

National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for **Lucas County Water Resource Recovery Facility**
(Revised 8/29/16)

Public Notice No.: 16-07-021
Public Notice Date: July 7, 2016
Comment Period Ends: August 6, 2016

Ohio EPA Permit No.: **2PK00000*MD**
Application No.: **OH0034223**

Name and Address of Applicant:
Lucas County Board of Commissioners
One Government Center, Suite 800
Toledo, Ohio 43604

Name and Address of Facility Where Discharge Occurs:
Lucas County Water Resource Recovery Facility
5758 North River Road
Waterville, Ohio 43566
Lucas County

Receiving Water: **Maumee 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: water temperature, dissolved oxygen, total suspended solids (TSS), oil and grease (O&G), ammonia, Kjeldahl nitrogen, nitrate plus nitrite, total phosphorus, free cyanide, nickel, zinc, cadmium, lead, chromium, copper, dissolved hexavalent chromium, *Escherichia coli* (*E. coli*), flow rate, mercury, pH, total filterable residue, five-day carbonaceous biochemical oxygen demand (CBOD₅), acute and chronic toxicity testing for *Ceriodaphnia dubia* and *Pimephales promelas*.

New monitoring is proposed for Diethyl phthalate because this parameter was placed into Group 4 of Table 18.

New monitoring is proposed for arsenic, selenium and molybdenum to monitor as part of the pretreatment program and for the land application of biosolids.

New Monitoring is proposed for dissolved orthophosphate (as P). Monitoring is proposed based upon Ohio Senate Bill 1 [ORC 6111.03].

This permit no longer authorizes the use of method 4500 CN-I from Standard Methods for free cyanide testing. As soon as possible, the permittee must begin using either ASTM D7237-10 or OIA-1677-09 both of which are approved methods for free cyanide listed in 40 CFR 136.

A new outfall 002 will be added to the permit. The outfall will monitor the plant bypass that occurs prior to the treatment plant headworks.

The mercury variance is going to be renewed with the same monthly limit as the previous permit (3.9 ng/l).

A compliance schedule is proposed for the permittee to prepare and submit a Phosphorus Discharge Optimization Evaluation plan.

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; mercury variance; pretreatment program requirements; and outfall signage.

Table of Contents

	Page
Introduction.....	1
Summary of Permit Conditions.....	2
Procedures for Participation in the Formulation of Final Determinations	5
Location of Discharge/Receiving Water Use Classification.....	7
Facility Description.....	7
Description of Existing Discharge	8
Assessment of Impact on Receiving Waters	8
Development of Water-Quality-Based Effluent Limits	10
Reasonable Potential/ Effluent Limits/Hazard Management Decisions	12
Other Requirements	15

List of Figures

Figure 1. Location of Lucas County Water Resource Recovery Facility.....	17
Figure 2. Diagram of Wastewater Treatment System.....	18
Figure 3. Maumee River Study Area	19

List of Tables

Table 1. Sewage Sludge Removal.....	20
Table 2. Effluent Violations for Outfall 001	20
Table 3. Average Annual Effluent Flow Rates	20
Table 4 Calculated Phosphorus Loadings	21
Table 5. Effluent Characterization Using Pretreatment Data.....	22
Table 6. Effluent Characterization Using Ohio EPA data.....	23
Table 7. Effluent Characterization Using Self-Monitoring Data	24

Table 8. Projected Effluent Quality.....	27
Table 9. Summary of Acute and Chronic Toxicity Results	28
Table 10. Ohio EPA Toxicity Screening Results for Outfall 001	29
Table 11. Use Attainment Table	29
Table 12. Water Quality Criteria in the Study Area.....	30
Table 13. Instream Conditions and Discharger Flow.....	31
Table 14. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria	33
Table 15. Parameter Assessment.....	34
Table 16. Final Effluent Limits for Outfall 001	35

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 Ryan Gierhart, 419-373-3053 or ryan.gierhart@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, written notification 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 3745-1-35. 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

Lucas County Water Resource Recovery Facility (WRRF) discharges to the Maumee River at River Mile (RM) 18.22. Figure 1 shows the approximate location of the facility.

This segment of the Maumee River is described by Ohio EPA River Code: 04-001, U.S.G.S Hydrologic Unit Code: 04100009 09 03, Large River Assessment Unit Code: 04100009 90 02, County: Lucas, Ecoregion: Huron-Erie Lake Plain. The Maumee River is designated for the following uses under Ohio's WQS (OAC 3745-1-11): Warmwater Habitat, Agricultural Water Supply, Industrial Water Supply, and Class A Primary Contact Recreation. Maumee River discharges to Lake Erie.

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

Lucas County WRRF was constructed in 1970 and last upgraded in 2003. The average design flow is 22.5 million gallons per day (MGD) and the peak hydraulic capacity is 54.8 MGD. Lucas County WRRF serves the City of Maumee, City of Sylvania, Village of Waterville, Village of Whitehouse, and unincorporated areas of Lucas and Wood Counties, for a total of 107,820 customers. Lucas County WRRF has the following treatment processes which are shown on Figure 2:

- Fine Screening
- Grit Removal
- Primary Clarification
- Ferrous Chloride Chemical Addition
- Conventional Aeration
- Secondary Clarification
- Ultra Violet Disinfection

Lucas County WRRF has 1 bypass. Flow bypasses all treatment processes and discharges directly to the receiving stream. The collection system has 100% separated sewers and 0% combined sewers. The Lucas County WRRF has an approved pretreatment program. The Lucas County WRRF has 6 categorical users that

discharge 0.155 MGD of flow, and 2 non-categorical significant industrial users that discharge 0.250 MGD of flow.

Lucas County WRRF utilizes the following sewage sludge treatment processes:

- Anaerobic Sludge Digestion
- Belt Filter Press Sludge Dewatering
- Centrifuge Sludge Dewatering

Treated sludge is land applied. Table 1 shows the last five years of sludge removed from Lucas County WRRF.

Description of Existing Discharge

Lucas County WRRF had several effluent violations which are shown on Table 2.

Lucas County WRRF estimates there is an infiltration/inflow (I/I) rate to the collection system of 2.0 MGD. The average annual effluent flow rate for Lucas County WRRF for the previous five years is presented on Table 3. Lucas County WRRF and satellite sewer systems perform the following activities to minimize I/I: installation of new storm sewers, video inspection, lining of sanitary sewers, manhole rehabilitation and rehabilitation of the main interceptor.

Lucas County WRRF reports SSOs at station 300. No SSOs were reported over the past five years

Under the provisions of 40 CFR 122.21(j), the Director has waived the requirement for submittal of expanded effluent testing data as part of the NPDES renewal application. Ohio EPA has access to substantially identical information through the submission of annual pretreatment program reports and/or from Ohio EPA effluent testing conducted.

Table 4 summarizes phosphorus loading results for outfall 001.

Table 5 presents chemical specific data compiled from data reported in annual pretreatment reports.

Table 6 presents chemical specific data compiled from data collected by Ohio EPA.

Table 7 presents a summary of unaltered Discharge Monitoring Report (DMR). Data are presented for the period January 2011 to December 2015, and current permit limits are provided for comparison.

