National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

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

Public Notice No.: 16-04-009
Public Notice Date: April 13, 2016
Comment Period Ends: May 14, 2016

OEPA Permit No.: 3PK00009*PD
Application No.: OH0043401

Name and Address of Facility Where
Name and Address of Applicant:

Trumbull County Board of Commissioners
160 High Street
Warren, Ohio 44481

Discharge Occurs:

Mosquito Creek Wastewater Treatment Plant
7500 Anderson Avenue
Warren, Ohio 44484

Receiving Water: Mosquito Creek
Subsequent Stream Network: Mahoning River, Beaver River (PA), 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.

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: flow rate, water temperature, total suspended solids (TSS), ammonia, 5-day carbonaceous biochemical oxygen demand ($CBOD_5$), phosphorus, dissolved oxygen (DO), oil & grease, *Escherichia coli (E.coli)*, total Kjeldahl nitrogen (TKN), nitrite plus nitrate, nickel, zinc, cadmium, chromium, copper, chlorine, total filterable residue (dissolved solids), and pH.

New and/or lower water-quality-based effluent limitations (WQBELs) are proposed for lead, silver, and mercury. The monitoring frequency of lead and mercury shall increase from quarterly to monthly. The monitoring frequency of silver shall remain on a monthly basis. A compliance schedule to meet the limitations has been included in the permit.

Annual chronic toxicity monitoring with the determination of acute endpoints is proposed for the life of the permit. This satisfies the minimum testing requirements of Ohio Administrative Code (OAC) 3745-33-07(B)(11) and will adequately characterize toxicity in the plant's effluent.

Limits are proposed to be removed for dissolved hexavalent chromium and free cyanide because recent data shows a low risk of exceeding the WQS at the receiving stream. Monitoring for dissolved hexavalent chromium and free cyanide are proposed to continue. Monitoring for dissolved hexavalent chromium has been reduced to a quarterly basis.

New monthly sampling requirement has been included for dissolved orthophosphate.

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 technical and Financial Capability Study will be required. More details can be found in the "Other Requirements" section of this Fact Sheet.

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

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; dissolved metal translator (DMT) study; method detection limits (MDLs); and outfall signage.

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PROCEDURES FOR PARTICIPATION IN THE FORMULATION OF FINAL DETERMINATIONS

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

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

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

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

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

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

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

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

For additional information about this fact sheet or the draft permit, contact Virginia Wilson, (330) 963-1180 or Virginia.Wilson@epa.ohio.gov.

INFORMATION REGARDING CERTAIN WATER QUALITY BASED EFFLUENT LIMITS

This draft permit may contain proposed 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

The Trumbull County Mosquito Creek WWTP discharges to Mosquito Creek via Outfall 3PK00009001 at River Mile 7.23 (Latitude: 41° 15' 09" N Longitude: 80° 45' 42" W). Figure 1 shows the approximate location of the facility.

This segment of Mosquito Creek is described by Ohio EPA River Code: 18-030, Hydrologic Unit Code: 050301030503, County: Trumbull, Ecoregion: Western Allegheny Plateau. Mosquito Creek is designated for the following uses under Ohio's WQS (OAC 3745-1-25): Warmwater Habitat (WWH), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), and Primary Contact Recreation (PCR), Class B.

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 (PCR) and wading only (Secondary Contact - 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 AWS and IWS.

FACILITY DESCRIPTION

The Trumbull County Mosquito Creek WWTP is an advanced treatment facility that was constructed in 1963 with the last major modification in 1986. The facility serves a population of approximately 15,170 people. The facility has a design flow of 4.2 million gallons per day (MGD), with a maximum daily flow of 9.5 MGD, and a 10.0 MGD peak hydraulic capacity.

The wet stream processes at the Trumbull County Mosquito Creek WWTP include the following operations (See Figure 2):

- Mechanical Coarse Screening and Pumping
- Off-line Flow Equalization
- Fine Screening
- Grit Removal
- Primary Settling
- Activated Sludge Biological Treatment System
- Intermediate Settling
- Nitrification Towers
- Final Settling

- Chlorination/dechlorination
- Post-aeration

Wet weather flows in excess of 9.5 MGD are routed to the off-line storage lagoon. The stored flow is subsequently pumped back once plant flows return to normal levels. The facility also has an internal bypass around the notification towers when flows exceed 8.5 to 9.0 MGD.

Sludge treatment processes at the facility include:

- Gravity Thickening
- Aerobic Digestion
- Aerated Sludge Storage
- Belt Filter Press
- Sludge Drying Beds

Presently, sludge is disposed by either hauling to another publicly owned treatment works or to an authorized solid waste landfill. Table 1 shows the last 5 years of sewage sludge removed from the Trumbull County Mosquito Creek WWTP.

The Trumbull County Mosquito Creek WWTP collection system is comprised of separate sanitary sewers. The facility serves parts of Howland Township, Bazetta Township, a small portion of the City of Warren, and part of the City of Cortland. Warren and Cortland are satellite communities and are responsible for the operation and maintenance of their respective portions of the collection system.

Trumbull County implements an Ohio EPA approved industrial pretreatment program for the Mosquito Creek WWTP. Based upon information in the annual program report and an Ohio EPA audit of the program conducted in August 2014, one significant industrial user discharges to the treatment plant.

DESCRIPTION OF EXISTING DISCHARGE

Table 2 shows the annual effluent flow rates for Mosquito Creek WWTP from 2010 through 2015 based upon Discharge Monitoring Report (DMR) data. The 50^{th} and 95^{th} percentile flow rates have remained relatively constant over this time period.

Table 3 present a summary of effluent data from pretreatment reports submitted by the Mosquito Creek WWTP.

Table 4 presents a summary of unaltered DMR data for outfall 001Data are presented for the period January 2011 to December 2015. The current permit effluent limitations at outfall 3PJ00001001 are provided for comparison. Supplement data for influent station 601, upstream station 801, and downstream station 901 are included in Attachment 1.

Table 5 summarizes the chemical specific data for outfall 001 by presenting the average and maximum PEQ values.

Table 6 summarizes the acute and chronic toxicity tests for the final effluent.

