pollutant(s) causing the impairment, when known. The Huron River-Frontal Lake Erie watershed assessment unit, which includes the Huron River in the vicinity of Huron Basin WWTP, is listed as impaired for human health on Ohio's 303(d) list due to PCBs in fish tissue. The recreation and aquatic life impairment status

was removed for the assessment unit in the 2018 Ohio Integrated Water Quality Monitoring and Assessment Report with new data showing that water quality standards are in attainment for recreation and aquatic life.

The Total Maximum Daily Load (TMDL) program focuses on identifying and restoring polluted rivers, streams, lakes and other surface water bodies. A TMDL is a written, quantitative assessment of water quality problems in a water body and contributing sources of pollution. It specifies the amount a pollutant needs to be reduced to meet water quality standards (WQS), allocates pollutant load reductions, and provides the basis for taking actions needed to restore a water body. A Total Daily Maximum Load (TMDL) report was approved for the Huron River in September 2005

An assessment of the impact of a permitted point source on the immediate receiving waters includes an evaluation of the available chemical/physical, biological, and habitat data which have been collected by Ohio EPA pursuant to the Five-Year Basin Approach for Monitoring and NPDES Reissuance. Other data may be used provided it was collected in accordance with Ohio EPA methods and protocols as specified by the Ohio WQS and Ohio EPA guidance documents. Other information which may be evaluated includes but is not limited to: NPDES permittee self-monitoring data; effluent and mixing zone bioassays conducted by Ohio EPA, the permittee, or U.S. EPA.

In evaluating this data, Ohio EPA attempts to link environmental stresses and measured pollutant exposure to the health and diversity of biological communities. Stresses can include pollutant discharges (permitted and unpermitted), land use effects, and habitat modifications. Indicators of exposure to these stresses include whole effluent toxicity tests, fish tissue chemical data, and fish health biomarkers (for example, fish blood tests).

Use attainment is a term which describes the degree to which environmental indicators are either above or below criteria specified by the Ohio WQS (OAC 3745-1). Assessing use attainment status for aquatic life uses primarily relies on the Ohio EPA biological criteria (OAC 3745-1-07; Table 7-1). These criteria apply to rivers and streams outside of mixing zones. Numerical biological criteria are based on measuring several characteristics of the fish and macroinvertebrate communities; these characteristics are combined into multimetric biological indices including the Index of Biotic Integrity and modified Index of Well-Being, which indicate the response of the fish community, and the Invertebrate Community Index, which indicates the response of the macroinvertebrate community. Numerical criteria are broken down by ecoregion, use designation, and stream or river size. Ohio has five ecoregions defined by common topography, land use, potential vegetation and soil type.

Three attainment status results are possible at each sampling location -full, partial, or non-attainment. Full attainment means that all of the applicable indices meet the biocriteria. Partial attainment means that one or more of the applicable indices fails meet the biocriteria. Nonattainment means that either none of the applicable indices meet the biocriteria or one of the organism groups indicates poor or very poor performance. An aquatic life use attainment table is constructed based on the sampling results and is arranged from upstream to downstream and includes the sampling locations indicated by river mile, the applicable biological indices, the use attainment status (i.e., full, partial, or non), the Qualitative Habitat Evaluation Index, and comments and observations for each sampling location.

The most recent integrated report list Huron River impaired for Human Health due to the PCBs. It is not likely that the Huron Basin WWTP is contributing to the impairment.

The 2018 integrated report indicates that the Huron River is in attainment for aquatic life and recreation. This is an improvement over what was observed in the 2005 Huron River TMDL report. In 2016 a follow up study was completed for the Huron River, *Biological and Water Quality Study of Huron River Basin 2016*. The results of the 2016 sampling provided data to show that the recreation and aquatic life uses were now in attainment. In the

future, the Ohio EPA will update the Huron River TMDL based on the 2016 study results. The 2016 water quality report states the following regarding the observed improvements.

"Aggregated community performance and summary statistics for each of the field years are provided in Figure 16. These data clearly portray the positive trajectory of the fish assemblages within the Huron River study area through time. Among the selected basin-wide stations employed to this purpose, results from the mid-1980s found nearly half impaired, with the lower end of the distribution well within the poor range at that time. Results from 1998 survey indicated considerable improvement, as nearly 75 percent of these sites supported fish community consistent with the minimum biocriteria, and of these, just under half exceeded it. The most recent results (2016) found the subset of sites to support a mix of WWH and EWH communities. Although aggregated trends analysis for the East and West branches did not include data prior to 1998, it yielded similar findings, namely considerable improvement through time. Between 1998 and 2016, the East and West branches recruited fish assemblages fully consistent with WWH biocriteria. In fact, conditions have so improved that much of the West Branch Huron River presently supports fully exceptional communities. A similar high degree of recovery was evident at selected locations on the East Branch."

The TMDL is available through the Ohio EPA, Division of Surface Water website at:
http://epa.ohio.gov/dsw/tmdl/HuronVermilionRivers.aspx

The 2016 background water quality report for the Huron River is available through the Ohio EPA, Division of Surface Water website at:
https://epa.ohio.gov/Portals/35/tmdl/TSD/Huron%20River%20Watershed%202016/2016_Huron%20River_TSD_Final_Web.pdf?ver=2020-01-10-120642-633

The full Integrated Report is available through the Ohio EPA, Division of Surface Water website at:
https://epa.ohio.gov/dsw/tmdl/OhioIntegratedReport

DEVELOPMENT OF WATER-QUALITY-BASED EFFLUENT LIMITS

Determining appropriate effluent concentrations is a multiple-step process in which parameters are identified as likely to be discharged by a facility, evaluated with respect to Ohio water quality criteria, and examined to determine the likelihood that the existing effluent could violate the calculated limits.

Parameter Selection

Effluent data for the Huron Basin WWTP were used to determine what parameters should undergo WLA. The parameters discharged are identified by the data available to Ohio EPA, DMR data submitted by the permittee, compliance sampling data collected by Ohio EPA, and any other data submitted by the permittee, such as priority pollutant scans required by the NPDES application or by pretreatment, or other special conditions in the NPDES permit. The sources of effluent data used in this evaluation are as follows:

Self-monitoring data (DMR)	June 2015 through January 2020
Ohio EPA compliance sampling data	2018
NPDES Application Data	2020

Statistical Outliers and Other Non-representative Data

The data were examined, and no values were removed from the evaluation.

This data is evaluated statistically, and PEQ values are calculated for each pollutant. Average PEQ (PEQ_{avg}) values represent the 95th percentile of monthly average data, and maximum PEQ (PEQ_{max}) values represent the 95th percentile of all data points (see Table 7).