Table 8 summarizes the chemical specific data for outfall 001 by presenting the average and maximum PEQ values.

Table 9 summarizes the results of acute and chronic WET tests of the final effluent.

Table 10 summarizes the screening results of Ohio EPA bioassay sampling of the final effluent.

Assessment of Impact on Receiving Waters

The Maumee River Mainstem (Beaver Creek to Maumee Bay) large river assessment unit, 04100009 90 02, which includes the Maumee River in the vicinity of the Lucas County WRRF, is listed as impaired for human health, recreation, aquatic life and public drinking water supply on Ohio's 2014 303(d) list.

The attainment status of the Maumee River is reported in the *Ohio 2014 Integrated Water Quality Monitoring and Assessment Report* and the "*Biological and Water Quality Study of the Maumee River and Auglaize River*

2012-2013". 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 7-15). 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 for the Maumee River is from 2012 and 2013 and according to the "*Biological and Water Quality Study of the Maumee River and Auglaize River 2012-2013*" the Maumee River is in full attainment for aquatic life and recreational use downstream of the Lucas County WRRF discharge. There are no public water system intakes downstream of the Lucas County WRRF discharge so it is not believed to be contributing to the public water supply impairment for the large river assessment unit. The large river assessment is in impairment for human health criteria for PCBs in fish tissue. PCB's have not been identified as a concern in the Lucas County WRRF whole effluent toxicity results or in their pretreatment program sampling. This information indicates that Lucas County WRRF is not contributing to the impairments and no additional limits are recommended. The use attainment reports can be found at the following websites:

Ohio 2014 Integrated Water Quality Monitoring and Assessment Report:

<http://epa.ohio.gov/dsw/tmdl/OhioIntegratedReport.aspx>

"Biological and Water Quality Study of the Maumee River and Auglaize River", Ohio EPA, 2014,

http://www.epa.state.oh.us/Portals/35/documents/MaumeeTSD_2014.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 Lucas County WRRF 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)	January 2011 through December 2015
Pretreatment data	2011-2015
Ohio EPA compliance sampling data	4/9/2012 and 5/21/2012

Statistical Outliers and Other Non-Representative Data

The data were examined and no values were removed from the evaluation as non-representative data.

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 8).

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 degrade 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 following dischargers in the Maumee River were considered interactive (see Figure 3):

- Lucas County WRRF
- City of Perrysburg WWTP

The Lucas County WRRF and the City of Perrysburg WWTP were allocated together for most parameters due to the size of the plant discharges, the flows of the Maumee River and the relatively close proximity of the two plants. The exception was the ammonia-N WLA, which was done separately for each facility because ammonia-N is considered to be a non-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) using available ambient stream data from upstream sampling stations. 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
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 13), and allocations cannot exceed the Inside Mixing Zone Maximum criteria.

The data used in the WLA are listed in Tables 13 and 14. The wasteload allocation results to maintain all applicable criteria are presented in Table 14. The current permit limits for ammonia-N were evaluated and are adequate to maintain the instream criteria.

Whole Effluent Toxicity WLA

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.

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 Lucas County WRRF, the WLA values are 0.80 TU_a and 1.72 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 (IC₂₅):

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

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):

$$TU_c = 100/\text{geometric mean of No Observed Effect Concentration and Lowest Observed Effect Concentration}$$

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 (LC₅₀) for the most sensitive test species:

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

This equation applies outside the mixing zone for warmwater, modified warmwater, exceptional warmwater, coldwater, and seasonal salmonid use designations.

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

<u>Dilution Ratio</u> (downstream flow to discharger flow)	<u>Allowable Effluent Toxicity</u> (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

The acute WLA for Lucas County WRRF is 40 percent mortality in 100 percent effluent based on the dilution ratio of 2.6 to 1.

Reasonable Potential/ Effluent Limits/Hazard 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 8, and the PEL_{max} is compared to the PEQ_{max}. Based on the calculated percentage of the allocated value [(PEQ_{avg} ÷ PEL_{avg}) X 100, or (PEQ_{max} ÷ 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 Lucas County WRRF 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 and Water Temperature

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

Ammonia, Dissolved Oxygen, Total Suspended Solids, and 5-Day Carbonaceous Biochemical Oxygen

The limits proposed for ammonia, dissolved oxygen, total suspended solids, and 5-day carbonaceous biochemical oxygen demand are all based on plant design criteria. These limits are protective of WQS and will be maintained in the permit renewal. The current ammonia limits have been evaluated using the WLA procedures and are protective of WQS for ammonia toxicity.

Nitrate + Nitrite and Total Kjeldahl Nitrogen

The *Biological and Water Quality Study of the Maumee River and Auglaize River 2012-2013* (Ohio EPA) lists the Maumee River watershed as impaired for aquatic life. Nutrients and eutrophication are listed as causes, and major municipal point sources are listed among the sources. Considering this information and the fact that municipal WRFs discharge a nutrient load to the river, monthly monitoring for nitrate + nitrite and total Kjeldahl nitrogen is proposed based on best technical judgment. Monitoring for nitrate + nitrite at the upstream

and downstream stations also is proposed. The purpose of the monitoring is to maintain a nutrient data set for use in future water quality studies.

Oil and Grease, pH, and *Escherichia coli*

Limits proposed for oil and grease, pH, and *Escherichia coli* are based on WQS (OAC 3745-1-07). Class A PCR *E. coli* standards apply to the Maumee River.

Total Phosphorus

Total phosphorus is limited based on provisions of OAC 3745-33-06(C). The 1.0 mg/L monthly limit and 1.5 mg/L weekly limit are proposed to continue. Also, Part I.C of the permit contains a schedule of compliance under Part A. Evaluation for Reducing Discharge of Phosphorus. Under this schedule of compliance, the permittee should evaluate collected effluent data, possible source reduction measures, operational improvements, and minor facility modifications that will optimize reductions in phosphorus discharges from the facility.

Dissolved Orthophosphate

New monthly monitoring is proposed for dissolved orthophosphate (as P). This monitoring is required by Ohio Senate Bill 1, which was signed by the Governor on April 2, 2015. Monitoring for orthophosphate is proposed to further develop nutrient datasets for dissolved reactive phosphorus and to assist stream and watershed assessments and studies. Ohio EPA monitoring, as well as other in-stream monitoring, is taken via grab sample, orthophosphate is proposed to be collected by grab sample to maintain consistent data to support watershed and stream surveys. Monitoring will be done by grab sample, which must be filtered within 15 minutes of collection using a 0.45-micron filter. The filtered sample must be analyzed within 48 hours.

Diethyl Phthalate

The Ohio EPA risk assessment (Table 15) places diethyl phthalate in group 4. This placement, as well as the data in Tables 5, 6, and 8 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).

Diethyl phthalate monitoring was not required in the previous permit. However, Ohio EPA bioassay sampling, compiled in Table 6, resulted in one detection of Diethyl phthalate. While the detection was not high enough to trigger limits based upon reasonable potential, they were high enough to trigger a monitoring requirement.