ASSESSMENT OF IMPACT ON RECEIVING WATERS

Mosquito Creek has been identified as a priority impaired water for recreation and aquatic life uses on Ohio's 303(d) list. The causes of impairment include direct habitat alterations, natural conditions (flow or habitat), and sedimentation/siltation. The sources of impairment include the upstream dam or impoundment, natural sources, urban runoff, and storm sewers.

The attainment status of the Mahoning River Watershed is reported in the final 2014 *Ohio Integrated Water Quality Monitoring and Assessment Report* (hereby known as the Integrated 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 7-15). 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 7. `Use Attainment Status`) 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 (QHEI), and comments and observations for each sampling location.

The Integrated Report summarizes the general condition of Ohio's waters and identifies waters that are not meeting water quality goals. The report satisfies the CWA requirements for both Section 305(b) for biennial reports on the condition of the State's waters and Section 303(d) for a prioritized list of impaired waters. The overall attainment status of Mosquito Creek is included in the report. The 2014 Integrated Report can be found at this website:

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

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 Mosquito Creek 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)	January 2011 through December 2015
Pretreatment Reports	2011-2014

The parameter data sets were examined to determine if any values should be removed from the evaluation, as either statistical outliers or non-representative data, to give more reliable PEQs. Based on discussions with the Mosquito Creek WWTP, no values were removed from the evaluation.

This data is evaluated statistically and PEQ values are calculated for each pollutant. Average PEQ (PEQ_{avg}) values represent the 95th percentile of monthly average data, and maximum PEQ (PEQ_{max}) values represent the 95th percentile of all data points (see Table 5).

The PEQ values are used according to Ohio rules to compare to applicable WQS and allowable WLA values for each pollutant evaluated. Ammonia represents a special case where the numeric WLA criteria are generally based on collected data for two seasonal periods, summer (June – September) and winter (December – February).

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 11 for a summary of the screening results.

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. WLAs using this method are done using the following general equation: Discharger WLA = (downstream flow x WQS) - (upstream flow x background concentration). Discharger WLAs are divided by the discharge flow so that the allocations are expressed as concentrations.

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

Aquatic life (WWH)		
Toxics (metals, organics, etc.)	Average	Annual 7Q10
	Maximum	Annual 1Q10
Ammonia	Average	Summer 30Q10
		Winter 30Q10
AWS		Harmonic mean flow
Human Health (nondrinking)		Harmonic mean flow

Allocations are developed using a percentage of stream design flow as specified in Table 9, and allocations cannot exceed the Inside Mixing Zone Maximum criteria.

The data used in the WLA are listed in Table 8 and Table 9. The WLA results to maintain all applicable criteria are presented in Table 10. The current ammonia limits have been evaluated using the WLA procedures and are protective of WQS.

Ohio's WQS implementation rules [OAC 3745-2-05(A)(2)(d)(iv)] required a phase out of mixing zones for bioaccumulative chemicals of concern (BCCs) as of November 15, 2010. This rule applied statewide. Mercury is a BCC. The mixing zone phase-out means that as of November 15, 2010 all dischargers requiring mercury limits in their NPDES permit must meet WQS at the end-of-pipe, which for mercury are 12 ng/L (average) and 1700 ng/L (maximum) in the Ohio River basin.

Dissolved Metals Translators

A dissolved metals translator (DMT) is the factor used to convert a dissolved metal aquatic life criterion to an effective total recoverable aquatic life criterion with which a total recoverable aquatic life allocation can be calculated as required by NPDES permit rules [OAC Rule 3745-33-05(C)(2)]. Currently, a DMT is based on site- or area-specific field data; each field data sample consists of a total recoverable measurement paired with a dissolved metal measurement.

In the previous permit, a DMT was applied to Mosquito Creek for cadmium, chromium, copper, lead, nickel, silver and zinc. However, the DMT was based on data from 1998 and may no longer be representative of the current stream conditions. A more recent DMT analysis was not submitted with the NPDES renewal application as requested by the previous NPDES permit 3PK00009*ND, Part II, Item X. Hence, no DMTs were applied in the WLA process. Part I.C. and Part II, Item Y of Mosquito Creek WWTP's current NPDES permit contains language with respect to continued use of DMTs.

Whole Effluent Toxicity WLA

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 the Mosquito Creek WWTP, the WLA values are 0.4 TU_a and 1.56 TU_c.

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

$TU_c = 100/IC_{25}$

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

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

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

$TU_a = 100/LC_{50}$

This equation applies outside the mixing zone for 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:

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

The acute WLA for Mosquito Creek WWTP is 30 percent mortality in 100 percent effluent based on the dilution ratio of 1.4 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 10. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from a Maximum **daily concentration**

Table 5. Projected Effluent Quality

, 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 11.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 1213 presents the final effluent limits and monitoring requirements proposed for Mosquito Creek 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 Suspended Solids (TSS), Ammonia, 5-day Carbonaceous Biochemical Oxygen Demand ($CBOD_5$) and Dissolved Oxygen (DO)

Limits proposed for total suspended solids (TSS), ammonia, $CBOD_5$, and DO are all based on plant design and are a continuation of the limits in the existing permit.

The current ammonia limits have been evaluated using the WLA procedures and are protective of WQS for ammonia toxicity.

Oil and Grease, Escherichia coli, and pH

Limits proposed for oil and grease, pH, and *E. coli* are based on WQS (OAC 3745-1-07) and are a continuation of existing permit limits. Class B PCR *E. coli* standards currently apply to the receiving stream.

Total Residual Chlorine

The Ohio EPA risk assessment (Table 11) places total residual chlorine in group 5. Hence, the existing limit is proposed to remain and is based on the WLA as limited by the Outside Mixing Zone Maximum (OMZM). The OMZM is a value calculated to avoid lethal conditions in the effluent mixing zone. This limitation is less than the quantification level of 0.050 mg/L. However, a pollutant minimization program is not required because the dosing rate of dechlorination chemicals ensures that the effluent effectively meets the WQBEL.

