

National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

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

Public Notice No.: 14-03-015
Public Notice Date: March 6, 2014
Comment Period Ends: April 6, 2014

Ohio EPA Permit No.: 1PD00022*ID
Application No.: OH0021083

Name and Address of Applicant:

Village of Greenfield
300 Jefferson Street
Greenfield, Ohio 45123

Name and Address of Facility Where

Discharge Occurs:

Village of Greenfield WWTP
187 Lost Bridge Road
Greenfield, Ohio 45123
Ross County

Receiving Water: Paint Creek

Subsequent
Stream Network: Scioto 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, 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 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 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 wasteload allocation for a pollutant to a measure of the effluent quality. The measure of effluent quality is called PEQ - Projected Effluent Quality. 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 most of the parameters are the same as in the current permit, although some monitoring frequencies have changed

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 rule 3745-33-07(B)(11) of the OAC and will adequately characterize toxicity in the plant's effluent.

Current monitoring requirements for hexachlorobenzene and dieldrin are being removed from the permit because this parameter does not have the reasonable potential to contribute to violations of WQS.

In Part II of the permit, special conditions are included that address sanitary sewer overflow (SSO) reporting; operator certification, minimum staffing and operator of record; whole effluent toxicity (WET) testing; storm water compliance; 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 Sara Hise, (614) 644-4824, Sara.Hise@epa.ohio.gov.

Information Regarding Certain Water Quality Based Effluent Limits

This draft permit may contain proposed water quality based effluent limitations 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 NDPEs 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 water quality based effluent limitations 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 water quality standard(s) used to develop the proposed effluent limitation in accordance with the terms and conditions set forth in OAC 3745-33-07(D). The permittee shall submit this application to the above address no later than 30 days after the Public Notice Date.

Alternately, the applicant may propose the development of site-specific WQS pursuant to OAC 3745-1-35. The permittee shall submit written notification regarding their intent to develop site specific 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

The Village of Greenfield WWTP discharges to Paint Creek at river mile (RM) 49.6. Figure 1 shows the approximate location of the facility. The Village of Greenfield is technically located in Highland County but the WWTP is located in Ross County.

This segment of Paint Creek is described by Ohio EPA River Code: 02-500, U.S. EPA River Reach #: 05060003, County: Ross, Ecoregion: Eastern Corn Belt Plains. Paint Creek is designated for the following uses under Ohio's WQS (OAC 3745-1-09): 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 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 Village of Greenfield WWTP is designed to treat an average daily flow of 1.64 million gallons per day (MGD) and has a peak hydraulic capacity of 3.3 MGD. The treatment plant was originally constructed in 1938 with the most recent major upgrade occurring in 2012. Treatment plant processes and equipment include:

- Bar screen
- Grit removal
- Activated sludge
- Alum addition
- Secondary clarification
- Post-aeration
- Ultraviolet disinfection

Numerous improvements were made to the system including replacing equipment in the final clarifiers, upgrading the electrical and control systems, and construction of a new chemical feed building, sludge storage pad, and drain pump station.

Sludge is processed by aerobic digestion and dewatered with a belt filter press. The single sludge pump was recently replaced with two pumps. A new sludge storage pad was also constructed. Drainage is directed to the drain pump station and ultimately to the headworks of the plant. Sludge removed from Greenfield WWTP is primarily managed through land application.

The collection system serves the Village of Greenfield and consists of 100% separate sanitary sewers. There are no engineered or constructed bypasses or overflows in the collection system. The infiltration and inflow rate for the collection system is estimated to be 0.235 MGD. There are eight industrial users, seven non-categorical significant industrial users, and one categorical industrial user. The total estimated average daily wastewater flow is 0.015 MGD from all industrial users, 0.00973 MGD from non-categorical significant industrial users, and 0.0057 MGD from the categorical industrial user. Greenfield WWTP does not enforce technically-based local limits for industrial dischargers, and the Village of Greenfield does not operate an Ohio EPA-approved pretreatment program.

The water supply source for the Village is wells.

Description of Existing Discharge

From 2008 through 2013, Greenfield WWTP reported a number of sample results which are violations of permit limits. The majority of violations are phosphorus limits, although there have several ammonia and total suspended solids (TSS) violations as well. The last reported limit violation was in September of 2012. The Village reports sanitary sewer overflow (SSO) occurrences under station 300 in its NPDES permit. The Village reported five SSOs in 2009, one in 2010, 11 in 2011, and two in 2012. None have been reported in 2013 through June.

