

National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

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

Public Notice No.: 14-12-004
Public Notice Date: December 3, 2014
Comment Period Ends: January 3, 2015

Ohio EPA Permit No.: 4PD00100*MD

Name and Address of Applicant:

City of Mount Vernon
40 Public Square
Mount Vernon, Ohio 43050

Name and Address of Facility Where
Discharge Occurs:

Mount Vernon Wastewater Treatment Plant
3 Cougar Drive
Mount Vernon, Ohio 43050
Knox County

Receiving Water: Kokosing River

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

Introduction

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

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

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 EPA (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 current permit, although some monitoring frequencies have changed: flow, temperature, dissolved oxygen, 5-day carbonaceous biochemical oxygen demand (CBOD₅), total suspended solids, ammonia-nitrogen, total phosphorus, nitrite+nitrate-nitrogen, total Kjeldahl nitrogen, oil and grease, pH, total residual chlorine, free cyanide, cadmium, chromium, dissolved hexavalent chromium, copper, lead, mercury and zinc.

Based on the levels at which they were detected in the plant's effluent, new monitoring requirements are being proposed for total filterable residue (dissolved solids).

Current permit limits for mercury are being removed because effluent data shows that it no longer has the reasonable potential to contribute to exceedances of WQS. Low-level monitoring for mercury will continue.

New final effluent limits are proposed for *Escherichia coli* replacing fecal coliform limits. New WQS for *E. coli* became effective in March 2010. A compliance schedule is proposed for meeting these new final effluent limits. Based on best engineering judgment (BEJ), it is proposed that the plant monitor *E. coli* during the initial period (12 months). It is proposed that the plant comply with its current fecal coliform limits during the initial period.

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.

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 the Ohio Administrative Code (OAC) 3754-33-07(B)(11) and will adequately characterize toxicity in the plant's effluent.

A compliance schedule is also proposed for the City to evaluate its local industrial pretreatment limits, to submit a technical justification for retaining or modifying its current local limits, and to incorporate revised local limits into any control documents it has issued.

Special conditions are proposed for sanitary sewer overflow (SSO) reporting, operator certification 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 Elizabeth Buening, (614) 644-2138, Elizabeth.buening@epa.ohio.gov.

Information Regarding Certain Water Quality Based Effluent Limits

This draft permit may contain proposed water quality based effluent limitations (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 water quality based effluent limits 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 Rule 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 Mount Vernon wastewater treatment plant discharges to the Kokosing River at River Mile (RM) 24.9. Figure 1 shows the approximate location of the facility.

This segment of the Kokosing River is described by Ohio EPA River Code: 17-650, U.S. EPA River Reach #: 05040003-004, County: Knox, Ecoregion: Erie-Ontario Lake Plain. The Kokosing River is designated for the following uses under Ohio's WQS OAC 3745-1-24): Exceptional Warmwater Habitat (EWH), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), and Class A Primary Contact Recreation (PCR).

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 Mt. Vernon WWTP serves the City of Mt. Vernon and Clinton Township. The plant was originally constructed in 1952, and was most recently modified in 2012. The average daily design flow is 5.0 million gallons per day (MGD). Wet stream processes are influent pumping, mechanical screening (new 2007), grit removal, scum removal, preaeration, primary settling, activated sludge aeration (contact stabilization; new blowers and diffusers installed in 2007), secondary clarification, chlorination and dechlorination. Solid stream processes are anaerobic digestion of primary sludge, aerobic digestion and gravity thickening of waste activated sludge, sludge holding tanks and disposal by land application at agronomic rates.

The Mt. Vernon WWTP has an internal secondary treatment bypass that is designated station 602. The bypass routes primary effluent around secondary treatment. It recombines with fully treated effluent prior to disinfection and final sampling. Table 1 summarizes discharges through station 602 for the period January 2010 through December 2013.

The previous NPDES permit included a compliance schedule for the City of Mt. Vernon to conduct a "no feasible alternatives analysis" to eliminate the secondary treatment bypass. The 2006 report identified power outages, infiltration and inflow (I/I) and temporary exceedances of plant capacity as causes of the bypasses. Because flows must be pumped to secondary treatment, the plant was susceptible to bypassing during power outages.

Electrical upgrades at the plant, including installation of a new generator that can run all essential plant processes were completed in 2012. Since the City of Mt. Vernon has improved the Center Run and Kokosing interceptors the average I/I flow rate went from 750,000 gallons per day (GPD) to 280,000 GPD. Currently, the city plans to continue evaluating the collection system to prioritize repairs of areas contributing the most I/I. The City addressed SSOs in the Northwest Sewer Subsystem through improvements at a pump station, relining, and other actions. The City also developed a comprehensive sewer maintenance program.

Mount Vernon implements an Ohio EPA-approved industrial pretreatment program. Based on information in the 2014 NPDES renewal application, 6 significant noncategorical industrial users contribute to discharge flows of approximately 0.04 MGD to the Mt. Vernon WWTP. The total amount of industrial users is 54 and all users contribute approximately 0.833 MGD to the WWTP. There are no categorical industrial users.

Description of Existing Discharge

Table 2 presents chemical specific data compiled from the data reported in annual pretreatment reports and data collected by Ohio EPA.

Table 3 presents a summary of unaltered Discharge Monitoring Report (DMR) data for outfall 4PD00100001. Data are presented for the period January 2010 through December 2013, and current permit limits are provided for comparison.

Table 4 summarizes the chemical specific data for outfall 001 by presenting the average and maximum PEQ values.