The PEQ values are used according to Ohio rules to compare to applicable WQS and allowable WLA values for each pollutant evaluated. Initially, PEQ values are compared to the applicable average and maximum WQS. If both PEQ values are less than 25 percent of the applicable WQS, the pollutant does not have the reasonable potential to cause or contribute to exceedances of WQS, and no WLA is done for that parameter. If either PEQ_{avg} or PEQ_{max} is greater than 25 percent of the applicable WQS, a WLA is conducted to determine whether the parameter exhibits reasonable potential and needs to have a limit or if monitoring is required (see Table 9).

Wasteload Allocation

For those parameters that require a WLA, the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. Dischargers are allocated pollutant loadings/concentrations based on the Ohio WQS (OAC 3745-1). Most pollutants are allocated by a mass-balance method because they do not break down in the receiving water. For free-flowing streams, WLAs using this method are done using the following general equation: Discharger WLA = (downstream flow x WQS) - (upstream flow x background concentration). Discharger WLAs are divided by the discharge flow so that the allocations are expressed as concentrations.

The applicable waterbody uses for this facility's discharge and the associated stream design flows are as follows:

Aquatic life (Warmwater Habitat)		
Toxics (metals, organics, etc.)	Average	Annual 7Q10
	Maximum	Annual 1Q10
Ammonia	Average	Summer 30Q10
		Winter 30Q10
Wildlife		Annual 90Q10
Agricultural Water Supply		Harmonic mean flow
Human Health (nondrinking)		Harmonic mean flow

Allocations are developed using a percentage of stream design flow as specified in Table 10, and allocations cannot exceed the Inside Mixing Zone Maximum (IMZM) criteria.

The data used in the WLA are listed in Table 9 and Table 10. The WLA results to maintain all applicable criteria are presented in Table 11.

Whole Effluent Toxicity Wasteload Allocation

WET is the total toxic effect of an effluent on aquatic life measured directly with a toxicity test. Acute WET measures short term effects of the effluent while chronic WET measures longer term and potentially more subtle effects of the effluent.

WQS for WET are expressed in Ohio's narrative "free from" WQS rule [OAC 3745-1-04(D)]. These "free froms" are translated into toxicity units (TUs) by the associated WQS Implementation Rule (OAC 3745-2-09). WLAs can then be calculated using TUs as if they were water quality criteria.

The WLA calculations for WET are similar to those for aquatic life criteria - using the chronic toxicity unit (TU_c) and 7Q10 flow for the average and the acute toxicity unit (TU_a) and 1Q10 flow for the maximum. These values are the levels of effluent toxicity that should not cause instream toxicity during critical low-flow conditions. For Huron Basin WWTP, the WLA values are 0.7 TU_a and 1.43 TU_c.

The chronic toxicity unit (TU_c) is defined as 100 divided by the estimate of the effluent concentration which causes a 25% reduction in growth or reproduction of test organisms (IC_{25}):

$$TU_c = 100/IC_{25}$$

This equation applies outside the mixing zone for warmwater, modified warmwater, exceptional warmwater, coldwater, and seasonal salmonid use designations except when the following equation is more restrictive (*Ceriodaphnia dubia* only):

TU_c = 100/geometric mean of No Observed Effect Concentration and Lowest Observed Effect Concentration

The acute toxicity unit (TU_a) is defined as 100 divided by the concentration in water having 50% chance of causing death to aquatic life (LC_{50}) for the most sensitive test species:

$$TU_a = 100/LC_{50}$$

This equation applies outside the mixing zone for all designated waters.

When the acute WLA is less than 1.0 TU_a, it may be defined as:

Dilution Ratio (downstream flow to discharger flow)	Allowable Effluent Toxicity (percent effects in 100% effluent)
up to 2 to 1	30
greater than 2 to 1 but less than 2.7 to 1	40
2.7 to 1 to 3.3 to 1	50

$$\text{Stream Dilution Ratio} = \frac{1Q10 + [\text{WWTP flow rate}]}{[\text{WWTP flow rate}]} = \frac{4.48 \text{ cfs} + 3.094 \text{ cfs}}{3.094 \text{ cfs}} = 2.45$$

The acute WLA for Huron Basin WWTP is 40 percent mortality in 100 percent effluent based on the dilution ratio of 2.45 to 1.

REASONABLE POTENTIAL/EFFLUENT LIMITS/MANAGEMENT DECISIONS

After appropriate effluent limits are calculated, the reasonable potential of the discharger to violate the WQS must be determined. Each parameter is examined and placed in a defined "group". Parameters that do not have a WQS or do not require a WLA based on the initial screening are assigned to either group 1 or 2. For the allocated parameters, the preliminary effluent limits (PEL) based on the most restrictive average and maximum WLAs are selected from Table 11. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 7, and the PEL_{max} is compared to the PEQ_{max}. Based on the calculated percentage of the allocated value [($PEQ_{avg} \div PEL_{avg}$) X 100, or ($PEQ_{max} \div PEL_{max}$) X 100)], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 12.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 13 presents the final effluent limits and monitoring requirements proposed for Huron Basin WWTP outfall 001 and the basis for their recommendation. Unless otherwise indicated, the monitoring frequencies proposed in the permit are continued from the existing permit.

Flow Rate, Water Temperature, and Ammonia (Winter)

Monitoring for flow rate, water temperature, and winter ammonia is proposed to continue in order to evaluate the performance of the treatment plant.

Ammonia (Summer)
The current ammonia limits have been evaluated using the WLA procedures and the summer limit it is not protective of WQS for ammonia toxicity. Ammonia limits are based upon downstream temperature and pH values. The 75th percentile of downstream temperature and pH data were calculated from station 901 for data over the previous five years. The applicable water quality criteria decreased from 4.1 mg/L to 3.8 mg/L.

Oil & Grease, pH, E. Coli, and Total Phosphorus
Limits proposed for oil & grease, pH, and *E. coli* are based on WQS (OAC 3745-1-07). Primary contact recreation E. coli standards apply to the Huron River. Total phosphorus is limited based on provisions of OAC 3745-33-06(C).

TSS and $CBOD_5$
The limits recommended for total suspended solids and $CBOD_5$ are technology-based treatment standards included in 40 CFR Part 133, Secondary Treatment Regulation. Secondary treatment is defined by the Best Practicable Waste Treatment Technology criteria, which are minimum standards required of all publicly owned treatment works.

Chlorine
The proposed limit for total residual chlorine is based on WLA as limited by the IMZM. The IMZM is a value calculated to avoid rapidly lethal conditions in the effluent mixing zone. The effluent limit for chlorine at outfall 001 is less than the quantification level of 0.050 mg/L. However, a pollutant minimization program is not required because the dosing rate of dechlorination chemicals ensures that the water quality based effluent limit is being met.

Selenium
The Ohio EPA risk assessment (Table 12) places selenium in group 5, which recommends limits to protect water quality. Using the discretion allowed the Director under OAC 3745-33-07(A)(5), monitoring rather than limits is proposed for this parameter. The PEQ values calculated for selenium (Table 7) may not be representative of its actual levels in the plant effluent since they were based on two data points. The purpose of the proposed monitoring is to collect additional data on the frequency of occurrence and variability of this pollutant in the plant's effluent.

