

National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio  
for **Tiffin Water Pollution Control Center (WPCC)**

Public Notice No.: 15-05-014  
Public Notice Date: May 15, 2015  
Comment Period Ends: June 14, 2015

Ohio EPA Permit No.: 2PD00025\*PD  
Application No.: OH0052949

Name and Address of Applicant:

**City of Tiffin**  
**51 East Market Street**  
**Tiffin, Ohio 44883**

Name and Address of Facility Where

Discharge Occurs:

**Tiffin WPCC**  
**961 North Water Street**  
**Tiffin, Ohio 44883**  
**Seneca County**

Receiving Water: Sandusky River

Subsequent Stream Network: Sandusky Bay, Lake Erie

Introduction

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

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

Effluent limits based on available treatment technologies are required by Section 301(b) of the CWA. Many of these have already been established by the United States Environmental Protection Agency (U.S. EPA) in the effluent guideline regulations (a.k.a. categorical regulations) for industry categories in 40 CFR Parts 405-499. Technology-based regulations for publicly-owned treatment works are listed in the Secondary Treatment Regulations (40 CFR Part 133). If regulations have not been established for a category of dischargers, the director may establish technology-based limits based on best professional judgment (BPJ).

Ohio EPA reviews the need for water-quality-based limits on a pollutant-by-pollutant basis. Wasteload allocations (WLAs) are used to develop these limits based on the pollutants that have been detected in the discharge, and the receiving water's assimilative capacity. The assimilative capacity depends on the flow in the water receiving the discharge, and the concentration of the pollutant upstream. The greater the upstream flow, and the lower the upstream concentration, the greater the assimilative capacity is. Assimilative capacity may

represent dilution (as in allocations for metals), or it may also incorporate the break-down of pollutants in the receiving water (as in allocations for oxygen-demanding materials).

The need for water-quality-based effluent limits (WQBELs) is determined by comparing the WLA for a pollutant to a measure of the effluent quality. The measure of effluent quality is called Projected Effluent Quality (PEQ). This is a statistical measure of the average and maximum effluent values for a pollutant. As with any statistical method, the more data that exists for a given pollutant, the more likely that PEQ will match the actual observed data. If there is a small data set for a given pollutant, the highest measured value is multiplied by a statistical factor to obtain a PEQ; for example if only one sample exists, the factor is 6.2, for two samples - 3.8, for three samples - 3.0. The factors continue to decline as samples sizes increase. These factors are intended to account for effluent variability, but if the pollutant concentrations are fairly constant, these factors may make PEQ appear larger than it would be shown to be if more sample results existed.

### Summary of Permit Conditions

The effluent limits and monitoring requirements proposed for the following parameters are the same as in the current permit, although some monitoring frequencies have changed: flow, temperature, dissolved oxygen, 5-day carbonaceous biochemical oxygen demand (CBOD<sub>5</sub>), total suspended solids, total filterable residue, ammonia, total phosphorus, nitrite+nitrate, oil and grease, pH, total residual chlorine, free cyanide, cadmium, chromium, dissolved hexavalent chromium, copper, *Escherichia coli* (*E. coli*), lead, mercury, nickel, zinc and bis(2-ethylhexyl) phthalate.

Limits for mercury are proposed to continue from the current permit. In order to comply with mercury limits, the permittee has applied for coverage under the general mercury variance, Rule 3745-33-07(D)(10) of the Ohio Administrative Code (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).

This permit includes a compliance schedule for the City of Tiffin's Combined Sewer Overflow (CSO) Long Term Control Plan (LTCP) to be revised no later than December 31, 2015.

New monthly monitoring is proposed for dissolved orthophosphate (as P). This monitoring is required by Ohio Senate Bill 1, which was signed by the Governor on April 2, 2015.

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

Annual chronic toxicity monitoring with the determination of acute endpoints is proposed for the life of the permit. This satisfies the minimum testing requirements of OAC 3754-33-07(B)(11) and will adequately characterize toxicity in the plant's effluent.

Upstream monitoring for nutrients (phosphorus and nitrite+nitrate) have been added to station 2PD00025801.

Downstream monitoring for nutrients (phosphorus and nitrite+nitrate) has been added to station 2PD00025901. Metals monitoring isn't necessary and therefore removed. Mercury monitoring continues at this station because of the mercury variance.

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; 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 Elizabeth Buening, (614) 644-2138, [Elizabeth.buening@epa.ohio.gov](mailto:Elizabeth.buening@epa.ohio.gov).

## Information Regarding Certain Water Quality Based Effluent Limits

This draft permit may contain proposed WQBELs for parameters that **are not** priority pollutants. (See the following link for a list of the priority pollutants: [http://epa.ohio.gov/portals/35/pretreatment/Pretreatment\\_Program\\_Priority\\_Pollutant\\_Detection\\_Limits.pdf](http://epa.ohio.gov/portals/35/pretreatment/Pretreatment_Program_Priority_Pollutant_Detection_Limits.pdf).) In accordance with ORC 6111.03(J)(3), the Director established these water quality based effluent limits after considering, to the extent consistent with the Federal Water Pollution Control Act, evidence relating to the technical feasibility and economic reasonableness of removing the polluting properties from those wastes and to evidence relating to conditions calculated to result from that action and their relation to benefits to the people of the state and to accomplishment of the purposes of this chapter. This determination was made based on data and

information available at the time the permit was drafted, which included the contents of the timely submitted NPDES permit renewal application, along with any and all pertinent information available to the Director.

This public notice allows the permittee to provide to the Director for consideration during this public comment period additional site-specific pertinent and factual information with respect to the technical feasibility and economic reasonableness for achieving compliance with the proposed final effluent limitations for these parameters. The permittee shall deliver or mail this information to:

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

Should the applicant need additional time to review, obtain or develop site-specific pertinent and factual information with respect to the technical feasibility and economic reasonableness of achieving compliance with these limitations, written notification for any additional time shall be sent to the above address no later than 30 days after the Public Notice Date on Page 1.

Should the applicant determine that compliance with the proposed WQBELs for parameters other than the priority pollutants is technically and/or economically unattainable, the permittee may submit an application for a variance to the applicable WQS used to develop the proposed effluent limitation in accordance with the terms and conditions set forth in OAC 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 WQS for parameters that are not priority pollutants to the above address no later than 30 days after the Public Notice Date.

## Location of Discharge/Receiving Water Use Classification

The Tiffin WPCC discharges to Sandusky River at River Mile (RM) 38.77. Figure 1 shows the approximate location of the facility.

This segment of the Sandusky River is described by Ohio EPA River Code: 05-001, U.S. EPA River Reach #: 04100011-008, County: Seneca, Ecoregion: Huron/Erie Lake Plains. The Sandusky River is designated for the following uses under Ohio's WQS (OAC 3745-1-12): 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 WQS are developed to protect these uses. Different uses have different water quality criteria.