Table 1 presents chemical specific data compiled from data reported in annual pretreatment reports, and data collected by Ohio EPA.

Table 2 presents a summary of unaltered discharge monitoring report (DMR) data for outfall 1PD00022001. Data are presented for the period July 2008 through July 2013, and current permit limits are provided for comparison.

Table 3 presents the average and maximum PEQ values for outfall 1PD00022001.

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

Assessment of Impact on Receiving Waters

The Total Maximum Daily Load (TMDL) for the Paint Creek watershed was approved in 2012. TMDLs were prepared for bacteria, total phosphorus, sediment, and habitat. The Paint Creek watershed met WQS for aquatic life uses at 69% of surveyed sites. In terms of bacterial contamination, only 38% of surveyed sites met WQS. Major causes of impairment include nutrient and organic enrichment and low dissolved oxygen. No changes to phosphorus limits for the Greenfield WWTP are recommended based on the TMDL. The complete report can be found at this website:

<http://www.epa.state.oh.us/dsw/tmdl/SciotoRiver.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 Greenfield WWTP were used to determine what parameters should undergo wasteload allocation. 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)	July 2008 through June 2013
Ohio EPA compliance sampling data	December 2009, April 2010

Outliers

The data were examined, and the following values were removed from the evaluation to give a more reliable PEQ: summer-time ammonia – 6.4 mg/L (6/22/09), 8.0 mg/L (6/23/09), and 7 mg/L (6/24/09); winter-time ammonia – 9.1 mg/L (12/25/12) and 8.9 mg/L (12/26/12); and copper – 126 µg/L (12/1/09).

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 water quality standards (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 6, and allocations cannot exceed the Inside Mixing Zone Maximum 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 12 ng/l (average) and 1700 ng/l (maximum) in the Ohio River basin.

The data used in the WLA are listed in Tables 5 and 6. 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 are protective of WQS for ammonia toxicity.

Whole Effluent Toxicity WLA

Whole effluent toxicity (WET) is the total toxic effect of an effluent on aquatic life measured directly with a toxicity test. Acute WET measures short term effects of the effluent while chronic WET measures longer term and potentially more subtle effects of the effluent.

WQS for WET are expressed in Ohio's narrative "free from" WQS rule [OAC 3745-1-04(D)]. These "free froms" are translated into toxicity units (TUs) by the associated WQS Implementation Rule (OAC 3745-2-09). WLAs can then be calculated using TUs as if they were water quality criteria.

The WLA calculations for WET are similar to those for aquatic life criteria - using the chronic toxicity unit (TU_c) and 7Q10 flow for the average and the acute toxicity unit (TU_a) and 1Q10 flow for the maximum. These values are the levels of effluent toxicity that should not cause instream toxicity during critical low-flow conditions. For Greenfield WWTP, the WLA values are 1.6 TU_a and 5.51 TU_c . The acute WLA defaults to 1.0 TU_a in accordance with OAC 3745-2-09.

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

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

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

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

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 (LC_{50}) for the most sensitive test species:

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

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

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 Greenfield WWTP outfall 1PD00022001 and the basis for their recommendation.

Temperature and Flow Rate

Monitoring for these parameters is proposed to continue in order to assist in the evaluation of effluent quality and plant performance.

Oil & Grease, pH, and E. coli

Limits are proposed to continue for these parameters and are based on WQS.

Dissolved Oxygen, Total Suspended Solids, and Carbonaceous Biochemical Oxygen Demand (5 day)

The limits are proposed to continue for dissolved oxygen, total suspended solids (TSS), and 5-day carbonaceous biochemical oxygen demand (CBOD₅), and are all based on plant design criteria. These limits are protective of WQS. Loading limits for TSS and CBOD₅ were decreased in the previous permit due to the ongoing facility upgrades. Those upgrades have been completed and loading limits will be increased to be consistent with the actual average design flow. These increases fall under the antibacksliding exception found in OAC 3745-33-05(F)(1)(a) and the antidegradation exception found in OAC 3745-1-05(B)(2)(b)(i).

Ammonia

The limits for summer and winter ammonia limits are proposed to continue from the existing permit. These limits are protective of WQS. Since plant upgrades have been completed, the loading limits will be increased to be consistent with the actual average design flow. This increase falls under the antibacksliding exception found in OAC 3745-33-05(F)(1)(a) and the antidegradation exception found in OAC 3745-1-05(B)(2)(b)(i).

Nitrate+Nitrite and Total Kjeldahl Nitrogen

Monitoring for these parameters is proposed to continue in order to facilitate the implementation of the Paint Creek TMDL.

