

National Pollutant Discharge Elimination System (NPDES) Permit Program
FACT SHEET

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

Public Notice No.: 14-12-003
Public Notice Date: December 3, 2014
Comment Period Ends: January 3, 2015

Ohio EPA Permit No.: 3PD00024*QD
Application No.: OH0028126

Name and Address of Applicant:

City of Willoughby
One Public Square
Willoughby, Ohio 44094

Name and Address of Facility Where

Discharge Occurs:

Willoughby-Eastlake WPCC
221 Erie Road
Eastlake, Ohio
Lake County

Receiving Water: Lake Erie

Subsequent
Stream Network: Not applicable

Introduction

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

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

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

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

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

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

Summary of Permit Conditions

The effluent limits and monitoring requirements proposed for the following parameters are the same as in the current permit, although some monitoring frequencies have changed: temperature, dissolved oxygen, oil and grease, ammonia-nitrogen, total Kjeldahl nitrogen, nitrite plus nitrate, phosphorus, free cyanide, nickel, zinc, lead, chromium, copper, dissolved hexavalent chromium, flow rate, mercury and pH

Slightly lower loading limits are proposed for total suspended solids (TSS) and 5-day carbonaceous biochemical oxygen demand (CBOD₅) in order to be consistent with accurate loading limit calculations based on a design flow capacity of 9.5 million gallons per day (MGD).

A new weekly limit is proposed for E. coli based on WQS. The monthly limit for E. coli is proposed to continue from the existing permit.

New water-quality-based limits are needed for cadmium because effluent data show the reasonable potential to violate WQS. Limits for cadmium are proposed to become effective thirty-six months after the effective date of the permit.

Current permit limits for chlorine are being removed because effluent data shows that they no longer have the reasonable potential to contribute to exceedances of WQS.

Monthly monitoring of total filterable residue is proposed for the life of the permit. The purpose of the proposed monitoring is to collect additional data on the frequency of occurrence and variability in the plant's effluent.

Annual acute whole effluent toxicity (WET) testing is proposed to continue from the existing permit for *Ceriodaphnia dubia*. Annual chronic WET testing is proposed for both *Ceriodaphnia dubia* and *Pimephales promelas*. A new limit of 1.0 TU_a is proposed for *Pimephales promelas*. A compliance schedule is included in Part I.C of the permit that allows 24 months for a Permit to Install (PTI) application to be submitted if improvements to the WPCC are necessary to meet the 1.0 TU_a limit and 36 months to achieve compliance.

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

A compliance schedule for wet weather improvements is included in Part I.C. This schedule includes the following requirements:

- Within 12 months from the effective date of the permit, the submittal of a PTI application for the 0.8 million gallon (MG) Quentin Road EQ basin;

- Within 18 months from the effective date of the permit, the submittal of a report detailing a WWPC analysis;
- Within 24 months from the effective date of the permit, completion of the 0.8 MG Quentin Road EQ basin construction;
- Within 36 months from the effective date of the permit, the submittal of a PTI application for the Waverly Road relief sewer;
- Within 48 months from the effective date of the permit, completion of the Waverly Road relief sewer; and
- Within 72 months from the effective date of the permit, submittal of an updated project list and implementation schedule that was initially included in the no feasible alternatives analysis submitted to Ohio EPA in March 2011.

In Part II of the permit, special conditions are included that address sanitary sewer overflow (SSO) reporting; operator certification, minimum staffing and operator of record; WET testing; 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 Ashley Ward, (614) 644-4852, Ashley.ward@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 Section 6111.03(J)(3), the Director established these water quality based effluent limits after considering, to the extent consistent with the Federal Water Pollution Control Act, evidence relating to the technical feasibility and economic reasonableness of removing the polluting properties from those wastes and to evidence relating to conditions calculated to result from that action and their relation to benefits to the people of the state and to accomplishment of the purposes of this chapter. This determination was made based on data and

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

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

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

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

Should the applicant determine that compliance with the proposed 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 WQS used to develop the proposed effluent limitation in accordance with the terms and conditions set forth in Ohio Administrative Code (OAC) Rule 3745-33-07(D). The permittee shall submit this application to the above address no later than 30 days after the Public Notice Date.