Use designations for aquatic life protection include habitats for coldwater fish and macroinvertebrates, warmwater aquatic life and waters with exceptional communities of warmwater organisms. These uses all meet the goals of the federal CWA. Ohio WQS also include aquatic life use designations for waterbodies which cannot meet the CWA goals because of human-caused conditions that cannot be remedied without causing fundamental changes to land use and widespread economic impact. The dredging and clearing of some small streams to support agricultural or urban drainage is the most common of these conditions. These streams are given Modified Warmwater or Limited Resource Water designations.

Recreation uses are defined by the depth of the waterbody and the potential for wading or swimming. Uses are defined for bathing waters, swimming/canoeing (PCR) and wading only (Secondary Contact - generally waters too shallow for swimming or canoeing).

Water supply uses are defined by the actual or potential use of the waterbody. Public Water Supply designations apply near existing water intakes so that waters are safe to drink with standard treatment. Most other waters are designated for AWS and IWS.

## Facility Description

The Tiffin WPCC has an average design flow of 4.0 million gallons per day (MGD). Wet stream processes are screening and grit removal, influent pumping, primary settling, scum removal, conventional activated sludge aeration, phosphorus removal, secondary clarification, disinfection by chlorination, and dechlorination. During wet weather when the capacity of secondary treatment is exceeded, a portion the primary effluent may be routed around the activated sludge tanks and the final clarifiers, to a storm chlorination tank. During the summer season (May 1<sup>st</sup>-October 31<sup>st</sup>), any discharge from the storm chlorination tank is dechlorinated before recombining with fully treated effluent prior to discharge to the river. Solid stream processes include sludge stabilization by anaerobic digestion, sludge holding lagoons where dewatering occurs, and land application of final product as Class B sludge.

The city of Tiffin's sewer system is approximately 60 percent separate sanitary sewers and 40 percent combined sewers. The combined portion of the collection system includes 30 CSOs. The City has developed and submitted an operational plan (approved 1996) and an addendum that outline the procedures it follows to implement the nine minimum control measures for CSOs. In January 2002, the City Council approved a phased plan for separating the combined portion of the system.

The City of Tiffin submitted a CSO LTCP on June 23, 2006. Final revisions were submitted on August 29, 2007. Ohio EPA approved the City's LTCP during the permit modification in August 2008 as plan approval

number 561764 (03-18328). Ohio EPA approved the City's LTCP updated compliance schedule during the permit modification in May 2014.

The City of Tiffin implements an Ohio EPA-approved industrial pretreatment program. A total of 58 industrial users discharge a total flow of approximately 62,700 gallons per day (GPD) to the WPCC. There are five categorical industrial users and two significant non-categorical industrial users.

#### Description of Existing Discharge

Table 1 presents chemical specific data compiled from the 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 2PD00025001. Data are presented for the period January 2009 through December 2013, and current permit limits are provided for comparison.

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

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

The City reports SSO occurrences under Station 300 in its NPDES permit. The City reported two SSOs in July 2012 and 23 SSOs in March 2013. Based on information from the City, all SSOs are caused by blockages and are corrected when they are discovered.

#### Assessment of Impact on Receiving Waters

An assessment of the impact of a permitted point source on the immediate receiving waters includes an evaluation of the available chemical/physical, biological, and habitat data which have been collected by Ohio EPA pursuant to the NPDES Reissuance. Other data may be used provided it was collected in accordance with Ohio EPA methods and protocols as specified by the Ohio WQS and Ohio EPA guidance documents. Other information which may be evaluated includes, but is not limited to: NPDES permittee self-monitoring data; effluent and mixing zone bioassays conducted by Ohio EPA, the permittee, or U.S. EPA.

In evaluating this data, Ohio EPA attempts to link environmental stresses and measured pollutant exposure to the health and diversity of biological communities. Stresses can include pollutant discharges (permitted and unpermitted), land use effects, and habitat modifications. Indicators of exposure to these stresses include whole effluent toxicity tests, fish tissue chemical data, and fish health biomarkers (for example, fish blood tests).

Use attainment is a term which describes the degree to which environmental indicators are either above or below criteria specified by Ohio's WQS (OAC 3745-1). Assessing use attainment status for aquatic life uses primarily relies on the Ohio EPA biological criteria (OAC 3745-1-07; Table 7-15). These criteria apply to rivers and streams outside of mixing zones. Numerical biological criteria are based on measuring several characteristics of the fish and macroinvertebrate communities; these characteristics are combined into multimetric biological indices including the Index of Biotic Integrity (IBI) and modified Index of Well-Being (MIwb), which indicate the response of the fish community, and the Invertebrate Community Index (ICI), which indicates the response of the macroinvertebrate community. Numerical criteria are broken down by ecoregion, use designation, and stream or river size. Ohio has five ecoregions defined by common topography, land use, potential vegetation and soil type.

Three attainment status results are possible at each sampling location -full, partial, or non-attainment. Full attainment means that all of the applicable indices meet the biocriteria. Partial attainment means that one or

more of the applicable indices fails meet the biocriteria. Nonattainment means that either none of the applicable indices meet the biocriteria or one of the organism groups indicates poor or very poor performance. An aquatic life use attainment table (see Table 5) is constructed based on the sampling results and is arranged from upstream to downstream and includes the sampling locations indicated by river mile, the applicable biological indices, the use attainment status (i.e., full, partial, or non), the Qualitative Habitat Evaluation Index (QHEI), and comments and observations for each sampling location.

The results of the most recent Ohio EPA water quality survey of the Sandusky River in the vicinity of Tiffin are included in the report, 2009 *Biological and Water Quality Study of the Lower Sandusky River Watershed* (Ohio EPA; May 12, 2011). The entire report is available at the following Ohio EPA Internet site: [http://www.epa.ohio.gov/portals/35/documents/SanduskyTSD\\_2011.pdf](http://www.epa.ohio.gov/portals/35/documents/SanduskyTSD_2011.pdf)

The complete TMDL report is available at the following Ohio EPA Internet site: <http://www.epa.state.oh.us/dsw/tmdl/SanduskyRiverUpperTMDL.html>.

#### *Ohio Integrated Report*

The 2014 *Ohio Integrated Water Quality Monitoring and Assessment Report* (Ohio EPA) lists the Sandusky River as impaired for aquatic life. Nutrients and organic enrichment/dissolved oxygen are listed as “high magnitude” causes, and agriculture are listed among the “high magnitude” sources. Considering the fact that municipal wastewater treatment plants discharge a nutrient load to the river, continued monthly monitoring for nitrate + nitrite and total Kjeldahl nitrogen is proposed to continue based on best technical judgment. Monitoring for phosphorus and nitrate + nitrite at the upstream and downstream stations also is proposed. The purpose of the monitoring is to maintain a nutrient data set for use in the future water quality studies.