Table 5 summarizes the results of acute and chronic whole effluent toxicity tests (WET) of the final effluent.

Mount Vernon has separate sanitary and storm sewers. There are 11 lift stations on the sanitary system. The City reports SSO occurrences under Station 300 in its NPDES permit. The City reported 12 SSOs in 2011, 10 SSOs in 2012, 12 in 2013 and 10 through August 2014. Based on information from the City, all SSOs are caused by blockages and are corrected when they are discovered.

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 effluent testing conducted by the Agency.

Assessment of Impact on Receiving Waters

In 2007, Ohio EPA conducted intensive biological and water quality monitoring in the Kokosing watershed to support the upcoming total maximum daily load (TMDL) study. At this time (Autumn 2014), the TMDL report is in preparation, but a draft report is not yet available. The Agency expects to complete the TMDL during 2015.

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 (IBI) and modified Index of Well-Being (MIwb), which indicate the response of the fish community, and the Invertebrate Community Index (ICI), 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 6) 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 following assessment is based on 2007 information that is in the Agency's technical support document for the Kokosing River, which was finalized on May 13, 2010. The Middle Kokosing River was evaluated for chemical water quality at 6 sites extending from RM 28.61, downstream of the confluence with North Branch, to RM 11.55, downstream of Gambier. The chemical composition of water downstream was typical of a major wastewater plan that does not have tertiary treatment for nutrient removal and one reason that biological communities were impaired downstream of the Mount Vernon plant. Diffuse urban and agricultural storm runoff are likely contributing sources of the 6 sites in violation of the *Escherichia coli* maximum. However, sampling during normal flow conditions (non-storm event) did not indicate a serious bacteria threat for recreational use activities in this reach.

The 2012 Integrated Report is available at the following Ohio EPA Internet site:
<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 Mount Vernon wastewater treatment plant were used to determine what parameters should undergo WLA. The parameters discharged are identified by the data available to Ohio EPA - Discharge Monitoring Report (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)
Pretreatment data

September 2009 through August 2014
2009 - 2011

The data were examined, and the following values were removed from the evaluation to give a more reliable PEQ: 4 low zinc values – 0.17 µg/l on June 5, 2012, 1.5 µg/l on March 5, 2013, 44 µg/l on May 14, 2013 and 13 µg/l on August 6, 2013.

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. The average and maximum PEQ values are presented in Table 4.

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 10 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 8, and allocations cannot exceed the Inside Mixing Zone Maximum (IMZM) criteria.

The data used in the WLA are listed in Tables 7 and 8. The WLA results to maintain all applicable criteria are presented in Table 6. The current ammonia limits have been evaluated using the WLA procedures and are protective of WQS for ammonia toxicity.

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 Mount Vernon, the WLA values are 1.0 TU_a and 3.73 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, EWH, and seasonal salmonid use designations.

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 9. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 4, 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 10.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 11 presents the final effluent limits and monitoring requirements proposed for Mt. Vernon WWTP outfall 4PD00100001 and the basis for their recommendation. Unless otherwise indicated, the monitoring frequencies proposed in the permit are continued from the existing permit.

Mercury and Total Filterable Residue

Ohio EPA risk assessment (Table 10) places mercury and total filterable residue in group 4. This placement as well as the data in Tables 3 and 4 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 Rule 3745-33-07(A)(2).

In November 2010, the use of mixing zones to determine the waste load allocation for bioaccumulative chemicals of concern (BCCs) will no longer be allowed. This means that limits for BCCs after November 2010 must meet WQS with no allowances for dilution. Since mercury is considered a BCC, discharges must comply with WQS at that time. In order to obtain mercury effluent data which can be compared to the WQS, the permittee must use a low level method for mercury sampling and analysis.

Based on BEJ, monitoring is proposed for total filterable residue (total dissolved solids). No effluent data is available for this parameter, which is an emerging water quality issue for municipal wastewater treatment plants. The purpose of the monitoring is to obtain data on the level and variability of total dissolved solids in the Mt. Vernon WWTP effluent.

Metals

Ohio EPA risk assessment (Table 10) places free cyanide, cadmium, chromium, dissolved hexavalent chromium, copper, nitrite+nitrate, lead, nickel and zinc in groups 2 and 3. This placement as well as the data in Tables 3 and 4 supports that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring at the current frequency is proposed to document that these pollutants continue to remain at low levels.

Dissolved Oxygen, Total Suspended Solids, Ammonia-Nitrogen and CBOD₅

The limits proposed for dissolved oxygen, total suspended solids, ammonia-nitrogen and CBOD₅ are all based on plant design criteria. These limits are protective of WQS.

E. Coli

Effluent limits are being proposed for *E. coli*. WQS for *E. coli* became effective in March 2010 (OAC 3745-1-07), and a compliance schedule is proposed for meeting these new final effluent limits no later than 12 months after the permit is issued. The schedule provides time during the summer disinfection season for the plant to evaluate the ability of its existing disinfection system to achieve the new limits and to make operational changes or equipment upgrades if necessary. It is proposed that the plant monitor *E. coli* during the initial period (12 months). It is proposed that the plant comply with its current fecal coliform limits during the initial period.

After the initial period, proposed monthly and weekly geometric mean concentrations of 126 and 284 counts per 100 ml respectively, apply to Mount Vernon WWTP for *E. coli*. These limits have been recommended in the permit for final effluent tables. Class A Primary Contact Recreation *E. coli* standards apply to the Kokosing river.

Oil & Grease and pH

Limits proposed for oil and grease and pH are based on WQS (OAC 3745-1-07).