Cadmium, Chromium, Hexavalent Chromium (dissolved), Copper Free Cyanide, Lead, Nickel, and Zinc

The Ohio EPA risk assessment (Table 15) places cadmium, chromium, hexavalent chromium (dissolved), copper free cyanide, lead, nickel, and zinc in groups 2 and 3. This placement, as well as the data in Tables 7 and 8, support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Continued monitoring is proposed to document that these pollutants continue to remain at low levels.

Barium, Bis(2-ethylhexyl) phthalate, Bromomethane, Chloroform, Dimethyl phthalate, Manganese, Methylene Chloride, and Strontium

The Ohio EPA risk assessment (Table 15) places barium, bis(2-ethylhexyl) phthalate, bromomethane, chloroform, dimethyl phthalate, manganese, methylene chloride, and strontium in groups 2 and 3. This placement, as well as the data in Tables 7 and 8, 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.

Total Filterable Residue

The Ohio EPA risk assessment (Table 15) places total filterable residue (total dissolved solids) in group 4. This placement, as well as the data in Tables 7 and 8 support that this parameter does not have the reasonable

potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Based on best technical judgment, monitoring is proposed to continue for total filterable residue (total dissolved solids). The purpose of the monitoring is to obtain data on the level and variability of total filterable residue in the effluent.

MERCURY

The Ohio EPA risk assessment (Table 15) places mercury in group 5. This placement, as well as the data in Tables 7 and 8 indicates that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality. For mercury, the PEQ is greater than 100 percent of the WLA. Pollutants that meet this requirement must have permit limits under OAC 3745-33-07(A)(1). The thirty-day average concentration limit is based on the mercury variance described below. The daily maximum concentration limit for mercury is based on WQS and is proposed to continue at 1700ng/l.

The Lucas County WRRF permit was renewed on June 1, 2011 to include a mercury variance, and variance-based limits for mercury. Based on the monitoring results from January 2011 to December 2015 and the new application information, the Lucas County WRRF has determined that the facility will not meet the 30-day average permit limit of 1.3. 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 Lucas County WRRF is eligible for the mercury variance under OAC 3745-33-07(D)(10)(a).

Lucas County WRRF submitted information supporting the renewal of the variance. The permittee has implemented a pollutant minimization program to reduce the amount of mercury coming being discharged. The calculation of the PEQ_{avg} value from 2011 to 2015 compared to the PEQ_{avg} calculated at the time the original variance was issued shows an increase from 3.9 ng/l to 6.1 ng/l. The previous monthly limit of 3.9 ng/l will be carried over into the permit renewal. The Pollutant Minimization Program (PMP) schedule developed from the original variance continues to be implemented, and 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 3.9 ng/L, which is a continuation of the current variance based limit;
- 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 acute and chronic toxicity results in Table 9 and Table 10 under the provisions of 40 CFR Part 132, Appendix F, Procedure 6, gives a chronic PEQ of 1.96 TU_c for *Ceriodaphnia Dubia* and 3.64 TU_c for *Pimephales promelas*. Reasonable potential for chronic toxicity is demonstrated, since these values exceed the

WLA value 1.72 TU_c. PEQ values for acute toxicity cannot be calculated because there was no detection of acute toxicity in the 19 samples measured. Consistent with Procedure 6 and OAC 3745-33-07(B), it is proposed to continue with the previous permit limits; a monthly average limit of 1.7 TU_c and a daily maximum limit of 1.0 TU_a.

Additional Monitoring Requirements

New monitoring is being proposed at influent monitoring station 601 and final effluent monitoring station 001 for arsenic, selenium and molybdenum to monitor as part of the pretreatment program and for the land application of biosolids.

A new outfall 002 will be added to the permit. The outfall will monitor the plant bypass that occurs prior to the treatment plant headworks. The facility had two bypasses at this location in 2015. The documented bypass in March 2015 had an estimated discharge volume of 3.77 million gallons. The bypass was attributed to an ice jam in the receiving stream that prevented the plant from discharging by gravity. The second bypass occurred in June 2015 and had an estimated discharge volume of 8.62 million gallons. The bypass was attributed to a rain event. Over 5 inches of rain occurred over a two-day period and overwhelmed the collection and treatment systems with high flows. Prior to the two bypasses in 2015, a bypass had not been reported since 2009.

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

Pretreatment Local Limits Review - A 6-month compliance schedule is proposed for the County 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 County must also submit a pretreatment program modification request. Details are in Part I.C of the permit.

Phosphorus Optimization - The permittee shall prepare and submit a Phosphorus Discharge Optimization Evaluation plan to Ohio EPA Northwest District Office. The plan shall be completed and submitted to Ohio EPA no later than 12 months from the effective date of this permit. 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 adopted in December 2006 (OAC 3745-7-02). These rules require the Lucas County WRRF 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”.

Low-Level Free Cyanide Testing

Currently there are two approved methods for free cyanide listed in 40 CFR 136.3 that have quantification levels lower than any water quality-based effluent limits:

- ASTM D7237-10 and OIA-1677-09 - Flow injection followed by gas diffusion amperometry

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. The new permits require permittees to begin using one of these approved methods as soon as possible. If a permittee must use method 4500 CN-I during the transition to an approved method, they are instructed to report the results on their DMR and enter “Method 4500 CN-I” in the remarks section.

Outfall Signage

Part II of the permit includes requirements for the permittee to place and maintain a sign at each outfall to the Maumee 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 Lucas County WRRF may seek permit coverage under the general permit for industrial storm water (permit # OHR000005) or submit a “No Exposure Certification.” Parts IV, V, and VI will be removed from the final permit if: 1) the Lucas County WRRF 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 Lucas County WRRF

