

National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio  
for the **Kent Water Reclamation Facility**

Public Notice No.: 15-06-040  
Public Notice Date: June 19, 2015  
Comment Period Ends: July 19, 2015

Ohio EPA Permit No.: 3PD00031\*PD  
Application No.: OH0025917

Name and Address of Applicant:

**City of Kent  
930 Overholt Road  
Kent, Ohio 44240**

Name and Address of Facility Where  
Discharge Occurs:

**Kent Water Reclamation Facility  
641 Middlebury Road  
Kent, Ohio 44240  
Portage County**

Receiving Water: **Cuyahoga River**

Subsequent  
Stream Network: **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.

No antidegradation review was necessary.

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

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

water receiving the discharge, and the concentration of the pollutant upstream. The greater the upstream flow, and the lower the upstream concentration, the greater the assimilative capacity is. Assimilative capacity may represent dilution (as in allocations for metals), or it may also incorporate the break-down of pollutants in the receiving water (as in allocations for oxygen-demanding materials).

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

### Summary of Permit Conditions

The effluent limits and monitoring requirements proposed for the following parameters are the same as in the current permit: flow, temperature, dissolved oxygen, 5-day carbonaceous biochemical oxygen demand (CBOD<sub>5</sub>), ammonia, total phosphorus, nitrite + nitrate, total Kjeldahl nitrogen (TKN), oil and grease, pH, *E. Coli*, bis(2-ethylhexyl)phthalate, chlorine, cadmium, chromium, copper, nickel, and zinc.

The proposed loading limits for total suspended solids are consistent with the existing permit concentration limits for a 5.0 MGD facility.

The Kent WWTP submitted information supporting the renewal of the mercury variance. Current permit limits for mercury are proposed to continue.

Monthly monitoring is proposed for total filterable residue (dissolved solids) in order to obtain data on the level and variability of the pollutant.

Current limits for lead are being removed and monitoring frequency is being reduced because effluent data shows that it no longer has the reasonable potential to contribute to WQS exceedances.

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. Quarterly monitoring for cyanide is being proposed in order to gather low level data for the pollutant.

As Kent WWTP has an approved pretreatment program, quarterly monitoring for hexavalent chromium (VI) is being proposed to document that the pollutant continues to remain at a low level.

In accordance with OAC 3745-33-07 and 40 CFR Part 132, Appendix F, Procedure 6, it has been determined that the effluent from Kent WWTP shows chronic toxicity to *Ceriodaphnia dubia* and *Pimephales promelas*. Quarterly monitoring for toxicity is required to better determine the potential for toxicity. After 27 months, monitoring for toxicity will be reduced to a semi-annual frequency with a trigger to conduct a toxicity reduction evaluation (TRE) as an interim condition. Final limits for acute and chronic toxicity for both species are proposed with semi-annual monitoring. A reopener clause is included that will allow the City to request a permit modification to remove the final toxicity limits and TRE requirements if the results of at least eight tests conducted over two years show there is no reasonable potential for whole effluent toxicity.

In Part II of the permit, special conditions are included that address sanitary sewer overflow reporting; operator certification, minimum staffing and operator of record; whole effluent toxicity 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 Chris Kosto, (614)644-2027, [christopher.kosto@epa.ohio.gov](mailto:christopher.kosto@epa.ohio.gov), or Erm Gomes, (330)963-1196, [erm.gomes@epa.ohio.gov](mailto:erm.gomes@epa.ohio.gov).

## Information Regarding Certain Water Quality Based Effluent Limits

This draft permit may contain proposed water quality based effluent limitations (WQBELs) for parameters that **are not** priority pollutants. (See the following link for a list of the priority pollutants: [http://epa.ohio.gov/portals/35/pretreatment/Pretreatment\\_Program\\_Priority\\_Pollutant\\_Detection\\_Limits.pdf](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 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 Kent Water Reclamation Facility (WWTP) discharges to the Cuyahoga River at River Mile (RM) 53.90. Figure 1 shows the approximate location of the facility.

