

National Pollutant Discharge Elimination System (NPDES) Permit Program

F A C T S H E E T

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for Medina County Sewer District #500 Wastewater Treatment Plant (WWTP)

Public Notice No.: 14-06-035
Public Notice Date: June 25, 2014
Comment Period Ends: July 24, 2014

Ohio EPA Permit No.: 3PK00004*OD
Application No.: OH0043567

Name and Address of Applicant:

Medina County Board of Commissioners
144 North Broadway Street
Medina, Ohio 44256

Name and Address of Facility Where
Discharge Occurs:

Medina County Sewer District #500 WWTP
89 Columbia Road
Valley City, Ohio
Medina County

Receiving Water: Unnamed tributary to
West Branch Rocky River

Subsequent
Stream Network: West Branch Rocky River, Rocky River,
Lake Erie

Introduction

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

This fact sheet is prepared in order to document the technical basis and risk management decisions that are considered in the determination of water quality based NPDES permit effluent limitations. The technical basis for the fact sheet may consist of evaluations of promulgated effluent guidelines, existing effluent quality, instream biological, chemical and physical conditions, and the relative risk of alternative effluent limitations. This fact sheet details the discretionary decision-making process empowered to the Director by the Clean Water Act (CWA) and Ohio Water Pollution Control Law, Chapter 6111 of the Ohio Revised Code (ORC). 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 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,

Fact Sheet for NPDES Permit Renewal, Medina County #500 WWTP, 2014

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

Limits and monitoring requirements will remain the same as in the existing permit, with the following proposed changes.

A more restrictive winter ammonia monthly average limit is proposed based on the WLA.

A new monthly average mercury limit is proposed in accordance with the permittee's mercury variance renewal.

Limits have been added for free cyanide and monitoring frequency is proposed to be increased. A compliance schedule is included to allow the permittee time to make plant/treatment adjustments to meet the limits.

Monitoring is proposed for bis(2-ethylhexyl)phthalate, based on the WLA.

Quarterly monitoring for whole effluent toxicity (WET) is proposed for the first 27 months of the permit to evaluate whether a Toxicity Reduction Evaluation (TRE) is needed. Semi-annual monitoring is proposed thereafter. Limits are proposed at 51 months.

New monitoring for total filterable residue (dissolved solids) is proposed.

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; WET testing; outfall signage; and pretreatment program requirements.

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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 Chuck Allen, Charles.Allen@epa.ohio.gov, (330) 963-1110, or Sara Hise, Sara.Hise@epa.ohio.gov, (614) 644-4824.

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 Section 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 Ohio Administrative Code (OAC) Rule 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 water quality standards 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

Medina County #500 WWTP discharges to an unnamed tributary, which flows 1000 feet before discharging into the West Branch of the Rocky River at river mile (RM) 14.7. Figure 1 shows the approximate location of the facility.

Because the discharge into the unnamed tributary is so close to the West Branch Rocky River, the West Branch Rocky River use designations will be utilized in the development of permit limits. This segment of the West Branch Rocky River is described by Ohio EPA River Code: 13-100, U.S. EPA River Reach #: 04110001-008, County: Medina, Ecoregion: Erie-Ontario Lake Plains. The West Branch Rocky River is designated for the following uses under Ohio's WQS (OAC 3745-1-20): Warmwater Habitat (WWH), 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 water quality standards 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 can not meet the CWA goals because of human-caused conditions that can not 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 Medina County #500 WWTP is a tertiary treatment facility with an average design flow of 15.6 million gallons per day (MGD). The treatment plant was originally constructed in 1971, with the most recent major upgrade occurring in 2002. Treatment plant processes include influent pumping, screening and grit removal, primary sedimentation, activated sludge aeration, addition of powdered activated carbon, secondary clarification, sand filtering, chlorination, and dechlorination. The collection system is 100% separate sanitary sewers.

The Medina County #500 WWTP has the capability of diverting influent flow after grit removal. When the influent flow rate exceeds 40 MGD, flow is diverted to storm flow clarifiers for storage. If the capacity of the storm flow clarifiers is exceeded (4 tanks with a total capacity of 2.8 million gallons), the overflow is sent directly to the sand filters, bypassing biological treatment and secondary (or final) clarification. As the influent flow rate decreases, wastewater in the storm flow clarifiers is re-directed to receive full treatment. The NPDES permit renewal application indicates that the Medina County #500 WWTP diverted overflows directly to the sand filters a total of 2 times in 2012.