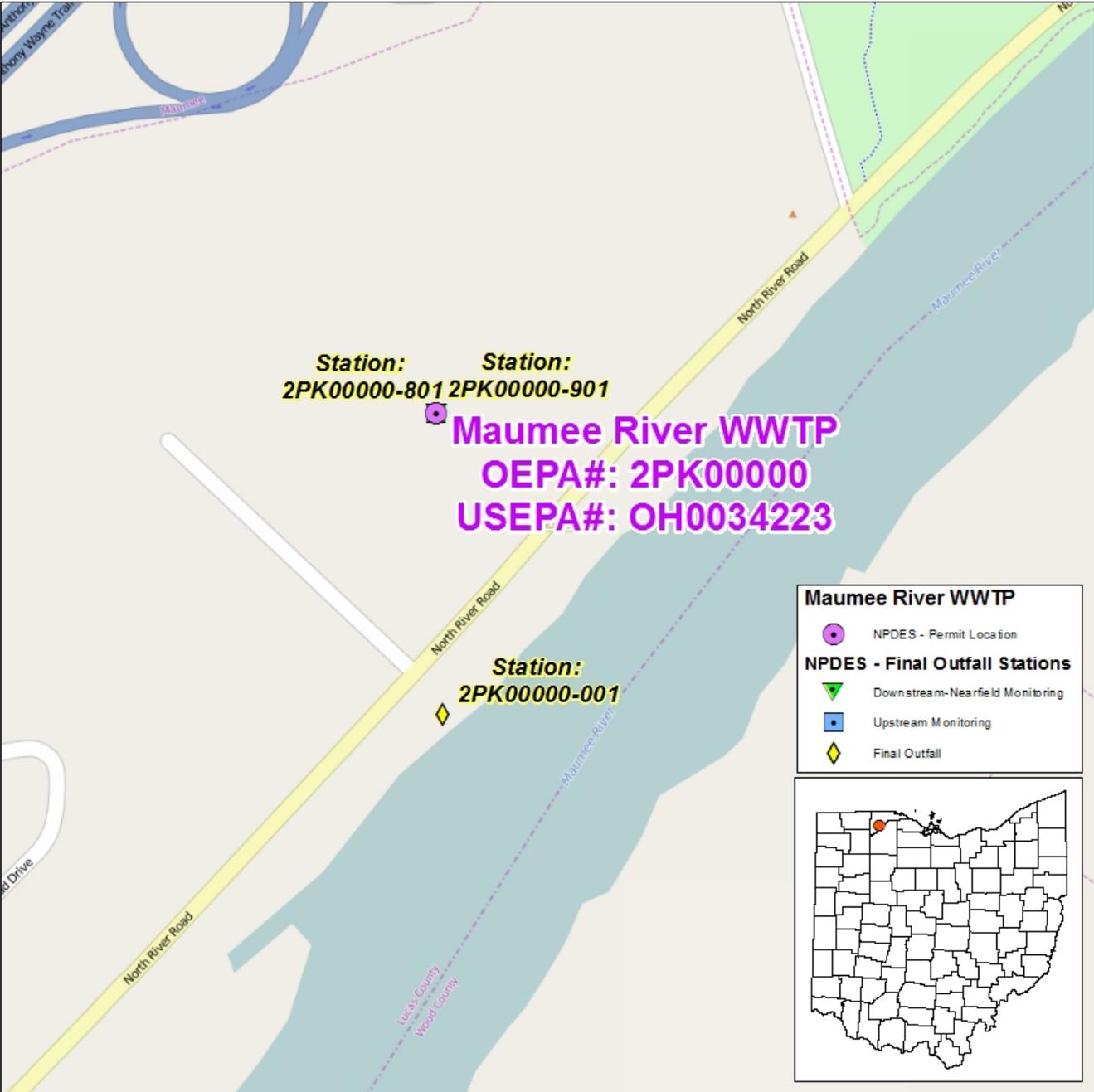


Figure 2. Diagram of Wastewater Treatment System

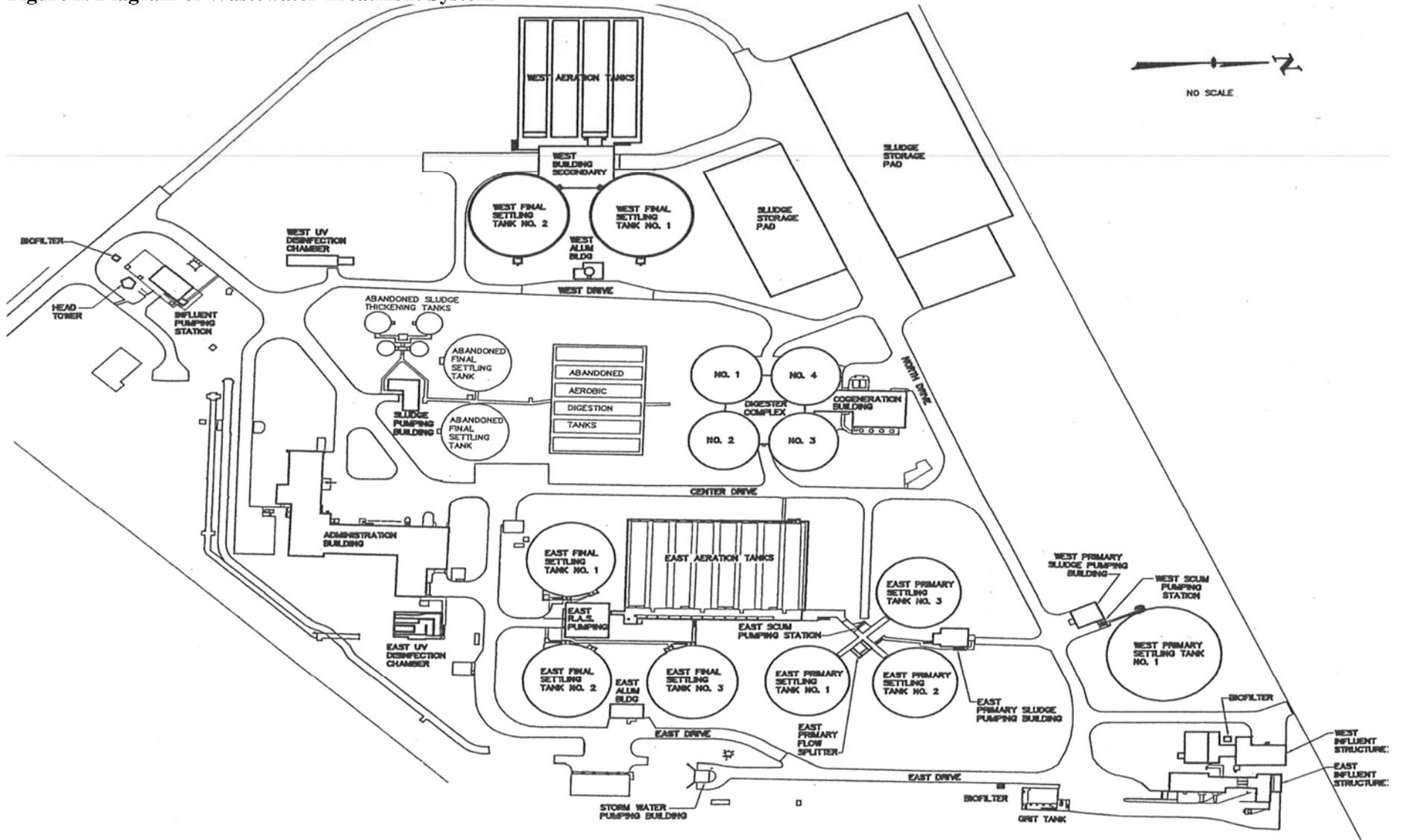
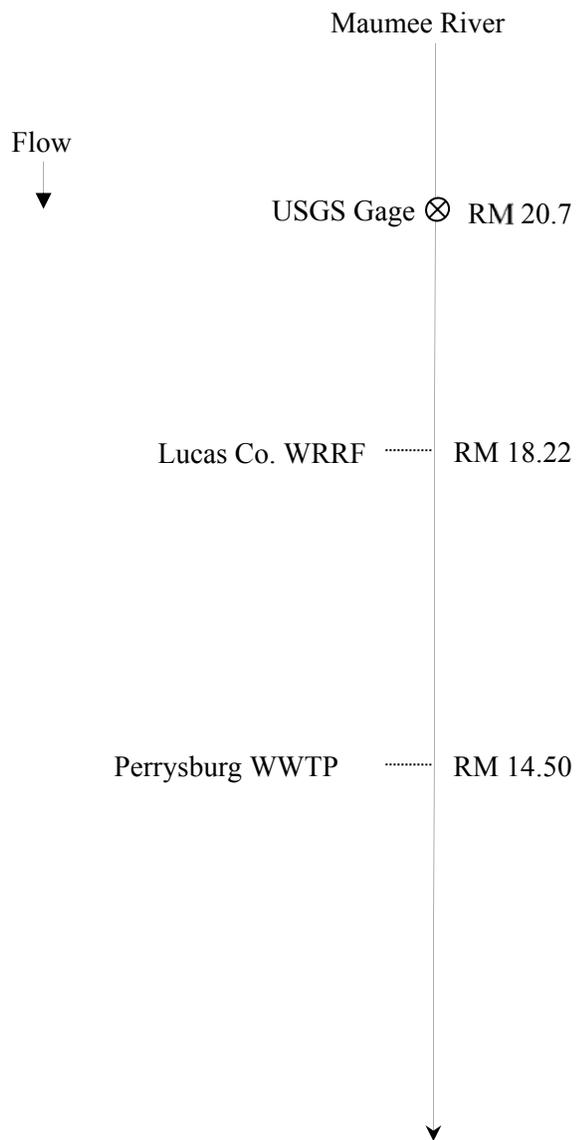