In addition, the selenium actual value falls within 75 percent of the WLA. Parameters from small data sets with values greater than 75 percent of the WLA need a tracking requirement in the permit that specifies reductions in pollutant concentrations if effluent concentrations exceed the WLA. The tracking/reduction requirements are included in Part II of the permit.

Considering the magnitude of the reported values compared to the WLA, a tracking provision is proposed in Part II of the permit that requires the Huron Basin WWTP to notify Ohio EPA if a sample result exceeds the preliminary effluent limit (Table 12). If certain conditions are met, the City is required to take steps to reduce the discharge level of this pollutant.

Total Dissolved Solids
The Ohio EPA risk assessment (Table 12) places total dissolved solids in group 4. This placement, as well as the data in Table 6 and Table 7, support that this parameter does not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring for Group 4 pollutants is required by OAC 3745-33-07(A)(2).

Cadmium, Chromium, Copper, Free Cyanide, Lead, Nickel, and Zinc
The Ohio EPA risk assessment (Table 12) places cadmium, chromium, copper, free cyanide, lead, nickel, and zincin groups 2 and 3. This placement, as well as the data in Table 6 and Table 7, support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring is proposed to document that these pollutants continue to remain at low levels.

Aluminum, Antimony, Arsenic, Barium, Iron, Manganese, and Strontium
The Ohio EPA risk assessment (Table 12) places aluminum, antimony, arsenic, barium, iron, manganese, and strontium in groups 2 and 3. This placement, as well as the data in Table 6 and Table 7, support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. No new monitoring is proposed.

Nitrate+Nitrite and Total Kjeldahl Nitrogen
The continuation of monitoring for nitrate+nitrite in the effluent is proposed based on best technical judgement. Monitoring for nitrate+nitrite at the upstream and downstream stations is also proposed. The purpose of the monitoring is to maintain a data set tracking nutrient levels in the Huron River.

Dissolved Orthophosphate
Monitoring for dissolved orthophosphate (as P) is required by Ohio Senate Bill 1 (ORC 6111.03), which was signed by the Governor on April 2, 2015. Monitoring for orthophosphate will further develop nutrient datasets for dissolved reactive phosphorus that are used in stream and watershed assessments and studies. Because Ohio EPA monitoring, as well as other in-stream monitoring, is taken by grab sample, grab samples are proposed for orthophosphate to maintain consistent data. The grab samples must be filtered within 15 minutes of collection using a 0.45-micron filter. The filtered sample must be analyzed within 48 hours.

Mercury
The Ohio EPA risk assessment (Table 12) places mercury in group 5. The Huron Basin WWTP permit was renewed on July 1, 2011, to include a mercury variance, and variance-based limits for mercury. Based on the monitoring results from June 2015 to January 2020, and the new application information, the Huron Basin WWTP has determined that the facility will not meet the 30-day average permit limit of 1.3 ng/L. However, the effluent data shows that the permittee can meet the mercury annual average value of 12 ng/L. The permittee's application has also demonstrated to the satisfaction of Ohio EPA that there is no readily apparent means of complying with the WQBEL without constructing prohibitively expensive end-of-pipe controls for mercury. Based upon these demonstrations, the Huron Basin WWTP is eligible for the mercury variance under OAC 3745-1-38(J).

Huron Basin WWTP submitted information supporting the renewal of the variance. The permittee implemented a pollutant minimization program to reduce the amount of mercury coming being discharged. The calculation of the PEQ_{avg} value from June 2015 to January 2020 compared to the PEQ_{avg} calculated at the time the original variance was issued shows a reduction from 4.25 ng/L to 1.8 ng/L. The Pollutant Minimization Program (PMP) schedule developed from the original variance continues to be implemented, and further reductions in mercury may be possible.

Ohio EPA has reviewed the mercury variance application and has determined that it meets the requirements of the OAC. A condition in Part II of the NPDES permit lists the provisions of the mercury variance, and includes the following requirements:

- A variance-based monthly average effluent limit of 1.8 ng/L, which was developed from sampling data submitted by the permittee;

- A requirement that the permittee make reasonable progress to meet the WQBEL for mercury by implementing the plan of study, which has been developed as part of the PMP;
- Low-level mercury monitoring of the plant's influent and effluent;
- A requirement that the annual average mercury effluent concentration is less than or equal to 12 ng/L as specified in the plan of study;
- A summary of the elements of the plan of study;
- A requirement to submit an annual report on implementation of the PMP; and
- A requirement for submittal of a certification stating that all permit conditions related to implementing the plan of study and the PMP have been satisfied, but that compliance with the monthly average WQBEL for mercury has not been achieved.

Whole Effluent Toxicity Reasonable Potential

Evaluating the chronic toxicity results for fathead minnows (*Pimephales promelas)* in Table 8 under the provisions of 40 CFR Part 132, Appendix F, Procedure 6, gives a chronic PEQ of 2.73 TU_c. Reasonable potential for toxicity is demonstrated, since this value exceeds the WLA value of 1.43 TU_c. Consistent with Procedure 6 and OAC 3745-33-07(B), a monthly average limit of 1.43 TU_c is proposed. Based on past data and best technical judgement, it is expected that the facility is able to comply with limits immediately. Chronic toxicity monitoring with the determination of acute endpoint for *P. promelas* is proposed at an increased frequency of twice annually.

The acute and chronic toxicity results for *Ceriodaphnia dubia* in Table 8 show that there have been no detections of toxicity. Under the provisions of 40 CFR Part 132, Appendix F, Procedure 6, no PEQ values can be calculated. Reasonable potential for toxicity is not demonstrated. While this indicates that the plant's effluent does not currently pose a toxicity problem, annual toxicity testing with determination of acute endpoints from chronic toxicity monitoring is proposed for the life of the permit for *C. dubia*, consistent with the minimum monitoring requirements at OAC 3754-33-07(B)(11). The proposed monitoring will adequately characterize toxicity in the plant's effluent.

Additional Monitoring Requirements

Monitoring for E. coli at upstream monitoring station 801 and downstream monitoring station 901 is proposed to change from summer to June-August and from monthly to once every two weeks. The higher frequency over a shorter period will facilitate impairment assessments in the receiving stream.

Additional monitoring requirements proposed at the final effluent, influent and upstream/downstream stations are included for all facilities in Ohio and vary according to the type and size of the discharge. In addition to permit compliance, this data is used to assist in the evaluation of effluent quality and treatment plant performance and for designing plant improvements and conducting future stream studies.

Sludge

Limits and monitoring requirements proposed for the disposal of sewage sludge by the following management practices are based on OAC 3745-40: land application, removal to sanitary landfill or transfer to another facility with an NPDES permit.