Lead, Silver and Mercury

The Ohio EPA risk assessment (Table 11) places lead, silver and mercury in group 5. This placement, as well as the data in Table 3, Table 4, and Table 5, indicates that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality. For these parameters, the PEQ is greater than 100 percent of the WLA and certain conditions exist that increase the risk to the environment. Pollutants that meet this requirement must have permit limits under OAC 3745-33-07(A)(1). In addition, the monitoring frequency for these parameters will be monthly.

Free Cyanide

The Ohio EPA risk assessment (Table 11) places free cyanide in group 4. This placement, as well as the data in Table 3, Table 4, and Table 5, support that this parameter does not have the reasonable potential to contribute to WQS exceedances and limits are not necessary to protect water quality. Monitoring for Group 4 pollutants (where PEQ exceeds 50 percent of the WLA) is required by OAC 3745-33-07(A)(2). Limits for free cyanide are proposed to be removed but monitoring frequency will continue on a monthly basis.

Cadmium, Chromium, Hexavalent Chromium, Copper, Nickel, Total Filterable Residue (Total Dissolved Solids), and Zinc

The Ohio EPA risk assessment (Table 11) places these parameters in groups 2 and 3. This placement, as well as the data in Table 3, Table 4, and Table 5, 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 recommended to document that these pollutants continue to remain at low levels. The monitoring frequency for these parameters will be quarterly. Limits for dissolved hexavalent chromium are proposed to be removed.

Antimony, Arsenic, Selenium, and Toluene

The Ohio EPA risk assessment (Table 11) places these parameters in group 2. This placement, as well as the data in Table 3, Table 4, and Table 5, 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 recommended.

Phosphorus, Total Kjeldahl Nitrogen (TKN), and Nitrate+Nitrite

The continuation of monitoring for phosphorus, TKN, and nitrate+nitrite is proposed based on best technical judgment. The purpose of the monitoring is to maintain a data set tracking nutrient levels in the basin.

Dissolved Orthophosphate (Dissolved Reactive Phosphorus)

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 and incorporated into ORC 6111.03. 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.

Whole Effluent Toxicity (WET) Reasonable Potential

Based on evaluating the WET data presented in

Table 6. Summary of Acute and Chronic Toxicity

6 and other pertinent data under the provisions of OAC 3745-33-07(B), the Mosquito Creek WWTP is placed in Category 4 with respect to WET for *C. dubia* and *P. promelas*. While this indicates that the plant's effluent does not currently pose a toxicity problem for *C. dubia* and *P. promelas*, annual chronic toxicity monitoring with the determination of acute endpoints is proposed for the life of the permit. This satisfies the minimum testing requirements of Ohio Administrative Code (OAC) 3745-33-07(B)(11) and will adequately characterize toxicity in the plant's effluent.

Additional Monitoring Requirements

Influent Monitoring – In order to maintain consistency with the proposed effluent monitoring frequency, monitoring for lead and mercury shall be on a monthly basis instead of quarterly. In addition, monitoring for dissolved hexavalent chromium shall be on a quarterly basis instead of monthly.

Downstream Monitoring – TKN is being added to this monitoring station in order to provide nutrient data in the basin. In addition, the monitoring frequency of hardness will now be monthly instead of quarterly. A monthly monitoring frequency is more suitable for providing representative data for a facility of this size.

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. Additionally, the data is used to assess downstream water quality that is related to the facility's effect on the watershed and in 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: removal to sanitary landfill or transfer to another facility with an NPDES permit.

OTHER REQUIREMENTS

Compliance Schedule

New Limit(s) - A compliance schedule is included in the permit to allow the facility an adequate period of time to meet the final effluent limitations for lead, silver and mercury. Interim requirements apply for 24 months. The schedule details are in Part I.C of the permit.

Pretreatment Local Limits Review – A six month compliance schedule is proposed for Trumbull 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.

Infiltration and Inflow (I/I): Comprehensive Analysis/Capital Improvement Plan - A compliance schedule is included in the permit for Trumbull County to submit the results of the comprehensive analysis performed under NPDES Permit No. 3PK00009*ND.

Dissolved Metal Translator Study – If the permittee chooses to develop a DMT or water-effect ratio for cadmium, chromium, copper, lead, nickel, silver, and zinc at outfall 001, the permittee shall follow the schedule presented 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 facility to have a Class III wastewater treatment plant operator in charge of the sewage treatment plant operations discharging through outfall 001. These rules also require the permittee to designate one or more operator of record to oversee the technical operation of the treatment works.

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 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.

Method Detection Limit (MDL)

Part II of the permit includes a condition requiring Mosquito Creek WWTP to use laboratory analytical methods with an appropriate MDL for copper and lead.

Development of Technical and Financial Capability Study to Reduce Phosphorus

Facilities which do not have effluent limits for total phosphorous as of July 3, 2015 must develop a study that evaluates the technical and financial capability of their existing treatment facilities to reduce total phosphorus to 1 mg/L or lower. This study is required by Ohio Senate Bill 1 (ORC 6111.03), which was signed by the Governor on April 2, 2015. The study must be submitted to Ohio EPA by December 1, 2017. Ohio EPA is implementing this requirement outside of NPDES permits. Instead, Ohio EPA will send a letter instructing all applicable facilities how to comply with the evaluation study required by ORC 6111.03.

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 facility may seek permit coverage under the general permit for industrial storm water (Permit # OHR000005 or subsequent renewal) or submit a "No Exposure Certification." Parts IV, V, and VI will be removed from the final permit if: 1) the facility 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.

Outfall Signage

Part II of the permit includes requirements for signs to be placed and maintained at each outfall to Mosquito Creek, providing information about the discharge. Signage at outfalls is required pursuant to OAC 3745-33-08(A).

Additional Permit Provisions

In addition to facility-specific requirements, Part III of the permit contains "boilerplate" requirements. Boilerplate is standard regulatory language that applies to all permittees and must be included in NPDES permits. Because the boilerplate requirements are based on regulations, they cannot be challenged in the context of an NPDES permit action. The boilerplate covers requirements such as monitoring, recording, reportingrequirements, compliance responsibilities, and general requirements.