#### 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 Tiffin WPCC were used to determine what parameters should undergo WLA. The parameters discharged are identified by the data available to Ohio EPA - DMR data submitted by the permittee, compliance sampling data collected by Ohio EPA, and any other data submitted by the permittee, such as priority pollutant scans required by the NPDES application or by pretreatment, or other special conditions in the NPDES permit. The sources of effluent data used in this evaluation are as follows:

Self-monitoring data (DMR)	January 2009 through December 2013
Pretreatment data	2009 through 2013
Ohio EPA compliance sampling data	2012

The data were examined, and the following values were removed from the evaluation to give a more reliable PEQ: one low total filterable residue value of 202 mg/L (March 26, 2012) and four phosphorus values of 0.06 mg/L (July 22, 2013), 0.08 mg/L (February 1, 2012), 1.21 mg/L (August 28, 2010) and 1.27 mg/L (September 2, 2013).

This data is evaluated statistically, and PEQ values are calculated for each pollutant. Average PEQ (PEQ<sub>avg</sub>) values represent the 95<sup>th</sup> percentile of monthly average data, and maximum PEQ (PEQ<sub>max</sub>) values represent the 95<sup>th</sup> 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<sub>avg</sub> or PEQ<sub>max</sub> 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 9 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 7, and allocations cannot exceed the Inside Mixing Zone Maximum (IMZM) criteria.

The data used in the WLA are listed in Tables 6 and 7. The WLA results to maintain all applicable criteria are presented in Table 5. The current ammonia limits have been evaluated using the WLA procedures and are protective of WQS for ammonia toxicity.

*Whole Effluent Toxicity WLA*

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

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

The WLA calculations for WET are similar to those for aquatic life criteria - using the chronic toxicity unit (TU<sub>c</sub>) and 7Q10 flow for the average and the acute toxicity unit (TU<sub>a</sub>) and 1Q10 flow for the maximum. These values are the levels of effluent toxicity that should not cause instream toxicity during critical low-flow conditions. For the Tiffin WPCC, the WLA values are 0.7 TU<sub>a</sub> and 2.69 TU<sub>c</sub>.

The chronic toxicity unit (TU<sub>c</sub>) 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<sub>25</sub>):

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

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.

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

Dilution Ratio (downstream flow to discharger flow)	Allowable Effluent Toxicity (percent effects in 100% effluent)
up to 2 to 1	30
greater than 2 to 1 but less than 2.7 to 1	40
2.7 to 1 to 3.3 to 1	50

The acute WLA for Tiffin WPCC is 40 percent mortality in 100 percent effluent based on the dilution ratio of 2.4 to 1. This ratio calculation is based on design effluent flow of 6.188 cfs plus the 1Q10 flow of 8.86 cfs over 6.188 cfs.

#### 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 8. 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 9.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 10 presents the final effluent limits and monitoring requirements proposed for Tiffin WPCC outfall 2PD00025001 and the basis for their recommendation. Unless otherwise indicated, the monitoring frequencies proposed in the permit are continued from the existing permit.

#### *Mercury*

The Ohio EPA risk assessment (Table 9) places Mercury in group 5. This placement as well as the data in Tables 2 and 3 indicate that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality. For these parameters, the PEQ is greater than 100 percent of the WLA and certain conditions exist that increase the risk to the environment. Pollutants that meet this requirement must have permit limits under OAC 3745-33-07(A)(1).

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.

#### *Renewal of Mercury Variance*

The Tiffin WPCC permit was renewed in June 28, 2010 to include a mercury variance, and variance-based limits for mercury. Based on the monitoring results from January 2009 through December 2013, and the new application information, the Tiffin WPCC has determined that the facility will not meet the 30-day average permit limit of 1.3 ng/L. However, the effluent data shows that the permittee can meet the mercury annual average value of 12 ng/L. The permittee's application has also demonstrated to the satisfaction of Ohio EPA that there is no readily apparent means of complying with the WQBEL without constructing prohibitively expensive end-of-pipe controls for mercury. Based upon these demonstrations, the Tiffin WPCC is eligible for the mercury variance under OAC 3745-33-07(D)(10)(a).

The Tiffin WPCC submitted information supporting the renewal of the variance. The permittee found sources of mercury from dental offices and small industries and will work with these entities to reduce the amount of mercury being discharged. The calculation of the PEQavg value from 2009 to 2013 compared to the PEQavg. (3.2 ng/L) calculated at the time the original variance was issued shows an increase from 2.7 ng/l to 4.6 ng/L. The PMP schedule developed from the original variance continues to be implemented, and reductions in mercury may be possible.

#### *Copper, Free Cyanide and Bis(2-ethylhexyl)phthalate*

Ohio EPA risk assessment (Table 9) places copper, free Cyanide and bis(2-ethylhexyl)phthalate in group 4. This placement as well as the data in Tables 2 and 3 supports that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring for Group 4 pollutants (where PEQ exceeds 50 percent of the WLA) is required by OAC Rule 3745-33-07(A)(2). Bis(2-ethylhexyl)phthalate had its monitoring reduced because of the large amount of non-detectable data.

#### *Total Filterable Residue*

Ohio EPA risk assessment (Table 9) places total filterable residue in group 3. This placement as well as the data in Tables 2 and 3 supports that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring at the current frequency is proposed to document that these pollutants continue to remain at low levels.

#### *Barium, Strontium, and Iron*

Ohio EPA risk assessment (Table 9) places barium, strontium, and iron in group 3. This placement as well as the data in Tables 2 and 3 supports that these parameters do not have the reasonable potential to contribute to WQS exceedances, limits and monitoring is not necessary to protect water quality.

#### *Arsenic, Chloroform, Selenium, Molybdenum, Silver and Tetrachloroethylene*

Ohio EPA risk assessment (Table 9) places arsenic, chloroform, selenium, silver, molybdenum, and tetrachloroethylene in group 2. This placement as well as the data in Tables 2 and 3 supports that these parameters do not have the reasonable potential to contribute to WQS exceedances, limits and monitoring is not necessary to protect water quality.

#### *Lead, Nitrate+Nitrite, Cadmium, Chromium, Chlorine, Dissolved Hexavalent Chromium, Nickel, and Zinc*

Ohio EPA risk assessment (Table 9) places lead, nitrate+nitrite, cadmium, chromium, chlorine, dissolved hexavalent chromium, nickel, and zinc in group 2. This placement as well as the data in Tables 2 and 3 supports that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring at the current frequency is proposed to document that these pollutants continue to remain at low levels.