Sludge is processed using gravity thickeners, wet air oxidation, ash separation, a filter press, and ultimately disposed by land application at agronomic rates. The facility is capable of producing exceptional quality biosolids.

The Medina County #500 WWTP services Medina County, Brunswick City, and Medina City, for a total population served of 107,019. The source water for the collection system is surface water from Lake Erie and ground water from private wells.

The facility uses an approved pretreatment program. Two non-categorical significant industrial users and four categorical industrial users discharge approximately 0.14 MGD and 0.03 MGD, respectively, into the collection system. The wastewater flow from all industrial users is estimated to be 0.30 MGD.

Description of Existing Discharge

The Medina County #500 WWTP estimates an infiltration/inflow rate of 1.0 MGD. The facility reports SSO occurrences under station 300 in its NPDES permit. The City reported 3 SSOs in 2009, 1 in 2010, 1 in 2011, and 1 in 2012.

Table 1 presents chemical specific data reported in annual pretreatment reports.

Table 2 presents a summary of unaltered discharge monitoring report (DMR) data for outfall 3PK00004001. Data are presented for the period March 2009 through February 2014, and current permit limits are provided for comparison.

Table 3 summarizes the chemical specific data for outfall 001 by presenting the average and maximum Projected Effluent Quality values.

Table 4 summarizes the results of acute and chronic whole effluent toxicity tests of the final effluent.

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

A Total Maximum Daily Load (TMDL) study of the Rocky River Basin conducted by Ohio EPA (October 2001) did not include any recommendations for the Medina County #500 WWTP. Intensive monitoring is scheduled to take place in 2014. The TMDL study report to address any impairment identified will be available in the future at <http://www.epa.state.oh.us/dsw/tmdl/BlackRockyRivers.aspx>.

The draft 2014 *Ohio Integrated Water Quality Monitoring and Assessment Report* lists the West Branch Rocky River as impaired for human health and aquatic life. Causes of impairment are nutrients, ammonia, organic enrichment, and sources of impairment are listed as urban runoff and municipal point sources. The report is available for viewing at <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 Medina County #500 WWTP were used to determine what parameters should undergo WLA. The parameters discharged are identified by the data available to Ohio EPA - DMR data submitted by the permittee, compliance sampling data collected by Ohio EPA, and any other data submitted by the permittee, such as priority pollutant scans required by the NPDES application or by pretreatment, or other special conditions in the NPDES permit. The sources of effluent data used in this evaluation are as follows:

Self-monitoring data (DMR):	March 2009 through February 2014
Pretreatment data:	2009 through 2011

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 3.

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 8 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
Wildlife		Annual 90Q10
AWS	Harmonic mean flow	
Human Health (nondrinking)		Harmonic mean flow

Allocations are developed using a percentage of stream design flow as specified in Table 6, and allocations cannot exceed the Inside Mixing Zone Maximum (IMZM) criteria.

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 are 1.3 ng/L (average) and 1700 ng/L (maximum) in the Lake Erie basin.

The data used in the WLA are listed in Tables 1 and 2. The WLA results to maintain all applicable criteria are presented in Table 7. The current ammonia limits have been evaluated using the WLA procedures, and the winter monthly average ammonia limit was determined to not be protective of WQS for ammonia toxicity. A new monthly average limit of 4.5 mg/L is proposed for winter ammonia nitrogen, based on the WLA.

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 Medina County #500 WWTP, the WLA values are 0.3 TU_a and 1.0 TU_c.

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

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

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

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

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

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

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

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

<u>Dilution Ratio</u> (downstream flow to discharger flow)	<u>Wasteload Allocation</u> (percent effects in 100% effluent)
up to 2 to 1	30
greater than 2 to 1 but less than 2.7 to 1	40
2.7 to 1 to 3.3 to 1	50

The acute WLA for Medina County #500 WWTP is 30 percent mortality in 100 percent effluent based on the dilution ratio of 1.03 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 7. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 3, and the PEL_{max} is compared to the PEQ_{max}. Based on the calculated percentage of the allocated value $[(PEQ_{avg} \div PEL_{avg}) \times 100]$, or $[(PEQ_{max} \div PEL_{max}) \times 100]$, the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 8.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 9 presents the final effluent limits and monitoring requirements proposed for Medina County #500 WWTP outfall 3PK00004001 and the basis for their recommendation.

A 27-month compliance schedule is provided for meeting free cyanide limits to allow the permittee to make necessary changes to the treatment process to meet limits. 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 WQBEL, 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.

The limits proposed for dissolved oxygen, total suspended solids, ammonia-nitrogen and 5-day carbonaceous biochemical oxygen demand (CBOD₅) are all based on plant design criteria. These limits are protective of WQS.