Total Residual Chlorine

The proposed limit for total residual chlorine is based on WLA as limited by the inside mixing zone maximum (IMZM). The IMZM is a value calculated to avoid rapidly lethal conditions in the effluent mixing zone. This is also a continuation of the existing permit limit.

Ohio Integrated Report

The 2012 *Ohio Integrated Water Quality Monitoring and Assessment Report* (Ohio EPA) lists the middle portion of the Kokosing River as impaired for aquatic life (Table 6). Nutrients and organic enrichment/dissolved oxygen are listed as “high magnitude” causes, and major municipal point sources are listed among the “high magnitude” sources. Considering this information and the fact that municipal wastewater treatment plants discharge a nutrient load to the river, monthly monitoring for phosphorus, nitrate + nitrite and total Kjeldahl nitrogen will continue based on BEJ. Monitoring for phosphorus and nitrate + nitrite at the upstream and downstream stations will also continue. The purpose of the monitoring is to maintain a nutrient data set for use in the future TMDL (total maximum daily loads) study.

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.

Additional Monitoring

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.

Whole Effluent Toxicity Reasonable Potential

Annual chronic toxicity monitoring with the determination of acute endpoints is proposed for the life of the permit. Evaluating the toxicity data presented in Table 5 and other pertinent data under the provisions of OAC 3745-33-07(B) placed the Mount Vernon WWTP in Category 4 with respect to WET. While this indicates that the plant's effluent does not currently pose a toxicity problem, annual toxicity testing is proposed consistent with the minimum monitoring requirements at OAC 3754-33-07(B)(11). The proposed monitoring will adequately characterize toxicity in the plant's effluent.

Other Requirements

Compliance Schedule

A compliance schedule is proposed for the City to submit a technical justification for either revising its local industrial user limits or retaining its existing local limits. If revisions to local limits are required, the City must also submit a pretreatment program modification request.

Final effluent limits are proposed for *E. coli*. New WQS for *E. coli* became effective in March 2010. A compliance schedule is proposed for meeting these new final effluent limits. Based on BEJ, it is proposed that the plant comply with its current fecal coliform limits during the interim period.

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

In accordance with rule 3745-7-04 of the OAC, the Mount Vernon WWTP has requested that Ohio EPA re-classify the treatment works from a Class IV to a Class III facility. Circumstances or factors cited by the permittee to justify the reclassification include the retirement of the Class IV superintendent on June 1, 2014.

Ohio EPA has reviewed the request and determined that re-classification to a Class III facility should be granted. As a result, the Mount Vernon WWTP will be required to meet the requirements associated with a Class III facility as defined in OAC 3745-7-04. The permittee has up to 12 months to meet the staffing requirements for this new classification. The permittee may submit an operating plan for the Mount Vernon wastewater treatment plant as part of an application for a staffing reduction.

Operator of Record

In December 2006, OAC rule revisions became effective that affect the requirements for certified operators for sewage collection systems and treatment works regulated under NPDES permits. Part II, Item A of this NPDES permit is included to implement rule 3745-7-02 of the OAC. It requires 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 WQBELs:

- 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 WQBELs, 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.

Storm Water Compliance

In order to comply with industrial storm water regulations, the permittee submitted a form for "No Exposure Certification" which was signed on April 2, 2014. Compliance with the industrial storm water regulations must be re-affirmed every five years. No later than March 28, 2019, the permittee must submit a new form for "No Exposure Certification" or make other provisions to comply with the industrial storm water regulations.

