National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

Regarding an NPDES Permit to Discharge to Waters of the State of Ohio
For **City of Newark Wastewater Treatment Plant (WWTP)**

Public Notice No.: 220502
Public Notice Date: 4/14/2026
Comment Period Ends: 5/14/2026

Ohio EPA Permit No.: **4PE00001*OD**
Application No.: **OH0026671**

Name and Address of Applicant:
City of Newark
1003 East Main Street
Newark, OH 43055

Name and Address of Facility Where Discharge Occurs:
Newark WWTP
Ecology Row
Newark, OH 43055
Licking County

Receiving Water: **Licking River**

Subsequent Stream Network: **Muskingum River, Ohio River**

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.

Antidegradation provisions in Ohio Administrative Code (OAC) Chapter 3745-1 describe the conditions under which water quality may be lowered in surface waters. 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/or monitoring requirements proposed for all parameters are the same as in the current permit, except those listed below.

Outfall 034, through which the high rate treatment system (HRT) discharges, is proposed to be reclassified from a CSO to a bypass. Monitoring for total phosphorus and carbonaceous biochemical oxygen demand (CBOD5) at CSO 034 is proposed to be removed, as these data are not used to assess effectiveness of the treatment system.

A new limit and monitoring for volatile solids reduction at Class B biosolids monitoring station 581 is proposed, based on the vector attraction reduction method employed at the facility.

The limit and monitoring for fecal coliform at Class B biosolids monitoring station 581 is proposed to be removed, based on the pathogen reduction method (anaerobic digestion) employed at the facility.

New monitoring station 588 is proposed to be added for reporting provisions associated with sewage sludge transferred to another NPDES permit holder.

Monitoring stations for CSOs 017 and 020 are proposed to be removed due to physical elimination of the overflow structures in 2024 as part of the Interceptor Siphon Project.

Monitoring for occurrence and volume at CSOs 008, 012, 013, 014, 015 and 027 is proposed to continue at a monthly frequency, as these outfalls are equipped with electronic meters.

Monitoring is proposed to be changed for overflow occurrences and volume for the remaining CSOs, which are to be estimated by the City's hydraulic model of the collection system. Annual reporting for these data is proposed. See Part I, B, Item 3 for details.

Monitoring at upstream station 801 is proposed to be removed for water temperature, dissolved oxygen, and pH, as these data are not used for reasonable potential analyses.

Monitoring at downstream station 901 is proposed to be removed for dissolved oxygen, as these data are not used for reasonable potential analyses.

Monitoring for total suspended solids (TSS), CBOD5, and bypass duration at bypass stations 002 and 602 is proposed to be removed due to infrequency of discharges at these stations.

A schedule of compliance for implementation of the approved Long Term Control Plan is included in Part I, C of the permit.

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; stormwater compliance; pretreatment program requirements; and outfall signage.

A revised Part III is proposed.

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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 emailed to HClerk@epa.ohio.gov or mailed 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 by email to epa.dswcomments@epa.ohio.gov (preferred method) or delivered 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 David Brumbaugh at (614) 644-2138 or david.brumbaugh@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: https://epa.ohio.gov/static/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 email to epa.dswcomments@epa.ohio.gov (preferred method) or 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 3745-33-07(D). 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

Newark WWTP discharges to the Licking River at River Mile 28.55. Figure 1 shows the approximate location of the facility.

This segment of the Licking River is described by Ohio EPA River Code: 17-200, Large River Assessment Unit Code: 05040006-90-01, County: Licking, Ecoregion: Erie/Ontario Lake Hills & Plains. The Licking River is designated for the following uses under Ohio's WQS (OAC 3745-1-24): Warmwater 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

Newark WWTP was constructed in 1948 and last upgraded in 2022. The average daily design flow (ADDF) has historically been 8.0 million gallons per day (MGD). Permit-to-Install # DSWPTI-260365 was issued to the City of Newark on April 7, 2026 approving a re-rating of the facility to an ADDF of 9.0 MGD. The PTI application included the *Newark WWTP Process model and Re-Rating Memo*, which used a modeling approach to demonstrate that the facility can provide adequate treatment at 9.0 MGD. The draft permit proposes to incorporate this revised ADDF. Newark WWTP serves the City of Newark and Village of St. Louisville, a population of approximately 50,000. Newark WWTP has the following treatment processes (Figure 2):

- Influent pumping
- Bar screening
- Grit & scum removal
- Primary sedimentation
- Activated sludge
- Secondary clarification
- Ultraviolet disinfection
- Post aeration

Newark WWTP utilizes the following sewage sludge treatment processes (Figure 2):

- Anaerobic digestion
- Polymer addition
- Gravity thickening
- Dewatering – filter press

Table 1 shows the last five years of sludge removed from Newark WWTP. Treated sludge is land applied as Class B biosolids (monitoring station 581) or hauled to a landfill (station 586). The permit also includes provisions for reporting sewage sludge transferred to another NPDES permit holder (station 588).

The City of Newark has an approved pretreatment program. The City has three significant categorical users that discharge 0.134 MGD of flow and 10 significant non-categorical users that discharge 0.755 MGD of flow.

The peak secondary treatment hydraulic capacity of Newark WWTP is 20 MGD. Flows that exceed 20 MGD are directed to a 1.0-MG equalization basin. When the basin is full, excess flows are directed to the High Rate Treatment (HRT) system which discharges directly to the Licking River via Outfall 034. The HRT is a ballasted flocculation process which provides solids removal and disinfection for an additional 28 MGD of partial treatment capacity. Outfall 034 has historically been permitted as a combined sewer overflow (CSO) but is proposed to be reclassified as a bypass.

Newark WWTP has two other bypasses, the use of which are not included in the facility's operational plan and have not been active since the HRT became operable in 2010. Bypass 602 is an internal overflow from the equalization basin, from which excess flow bypasses primary and secondary treatment and blends with fully treated effluent. The blended effluent receives ultraviolet disinfection, monitored at Outfall 001, and discharged to the Licking River. Headworks bypass 002 is located at Manhole #3, which bypasses all treatment and discharges directly to the Licking River.

The City of Newark has 84% separate sewers and 16% combined sewers in the collection system. The *City of Newark Phase II Combined Sewer Overflow Long-Term Control Plan* (LTCP) was submitted on December 31, 2016, amended on February 21, 2020, and approved by Ohio EPA on March 27, 2020. The LTCP proposes a series of projects, including extensive separations, upsizing of interceptors and connections, installation of relief sewers and siphons, and improvements to the WWTP headworks. The LTCP proposes to attain a final level of control of 11 events per typical year which correlates to over 99% capture of wet weather flows. Bundle 1 was implemented during the last five years and a Programmatic Review was submitted on October 24, 2025, which indicated that the Bundle 1 projects performed better than expected, and includes a revised Bundle 2 schedule. The 16 North Separation project is proposed to be divided into two phases and the duration extended to facilitate ease of implementation. Additionally, control projects from Bundle 3 for CSOs 012 and 015 are proposed.

DESCRIPTION OF EXISTING DISCHARGE

Table 2 presents the effluent violations for Newark WWTP during the previous five years.

Table 3 presents the annual effluent flow rate for Newark WWTP for the previous five years. Newark WWTP estimates there is an infiltration/inflow (I/I) rate to the collection system of 0.45 MGD. Several projects to separate portions of the combined sewer system have been implemented in recent years and more are planned for this permit cycle.

Sanitary sewer overflows (SSOs) are reported at station 300. A single SSO was reported in September 2020.

Table 4 presents data characterizing high rate treatment activity at Newark WWTP for the previous five years. High rate treatment discharges are reported at station 034. Other bypasses at Newark WWTP are monitored as stations 602 and 002 but no occurrences have been reported in the last five years.

Table 5 presents the number of CSOs reported by Newark WWTP during the previous five years. Newark WWTP has 20 permitted combined sewer overflows (CSOs).

Table 6 presents data characterizing the seasonal total phosphorus load from Newark WWTP during the previous five years. A Part II condition sets a daily load target for total phosphorus (331 kg/day) from May through October. The permittee exceeded this target four times in the last five years (three times in August 2023, once in October 2023) but, on average, performs well below this level.