Alternately, the applicant may propose the development of site-specific WQS pursuant to OAC Rule 3745-1-35. The permittee shall submit written notification regarding their intent to develop site specific 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 Willoughby-Eastlake WPCC discharges to Lake Erie at approximately Lake Mile 1169.39. The approximate location of the facility is shown in Figure 1.

Lake Erie is presently designated for the following uses under Ohio's WQS (OAC 3745-1-31): Exceptional Warmwater Habitat, Superior High Quality water, Agricultural Water Supply, Public Water Supply, Industrial Water Supply, and Bathing Waters.

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 (Primary Contact) 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 agricultural and industrial water supply.

Facility Description

The Willoughby-Eastlake WPCC has a design capacity of 9.5 MGD and the last major upgrade was in August 1987. The treatment process consists of a bar screen, grit removal, primary clarification, aeration, secondary clarification, phosphorus removal using ferrous chloride and polymer addition, chlorination and dechlorination. Biosolids handling at the facility utilizes gravity thickening processes (centrifuge), polymer addition, dewatering through filter press and storage. Currently biosolids are disposed at the French Creek facility (quasar energy group) and prior to September 12, 2012 all biosolids were incinerated on site.

The collection system tributary to the Willoughby-Eastlake WPCC has 100 percent separate sanitary and storm sewers and serves the cities of Willoughby and Eastlake and the villages of Timberlake and Lakeline. The WPCC currently includes a bypass which re-routes a portion of wastewater flow when influent flow rate exceeds 20 MGD. Bypassed flow doesn't receive primary clarification, aeration, final clarification or disinfection. Table 1 shows SSO occurrences and bypass occurrences from January 2010 through July 2014. The cities are working towards eliminating the plant bypass, SSOs and basement flooding through a series of projects that are described in more detail in the proposed compliance schedule.

Table 1. Number of reported Bypasses and Sanitary Sewer Overflows (SSOs).

Year	Number of Bypasses	Number of SSOs
2010	6	1
2011	35	7
2012	11	1
2013	7	5
2014	8	0

The Willoughby-Eastlake WPCC operates an approved pretreatment program that includes 335 industrial users that discharge an average of 1.092 MGD to the WPCC. Currently of those industrial users 8 are categorical significant industrial users and 2 are non-categorical industrial users.

Description of Existing Discharge

Table 2 presents chemical specific data compiled from data reported in annual pretreatment reports.

Table 3 presents a summary of unaltered discharge monitoring report (DMR) data for outfall 3PD00024001. Data are presented for the period August 2009 through July 2014, and current permit limits are provided for comparison.

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

Under the provisions of 40 CFR 122.21(j), the Director has waived the requirement for submittal of expanded effluent testing data as part of the NPDES renewal application. Ohio EPA has access to substantially identical information through the submission of annual pretreatment program reports and/or from effluent testing conducted by the Agency.

Assessment of Impact on Receiving Waters

Information on the Lake Erie Central Basin Shoreline assessment unit is included in the Ohio 2012 *Integrated Water Quality Monitoring and Assessment Report*, Final Report (Ohio EPA Division of Surface Water, May 20, 2012). The assessment indicates 25% of sites are in full attainment, 33.3% are in partial attainment, and 41.7% are in non-attainment of the aquatic life use. The Central Basin is also impaired for recreational use and for fish tissue. Causes of impairment are listed as nutrients, siltation, direct habitat alterations, and exotic species. Major sources of impairment are municipal point sources, combined sewer overflows, non-irrigated crop production, urban runoff/storm sewers, streambank modification/destabilization, and habitat modifications other than hydromodification.