Outfall Signage

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

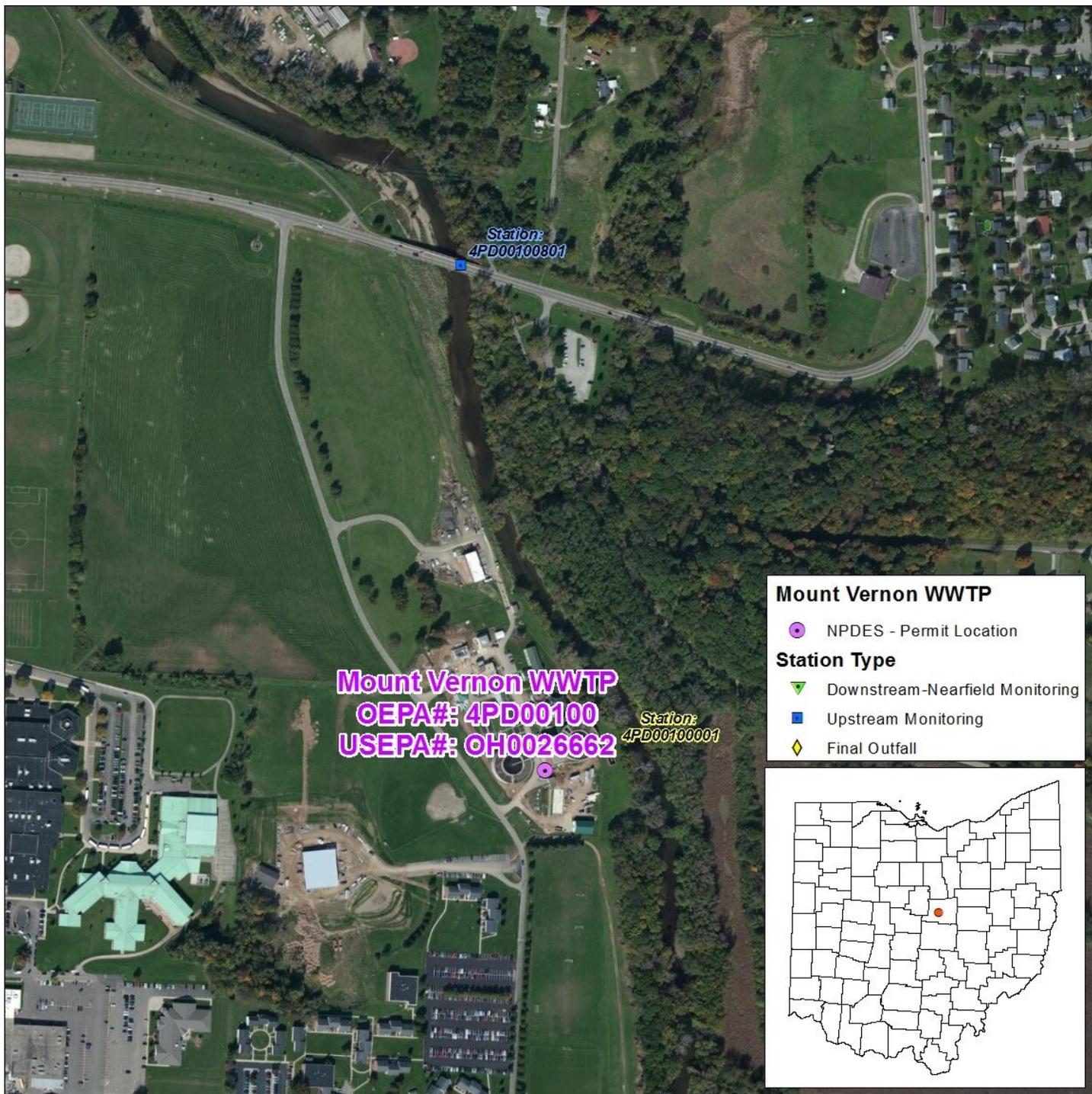


Figure 1. Approximate location of the Mount Vernon wastewater treatment plant.

Table 1. Mount Vernon Secondary Treatment Bypass, Station 602

Summary of discharge monitoring report data for secondary treatment bypass discharged through monitoring station 602 for the period January 2010 through December 2013

Year	Number of Observations	Bypass Total Hours		Bypass Volume		Total Suspended Solids		CBOD ₅	
		Hours/day		Million Gallons		mg/L		mg/L	
		Mean	Maximum	Mean	Maximum	Mean	Maximum	Mean	Maximum
2010	1	4	7.2	0.0641	0.0641	139	139	97	97
2011	12	13	24	0.9147	2.312	93.7	132	46.8	72
2012	2	3.5	5.9	0.217	0.342	107.5	118	21	21
2013	2	24.8	27	2.2975	4.1	66	94	24.5	25

CBOD₅ = 5-day carbonaceous biochemical oxygen demand

Table 2. Effluent Characterization Using Ohio EPA and Pretreatment Data

Summary of analytical results for Mount Vernon outfall 4PD00100001.

Parameter	Units	OEPA	PT	PT	PT
		5/14/2013	7/21/2011	8/4/2010	8/19/2009
Arsenic	µg/L	ND(2.0)	ND(5.0)	ND(3.0)	ND(3.0)
Barium	µg/L	48	NA	NA	NA
Bis(2-ethylhexyl) Phthalate	µg/L	ND(11.5)	ND(10)	ND(10)	ND(10)
Cadmium	µg/L	ND(0.2)	ND(3.0)	ND(10)	ND(10)
Chloride	mg/L	103	NA	NA	NA
Chloroform	µg/L	1	ND(5.0)	ND(2.0)	ND(2.0)
Chromium	µg/L	ND(2.0)	ND(7.0)	ND(10)	ND(10)
Copper	µg/L	8.8	12	ND(10)	17.5
Total Filterable Residue (dissolved solids)	mg/L	528	NA	NA	NA
Iron	µg/L	150	NA	NA	NA
Lead	µg/L	ND(2.0)	ND(10)	ND(10)	ND(10)
Magnesium	mg/L	24	NA	NA	NA
Manganese	µg/L	33	NA	NA	NA
Nickel	µg/L	2.4	ND(8.0)	ND(10)	2.39
Nitrate+Nitrite	µg/L	18	NA	NA	NA
Phosphorus	mg/L	3.07	NA	NA	NA
Selenium	µg/L	ND(2.0)	ND(4.0)	ND(5.0)	ND(5.0)
Strontium	µg/L	454	NA	NA	NA
Kjeldahl Nitrogen, Total	mg/L	4.26	NA	NA	NA
Zinc	µg/L	44	155	115	132

OEPA = Data from analyses by Ohio EPA

PT = Data from pretreatment program reports

NA = Not analyzed

ND = Not detected (detection limit)

Table 3. Effluent Characterization Using Self-Monitoring Data

Summary of current permit limits and unaltered discharge monitoring report for Mount Vernon outfall 4PD00100001 (September 2009 - August 2014). All values are based on annual records unless otherwise indicated.