Table 7 presents chemical specific data compiled from data reported in annual pretreatment reports and collected by Ohio EPA. Because this data is substantially identical to the application requirements in CFR 122.21(j), the Director has waived the requirement for submittal of supplemental effluent testing data as part of the NPDES renewal application.

Table 8 presents a summary of unaltered Discharge Monitoring Report (DMR). Data are presented for the period March 2020 through February 2025, and current permit limits are provided for comparison.

Table 9 summarizes the chemical specific data for outfall 001 by presenting the average and maximum PEQ values.

Table 10 summarizes the results of acute and chronic Whole Effluent Toxicity (WET) tests of the final effluent, using the water flea (*Ceriodaphnia dubia*) and fathead minnow (*Pimephales promelas*) as test organisms.

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 Licking River Mainstem large river assessment unit, which includes the Licking River in the vicinity of Newark WWTP, is listed as impaired for aquatic life, recreation, and human health useson Ohio's 303(d) list.

The attainment status of the Licking River Mainstem is reported in the final *Ohio 2024 Integrated Water Quality Monitoring and Assessment Report*. 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 (see Table 11) 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 data available for the Licking River is from Ohio EPA's Large River Survey, conducted in 2020 and 2021, the data from which is presented in the *Summary of Findings from the 2020-2021 Aquatic Life and Water Quality Survey of Ohio's Large Rivers*. Licking River is in full attainment of aquatic life use between the outfall and Dillon Lake; however, the river is impaired due to nutrients and ammonia downstream of the Dillon Lake Dam. This finding is consistent with an impairment identified during the Ohio EPA's 2008 watershed survey, the data from which is presented in the *Biological and Water Quality Study of the Licking River and Selected Tributaries, 2008.*

The Licking River is impaired for recreation use due to high *E. coli* levels. The permittee is continuing to reduce the frequency and magnitude of CSO discharges through implementation of the LTCP.

The full Integrated Report is available through the Ohio EPA, Division of Surface Water website at: https://epa.ohio.gov/divisions-and-offices/surface-water/reports-data/ohio-integrated-water-quality-monitoring-and-assessment-report

The *Summary of Findings from the 2020-2021 Aquatic Life and Water Quality Survey of Ohio's Large Rivers* is available through the Ohio EPA, Division of Surface Water website at: https://dam.assets.ohio.gov/image/upload/epa.ohio.gov/Portals/35/tmdl/LargeRiverSurvey-DataSummary-2023.pdf

The *Biological and Water Quality Study of the Licking River and Selected Tributaries, 2008* is available through the Ohio EPA, Division of Surface Water website at: https://dam.assets.ohio.gov/image/upload/epa.ohio.gov/Portals/35/documents/2008LickingTSD.pdf

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 Newark 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)	March 2020 through February 2025
Pretreatment data	2020-2024
Ohio EPA compliance sampling data	2024

Statistical Outliers and Other Non-representative Data
The data were examined and no values were removed from the evaluation. These data are 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 9). See Modeling Guidance #1 for more information on PEQ calculations, available through the Ohio EPA, Division of Surface Water website at:
https://www.epa.ohio.gov/portals/35/guidance/model1.pdf

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 12).

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. By rule, mixing zones are not authorized for pollutants, such as mercury, which have been designated as bioaccumulative chemicals of concern (BCCs). For BCCs, the WLA is set equal to the respective WQS value.

The methodology employed generally depends on whether the facility is considered a direct discharger to a (1) free-flowing receiving water/stream or (2) non-flowing receiving water/Lake. For free-flowing streams, WLAs for both average and maximum criteria are performed 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.

Newark WWTP and Heath WWTP were considered interactive (see Figure 3). These facilities were allocated together for most parameters due to the size of the plant discharges, the flows of the Licking River and the relatively close proximity of the two plants. The exception was the ammonia WLA, which was done separately for each facility because ammonia is not considered to be a conservative parameter.

The available assimilative capacity was distributed among them using the conservative substance wasteload allocation (CONSWLA) water quality model for conservative parameters. CONSWLA is the model Ohio EPA typically uses in multiple discharger situations. CONSWLA model inputs for flow are fixed at their critical low levels and inputs for effluent flow are fixed at their design or 50th percentile levels. Background concentrations are fixed at a representative value (generally a 50th percentile). A mass balancing method is then used to allocate effluent concentrations that maintain WQS under these conditions. This technique is appropriate when data bases are unavailable to generate statistical distributions for inputs and if the parameters modeled are conservative.

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
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 13, and allocations cannot exceed the Inside Mixing Zone Maximum (IMZM) criteria. The data used in the WLA are listed in Table 12 and Table 13. The WLA results to maintain all applicable criteria are presented in Table 14.

Whole Effluent Toxicity Wasteload Allocation

Whole effluent toxicity (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. WQC for WET are 0.3 TUa for acute toxicity and 1.0 TUc for chronic toxicity (OAC 3745-1-44).

There are two separate reasonable potential procedures in Ohio - one for the Lake Erie watershed and one for the Ohio River watershed. Dischargers in the Ohio River watershed are assessed using OAC 3745-33-07(B). Dischargers in the Lake Erie watershed are assessed in accordance with the "Great Lakes Water Quality Initiative Implementation Procedures" contained in 40 CFR Part 132, Appendix F, Procedure 6.

The WLA calculations for WET are similar to those for aquatic life criteria - using the chronic toxicity unit (TUc) and 7Q10 flow for the average and the acute toxicity unit (TUa) and 1Q10 flow for the maximum. WET WLAs are based on meeting the values of 0.3 TUa and 1.0 TUc downstream of the discharge, and include any available dilution. These values are the levels of effluent toxicity that should not cause instream toxicity during critical low-flow conditions. WLAs for acute toxicity are capped at 1.0 TUa unless the discharger demonstrates that an Area-of-Initial-Mixing (AIM) exists under OAC 3745-1-06, or that one of the factors in OAC 3745-33-07(B)(5)-(9) allows a higher TUa limit to be granted. For the purposes of establishing WET limitations, the values of 1.0 TUa and 1.0 TUc are the most restrictive limitations that can be applied in NPDES permits [OAC 3745-33-07(B)(10)].

For Newark WWTP, the WLA values for outfall 001 are 0.54 TUa and 2.01 TUc.

The chronic toxicity unit (TUc) is defined as 100 divided by the estimate of the effluent concentration which causes a 25% reduction in growth or reproduction of test organisms (IC25):

$$TUc = 100/IC25$$

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):

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

The acute toxicity unit (TUa) is defined as 100 divided by the concentration in water having 50% chance of causing death to aquatic life (LC50) for the most sensitive test species:

$$TUa = 100/LC50$$

This equation applies outside the mixing zone for all designated waters. Based on the above, a value of 1.0 TUa is the lowest value that can be calculated using the equation. TUa values between 0.2 and 1.0 are based on an interpolation of toxic effects where an LC50 cannot be identified.

When the acute WLA is less than 1.0 TUa, it may be defined as a ratio of the stream dilution to the effluent flow:

Acute 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

$$\text{Acute Dilution Ratio} = \frac{1Q10 + [\text{WWTP flow rate}]}{[\text{WWTP flow rate}]} = \frac{2.30 \text{ cfs} + 12.38 \text{ cfs}}{12.38 \text{ cfs}} = 1.2$$

The acute WLA for Newark WWTP can be expressed as 30 percent mortality in 100 percent effluent based on the dilution ratio of 1.2 to 1. If the acute dilution ratio is less than 3.3 to 1.0, and there is evidence that effluent values between 0.3 TUa and 1.0 TUa cause or contribute to violations of WQS, the permittee may be required to investigate and remediate toxicity in this range.

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 14. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 9, 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 15.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 16 presents the final effluent limits and monitoring requirements proposed for Newark 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.

Total Suspend Solids (Winter) and CBOD5 (Winter)
The current limits for total suspended solids (TSS) and 5-day carbonaceous biochemical oxygen demand (CBOD5) during winter months 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. Although the ADDF is proposed to increase to 9.0 MGD based PTI #260365, the current load limits are proposed to be maintained; therefore, the concentration limits are proposed to be revised lower accordingly.