Figure 1. Location of Mosquito Creek WWTP

Figure 2. Diagram of Mosquito Creek WWTP

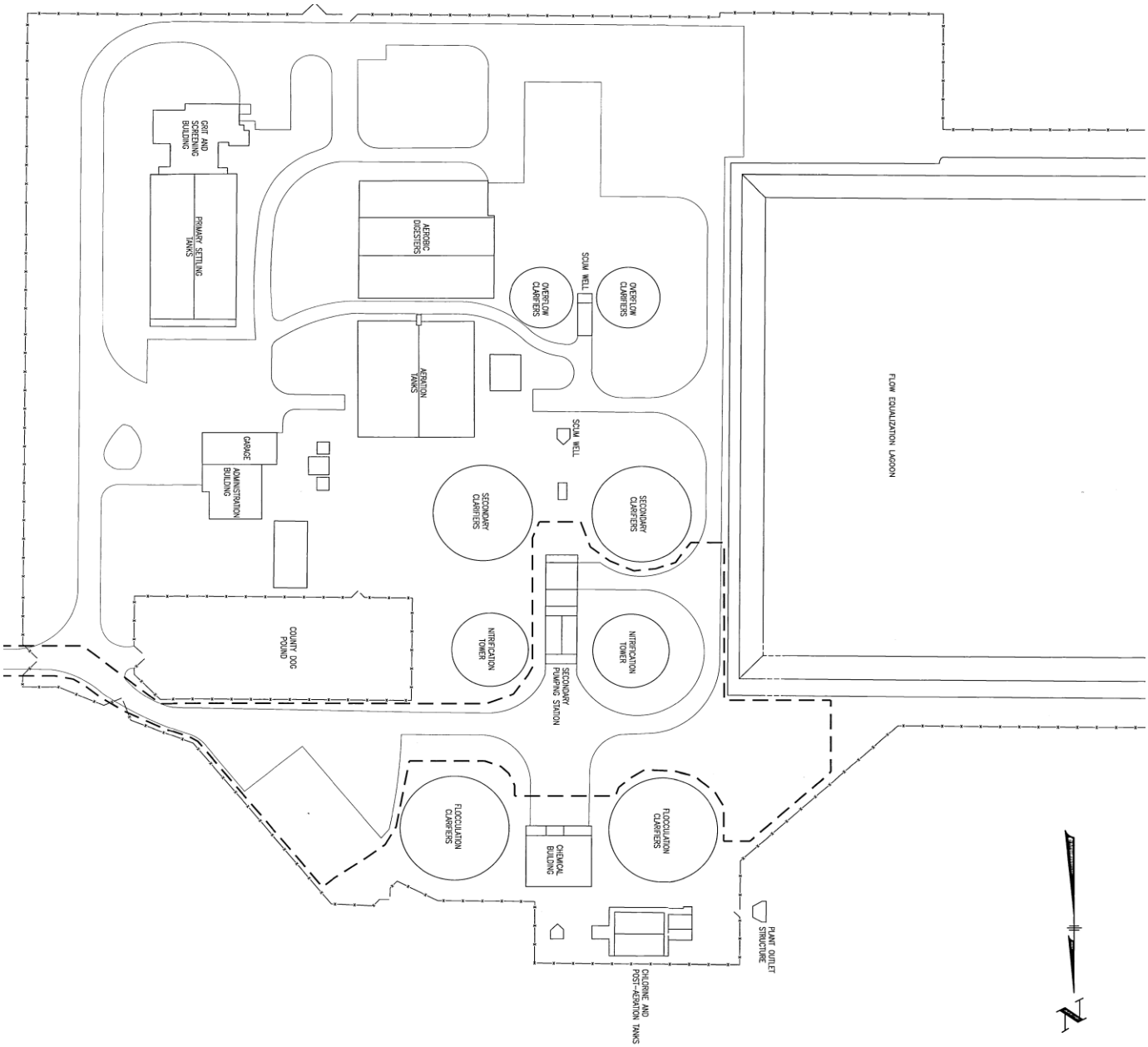

Table 1. Sewage Sludge Removal

Year	Landfill Disposal (Dry Tons) (*)	Hauled to Another NPDES Facility (Dry Tons)
2011	420.05	384.83
2012	178.43	502.47
2013	751.89	-
2014	875.49	-

(*) – Fee Weight excludes admixtures

Table 2. Average Annual Effluent Flow Rate

Year	Annual Flow in MGD			
	50th Percentile	95th Percentile	Maximum	Mean
2011	3.86	7.063	8.22	4.3951
2012	3.53	6.144	7.94	3.7943
2013	3.83	6.022	13.15	4.056
2014	3.37	6.3	7.95	3.7286
2015	3.6	7.02	8.26	4.024

MGD = million gallons per day

Table 3. Effluent Characterization Using Pretreatment Data

Parameter (µg/l)	10/30/2011	10/30/2012	11/26/2013	12/7/2014
Antimony	AA (10)	AA (10)	74.8	AA (15)
Cadmium	AA (1)	AA (1)	AA (1)	AA (1)
Chloroform	AA (5.0)	7.4	AA (5.0)	7.4
Chromium	AA (10)	AA (10)	AA (10)	AA (10)
Copper	AA (20)	AA (20)	AA (20)	AA (20)
Lead	AA (10)	55.7	AA (10)	AA (10)
Mercury	0.219	AA (0.20)	AA (0.20)	AA (0.20)
Nickel	AA (5)	AA (5)	AA (5)	AA (5)
Selenium	AA (10)	AA (10)	AA (10)	AA (10)
Silver	AA (10)	AA (10)	AA (10)	AA (10)
Toluene	AA (5.0)	AA (5.0)	AA (5.0)	6.9
Zinc	13.9	12.7	46.9	25.8