Phosphorus

The limits for this parameter are proposed to continue based upon the water quality impairment due to nutrients downstream from Greenfield WWTP and to facilitate the implementation of the Paint Creek TMDL. Since plant upgrades have been completed, the loading limits will be increased to be consistent with the actual average design flow. This increase falls under the antibacksliding exception found in OAC 3745-33-05(F)(1)(a) and the antidegradation exception found in OAC 3745-1-05(B)(2)(b)(i).

Strontium, Silver, and Phenol

Ohio EPA risk assessment (Table 8) places these parameters in group 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. No monitoring is recommended.

Chromium, Nickel, Cadmium, Copper, Lead, and Zinc

Ohio EPA risk assessment (Table 8) places these parameters 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 at a low frequency is proposed to document that these pollutants continue to remain at low levels.

Hexachlorobenzene

Ohio EPA risk assessment (Table 8) places this parameter in group 3. This placement, as well as the data in Tables 1, 2, and 3, supports that this parameter does not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring is proposed to be removed from the permit.

Mercury

Ohio EPA risk assessment (Table 8) places this parameter in group 4. This placement, as well as the data in Tables 1, 2, and 3, supports that this parameter does not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring for Group 4 pollutants (where PEQ exceeds 50 percent of the WLA) is required by OAC 3745-33-07(A)(2).

Dieldrin

The Ohio EPA risk assessment (Table 8) places this parameter in group 5, which recommends limits to protect water quality. However, based on best engineering judgment, limits or monitoring are not proposed for this pollutant. The preliminary effluent limits for dieldrin, 0.002 µg/L, (Table 7) is less than the method detection limits reported by labs that perform analytical work for Ohio wastewater plants. The PEQ values calculated for dieldrin (Table 3) may not be representative of its actual levels in the plant effluent since they were based on only two detections. Additionally, the most recent detection of this parameter in the effluent was over three years ago. Monitoring for this pollutant would not yield data that is useable for making water quality-related decisions on dieldrin in the effluent.

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. The sampling frequency is proposed to be decreased to once per year based on the amount of sludge removed from the facility.

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 4 and other pertinent data under the provisions of OAC 3745-33-07(B) placed the Greenfield 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

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 of the permit in accordance with rules adopted in December 2006. These rules require the Greenfield WWTP to have a Class III WWTP operator in charge of the sewage treatment plant operations discharging through outfall 1PD00022001.

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. In Part II of this NPDES

permit an item 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

Parts IV, V, and VI have been included with the draft permit in order to ensure that any storm water flows from the facility site are properly regulated and managed. As an alternative to complying with Parts IV, V, and VI, the Greenfield WWTP may seek permit coverage under the general permit for industrial stormwater (permit # OHR000005) or submit a "No Exposure Certification." Parts IV, V, and VI will be removed from the final permit if: 1) the Greenfield WWTP submits a Notice of Intent (NOI) for coverage under the general permit for industrial stormwater or submits a No Exposure Certification, 2) Ohio EPA determines that the facility is eligible for coverage under the general permit or meets the requirements for a No Exposure Certification, and 3) the determination by Ohio EPA can be made prior to the issuance of the final permit.

Parts IV, V, and VI have been updated to make individual permits consistent with Ohio EPA's Industrial Storm Water General Permit.