Total Suspend Solids (Summer) and CBOD5 (Summer)
The current limits for total suspended solids and 5-day carbonaceous biochemical oxygen demand (CBOD5) during summer months are all based on plant design criteria. The TSS and CBOD5 limits are more stringent than the Secondary Treatment Standards in 40 CFR Part 133. Although the ADDF is proposed to increase to 9.0 MGD based PTI #260365, the current load limits are proposed to be maintained; therefore, the concentration limits are proposed to be revised lower accordingly.

Dissolved Oxygen
A new limit for dissolved oxygen during winter months is proposed, to be protective of WQS. Based on a review of historical data, the permittee is able to comply with the new limit, therefore the limit is proposed to become effective immediately. The current limit for dissolved oxygen during summer months is protective of WQS and proposed to continue.

Ammonia (Summer and Winter)
The current ammonia limits, which are based on a previous wasteload allocation, have been evaluated using the WLA procedures. The current limits are protective of WQS for ammonia toxicity. Although the current WLA would allow slightly higher limits for ammonia, anti-backsliding provisions in the OAC prevent the imposition of less stringent limits than those in the existing permit unless specific conditions have been satisfied. In the case of the Newark WWTP, none of those conditions have been satisfied, so the existing limits are proposed to continue. The anti-backsliding provisions of OAC 3745-33-05(F) require that an anti-degradation review must be completed before an existing permit limit can be made less stringent. The rule requires other conditions to be satisfied as well.

Although the ADDF is proposed to increase to 9.0 MGD, the current load limits are proposed to be maintained; therefore, the concentration limits are proposed to be revised lower accordingly.

***E. coli*, Oil & Grease, and pH**
Limits proposed for *Escherichia coli,* oil and grease, and pH are based on WQS (OAC 3745-1-35 and 37). Primary contact recreation *E. coli* standards apply to the Licking River.

Dissolved Hexavalent Chromium and Free Cyanide
The Ohio EPA risk assessment (Table 15) places dissolved hexavalent chromium and free cyanide in group 4. This placement, as well as the data in Table 8 and Table 9, 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 for Group 4 pollutants (where PEQ exceeds 50 percent of the WLA) is required by OAC 3745-33-07(A)(2). Monthly monitoring is proposed for both parameters.

Cadmium, Chromium, Lead, Mercury, Nickel, Total Filterable Residue, and Zinc
The Ohio EPA risk assessment (Table 15) places cadmium, chromium, lead, mercury, nickel, total filterable residue, and zinc in groups 2 and 3. This placement, as well as the data in Table 8 and Table 9, 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 continue at the same frequency, to document that these pollutants continue to remain at low levels.

Antimony, Arsenic, Barium, Bis(2-ethylhexyl) Phthalate, Carbon Disulfide, Chloroform, 1,4-Dichlorobenzene, Fluoranthene, Iron, Methyl Ethyl Ketone, Molybdenum, Selenium, Strontium, Toluene, and 1,3,5-Trimethylbenzene
The Ohio EPA risk assessment (Table 15) places these parameters in groups 2 and 3. This placement, as well as the data in Table 8 and Table 9, 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.

Data for most of these parameters will be available for future reasonable potential analyses through the approved pretreatment program annual reports.

Flow Rate and Water Temperature
Monitoring for these parameters is proposed to continue to evaluate the performance of the treatment plant.

Nitrate plus Nitrite and Total Kjeldahl Nitrogen
Municipal treatment works discharge a nutrient load to the river, therefore monthly monitoring for total Kjeldahl nitrogen and nitrate plus nitrite is proposed based on best technical judgment. The purpose of the monitoring is to maintain a nutrient data set for use in future studies. Nitrate + nitrite was evaluated and determined to not have the reasonable potential to contribute to WQS exceedances.

Dissolved Orthophosphate and Total Phosphorus
Monitoring for dissolved orthophosphate (as P) and total phosphorus is required by ORC 6111.03. This monitoring will further develop nutrient datasets that are used in stream and watershed assessments and studies. Because Ohio EPA monitoring, as well as other in-stream monitoring, for dissolved orthophosphate 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. A Part II condition sets a daily load target for total phosphorus during the recreation season. The target of a monthly average of 331 kg/day is based on best technical judgement, as the permittee identifies opportunities to decrease nutrient loading to the receiving stream.

Whole Effluent Toxicity Reasonable Potential
Based on evaluating the WET data presented in Table 10 and other pertinent data under the provisions of OAC 3745-33-07(B), the Newark WWTP is placed in Category 4 with respect to WET. While this indicates that the plant's effluent does not currently pose a toxicity problem, annual toxicity testing is proposed consistent with the minimum monitoring requirements at OAC 3754-33-07(B)(11). Annual chronic toxicity monitoring with the determination of acute endpoints is proposed for the life of the permit. The proposed monitoring will adequately characterize toxicity in the plant's effluent.

Additional Monitoring Requirements
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. The following changes are proposed:

Monitoring stations for CSOs 017 and 020 are proposed to be removed due to physical elimination of the overflow structures in 2024 as part of the Interceptor Siphon Project.

Monitoring for occurrence and volume at CSOs 008, 012, 013, 014, 015 and 027 is proposed to continue at a monthly frequency, as these outfalls are equipped with electronic meters.

Overflow occurrence and volume for the remaining 13 CSOs are estimated by the City's hydraulic model of the collection system. Reporting for overflow volume is new, as these outfalls are not equipped with electronic meters. Annual reporting for these data is required. See Part I,B, Item 3 for details.

Monitoring for total phosphorus and CBOD5 at outfall 034 (HRT discharge) is proposed to be removed, as these data are not used to assess effectiveness of the treatment system.

Monitoring at upstream monitoring station 801 is proposed to be removed for water temperature, dissolved oxygen, and pH, as these data are not used for reasonable potential analyses.

Monitoring at downstream monitoring station 901 is proposed to be removed for dissolved oxygen, as these data are not used for reasonable potential analyses.

Monitoring for TSS, CBOD5, and bypass duration at bypass stations 002 and 602 is proposed to be removed due to infrequency of discharges at these stations.

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 of Class B biosolids (monitoring station 581), disposal in an authorized landfill (monitoring station 586), or a new station is proposed for transfer to another NPDES permittee (monitoring station 588).

A new limit and monitoring for volatile solids reduction at Class B biosolids monitoring station 581 is proposed, based on the vector attraction reduction method employed at the facility.

The limit and monitoring for fecal coliform at Class B biosolids monitoring station 581 is proposed to be removed, based on the pathogen reduction method (anaerobic digestion) employed at the facility.

OTHER REQUIREMENTS

Compliance Schedule
Pretreatment Local Limits Review - A 6-month compliance schedule is proposed for the City to submit a technical justification for either revising its local industrial user limits or retaining its existing local limits. If revisions to local limits are required, the City must also submit a pretreatment program modification request. Details are in Part I, C of the permit.

CSO Long Term Control Plan - A compliance schedule is proposed for the City to continue LTCP implementation to control CSO discharges. 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 July 3, 2025 (OAC 3745-7). These rules require the Newark WWTP to have a Class IV 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.

Low-Level Free Cyanide Testing
Currently there are four approved methods for free cyanide listed in 40 CFR 136 that have a quantification level lower than water quality-based effluent limits: ASTM D7237-18(A), OIA-1677-09, SM 4500-CN-R-2021, and

ASTM D4282-15.These methods will allow Ohio EPA to make more reliable water quality-related decisions regarding free cyanide.

Method Detection Limit Reporting
When submitting monitoring results in eDMR, the permittee must report all detected concentration values above the method detection limit (MDL), even if that value is below the quantification level. A detection above the MDL indicates the presence of a pollutant with strong confidence, which must be considered in reasonable potential analyses. Per OAC 3745-33-07(C)(2)(c), for the purpose of assessing compliance, any value reported below the quantification level shall be considered in compliance with an effluent limit.

Outfall Signage
Part II of the permit includes requirements for the permittee to place and maintain a sign at each outfall to the Licking River and tributaries 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.