Figure 3. Maumee River Study Area



RM = River Mile

WRRF = Water Resource Recovery Facility

WWTP = Waste Water Treatment Plant

USGS = United States Geological Survey

Table 1. Sewage Sludge Removal

Year	Dry Tons Removed
2011	2174
2012	2187.4
2013	1794.7
2014	2027.7
2015	2085.2

Table 2. Effluent Violations for Outfall 001

PARAMETER	2011	2012	2013	2014	2015
E. coli	7	0	2	2	0
Mercury	2	1	1	6	0
Nitrogen, Ammonia (NH3)	18	11	1	7	0
Phosphorus	0	1	2	0	0
pH, Minimum	1	12	0	0	0
<i>Total</i>	28	25	6	15	0

Table 3. Average Annual Effluent Flow Rates

Year	Annual Flow in MGD		
	50th Percentile	95th Percentile	Maximum
2011	15.8	31.6	51.2
2012	13.6	23.2	37.6
2013	13.9	24.5	36.1
2014	14.4	25.3	39.8
2015	15.5	22.3	42.9

MGD = million gallons per day

Table 4 Calculated Phosphorus Loadings

<i>Calculated Phosphorus Loadings from 2011-2015</i>					
Median Flows for May through October		Median Daily P Concentration for May through October		Calculated Loading	
Range	Flow (MGD)	Year	Phosphorus (mg/L)	Year	Loading (kg/day)
'07-'11	14.6	2011	0.68	2011	37.8
'08-'12	13.1	2012	0.87	2012	41.7
'09-'13	13.6	2013	0.72	2013	43.8
'10-'14	14.2	2014	0.80	2014	43.1
'11-'15	15.1	2015	0.56	2015	30.0

MGD = million gallons per day

Table 5. Effluent Characterization Using Pretreatment Data

Parameter (µg/L)	4/12/2011	3/6/2012	6/4/2013	3/4/2014	4/14/2015
Antimony	AA (8)	AA (8)	AA (8)	AA (8)	AA (8)
Arsenic	AA (8)	AA (8)	AA (8)	AA (8)	AA (8)
Beryllium	AA (1)	AA (1)	AA (1)	AA (1)	AA (1)
Cadmium	AA (1)	AA (1)	AA (1)	AA (1)	AA (1)
Chloroform	1.1	AA (1)	1.1	AA (1)	AA (1)
Chromium	AA (4)	AA (4)	AA (4)	AA (4)	AA (4)
Copper	AA (4)	AA (4)	AA (4)	AA (4)	4
Diethylphthalate	AA (5)	AA (5)	AA (5)	AA (5)	AA (5)
Dimethylphthalate	AA (5)	AA (5)	AA (5)	AA (5)	AA (5)
Lead	AA (5)	AA (5)	AA (5)	AA (5)	AA (5)
Mercury	AA (0.2)	AA (0.2)	AA (0.2)	AA (0.2)	AA (0.2)
Methylene Chloride	AA (2)	AA (2)	AA (2)	2	AA (2)
Nickel	7	AA (4)	5	4	AA (4)
Selenium	AA (8)	AA (8)	AA (8)	AA (8)	AA (8)
Silver	AA (4)	AA (4)	AA (4)	AA (4)	AA (4)
Thallium	AA (10)	AA (10)	AA (10)	AA (10)	AA (10)
Zinc	59	33	27	32	31

AA = not-detected (analytical method detection limit)

Table 6. Effluent Characterization Using Ohio EPA data

Parameter (µg/L)	4/9/2012	5/21/2012
Aluminum	RL (200)	RL (200)
Ammonia (mg/L)	RL (0.05)	9.55
Arsenic	RL (2.0)	RL (2.0)
Barium	25	19
Bromomethane	0.57	RL (0.5)
Cadmium	RL (0.2)	RL (0.2)
Chloride (mg/L)	162	145
Chloroform	RL (0.5)	RL (0.5)
Chromium	RL (2.0)	RL (2.0)
Copper	3.0	3.9
Diethylphthalate	RL (5.3)	136
Dimethylphthalate	RL (5.3)	16.1
Iron	461	319
Lead	RL (2.0)	RL (2.0)
Manganese	73	120
Methylene Chloride	RL (0.5)	RL (0.5)
Nickel	4.9	7.2
Nitrate + Nitrite (mg/L)	17.7	10.6
Selenium	RL (2.0)	RL (2.0)
Strontium	961	847
Total Dissolved Solids (mg/L)	642	600
Zinc	19	16