No monitoring of the area has been completed since 2001 and 2002. A total maximum daily load (TMDL) study is scheduled for 2016. The 2014 *Integrated Water Quality Monitoring and Assessment Report* can be found at: <http://epa.ohio.gov/dsw/tmdl/OhioIntegratedReport.aspx>.

Development of Water-Quality-Based Effluent Limits

Determining appropriate effluent concentrations is a multiple-step process in which parameters are identified as likely to be discharged by a facility, evaluated with respect to Ohio water quality criteria, and examined to determine the likelihood that the existing effluent could violate the calculated limits.

Parameter Selection

Effluent data for the Willoughby-Eastlake WPCC were used to determine what parameters should undergo WLA. The parameters discharged are identified by the data available to Ohio EPA - electronic 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 (eDMR)	August 2009 through July 2014
Pretreatment Annual Report data	2010-2013

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

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 8.

WLA 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 for direct discharges to lakes are done using the following equation for average criteria: $WLA = (11 \times \text{Water Quality Criteria}) - (10 \times \text{Background Concentration})$. Allocations for maximum criteria are set equal to the Inside Mixing Zone Maximum values.

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

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

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

The WLA calculations for WET are similar to those for aquatic life criteria - using the chronic toxicity unit (TU_c) and 7Q10 flow for the average and the acute toxicity unit (TU_a) and 1Q10 flow for the maximum. These values are the levels of effluent toxicity that should not cause instream toxicity during

critical low-flow conditions. For Willoughby-Eastlake WPCC, the WLA values are 1.0 TU_a and 11.0 TU_c.

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

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

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

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

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

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

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

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} ÷ PEL_{avg}) X 100, or (PEQ_{max} ÷ PEL_{max}) X 100], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 5.

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 final outfall 001 and the basis for their recommendation.

Cadmium, Copper, Free Cyanide and Mercury

The Ohio EPA risk assessment (Table 5) places cadmium, copper, free cyanide and 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. Pollutants that meet this requirement must have permit limits under OAC 3745-33-07(A)(1).

Dissolved Chromium and Chlorine

Ohio EPA risk assessment (Table 5) places dissolved hexavalent chromium and chlorine in group 4. This placement as well as the data in Tables 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 for Group 4 pollutants (where PEQ exceeds 50 percent of the WLA) is required by OAC Rule 3745-33-07(A)(2).

Chromium, Lead, Nickel and Zinc

Ohio EPA risk assessment (Table 5) places aluminum, chromium, lead, nickel, nitrate plus nitrite and zinc in groups 2 and 3. This placement as well as the data in Tables 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 is proposed to continue from the existing permit for chromium, lead, nickel and zinc to document that these parameters continue to remain at low levels.

Total Filterable Residue

Based on best engineering judgment, monitoring is proposed for total dissolved solids (total filterable residue). No effluent data is available for this parameter, which is an emerging water quality issue for municipal wastewater treatment plants. The purpose of the monitoring is to obtain data on the level and variability of total filterable residue in the final outfall 001 effluent.

TSS and CBOD₅

The limits proposed for TSS and CBOD₅ are proposed to continue from the existing permit and are all based on plant design criteria. These limits are protective of WQS.

Oil & Grease, pH and E. Coli

Limits are proposed for oil and grease, pH, and *Escherichia coli* are based on WQS (OAC 3745-1-07). Bathing Water *E. coli* standards apply to Lake Erie.

Nitrogen, Ammonia

Based on best engineering judgment (BEJ) monitoring is proposed to continue from the existing permit for ammonia. Monitoring is proposed in the winter as well as summer based on toxicity and ammonia data. High ammonia levels are correlated with acute toxicity in *Pimephales promelas*.

Temperature, Dissolved Oxygen, and Flow Rate

Based on BEJ, monitoring is proposed to continue from the existing permit for temperature, dissolved oxygen and flow rate.