Stormwater Compliance
Parts IV, V, and VI have been included with the draft permit to ensure that any stormwater flows from the facility site are properly regulated and managed.

Figure 1. Location of Newark WWTP

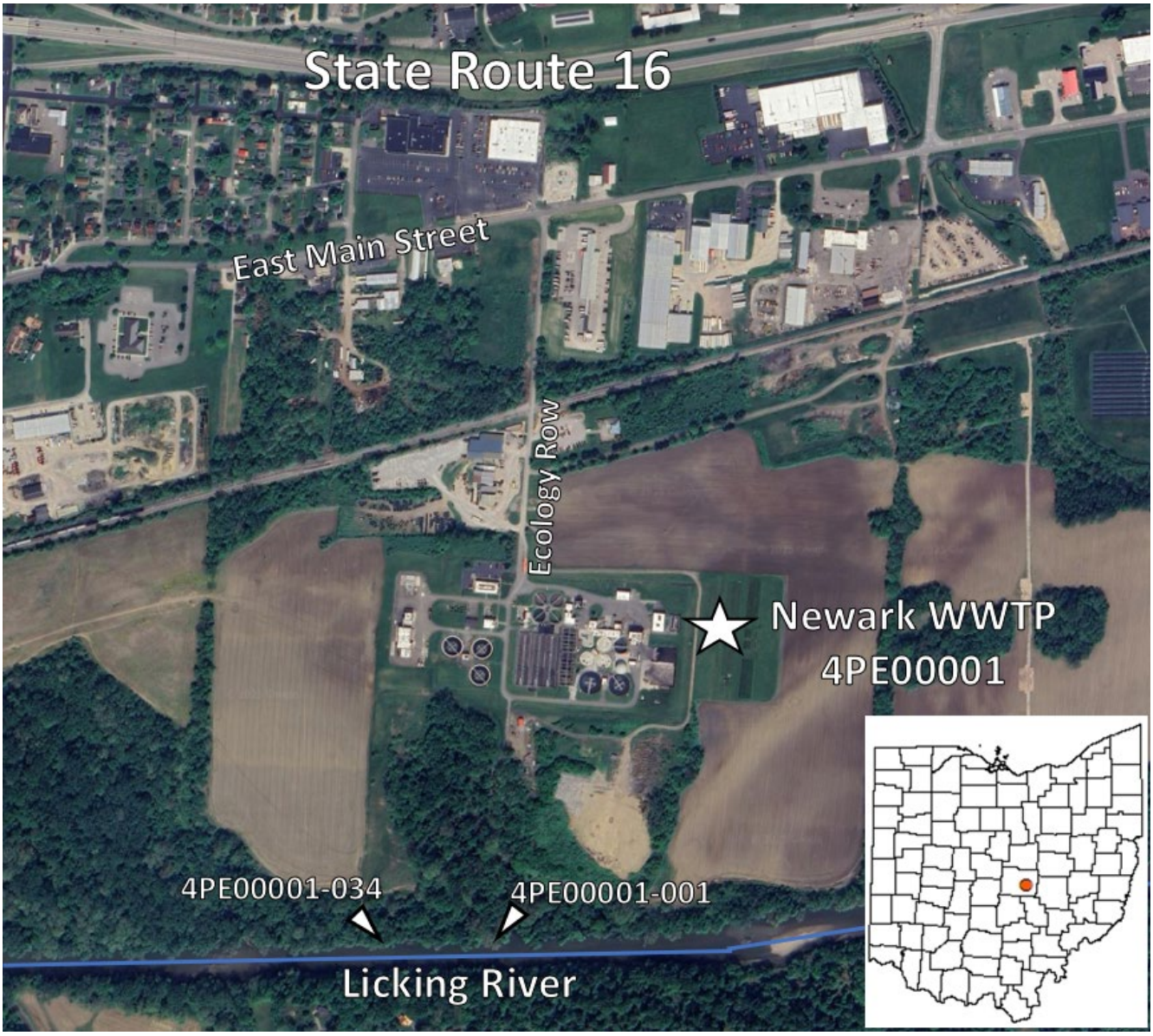

Figure 2. Diagram of Wastewater Treatment System

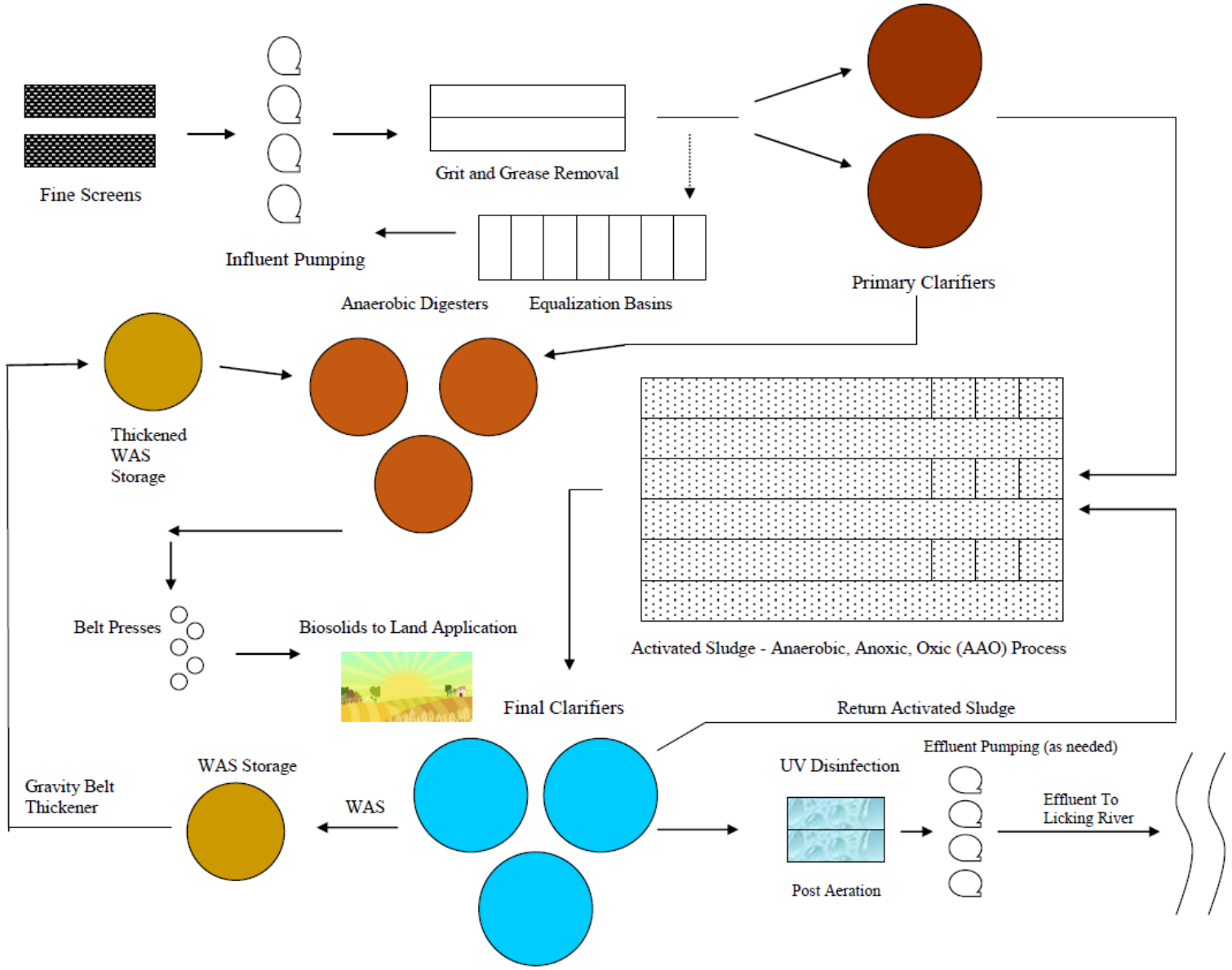

Figure 3. Licking River Study Area

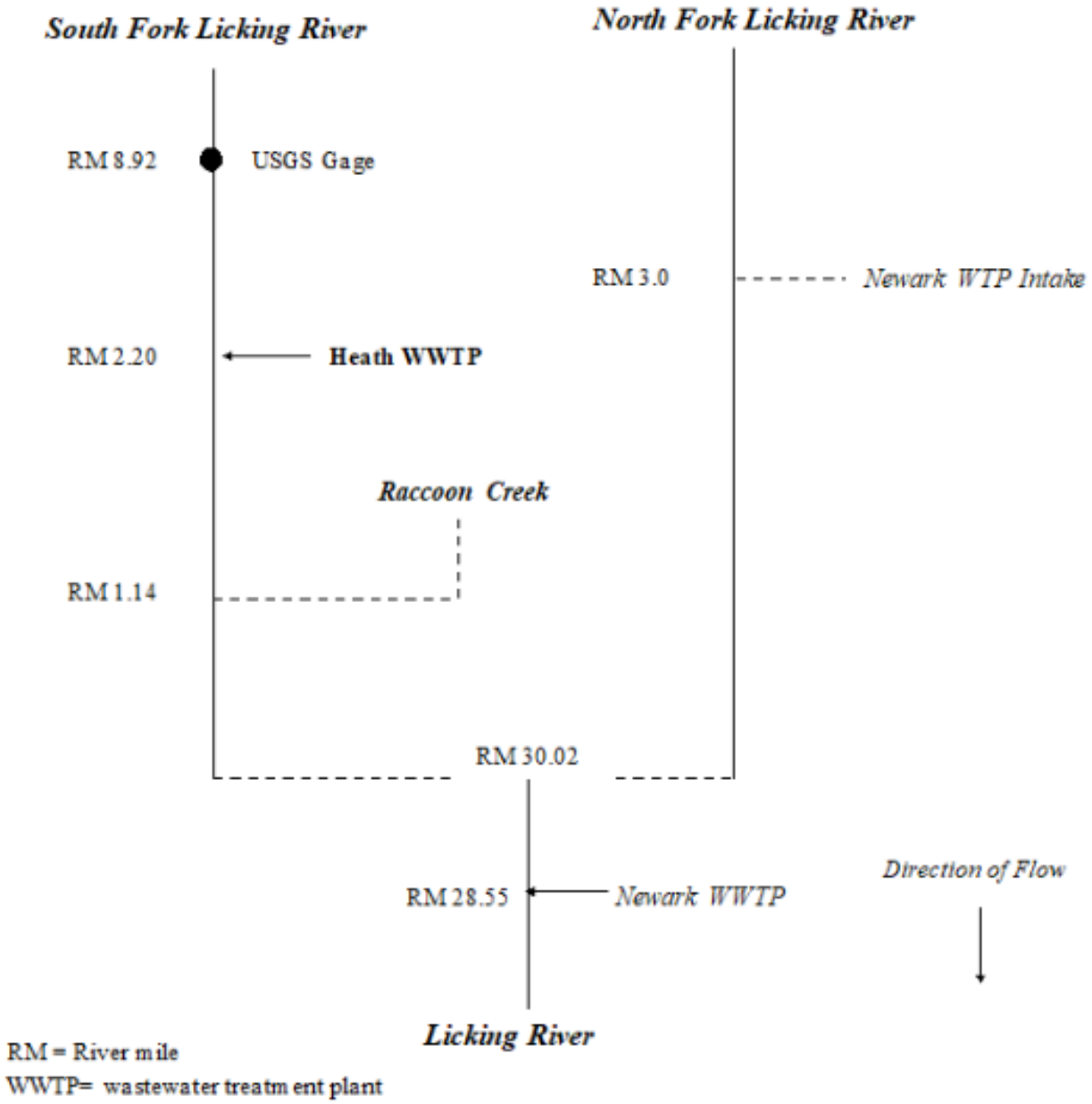

Table 1. Sewage Sludge Removal

Year	Dry Tons Removed	
	Station 581	Station 586
2020	1198	431
2021	1111	243
2022	1388	311
2023	1256	375
2024	1313	43

Table 2. Effluent Violations for Outfall 001

Parameter	2020[a]	2021	2022	2023	2024	2025[b]
Dissolved Oxygen	0	0	0	1	0	0
Ammonia	0	0	0	3	0	0

[a] Data from March through December only
[b] Data from January and February only

Table 3. Average Annual Effluent Flow Rates

Year	Annual Flow (MGD)		
	50th Percentile	95th Percentile	Maximum
2020[a]	7.44	15.88	19.46
2021	7.07	12.20	18.00
2022	8.07	14.24	20.06
2023	6.71	11.52	16.40
2024	6.87	11.91	18.69
2025[b]	7.14	8.70	15.83

MGD = million gallons per day.
[a] Data from March through December only
[b] Data from January and February only

Table 4. High Rate Treatment Discharges (CSO 034)

Year	Occurrences	Total Volume (Million Gallons)	Median TSS (mg/L)	Median *E. coli* (#/100 mL)	Median CBOD5 (mg/L)
2020[a]	11	61.0	18.5	35	18.5
2021	24	72.8	25.9	790	25.9