AA = not-detected (analytical method detection limit)
N/A = Not analyzed

Table 4. Effluent Characterization Using Self-Monitoring Data

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Weekly		50th	95th	
Outfall 001								
Water Temperature	Annual	°C	Monitor		1824	16	22	8-29
Dissolved Oxygen	Summer	mg/l	6.0 Minimum		920	9.2	10.4	6-11.3
Dissolved Oxygen	Winter	mg/l	6.0 Minimum		906	10.7	11.8	6.9-12.5
Total Suspended Solids	Annual	mg/l	20	30	722	6	13	0-70
Oil and Grease	Annual	mg/l	10 Maximum		124	0	3.2	0-190
Ammonia	Summer	mg/l	2.0	3.0	246	1.18	3.06	0.1-11.6
Ammonia	Winter	mg/l	7.5	11	182	1.08	6.2	0.18-14.7
Total Kjeldahl Nitrogen	Annual	mg/l	Monitor		60	2.2	5.82	0.56-8.2
Nitrite + Nitrate	Annual	mg/l	Monitor		60	19.8	31.5	10.2-32.6
Phosphorus	Annual	mg/l	Monitor		239	1.43	3.1	0.31-5.9
Cyanide, Free	Annual	mg/l	0.019	0.065[a]	57	0	0.0112	0-0.032
Nickel	Annual	µg/l	Monitor		20	0.8	2	0-2
Silver	Annual	µg/l	2.0	12[a]	60	0	0	0-5.54
Zinc	Annual	µg/l	Monitor		20	6	38.5	0-51.3
Cadmium	Annual	µg/l	Monitor		20	0	0.405	0-0.5
Lead	Annual	µg/l	Monitor		20	0	14.5	0-21.6
Chromium	Annual	µg/l	Monitor		20	0	0	0-0
Copper	Annual	µg/l	Monitor		20	3	5.15	0-8
Chromium, Dissolved Hexavalent	Annual	µg/l	17	22[a]	57	0	0	0-0.6
Fecal Coliform[b]	Annual	#/100 ml	1000	2000	69	183	942	21-1200
E. coli	Annual	#/100 ml	161	362	367	160	2070	1-42000
Flow Rate	Summer	MGD	Monitor		863	3.17	6.44	0.49-7.79
Flow Rate	Winter	MGD	Monitor		906	4.18	7	1.14-13.2
Flow Rate	Annual	MGD	Monitor		1769	3.68	6.74	0.49-13.2
Chlorine, Total Residual	Annual	mg/l	0.027 Maximum		920	0	0	0-0.9
Mercury	Annual	ng/l	Monitor		20	3.6	364	1.35-546
Acute Toxicity, *Ceriodaphnia dubia*	Annual	TU_a	Monitor		5	0	0	0-0
Chronic Toxicity, *Ceriodaphnia dubia*	Annual	TU_c	Monitor		5	0	0	0-0
Acute Toxicity, *Pimephales promelas*	Annual	TU_a	Monitor		5	0	0.16	0-0.2
Chronic Toxicity, *Pimephales promelas*	Annual	TU_c	Monitor		5	0	0	0-0
pH, Maximum	Annual	S.U.	9.0		1826	7.3	7.77	6.56-8.13
pH, Minimum	Annual	S.U.	6.5		1826	7.2	7.66	6.4-7.9
Total Filterable Residue	Annual	mg/l	Monitor		114	694	835	472-921
$CBOD_5$	Summer	mg/l	10	15	362	1.4	4.5	0-7
$CBOD_5$	Winter	mg/l	10	15	361	3.8	7.3	1.7-12

[a] Maximum daily concentration

Table 5. Projected Effluent Quality

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
Antimony	µg/l	4	1	141.9704	194.48
Ammonia-Summer	mg/l	246	246	2.2102	4.4654
Ammonia-Winter	mg/l	182	182	2.8813	6.0807
Arsenic	µg/l	--	--	--	--
Cadmium	µg/l	24	2	0.4745	0.65
Chlorine, Total Residual	mg/l	920	10	0.09308	0.22703
Chloroform	µg/l	4	2	14.0452	19.24
Chromium	µg/l	24	0	--	--
Chromium, Dissolved Hexavalent	µg/l	42	1	0.48983	0.671
Copper	µg/l	24	13	0.50058	7.3986
Cyanide, Free	mg/l	57	17	0.012065	0.018914
Lead	µg/l	23	3	52.8593	72.41
Mercury	ng/l	24	21	256.77	296.86
Nickel	µg/l	24	12	1.3644	2.0817
Nitrate-N + Nitrite-N	mg/l	60	60	25.468	32.383
Oil & grease	mg/l	124	10	7.2318	5.5629
Selenium	µg/l	--	--	--	--
Silver	µg/l	58	2	4.0442	5.54
Toluene	µg/l	4	1	11.1982	15.34
Zinc	µg/l	24	19	56.454	95.504
Total Filterable Residue (Dissolved Solids)	mg/l	114	114	776.51	868.56

MDL = analytical method detection limit
PEQ = projected effluent quality

Table 6. Summary of Acute and Chronic Toxicity

Date	*Ceriodaphnia Dubia*		*Pimephales promelas*	
	TU_a	TU_c	TU_a	TU_c
8/19/2011	AA	AA	AA	AA
8/17/2012	AA	AA	0.2	AA
8/23/2013	AA	AA	AA	AA
8/22/2014	AA	AA	AA	AA
8/2/2015	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 7. Use Attainment Status

Year	Station	River Mile	Use	Attain Status	Impairment	
					Cause	Sources
2013	Mosquito Creek at Greene Center @ State Route 87	24.40	WWH	Full		
2013	Mosquito Creek Downstream Reservoir @ USGS Gage	12.45	WWH	Partial	Direct Habitat Alterations, Other flow regime alterations	Dam or Impoundment
2013	Mosquito Creek Upst. Mosquito Creek WWTP	7.24	WWH	Partial	Natural Conditions (Flow or Habitat)	Natural Sources
2013	Mosquito Creek 100 Yds. Downstream Mosquito Creek WWTP	7.10	WWH	Non	Natural Conditions (Flow or Habitat)	Natural Sources
2013	Mosquito Creek North of Niles, 0.9 Mi. Downstream U.S. Route 422	2.10	WWH	Non	Natural Conditions (Flow or Habitat)	Natural Sources
2013	Mosquito Creek At Niles @ McKinley High School	1.00	WWH	Non	Natural Conditions (Flow or Habitat)	Natural Sources
2013	Mosquito Creek At Niles @ Park Ave.	0.25	WWH	Non	Sedimentation/Siltation, Other	Urban Runoff/Storm Sewers