This segment of the Cuyahoga River is described by Ohio EPA River Code: 19-001, U.S. EPA River Reach #: 04110002-004, County: Portage, Ecoregion: Erie/Ontario Drift and Lake Plain. The Cuyahoga River is designated for the following uses under Ohio's WQS (OAC 3745-1-07): 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 (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 City of Kent WWTP was originally built in 1916. Facility upgrades were implemented in 1953, 1967, 1986, 2004, and 2014. The current average design capacity is 5.0 million gallons per day (MGD) and the peak hydraulic capacity is 15.0 MGD. Wet stream processes include influent bar screening, grit removal, pre-aeration, primary settling, activated sludge, aeration, final settling, chlorination, dechlorination, and post-aeration. Sludge is anaerobically digested in both the primary and secondary digesters and ultimately disposed of at the PPG Lime Lakes Reclamation Project or by land application. Total sewage sludge generated at the facility for the most recent year is 343.45 dry tons.

There are two internal bypasses, one after the bar screen, and one after primary sedimentation. Neither bypass had been used in the year prior to the NPDES renewal application (submitted April 2014).

The Kent WWTP collection system is 100% separate sanitary sewers. The current average infiltration and inflow (I/I) rates are estimated to be 300,000 GPD. The City is targeting the collection area in the vicinity of the Gougler lift station (northeast section of Kent) for I/I reduction.

The Kent WWTP has an approved pretreatment program. There are 2 non-categorical significant industrial users and 1 categorical industrial user.

### Description of Existing Discharge

Table 2 shows the annual effluent flow rates for the Kent WWTP from 2009 through 2013 based upon Discharge Monitoring Report (DMR) data.

Table 3 presents chemical specific data compiled from the NPDES renewal application, data reported in annual pretreatment reports, and data collected by Ohio EPA.

Table 4 presents a summary of unaltered Discharge Monitoring Report (DMR) data for outfall 001. Data are presented for the period of January 2009 through August 2014, and current permit limits are provided for comparison.

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

Table 6 summarizes the chemical specific data for outfall 001 by presenting the average and maximum PEQ values.

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

The Cuyahoga River has been identified as a priority impaired water on Ohio's 303(d) list.

A TMDL report was approved for the Middle Cuyahoga River in March 2000. The March 24, 2015, Supreme Court of Ohio decision *Fairfield Cty. Bd. of Commrs. v. Nally, Slip Opinion No. 2015-Ohio-991* vacated all previously approved TMDLs. As of April 23, 2015, this TMDL is considered a technical guidance document pending final TMDL approval.

The TMDL is available through the OEPA, Division of Surface Water website at:

<http://epa.ohio.gov/portals/35/tmdl/MidCuyFinalTMDL.pdf>

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

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

Use attainment is a term which describes the degree to which environmental indicators are either above or below criteria specified by the Ohio Water Quality Standards (WQS; Ohio Administrative Code 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 1) 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 most recent biological data is contained in the 2008 Ohio EPA Biological and Water Quality Report for surveys conducted in 2007 following the Kent and Munroe Falls dam modifications. The use attainment status in the Cuyahoga River during this year was assessed to be full-attainment of its use designation upstream of the Kent and Fishcreek WWTPs but only partial-attainment was achieved downstream of these facilities. Organic enrichment and low D.O. were listed as the primary causes of impairment within this segment. The report can be obtained through the OEPA, Division of Surface Water website at:  
<http://epa.ohio.gov/portals/35/documents/MiddleCuyahoga2007final-amended2.pdf>

Table 1 summarizes the use designation status as well as causes and sources of impairment from the 2007 biological sampling for the Cuyahoga River.

Instream conditions for the Cuyahoga River, including background water quality data, are summarized in Table 8.

#### 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.

This facility is considered to be interactive with the Summit County Fishcreek WWTP. The CONSWLA (conservative substance wasteload allocation) model was used to distribute effluent loadings between these entities. The study area is depicted in Figure 2.