Parameter	Season	Units	Current Permit Limits		Percentiles			Data Range
			30 day	Daily	# Obs.	50 th	95 th	
Water Temperature	Annual	°C	Monitor	5.0	1857	17.1	22.2	9.5-24.1
Dissolved Oxygen	Summer	mg/L	--	min 5.0	951	7.8	8.5**	4.7-8.8
Dissolved Oxygen	Winter	mg/L	--	min	906	8.3	9.4**	5.4-9.9
Total Suspended Solids	Summer	mg/L	15	23 ^a	253	6	12	1-27
Total Suspended Solids	Winter	mg/L	30	45 ^a	180	10	16	3-60
Total Suspended Solids	Summer	kg/day	284	435 ^a	253	6	12	1-27
Total Suspended Solids	Winter	kg/day	568	852 ^a	180	10	16	3-60
Oil and Grease	Annual	mg/L	--	10	123	0	8.31	0-33
Ammonia	Summer	mg/L	4	6 ^a	374	1.12	2.96	0.02-5.52
Ammonia	Winter	mg/L	Monitor		360	2.19	4.19	0.18-10.4
Ammonia	Summer	kg/day	76	114 ^a	374	1.12	2.96	0.02-5.52
Kjeldahl Nitrogen, Total	Annual	mg/L	Monitor		62	3.77	6.99	1.6-9.7
Nitrate+Nitrite	Annual	mg/L	Monitor		62	17.8	25.2	5.14-31
Phosphorus	Annual	mg/L	Monitor		235	2.6	3.79	0.55-4.52
Cyanide, Free	Annual	mg/L	Monitor		21	0	0	0-0.01
Nickel	Annual	µg/L	Monitor		21	0	0	0-0
Zinc	Annual	µg/L	Monitor		24	145	179	0.17-189
Cadmium	Annual	µg/L	Monitor		21	0	0	0-0
Lead	Annual	µg/L	Monitor		21	0	0	0-0
Chromium	Annual	µg/L	Monitor		21	0	0	0-0
Copper	Annual	µg/L	Monitor		21	0	11	0-14.6
Dissolved Hexavalent Chromium	Annual	µg/L	Monitor		21	0	0	0-0

Table 3. (Continued)

Parameter	Season	Units	Current Permit Limits		Percentiles			Data Range
			30 day	Daily	# Obs.	50 th	95 th	
Fecal Coliform Bis(2-ethylhexyl) Phthalate	Annual	#/100 ml	1000	2000 ^a	374	21	290	0-7500
Flow Rate	Summer	MGD	Monitor		951	2.33	4.61	0-15.9
Flow Rate	Winter	MGD	Monitor		906	2.9	5.98	1.19-14.4
Flow Rate	Annual	MGD	Monitor		1857	2.63	5.44	0-15.9
Chlorine, Total Residual	Annual	mg/L	--	0.038 max 1700	664	0	0	0-0.021
Mercury	Annual	ng/L	12	max	60	3.8	7.59	0-13
Mercury	Annual	kg/day	0.000227	0.0322	60	3.8	7.59	0-13
pH, Maximum	Annual	S.U.	--	9.0	1857	7.41	7.53	6.98-8.32
pH, Minimum	Annual	S.U.	--	6.5	1857	7.27*	7.39	6.57-7.98
CBOD ₅	Summer	mg/L	15	23 ^a	373	4	8	0-19
CBOD ₅	Winter	mg/L	25	40 ^a	360	6	9	2-55
CBOD ₅	Summer	kg/day	284	435 ^a	373	4	8	0-19
CBOD ₅	Winter	kg/day	473	757 ^a	360	6	9	2-55

* = For minimum pH, 5th percentile shown in place of 50th percentile

** = For dissolved oxygen, 5th percentile shown in place of 95th percentile

a = weekly average

CBOD₅ = 5-day carbonaceous biochemical oxygen demand

Table 4. Projected Effluent Quality for Mount Vernon Wastewater Treatment Plant

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
Aldrin	µg/L	4	0	--	--
Aluminum	µg/L	1	0	--	--
Ammonia (Summer)	mg/L	253	253	1.9582	4.0655
Ammonia (Winter)	mg/L	180	180	3.4579	6.385
Arsenic	µg/L	4	0	--	--
Barium	µg/L	1	1	217.248	297.6
Bis(2-ethylhexyl)phthalate	µg/L	6	0	--	--
Cadmium	µg/L	25	0	--	--
Chlorides	mg/L	1	1	466.178	638.6
Chlorine, Total Residual	mg/L	664	6	0.001918	0.004414
Chloroform	µg/L	3	1	2.19	3
Chromium	µg/L	25	0	--	--
Dissolved Hexavalent Chromium	µg/L	21	0	--	--
Copper	µg/L	25	7	12.48	19.066
Cyanide, Free	mg/L	17	1	0.01022	0.014
Dieldrin	µg/L	4	0	--	--
Total Filterable Residue (dissolved solids)	mg/L	1	1	2389.728	3273.6
Heptachlor	µg/L	4	0	--	--
Iron	µg/L	1	1	678.9	930
Lead	µg/L	25	0	--	--
Magnesium	mg/L	1	1	108.624	148.8
Manganese	µg/L	1	1	149.358	204.6
Mercury	ng/L	61	59	6.6249	9.4081
Nickel	µg/L	3	2	5.256	7.2
Nitrate+Nitrite	mg/L	63	63	24.608	33.184
Phosphorus	mg/L	236	236	3.5373	4.5805
Selenium	µg/L	4	0	--	--
Strontium	µg/L	1	1	1919.024	2628.8
Kjeldahl Nitrogen, Total	mg/L	63	63	5.7617	7.9397
Zinc	µg/L	24	24	171.69	195.59
Molybdenum	µg/L	--	--	--	--

PEQ = Projected Effluent Quality

Table 5. Summary of Effluent Acute Toxicity Test Results

Date	<i>Ceriodaphnia Dubia</i>		<i>Pimephales promelas</i>	
	Acute Toxicity (TU _a)	Chronic Toxicity (TU _c)	Acute Toxicity (TU _a)	Chronic Toxicity (TU _c)
7/1/2010	AA	1.8	1.2	1.7
7/1/2011	0.2	AA	AA	AA
7/24/2012	AA	AA	AA	AA
7/23/2013	AA	AA	AA	AA