WWH = warmwater habitat

Table 8. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum Aquatic Life	
		Human Health	Agri-culture	Aquatic Life		
Antimony	µg/l	4300	--	190	900	1800
Ammonia-Summer	mg/l	--	--	1.6	--	--
Ammonia-Winter	mg/l	--	--	8.6	--	--
Arsenic	µg/l	--	100	150	340	680
Cadmium	µg/l	--	50	2.8	5.4	11
Chlorine, Total Residual	mg/l	--	--	0.011	0.019	0.038
Chloroform	µg/l	4700c	--	140	1300	2600
Chromium	µg/l	--	100	98	2000	4100
Chromium VI, Dissolved	µg/l	--	--	11	16	31
Copper	µg/l	1300	500	11	16	32
Cyanide, Free	mg/l	220	--	0.012	0.046	0.092
Lead	µg/l	--	100	7.8	150	300
Mercury	ng/l	12	10000	910	1700	3400
Nickel	µg/l	4600	200	59	530	1100
Nitrate-N + Nitrite-N	mg/l	--	100	--	--	--
Oil & grease	mg/l	--	--	--	10	--
Selenium	µg/l	11000	50	5	--	--
Silver	µg/l	--	--	1.3	2.1	4.2
Toluene	µg/l	200000	--	62	560	1100
Zinc	µg/l	69000	25000	140	140	270
Dissolved solids	mg/l	--	--	1500	--	--

c = carcinogen

Table 9. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
Stream Flows				
1Q10	cfs	annual	2.64	Calc. from USGS Gage 03095500 (1.26:1 area ratio)
7Q10	cfs	annual	3.64	Calc. from USGS Gage 03095500 (1.26:1 area ratio)
30Q10	cfs	summer	6.66	Calc. from USGS Gage 03095500 (1.26:1 area ratio)
		winter	5.4	Calc. from USGS Gage 03095500 (1.26:1 area ratio)
Harmonic Mean	cfs	annual	19.1	Calc. from USGS Gage 03095500 (1.26:1 area ratio)
Mixing Assumption	%	average	100	
	%	maximum	100	
Hardness	mg/l	annual	116.5	DMR Station 901; 2011-2015; n=18; 50th percentile
pH	S.U.	summer	7.5	DMR Station 901; 2011-2015; n=20; 75th percentile
		winter	7.4	DMR Station 901; 2011-2015; n=9; 75th percentile
Temperature	C	summer	24	DMR Station 901; 2011-2015; n=20; 75th percentile
		winter	10	DMR Station 901; 2011-2015; n=9; 75th percentile
Mosquito Creek WWTP flow	cfs	annual	6.5	NPDES Application
Background Water Quality				
Ammonia -Summer	mg/l		0.19	DMR; 2011-2015; n=20; 0<MDL; Station 801; Median Value
Ammonia -Winter	mg/l		0.22	DMR; 2011-2015; n=9; 0<MDL; Station 801; Median Value
Antimony	µg/l		0	No representative data available.
Arsenic	µg/l		3.2	Ohio EPA; 2013; n=20; 2<MDL; STORET Stations N03W06, N03S24; Median Value
Cadmium	µg/l		0	Ohio EPA; 2013; n=20; 20<MDL; STORET Stations N03W06, N03S24; Median Value
Chlorine, Total Residual	mg/l		0	No representative data available.
Chloroform	µg/l		0	No representative data available.
Chromium	µg/l		0	Ohio EPA; 2013; n=20; 20<MDL; STORET Stations N03W06, N03S24; Median Value

Parameter	Units	Season	Value	Basis
Chromium VI, Dissolved	µg/l		0	No representative data available.
Copper	µg/l		1	Ohio EPA; 2013; n=20; 19<MDL; STORET Stations N03W06, N03S24; Median Value
Cyanide, Free	mg/l		0	No representative data available.
Lead	µg/l		0	Ohio EPA; 2013; n=20; 20<MDL; STORET Stations N03W06, N03S24; Median Value
Mercury	ng/l		0	No representative data available.
Nickel	µg/l		0	Ohio EPA; 2013; n=20; 20<MDL; STORET Stations N03W06, N03S24; Median Value
Nitrate-N + Nitrite-N	mg/l		0.26	DMR; 2011-2015; n=52; 0<MDL; Station 801; Median Value
Oil & grease	mg/l		0	No representative data available.
Selenium	µg/l		0	Ohio EPA; 2013; n=20; 20<MDL; STORET Stations N03W06, N03S24; Median Value
Silver	µg/l		0	No representative data available.
Toluene	µg/l		0	No representative data available.
Zinc	µg/l		5	Ohio EPA; 2013; n=20; 19<MDL; STORET Stations N03W06, N03S24; Median Value
Dissolved solids	mg/l		177	Ohio EPA; 2013; n=20; 0<MDL; STORET Stations N03W06, N03S24; Median Value

DMR = discharge monitoring report
MDL = analytical method detection limit
n = number of samples
NPDES = National Pollutant Discharge Elimination System
Ohio EPA = Ohio Environmental Protection Agency
STORET = United States Environmental Protection Agency Storage and Retrieval Data Warehouse
USGS = United States Geological Survey
WWTP = water pollution control facility

Table 10. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum Aquatic Life	
		Human Health	Agri-culture	Aquatic Life		
Antimony	µg/l	16935	--	296	1266	1800
Ammonia-Summer	mg/l	--	--	3.04	--	--
Ammonia-Winter	mg/l	--	--	15.56	--	--
Arsenic	µg/l	--	384	232	477	680
Cadmium	µg/l	--	197	4.4	7.6	11
Chlorine, Total Residual	mg/l	--	--	0.017	0.027	0.038
Chloroform	µg/l	18511	--	218	1828	2600
Chromium	µg/l	--	394	153	2812	4100
Chromium VI, Dissolved	µg/l	--	--	17	22	31
Copper	µg/l	5117	1966	17	22	32
Cyanide, Free	mg/l	866	--	0.019	0.065	0.092
Lead	µg/l	--	394	12	211	300
Mercury	ng/l	12	10000	910	1700	3400
Nickel	µg/l	18117	788	92	745	1100
Nitrate-N + Nitrite-N	mg/l	--	393	--	--	--
Oil & grease	mg/l	--	--	--	14	--
Selenium	µg/l	43323	197	7.8	--	--
Silver	µg/l	--	--	2	3	4.2
Toluene	µg/l	787692	--	97	787	1100
Zinc	µg/l	271739	98447	216	195	270
Dissolved solids	mg/l	--	--	2241	--	--

Table 11. Parameter Assessment

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

No parameters assigned to this group.