2022	25	118.2	26.91	4000	26.91
2023	17	40.8	19	1500	19
2024	14	53.2	16.7	4000	16.7
2025[b]	1	5.8	13	--	13

[a] Data from March through December only
[b] Data from January and February only

Table 5. Untreated Combined Sewer Overflow Discharges

Station	Occurrences					
	2020[a]	**2021**	**2022**	**2023**	**2024**	**2025[b]**
004	20	30	28	18	22	2
005	44	47	46	30	26	3
008	8	8	11	3	3	--
009	17	14	17	4	18	
012	33	36	36	18	16	1
013	22	21	20	10	11	--
014	52	16	17	7	8	--
015	34	42	39	25	20	--
016	6	--	6	1	1	1
017*	1	1	1	2	8	--
019	21	26	32	24	23	--
020*	7	2	3	--	--	--
021	19	2	2	1	--	--
022	14	17	19	6	3	--
023	17	25	24	18	19	3
024	16	24	23	9	13	--
025	11	9	6	6	4	1
026	24	24	24	8	15	1
027	28	34	42	30	30	2
028	22	15	9	9	14	--
033	20	25	29	27	26	2
Maximum	**52**	**47**	**46**	**30**	**30**	**3**
Station	**Volume**					
	2020[a]	**2021**	**2022**	**2023**	**2024**	**2025[b]**
008	3.19	--	0.01	--	23.00	--
012	4.30	1.53	2.09	1.49	1.07	0.07
013	2.09	0.14	0.45	0.07	0.20	--
014	11.80	0.03	1.65	0.01	0.24	--
015	0.18	0.82	1.44	0.39	0.87	--
021	1.70	--	--	--	--	--

*CSOs 017 and 020 were eliminated in 2024

[a] Data from March through December only

[b] Data from January and February only

Table 6. Calculated Seasonal Total Phosphorus Loadings

Year	Median Phosphorus (mg/L)	Median Flow (MGD)	Median Loading (kg/day)
2020	7.90	6.87	227
2021	4.55	7.78	148
2022	5.33	7.68	171
2023	9.50	6.51	237
2024	5.54	6.18	131