RL = Below Reporting Level

Table 7. Effluent Characterization Using Self-Monitoring Data

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50 th	95 th	
Outfall 001								
Water Temperature	Annual	C	-----Monitor-----		1093	17.5	21.3	10.8-22.5
Dissolved Oxygen	Summer	mg/l	5.3 Minimum		617	7.5	9.2	5.3-9.8
	Winter	mg/l	5.3 Minimum		476	8.8	9.9	5.9-11.5
Total Suspended Solids	Annual	mg/l	24	36 ^a	817	7.6	15	2-32.2
		kg/day	2044	3066 ^a				
Oil and Grease	Annual	mg/l	--	10 ^a	60	0	0	0-0
Ammonia	Summer	mg/l	3.0	4.5 ^a	467	0.57	6.08	0-9.85
		kg/day	255.5	383.3 ^a				
	Winter	mg/l	11.0	16.5 ^a	359	0.61	8.15	0-18.7
		kg/day	936.9	1405 ^a				
Nitrogen Kjeldahl	Annual	mg/l	-----Monitor-----		53	1.6	7.06	0-10.8
Nitrite + Nitrate	Annual	mg/l	-----Monitor-----		107	17.6	24.6	8.47-28
Phosphorus	Annual	mg/l	1.0	1.5 ^a	432	0.69	1.14	0.33-2
		kg/day	85.2	128 ^a				
Cyanide, Free	Annual	mg/l	-----Monitor-----		106	0	0.005	0-0.011
Nickel	Annual	µg/l	-----Monitor-----		53	5	14	0-18
Zinc	Annual	µg/l	-----Monitor-----		53	28	50	19-55
Cadmium	Annual	µg/l	-----Monitor-----		19	0	0	0-0
Lead	Annual	µg/l	-----Monitor-----		19	0	0	0-0
Chromium	Annual	µg/l	-----Monitor-----		19	0	0	0-0
Copper	Annual	µg/l	-----Monitor-----		53	0	1.6	0-8
Hexavalent Chromium	Annual	µg/l	-----Monitor-----		19	0	0	0-0
E. coli	Annual	#/100 ml	126	284 ^a	754	50	435	1-3700
Flow Rate	Annual	MGD	-----Monitor-----		1614	14.4	24.9	8.35-51.2
Mercury, Total (Low Level)	Annual	ng/l	3.9	1700	78	2.77	7.96	0.56-12.6
		kg/day	0.00033	0.14				
Acute Toxicity, <i>Ceriodaphnia dubia</i>	Annual	TUa	--	1.0	18	0	0	0-0
Chronic Toxicity, <i>Ceriodaphnia dubia</i>	Annual	TUc	1.7	--	18	0	1.23	0-1.4
Acute Toxicity, <i>Pimephales promelas</i>	Annual	TUa	--	1.0	18	0	0	0-0
Chronic Toxicity, <i>Pimephales promelas</i>	Annual	TUc	1.7	--	18	0	0.39	0-2.6
pH, Maximum	Annual	S.U.	9.0 Maximum		1093	7	7.3	6.4-7.5
pH, Minimum	Annual	S.U.	6.5 Minimum		1093	6.9	7.2	6.3-7.4
Residue, Total Filterable	Annual	mg/l	-----Monitor-----		51	668	886	532-996
CBOD 5 day	Summer	mg/l	13.3	20.3 ^a	411	3.1	5.1	0-8
		kg/day	1133	1729 ^a				
	Winter	mg/l	20.0	31.7 ^a	304	4.25	7.29	0-17
		kg/day	1703	2700 ^a				

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50 th	95 th	
Outfall 581								
Ammonia	Annual	mg/kg	-----Monitor-----		28	8700	12300	5990-13800
Nitrogen Kjeldahl	Annual	mg/kg	-----Monitor-----		28	38600	52800	20600-57600
Phosphorus	Annual	mg/kg	-----Monitor-----		28	29200	31500	2800-32900
Potassium	Annual	mg/kg	-----Monitor-----		26	667	919	455-3230
Arsenic	Annual	mg/kg	--	75	28	11.2	12.7	7.8-13.2
Cadmium	Annual	mg/kg	--	85	28	0	1.37	0-1.4
Copper	Annual	mg/kg	--	4300	28	268	299	247-317
Lead	Annual	mg/kg	--	840	28	19.4	31	15.9-34.7
Nickel	Annual	mg/kg	--	420	28	28.3	39.8	22.9-65.3
Zinc	Annual	mg/kg	--	7500	28	1270	1600	746-1920
Selenium	Annual	mg/kg	--	100	28	5.4	7.8	4.3-8.1
Sludge Fee Weight	Annual	dry tons	-----Monitor-----		1002	7.9	19.1	0.6-64.3
Sludge Weight	Annual	Dry Tons	-----Monitor-----		1002	7.9	19.1	0.6-64.3
Mercury	Annual	mg/kg	--	57	28	0.965	1.37	0.51-1.55
Molybdenum	Annual	mg/kg	--	75	28	16.8	21.1	11.7-21.8
Outfall 601								
Total Suspended Solids	Annual	mg/l	-----Monitor-----		817	184	362	68-1390
Cyanide, Free	Annual	mg/l	-----Monitor-----		53	0	0.0054	0-0.007
Nickel	Annual	µg/l	-----Monitor-----		53	8	34.4	0-85
Zinc	Annual	µg/l	-----Monitor-----		53	163	585	65-3070
Cadmium	Annual	µg/l	-----Monitor-----		53	0	0	0-0
Lead	Annual	µg/l	-----Monitor-----		53	0	13.2	0-30
Chromium	Annual	µg/l	-----Monitor-----		53	14	36.2	0-88
Copper	Annual	µg/l	-----Monitor-----		53	33	87.8	13-177
Hexavalent Chromium	Annual	µg/l	-----Monitor-----		53	0	0	0-0
Mercury, Total (Low Level)	Annual	ng/l	-----Monitor-----		51	66.1	249	6.99-485
pH, Maximum	Annual	S.U.	-----Monitor-----		1093	7.1	7.7	6.6-9.8
pH, Minimum	Annual	S.U.	-----Monitor-----		1093	6.9	7.2	5-7.7
CBOD 5 day	Summer	mg/l	-----Monitor-----		411	185	274	61-754
CBOD 5 day	Winter	mg/l	-----Monitor-----		301	162	268	58.3-497
Outfall 801								
Water Temperature	Annual	C	-----Monitor-----		47	16.9	23.8	2.1-25.6
Dissolved Oxygen	Summer	mg/l	-----Monitor-----		29	6.2	9.54	3.6-10
	Winter	mg/l	-----Monitor-----		18	11.4	12.4	5.8-12.7
pH	Annual	S.U.	-----Monitor-----		47	7.7	8.4	6.9-8.6
Ammonia	Summer	mg/l	-----Monitor-----		29	0	0	0-0.44

	Winter	mg/l	-----Monitor-----	18	0	0	0-0	
Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50 th	95 th	
Nitrite + Nitrate	Annual	mg/l	-----Monitor-----	47	3.4	8.29	0-19.9	
Phosphorus, Total (P)	Annual	mg/l	-----Monitor-----	47	0.22	0.384	0.07-0.59	
E. coli	Annual	#/100 ml	-----Monitor-----	40	124	603	13-1990	
48-Hr. Acute Toxicity <i>Ceriodaphnia dubia</i>	Annual	% Affected	-----Monitor-----	17	0	0	0-0	
96-Hr. Acute Toxicity <i>Pimephales promela</i>	Annual	% Affected	-----Monitor-----	17	0	5	0-5	
7-Day Chronic Toxicity <i>Ceriodaphnia dubia</i>	Annual	% Affected	-----Monitor-----	17	0	2	0-10	
7-Day Chronic Toxicity <i>Pimephales promelas</i>	Annual	% Affected	-----Monitor-----	17	2.5	7.5	0-7.5	
Outfall 901								
Water Temperature	Annual	F	-----Monitor-----	45	60.1	74	32.7-77	
Dissolved Oxygen	Summer	mg/l	-----Monitor-----	29	5.7	8.56	3.5-8.7	
	Winter	mg/l	-----Monitor-----	18	11.2	12.2	5-12.3	
pH	Annual	S.U.	-----Monitor-----	47	7.5	8.1	6.9-8.3	
Nitrogen, Ammonia (NH3)	Summer	mg/l	-----Monitor-----	29	0	0.832	0-0.96	
	Winter	mg/l	-----Monitor-----	18	0	1.23	0-2.5	
Nitrite + Nitrate	Annual	mg/l	-----Monitor-----	47	5.82	10	2.6-11.2	
Phosphorus, Total (P)	Annual	mg/l	-----Monitor-----	47	0.28	0.487	0.11-0.6	
E. coli	Annual	#/100 ml	-----Monitor-----	38	164	2040	13-4400	

All values are based on annual records unless otherwise indicated. a = weekly average.”