Limits proposed for oil and grease, pH, and *Escherichia coli* are based on WQS (OAC 3745-1-07). Class A Primary Contact Recreation *E. coli* standards apply to the West Branch Rocky River.

The proposed limit for total residual chlorine is based on WLA as limited by the IMZM. The IMZM is a value calculated to avoid rapidly lethal conditions in the effluent mixing zone. The effluent limit for chlorine at outfall 3PK00004001 is less than the quantification level of 0.050 mg/l. However, a pollutant minimization program (PMP) is not required because the dosing rate of dechlorination chemicals ensures that the water quality based effluent limit is being met.

Phosphorus is limited based on provisions of OAC 3745-33-06(C).

Monitoring for nitrate + nitrite and total Kjeldahl nitrogen is proposed to continue based on best engineering judgment. The purpose of the monitoring is to maintain a nutrient data set for use in the future TMDL study. New monitoring for total filterable residue (dissolved solids) is proposed to add to the data set for the future TMDL study.

Mercury Reasonable Potential and Mercury Variance The Ohio EPA risk assessment (Table 8) places mercury in group 5. This placement as well as the data in Tables 1, 2 and 3 indicate that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality.

To comply with mercury limits, the permittee has applied for coverage under the general mercury variance, Rule 3745-33-07(D)(10) of the OAC. Based on the results of low-level mercury monitoring, the permittee has determined that its wastewater treatment plant cannot meet the 30-day average WQBEL of 1.3 nanograms per liter (ng/l). However, the permittee believes that the plant will be able to achieve an annual average mercury effluent concentration of 12 ng/l. The variance application also demonstrated to the satisfaction of Ohio EPA that there is no readily apparent means of complying with the WQBEL without constructing prohibitively expensive end-of-pipe controls for mercury. Based on these factors, the permittee is eligible for coverage under the general mercury variance.

Ohio EPA has reviewed the mercury variance application and has determined that it meets the requirements of the OAC. Items V and W in Part II of the draft NPDES permit list the provisions of the mercury variance, and includes the following requirements:

- A variance-based monthly average effluent limit of 3.0 ng/l, which was developed from sampling data submitted by the permittee;
- A requirement that the permittee make reasonable progress to meet the WQBEL for mercury by implementing the plan of study, which has been developed as part of the PMP;
- Low-level mercury monitoring of the plant's influent and effluent;
- A requirement that the annual average mercury effluent concentration is less than or equal to 12 ng/l as specified in the plan of study;
- A summary of the elements of the plan of study;
- A requirement to submit an annual report on implementation of the PMP; and
- A requirement for submittal of a certification stating that all permit conditions related to implementing the plan of study and the PMP have been satisfied, but that compliance with the monthly average WQBEL for mercury has not been achieved.

The Ohio EPA risk assessment (Table 8) places free cyanide in group 5. This placement as well as the data in Tables 1 and 2 indicate that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality. For this parameter, the PEQ is greater than 100 percent of the WLA. Pollutants that meet this requirement must have permit limits under OAC Rule 3745-33-07(A)(1).

The Ohio EPA risk assessment (Table 8) places Bis(2-ethylhexyl)phthalate in group 5, which recommends limits to protect water quality. Using the discretion allowed the Director under OAC 3745-33-07(A)(5), we are proposing monitoring, rather than limits, for these pollutants. The PEQ values calculated for Bis(2-ethylhexyl)phthalate (Table 3) may not be representative of its actual levels in the plant effluent they were based on three data points. The purpose of the proposed monitoring is to collect additional data on the frequency of occurrence and variability of these pollutants in the plant's effluent. A condition describing the sampling procedure for this parameter is included in Part II of the permit.

Ohio EPA risk assessment (Table 8) places Arsenic, Beryllium, Cadmium, Chloroform, Chromium, Dissolved hexavalent chromium, Copper, Lead, Molybdenum, Nickel, Nitrate+Nitrite, Selenium, Silver, Thallium, and Zinc in groups 2 and 3. This placement, as well as the data in Tables 1, 2 and 3, 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 will remain the same as in the previous permit.

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

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 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. Metals monitoring at downstream station 901 is proposed to be removed. Nutrient monitoring at downstream station 901 is proposed to be added.