*Parameter Selection* Effluent data for the Kent WWTP were used to determine what parameters should undergo WLA. The parameters discharged are identified by the data available to Ohio EPA - Discharge Monitoring Report (DMR) data submitted by the permittee, compliance sampling data collected by Ohio EPA, and any other data submitted by the permittee, such as priority pollutant scans required by the NPDES application or by pretreatment, or other special conditions in the NPDES permit. The sources of effluent data used in this evaluation are as follows:

Self-monitoring data (DMR)	January 2009 through August 2014
Pretreatment data	2011 through 2012

#### *Non-Representative Data and Statistical Outliers*

Chromium – 18 data points for Chromium from 03/03/09 to 08/06/13 were excluded for having analytical method detection limits (MDLs) outside of an acceptable range.

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 6.

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 10 for a summary of the screening results.

*Wasteload Allocation* For those parameters that require a WLA, the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. Dischargers are allocated pollutant loadings/concentrations based on the Ohio WQS (OAC 3745-1). Most pollutants are allocated by a mass-balance method because they do not degrade in the receiving water. WLAs using this method are done using the following general equation: Discharger WLA = (downstream flow x WQS) - (upstream flow x background concentration). Discharger WLAs are divided by the discharge flow so that the allocations are expressed as concentrations.

The applicable waterbody uses for this facility’s discharge and the associated stream design flows are as follows:

Aquatic life (WWH)		
Toxics (metals, organics, etc.)	Average	Annual 7Q10
	Maximum	Annual 1Q10
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 8, and allocations cannot exceed the Inside Mixing Zone Maximum criteria.

Ohio’s WQS implementation rules [OAC 3745-2-05(A)(2)(d)(iv)] required a phase out of mixing zones for bioaccumulative chemicals of concern (BCCs) as of November 15, 2010. This rule applied statewide. Mercury is a BCC. The mixing zone phase-out means that as of November 15, 2010 all dischargers requiring mercury limits in their NPDES permit must meet WQS at the end-of-pipe, which are 12 ng/L (average) and 1700 ng/L (maximum) in the Ohio River basin, or 1.3 ng/L (average) and 1700 ng/L (maximum) in the Lake Erie basin.

The data used in the WLA are listed in Tables 7 and 8. The WLA results to maintain all applicable criteria are presented in Table 9. The current ammonia limits have been evaluated using the WLA procedures and are protective of WQS for ammonia toxicity.

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

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

The WLA calculations for WET are similar to those for aquatic life criteria - using the chronic toxicity unit (TU<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 Kent WWTP, the WLA values are 1.0 TU<sub>a</sub> and 1.94 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<sub>a</sub>) is defined as 100 divided by the concentration in water having 50% chance of causing death to aquatic life (LC<sub>50</sub>) 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 9. The average PEL (PEL<sub>avg</sub>) is compared to the average PEQ (PEQ<sub>avg</sub>) from Table 6, and the PEL<sub>max</sub> is compared to the PEQ<sub>max</sub>. Based on the calculated percentage of the allocated value [(PEQ<sub>avg</sub> ÷ PEL<sub>avg</sub>) X 100, or (PEQ<sub>max</sub> ÷ PEL<sub>max</sub>) X 100], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 10.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 11 presents the final effluent limits and monitoring requirements proposed for outfall 001 and the basis for their recommendation. Unless otherwise indicated, the monitoring frequencies proposed in the permit are continued from the existing permit.

#### *Dissolved Oxygen, Total Suspended Solids, Ammonia, CBOD<sub>5</sub>, Nitrate + Nitrite, and TKN*

The limits proposed for dissolved oxygen, total suspended solids, summer and winter ammonia, and CBOD<sub>5</sub>, are based on the existing permit. These limits are protective of WQS. Monitoring for nitrate + nitrite and TKN will continue in order to assist in the evaluation of effluent quality and treatment plant performance.