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

Arsenic	Cadmium	Chromium
Chromium, Dissolved Hexavalent		Nickel
Selenium	Toluene	Chloroform

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

Antimony	Ammonia (winter)	
Copper	Nitrate-N + Nitrite-N	Oil & grease
Zinc	Total Filterable Residue (Dissolved solids)	

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.

Cyanide, Free	Ammonia (summer)

Group 5: Maximum PEQ >= 100 percent of the maximum PEL or average PEQ >= 100 percent of the average PEL, or either the average or maximum PEQ is between 75 and 100 percent of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

Limits to Protect Numeric Water Quality Criteria

			Recommended Effluent Limits	
Parameter	Units	Period	Average	Maximum
Chlorine, Total Residual	mg/l		0.017	0.027
Lead	µg/l		12	211
Mercury	ng/l		12	1700
Silver	µg/l		2	3

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

Table 12. Interim Effluent Limits for Outfall 001

Interim effluent limits and monitoring requirements for Mosquito Creek WWTP outfall 3PK00009001 and the basis for their recommendation. Interim requirements apply to Lead, Silver, and Mercury (24 months).

Parameter	Units	Effluent Limits				
		Concentration		Loading (kg/day)[a]		Basis[b]
		30 Day Average	Daily[1] Maximum	30 Day Average	Daily[1] Maximum	
Flow Rate	MGD	----------Monitor----------				M[c]
Temperature	°C	----------Monitor----------				M[c]
Dissolved Oxygen	mg/l	6.0 (Minimum)				PD, EP
$CBOD_5$	mg/l	10	15	159	238	PD, EP
Total Suspended Solids	mg/l	20	30	318	477	PD, EP
Ammonia (as N)	mg/l					
Summer	mg/l	2.0	3.0	32	48	PD, EP
Winter	mg/l	7.5	11	119	175	PD, EP
Oil & Grease	mg/l	-	10	-	-	WQS
pH	S.U.	----------6.5 to 9.0----------				WQS
E. coli	#/100 ml	161	362	--	--	WQS
Total Filterable Residue	mg/l	----------Monitor----------				M[c], EP
Total Kjeldahl Nitrogen	mg/l	----------Monitor----------				M[c], EP
Nitrate + Nitrite (as N)	mg/l	----------Monitor----------				M[c], EP
Phosphorus	mg/l	----------Monitor----------				M[c], EP
Orthophosphate, dissolved (as P)	mg/l	----------Monitor----------				SB1
Cyanide, Free	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----------				WLA,RP
Silver	µg/l	2.0	12	0.032	0.19	WLA,RP
Chromium	µg/l	----------Monitor----------				M[c]
Copper	µg/l	----------Monitor----------				WLA,RP
Chromium, Dissolved Hexavalent	µg/l	----------Monitor----------				M[c]
Chlorine, Total Residual	mg/l	--	0.027	--	--	RP/OMZM
Mercury	ng/l	----------Monitor----------				WLA,RP
Whole Effluent Toxicity						
Acute Toxicity, *C. dubia*	TU_a	----------Monitor----------				WET
Chronic Toxicity, *C. dubia*	TU_c	----------Monitor----------				WET
Acute Toxicity, *P. promelas*	TU_a	----------Monitor----------				WET
Chronic Toxicity, *P. promelas*	TU_c	----------Monitor----------				WET

[1] Weekly concentrations & loading are applicable to the following parameters: $CBOD_5$, total suspended solids, ammonia, and *E. coli*

[a] Effluent loadings based on average design discharge flow of 4.2 million gallons per day.

[b] Definitions:
ABS = Antibacksliding Rule (OAC 3745-33-05(F) and 40 CFR Part 122.44(l))
$CBOD_5$ = carbonaceous biochemical oxygen demand (5 day)
EP = Existing Permit
M = Division of Surface Water NPDES Permit Guidance 1: Monitoring frequency requirements for Sanitary Discharges
OMZM = Outside Mixing Zone Maximum
PD = Plant Design, OAC 3745-33-05(E)

RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in permits (3745-33-07(A))
SB1 = Implementation of Senate Bill 1 [ORC 6111.03]
WET = Whole Effluent Toxicity (OAC 3745-33-07(B))
WLA = Wasteload Allocation procedures (OAC 3745-2)
WQS = Ohio Water Quality Standards (OAC 3745-1)

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

Table 13. Final Effluent Limits for Outfall 001

Final effluent limits and monitoring requirements for Mosquito Creek WWTP outfall 3PK00009001 and the basis for their recommendation.

Parameter	Units	Effluent Limits				
		Concentration		Loading (kg/day)[a]		Basis[b]
		30 Day Average	Daily[1] Maximum	30 Day Average	Daily[1] Maximum	
Flow Rate	MGD	----------Monitor----------				M[c]
Temperature	°C	----------Monitor----------				M[c]
Dissolved Oxygen	mg/l	6.0 (Minimum)				PD, EP
$CBOD_5$	mg/l	10	15	159	238	PD, EP
Total Suspended Solids	mg/l	20	30	318	477	PD, EP
Ammonia (as N)	mg/l					
Summer	mg/l	2.0	3.0	32	48	PD, EP
Winter	mg/l	7.5	11	119	175	PD, EP
Oil & Grease	mg/l	-	10	-	-	WQS
pH	S.U.	----------6.5 to 9.0----------				WQS
E. coli	#/100 ml	161	362	--	--	WQS
Total Filterable Residue	mg/l	----------Monitor----------				M[c], EP
Total Kjeldahl Nitrogen	mg/l	----------Monitor----------				M[c], EP
Nitrate + Nitrite (as N)	mg/l	----------Monitor----------				M[c], EP
Phosphorus	mg/l	----------Monitor----------				M[c], EP
Orthophosphate	mg/l	----------Monitor----------				SB1
Cyanide, Free	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	12	211	0.19	3.4	WLA,RP
Silver	µg/l	2.0	3.0	0.032	0.048	WLA,RP
Chromium	µg/l	----------Monitor----------				M[c]
Copper	µg/l	----------Monitor----------				M[c]
Chromium, Dissolved Hexavalent	µg/l	----------Monitor----------				M[c]
Chlorine, Total Residual	mg/l	--	0.027	--	--	RP/OMZM
Mercury	ng/l	12	1700	0.0002	0.027	WLA,RP
Whole Effluent Toxicity						
Acute Toxicity, *C. dubia*	TU_a	----------Monitor----------				WET
Chronic Toxicity, *C. dubia*	TU_c	----------Monitor----------				WET
Acute Toxicity, *P. promelas*	TU_a	----------Monitor----------				WET
Chronic Toxicity, *P. promelas*	TU_c	----------Monitor----------				WET