Whole Effluent Toxicity Reasonable Potential

Evaluating the acute and chronic toxicity results in Table 4 under the provisions of 40 CFR Part 132, Appendix F, Procedure 6, gives an acute PEQ value of **0.667 TU_a** for both *P. promelas* and *C. dubia* using a coefficient of variation (CV) of 2.0; a chronic PEQ of **4.0 TU_c** for *P. promelas* using a CV of 3.0; and a chronic PEQ of **2.34 TU_c** for *C. dubia* using a CV of 1.5. Reasonable potential for toxicity is demonstrated, since these values exceed the WLA values of 0.3 TU_a and 1.0 TU_c. Consistent with Procedure 6 and OAC 3745-33-07(B), a monthly average limit of 1.0 TU_c and a daily maximum limit of 1.0 TU_a are proposed. It is proposed that the final effluent limits for toxicity become effective 51 months from the effective date of the permit. Quarterly toxicity monitoring for the first 27 months of the permit with a trigger to conduct a TRE, and semi-annual monitoring thereafter are proposed.

Other Requirements

Compliance Schedule

A six month compliance schedule is proposed for the City/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 City/County must also submit a pretreatment program modification request.

A six month compliance schedule is proposed for the City/County to submit a pretreatment program modification request for implementing changes required by Ohio's pretreatment rules and U.S. EPA's pretreatment streamlining rule.

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

Operator certification requirements have been included in Part II, Item A of the permit in accordance with rules adopted in December 2006. These rules require the Medina County #500 WWTP to have a Class IV wastewater treatment plant operator in charge of the sewage treatment plant operations discharging through outfall 001.

Operator of Record

In December 2006, 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 OAC 3745-7-02. It requires the permittee to designate one or more operator of record to oversee the technical operation of the treatment works.

Storm Water Compliance

Medina County #500 WWTP is covered under the Industrial Storm Water General Permit, permit number 3GR00936*EG.