#### *Total Suspended Solids*

The concentration limits proposed for total suspended solids are based on the existing permit. As the Kent WWTP was not cited as a significant source for remaining siltation in the Cuyahoga River in the 2008 Ohio EPA Biological and Water Quality Report, it is proposed that the loading limits for total suspended solids be increased to be consistent with the concentration limits and the average design capacity of 5.0 MGD. Since the proposed loading limits were previously authorized based on treatment capacity, the change is exempt from an antidegradation review per OAC 3745-1-05(B)(2)(b)(i).

### *Oil & Grease, pH, and E. coli*

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

### *Phosphorus*

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

### *Chlorine*

The proposed limits for total residual chlorine are a continuation of existing permit conditions and are protective of WQS (Table 9). The effluent limit for chlorine at outfall 001 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 water quality based effluent limit is being met.

### *Mercury Reasonable Potential and Mercury Variance*

The Kent WWTP permit was renewed June 30, 2010 to include a mercury variance, and variance-based limits for mercury. Based on the monitoring results from January 2014 through January 2015, and the new application information, the Kent WWTP has determined that the facility will not meet the 30-day average permit limit of 1.3 nanograms per liter (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 Kent WWTP is eligible for the mercury variance under Rule 3745-33-07(D)(10)(a) of the Ohio Administrative Code (OAC).

The Kent WWTP submitted information supporting the renewal of the variance. The permittee inspected the six dental practices which contribute to the Kent collection system. After sample analysis revealed significant mercury concentrations, all six practices were required to install amalgam separators and implement dental waste best management practices (BMPs). All undersink P-traps which were potentially contaminated were also replaced. All orthodontists, health care centers, and the science building of Kent State University which contribute to the Kent collection system were sampled and not found to be in excess of mercury background concentrations. Kent continues to survey and inspect local industries. No industrial samples have been found to be in excess of mercury background concentrations. The PMP schedule developed from the original variance continues to be implemented, and further reductions in mercury may be possible.

The mercury variance is proposed to be issued as a condition in Part II of the NPDES permit, and the following requirements have been incorporated into the draft permit:

- mercury effluent limits of 2.4 ng/L for the 30-day average limit will continue from the existing permit;
- a requirement that Kent WWTP make reasonable progress to meet the water-quality-based effluent limit for mercury by implementing the plan of study which has been developed as part of the pollutant minimization program;
- influent and effluent monitoring for mercury;
- a requirement that the average annual effluent concentration for mercury is less than or equal to 12 ng/L as specified in the plan of study;
- a summary of the elements of the plan of study;
- a requirement for Kent WWTP to use the most sensitive analytical method approved by U.S. EPA; and

- a requirement that Kent WWTP submit a certification to Ohio EPA stating that all required permit conditions for the plan of study have been satisfied once these have been completed. In addition, the certification must state that compliance with the WQBEL for mercury has not been achieved.

#### *Bis(2-ethylhexyl)phthalate*

The Ohio EPA risk assessment (Table 10) places bis(2-ethylhexyl)phthalate in group 5. This placement as well as the data in Tables 3, 4, and 5 indicate that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality. For this 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). The thirty day average limit for bis(2-ethylhexyl)phthalate is based on the WLA for aquatic life. The daily maximum limit is based on the current permit limit, which is more stringent than the WLA, due to the antibacksliding rule (OAC 3745-33-05(E)).