Seasonal = May through October
MGD = million gallons per day

Table 7. Effluent Characterization Using Pretreatment and Ohio EPA Data

Parameter	Ohio EPA 2/21/2024	PT 9/16/2020	PT 9/13/2021	PT 9/12/2022	PT 9/11/2023	PT 9/9/2024
Ammonia (mg/L)	3.46	NT	NT	NT	NT	NT
Antimony	5.61	AA (1)	AA (5)	AA (1)	0.9	2
Arsenic	1.24	1	AA (5)	1	AA (1.5)	1
Barium	14.7	NT	NT	NT	NT	NT
Cadmium	0.02	AA (0.1)	AA (3)	AA (0.1)	AA (0.2)	AA (0.1)
Carbon disulfide	0.322	NT	NT	NT	NT	NT
Chloroform	0.45	AA (0.3)	AA (5)	0.4	AA (0.3)	AA (0.3)
Chromium	6.06	3	AA (7)	3	2.2	5
Copper	5.85	4	AA (8)	3	AA (4.8)	3
Dichlorobenzene, 1-4	0.462	AA (0.5)	AA (5)	AA (0.5)	AA (0.4)	AA (0.5)
Iron	74.8	NT	NT	NT	NT	NT
Lead	0.48	AA (0.1)	AA (10)	AA (0.1)	AA (1.9)	AA (0.1)
Manganese	60.2	NT	NT	NT	NT	NT
Mercury (ng/L)	AA (134)	AA (0.5)	NT	NT	AA (0.18)	0.78
Methyl ethyl ketone	0.644	NT	NT	NT	NT	NT
Molybdenum	NT	7	AA (20)	10	6.4	6
Nickel	23.6	18	17	20	26	13
Nitrite plus nitrate (mg/L)	15.2	NT	NT	NT	NT	NT
Selenium	1.34	2	AA (4)	1	AA (2.4)	1
Total Filterable Residue (mg/L)	1220	NT	NT	NT	NT	NT
Strontium	246	NT	NT	NT	NT	NT
Toluene	0.269	AA (0.4)	AA (5)	AA (0.4)	AA (0.3)	AA (0.4)
Trichlorobenzene, 1,2,3-	0.196	NT	NT	NT	NT	NT
Trimethylbenzene, 1,3,5-	0.245	NT	NT	NT	NT	NT
Zinc	40.7	22	21	22	30	20

AA = not-detected (analytical method detection limit)
NT = not tested
Units in µg/L unless otherwise noted

Table 8. Effluent Characterization Using Self-Monitoring Data

Parameter	Unit	Current Limits		# Obs	Percentiles		Data Range
		30 Day	Daily		50th	95th	
Water Temperature	°C	- - - Monitor - - -		1798	17.9	23.4	6.06 - 28.2
Dissolved Oxygen (Summer)	mg/L	--	6.0[m]	920	8.85	6.89*	4.23 - 13.8
Dissolved Oxygen (Winter)	mg/L	--	2.0[m]	878	8.26	5.05*	2.84 - 12.1
TSS (Summer)	kg/day	454	697[w]	363	52.2	126	14.6 - 392
TSS (Summer)	mg/L	15	23[w]	363	1.80	4.19	0.600 - 11.7
TSS (Winter)	kg/day	909	1363[w]	350	64.7	192	11.2 - 2280
TSS (Winter)	mg/L	30	45[w]	350	2.20	5.06	0.500 - 32.2
Oil and Grease	mg/L	--	10	118	< 5.00	< 5.00	0 - 6.40
Ammonia (Summer)	kg/day	66.6	99.9[w]	381	3.37	45.7	0.698 - 423
Ammonia (Summer)	mg/L	2.2	3.3[w]	381	0.122	1.40	0.0300 - 11.9
Ammonia (Winter)	kg/day	318	479[w]	356	14.9	206	0.722 - 651
Ammonia (Winter)	mg/L	10.5	15.8[w]	356	0.528	7.62	0.0340 - 24.2
Nitrogen Kjeldahl	mg/L	- - - Monitor - - -		59	1.10	12.0	0.400 - 37.6
Nitrite Plus Nitrate	mg/L	- - - Monitor - - -		62	14.5	28.4	4.03 - 33.9
Phosphorus, Total	mg/L	- - - Monitor - - -		272	5.90	10.8	0.150 - 23.4
Orthophosphate	mg/L	- - - Monitor - - -		84	4.80	11.1	0.400 - 22.5
Cyanide, Free	mg/L	- - - Monitor - - -		2	--	--	< 0.00300
Selenium, TR	µg/L	7.8	--	4	--	--	< 5.00
Selenium, TR	kg/day	0.24	--	4	--	--	< 0.173
Nickel, TR	µg/L	- - - Monitor - - -		22	20.0	30.9	0 - 43.0
Zinc, TR	µg/L	- - - Monitor - - -		22	24.0	32.0	16.0 - 33.0
Cadmium, TR	µg/L	- - - Monitor - - -		22	--	--	< 0.500
Lead, TR - All	µg/L	32	574	4	--	--	< 2.00
Lead, TR - All	kg/day	0.97	17.4	4	--	--	< 0.0691
Lead, TR	µg/L	- - - Monitor - - -		20	< 2.00	9.97	0 - 17.0
Chromium, TR	µg/L	- - - Monitor - - -		22	--	--	< 10.0
Copper, TR	µg/L	- - - Monitor - - -		22	--	--	< 10.0
Chromium, Hexavalent	µg/L	- - - Monitor - - -		58	< 8.70	13.0	0 - 20.0
E. coli	#/100 mL	126	284[w]	362	32.0	160	2.00 - 4000
Fluoranthene	µg/L	- - - Monitor - - -		4	--	--	< 10.0
Bis(2-ethylhexyl) Phthalate	µg/L	- - - Monitor - - -		4	--	--	< 0.00500
Flow Rate	MGD	- - - Monitor - - -		1798	7.12	13.1	4.54 - 20.1
Mercury, Total	ng/L	- - - Monitor - - -		23	< 0.500	0.591	0 - 0.674
Cyanide, Free	µg/L	- - - Monitor - - -		19	<0.003	2.30	0 - 23.0
Acute Toxicity, *Ceriodaphnia dubia*	TUa	- - - Monitor - - -		5	--	--	< 0.200
Chronic Toxicity, *Ceriodaphnia dubia*	TUc	- - - Monitor - - -		5	--	--	< 1.00
Acute Toxicity, *Pimephales promelas*	TUa	- - - Monitor - - -		5	--	--	< 0.200

Parameter	Unit	Current Limits		# Obs	Percentiles		Data Range
		30 Day	Daily		50th	95th	
Chronic Toxicity, *Pimephales promelas*	TUc	- - - Monitor - - -		5	--	--	< 1.00
pH, Maximum	S.U.	--	9.0	1798	7.70	8.30	7.10 - 9.00
pH, Minimum	S.U.	--	6.5[m]	1798	7.40	7.00*	6.50 - 8.80
Residue, Total Filterable	mg/L	- - - Monitor - - -		116	1160	1520	589 - 1670
CBOD5 (Summer)	kg/day	454	697[w]	359	65.7	132	23.0 - 632
CBOD5 (Summer)	mg/L	15	23[w]	359	2.40	3.86	1.03 - 26.8
CBOD5 (Winter)	kg/day	757	1212[w]	348	85.8	214	19.4 - 836
CBOD5 (Winter)	mg/L	25	40[w]	348	2.90	6.20	0.760 - 22.0

* = For minimum pH, 5th percentile shown in place of 50th percentile.
** = For dissolved oxygen, 5th percentile shown in place of 95th percentile.
[w]= weekly average.
[m] = minimum limit
TR = total recoverable

Table 9. Projected Effluent Quality for Outfall 001

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
Ammonia (Summer)	mg/L	242	242	0.230	0.610
Ammonia (Winter)	mg/L	189	189	7.85	13.5
Antimony	µg/L	6	3	8.60	11.8
Arsenic	µg/L	4	4	2.35	3.22
Barium	µg/L	1	1	66.5	91.1
Bis(2-ethylhexyl) phthalate	µg/L	6	0	--	--
Cadmium	µg/L	1	1	0.091	0.124
Carbon Disulfide	µg/L	1	1	1.46	2.00
Chloroform	µg/L	5	2	0.76	1.04
Chromium	µg/L	28	5	4.32	7.22
Chromium, Dissolved Hexavalent	µg/L	59	8	10.3	16.2
Copper	µg/L	28	4	8.76	12
Cyanide, Free	µg/L	19	1	23.5	32.2
Dichlorobenzene, 1,4-	µg/L	5	1	0.84	1.15
Fluoranthene	µg/L	10	0	--	--
Iron	µg/L	1	1	338	463
Lead	µg/L	30	8	14.9	20.4
Manganese	µg/L	1	1	272	373
Mercury	ng/L	27	6	0.612	0.896
Methyl Ethyl Ketone	µg/L	1	1	2.91	3.99
Molybdenum	µg/L	4	4	19	26
Nickel	µg/L	28	27	28.8	38.7
Nitrate + Nitrite	mg/L	64	64	24.6	35.2
Phosphorus	mg/L	276	276	9.09	12.9
Selenium	µg/L	4	4	3.80	5.20
Silver	µg/L	6	0	--	--
Strontium	µg/L	1	1	1113	1525
Total Filterable Residue	mg/L	119	119	1402	1692
Trichlorobenzene, 1,2,3-	µg/L	1	1	1.11	1.52
Trimethylbenzene, 1,3,5-	µg/L	1	1	1.11	1.52
Zinc	µg/L	28	28	31.4	38.8