OTHER REQUIREMENTS

Compliance Schedule

Sanitary Sewer Improvements – The compliance schedule from the previous permit will be carried over and will include a schedule to submit a Permit to Install application(s) and detailed plans to make sewer improvements within the Huron Basin collection system and connect Mittawanga-Ruggles Beach WWTP to the Huron Basin Sewer System. The application(s) and detailed plans shall be submitted to the Ohio EPA Northwest District Office. Details are in Part I.C of the permit.

Sanitary Sewer Overflow Reporting
Provisions for reporting SSOs are again proposed in this permit. These provisions include: the reporting of the system-wide number of SSO occurrences on monthly operating reports; telephone notification of Ohio EPA and the local health department, and 5-day follow up written reports for certain high risk SSOs; and preparation of an annual report that is submitted to Ohio EPA and made available to the public. Many of these provisions were already required under the "Noncompliance Notification", "Records Retention", and "Facility Operation and Quality Control" general conditions in Part III of Ohio NPDES permits.

Operator Certification and Operator of Record
Operator certification requirements have been included in Part II of the permit in accordance with rules effective on August 15, 2018 (OAC 3745-7). These rules require the Huron Basin WWTP to have a Class III wastewater treatment plant operator in charge of the sewage treatment plant operations discharging through outfall 001. These rules also require the permittee to designate one or more operator of record to oversee the technical operation of the treatment works and sewerage system.

In accordance with OAC 3745-7-04, the permittee has requested that Ohio EPA reduce the minimum staffing requirements from 40 hours to 20 hours. Ohio EPA has reviewed the request and determined that the reduced staffing plan should be granted. This permit proposes to continue the approved staffing hour reduction. Any change in the criteria under which the reduced staffing plan was approved (such as enforcement status, history of compliance, or provisions included in the plan) will require that the treatment works immediately return to the minimum staffing requirements included in OAC 3745-7-04(C)(1). The permittee is also required to designate one or more operator of record to oversee the technical operation of the treatment works and sewerage system.

Low-Level Free Cyanide Testing
Currently there are three approved methods for free cyanide listed in 40 CFR 136 that have a quantification level lower than water quality-based effluent limits:

- ASTM D7237-10, OIA-1677-09, and ASTM D4282-02. (Note: The use of ASTM D4282-02 requires supporting documentation that it meets the requirement of a "sufficiently sensitive" test procedure as defined in 40 CFR 122.44(i)(1)(iv)).

These methods will allow Ohio EPA to make more reliable water quality-related decisions regarding free cyanide. Because the quantification levels are lower than any water quality-based effluent limits, it will also be possible to directly evaluate compliance with free cyanide limits.

New NPDES permits no longer authorize the use of method 4500 CN-I from Standard Methods for free cyanide testing.

Method Detection Limit
Part II of the permit includes a condition requiring Huron Basin WWTP to use laboratory analytical methods with an appropriate MDL for cadmium (1 µg/L) and lead (5 µg/L)

Outfall Signage

Part II of the permit includes requirements for the permittee to place and maintain a sign at each outfall to the Huron River providing information about the discharge. Signage at outfalls is required pursuant to OAC 3745-33-08(A).

Part III
Part III of the permit details standard conditions that include monitoring, reporting requirements, compliance responsibilities, and general requirements.

Storm Water Compliance
Parts IV, V, and VI have been included with the draft permit to ensure that any storm water flows from the facility site are properly regulated and managed. As an alternative to complying with Parts IV, V, and VI, the Huron Basin WWTP may seek permit coverage under the general permit for industrial storm water (permit # OHR000006) or submit a "No Exposure Certification." Parts IV, V, and VI will be removed from the final permit if: 1) the Huron Basin WWTP submits a Notice of Intent (NOI) for coverage under the general permit for industrial storm water or submits a No Exposure Certification, 2) Ohio EPA determines that the facility is eligible for coverage under the general permit or meets the requirements for a No Exposure Certification, and 3) the determination by Ohio EPA can be made prior to the issuance of the final permit.