Outfall Signage

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

Figure 1. Approximate Location of Facility

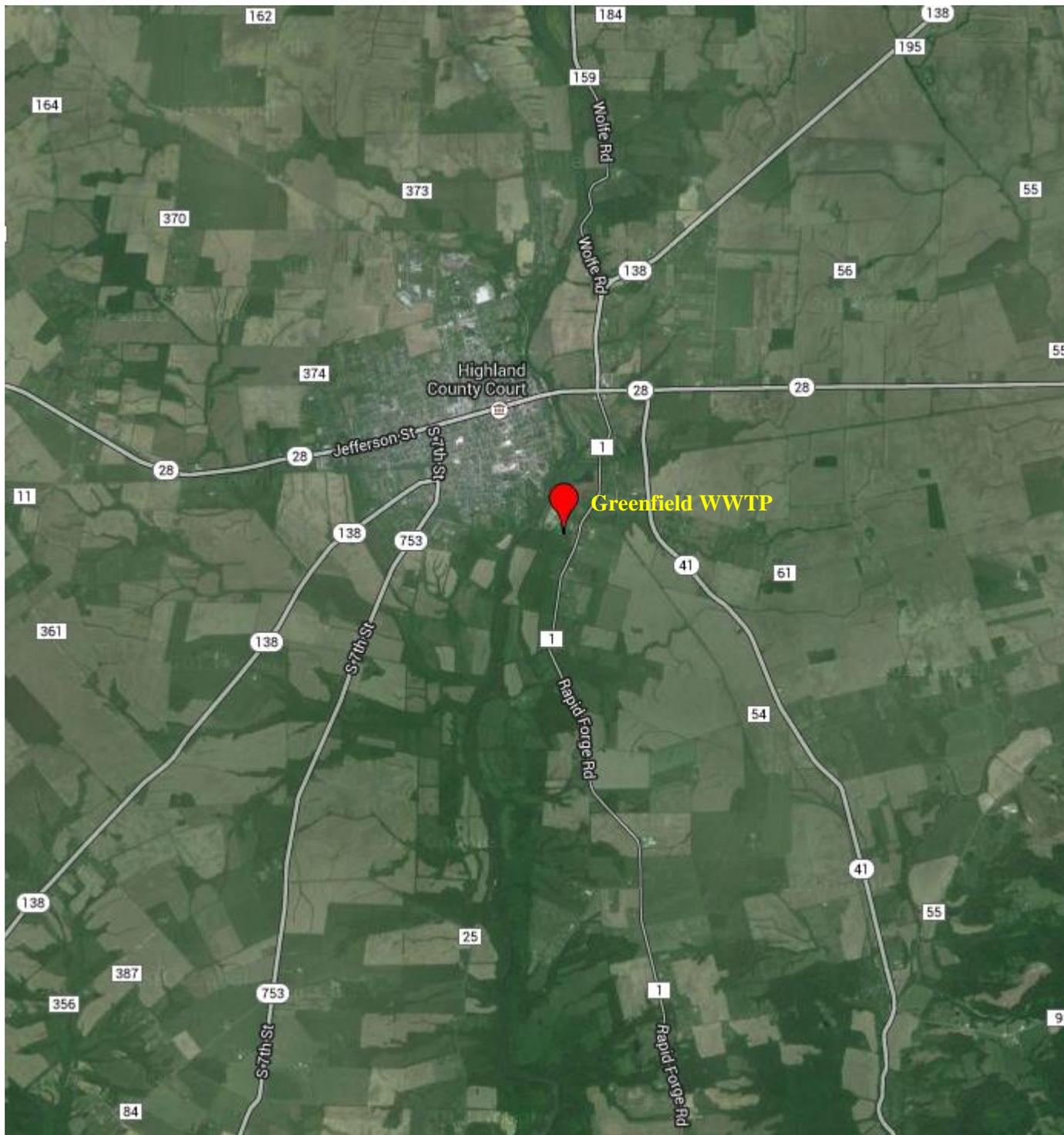


Table 1. Effluent Characterization Using Ohio EPA Data

Date		12/9/2009	4/26/2010
Parameter	Units	Result	Result
Aluminum	µg/L	AA (200)	AA (200)
Ammonia	mg/L	AA (0.05)	0.069
Arsenic	µg/L	AA (2)	AA (2)
Barium	µg/L	35	40
Cadmium	µg/L	AA (0.2)	AA (0.2)
Carbonaceous Biochemical Oxygen Demand (5 day)	mg/L	AA (2)	AA (2)
Chemical Oxygen Demand	mg/L	AA (20)	AA (20)
Chloride	mg/L	27.7	106
Chromium	µg/L	AA (2)	AA (2)
Copper	µg/L	8.8	5.3
Cyanide, free	µg/L	AA (5)	AA (5)
Iron	µg/L	AA (50)	AA (50)
Lead	µg/L	AA (2)	AA (2)
Magnesium	mg/L	35	32
Manganese	µg/L	AA (10)	AA (10)
Mercury	µg/L	AA (0.2)	NA
Nickel	µg/L	3.8	5
Nitrate+Nitrite	mg/L	18.1	12
Oil & grease	mg/L	AA (2)	AA (2)
Phenol	µg/L	2.3	AA (5)
Phenolics	µg/L	AA (10)	AA (10)
Phosphorus	mg/L	0.88	0.769
Selenium	µg/L	AA (2)	AA (2)
Strontium	µg/L	432	336
Total Kjeldahl Nitrogen	mg/L	1.43	1.7
Total Dissolved Solids	mg/L	622	582
Total Suspended Solids	mg/L	AA (5)	AA (5)
Zinc	µg/L	44	30

AA = non-detection (detection limit)

NA = not analyzed

Table 2. Effluent Characterization Using Self-Monitoring Data

Summary of current permit limits and unaltered discharge monitoring report data (July 2008 – June 2013). 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; d = weekly average.