Phosphorus

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

Total Kjeldahl Nitrogen and Nitrite plus Nitrate

Nutrients are a source of impairment on the Lake Erie Basin Shoreline. Based on BEJ, monitoring is proposed to continue from the existing permit for total Kjeldahl nitrogen and nitrite plus nitrate.

WET Reasonable Potential

Evaluating the acute toxicity results in Table 4 under the provisions of 40 CFR Part 132, Appendix F, Procedure 6, gives an acute PEQ value of 0.32 TU_a. Reasonable potential for toxicity is demonstrated, since these values exceed the WLA value of 0.3 TU_a. Consistent with Procedure 6 and OAC 3745-33-07(B), a monthly average limit 1.0 TU_a is proposed for *Pimephales promelas*. It is proposed that the final effluent limits for toxicity become effective 36 months from the effective date of the permit. Semi-annual monitoring is proposed as the interim condition.

WET Calculations

$(TU_a \text{ effluent}) * (B) (\text{effluent flow}/Q_{ad} + \text{effluent flow}) > AC$

TU_a effluent: maximum measured acute toxicity of 100 percent effluent pursuant to 40 CFR Part 132 App. F. Section D.1.a. The maximum value reported was TU_a of 1.39 on 7/1/2013;

(B): a multiplying factor taken from Table F6-1;

Effluent Flow: Design discharge from the facility;

Qad: The receiving water available for dilution. This factor was assumed with a dilution ratio of 10:1;

AC: Numeric acute WET criterion.

$(1.39 \text{ TUa}) (2.3)(9.5 \text{ MGD} / 95 \text{ MGD}) = 0.32$

Sludge Limits and Monitoring Requirements

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. Station 3PD00024585 has been removed from the permit because the facility no longer incinerates sludge.

Additional Monitoring

Additional monitoring requirements proposed at the influent station 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

SSO Reporting

Provisions for reporting SSOs are again proposed in this permit. These provisions include: the reporting of system-wide number of SSO occurrences on monthly operating reports; telephone notification of the 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 Willoughby-Eastlake WPCC to have a class IV wastewater treatment plant operator in charge of the sewage treatment plant operations discharging through outfall 001.

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 January 11, 2013 (CGRN00175*EG). This certification will expire in 5 years from the date of issuance. Compliance with the industrial storm water regulations must be designated one or more operator of record to oversee the technical operation of the treatment works and sewerage system.

Outfall Signage

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

Evaluation for Reducing Discharge of Phosphorus

Part II of the permit includes a requirement for the permittee to submit a Phosphorus Discharge Optimization Evaluation plan. The plan shall include an evaluation of collected effluent data, possible source reduction measures, operational improvements, and minor facility modifications that will optimize reductions in phosphorus discharges from the WPCC. The plan shall include a proposed schedule for implementing discharge optimization measures identified through the evaluation process.

Detection Methods

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

Currently there are two approved methods for free cyanide listed in 40 CFR 136.3 that have quantification levels lower than any water quality-based effluent limits:

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

These methods will allow Ohio EPA make more reliable water quality-related decisions regarding free cyanide. Because the quantification levels are lower than any 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.