Figure 1. Location of Huron Basin WWTP

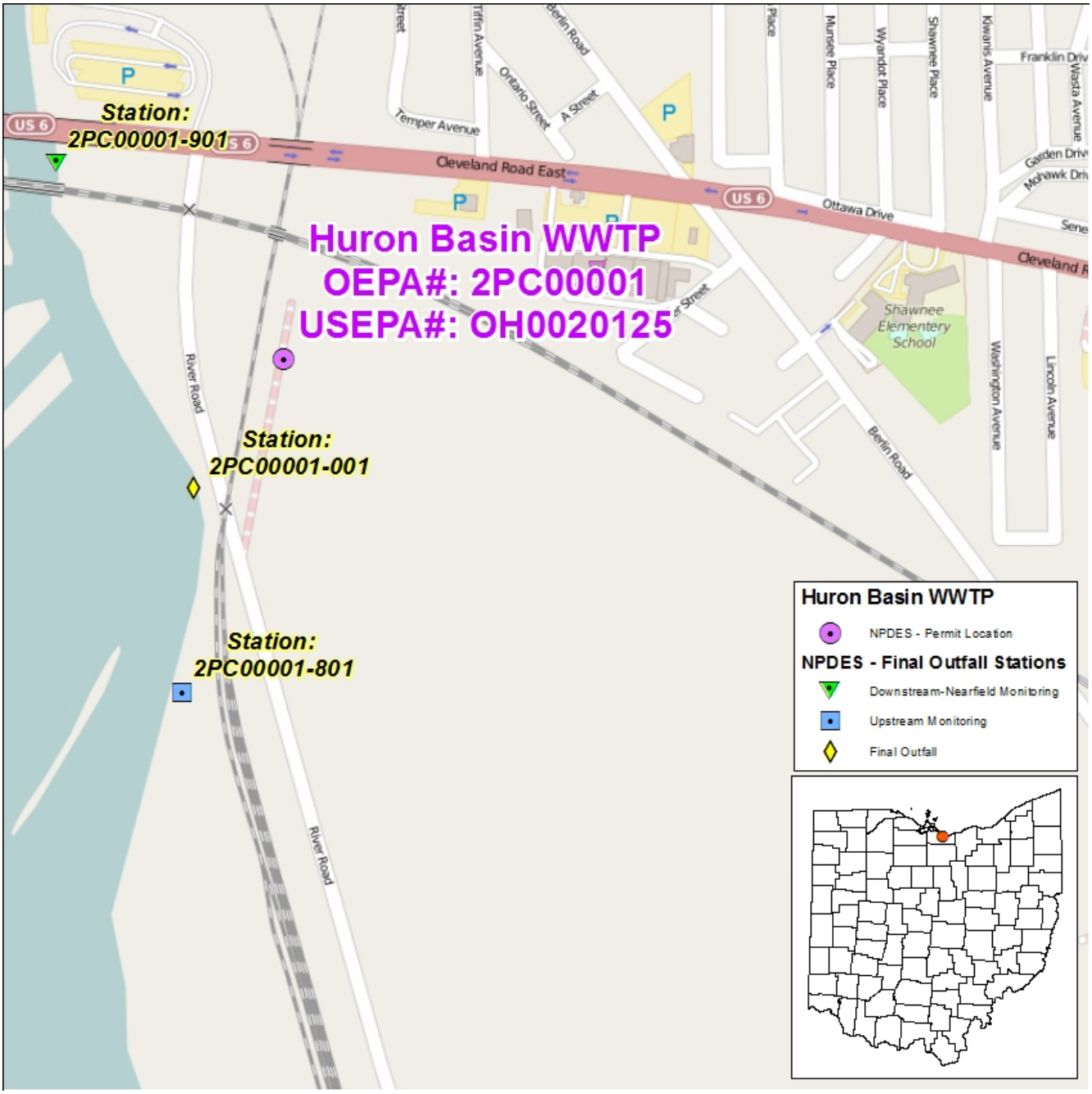
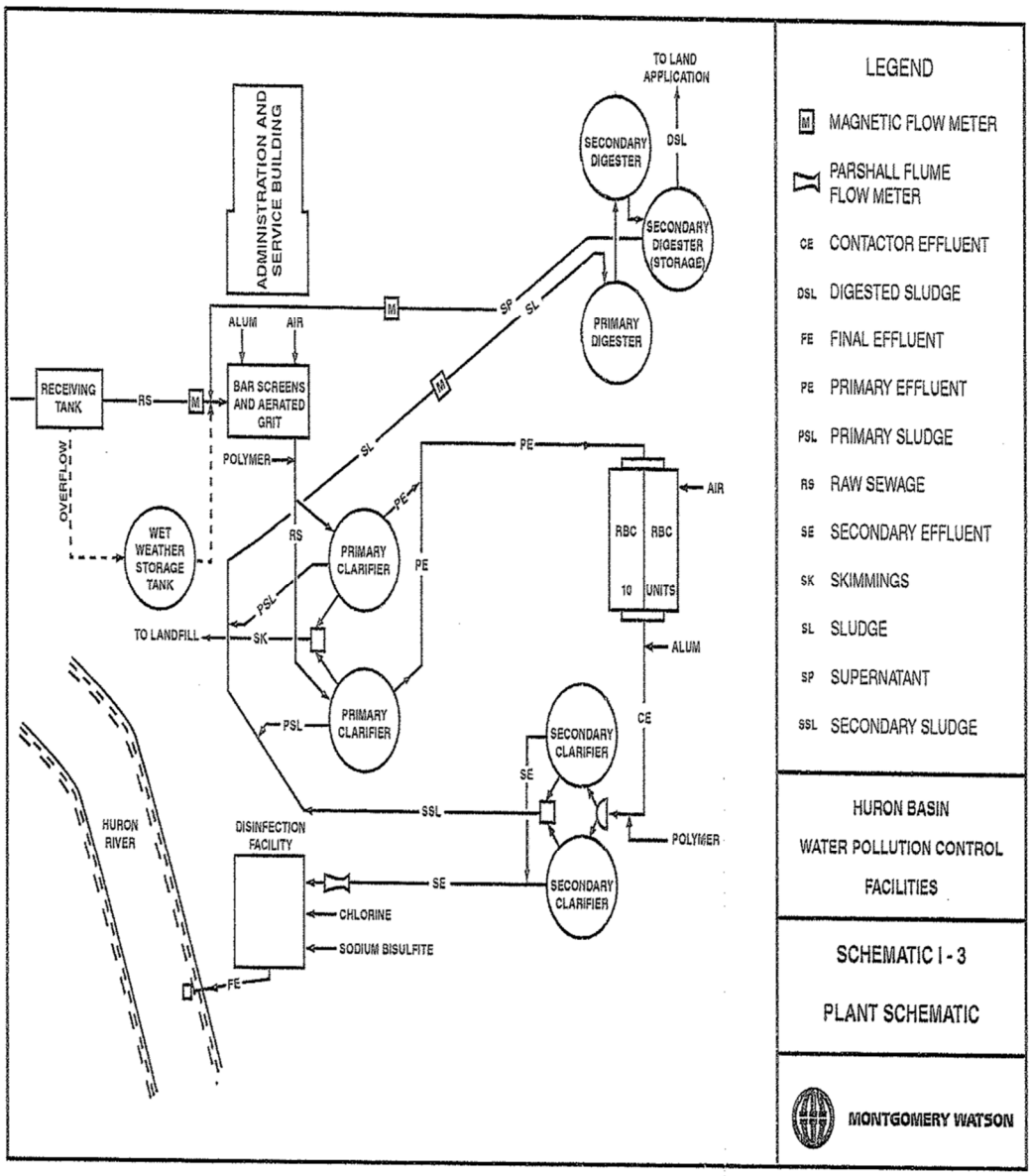


Figure 2. Diagram of Wastewater Treatment System



Huron Basin Water Pollution Control Facilities

Table 1. Sewage Sludge Removal

Year	Dry Tons Removed
2015	241.6
2016	267
2017	334.9
2018	299
2019	283.2

Table 2. Effluent Violations for Outfall 001

PARAMETER	2015	2016	2017	2018	2019
CBOD 5 day	0	0	0	1	0
Mercury, Total (Low Level)	0	1	1	1	1
Nitrogen, Ammonia (NH3)	1	0	1	0	30
Total Suspended Solids	0	0	0	1	0
Total	1	1	2	3	31

Table 3. Average Annual Effluent Flow Rates

Flow Rate (Million Gallons per Day)					
Year	# obs	Average	Median	95th Percentile	Maximum
2015	214	0.91	0.71	1.87	6.38
2016	366	0.84	0.67	1.76	4.67
2017	365	1.01	0.85	1.92	6.16
2018	365	1.25	1.04	2.50	7.26
2019	365	1.31	1.11	2.86	9.88

Table 4. Calculated Phosphorus Compared to Annex 4 Target (2008)

Year	Average Concentration (mg/L)		Annual Average Flow rate (MGD)	Annual Load[b] (kg/yr)	Reduction from 2008 baseline (%)
	Seasonal[a]	Annual			
2008	0.41	0.40	1.13	624	--
2015	0.23	0.20	0.93	257	58.85
2016	0.19	0.15	0.84	174	72.12
2017	0.27	0.29	1.01	404	35.20
2018	0.27	0.24	1.24	411	34.16
2019	0.54	0.43	1.31	778	-24.62

[a]April-October
[b] Calculated using monthly average concentrations and monthly average flow rates

MGD = million gallons per day

Table 5. Effluent Characterization Using Ohio EPA data and NPDES application data