MDL = analytical method detection limit
PEQ = projected effluent quality
* Per OAC 3745-2-04(E)(3), ammonia PEQ is based on data collected during the following months:
Summer – June through September
Winter – December through February

Table 10. Summary of Acute and Chronic Toxicity Results

	Ceriodaphnia Dubia		*Pimephales promelas*	
Date	**TU_a**	**TU_c**	**TU_a**	**TU_c**
9/17/2020	AA	AA	AA	AA
9/17/2021	AA	AA	AA	AA
9/12/2022	AA	AA	AA	AA
9/15/2023	AA	AA	AA	AA
9/8/2024	AA	AA	AA	AA

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

Table 11. Use Attainment Table

Location	RM	Year	Use	Status	Cause	Source
[a] Licking River at Newark, downstream of North & South Forks (station R99Q25)	30.1	2008	WWH	Full		
[b] Licking River near Newark at State Route 16, Stadden Bridge (station 601770)	26.75	2020	WWH	Full		
[b] Licking River at Toboso Road (station 603300)	18.87	2020	WWH	Full		
[b] Licking River at Dillon Falls Road (station R13S27)	3.68	2020	WWH	Partial [c]	Nutrients/Ammonia	Dam/Impoundment Animal agriculture HSTS

[a] Data gathered from *Biological and Water Quality Study of the Licking River and Selected Tributaries, 2008*
[b] Data gathered from *Summary of Findings from the 2020-2021 Aquatic Life and Water Quality Survey of Ohio's Large Rivers*
[c] Impaired condition is consistent with prior biological and water quality survey; cause and source reported from 2008 document above.
RM = River mile
WWH = warmwater habitat
HSTS = home sewage treatment system

Table 12. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum	
		Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Ammonia (Summer)	mg/L	--	--	1	--	--
Ammonia (Winter)	mg/L	--	--	2.8	--	--
Antimony	µg/L	640	--	190	900	1800
Arsenic	µg/L	--	100	150	340	680
Barium	µg/L	--	--	220	2000	4000
Bis(2-ethylhexyl) phthalate	µg/L	3.7 [C]	--	8.4	1100	2100
Cadmium	µg/L	--	50	5.2	13	27
Carbon disulfide	µg/L	--	--	15	130	260
Chloroform	µg/L	20000 [C]	--	140	1300	2600
Chromium	µg/L	--	100	190	4000	7900
Chromium, Dissolved Hexavalent	µg/L	--	--	11	16	31
Copper	µg/L	--	500	21	35	69
Cyanide, Free	µg/L	400	--	12	46	92
Dichlorobenzene, 1,4-	µg/L	900	--	9.4	57	110
Fluoranthene	µg/L	20	--	0.8	3.7	7.4
Iron - TR	µg/L	--	5000	--	--	--
Lead	µg/L	--	100	22	420	830
Manganese - TR	µg/L	--	--	--	--	--
Mercury (BCC)	ng/L	12	10000	910	1700	3400
Methyl ethyl ketone	µg/L	--	--	22000	200000	400000
Molybdenum	µg/L	--	--	20000	190000	370000
Nickel	µg/L	4600	200	120	1100	2100
Nitrate + Nitrite	mg/L	--	100	--	--	--
Phosphorus	mg/L	--	--	--	--	--
Selenium	µg/L	4200	50	5	62	120
Silver	µg/L	--	--	1.3	8.3	17
Strontium	µg/L	--	--	21000	40000	81000
Toluene	µg/L	520	--	62	560	1100
Total Filterable Residue	mg/L	--	--	1500	--	--
Trichlorobenzene, 1,2,3-	µg/L	--	--	--	--	--
Trimethylbenzene, 1,3,5-	µg/L	950	--	26	230	460
Zinc	µg/L	26000	25000	270	270	540

[c] = carcinogen

Table 13. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
Upstream Flows				
South Fork Licking River				
7Q10	cfs	annual	3.22	USGS gage #03145000, 1940-2022 data
1Q10	cfs	annual	2.30	USGS gage #03145000, 1940-2022 data
30Q10	cfs	summer	4.83	USGS gage #03145000, 1940-2021 data
		winter	25.5	USGS gage #03145000, 1939-2022 data
Harmonic Mean Flow	cfs	annual	26.2	USGS gage #03145000, 1939-2022 data
Mixing Assumption	%	average	100	Stream-to-discharge ratio
	%	max.	100	Stream-to-discharge ratio
North Fork Licking River				
7Q10	cfs	annual	6.32	USGS gage #03146402, 1911-2022 data
1Q10	cfs	annual	3.66	USGS gage #03146402, 1911-2022 data
30Q10	cfs	summer	10.5	USGS gage #03146402, 1911-2021 data
		winter	60.7	USGS gage #03146402, 2010-2022 data
Harmonic Mean Flow	cfs	annual	76.9	USGS gage #03146402, 2011-2022 data
Mixing Assumption	%	average	100	Stream-to-discharge ratio
	%	max	100	Stream-to-discharge ratio
Raccoon Creek				
7Q10	cfs	annual	12.9	USGS gage #03145534, 2011-2022 data
1Q10	cfs	annual	11.8	USGS gage #03145534, 2011-2022 data
30Q10	cfs	summer	16.6	USGS gage #03145534, 2011-2021 data
		winter	58.8	USGS gage #03145534, 2010-2022 data
Harmonic Mean Flow	cfs	annual	59.3	USGS gage #03145534, 2010-2022 data
Mixing Assumption	%	average	100	Stream-to-discharge ratio
	%	max	100	Stream-to-discharge ratio
Instream Conditions				
pH	S.U.	Summer	8	Station 901, 2020-24, n=20, 75th percentile
	S.U.	Winter	8.1	Station 901, 2020-24, n=14, 75th percentile
Temperature	ºC	Summer	21.2	Station 901, 2020-24, n=20, 75th percentile
	ºC	Winter	5.5	Station 901, 2020-24, n=14, 75th percentile
Discharger Flows				
Heath WWTP	cfs (MGD)	design	2.71 (1.75)	NPDES permit application
Newark WWTP	cfs (MGD)	design	13.925 (9.0)	NPDES permit application

Parameter	Units	Season	Value	Basis
Background Water Quality				
Ammonia	mg/L	summer	0.05	Station 801; 20 values, 0<MDL, 2020-24; median
Ammonia	mg/L	winter	0.14	Station 801; 14 values, 0<MDL, 2020-24, median
Antimony	µg/L	annual	0	No representative data available.
Arsenic	µg/L	annual	1	R13S01; 15 values, 14<MDL, 2008
Barium	µg/L	annual	77	R13W07; 4 values, 0<MDL, 2008
Bis(2-ethylhexyl) phthalate	µg/L	annual	0	R13S01; 1 value, 1<MDL, 2008
Cadmium	µg/L	annual	0.1	R13S01; 15 values, 14 <MDL, 2008
Carbon Disulfide	µg/L	annual	0	No representative data available.
Chloroform	µg/L	annual	0	No representative data available.
Chromium	µg/L	annual	0	R13S01; 15 values, 15 <MDL, 2008
Chromium, Dissolved Hexavalent	µg/L	annual	0	No representative data available.
Copper	µg/L	annual	1	R13S01; 15 values, 14 <MDL, 2008
Cyanide, Free	µg/L	annual	0	No representative data available.
Dichlorobenzene, 1-4-	µg/L	annual	0	No representative data available.
Fluoranthene	µg/L	annual	0	No representative data available.
Iron	µg/L	annual	292	R13W07; 4 values, 0<MDL, 2008
Lead	µg/L	annual	1	R13S01; 15 values, 12 <MDL, 2008
Manganese	µg/L	annual	0	No representative data available.
Mercury	µg/L	annual	0	R13S01; 13 values, 13 <MDL, 2008
Methyl Ethyl Ketone	µg/L	annual	0	No representative data available.
Molybdenum	µg/L	annual	0	No representative data available.
Nickel	µg/L	annual	2.1	R13S01; 15 values, 10 <MDL, 2008
Nitrate + Nitrite	mg/L	annual	1.57	Station 801; 63 values, 0<MDL, 2018-23
Selenium	µg/L	annual	0	R13S01; 15 values, 15 <MDL, 2008
Silver	µg/L	annual	0	No representative data available.
Strontium	µg/L	annual	657	R13W07; 4 values, 0<MDL, 2008
Toluene	µg/L	annual	0	No representative data available.
Total Filterable Residue	µg/L	annual	360	R13S01; 15 values, 0<MDL, 2008
Trimethylbenzene, 1,2,3-	µg/L	annual	0	No representative data available.
Trimethylbenzene, 1,3,5-	µg/L	annual	0	No representative data available.
Zinc	µg/L	annual	5	R13S01; 15 values, 12 <MDL, 2008