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50 th	95 th	
<u>Outfall 001</u>								
Water Temperature	Annual	°C	Monitor		1266	16.8	24.9	7.9-26.5
Dissolved Oxygen	Summer	mg/L	6.0 minimum		643	8	9.4	5.6-10.5
Dissolved Oxygen	Winter	mg/L	6.0 minimum		623	9.6	11.3	4.3-12.3
Total Suspended Solids	Annual	mg/L	12	18 ^d	724	2	8.85	0-208
Oil and Grease	Annual	mg/L	10 maximum		119	0	0	0-0
Ammonia	Summer	mg/L	1.0	1.5	361	0	0.5	0-9.3
Ammonia	Winter	mg/L	3.0	4.5	362	0	0.895	0-9.1
Total Kjeldahl Nitrogen	Annual	mg/L	Monitor		49	1.2	2.02	0-10
Nitrite + Nitrate	Annual	mg/L	Monitor		60	15.4	28.4	5.4-34
Phosphorus	Annual	mg/L	1.0	1.5	269	0.63	1.34	0.09-1.96
Nickel	Annual	µg/L	Monitor		28	0	0	0-12
Zinc	Annual	µg/L	Monitor		28	36	67.9	0-74
Cadmium	Annual	µg/L	Monitor		28	0	0	0-5
Lead	Annual	µg/L	Monitor		28	0	18.2	0-45
Chromium	Annual	µg/L	Monitor		28	0	0	0-0
Copper	Annual	µg/L	Monitor		28	18	31.7	0-126
<i>E. coli</i>	Annual	#/100 mL	126	284	150	0	50	0-750
Dieldrin	Annual	µg/L	Monitor		17	0	0.00226	0-0.0033
Hexachlorobenzene	Annual	µg/L	Monitor		28	0	0.001	0-0.002
Flow Rate	Annual	MGD	Monitor		1826	0.657	1.93	0.1-5.88
Mercury	Annual	ng/L	Monitor		28	1.74	6.81	0-8.01
Acute Toxicity, <i>Ceriodaphnia dubia</i>	Annual	TU _a	Monitor		4	0.1	0.71	0-0.8

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50 th	95 th	
Chronic Toxicity, <i>Ceriodaphnia dubia</i>	Annual	TU _c	Monitor		4	1.8	5.05	0-5.5
Acute Toxicity, <i>Pimephales promelas</i>	Annual	TU _a	Monitor		4	0	0	0-0
Chronic Toxicity, <i>Pimephales promelas</i>	Annual	TU _c	Monitor		4	0	0	0-0
pH, Maximum	Annual	S.U.	9.0		1266	7.7	8.1	7-8.4
pH, Minimum	Annual	S.U.	6.5		1265	7.6	8	6.9-8.2
Carbonaceous Biochemical Oxygen Demand (5 day)	Summer	mg/L	10	15 ^d	359	0	7	0-16
Carbonaceous Biochemical Oxygen Demand (5 day)	Winter	mg/L	10	15 ^d	361	3	8	0-45
<u>Outfall 300</u>								
Overflow Occurrence	Annual	No./Month	Monitor		17	1	2	1-2
<u>Outfall 581</u>								
Ammonia	Annual	mg/kg	Monitor		9	663	4650	139-4810
Total Kjeldahl Nitrogen	Annual	mg/kg	Monitor		15	10900	43400	2760-52400
Phosphorus	Annual	mg/kg	Monitor		11	10500	21000	367-22200
Potassium	Annual	mg/kg	Monitor		5	1900	2540	323-2650
Arsenic	Annual	mg/kg	75 maximum		12	6.5	11	4-11
Cadmium	Annual	mg/kg	85 maximum		12	3	7	1-7
Copper	Annual	mg/kg	4300 maximum		12	517	844	231-1050
Lead	Annual	mg/kg	840 maximum		12	36.5	58.6	18-63
Nickel	Annual	mg/kg	420 maximum		12	18.5	22.9	10-24
Zinc	Annual	mg/kg	7500 maximum		12	865	1250	534-1500
Selenium	Annual	mg/kg	100 maximum		12	5.5	9.9	1-11
Sludge Fee Weight	Annual	dry tons	Monitor		9	44.8	88.2	0-89.8