Parameter	Units	7/31/18	10/4/2018	1/9/2020	1/10/2020	1/14/2020
Aluminum	µg/L	66.8	119	NT	NT	NT
Antimony	µg/L	0.418	AA (0.346)	AA (11)	AA (11)	AA (11)
Arsenic	µg/L	3.23	3.42	AA (3)	AA (3)	AA (3)
Barium	µg/L	12.1	29.7	NT	NT	NT
Cadmium	µg/L	AA (0.061)	AA (0.061)	AA (0.4)	AA (0.4)	AA (0.4)
Chromium	µg/L	0.82	1.01	AA (1)	AA (1)	AA (1)
Copper	µg/L	4.45	4.91	AA (1)	AA (1)	AA (1)
Iron	µg/L	135	157	NT	NT	NT
Lead	µg/L	AA (0.251)	AA (0.251)	AA (3)	AA (3)	AA (3)
Magnesium	mg/L	18	23.7	NT	NT	NT
Manganese	µg/L	25.3	29.8	NT	NT	NT
Nickel	µg/L	4.86	5.68	12	12	AA (2)
Selenium	µg/L	1.4	3.43	AA (12)	AA (12)	AA (12)
Total Dissolved Solids	mg/L	814	1350	NT	NT	NT
Total Phenols	µg/L	NT	NT	11.6	15.1	AA (10)
Strontium	µg/L	267	380	NT	NT	NT
Zinc	µg/L	10.1	9.25	15	14	16

AA = not detected (analytical method detection limit)
NT= not tested

Table 6. Effluent Characterization Using Self-Monitoring Data

Parameter	Unit	Current Limits		# Obs	Percentiles		Data Range
		30 Day	Daily		50th	95th	
Water Temperature	°C	Monitoring Only		1651	16	23	6 - 24
Dissolved Oxygen	mg/L	--	5.0[m]	1651	6.5	5.3*	5 - 11.4
Total Suspended Solids	kg/day	227	341[w]	660	7.08	39.7	0 - 1320
Total Suspended Solids	mg/L	30	45[w]	660	2	6	0 - 48
Oil and Grease	mg/L	--	10	55	--	--	< 5
Nitrogen, Ammonia - Summer	kg/day	31.0	46.9[w]	348	3.01	54.8	0 - 145
Nitrogen, Ammonia - Summer	mg/L	4.1	6.2[w]	348	.9	12.2	0 - 29.2
Nitrogen, Ammonia - Winter	mg/L	Monitoring Only		312	1.7	13.9	0 - 39.6
Nitrite Plus Nitrate, Total	mg/L	Monitoring Only		55	22.8	33.2	11.1 - 47.7
Phosphorus, Total	kg/day	7.57	11.4[w]	56	.713	2.61	0 - 3.69
Phosphorus, Total	mg/L	1.0	1.5[w]	56	.215	.65	0 - 1.14
Orthophosphate, Dissolved	mg/L	Monitoring Only		45	.07	.662	0 - .89
Cyanide, Free	mg/L	Monitoring Only		10	--	--	< .005
Nickel, TR	µg/L	Monitoring Only		19	< 10	1.1	0 - 11
Zinc, TR	µg/L	Monitoring Only		19	18	28.5	0 - 33
Cadmium, TR	µg/L	Monitoring Only		19	--	--	< 5
Lead, TR	µg/L	Monitoring Only		19	--	--	< 20
Chromium, TR	µg/L	Monitoring Only		19	< 10	2	0 - 20
Copper, TR	µg/L	Monitoring Only		19	< 5	8.6	0 - 14
E. coli	#/100 mL	126	284[w]	348	< 1	17.7	0 - 816
Flow Rate	MGD	Monitoring Only		1675	.861	2.36	.27 - 9.88
Chlorine, Total Residual	mg/L	--	0.038	889	--	--	< .038
Mercury, Total - 2016-2019	kg/day	0.000015	0.0129	52	.00000454	.0000129	.00000217 - .0000285
Mercury, Total - 2015-2016	kg/day	0.0000212	0.0129	10	.0000039	.00000832	.0000014 - .0000108
Mercury, Total - 2016-2019	ng/L	1.86	1700	52	1.25	2.15	.9 - 4.8
Mercury, Total - 2015-2016	ng/L	2.8	1700	10	1.15	1.6	.6 - 1.6
Cyanide, Free (Low-Level)	µg/L	Monitoring Only		45	< .01	< .01	0 - 4

Table 6. Effluent Characterization Using Self-Monitoring Data

Parameter	Unit	Current Limits		# Obs	Percentiles		Data Range
		30 Day	Daily		50th	95th	
Acute Toxicity, Ceriodaphnia dubia	TUa	Monitoring Only		5	--	--	< .2
Chronic Toxicity, Ceriodaphnia dubia	TUc	Monitoring Only		5	--	--	< 1
Acute Toxicity, Pimephales promelas	TUa	Monitoring Only		5	< .2	.16	0 - .2
Chronic Toxicity, Pimephales promelas	TUc	Monitoring Only		5	< 1	1.04	0 - 1.3
pH, Maximum	S.U.	--	9.0	1652	7.6	7.9	6.9 - 8.3
pH, Minimum	S.U.	--	6.5[m]	1652	7.5	7.1*	6.8 - 8.3
Residue, Total Filterable	mg/L	Monitoring Only		55	848	1280	548 - 1620
CBOD 5 day	kg/day	190	303[w]	660	12.6	58.6	0 - 989
CBOD 5 day	mg/L	25	40[w]	660	4	9.05	0 - 60

* = For minimum pH, 5th percentile shown in place of 50th percentile.
** = For dissolved oxygen, 5th percentile shown in place of 95th percentile.
[a] = weekly average.

Table 7. Projected Effluent Quality for Outfall 001

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
Aluminum	µg/L	2	2	330.1	452.2
Ammonia (Summer)	mg/L	240	204	9.89	16.09
Ammonia (Winter)	mg/L	168	146	11.16	22.79
Antimony	µg/L	2	1	1.16	1.59
Arsenic - TR	µg/L	5	2	5.74	7.87
Barium	µg/L	2	2	82.39	112.86
Cadmium - TR	µg/L	24	0	--	--
Chromium - TR	µg/L	24	3	18.98	26
Copper - TR	µg/L	24	6	8.93	15.36
Cyanide - free	mg/L	46	1	0.0032	0.0044
Dissolved Solids	mg/L	58	58	1075.3	1287.9
Iron - TR	µg/L	2	2	435.518	596.6
Lead - TR	µg/L	24	0	--	--
Manganese - TR	µg/L	2	2	82.67	113.24
Mercury	ng/L	63	63	1.84	2.42
Nickel - TR	µg/L	5	0	10.44	17.99
Nitrite plus Nitrite	mg/L	57	57	32.88	43.0
Total Phenols	µg/L	3	2	33.07	45.3
Selenium - TR	µg/L	2	2	9.52	13.03
Strontium	µg/L	2	2	1054.12	1444
Zinc - TR	µg/L	24	22	25.99	37.11