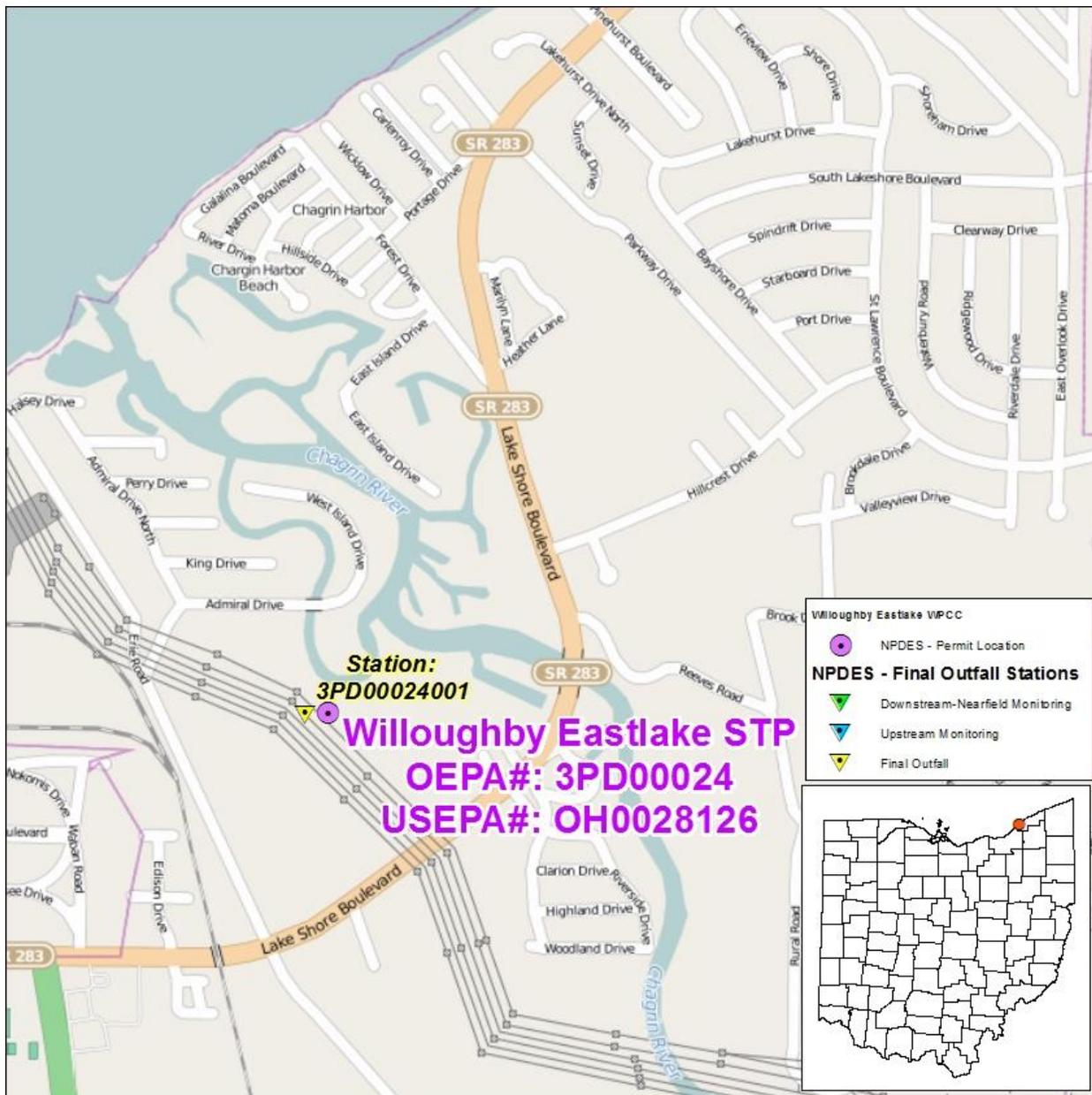


Figure 1. Location of Willoughby-Eastlake WPCC

Table 2. Effluent Characterization Using Pretreatment Annual Report Data.

Parameter (µg/L)	4/14/2010	4/13/2011	3/14/2012	4/16/2013
Cadmium	<1.0	1.10	<1.0	<1.0
Copper	<20	<20	<20	20.3
Lead	<10	<10	<10	21.7
Nickel	<5	9.19	<5	5.31
Zinc	34.1	50.0	36.7	37.2

Table 3. Effluent Characterization Using Self-Monitoring Data.

Summary of current permit limits and unaltered discharge monitoring report data for Willoughby Eastlake Water Pollution Control Center outfall 3PD00024001 (August 2009 – July 2014). All values are based on annual records unless otherwise indicated. * = For minimum pH, 5th percentile shown in place of 50th percentile; ** = For dissolved oxygen, 5th percentile shown in place of 95th percentile; a = weekly average.