Table 8. Projected Effluent Quality

Parameter	Units	Number of samples	Number > MDL	PEQ Average	PEQ Maximum
Ammonia (summer)	mg/l	331	176	2.943	6.572
Ammonia (winter)	mg/l	226	141	22.58	34.24
Bis(2-ethylhexyl)phthalate	µg/l	2	0	--	--
Bromomethane ^A	µg/l	4	1	1.082	1.482
Cadmium ^A	µg/l	32	0	--	--
Chromium ^A	µg/l	32	0	--	--
Copper ^A	µg/l	67	7	3.298	5.202
Cyanide - free	µg/l	120	8	3.836	5.884
Hexavalent Chromium (dissolved)	µg/l	25	0	--	--
Lead - TR ^A	µg/l	32	0	--	--
Mercury - TR ^A	ng/l	85	80	6.112	9.367
Nitrate-N + Nitrite-N ^A	mg/l	123	123	24.9	33.36
Nickel ^A	µg/l	67	47	9.487	13.94
Phosphorus	mg/l	488	488	0.873	1.207
Strontium ^A	µg/l	9	9	1695	2322
Total Filterable Residue ^A	mg/l	53	53	774.6	882.7
Zinc ^A	µg/l	67	67	40.75	52.46
Combined Other Data					
Barium	µg/l	2	2	69.35	95
Chloride	mg/l	2	2	449.4	615.6
Chloroform	µg/l	7	2	1.606	2.2
Diethyl phthalate	µg/l	7	1	198.6	272
Dimethyl phthalate	µg/l	7	1	23.51	32.2
Iron	µg/l	2	2	1279	1752
Manganese	µg/l	2	2	332.9	456
Methylene chloride	µg/l	7	1	2.92	4

^A DMR data combined with Pretreatment data and OEPA Compliance data.

^B Combined other data sources include Pretreatment Program data and Ohio EPA data.

DMR = Discharge Monitoring Report

MDL = analytical laboratory method detection limit

PEQ = projected effluent quality

Table 9. Summary of Acute and Chronic Toxicity Results

Date	<i>Ceriodaphnia Dubia</i>		<i>Pimephales promelas</i>	
	TU _a	TU _c	TU _a	TU _c
3/11/2011	AA	AA	AA	AA
6/6/2011	AA	AA	AA	AA
8/1/2011	AA	AA	AA	AA
12/5/2011	AA	1.4	AA	AA
3/6/2012	AA	AA	AA	AA
6/12/2012	AA	AA	AA	AA
8/8/2012	AA	AA	AA	AA
12/4/2012	AA	AA	AA	2.6
3/6/2013	AA	AA	AA	AA
6/5/2013	AA	AA	AA	AA
8/7/2013	AA	AA	AA	AA
12/4/2013	AA	AA	AA	AA
3/5/2014	AA	AA	AA	AA
6/4/2014	AA	AA	AA	AA
8/6/2014	AA	AA	AA	AA
12/3/2014	AA	1.2	AA	AA
3/4/2015	AA	AA	AA	AA
6/1/2015	AA	AA	AA	AA
8/10/2015	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 10. Ohio EPA Toxicity Screening Results for Outfall 001

Date	<i>Pimephales promelas</i>		<i>Ceriodaphnia dubia</i>	
	%M		%M	
	24 hours	48 hours	24 hours	48 hours
4/9/2012	0	0	0	5
4/10/2012	0	0	0	0
4/9/12-4/10/12 ^a	0	0	0	0
5/21/2012	0	0	0	10
5/22/2012	0	0	0	5
5/21/12-5/22/12 ^a	0	0	0	5

^a = 24-hour composite sample

%M = percent mortality in 100% effluent

Table 11. Aquatic Life Use Attainment Table

Location	River Mile	Use Designation	Attainment Status	Causes of Impairment	Sources of Impairment
Maumee River at Waterville / SR 64 ^a	20.6	WWH	Full		
Maumee River at Buttonwood Park ^b	16.5	WWH	Full		

WWH = warmwater habitat

a. Upstream of the Lucas County WRRF discharge

b. Downstream of the Lucas County WRRF discharge

Table 12. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria					Inside Mixing Zone Maximum
		Wildlife	Average			Maximum Aquatic Life	
			Human Health	Agri-Culture	Aquatic Life		
Barium	µg/l	--	160000	--	220	2000	4000
Bis(2-ethylhexyl)phthalate	µg/l	--	32 ^c	--	8.4	1100	2100
Bromomethane	µg/l	--	2600	--	16	38	75
Cadmium	µg/l	--	730	50	4.6	11	22
Chlorides	mg/l	--	--	--	--	--	--
Chloroform	µg/l	--	1700 ^c	--	140	1300	2600
Chromium	µg/l	--	14000	100	160	3400	6900
Copper - TR	µg/l	--	64000	500	18	29	59
Cyanide - free	µg/l	--	48000	--	5.2	22	44
Diethyl phthalate	µg/l	--	--	--	220	980	2000
Dimethyl phthalate	µg/l	--	--	--	1100	3200	6400
Hexavalent Chromium (dissolved)	µg/l	--	14000	--	11	16	31
Iron	µg/l	--	--	5000	--	--	--
Lead	µg/l	--	--	100	17	330	660
Manganese	µg/l	--	61000	--	--	--	--
Mercury ^A	ng/l	1.3	3.1	10000	910	1700	3400
Methylene chloride	µg/l	--	2600 ^c	--	1900	11000	22000
Nickel	µg/l	--	43000	200	100	910	1800
Nitrate-N + Nitrite-N	mg/l	--	--	100	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--
Strontium	µg/l	--	1400000	--	21000	40000	81000
Total Filterable Residue	mg/l	--	--	--	1500	--	--
Zinc	µg/l	--	35000	25000	230	230	470

^A Bioaccumulative Chemical of Concern (BCC)

^C Carcinogen

Table 13. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
<i>Stream Flows</i>				
7Q10	cfs	annual	99.84	USGS gage #04193500, 1940-2015 data
1Q10	cfs	annual	57.65	USGS gage #04193500, 1940-2015 data
30Q10	cfs	summer	151.6	USGS gage #04193500, 1940-2014 data
		winter	376.9	USGS gage #04193500, 1939-2015 data
Harmonic Mean Flow	cfs	annual	797.3	USGS gage #04193500, 1939-2014 data
Mixing Assumption	%	average	25	Stream-to-discharge ratio
		maximum	100	Stream-to-discharge ratio
<i>Lucas Co. WRRF Outfall 001 flow rate</i>				
<i>Lucas Co. WRRF Outfall 001 flow rate</i>	cfs (MGD)	design	34.81 (22.5)	NPDES permit application
<i>Perrysburg WWTP Outfall 001 flow rate</i>	cfs (MGD)	average	12.38 (8.0)	NPDES permit application
<i>Hardness</i>				
<i>Hardness</i>	mg/l	annual	219	DMR (Perrysburg 901); 54 values, 2011-2015
<i>Background Water Quality for the Maumee River</i>				
Barium	µg/l	annual	48	STORET; 85 values, 0<MDL, 2007-15
Bromomethane	µg/l	annual	0	No representative data available.
Cadmium	µg/l	annual	0.1	STORET; 85 values, 78<MDL, 2007-15
Chloroform	µg/l	annual	0	No representative data available.
Chromium	µg/l	annual	1	STORET; 84 values, 67<MDL, 2007-15
Copper	µg/l	annual	3.1	STORET; 85 values, 17<MDL, 2007-15
Cyanide, free	µg/l	annual	0	No representative data available.