[1] Weekly concentrations & loading are applicable to the following parameters: $CBOD_5$, total suspended solids, ammonia, and *E. coli*

[a] Effluent loadings based on average design discharge flow of 1.3 million gallons per day.

[b] Definitions: ABS = Antibacksliding Rule (OAC 3745-33-05(F) and 40 CFR Part 122.44(l))
$CBOD_5$ = carbonaceous biochemical oxygen demand (5 day)
EP = Existing Permit
M = Division of Surface Water NPDES Permit Guidance 1: Monitoring frequency requirements for Sanitary

Discharges
OMZM = Outside Mixing Zone Maximum
PD = Plant Design, OAC 3745-33-05(E)
RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in permits (3745-33-07(A))
SB1 = Implementation of Senate Bill 1 [ORC 6111.03]
WET = Whole Effluent Toxicity (OAC 3745-33-07(B))
WLA = Wasteload Allocation procedures (OAC 3745-2)
WQS = Ohio Water Quality Standards (OAC 3745-1)

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

Attachment 1. Supplemental Discharge Monitoring Report (DMR) Data

Parameter	Season	Units	# Obs.	Percentiles		Data Range
				50th	95th	
Sludge Station 586						
Sludge Fee Weight	Annual	dry tons	4	778	865	178-875
Sludge Station 588						
Sludge Weight	Annual	Dry Tons	1	502	502	502-502
Influent Station 601						
Total Suspended Solids	Annual	mg/l	717	176	397	32-3340
Cyanide, Total	Annual	mg/l	57	0	0.0073	0-0.014
Nickel, Total Recoverable	Annual	µg/l	20	1.5	3	0-3
Silver, Total Recoverable	Annual	µg/l	60	0	3.52	0-12.4
Zinc, Total Recoverable	Annual	µg/l	20	73.5	189	0-222
Cadmium, Total Recoverable	Annual	µg/l	20	0	0.0955	0-0.2
Lead, Total Recoverable	Annual	µg/l	20	0	16.3	0-24.7
Chromium, Total Recoverable	Annual	µg/l	20	0	2	0-2
Copper, Total Recoverable	Annual	µg/l	20	20.5	69.5	0-86.4
Chromium, Dissolved Hexavalent	Annual	µg/l	57	0	0.12	0-27
Mercury, Total (Low Level)	Annual	ng/l	20	232	922	10.4-1910
pH, Maximum	Annual	S.U.	1826	7.43	7.67	7.04-8.35
pH, Minimum	Annual	S.U.	1826	7.26	7.41	6.4-7.63
CBOD 5 day	Summer	mg/l	356	150	220	13-542
CBOD 5 day	Winter	mg/l	360	110	210	6.7-1150
Upstream Station 801						
Water Temperature	Annual	C	52	16.5	24.5	1-29
Dissolved Oxygen	Summer	mg/l	29	7.1	10.2	5.7-10.9
Dissolved Oxygen	Winter	mg/l	23	10.4	12.4	7.1-12.6
pH	Annual	S.U.	52	7.26	7.53	6.83-7.6
Nitrogen, Ammonia (NH3)	Summer	mg/l	29	0.19	0.322	0.08-0.39
Nitrogen, Ammonia (NH3)	Winter	mg/l	23	0.21	0.383	0.06-0.42
Nitrogen Kjeldahl, Total	Annual	mg/l	51	0.95	3.55	0-5.9
Nitrite Plus Nitrate, Total	Annual	mg/l	52	0.26	0.535	0.09-3.36
Phosphorus, Total (P)	Annual	mg/l	52	0.255	0.384	0.07-0.51
E. coli	Annual	#/100 ml	29	198	442	43-2250
48-Hr. Acute Toxicity Ceriodaphnia dubia	Annual	% Affected	5	0	0	0-0
96-Hr. Acute Toxicity Pimephales promela	Annual	% Affected	5	2	13	0-15
7-Day Chronic Toxicity Ceriodaphnia dubia	Annual	% Affected	5	0	8	0-10

Parameter	Season	Units	# Obs.	Percentiles		Data Range
				50th	95th	
7-Day Chronic Toxicity Pimephales promelas	Annual	% Affected	5	8	30	0-35
Downstream Station 901						
Water Temperature	Annual	C	52	17	24	2-29
Dissolved Oxygen	Summer	mg/l	29	7.6	10.1	6.2-11.3
Dissolved Oxygen	Winter	mg/l	23	10.8	12.4	8.7-12.5
pH	Annual	S.U.	52	7.37	7.59	7.07-7.65
Nitrogen, Ammonia (NH3)	Summer	mg/l	29	0.43	0.782	0.11-1.6
Nitrogen, Ammonia (NH3)	Winter	mg/l	23	0.34	1.09	0.15-1.16
Nitrite Plus Nitrate, Total	Annual	mg/l	52	3.19	9.54	1.11-23.8
Phosphorus, Total (P)	Annual	mg/l	52	0.43	0.935	0.21-1.92
Hardness, Total (CaCO3)	Annual	mg/l	18	117	160	93-170
E. coli	Annual	#/100 ml	29	210	1410	25-2560

Addendum 1. Acronyms

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