Collection Date	<i>Ceriodaphnia dubia</i>								<i>Pimephales promelas</i>							
	24 Hours				48 Hours				24 Hours				48 Hours			
	UP	C	%M	TU _a	UP	C	%M	TU _a	UP	C	%M	TU _a	UP	C	%M	TU _a
5/14/2013	0	0	0	ND	0	0	0	ND	0	0	0	ND	0	0	0	ND
5/15/2013	0	0	0	ND	0	0	0	ND	0	0	0	ND	0	0	0	ND
5/14/13-5/15/13 ^a	0	0	0	ND	0	0	0	ND	0	0	0	ND	0	0	0	ND

TU_a = acute toxicity units

TU_c = chronic toxicity units

AA = below detection limit (0.2 TU_a, 1.0 TU_c)

a = 24-hour composite sample

C = laboratory control water

%M = percent mortality in 100% effluent

ND = not determined

UP = percent mortality in upstream control water

Table 6. Biological Survey Results and Biocriteria

Aquatic life use attainment status for stations sampled in the Kokosing River basin based on data collected June-October 2007. The Index of Biotic Integrity (IBI), Modified Index of well being (MIwb), and Invertebrate Community Index (ICI) are scores based on the performance of the biotic community. The Qualitative Habitat Evaluation Index (QHEI) is a measure of the ability of the physical habitat to support a biotic community.

River Mile Fish/Invertebrate	IBI	MIwb	ICI	QHEI	Attainment Status	Causes	Sources
Kokosing River - (17650) Erie Ontario Lake Plain Ecoregion WWH existing, recommended EWH							
54.7/54.6 ^H	50	NA	VG ^{ns}	65.5	Full		
50.5/49.8 ^H	44*	NA	44 ^{ns}	57.5	Partial	Sedimentation/Siltation	Agriculture
45.4 ^W	46 ^{ns}	9.2 ^{ns}	48	46.0	Full		
39.3/39.2 ^W	39*	9.2 ^{ns}	46	55.5	Partial	Sedimentation/Siltation	Unrestricted Cattle Access
32.6/32.5 ^W	47 ^{ns}	9.4	48	75	Full		
Kokosing River - (17650) Erie Ontario Lake Plain Ecoregion - EWH existing							
28.6/28.7 ^W	48 ^{ns}	9.3 ^{ns}	52	82.0	Full		
25.3/25.1 ^W	56	9.9	52	82.5	Full		
24.3/24.5 ^W	54	8.9 ^{ns}	38*	87.5	Partial	Nutrient/Eutrophication, Phosphorus	Municipal Point Source Discharge
20.9/22.1 ^W	49 ^{ns}	9.0 ^{ns}	42 ^{ns}	82.5	Full		
18.9 ^W	53	10.0	52	82.0	Full		
11.6 ^B	53	9.15 ^{ns}	E	81.0	Full		
6.2 ^W	48 ^{ns}	9.4	52	87.0	Full		
2.7 ^B	52	9.3 ^{ns}	50	88.0	Full		
0.1 ^B	55	9.1 ^{ns}	E	81.0	Full		

Table 6. (Continued)

Ecoregion Biocriteria for Erie-Ontario Lake Plain

Site Type	IBI			MIwb			ICI		
	WWH	EWB	MWH	WWH	EWB	MWH	WWH	EWB	MWH
Headwaters	40	50	20	H	H	H	34	46	22
Wading	38	50	22	7.9	9.4	5.6	34	46	22
Boat	40	48	20	8.7	9.6	5.7	34	46	22

H = Headwater site, MIwb is not applicable.

W = Wading site.

B = Boat site.

a = MIwb is not applicable to headwater streams with drainage areas < 20 mi².

b = A narrative evaluation of the qualitative sample based on attributes such as EPT taxa richness, number of sensitive taxa, and community composition was used when quantitative data was not available or considered unreliable due to current velocities less than 0.3 fps flowing over the artificial substrates. VP=Very Poor, P=Poor, LF=Low Fair, F=Fair, HF=High Fair, MG=Marginally Good, G=Good, VG=Very Good, E=Exceptional

c = Attainment status is given for the existing or if a change is proposed then the proposed use designations.

NA = Not applicable

ns = Nonsignificant departure from biocriteria (<4 IBI or ICI units, or <0.5 MIwb units).

* = Indicates significant departure from applicable biocriteria (>4 IBI or ICI units, or >0.5 MIwb units).

Underlined scores are in the Poor or Very Poor range.