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range	Decision Criteria		
			30 day	Daily		50 th	95 th		# Obs.	PEQ _{ave}	PEQ _{max}
Outfall 001											
Water Temperature	Annual	°C	Monitor		1826	18.9	25.9	11.2-28.3			
Dissolved Oxygen	Summer	mg/L	Monitor		920	4.4	6.41	0.2-7.8	610	5.0458	9.5359
Dissolved Oxygen	Winter	mg/L	Monitor		906	5.8	6.9	0.3-7.5	451	6.3976	9.8758
Total Suspended Solids	Annual	mg/L	20	30 ^a	720	9	23	3-100	720	13.687	22.932
Oil and Grease	Annual	mg/L	--	10	120	2.6	4.52	0.8-7	120	3.9893	5.4574
Nitrogen, Ammonia (NH ₃)	Summer	mg/L	Monitor		360	13	23	1.13-27	240	18.707	33.773
Nitrogen Kjeldahl, Total	Annual	mg/L	Monitor		60	14.5	24.9	3.03-29.8	60	23.647	33.791
Nitrite Plus Nitrate, Total	Annual	mg/L	Monitor		60	1.47	8.98	0.3-14.6	60	5.9543	9.4577
Phosphorus, Total (P)	Annual	mg/L	1.5	1.0 ^a	242	0.8	1.2	0.2-1.6	242	1.0209	1.2989
Cyanide, Free	Annual	mg/L	--	0.044	61	0	0.035	0-0.077	61	0.042887	0.062621
Nickel, Total Recoverable	Annual	µg/L	Monitor		60	9	18	0-22	64	15.962	23.149
Zinc, Total Recoverable	Annual	µg/L	Monitor		60	35.5	64.1	13-86	64	56.074	77.122
Cadmium, Total Recoverable	Annual	µg/L	Monitor		60	0	16.1	0-28	64	14.973	23.625
Lead, Total Recoverable	Annual	µg/L	Monitor		60	30	56.1	0-62	64	43.702	59.63
Chromium, Total Recoverable	Annual	µg/L	Monitor		60	0	18	0-32	60	15.43	22.251
Copper, Total Recoverable	Annual	µg/L	Monitor		60	18.5	32.1	3-36	64	29.598	42.041
Chromium, Dissolved Hexavalent	Annual	µg/L	Monitor		60	9	13.1	2-17	60	12.502	17.016
Fecal Coliform	Annual	#/100 mL	200	400 ^a	108	10	81.3	1-352			
<i>E. coli</i>	Annual	#/100 mL	126	--	358	10	122	0-1060			
Flow Rate	Annual	MGD	Monitor		1826	5.55	12.6	3.48-33.1			
Chlorine, Total Residual	Annual	mg/L		0.038	925	0.01	0.03	0-0.32	925	0.017858	0.031661
Mercury, Total (Low Level)	Annual	ng/L	5.1	340	65	1.9	6.19	0-8.76	65	6.5721	10.36
Acute Toxicity, <i>Ceriodaphnia dubia</i>	Annual	TU _a	Monitor		5	0	0.956	0-1.07	5	1.797	2.461
Acute Toxicity, <i>Pimephales promelas</i>	Annual	TU _a	Monitor		6	1.16	1.37	0-1.39	6	2.131	2.919

Table 3. Effluent Characterization Using Self-Monitoring Data - Continued.

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range	Decision Criteria		
			30 day	Daily		50 th	95 th		# Obs.	PEQ _{ave}	PEQ _{max}
pH, Maximum	Annual	S.U.	--	9.0	1824	7.15	7.39	6.62-7.63			
pH, Minimum	Annual	S.U.	6.5 Min	--	1824	7	7.24	6.28-7.54			
CBOD 5 day	Summer	mg/L	15	23 ^a	359	6	12	2-38	239	8.0709	11.836
CBOD 5 day	Winter	mg/L	15	23 ^a	360	9	17.1	3-48	180	12.156	19.076

Definitions: CBOD Carbonaceous biochemical oxygen demand;
 PEQ Projected Effluent Quality.