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Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50 th	95 th	
Fecal Coliform	Annual	CFU/gram	2000000 maximum		7	4140	51700	2740-55300
Sludge Weight	Annual	Dry Tons	Monitor		15	40.9	87	0-89.8
Mercury	Annual	mg/kg	57 maximum		12	0.125	0.601	0-0.712
Molybdenum	Annual	mg/kg	75 maximum		12	6	7.45	3-8
<u>Outfall 586</u>								
Sludge Fee Weight	Annual	dry tons	Monitor		0	0	0	0
<u>Outfall 601</u>								
Total Suspended Solids	Annual	mg/L	Monitor		719	160	344	0-1630
Nickel	Annual	µg/L	Monitor		28	0	6.5	0-20
Zinc	Annual	µg/L	Monitor		28	127	213	46-366
Cadmium	Annual	µg/L	Monitor		28	0	0	0-0
Lead	Annual	µg/L	Monitor		28	0	30.3	0-50
Chromium	Annual	µg/L	Monitor		28	0	0	0-0
Copper	Annual	µg/L	Monitor		28	58	114	20-286
Mercury	Annual	ng/L	Monitor		28	33.5	149	5.09-486
pH, Maximum	Annual	S.U.	Monitor		1265	7.8	8.1	7.4-9.2
pH, Minimum	Annual	S.U.	Monitor		1265	7.7	7.9	6.4-8.2
Carbonaceous Biochemical Oxygen Demand (5 day)	Summer	mg/L	Monitor		358	110	252	0-520
Carbonaceous Biochemical Oxygen Demand (5 day)	Winter	mg/L	Monitor		359	100	200	0-600
<u>Outfall 801</u>								
Water Temperature	Annual	C	Monitor		60	14.7	24	1.6-26.5
Dissolved Oxygen	Summer	mg/L	Monitor		30	7.2	9.69	4.2-11.5
Dissolved Oxygen	Winter	mg/L	Monitor		30	10.8	13.3	7.7-15.8
pH	Annual	S.U.	Monitor		60	8.1	8.5	6.8-8.8

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50 th	95 th	
Ammonia	Summer	mg/L	Monitor		14	0	0.035	0-0.1
Ammonia	Winter	mg/L	Monitor		14	0	0	0-0
<i>E. coli</i>	Annual	#/100 mL	Monitor		5	350	960	0-1100
Acute Toxicity, <i>Ceriodaphnia dubia</i>	Annual	% Affected	Monitor		4	5	18.5	0-20
Chronic Toxicity, <i>Ceriodaphnia dubia</i>	Annual	% Affected	Monitor		4	0	2.13	0-2.5
Acute Toxicity, <i>Pimephales promelas</i>	Annual	% Affected	Monitor		4	10	20	0-20
Chronic Toxicity, <i>Pimephales promelas</i>	Annual	% Affected	Monitor		4	3.75	9.25	0-10
<u>Outfall 901</u>								
Water Temperature	Annual	C	Monitor		60	14.8	24.2	1.7-26
Dissolved Oxygen	Summer	mg/L	Monitor		30	7.25	10	3.3-11.8
Dissolved Oxygen	Winter	mg/L	Monitor		30	11	14	7.5-15.5
pH	Annual	S.U.	Monitor		60	8.2	8.6	7-8.8
Ammonia	Summer	mg/L	Monitor		14	0	0.135	0-0.2
Ammonia	Winter	mg/L	Monitor		14	0	0	0-0
Hardness	Annual	mg/L	Monitor		60	328	409	33.6-456
<i>E. coli</i>	Annual	#/100 mL	Monitor		4	300	400	0-400

Table 3. Projected Effluent Quality Values for Outfall 001

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
Ammonia (Summer)	mg/L	237	46	0.39755	0.53262
Ammonia (Winter)	mg/L	179	47	3.3872	4.64
Cadmium	µg/L	30	1	4.38	6
Chromium	µg/L	30	0	--	--
Copper	µg/L	29	18	28.032	38.4
Dieldrin	µg/L	13	2	0.038544	0.0528
Hexachlorobenzene	µg/L	15	3	0.00219	0.003
Lead	µg/L	30	2	39.42	54
Mercury	ng/L	28	24	6.3161	10.681
Nickel	µg/L	30	3	10.512	14.4
Nitrate + Nitrite	mg/L	60	60	24.809	34.531
Phenol	µg/L	1	1	10.4098	14.26
Phosphorus	mg/L	271	271	1.0457	1.5309
Silver	µg/L	11	0	--	--
Strontium	µg/L	13	12	637.39	878.85
Total Kjeldahl Nitrogen	mg/L	51	35	7.3	10
Zinc	µg/L	30	29	63.353	92.732