Outfall Signage

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

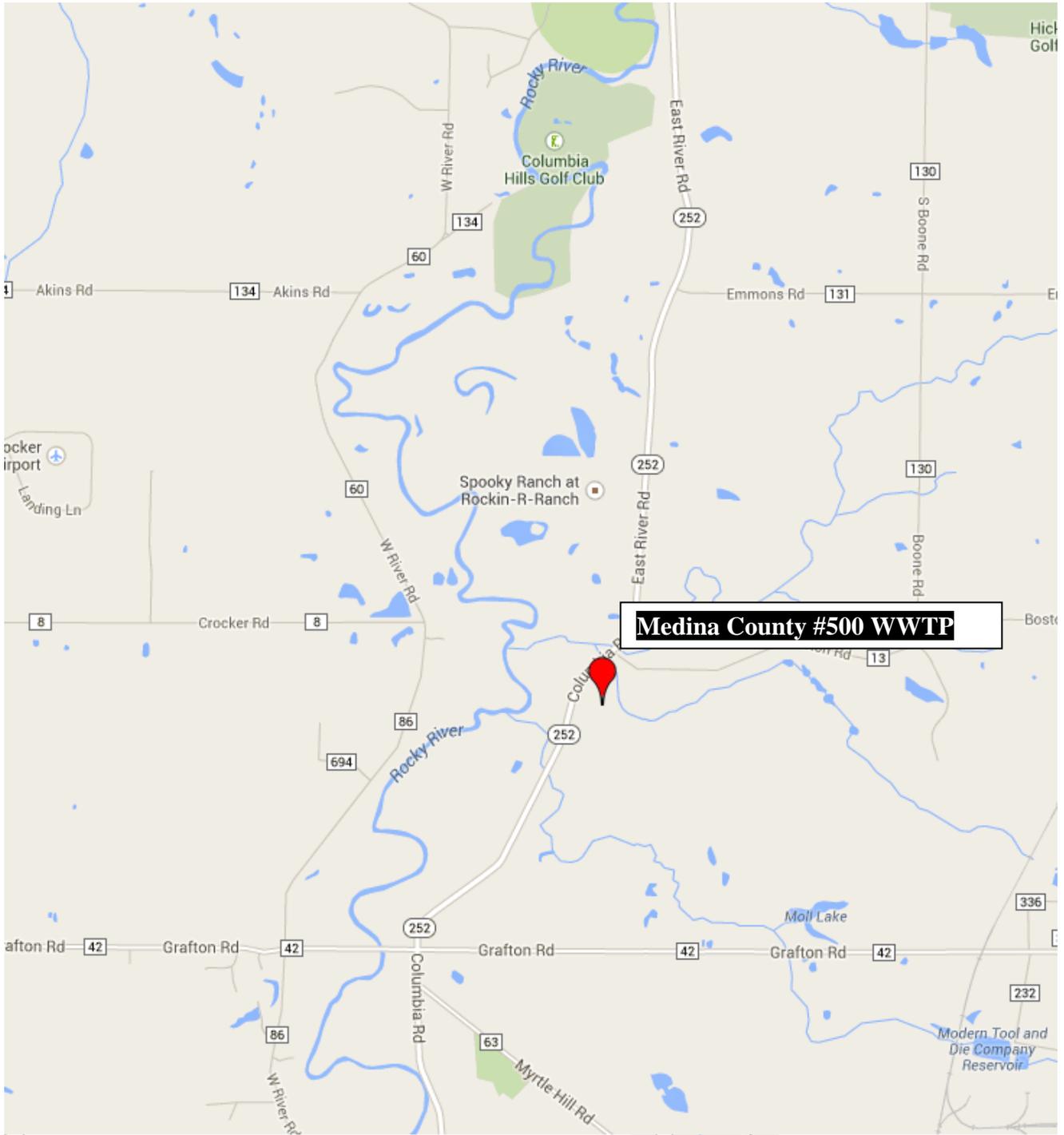


Figure 1. Location of Medina County #500 wastewater treatment plant.

Table 1. Effluent Characterization Using Pretreatment Data

Summary of analytical results for Medina County #500 WWTP outfall 3PK00004001. Units $\mu\text{g/L}$.

Parameter	9/25/2009	10/28/2010	9/13/2011
Antimony	4.8	<2.0	<40
Arsenic	<1.0	1.6	<40
Beryllium	<0.2	<0.2	<5
Cadmium	<0.5	<0.5	<5
Chromium	<2.0	<2.0	<10
Copper	3	13	<10
Lead	<2.0	<2.0	<20
Mercury	<0.2	<0.2	0.0082
Nickel	2	<0.2	<10
Selenium	<1.0	1.1	<50
Silver	<0.2	<0.2	<10
Thallium	<2.0	<2.0	<50
Zinc	42	56	62
Chlorodibromomethane	1.2	1.3	<2
Chloroform	2.2	4.1	16
Bis(2-ethylhexyl)phthalate	2.4	5.1	<10

Table 2. Effluent Characterization Using Self-Monitoring Data

Summary of current permit limits and unaltered discharge monitoring report data for Medina County #500 WWTP outfall 3PK00004001 (March 2009 - February 2014). All values are based on annual records unless otherwise indicated. * = 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.

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
Water Temperature	Annual	C	Monitor		1826	17.3	23	9-24.6
Dissolved Oxygen	Summer	mg/L	7.0 Minimum		610	8.5	8.1	7.7-11.7
Dissolved Oxygen	Winter	mg/L	7.0 Minimum		451	9.6	8.8	7.6-12.9
Total Suspended Solids	Summer	mg/L	12	18	610	2.8	7.9	0-24.7
Total Suspended Solids	Winter	mg/L	16	24	451	4	12.6	1-22.2
Oil and Grease	Annual	mg/L	10 max.		231	1	4.7	0-8.1
Ammonia	Summer	mg/L	1.15	2.0	609	0.21	1.06	0-9.29
Ammonia	Winter	mg/L	6.15	9.5	451	0.25	2.63	0-7.25
Nitrogen Kjeldahl, Total	Annual	mg/L	Monitor		99	3.53	5.576	1.43-11
Nitrite Plus Nitrate	Annual	mg/L	Monitor		257	10.3	21.24	3.4-72.5
Phosphorus	Annual	mg/L	1.0	1.5	1825	0.38	1.18	0.06-4.32
Cyanide, Free	Annual	ug/L	Monitor		60	0	0	0-0.01
Selenium	Annual	ug/L	Monitor		70	0.685	1.933	0-7.03
Nickel	Annual	ug/L	Monitor		106	2.7	9.165	0.4-22.7
Silver	Annual	ug/L	Monitor		102	0	0.4085	0-0.85
Zinc	Annual	ug/L	Monitor		106	38	62	11-241
Cadmium	Annual	ug/L	Monitor		106	0.04	0.2	0-3.53
Lead	Annual	ug/L	Monitor		106	0.3	1.15	0-5.1
Chromium	Annual	ug/L	Monitor		106	1	2.48	0-8.2
Copper	Annual	ug/L	Monitor		106	4	9.8	1-68
Chromium, Dissolved Hexavalent	Annual	ug/L	Monitor		61	0	0	0-6.1
<i>E. coli</i>	Annual	#/100mL	1000	2000	639	4	497.1	0-2420
Flow Rate	Summer	MGD	Monitor		610	7.2	11.3	5.17-26.7
Flow Rate	Winter	MGD	Monitor		451	9.5	17.2	5.68-42.9