EWB = Exceptional Warmwater

Habitat

MWH = Modified Warmwater

Habitat

WWH = Warmwater Habitat

Table 7. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum	
		Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Aldrin	µg/L	0.0014	--	--	--	--
Aluminum	µg/L	--	--	--	--	--
Ammonia (Summer)	mg/l	--	--	1.1	--	--
Ammonia (Winter)	mg/l	--	--	3.2	--	--
Arsenic	µg/L	--	100	150	340	680
Barium	µg/L	--	--	220	2000	4000
Bis(2-ethylhexyl)phthalate	µg/L	59	--	8.4	1100	2100
Cadmium	µg/L	--	50	4.8	12	23
Chlorides	mg/l	--	--	--	--	--
Chlorine, Total Residual	mg/l	--	--	0.011	0.019	0.038
Chloroform	µg/L	4700	--	140	1300	2600
Chromium	µg/L	--	100	170	3600	7200
Dissolved Hexavalent Chromium	µg/L	--	--	11	16	31
Copper	µg/L	1300	500	19	31	62
Cyanide, Free	mg/l	220	--	0.012	0.046	0.092
Dieldrin	µg/L	0.0014	--	0.056	0.24	0.47
Total Filterable Residue (dissolved solids)	mg/l	--	--	1500	--	--
Heptachlor	µg/L	0.0021	--	--	--	--
Iron	µg/L	--	5000	--	--	--
Lead	µg/L	--	100	19	360	720
Magnesium	mg/l	--	--	--	--	--
Manganese	µg/L	--	--	--	--	--
Mercury	ng/l	12	10000	910	1700	3400
Nickel	µg/L	4600	200	110	960	1900
Nitrate+Nitrite	mg/l	--	100	--	--	--
Phosphorus	mg/l	--	--	--	--	--
Selenium	µg/L	11000	50	5	--	--
Strontium	µg/L	--	--	21000	40000	81000
Kjeldahl Nitrogen, Total	mg/l	--	--	--	--	--
Zinc	µg/L	69000	25000	250	250	490
Molybdenum	µg/L	--	--	20000	190000	370000

Table 8. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
1Q10	cfs	annual	18.5	USGS Station 03136500
7Q10	cfs	annual	21.1	USGS Station 03136500
30Q10	cfs	summer	25	USGS Station 03136500 1953-2003
30Q10	cfs	winter	50.9	USGS Station 03136500 1953-2003
90Q10	cfs	annual	0	
Harmonic Mean	cfs	annual	91.3	USGS Station 03136500 1953-2003
Mixing Assumption	%	average	100	
Mixing Assumption	%	maximum	100	
Hardness	mg/L	annual	233	eDMR Station 901 50th percentile 2009-2014 eDMR Station 901 2009-
pH	S.U.	summer	8	2014 eDMR Station 901 2009-
pH	S.U.	winter	8.025	2014 eDMR Station 901 2009-
Temperature	°C	summer	22.055	2015 eDMR Station 901 2009-
Temperature	°C	winter	8.4375	2016
Mt Vernon WWTP flow	cfs	annual	7.74	Design Flow

Table 8. (Continued)

Parameter	Units	Season	Value	Basis
Aldrin	µg/L		0	No representative data available.
Aluminum	µg/L		220.6	STORET; 2007; n=5; 4<MDL; Mean Value from Station R12K14
Ammonia (Summer)	mg/L		0.0175	eDMR; 2009-2013; n=20; 8<MDL; Median Value from Station 801
Ammonia (Winter)	mg/L		0.04	eDMR; 2009-2013; n=15; 1<MDL; Median Value from Station 801
Arsenic	µg/L		2.02	STORET; 2007; n=5; 1<MDL; Mean Value from Station R12K14
Barium	µg/L		91	STORET; 2007; n=5; 0<MDL; Mean Value from Station R12K14
Bis(2-ethylhexyl)phthalate	µg/L		0	No representative data available.
Cadmium	µg/L		0	STORET; 2007; n=5; 5<MDL; Station R12K14
Chlorides	mg/L		27.8	STORET; 2007; n=5; 0<MDL; Mean Value from Station R12K14
Chlorine, Total Residual	mg/L		0	No representative data available.
Chloroform	µg/L		0	No representative data available.
Chromium	µg/L		0	STORET; 2007; n=5; 5<MDL; Station R12K14
Dissolved Hexavalent Chromium	µg/L		0	No representative data available.
Copper	µg/L		0	STORET; 2007; n=5; 0<MDL; Station R12K14
Cyanide, Free	mg/L		0	No representative data available.
Dieldrin	µg/L		0	No representative data available.
Total Filterable Residue (dissolved solids)	mg/L		314	STORET; 2007; n=5; 0<MDL; Mean Value from Station R12K14
Heptachlor	µg/L		0	No representative data available.
Iron	µg/L		468.2	STORET; 2007; n=5; 0<MDL; Mean Value from Station R12K14
Lead	µg/L		2.04	STORET; 2007; n=5; 4<MDL; Mean Value from Station R12K14

Table 8. (Continued)

Parameter	Units	Season	Value	Basis
Magnesium	mg/l		22	STORET; 2007; n=5; 0<MDL; Mean Value from Station R12K14
Manganese	µg/L		57.8	STORET; 2007; n=5; 0<MDL; Mean Value from Station R12K14
Mercury	ng/l		0	No representative data available.
Nickel	µg/L		0	STORET; 2007; n=5; 5<MDL; Station R12K14
Nitrate+Nitrite	mg/l		0.556	STORET; 2007; n=5; 0<MDL; Mean Value from Station R12K14
Phosphorus	mg/l		0.0312	STORET; 2007; n=5; 0<MDL; Mean Value from Station R12K14
Selenium	µg/L		0	STORET; 2007; n=5; 5<MDL; Station R12K14
Strontium	µg/L		363.8	STORET; 2007; n=5; 0<MDL; Mean Value from Station R12K14
Kjeldahl Nitrogen, Total	mg/l		0.244	STORET; 2007; n=5; 1<MDL; Mean Value from Station R12K14
Zinc	µg/L		6	STORET; 2007; n=5; 4<MDL; Mean Value from Station R12K14
Molybdenum	µg/L		0	No representative data available.