Table 4. Summary of Acute Toxicity Results.

Date	<i>Ceriodaphnia dubia</i> (TU_a)	<i>Pimephales promelas</i> (TU_a)
7/20/2010	0.5	1.3
7/21/2011	AA	1.14
7/18/2012	1.07	1.17
7/1/2013	AA	1.39
7/29/2013	NT	AA
7/21/2014	AA	AA

Definitions: AA Below detection (0.2 TU_a);
NT Not tested;
TU_a Acute toxicity units.

Table 6. Water Quality Criteria in the Study Area.

Parameter	Units	Outside Mixing Zone Criteria					Maximum Aquatic Life	Inside Mixing Zone Maximum
		Wildlife	Average					
			Human Health	Agri-culture	Aquatic Life			
Cadmium	µg/L	--	730	50	3.2	6.6	13	
Chlorine, Total Residual	mg/L	--	--	--	0.011	0.019	0.038	
Chromium	µg/L	--	14000	100	110	2400	4800	
Chromium VI - Dissolved	µg/L	--	14000	--	11	16	31	
Copper	µg/L	--	64000	500	12	19	38	
Cyanide - free	mg/L	--	48	--	0.0052	0.022	0.044	
Mercury	ng/L	1.3	3.1	10000	910	1700	3400	
Nickel	µg/L	--	43000	200	69	620	1200	
Nitrate-N + Nitrite-N	mg/L	--	--	100	--	--	--	
Zinc	µg/L	--	35000	25000	160	160	320	
Lead	µg/L	--	--	100	9.9	190	380	
Ammonia, summer	mg/L	--	--	--	0.3	--	--	
Aluminum	µg/L	--	4500	--	--	--	--	

Table 7. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
Mixing Assumption	%	average	25	
	%	maximum	100	
Hardness	mg/L	annual	140	STORET
pH	S.U.	summer	8.6	Lake Erie Fairport West Station; 75 th percentile
Temperature	°C	summer	22.8	NOAA 1927-2012; 75 th percentile
Willoughby-Eastlake WPCC flow	cfs	annual	14.7	Design Flow
<i>Background Water Quality</i>				
Cadmium	µg/L		0.25	N=1696; 1365<MDL; BWQR, Statewide statistics.
Chlorine	mg/L		0	No representative data available.
Chromium	µg/L		15	N=1641; 1388<MDL; BWQR, Statewide statistics.
Chromium VI - Dissolved	µg/L		0	No representative data available.
Copper	µg/L		5	N=2867; 1597<MDL; BWQR, Statewide statistics.
Cyanide - free	mg/L		0	No representative data available.
Mercury	ng/L		0	No representative data available.
Nickel	µg/L		20	N=1259; 1105<MDL; BWQR, Statewide statistics.
Nitrate-N + Nitrite-N	mg/L		0.73	N=5852; 515<MDL; BWQR, Statewide statistics.
Phosphorus	mg/L		0.06	N=5820; 1769<MDL; BWQR, Statewide statistics.
Total Kjeldahl Nitrogen	mg/L		0.5	N=5453; 229<MDL; BWQR, Statewide statistics.
Zinc	µg/L		15	N=2284; 1117<MDL; BWQR, Statewide statistics.
Lead	µg/L		2	N=2814; 1458<MDL; BWQR, Statewide statistics.
Ammonia, summer	mg/L		0.05	N=3172; 1307<MDL; BWQR, Statewide statistics.
Aluminum	µg/L		330	No representative data available.

Definitions: BWQR Analysis of Unimpacted Stream Data for the State of Ohio;
 MDL Minimum detection level;
 N Number of samples;
 NOAA National Oceanic and Atmospheric Administration;
 STORET US EPA Storage and Retrieval Data Warehouse.