MDL = analytical method detection limit
PEQ = projected effluent quality

Table 8. Summary of Acute and Chronic Toxicity Results

Date	*Ceriodaphnia Dubia*		*Pimephales Promelas*	
	Acute (Tu_a)	Chronic (Tu_c)	Acute (Tu_a)	Chronic (Tu_c)
10/20/2015	AA (0.2)	AA (1.0)	.2	AA (1.0)
10/21/2016	AA (0.2)	AA (1.0)	AA (0.2)	AA (1.0)
10/1/2017	AA (0.2)	AA (1.0)	AA (0.2)	AA (1.0)
10/15/2018	AA (0.2)	AA (1.0)	AA (0.2)	AA (1.0)
10/7/2019	AA (0.2)	AA (1.0)	AA (0.2)	1.3

AA = non-detection; analytical method detection limit of 0.2 TU_a, 1.0 TU_c
TU_a = acute toxicity unit
TU_c = chronic toxicity unit

	Water Flea (*Ceriodaphnia dubia*)		Fathead Minnow (*Pimephales promelas*)	
	Acute	Chronic	Acute	Chronic
WLA	0.7 TU_a	1.43 TU_c	0.7 TU_a	1.43 TU_c
n	5	5	5	5
Maximum Value	AA	AA	0.2	1.3
Coefficient of Variation[1]	N/A	N/A	0.6	0.6
Multiplying factors[2]	N/A	N/A	2.1	2.1
PEQ[3]	N/A	N/A	0.42	2.73
RP Demonstrated? (Yes, if PEQ > WLA)	No*	No*	No	Yes

* All Values were non-detect

[1] *Technical Support Document for Water Quality-based Toxics Control*, Box 3-2 (US EPA, March 1991).
[2] *Technical Support Document for Water Quality-based Toxics Control*, Table 3-2 (US EPA, March 1991).

Table 9. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria					Inside Mixing Zone Maximum
		Average				Maximum	
		Wildlife	Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Aluminum	µg/L	--	4500	--	--	--	--
Ammonia (Summer)	mg/L	--	--	--	1.1	--	--
Ammonia (Winter)	mg/L	--	--	--	3.3	--	--
Antimony	µg/L	--	780	--	190	900	1800
Arsenic - TR	µg/L	--	580	100	150	340	680
Barium	µg/L	--	160000	--	220	2000	4000
Cadmium - TR	µg/L	--	730	50	4.2	9.8	20
Chromium - TR	µg/L	--	14000	100	150	3200	6300
Copper - TR	µg/L	--	64000	500	17	27	54
Cyanide - free	mg/L	--	48	--	0.0052	0.022	0.044
Dissolved Solids	mg/L	--	--	--	1500	--	--
Iron - TR	µg/L	--	--	5000	--	--	--
Lead - TR	µg/L	--	--	100	15	290	590
Manganese - TR	µg/L	--	61000	--	--	--	--
Mercury	ng/L	1.3	3.1	10000	910	1700	3400
Nickel - TR	µg/L	--	43000	200	93	840	1700
Selenium - TR	µg/L	--	3100	50	5	--	--
Strontium	µg/L	--	1400000	--	21000	40000	81000
Zinc - TR	µg/L	--	35000	25000	210	210	430
Nitrate-N + Nitrite-N	mg/L	--	--	100	--	--	--
Phenolics	µg/L	--	--	--	--	--	--

Table 10. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
Stream Flows				
1Q10	cfs	annual	4.48	USGS Gage 04199000 1950-2003
7Q10	cfs	annual	5.34	USGS Gage 04199000 1950-2003
		summer	0	
		winter	0	
30Q10	cfs	summer	7.58	USGS Gage 04199000 1950-2003
		winter	24.54	USGS Gage 04199000 1950-2003
90Q10	cfs	annual	12.8	USGS Gage 04199000 1950-2003
Harmonic Mean	cfs	annual	46.97	USGS Gage 04199000 1950-2003
Mixing Assumption	%	average	25	
		maximum	100	
Hardness, OMZ	mg/L	annual	199	EDMR 901 station median n=55
Hardness, IMZ	mg/L	annual	199	EDMR 901 station median n=55
pH	S.U.	summer	7.9	EDMR 901 station 75th percentile n=20
		winter	8	EDMR 901 station 75th percentile n=12
Temperature	ºC	summer	25	EDMR 901 station 75th percentile n=20
		winter	6.3	EDMR 901 station 75th percentile n=12
Huron Basin flow	cfs	annual	3.0945	Average Daily Design Flow
Background Water Quality				
Aluminum	µg/L		435	OEPA; 2016; n=6; 1<MDL; Station 501040
Ammonia (Summer)	mg/L		0	EDMR; 2015-2019; n=20; 16<MDL; 801 Station
Ammonia (Winter)	mg/L		0	EDMR; 2015-2019; n=12; 11<MDL; 801 Station
Antimony	µg/L		0	No representative data available.
Arsenic - TR	µg/L		1.88	OEPA; 2016; n=6; 2<MDL; Station 501040
Barium	µg/L		58	OEPA; 2016; n=6; 0<MDL; Station 501040
Cadmium - TR	µg/L		0	OEPA; 2016; n=6; 6<MDL; Station 501040
Chromium - TR	µg/L		0	OEPA; 2016; n=6; 6<MDL; Station 501040
Copper - TR	µg/L		2.43	OEPA; 2016; n=6; 1<MDL; Station 501040
Cyanide - free	mg/L		0	No representative data available.
Dissolved Solids	mg/L		445	OEPA; 2016; n=6; 0<MDL; Station 501040
Iron - TR	µg/L		847	OEPA; 2016; n=6; 0<MDL; Station 501040
Lead - TR	µg/L		0	OEPA; 2016; n=6; 6<MDL; Station 501040
Manganese - TR	µg/L		54.3	OEPA; 2016; n=6; 0<MDL; Station 501040
Mercury	ng/L		0	No representative data available.
Nickel - TR	µg/L		4.45	OEPA; 2016; n=6; 0<MDL; Station 501040
Selenium - TR	µg/L		0	OEPA; 2016; n=6; 6<MDL; Station 501040
Strontium	µg/L		361.8	OEPA; 2016; n=6; 0<MDL; Station 501040
Zinc - TR	µg/L		6.2	OEPA; 2016; n=6; 5<MDL; Station 501040

MDL = analytical method detection limit
n = number of samples
Ohio EPA = Ohio Environmental Protection Agency