#### *Dissolved Oxygen, Total Suspended Solids, Ammonia-Nitrogen and CBOD<sub>5</sub>*

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

#### *Escherichia coli, Oil & Grease and pH*

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

#### *Total Residual Chlorine*

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 2PD00025001 is less than the quantification level of 0.050 mg/l. However, a pollutant minimization program is not required because the dosing rate of dechlorination chemicals ensures that the WQBEL is being met.

#### *Total Phosphorus*

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

#### *Dissolved Orthophosphate*

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

#### *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 under the provisions of 40 CFR Part 132, Appendix F, Procedure 6 does not show reasonable potential 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.

#### *Sludge*

Limits and monitoring requirements proposed for the disposal of sewage sludge by the following management practices are based on OAC 3745-40: land application, removal to sanitary landfill or transfer to another facility with an NPDES permit.

#### *Additional Monitoring*

Additional monitoring requirements proposed at the final effluent, influent and upstream/downstream stations are included for all facilities in Ohio and vary according to the type and size of the discharge. In addition to permit compliance, this data is used to assist in the evaluation of effluent quality and treatment plant performance and for designing plant improvements and conducting future stream studies.

#### Other Requirements

#### *CSO Long-Term Control Plan Implementation Schedule*

Tiffin submitted a CSO LTCP in June 2006. This submittal was a requirement of Ohio NPDES permit number 2PD00025. The City submitted final revisions to the plan on August 29, 2007. During NPDES modification in 2008, the Director approved Tiffin's long-term control plan as plan approval number 561764 (03-18328). Actions from the referenced LTCP are hereby suspended in lieu of the actions for I/I investigation work, submitting a revised CSO LTCP, and constructing a downtown relief sewer. The City of Tiffin shall achieve no more than four (4) combined sewer overflow events per typical year no later than December 31, 2027.

#### *Pretreatment Compliance Schedule*

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

#### *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 Tiffin WPCC to have a Class III wastewater treatment plant operator in charge of the sewage treatment plant operations discharging through outfall 001.

#### *Operator of Record*

In December 2006, OAC rule revisions became effective that affect the requirements for certified operators for sewage collection systems and treatment works regulated under NPDES permits. Part II, Item A of this NPDES permit is included to implement rule 3745-7-02 of the OAC. It requires the permittee to designate one or more operator of record to oversee the technical operation of the treatment works.

#### *Low-Level Free Cyanide Testing*

Currently there are two approved methods for free cyanide listed in 40 CFR 136.3 that have quantification levels lower than any WQBELs:

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

These methods will allow Ohio EPA make more reliable water quality-related decisions regarding free cyanide. Because the quantification levels are lower than any WQBELs, it will also be possible to directly evaluate compliance with free cyanide limits.

New NPDES permits no longer authorize the use of method 4500 CN-I from Standard Methods for free cyanide testing. The new permits require permittees to begin using one of these approved methods as soon as possible. If a permittee must use method 4500 CN-I during the transition to an approved method, they are instructed to report the results on their DMR and enter "Method 4500 CN-I" in the remarks section.

#### *Storm Water Compliance*

In order to comply with industrial storm water regulations, the permittee submitted a form for "No Exposure Certification" which was issued on July 29th, 2010. Compliance with the industrial storm water regulations must

be re-affirmed every five years. Before July 29th, 2015, the permittee must submit a new form for "No Exposure Certification" or make other provisions to comply with the industrial storm water regulations.

*Phosphorus Optimization*

The permittee shall prepare and submit a Phosphorus Discharge Optimization Evaluation plan to Ohio EPA Northwest District Office. The plan shall be completed and submitted to Ohio EPA no later than 18 months from the effective date of this permit. Details are in Part I.C of the permit.

*Outfall Signage*

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



**Figure 1. Approximate location of the Tiffin Water Pollution Control Center.**

Upstream sampling is collected from Huss Street Bridge. Downstream sampling is collected at County Road 38 Bridge.

**Table 1. Effluent Characterization Using Ohio EPA and Pretreatment Data**

Summary of analytical results for Tiffin outfall 2PD00025001. Units µg/L unless otherwise noted.

<b>Parameter</b>	<b>OEPA 9/24/2012</b>	<b>PT 8/6/2012</b>	<b>PT 9/19/2011</b>	<b>PT 8/24/2010</b>	<b>PT 8/12/2009</b>
Arsenic	ND(2.0)	ND(5.0)	ND(3.0)	ND(8.0)	ND(8.0)
Barium	24	NA	NA	NA	NA
Bis(2-ethylhexyl) Phthalate	ND(10.6)	ND(5.0)	ND(10)	ND(5.0)	ND(5.0)
Bromodichloromethane	NA	ND(5.0)	ND(5.0)	1.2	1.0
Cadmium	ND(0.2)	ND(3.0)	ND(0.5)	ND(1.0)	ND(1.0)
Chloride (mg/L)	145	NA	NA	NA	NA
Chloroform	2.28	ND(5.0)	ND(5.0)	3.3	3.3
Chromium	2.0	ND(7.0)	ND(10)	ND(4.0)	ND(4.0)
Copper	7.0	ND(8.0)	ND(10)	4.0	ND(4.0)
Cyanide, Free (mg/L)	0.005	NA	NA	NA	NA
Total Filterable Residue (mg/L)	740	NA	NA	NA	NA
Iron	606	NA	NA	NA	NA
Lead	ND(2.0)	ND(10)	ND(2.0)	ND(5.0)	ND(5.0)
Nickel	4.6	ND(8.0)	ND(10)	ND(4.0)	ND(4.0)
Nitrate+Nitrite	18.6	NA	NA	NA	NA
Phosphorus (mg/L)	0.81	NA	NA	NA	NA
Selenium	ND(2.0)	ND(4.0)	ND(3.0)	ND(8.0)	ND(8.0)
Silver	NA	ND(5.0)	ND(5.0)	ND(4.0)	ND(4.0)
Strontium	6530	NA	NA	NA	NA
Tetrachloroethylene	NA	ND(5.0)	ND(5.0)	ND(1.0)	4.0
Total Kjeldahl Nitrogen (mg/L)	1.96	NA	NA	NA	NA
Zinc	ND(10)	15	ND(10)	16	18

OEPA = data from analyses by Ohio EPA

PT = data from pretreatment program reports

NA = not analyzed

ND = not detected (detection limit)

**Table 2. Effluent Characterization Using Self-Monitoring Data**

Summary of current permit limits and unaltered discharge monitoring report for Tiffin outfall 2PD00025001 (January 2009 - December 2013). All values are based on annual records unless otherwise indicated.