MDL = method detection limit
PEQ = projected effluent quality

Table 4. Summary of Acute and Chronic Toxicity Results

Date	<i>Ceriodaphnia dubia</i>		<i>Pimphales promelas</i>
	Acute Toxicity (TU _a)	Chronic Toxicity (TU _c)	Acute Toxicity (TU _a)
9/21/2009	AA	1.1	AA
12/8/09 ^a	ND	ND	ND
4/28/10 ^a	ND	ND	ND
9/21/2010	0.8	2.5	AA
9/1/2011	0.2	5.5	AA
9/24/2012	AA	AA	AA

^a = Ohio EPA test

ND = not determined; no mortality observed

TU_a = acute toxicity units

TU_c = chronic toxicity units

Table 5. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum Aquatic Life	
		Human Health	Agri-culture	Aquatic Life		
Ammonia (Summer)	mg/L	--	--	0.5	--	--
Ammonia (Winter)	mg/L	--	--	1.5	--	--
Cadmium	µg/L	--	50	6.3	17	34
Chromium	µg/L	--	100	230	4800	9500
Copper	µg/L	1300	500	26	43	86
Dieldrin	µg/L	0.0014	--	0.056	0.24	0.47
Hexachlorobenzene	µg/L	0.0077	--	--	--	--
Lead	µg/L	--	100	29	560	1100
Mercury	ng/L	12	10000	910	1700	3400
Nickel	µg/L	4600	200	140	1300	2600
Nitrate + Nitrite	mg/L	--	100	--	--	--
Phenol	µg/L	4600000	--	400	4700	9400
Phosphorus	mg/L	--	--	--	--	--
Silver	µg/L	--	--	1.3	12	25
Strontium	µg/L	--	--	21000	40000	81000
Total Kjeldahl Nitrogen	mg/L	--	--	--	--	--
Zinc	µg/L	69000	25000	330	330	660

Table 6. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
Stream Flows				
1Q10	cfs	annual	9.48	USGS Gage 03232000 plus Washington C.H. WWTP
7Q10	cfs	annual	9.58	USGS Gage 03232000 plus Washington C.H. WWTP
30Q10	cfs	summer	10.18	USGS Gage 03232000 plus Washington C.H. WWTP
		winter	17.08	USGS Gage 03232000 plus Washington C.H. WWTP
Harmonic Mean	cfs	annual	16.41	USGS Gage 03232000 plus Washington C.H. WWTP
Mixing Assumption	%	average	100	
	%	maximum	100	
Hardness	mg/l	annual	328	901 station; 50th percentile; n=60
pH	S.U.	summer	8.3	901 station; 75th percentile; n=20
		winter	8.4	901 station; 75th percentile; n=15
Temperature	C	summer	23.4	901 station; 75th percentile; n=20
		winter	7.9	901 station; 75th percentile; n=15
Greenfield WWTP flow	cfs	annual	2.537	NPDES application ADF
Background Water Quality				
Ammonia (Summer)	mg/L		0	Ohio EPA; 2008-2013; n=12; 0<MDL; Station 801; 50th percentile
Ammonia (Winter)	mg/L		0	Ohio EPA; 2008-2013; n=7; 0<MDL; Station 801; 50th percentile
Cadmium	µg/L		0	Ohio EPA; 1999-2012; n=185; 0<MDL; Station V10S30; 50th percentile
Chromium	µg/L		15	Ohio EPA; 1999-2012; n=185; 181<MDL; Station V10S30; 50th percentile
Copper	µg/L		5	Ohio EPA; 1999-2012; n=185; 163<MDL; Station V10S30; 50th percentile
Dieldrin	µg/L		0	No representative data available.
Hexachlorobenzene	µg/L		0	No representative data available.
Lead	µg/L		1	Ohio EPA; 1999-2012; n=185; 163<MDL; Station V10S30; 50th percentile
Mercury	ng/L		0	No representative data available.