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

Parameter	Units	Outside Mixing Zone Criteria					Inside Mixing Zone Maximum
		Wildlife	Average			Maximum	
			Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Cadmium	µg/L	--	8028	548	33	--	13
Chlorine, Total Residual	mg/L	--	--	--	0.12	--	0.038
Chromium	µg/L	--	153850	950	1060	--	4800
Chromium VI - Dissolved	µg/L	--	154000	--	121	--	31
Copper	µg/L	--	703950	5450	82	--	38
Cyanide - free	mg/L	--	528	--	0.057	--	0.044
Mercury	ng/L	1.3	3.1	10000	910	--	3400
Nickel	µg/L	--	472800	2000	559	--	1200
Nitrate-N + Nitrite-N	mg/L	--	--	1093	--	--	--
Phosphorus	mg/L	--	--	--	--	--	--
Total Kjeldahl Nitrogen	mg/L	--	--	--	--	--	--
Zinc	µg/L	--	384850	274850	1610	--	320
Lead	µg/L	--	--	1080	89	--	380
Ammonia, Summer	mg/L	--	--	--	--	--	--
Aluminum	µg/L	--	46200	--	--	--	--

Table 9. Final effluent limits and monitoring requirements for Willoughby Eastlake WPCC Outfall 3PD00024001 and the basis for their recommendation.

Parameter	Units	Effluent Limits				Basis
		Concentration		Loading (kg/day)		
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Temperature	°C	Monitor		--	--	M
Dissolved Oxygen	mg/L	Monitor		--	--	M
Total Suspended Solids	mg/L	20	30 ^C	720	1080 ^C	EP/PD
Oil and Grease	mg/L	--	10	--	--	WQS
Nitrogen, Ammonia	mg/L	Monitor		--	--	EP/BEJ
Nitrogen, Kjeldahl	mg/L	Monitor		--	--	EP/BEJ
Nitrite + Nitrate	mg/L	Monitor		--	--	EP/BEJ
Phosphorus	mg/L	1.0	1.5 ^C	36	54 ^C	PT
Nickel	µg/L	Monitor		--	--	BEJ
Zinc	µg/L	Monitor		--	--	BEJ
Cadmium	µg/L	--	13	--	0.468	RP/WLA
Lead	µg/L	Monitor		--	--	BEJ
Chromium	µg/L	Monitor		--	--	BEJ
Copper	µg/L	--	38	--	1.37	RP/WLA
Chromium, Dissolved Hexavalent	µg/L	Monitor		--	--	BEJ
<i>E. coli</i>	#/100 mL	126	284 ^C	--	--	WQS
Flow Rate	MGD	Monitor		--	--	M
Chlorine, Total Residual	µg/L	Monitor		--	--	BEJ
Mercury	ng/L	1.3	340	0.000047	0.0123	RP/WLA
Free Cyanide	µg/L	--	44	--	1.59	RP/WLA
Acute Toxicity, <i>Ceriodaphnia dubia</i>	TU _a	Monitor		--	--	WET
Acute Toxicity, <i>Pimephales promelas</i>	TU _a	--	1.0	--	--	RP
pH	S.U.	6.5 Min	9.0 Max	--	--	WQS
Total Filterable Residue	mg/L	Monitor		--	--	BEJ
CBOD 5 day	mg/L	15	23 ^C	540	828 ^C	EP/PD

^a Effluent loadings based on average design discharge flow of 9.5 million gallons per day.

^b Definitions:

BEJ = Best Engineering Judgment

CBOD = Carbonaceous biochemical oxygen demand

EP = Existing Permit

M = BEJ of permit guidance

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

PD = Plant Design

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

WET = Whole Effluent Toxicity (OAC 3745-33-07(B))
WLA = Wasteload Allocation procedures (OAC 3745-2)
WQS = Ohio Water Quality Standards (OAC 3745-1)

^c 7 day average limit.