Parameter	Season	Units	Current Permit Limits			Percentiles		Data Range
			30 day	Daily	# Obs.	50 <sup>th</sup>	95 <sup>th</sup>	
Water Temperature	Annual	°C	--	Monitor	1857	15.8	22.6	7.3-24.6
Dissolved Oxygen	Summer	mg/L	--	5.0 min	920	6.56	8.17**	5.01-9.3
Dissolved Oxygen	Winter	mg/L	--	5.0 min	937	7.18	9.5**	4.74-70
Total Filterable Residue	Annual	mg/L	Monitor	--	61	651	1010	202-1100
Total Suspended Solids	Annual	mg/L	30	45 <sup>a</sup>	742	5	15	0-38
Total Suspended Solids	Annual	kg/day	455	682 <sup>a</sup>	742	5	15	0-38
Oil and Grease	Annual	mg/L	10 max	--	42	0	0	0-12
Ammonia	Summer	mg/L	1.5	2.2 <sup>a</sup>	363	0.125	0.584	0-4.96
Ammonia	Summer	kg/day	23	33 <sup>a</sup>	363	0.125	0.584	0-4.96
Ammonia	Winter	mg/L	12.9	19.4 <sup>a</sup>	375	0.504	5.17	0-17.7
Ammonia	Winter	kg/day	195	294 <sup>a</sup>	375	0.504	5.17	0-17.7
Nitrate + Nitrite	Annual	mg/L	Monitor	--	61	14.4	24	6.74-29
Phosphorus	Annual	mg/L	1.0	1.5 <sup>a</sup>	242	0.64	0.92	0.06-1.27
Phosphorus	Annual	kg/day	15.0	23 <sup>a</sup>	242	0.64	0.92	0.06-1.27
Cyanide, Free	Annual	mg/L	Monitor	--	48	0	0.00665	0-0.011
Nickel	Annual	µg/L	Monitor	--	20	0	0	0-0
Strontium	Annual	µg/L	--	--	6	5840	8840	4250-9170
Zinc	Annual	µg/L	Monitor	--	20	19.5	37.2	11-59
Cadmium	Annual	µg/L	Monitor	--	20	0	0	0-0
Lead	Annual	µg/L	Monitor	--	20	0	0	0-0
Chromium	Annual	µg/L	Monitor	--	20	0	0.2	0-4
Copper	Annual	µg/L	Monitor	--	33	0	21.4	0-43
Chromium, Dissolved Hexavalent	Annual	µg/L #/100	Monitor	--	20	0	0	0-0
Fecal Coliform	Annual	mL #/100	--	--	111	156	664	0-1220
E. coli	Annual	mL	126	284 <sup>a</sup>	251	70	227	0-480

**Table 2. (Continued)**

Parameter	Season	Units	Current Permit Limits			Percentiles		Data Range
			30 day	Daily	# Obs.	50 <sup>th</sup>	95 <sup>th</sup>	
Bis(2-ethylhexyl) Phthalate	Annual	µg/L	Monitor	--	42	0	0	0-8.4
Flow Rate	Summer	MGD	Monitor	--	920	3.64	5.69	1.91-7.19
Flow Rate	Winter	MGD	Monitor	--	937	4.07	5.36	1.78-6.22
Flow Rate	Annual	MGD	Monitor	--	1857	3.89	5.47	1.78-7.19
Chlorine, Total Residual	Annual	mg/L	--	0.038 1700	920	0	0	0-0
Mercury	Annual	ng/L	3.2	max	70	1.61	6.19	0-24.9
Mercury	Annual	kg/day	0.00005	0.0258	70	1.61	6.19	0-24.9
pH, Maximum	Annual	S.U.	--	9.0	1857	7.45	7.74	7.04-10.6
pH, Minimum	Annual	S.U.	--	6.5	1857	7.34*	7.66	5.45-9.45
CBOD 5 day	Annual	mg/L	25	40 <sup>a</sup>	362	3.09	6.16	0-19.6
CBOD 5 day	Annual	kg/day	379	606 <sup>a</sup>	376	3.62	8.97	0-22.3

\* = 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

CBOD = Carbonaceous biochemical oxygen demand

S.U. = Standard units

**Table 3. Projected Effluent Quality Values**

<b>Parameter</b>	<b>Units</b>	<b>Number of Samples</b>	<b>Number &gt; MDL</b>	<b>PEQ Average</b>	<b>PEQ Maximum</b>
Ammonia (Summer)	mg/L	244	205	0.2869	0.60744
Ammonia (Winter)	mg/L	195	186	5.5201	10.402
Arsenic	µg/L	5	0	--	--
Barium	µg/L	1	1	108.624	148.8
Bis(2-ethylhexyl)phthalate	µg/L	34	2	7.3584	10.08
Bromochloromethane	µg/L	2	2	3.3288	4.56
Cadmium	µg/L	26	0	--	--
Chlorine, Total Residual	mg/L	920	0	--	--
Chloroform	µg/L	3	3	7.227	9.9
Chromium	µg/L	11	2	4.964	6.8
Chromium, Dissolved Hexavalent	µg/L	20	0	--	--
Copper	µg/L	36	18	22.176	35.313
Cyanide, Free	mg/L	49	6	0.005608	0.009032
Total Filterable Residue	mg/L	61	61	838.95	1013.4
Iron	µg/L	1	1	2742.756	3757.2
Lead	µg/L	24	0	--	--
Mercury	ng/L	74	66	4.6263	7.2313
Molybdenum	µg/L	--	0	--	--
Nickel	µg/L	11	1	5.7086	7.82
Nitrate + Nitrite	mg/L	62	62	21.165	27.985
Phosphorus	mg/L	239	239	0.85373	1.1018
Selenium	µg/L	5	0	--	--
Silver	µg/L	4	0	--	--
Strontium	µg/L	7	7	13388.2	18340
Tetrachloroethylene	µg/L	4	1	7.592	10.4
Total Kjeldahl Nitrogen	mg/L	1	1	8.87096	12.152
Zinc	µg/L	23	21	31.9	47.151

PEQ = Projected Effluent Quality

MDL = Method Detection Limit

**Table 4. Summary of Acute and Chronic Toxicity Test Results**

Discharge Monitoring Report Data from Station 2PD00025001				
<i>Ceriodaphnia Dubia</i>			<i>Pimephales promelas</i>	
Date	Acute Toxicity (TU <sub>a</sub> )	Chronic Toxicity (TU <sub>c</sub> )	Acute Toxicity (TU <sub>a</sub> )	Chronic Toxicity (TU <sub>c</sub> )
8/15/2011	AA	AA	AA	AA
7/16/2012	AA	AA	AA	AA
5/22/2013	AA	AA	AA	AA

Ohio EPA Bioassay Data																
<i>Ceriodaphnia dubia</i>									<i>Pimephales promelas</i>							
Collection Date	24 Hours				48 Hours				24 Hours				48 Hours			
	UP	C	%M	TU <sub>a</sub>	UP	C	%M	TU <sub>a</sub>	UP	C	%M	TU <sub>a</sub>	UP	C	%M	TU <sub>a</sub>
9/25/2012	0	0	0	ND	0	0	0	ND	0	0	0	ND	0	0	0	ND
9/26/2012	0	10	0	ND	0	0	0	ND	0	0	0	ND	0	0	0	ND
9/25/12-9/26/12 <sup>a</sup>	0	0	0	ND	0	0	0	ND	0	0	0	ND	0	0	0	ND

TU<sub>c</sub> = chronic toxicity units

AA = below detection limit (0.2 TU<sub>a</sub>, 1.0 TU<sub>c</sub>)

a = 24-hour composite sample

C = laboratory control water

%M = percent mortality in 100% effluent

ND = not determined

TU<sub>a</sub> = acute toxicity units

UP = percent mortality in upstream control water

**Table 5. Biological Survey Results and Biocriteria**

Aquatic life use attainment status for stations sampled in the Sandusky River, 2009.