Diethyl phthalate	µg/l	annual	0	No representative data available.
Dimethyl phthalate	µg/l	annual	0	No representative data available.
Hexavalent Chromium (dissolved)	µg/l	annual	0	No representative data available.
Iron	µg/l	annual	761	STORET; 85 values, 0<MDL, 2007-15
Lead	µg/l	annual	1	STORET; 85 values, 63<MDL, 2007-15
Mercury	ng/l	annual	0	No representative data available.
Methylene chloride	µg/l	annual	0	No representative data available.
Nickel	µg/l	annual	4	STORET; 85 values, 11<MDL, 2007-15
Strontium	µg/l	annual	756	STORET; 84 values, 0<MDL, 2007-15
Total Filterable Residue	mg/l	annual	363	STORET; 94 values, 0<MDL, 2007-15
Zinc	µg/l	annual	5	STORET; 84 values, 58<MDL, 2007-15

DMR = Discharge Monitoring Report

MDL = method detection limit

NPDES = National Pollutant Discharge Elimination System

STORET = United States Environmental Protection Agency Storage and Retrieval Data Warehouse

USGS = United States Geological Survey

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

Parameter	Units	Outside Mixing Zone Criteria					Inside Mixing Zone Maximum
		Wildlife	Average			Maximum Aquatic Life	
			Human Health	Agri-Culture	Aquatic Life		
Barium	µg/l	--	834517 ^A	--	311	4385 ^A	4000
Bis(2-ethylhexyl) phthalate	µg/l	--	--	--	--	--	--
Bromomethane ^B	µg/l	--	17464 ^A	--	27	101 ^A	75
Cadmium ^B	µg/l	--	3808 ^A	260 ^A	7	24 ^A	22
Chloride	µg/l	--	--	--	--	--	--
Chloroform ^B	µg/l	--	11418 ^A	--	241	3453 ^A	2600
Chromium ^B	µg/l	--	73034 ^A	517	244	7552 ^A	6900
Copper ^B	µg/l	--	333875 ^A	2595 ^A	26	61 ^A	59
Cyanide, free	µg/l	--	322404 ^A	--	8.9	58 ^A	44
Diethyl phthalate	µg/l	--	--	--	378	2603 ^A	2000
Dimethyl phthalate ^B	µg/l	--	--	--	1890	8500 ^A	6400
Hexavalent Chromium (dissolved) ^B	µg/l	--	73038 ^A	--	17	36 ^A	31
Iron	µg/l	--	--	22876	--	--	--
Lead ^B	µg/l	--	--	517	25	732 ^A	660
Manganese ^D	µg/l	--	--	--	--	--	--
Mercury ^C	ng/l	1.3	3.1	10000 ^A	910	1700	3400
Methylene chloride ^B	µg/l	--	17464	--	3265	29217 ^A	22000
Nickel ^B	µg/l	--	224314 ^A	1027	151	2017 ^A	1800
Nitrate-N + Nitrite-N ^D	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--
Strontium ^B	µg/l	--	7301000 ^A	--	3172 5	87943 ^A	81000
Total Filterable Residue	mg/l	--	--	--	2102	--	--
Zinc ^B	µg/l	--	182574 ^A	130404 ^A	349	505 ^A	470

^A Allocation must not exceed the Inside Mixing Zone Maximum.

^B Parameter would not require a WLA based on reasonable potential procedures, but allocation requested by permit staff.

^C Bioaccumulative Chemical of concern (BCC).

^D No WLA required for this parameter.

Table 16. Final Effluent Limits for Outfall 001

Parameter	Units	Concentration		Loading (kg/day) ^a		Basis ^b
		30 Day Average	Daily Maximum	30 Day	Daily	
				Average	Maximum	
Water Temperature	°C	----- Monitor -----				M ^c
Flow Rate	MGD	----- Monitor -----				M ^c
pH	SU	6.5 - 9.0		--	--	WQS
Dissolved Oxygen	mg/L	5.3 Minimum				BTJ/PD
Total Suspended Solids	mg/L	24.0	36.0 ^d	2044	3066 ^d	BTJ
Oil & Grease	mg/L	--	10.0	--	--	WQS
Ammonia						
March-Nov.	mg/L	3.0	4.5 ^d	255.5	383.3 ^d	BTJ/PD
Dec.-Feb.	mg/L	11.0	16.5 ^d	936.9	1405 ^d	BTJ/PD
Total Kjeldahl Nitrogen	mg/L	----- Monitor -----				M ^c
Nitrate+Nitrite	mg/L	----- Monitor -----				M ^c
Phosphorus	mg/L	1.0	1.5 ^d	85.2	128 ^d	PTS
Orthophosphate	mg/L	----- Monitor -----				M ^c
Total Filterable Residue	mg/L	----- Monitor -----				BTJ
Arsenic	µg/L	----- Monitor -----				M ^c
Selenium	µg/L	----- Monitor -----				M ^c
Nickel	µg/L	----- Monitor -----				M ^c
Zinc	µg/L	----- Monitor -----				M ^c
Cadmium	µg/L	----- Monitor -----				M ^c
Lead	µg/L	----- Monitor -----				M ^c
Chromium	µg/L	----- Monitor -----				M ^c
Copper	µg/L	----- Monitor -----				M ^c
Molybdenum	µg/L	----- Monitor -----				M ^c
Hexavalent Chromium (Dissolved)	µg/L	----- Monitor -----				M ^c
Mercury	ng/L	3.9	1700	0.00033	0.14	VAR, WQS
<i>E. coli</i>	#/100 mL	126	284 ^d	--	--	WQS
Diethyl phthalate	µg/L	----- Monitor -----				RP

Parameter	Units	Concentration		Loading (kg/day) ^a		Basis ^b
		30 Day Average	Daily Maximum	30 Day	Daily	
				Average	Maximum	
Carbonaceous Biochemical Oxygen Demand (5 day)						
March-Nov	mg/L	13.3	20.3 ^d	1133	1729 ^d	BTJ
Dec.-Feb	mg/L	20.0	31.7 ^d	1703	2700 ^d	BTJ
Toxicity						
<i>Ceriodaphnia dubia</i>	TU _a	--	1.0	--	--	WET
<i>Pimephales promelas</i>	TU _a	--	1.0	--	--	WET
<i>Ceriodaphnia dubia</i>	TU _c	1.7	--	--	--	WET
<i>Pimephales promelas</i>	TU _c	1.7	--	--	--	WET

^a Effluent loadings based on average design discharge flow of 22.5 MGD.

^b Definitions:

BTJ = Best Technical Judgment

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

OAC = Ohio Administrative Code

PD = Plant Design, OAC 3745-33-05(E)

PTS = Phosphorus Treatment Standards (OAC 3745-33-06 (C))

RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in permits (3745-33-07(A))

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)]

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.