WWTP = Wastewater Treatment Plant
 eDMR = Electronic Discharge Monitoring Report
 USGS = United States Geological Survey
 STORET = STOrage and RETrieval
 n = Number of samples
 MDL = Method Detection Limit

Table 9. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Outside Mixing Zone Criteria				Inside
		Average Human Health	Agri-culture	Aquatic Life	Maximum Aquatic Life	Mixing Zone Maximum
Aldrin	µg/L	0.018	--	--	--	--
Aluminum	µg/L	--	--	--	--	--
Ammonia (Summer)	mg/l	--	--	--	--	--
Ammonia (Winter)	mg/l	--	--	--	--	--
Arsenic	µg/L	--	1256	553	1148	680
Barium	µg/L	--	--	572	6563	4000
Bis(2-ethylhexyl)phthalate	µg/L	755	--	31	3729	2100
Cadmium	µg/L	--	640	18	41	23
Chlorides	mg/l	--	--	--	--	--
Chlorine, Total Residual	mg/l	--	--	0.041	0.064	0.038
Chloroform	µg/L	60141	--	522	4407	2600
Chromium	µg/L	--	1280	633	12205	7200
Dissolved Hexavalent Chromium	µg/L	--	--	41	54	31
Copper	µg/L	16635	6398	71	105	62
Cyanide, Free	mg/l	2815	--	0.045	0.16	0.092
Dieldrin	µg/L	0.0014	--	0.056	0.24	0.47
Total Filterable Residue (dissolved solids)	mg/l	--	--	4733	--	--
Heptachlor	µg/L	0.027	--	--	--	--
Iron	µg/L	--	58457	--	--	--
Lead	µg/L	--	1256	65	1216	720
Magnesium	mg/l	--	--	--	--	--
Manganese	µg/L	--	--	--	--	--
Mercury	ng/l	12	10000	910	1700	3400
Nickel	µg/L	58861	2559	410	3255	1900
Nitrate+Nitrite	mg/l	--	1273	--	--	--
Phosphorus	mg/l	--	--	--	--	--
Selenium	µg/L	140755	640	19	--	--
Strontium	µg/L	--	--	77256	134738	81000
Kjeldahl Nitrogen, Total	mg/l	--	--	--	--	--
Zinc	µg/L	882844	319826	915	833	490
Molybdenum	µg/L	--	--	74522	644134	370000

Table 10. Parameter Assessment

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

Aluminum	Chlorides	Magnesium
Kjeldahl Nitrogen, Total	Phosphorus	Manganese

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

Aldrin	Arsenic	Strontium
Cadmium	Chlorine, Total Residual	Chloroform
Chromium	Dissolved Hexavalent Chromium	Dieldrin
Heptachlor	Iron	Lead
Nickel	Nitrate+Nitrite	Selenium
Bis(2-ethylhexyl)phthalate	Molybdenum	

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

Barium	Copper	Cyanide, Free
Zinc		

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

Total Filterable Residue	Mercury
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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

Parameter

No Parameters meet these criteria

Table 11. Final Effluent Limits and Monitoring Requirements

Parameter	Units	Concentration		Loading (kg/day) ^a		Basis ^b
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Acute Toxicity						
<i>Ceriodaphnia dubia</i>	TU _a	----- Monitor -----				WET
<i>Pimephales promelas</i>	TU _a	----- Monitor -----				WET
Chronic Toxicity						
<i>Ceriodaphnia dubia</i>	TU _c	----- Monitor -----				WET
<i>Pimephales promelas</i>	TU _c	----- Monitor -----				WET
Ammonia						
Summer	mg/L	4	6.0 ^c	76	114 ^c	EP
Winter	mg/L	----- Monitor -----				EP
Cadmium	µg/L	----- Monitor -----				EP
CBOD ₅						
Summer	mg/L	15	23	284	435	EP
Winter	mg/L	25	40	473	757	EP
Chlorine, Total Residual	mg/L	--	0.038	--	--	EP
Chromium	µg/L	----- Monitor -----				EP
Copper	µg/L	----- Monitor -----				EP
Cyanide, Free	mg/L	----- Monitor -----				EP
Dissolved Oxygen	mg/L	5.0 minimum		--	--	EP
<i>E. coli</i> (Final)						
Summer Only	#/100 mL	126	284 ^c	--	--	WQS
Flow Rate	MGD	----- Monitor -----				M
Dissolved Hexavalent Chromium	µg/L	----- Monitor -----				EP
Lead	µg/L	----- Monitor -----				EP
Mercury	ng/L	----- Monitor -----				RP, EP
Nickel	µg/L	----- Monitor -----				EP
Nitrate+Nitrite	mg/L	----- Monitor -----				EP
Oil & Grease	mg/L	--	10	--	--	WQS, EP

Table 11. (Continued)

Parameter	Units	Concentration		Loading (kg/day) ^a		Basis ^b
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
pH	SU	6.5 - 9.0		--	--	WQS, EP
Phosphorus	mg/L	----- Monitor -----				EP
Total Filterable Residue	mg/L	----- Monitor -----				RP, BPJ
Kjeldahl Nitrogen, Total	mg/L	----- Monitor -----				EP
Total Suspended Solids						
Summer	mg/L	15	23 ^c	284	435 ^c	EP
Winter	mg/L	30	45 ^c	568	825 ^c	EP
Water Temperature	°C	----- Monitor -----				M
Zinc	µg/L	----- Monitor -----				EP

a = Effluent loadings based on average design discharge flow of 5.0 MGD.

b = Definitions

BEJ = Best Engineering Judgment

BPJ = Best Professional Judgment

EP = Existing Permit

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

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

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 = Weekly average limit

CBOD₅ = 5-day carbonaceous biochemical oxygen demand