The Index of Biotic Integrity (IBI), Modified Index of well being (MIwb), and Invertebrate Community Index (ICI) are scores based on the performance of the biological community.

The Lower Sandusky River watershed is located in the Eastern Corn Belt Plain and Huron-Erie Lake Plain ecoregions.

River Mile <sup>a</sup>	IBI	MIwb <sup>c</sup>	ICI <sup>d</sup>	Stream Habitat	Attainment Status <sup>b</sup>	Causes of Impairment	Sources of Impairment
65.01	53	9.4	52	81.5	Full		
52.58	44	8.7	48	60.5	Full		
47.75	52	10.0	48	86.5	Full		
42.92	43	7.7	8	45.5	Full		
41.84	53	9.9	38	83.0	Full		
38.90	52	10.7	42	82.5	Full		
38.50			36		(Full)		
31.95	51	9.6	E	69.0	Full		
26.94	39 <sup>ns</sup>	9	<u>10</u> *	65.0	Non	Sedimentation/Siltation	Crop Production with Subsurface Drainage
23.00	55	10.2	52	83.5	Full		
21.30	54	9.7	58	76.0	Full		
19.00	44	8.0*		59.0	Partial	Sedimentation/Siltation Direct Habitat Alterations	Dam or Impoundment
18.05	35 <sup>ns</sup>	7.2*	<u>P</u> *	52.0	Non	Sedimentation/Siltation Direct Habitat Alterations	Dam or Impoundment
17.70	41	9.9	34	93.0	Full		
15.40	38	9.7	G	67.0	Full		
12.96	<u>26</u>	9.2		67.0	Non	Sedimentation/Siltation Nutrient/Eutrophication Biological Indicators	Municipal Point Source Discharges Crop Production with Subsurface Drainage
4.70	32	8.7	<u>14</u>	60.0	Non	Nutrient/Eutrophication Biological Indicators Sedimentation/Siltation Particle distribution (Embeddedness)	Crop Production with Subsurface Drainage
1.00	31	7.5		64.5	Non	Sedimentation/Siltation Particle distribution (Embeddedness)	Crop Production with Subsurface Drainage

**Table 5. (Continued)**

Index - Site Type	Biological Criteria					
	Huron Erie Lake Plain			Eastern Corn Belt Plain		
	EWH	WWH	MWH (Channelized)	EWH	WWH	MWH (Channelized)
IBI - Headwaters	50	28	20	50	40	24
IBI - Wading	50	32	22	50	40	24
IBI - Boat	48	34	20	48	42	24
MIwb - Wading	9.4	7.3	5.6	9.4	8.3	6.2
MIwb - Boat	9.6	8.6	5.7	9.6	8.5	5.8
ICI	46	34	22	46	36	22

a - River Mile (RM) represents the Point of Record (POR) for the station, not the actual sampling RM.

b - Attainment is given for the proposed status when a change is recommended

c - MIwb is not applicable to headwater streams with drainage areas < 20 mi<sup>2</sup>.

d - A narrative evaluation of the qualitative sample based on attributes such as EPT taxa richness, number of sensitive taxa, and community composition was used when quantitative data was not available or considered unreliable. VP=Very Poor, P=Poor, LF=Low Fair, F=Fair, MG=Marginally Good, G=Good, VG=Very Good, E=Exceptional

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

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

Underlined scores are in the Poor or Very Poor range

EWH = Exceptional Warmwater Habitat

MWH = Modified Warmwater Habitat

WWH = Warmwater Habitat

**Table 6. Water Quality Criteria in the Study Area**

Parameter	Units	Outside Mixing Zone Criteria					Maximum Aquatic Life	Inside Mixing Zone Maximum
		Average						
		Wildlife	Human Health	Agri-culture	Aquatic Life			
Ammonia (Summer)	mg/L	--	--	--	0.6	--	--	
Ammonia (Winter)	mg/L	--	--	--	2.2	--	--	
Arsenic	µg/L	--	580	100	150	340	680	
Barium	µg/L	--	160000	--	220	2000	4000	
Bis(2-ethylhexyl)phthalate	µg/L	--	32c	--	8.4	1100	2100	
Bromochloromethane	µg/L	--	--	--	--	--	--	
Cadmium	µg/L	--	730	50	5.8	15	31	
Chlorine, Total Residual	mg/L	--	--	--	0.011	0.019	0.038	
Chloroform	µg/L	--	1700c	--	140	1300	2600	
Chromium	µg/L	--	14000	100	210	4400	8800	
Chromium, Dissolved Hexavalent	µg/L	--	14000	--	11	16	31	
Copper	µg/L	--	64000	500	24	39	78	
Cyanide, Free	mg/L	--	48	--	0.0052	0.022	0.044	
Total Filterable Residue	mg/L	--	--	--	1500	--	--	
Iron	µg/L	--	--	5000	--	--	--	
Lead	µg/L	--	--	100	26	490	980	
Mercury	ng/L	1.3	3.1	10000	910	1700	3400	
Molybdenum	µg/L	--	10000	--	20000	190000	370000	
Nickel	µg/L	--	43000	200	130	1200	2400	
Nitrate + Nitrite	mg/L	--	--	100	--	--	--	
Phosphorus	mg/L	--	--	--	--	--	--	
Selenium	µg/L	--	3100	50	5	--	--	
Silver	µg/L	--	11000	--	1.3	10	21	
Strontium	µg/L	--	1400000	--	21000	40000	81000	
Tetrachloroethylene	µg/L	--	1800	--	53	430	850	
Total Kjeldahl Nitrogen	mg/L	--	--	--	--	--	--	
Zinc	µg/L	--	35000	25000	300	300	600	