Flow Rate	Annual	MGD	Monitor		1826	8.2	15.9	0.15-42.9
Chlorine, Total Residual	Annual	mg/L		0.017 max.	920	0	0	0-0.15
Mercury	Annual	ng/L	7.4033	1700	709	1.8	4.1	0-9.4
pH, Maximum	Annual	S.U.		9.0 max.	1826	7.35	7.72	6.7-8.7
pH, Minimum	Annual	S.U.		6.5 min.	1826	6.77	7.46	6.36-7.87
Carbonaceous Biochemical Oxygen Demand (5 day)	Summer	mg/L	10	15	608	0	3.7	0-8
Carbonaceous Biochemical Oxygen Demand (5 day)	Winter	mg/L	25	40	446	2.6	4.975	0-16.1

Table 3. Projected Effluent Quality Values

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
Arsenic	µg/L	2	1	4.4384	6.08
Beryllium	µg/L	3	0	--	--
Bis(2-ethylhexyl)phthalate	µg/L	2	2	14.1474	19.38
Cadmium	µg/L	109	55	0.4105	0.53964
Chlorine – Total residual	mg/L	920	8	0.0657	0.09
Chloroform (Trichloromethane)	µg/L	3	3	35.04	48
Chromium	µg/L	109	102	2.4846	3.7996
Chromium, Dissolved Hexavalent	µg/L	48	1	4.8983	6.71
Copper	µg/L	109	108	8.6486	12.666
Cyanide - free	mg/L	60	2	0.0073	0.01
Lead	µg/L	109	70	0.89775	1.3825
Mercury	ng/L	709	689	3.0134	5.8736
Nickel	µg/L	109	107	6.6295	10.087
Nitrate + Nitrite	mg/L	257	257	15.92	21.314
Selenium	µg/L	73	58	2.4008	3.7664
Silver	µg/L	105	37	0.36242	0.55973
Thallium	µg/L	3	0	--	--
Zinc	µg/L	109	109	59.354	80.796
Ammonia-Summer	mg/L	609	573	0.43271	0.97041
Ammonia-Winter	mg/L	451	421	1.0122	2.5368
Molybdenum	µg/L	--	--	--	--

Table 4. Summary of Whole Effluent Toxicity Test ResultsAA=not detected; TU_a=acute toxicity units; TU_c=chronic toxicity units

Test Date	<i>Pimephales promelas</i>		<i>Ceriodaphnia dubia</i>	
	TU_a	TU_c	TU_a	TU_c
8/31/2010	0.2	AA	0.2	1.42
10/29/2010	-	-	AA	AA
11/20/2010	0.2	1.22	AA	1.01
12/20/2010	AA	AA	-	-
1/14/2011	AA	AA	AA	1.01
4/5/2011	AA	AA	AA	AA
7/22/2011	AA	AA	AA	AA
10/21/2011	AA	AA	AA	1.43
1/16/2012	AA	AA	AA	AA
4/20/2012	AA	AA	AA	AA
7/17/2012	AA	AA	AA	AA
10/19/2012	AA	AA	AA	AA
1/27/2013	AA	AA	AA	AA

Table 5. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria					Inside Mixing Zone Maximum
		Wildlife	Average			Maximum	
			Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Arsenic	µg/L	--	580	100	150	340	680
Beryllium	µg/L	--	130c	100	45	380	760
Bis(2-ethylhexyl)phthalate	µg/L	--	32c	--	8.4	1100	2100
Cadmium	µg/L	--	730	50	4.9	12	24
Chlorine – Total Residual	mg/L	--	--	--	0.011	0.019	0.038
Chloroform (Trichloromethane)	µg/L	--	1700c	--	140	1300	2600
Chromium	µg/L	--	14000	100	180	3700	7400
Chromium, Dissolved Hexavalent	µg/L	--	14000	--	11	16	31
Copper	µg/L	--	64000	500	20	32	64
Cyanide - free	mg/L	--	48	--	0.0052	0.022	0.044
Lead	µg/L	--	--	100	20	370	750
Mercury	ng/L	1.3	3.1	10000	910	1700	3400
Nickel	µg/L	--	43000	200	110	980	2000
Nitrate + Nitrite	mg/l	--	--	100	--	--	--
Selenium	µg/L	--	3100	50	5	--	--
Silver	µg/L	--	11000	--	1.3	7.2	14
Thallium	µg/L	--	--	--	17	79	160
Zinc	µg/L	--	35000	25000	250	250	500
Ammonia-Summer	mg/L	--	--	--	1.2	--	--
Ammonia-Winter	mg/L	--	--	--	2.8	--	--
Molybdenum	µg/L	--	10000	--	20000	190000	370000