Table 11. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Outside Mixing Zone Criteria					Inside Mixing Zone Maximum
		Average				Maximum	
		Wildlife	Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Aluminum	µg/L	--	19925	--	--	--	--
Ammonia (Summer)	mg/L	--	--	--	3.79	--	--
Ammonia (Winter)	mg/L	--	--	--	29.47	--	--
Antimony	µg/L	--	3740	--	272	2203	1800
Arsenic - TR	µg/L	--	2774	472	214	830	680
Barium	µg/L	--	766922	--	290	4811	4000
Cadmium - TR	µg/L	--	3500	240	6	24	20
Chromium - TR	µg/L	--	67125	479	215	7833	6300
Copper - TR	µg/L	--	306847	2388	23	63	54
Cyanide - free	mg/L	--	230	--	0.0074	0.054	0.044
Dissolved Solids	mg/L	--	--	--	1955	--	--
Iron - TR	µg/L	--	--	20759	--	--	--
Lead - TR	µg/L	--	--	479	21	710	590
Manganese - TR	µg/L	--	292267	--	--	--	--
Mercury	ng/L	1.3	3.1	10000	910	1700	3400
Nickel - TR	µg/L	--	206152	942	131	2050	1700
Selenium - TR	µg/L	--	14863	240	7.2	--	--
Strontium	µg/L	--	6711117	--	29904	97385	81000
Zinc - TR	µg/L	--	167789	119842	298	505	430
Nitrate-N + Nitrite-N	mg/L	--	--	479	--	--	--
Phenolics	µg/L	--	--	--	--	--	--

Table 12. Parameter Assessment

Group 1:	Due to a lack of criteria, the following parameters could not be evaluated at this time.				
	Phenolics				
Group 2:	PEQ < 25 percent of WQS or all data below minimum detection limit.				
	WLA not required. No limit recommended; monitoring optional.				
	Aluminum		Antimony		Arsenic - TR
	Cadmium - TR		Chromium - TR		Iron - TR
	Lead - TR		Manganese - TR		Nickel - TR
	Strontium		Zinc - TR		
Group 3:	PEQmax < 50 percent of maximum PEL and PEQavg < 50 percent of average PEL.				
	No limit recommended; monitoring optional.				
	Ammonia (Winter)		Barium		Copper - TR
	Nitrate-N + Nitrite-N		Cyanide-Free		
Group 4:	PEQmax >= 50 percent, but < 100 percent of the maximum PEL or				
	PEQavg >= 50 percent, but < 100 percent of the average PEL. Monitoring is appropriate.				
	Dissolved Solids				
Group 5:	Maximum PEQ >= 100 percent of the maximum PEL or average PEQ >= 100				
	percent of the average PEL, or either the average or maximum PEQ is between 75				
	and 100 percent of the PEL and certain conditions that increase the risk to the				
	environment are present. Limit recommended.				
	Limits to Protect Numeric Water Quality Criteria				
				Recommended Effluent Limits	
	Parameter	*Units*		*Average*	*Maximum*
	Ammonia (Summer)	mg/L		3.8	--
	Mercury	ng/L		1.3	1700
	Selenium - TR	µg/L		7.2	--

PEL = preliminary effluent limit
PEQ = projected effluent quality
WLA = waste load allocation
WQS = water quality standard

Table 13. Final Effluent Limits for Outfall 001

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	5.0 Minimum				WQS
Total Suspended Solids	mg/L	30	45[d]	227	341[d]	BPT
Oil & Grease	mg/L	--	10	--	--	WQS
Ammonia						
Summer	mg/L	3.8	5.7[d]	28.8	43.2	WLA
Winter	mg/L	- - - - - - - - - - Monitor - - - - - - - - - - -				M
Nitrate+Nitrite	mg/L	- - - - - - - - - - Monitor - - - - - - - - - - -				M
Total Kjeldahl Nitrogen	mg/L	- - - - - - - - - - Monitor - - - - - - - - - - -				M
Phosphorus	mg/L	1.0	1.5[d]	7.57	11.4	PTS
Orthophosphate, Dissolved (as P)	mg/L	- - - - - - - - - - Monitor - - - - - - - - - - -				SB1
Selenium	µg/L	- - - - - - - - - - Monitor - - - - - - - - - - -				RP
Nickel	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
E. coli	#/100 ml	126	284[d]	--	--	WQS
Flow Rate	MGD	- - - - - - - - - - Monitor - - - - - - - - - - -				M[c]
Chlorine, Total Residual	mg/L	--	0.038	--	--	WQS
Mercury	ng/L	1.8	1700	0.000014	0.0129	VAR
Free Cyanide	µg/L	- - - - - - - - - - Monitor - - - - - - - - - - -				M
Acute Toxicity						
Ceriodaphnia dubia	TU_a	- - - - - - - - - - Monitor - - - - - - - - - - -				WET
Pimephales promelas	TU_a	- - - - - - - - - - Monitor - - - - - - - - - - -				WET
Chronic Toxicity						
Ceriodaphnia dubia	TU_c	- - - - - - - - - - Monitor - - - - - - - - - - -				WET
Pimephales promelas	TU_c	1.43	--	--	--	WET
pH, Maximum	S.U.	--	9.0	--	--	WQS
pH, Minimum	S.U.	6.5 Minimum				WQS
Total Filterable Residue	mg/L	- - - - - - - - - - Monitor - - - - - - - - - - -				M
Carbonaceous Biochemical Oxygen Demand (5 day)	mg/L	25	40[d]	190	303[d]	BPT

[a] Effluent loadings based on average design discharge flow of 2.0 MGD.

[b] Definitions: BPT = Best Practicable Waste Treatment Technology, 40 CFR Part 133, Secondary Treatment Regulation

M = Division of Surface Water NPDES Permit Guidance 1: Monitoring frequency requirements for Sanitary Discharges

PTS = Phosphorus Treatment Standards (OAC 3745-33-06 (C))
RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in permits (OAC 3745-33-07(A))
SB1 = Implementation of Senate Bill 1 (ORC 6111.03)

VAR = Mercury variance (OAC 3745-33-07(D)(10)(a))
WET = Requiring water quality-based effluent limits and monitoring requirements for whole effluent toxicity in NPDES permits [40 CFR Part 132, Appendix F, Procedure 6 and OAC 3745-33-07(B)]
WLA = Wasteload Allocation procedures (OAC 3745-2)
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.

Addendum 1. Acronyms

ABS	Anti-backsliding
BPJ	Best professional judgment
CFR	Code of Federal Regulations
CMOM	Capacity Management, Operation, and Maintenance
CONSWLA	Conservative substance wasteload allocation
CSO	Combined sewer overflow
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DMT	Dissolved metal translator
IMZM	Inside mixing zone maximum
LTCP	Long-term Control Plan
MDL	Analytical method detection limit
MGD	Million gallons per day
NPDES	National Pollutant Discharge Elimination System
OAC	Ohio Administrative Code
Ohio EPA	Ohio Environmental Protection Agency
ORC	Ohio Revised Code
ORSANCO	Ohio River Valley Water Sanitation Commission
PEL	Preliminary effluent limit
PEQ	Projected effluent quality
PMP	Pollution Minimization Program
PPE	Plant performance evaluation
SSO	Sanitary sewer overflow
TMDL	Total Daily Maximum Load
TRE	Toxicity reduction evaluation
TU	Toxicity unit
U.S. EPA	United States Environmental Protection Agency
WET	Whole effluent toxicity
WLA	Wasteload allocation
WPCF	Water Pollution Control Facility
WQBEL	Water-quality-based effluent limit
WQS	Water Quality Standards
WWTP	Wastewater Treatment Plant