c = carcinogen

**Table 7. Instream Conditions and Discharger Flow**

<b>Parameter</b>	<b>Units</b>	<b>Season</b>	<b>Value</b>	<b>Basis</b>
<i>Stream Flows</i>				
1Q10	cfs	annual	8.86	USGS gage #04198000, 1923-2003 data
7Q10	cfs	annual	10.47	USGS gage #04198000, 1923-2003 data
7Q10	cfs	summer	0	
7Q10	cfs	winter	0	
30Q10	cfs	summer	15.31	USGS gage #04198000, 1923-2003 data
30Q10	cfs	winter	47.54	USGS gage #04198000, 1923-2003 data
90Q10	cfs	annual	23.37	
Harmonic Mean	cfs	annual	85.41	USGS gage #04198000, 1923-2003 data
Mixing Assumption	%	average	25	
Mixing Assumption	%	maximum	100	
<i>Hardness</i>	mg/L	annual	297	eDMR 901 data 2009-2014 n=61
<i>pH</i>	S.U.	summer	8.25	eDMR 901 data 2009-2014 n=20
<i>pH</i>	S.U.	winter	8.215	eDMR 901 data 2009-2014 n=16
<i>Temperature</i>	°C	summer	23.8	eDMR 901 data 2009-2014 n=20
<i>Temperature</i>	°C	winter	4.24	eDMR 901 data 2009-2014 n=16
<i>Tiffin WPCC flow</i>	cfs	annual	6.188	Permit Renewal Application

**Table 7. (Continued)**

<b>Parameter</b>	<b>Units</b>	<b>Season</b>	<b>Value</b>	<b>Basis</b>
<i>Background Water Quality</i>				
Ammonia	mg/L	summer	0.0365	eDMR; 2009-2014; n=20; 8<MDL; Median Value from 801 station
Ammonia	mg/L	winter	0.108	eDMR; 2009-2014; n=15; 0<MDL; Median Value from 801 station
Arsenic	µg/L	--	2.2	STORET; 2001; n=5; 2<MDL; Mean value from Station 500920
Barium	µg/L	--	68.4	STORET; 2001; n=5; 0<MDL; Mean value from Station 500920
Bis(2-ethylhexyl)phthalate	µg/L	--	--	No representative data available.
Bromochloromethane	µg/L	--	--	No representative data available.
Cadmium	µg/L	--	0	STORET; 2001; n=5; 5<MDL; Mean value from Station 500920
Chlorine, Total Residual	mg/L	--	--	No representative data available.
Chloroform	µg/L	--	--	No representative data available.
Chromium	µg/L	--	0	STORET; 2001; n=5; 0<MDL; Non-detect from Station 500920
Chromium, Dissolved Hexavalent	µg/L	--	--	No representative data available.
Copper	µg/L	--	0	STORET; 2001; n=5; 5<MDL; Non-detect from Station 500920
Cyanide, Free	mg/L	--	--	No representative data available.
Total Filterable Residue	mg/L	--	527	STORET; 2001; n=5; 0<MDL; Mean value from Station 500920

**Table 7. (Continued)**

<b>Parameter</b>	<b>Units</b>	<b>Season</b>	<b>Value</b>	<b>Basis</b>
<i>Background Water Quality</i>				
Iron	µg/L	--	605	STORET; 2001; n=5; 0<MDL; Mean value from Station 500920
Lead	µg/L	--	0	STORET; 2001; n=5; 5<MDL; Non-detect from Station 500920
Mercury	ng/L	--	--	No representative data available.
Molybdenum	µg/L	--	--	No representative data available.
Nickel	µg/L	--	0	STORET; 2001; n=5; 5<MDL; Non-detect from Station 500920
Nitrate + Nitrite	mg/L	--	2.56	STORET; 2001; n=5; 1<MDL; Mean value from Station 500920
Phosphorus	mg/L	--	0.074	STORET; 2001; n=5; 1<MDL; Mean value from Station 500920
Selenium	µg/L	--	0	STORET; 2001; n=5; 5<MDL; Non-detect from Station 500920
Silver	µg/L	--	--	No representative data available.
Strontium	µg/L	--	3118	STORET; 2001; n=5; 0<MDL; Mean value from Station 500920
Tetrachloroethylene	µg/L	--	--	No representative data available.
Total Kjeldahl Nitrogen	mg/L	--	0.708	STORET; 2001; n=5; 0<MDL; Mean value from Station 500920
Zinc	µg/L	--	6.8	STORET; 2001; n=5; 4<MDL; Mean value from Station 500920

WPCC = Water Pollution Control Center

eDMR = Electronic Discharge Monitoring Report

USGS = United States Geological Survey

STORET = United States Environmental Protection Agency STORage and RETrieval Data Warehouse

n = Number of samples

MDL = Method Detection Limit

cfs = cubic feet per second

S.U. = Standard units

**Table 8. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria**

Parameter	Units	Outside Mixing Zone Criteria					Maximum Aquatic Life	Inside Mixing Zone Maximum
		Average						
		Wildlife	Human Health	Agri-culture	Aquatic Life			
Ammonia (Summer)	mg/L	--	--	--	--	--	--	
Ammonia (Winter)	mg/L	--	--	--	--	--	--	
Arsenic	µg/L	--	2574	437	213	824	680	
Barium	µg/L	--	711865	--	284	4766	4000	
Bis(2-ethylhexyl)phthalate	µg/L	--	142	--	12	2675	2100	
Bromochloromethane	µg/L	--	--	--	--	--	--	
Cadmium	µg/L	--	3249	223	8.3	36	31	
Chlorine, Total Residual	mg/L	--	--	--	0.016	0.046	0.038	
Chloroform	µg/L	--	7566	--	199	3161	2600	
Chromium	µg/L	--	62309	445	299	10700	8800	
Chromium, Dissolved Hexavalent	µg/L	--	62309	--	16	39	31	
Copper	µg/L	--	284840	2225	34	95	78	
Cyanide, Free	mg/L	--	214	--	0.0074	0.053	0.044	
Total Filterable Residue	mg/L	--	--	--	1912	--	--	
Iron	µg/L	--	--	20166	--	--	--	
Lead	µg/L	--	--	445	37	1192	980	
Mercury	ng/L	1.3	3.1	10000	910	1700	3400	
Molybdenum	µg/L	--	44506	--	28460	462043	370000	
Nickel	µg/L	--	191377	890	185	2918	2400	
Nitrate-N + Nitrite-N	mg/L	--	--	436	--	--	--	
Phosphorus	mg/L	--	--	--	--	--	--	
Selenium	µg/L	--	13797	223	7.1	--	--	
Silver	µg/L	--	48957	--	1.8	24	21	
Strontium	µg/L	--	6220123	--	28564	92808	81000	
Tetrachloroethylene	µg/L	--	8011	--	75	1046	850	
Total Kjeldahl Nitrogen	mg/L	--	--	--	--	--	--	
Zinc	µg/L	--	155749	111242	424	720	600	

**Table 9. Parameter Assessment**

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

Bromodichloromethane                      Total Kjeldahl Nitrogen                      Phosphorus

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

Chlorine, Total Residual                      Cadmium                      Arsenic  
Tetrachloroethylene                      Chromium                      Lead  
Chromium, Dissolved  
Hexavalent                      Chloroform                      Nickel  
Nitrate + Nitrite                      Selenium                      Zinc  
Silver                      Molybdenum

*Group 3:* PEQ<sub>max</sub> < 50 percent of maximum PEL and PEQ<sub>avg</sub> < 50 percent of average PEL.  
No limit recommended; monitoring optional.