Table 6. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
<i>Stream Flows</i>				
1Q10	cfs	annual	0.6	USGS 04201500
7Q10	cfs	annual	0.9	USGS 04201500
		summer	0	
		winter	0	
30Q10	cfs	summer	1.59	USGS 04201500
		winter	14.4	USGS 04201500
90Q10	cfs	annual	3.19	
Harmonic Mean	cfs	annual	11.2	USGS 04201500
Mixing Assumption	%	average	25	
	%	maximum	100	
<i>Hardness</i>	mg/l	annual	240	901 Station 50th percentile
<i>pH</i>	S.U.	summer	8	901 Station
		winter	8.1	901 Station
<i>Temperature</i>	C	summer	21.55	901 Station
		winter	1.7	901 Station
<i>Medina County #500 flow</i>	cfs	annual	23.20	
<i>Background Water Quality</i>				
Arsenic	µg/L		2.45	STORET; 2001; n=2; 0<MDL; 501890
Beryllium	µg/L		0	No representative data available.
Bis(2-ethylhexyl)phthalate	µg/L		0	No representative data available.
Cadmium	µg/L		0.16	STORET; 2001; n=2; 1<MDL; 501890
Chlorine – Total Residual	mg/L		0	No representative data available.
Chloroform (Trichloromethane)	µg/L		0	No representative data available.
Chromium	µg/L		0	STORET; 2001; n=2; 2<MDL; 501890
Chromium, Dissolved Hexavalent	ug/L		0	No representative data available.
Copper	µg/L		0	STORET; 2001; n=2; 2<MDL; 501890
Cyanide - free	mg/L		0	No representative data available.
Lead	µg/L		0	STORET; 2001; n=2; 2<MDL; 501890
Mercury	ng/L		0	No representative data available.
Nickel	µg/L		0	STORET; 2001; n=2; 2<MDL; 501890
Nitrate+ Nitrite	mg/L		0.085	STORET; 2001; n=2; 1<MDL; 501890
Selenium	µg/L		0	STORET; 2001; n=2; 2<MDL; 501890
Silver	µg/L		0	No representative data available.
Thallium	µg/L		0	No representative data available.
Zinc	µg/L		0	STORET; 2001; n=2; 2<MDL; 501890
Ammonia-Summer	mg/L		0.04	801 Station; 2009-2014; n=20; 3<MDL; 50th percentile
Ammonia-Winter	mg/L		0.04	801 Station; 2009-2014; n=15; 3<MDL; 50th percentile
Molybdenum	µg/L			No representative data available.

MDL = analytical method detection limit
STORET = United States Environmental Protection Agency Storage and Retrieval Database
USGS = United States Geological Survey

Table 7. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Outside Mixing Zone Criteria					Inside Mixing Zone Maximum
		Wildlife	Average			Maximum Aquatic Life	
			Human Health	Agri-culture	Aquatic Life		
Arsenic	µg/L	--	650	112	151	349	680
Beryllium	µg/L	--	146	112	45	390	760
Bis(2-ethylhexyl)phthalate	µg/L	--	36	--	8.5	1128	2100
Cadmium	µg/L	--	818	56	4.9	12	24
Chlorine – Total Residual	mg/L	--	--	--	0.011	0.019	0.038
Chloroform (Trichloromethane)	µg/L	--	1905	--	141	1334	2600
Chromium	µg/L	--	15689	112	182	3796	7400
Chromium, Dissolved Hexavalent	µg/L	--	15689	--	11	16	31
Copper	µg/L	--	71722	560	20	33	64
Cyanide - free	mg/L	--	54	--	0.0053	0.023	0.044
Lead	µg/L	--	--	112	20	380	750
Mercury	ng/L	1.3	3.1	10000	910	1700	3400
Nickel	µg/L	--	48189	224	111	1005	2000
Nitrate + Nitrite	mg/L	--	--	112	--	--	--
Selenium	µg/L	--	3474	56	5	--	--
Silver	µg/L	--	12327	--	1.3	7.4	14
Thallium	µg/L	--	--	--	17	81	160
Zinc	µg/L	--	39223	28017	252	256	500
Ammonia-Summer	mg/L	--	--	--	--	--	--
Ammonia-Winter	mg/L	--	--	--	4.5	--	--
Molybdenum	µg/L	--	11207	--	20194	194913	370000

Table 8. Parameter Assessment

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

N/A

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

Arsenic	Beryllium	Cadmium
Chromium	Lead	Nickel
Nitrate+ Nitrite	Thallium	Molybdenum

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

Chloroform (Trichloromethane)	Chromium VI Dissolved	Copper
Selenium	Silver	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.