Parameter	Units	Season	Value	Basis
Nickel	µg/L		20	Ohio EPA; 1999-2012; n=185; 153<MDL; Station V10S30; 50th percentile
Nitrate + Nitrite	mg/L		5.8	Ohio EPA; 1999-2012; n=193; 3<MDL; Station V10S30; 50th percentile
Phenol	µg/L		5	BWQR; 1988; n=29; 21<MDL; Scioto River basin; 50th percentile
Phosphorus	mg/L		0.205	Ohio EPA; 1999-2012; n=193; 4<MDL; Station V10S30; 50th percentile
Silver	µg/L		0	No representative data available.
Strontium	µg/L		1720	Ohio EPA; 1999-2012; n=185; 0<MDL; Station V10S30; 50th percentile
Total Kjeldahl Nitrogen	mg/L		0.5	Ohio EPA; 1999-2012; n=193; 4<MDL; Station V10S30; 50th percentile
Zinc	µg/L		5	Ohio EPA; 1999-2012; n=185; 146<MDL; Station V10S30; 50th percentile

ADF = average design flow

MDL = method detection limit

NPDES = National Pollutant Discharge Elimination System

Ohio EPA = Ohio Environmental Protection Agency

USGS = United States Geological Survey

Washington C.H. = Washington Court House

WWTP = wastewater treatment plant

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

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum	
		Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Ammonia (Summer)	mg/L	--	--	--	--	--
Ammonia (Winter)	mg/L	--	--	--	--	--
Cadmium	µg/L	--	373	30	81	34
Chromium	µg/L	--	650	1042	22680	9500
Copper	µg/L	9676	3702	105	185	86
Dieldrin	µg/L	0.0014	--	0.056	0.24	0.47
Hexachlorobenzene	µg/L	0.0077	--	--	--	--
Lead	µg/L	--	740	135	2649	1100
Mercury	ng/L	12	10000	910	1700	3400
Nickel	µg/L	34225	1364	593	6083	2600
Nitrate + Nitrite	mg/L	--	709	--	--	--
Phenol	µg/L	34354008	--	1892	22244	9400
Phosphorus	mg/L	--	--	--	--	--
Silver	µg/L	--	--	6.2	57	25
Strontium	µg/L	--	--	93803	183041	81000
Total Kjeldahl Nitrogen	mg/L	--	--	--	--	--
Zinc	µg/L	515278	186674	1557	1544	660

Table 9. Final Effluent Limits and Monitoring Requirements for Outfall 001

Parameter	Units	Concentration		Loading (kg/day) ^a		Basis ^b
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Temperature	°C	----- Monitor -----				M ^c
Dissolved Oxygen	mg/L	6.0 minimum		--	--	EP/PD
pH	S.U.	6.5 - 9.0		--	--	WQS
Carbonaceous Biochemical Oxygen Demand (5 day)	mg/L	10	15 ^d	62.0	93.0 ^d	EP/PD
Total Suspended Solids	mg/L	12	18 ^d	74.4	112 ^d	EP/PD
Oil & Grease	mg/L	10 maximum		--	--	WQS
Ammonia						
Summer	mg/L	1.0	1.5	6.2	9.3	EP/PD
Winter	mg/L	3.0	4.5	18.6	27.9	EP/PD
Total Kjeldahl Nitrogen	mg/L	----- Monitor -----				EP
Nitrate + Nitrite	mg/L	----- Monitor -----				EP
Phosphorus	mg/L	1.0	1.5	6.2	9.3	EP/TMDL
Nickel	µg/L	----- Monitor -----				EP
Zinc	µg/L	----- Monitor -----				EP
Cadmium	µg/L	----- Monitor -----				EP
Lead	µg/L	----- Monitor -----				EP
Chromium	µg/L	----- Monitor -----				EP
Copper	µg/L	----- Monitor -----				EP
Mercury	ng/L	----- Monitor -----				EP
<i>E. coli</i> (summer)	#/100 mL	126	284 ^d	--	--	WQS
Flow Rate	MGD	----- Monitor -----				M ^c
Whole Effluent Toxicity						
Acute, <i>Ceriodaphnia dubia</i>	TU _a	----- Monitor -----				EP/WET
Chronic, <i>Ceriodaphnia dubia</i>	TU _c	----- Monitor -----				EP/WET
Acute, <i>Pimephales promelas</i>	TU _a	----- Monitor -----				EP/WET
Chronic, <i>Pimephales promelas</i>	TU _c	----- Monitor -----				EP/WET

^a Effluent loadings based on average design discharge flow of 1.64 MGD.

^b Definitions: **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))
PD = Plant Design
TMDL = Total Maximum Daily Load
WET = Whole Effluent Toxicity (OAC 3745-33-07(B))
WQS = Ohio Water Quality Standards (OAC 3745-1)

^c Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality

and treatment plant performance.

^d 7 day average limit.