Total Filterable Residue                      Barium                      Strontium                      Iron

*Group 4:* PEQ<sub>max</sub> >= 50 percent, but < 100 percent of the maximum PEL or  
PEQ<sub>avg</sub> >= 50 percent, but < 100 percent of the average PEL. Monitoring is appropriate.

Bis(2-ethylhexyl)phthalate                      Copper                      Cyanide, Free

*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>
Mercury	ng/L		1.3	1700

PEQ = Projected Effluent Quality

PEL = Projected Effluent Limit

WLA = Wasteload Allocation procedures (OAC 3745-2)

WQS = Ohio Water Quality Standards (OAC 3745-1)

**Table 10. Application of the Loading Test [OAC 3745-2-06(B)(1)(b)]**

Parameter name:	Cyanide, free - PEQaverage = 75.8 % of PELaverage	
Loading capacity	=	WQS * (100% of upstream flow + effluent flow)
	=	.0052 µg/L * ( 10.47 cfs + 6.188 cfs) * 0.0024467 (conversion factor)
	=	.00021193706872 kg/day
Background load	=	(background concentration * 100% of upstream flow)
	=	0 µg/L * 10.47 cfs * 0.0024467 (conversion factor)
	=	0 kg/day
Effluent Load	=	WLA * effluent flow
	=	.0074 µg/L * 6.188 cfs * 0.0024467 (conversion factor)
	=	.00011203732904 kg/day
Total Load	=	Background Load + Effluent Load
	=	0 kg/day & .00011203732904 kg/day
	=	.00011203732904 kg/day
Total Load / Loading Capacity	=	52.86%

\*\*\* Therefore, Cyanide, free remains a Group 4 parameter.

PEQ = Projected Effluent Quality

PEL = Projected Effluent Limit

**Table 11. Final Effluent Limits and Monitoring Requirements**

Parameter	Units	Concentration		Loading (kg/day) <sup>a</sup>		Basis <sup>b</sup>
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Water Temperature	°C	----- Monitor -----				EP, M
Dissolved Oxygen	mg/L	5.0 minimum		--	--	EP, M
Total Suspended Solids	mg/L	30	45 <sup>c</sup>	455	682 <sup>c</sup>	EP, PD
Oil & Grease	mg/L	--	10.0	--	--	WQS, EP
Ammonia (Summer)	mg/L	1.5	2.2 <sup>c</sup>	23.0	33.0 <sup>c</sup>	EP, PD
Ammonia (Winter)	mg/L	12.9	19.4 <sup>c</sup>	195	294 <sup>c</sup>	EP, PD
Nitrate+Nitrite	mg/L	----- Monitor -----				BTJ, EP
Phosphorus	mg/L	1.0	1.5 <sup>c</sup>	15.0	23.0 <sup>c</sup>	EP, PTS
Orthophosphate, Dissolved (as P)	mg/L	----- Monitor -----				SB1
Nickel	µg/L	----- Monitor -----				EP, M
Zinc	µg/L	----- Monitor -----				EP, M
Cadmium	µg/L	----- Monitor -----				EP, M
Lead	µg/L	----- Monitor -----				EP, M
Chromium	µg/L	----- Monitor -----				EP, M
Copper	µg/L	----- Monitor -----				EP, WLA
Hexavalent Chromium (Dissolved)	µg/L	----- Monitor -----				EP, M
<i>E. coli</i>	#/100 mL	126	284	--	--	WQS, EP
Bis (2-ethylhexyl) Phthalate	µg/L	----- Monitor -----				EP, WLA
Flow Rate	MGD	----- Monitor -----				EP, M
Chlorine, Total Residual	mg/L	--	0.038	--	--	EP, M
Mercury	ng/L	3.2	1700	0.00005	0.0258	WLA, VAR
Cyanide, Free	µg/L	----- Monitor -----				EP, WLA

**Table 11. (Continued)**

Parameter	Units	Concentration		Loading (kg/day) <sup>a</sup>		Basis <sup>b</sup>
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Acute Toxicity						
<i>Ceriodaphnia dubia</i>	TU <sub>a</sub>	----- Monitor -----				WET
<i>Pimephales promelas</i>	TU <sub>a</sub>	----- Monitor -----				WET
Chronic Toxicity						
<i>Ceriodaphnia dubia</i>	TU <sub>c</sub>	----- Monitor -----				WET
<i>Pimephales promelas</i>	TU <sub>c</sub>	----- Monitor -----				WET
pH	S.U.	6.5 - 9.0		--	--	WQS, EP
Total Filterable Residue	mg/L	----- Monitor -----				BTJ, EP
CBOD <sub>5</sub>	mg/L	25.0	40.0 <sup>c</sup>	379	606 <sup>c</sup>	EP, PD

a = Effluent loadings based on average design discharge flow of 4.0 MGD.

b = Definitions

BTJ = Best Technical Judgment

EP = Existing Permit

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

WET = Whole Effluent Toxicity (CFR 40 part 132, Great Lakes Initiative procedure 6 and OAC 3745-33-07(B))

WLA = Wasteload Allocation procedures (OAC 3745-2)

WQS = Ohio Water Quality Standards (OAC 3745-1)

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

PD = Plant Design

SB1 = Implementation of Senate Bill 1 [ORC 6111.03]

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

c = Weekly average limit

MGD = Million gallons per day

S.U. = Standard Units

TU<sub>a</sub> = acute toxicity units

TU<sub>c</sub> = chronic toxicity units

CBOD<sub>5</sub> = 5-day carbonaceous biochemical oxygen demand

P = Phosphorus

**Table 12. Phosphorus Loading at Tiffin Water Pollution Control Center**

Year	Median Qeff <sup>a</sup>	Med Peff <sup>b</sup>	Loading
	MGD	mg/L	(kg/day)
2009	3.52	0.64	8.53
2010	3.5	0.685	9.08
2011	3.72	0.46	6.48
2012	3.79	0.66	9.47
2013	3.86	0.695	10.16

MGD = Million gallons per day

a = this flow value shall be the median of the daily effluent flows at station number 2PD00025001 from the previous 5 calendar years (MGD).

b = median daily effluent total phosphorus concentration during previous calendar year (mg/L)