R13S01– Ohio EPA ambient monitoring station in North Fork Licking River at River Mile 0.05.
R13W07 – Ohio EPA ambient monitoring station in Licking River at River Miles 28.7
MDL = analytical method detection limit

Table 14. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum	
		Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Ammonia (Summer)	mg/L	--	--	3.4	--	--
Ammonia (Winter)	mg/L	--	--	32	--	--
Antimony	µg/L	9177*	--	475	2388*	1800
Arsenic	µg/L	--	1187 *	337	763*	680
Barium	µg/L	--	--	426	17387*	13000
Cadmium	µg/L	--	599 *	11.6	29 *	27
Carbon disulfide	µg/L	--	--	37.3	345*	260
Chloroform	µg/L	20000 *	--	124	1300*	2600
Chromium	µg/L	--	1200*	436	9095 *	7900
Chromium, Dissolved Hexavalent	µg/L	--	--	24.9	36 *	31
Copper	µg/L	--	5992 *	48	79 *	69
Cyanide, free	µg/L	4799 *	--	27.6	104 *	92
1,4-Dichlorobenzene	µg/L	12905*	--	23.1	151*	110
Iron - TR	µg/L	--	59350	--	--	--
Lead	µg/L	--	1193 *	49.8	959 *	830
Mercury [B]	ng/L	12	10000	910	1700	--
Methyl ethyl ketone	µg/L	--	--	55008	530748*	400000
Molybdenum	µg/L	--	--	45421	427577*	370000
Nickel	µg/L	55160 *	2374 *	274	2519 *	2100
Nitrate + Nitrite	mg/L	--	1060	--	-	--
Selenium	µg/L	50386 *	600 *	11.6	140 *	120
Silver	µg/L	--	--	2.9	19 *	17
Strontium	µg/L	--	--	51448	105063*	81000
Toluene	µg/L	7456*	--	154*	1486*	1100
Total Filterable Residue	mg/L	--	--	2807	--	--
1,3,5-Trimethylbenzene	µg/L	13622*	--	64.9	610*	460
Zinc	µg/L	311885 *	299888 *	616	611 *	540

[B] Bioaccumulative Chemical of Concern (BCC); no mixing zone allowed after 11/15/2010, WQS must be met at end-of-pipe, unless requirements for an exception are met as listed in OAC 3745-2-05(A)(2)(e)(ii)

*Based on initial calculations using 8 MGD; not revised because another preliminary effluent limit is more restrictive

Table 15. Parameter Assessment

Group 1: Due to a lack of criteria, the following parameters could not be evaluated at this time.

Manganese	Trichlorobenzene, 1,2,3-

Group 2: PEQ < 25 percent of WQS or all data below minimum detection limit.
WLA not required. No limit recommended; monitoring optional.

Ammonia	Antimony	Arsenic
Bis(2-ethylhexyl) Phthalate	Cadmium	Carbon disulfide
Chloroform	Chromium	Dichlorobenzene, 1-4
Fluoranthene	Iron	Mercury
Methyl ethyl ketone	Molybdenum	Nitrite plus nitrate
Strontium	Toluene	Trimethylbenzene, 1,3,5-

Group 3: PEQ_{max} < 50 percent of maximum PEL and PEQ_{avg} < 50 percent of average PEL.
No limit recommended; monitoring optional.

Barium	Copper	Lead
Nickel	Selenium	Total Filterable Residue
Zinc		

Group 4: PEQ_{max} >= 50 percent, but < 100 percent of the maximum PEL or
PEQ_{avg} >= 50 percent, but < 100 percent of the average PEL. Monitoring is appropriate.

Chromium, Hexavalent	Cyanide, Free

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.

No parameters fit this category

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

Table 16. Final Effluent Limits for Outfall 001

Parameter	Units	Concentration		Loading (kg/day)[a]		Basis[b]
		Daily Maximum	30 Day Average	Daily Maximum	30 Day Average	
Water Temperature	°C	- - - - - - - - - - Monitor - - - - - - - - - - -				M[c]
Dissolved Oxygen (summer)	mg/L	6.0[m]	--	--	--	PD
Dissolved Oxygen (winter)	mg/L	5.0[m]	--	--	--	WQS
TSS (summer)	mg/L	20[d]	13	697[d]	454	PD
TSS (winter)	mg/L	40[d]	27	1363[d]	909	PD
Oil & Grease	mg/L	10	--	--	--	WQS
Ammonia (summer)	mg/L	2.9[d]	2.0	99.9[d]	66.6	WLA/PD/ABS
Ammonia (winter)	mg/L	14[d]	9.3	479[d]	318	WLA/PD/ABS
Total Kjeldahl Nitrogen	mg/L	- - - - - - - - - - Monitor - - - - - - - - - - -				M
Nitrate plus Nitrite	mg/L	- - - - - - - - - - Monitor - - - - - - - - - - -				M
Phosphorus	mg/L	- - - - - - - - - - Monitor - - - - - - - - - - -				PMR
Orthophosphate	mg/L	- - - - - - - - - - Monitor - - - - - - - - - - -				PMR
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
Dissolved Hexavalent Chromium	µg/L	- - - - - - - - - - Monitor - - - - - - - - - - -				RP
E. coli	#/100 mL	284[d]	126	--	--	WQS
Flow Rate	MGD	- - - - - - - - - - Monitor - - - - - - - - - - -				M[c]
Mercury	ng/L	- - - - - - - - - - Monitor - - - - - - - - - - -				M
Free Cyanide	µg/L	- - - - - - - - - - Monitor - - - - - - - - - - -				RP
Acute Toxicity, *Ceriodaphnia dubia*	TUa	- - - - - - - - - - Monitor - - - - - - - - - - -				WET
Chronic Toxicity, *Ceriodaphnia dubia*	TUc	- - - - - - - - - - Monitor - - - - - - - - - - -				WET
Acute Toxicity, *Pimephales promelas*	TUa	- - - - - - - - - - Monitor - - - - - - - - - - -				WET
Chronic Toxicity, *Pimephales promelas*	TUc	- - - - - - - - - - Monitor - - - - - - - - - - -				WET
Total Filterable Residue	mg/L	- - - - - - - - - - Monitor - - - - - - - - - - -				M
pH, maximum	SU	9.0	--	--	--	WQS
pH, minimum	SU	6.5[m]	--	--	--	WQS
CBOD5 (summer)	mg/L	20[d]	13	697[d]	454	PD
CBOD5 (winter)	mg/L	36[d]	22	1212[d]	757	PD

[a] Effluent loadings based on average design discharge flow of 9.0 MGD.

[b] Definitions:
ABS = Antibacksliding Rule (OAC 3745-33-05(F) and 40 CFR Part 122.44(l))
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

PD = Plant Design (OAC 3745-33-05(E))
PMR = Phosphorus monitoring requirements (ORC 6111.03)
RP = Monitoring requirements based on a Group 4 assignment in the reasonable potential analysis (OAC 3745-33-07(A))
WET = Minimum testing requirements for whole effluent toxicity [OAC 3745-33-07(B)(11)]
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.
[m] minimum limit

Attachment 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