N/A

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

<u>Parameter</u>	<u>Units</u>	<u>Period</u>	<u>Recommended Effluent Limits</u>	
			<u>Average</u>	<u>Maximum</u>
Bis(2-ethylhexyl)phthalate	µg/L		8.5	1128
Chlorine – Total Residual	mg/L		0.011	0.019
Cyanide - free	mg/L		0.0053	0.023
Mercury	ng/L		1.3	1700
Ammonia-Winter	mg/L		4.5	--

PEL = preliminary effluent limitation
PEQ = projected effluent quality
WLA = wasteload allocation
WQS = water quality standards

Table 9. Final Effluent Limits and Monitoring Requirements

Parameter	Units	Effluent Limitations				Basis ^b
		Concentration		Loading (kg/day) ^a		
		Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	
Temperature	°C	----- Monitor -----				M
Dissolved Oxygen	mg/L	----- 7.0 Minimum -----				EP, PD
Suspended Solids	mg/L					
Summer		12	18 ^c	681	1022	EP, PD
Winter		16	24 ^c	908	1363	EP, PD
Oil and Grease	mg/L	--	10	--	--	WQS, EP
Ammonia Nitrogen	mg/L					
Summer		1.15	2.0 ^c	65	114	EP, PD
Winter		4.5	9.5 ^c	256	539	EP, PD, WQS
Total Kjeldahl Nitrogen	mg/L	----- Monitor -----				M
Nitrite + Nitrate	mg/L	----- Monitor -----				M
Total Filterable Residue	mg/L	----- Monitor -----				M
Phosphorus, Total	mg/L	1.0	1.5 ^c	57	85	PT
Cyanide, Free	mg/L					
(initial)		----- Monitor -----				BEJ
(final)		0.0053	0.023	0.301	1.31	WLA
Selenium	mg/L	----- Monitor -----				M
Nickel	µg/L	----- Monitor -----				M
Silver	µg/L	----- Monitor -----				M
Zinc	µg/L	----- Monitor -----				M
Cadmium	µg/L	----- Monitor -----				M
Lead	µg/L	----- Monitor -----				M
Chromium	µg/L	----- Monitor -----				M
Copper	µg/L	----- Monitor -----				M
Hexavalent Chromium (Dissolved)	µg/L	----- Monitor -----				M
<i>E. coli</i>						
Summer Only	#/100mL	126	284 ^c	--	--	WQS
Bis(2-ethylhexyl) phthalate	µg/L	----- Monitor -----				M
Flow	MGD	----- Monitor -----				M
Chlorine, Total Residual						
Summer	mg/L	0.019	--	--	--	WQS, EP
Mercury	ng/L	3.0	700	0.000171	0.04	VAR
Whole Effluent Toxicity – <i>C. dubia</i> and <i>P. promelas</i>						
Acute (initial)	TU _a	----- Monitor -----				BEJ
Chronic (initial)	TU _c	----- Monitor -----				BEJ
Acute (final)	TU _a	--	1.0	--	--	WET
Chronic (final)	TU _c	1.0	--	--	--	WET
pH	S.U.	----- 6.5 to 9.0 -----				WQS, EP
CBOD ₅	mg/L					
Summer		8.0	12 ^c	454	681	EP, PD
Winter		13	20 ^c	738	1136	EP, PD

^a Effluent loadings based on average design discharge flow of 15 MGD.

^b Definitions: BEJ = Best Engineering Judgment

CBOD₅ = carbonaceous biochemical oxygen demand (5 day)

EP = Existing Permit;

M = BEJ of Permit Guidance 1: Monitoring Frequency Requirements for Sanitary Discharges;

PD = Plant Design Criteria;

PT = Phosphorus treatment required under OAC 3745-33-06(C);

VAR = mercury variance-based limits, OAC 3745-33-07(D)(10);

WET = Reasonable potential for requiring water quality-based effluent limits and monitoring requirements for whole effluent toxicity in NPDES permits [40 CFR Part 132, Appendix F,

Procedure 6 and OAC 3745-33-07(B)]; WLA = Wasteload Allocation procedures (OAC 3745-2); WQS = Ohio Water Quality Standards (OAC 3745-1-07).

^c Weekly average limit.