#### *Whole Effluent Toxicity Reasonable Potential*

Evaluating the acute and chronic toxicity results in Table 5 under the provisions of 40 CFR Part 132, Appendix F, Procedure 6, gives an acute PEQ value of 0.26 TU<sub>a</sub> and a chronic PEQ of 3.67 TU<sub>c</sub> for *C. dubia*. For *P. promelas*, the acute PEQ is 0.52 TU<sub>a</sub> and the chronic PEQ is 11.54. Reasonable potential for toxicity for *C. dubia* and *P. promelas* is demonstrated, since these values exceed the WLA values of 1.94 TU<sub>c</sub>. However, further examination of data for the plant effluent has not led to a cause for the toxicity. Also, chapter 6.1.3 of the U.S. EPA guidance, "Understanding and Accounting for Method Variability in Whole Effluent Toxicity Applications Under the National Pollutant Discharge Elimination System Program" recommends that a large dataset be used to determine if limits and other provisions are needed to address toxicity. In cases where reasonable potential is determined on a small data set, Ohio EPA allows for additional tests to be done before the limits become effective so that a more precise determination of effluent toxicity can be done. The guidance referenced above can be found online at: <http://www.epa.gov/npdes/pubs/chapt6f.pdf>.

Consistent with Procedure 6 and OAC 3745-33-07(B), a daily maximum limit of 1.0 TU<sub>a</sub> and a monthly average limit of 1.94 TU<sub>c</sub> are proposed for *C. dubia* that would become effective 48 months from the effective date of the permit. To obtain a larger data set that includes seasonal results, quarterly acute testing for the first two years of the permit with a trigger to conduct a toxicity reduction evaluation (TRE) is proposed as the interim condition. Semi-annual monitoring of chronic toxicity with the determination of acute endpoints is proposed for the remainder of the permit.

A compliance schedule is proposed that includes a requirement for an initial TRE investigation if toxicity is detected, outlines requirements for the TRE if one is necessary, and requires compliance with the final limits for acute and chronic toxicity.

The draft permit includes a reopener clause that would allow the City to request a permit modification to remove the final toxicity limits and TRE requirements if the results of at least eight tests conducted over two years show there is no reasonable potential for whole effluent toxicity.

#### *Free Cyanide*

Quarterly monitoring for cyanide is being proposed as no data has been gathered using the new testing methods which have a lower detectable limit than the previous method.

#### *Chromium VI*

As Kent WWTP has an approved pretreatment program, quarterly monitoring for chromium VI is being proposed to document that the pollutant continues to remain at a low level.

#### *Cadmium, Chromium, Copper, Lead, Nickel, Total Filterable Residue, and Zinc*

Ohio EPA risk assessment (Tables 10) places cadmium, chromium, copper, lead, nickel, total filterable residue (dissolved solids), and zinc in groups 2 and 3. This placement as well as the data in Tables 3, 4, and 5 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 document that these pollutants continue to remain at low levels. Existing limits for lead have been removed and monitoring frequency has been reduced.

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

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

### Other Requirements

#### *Compliance Schedule*

##### Pretreatment

A six 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.

##### Phosphorus Optimization

The permittee shall prepare and submit a Phosphorus Discharge Optimization Evaluation plan to Ohio EPA Northeast District Office. The plan shall be completed and submitted to Ohio EPA no later than 12 months from the effective date of the permit.

##### Whole Effluent Toxicity

Within 6 months of the effective date of the permit, the permittee shall submit an initial investigation TRE work plan to Ohio EPA Northeast District Office describing steps which would be taken if a TRE were triggered. If Ohio EPA determines a TRE is required, the permittee shall develop and implement a more detailed TRE work plan. Not later than 48 months after the effective date of the permit, the permittee shall achieve compliance with a daily maximum toxicity limit of 1.0 TU<sub>a</sub> and monthly average limit of 1.94 TU<sub>c</sub> at outfall 3PD00031001. Beginning 12 months from the effective date of this permit, the permittee shall submit annual reports summarizing the biomonitoring results for the previous year and detailing the progress of the TRE if one is required.

#### *Sanitary Sewer Overflow Reporting*

Provisions for reporting sanitary sewer overflows (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 Kent WWTP to have a Class IV wastewater treatment plant operator in charge of the sewage treatment plant operations discharging through outfall 001.

#### *Operator of Record*

In December 2006, Ohio Administrative Code 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(2) of this NPDES permit is included to implement rule 3745-7-02 of the Ohio Administrative Code (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 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 water quality-based effluent limits, it will also be possible to directly evaluate compliance with free cyanide limits.

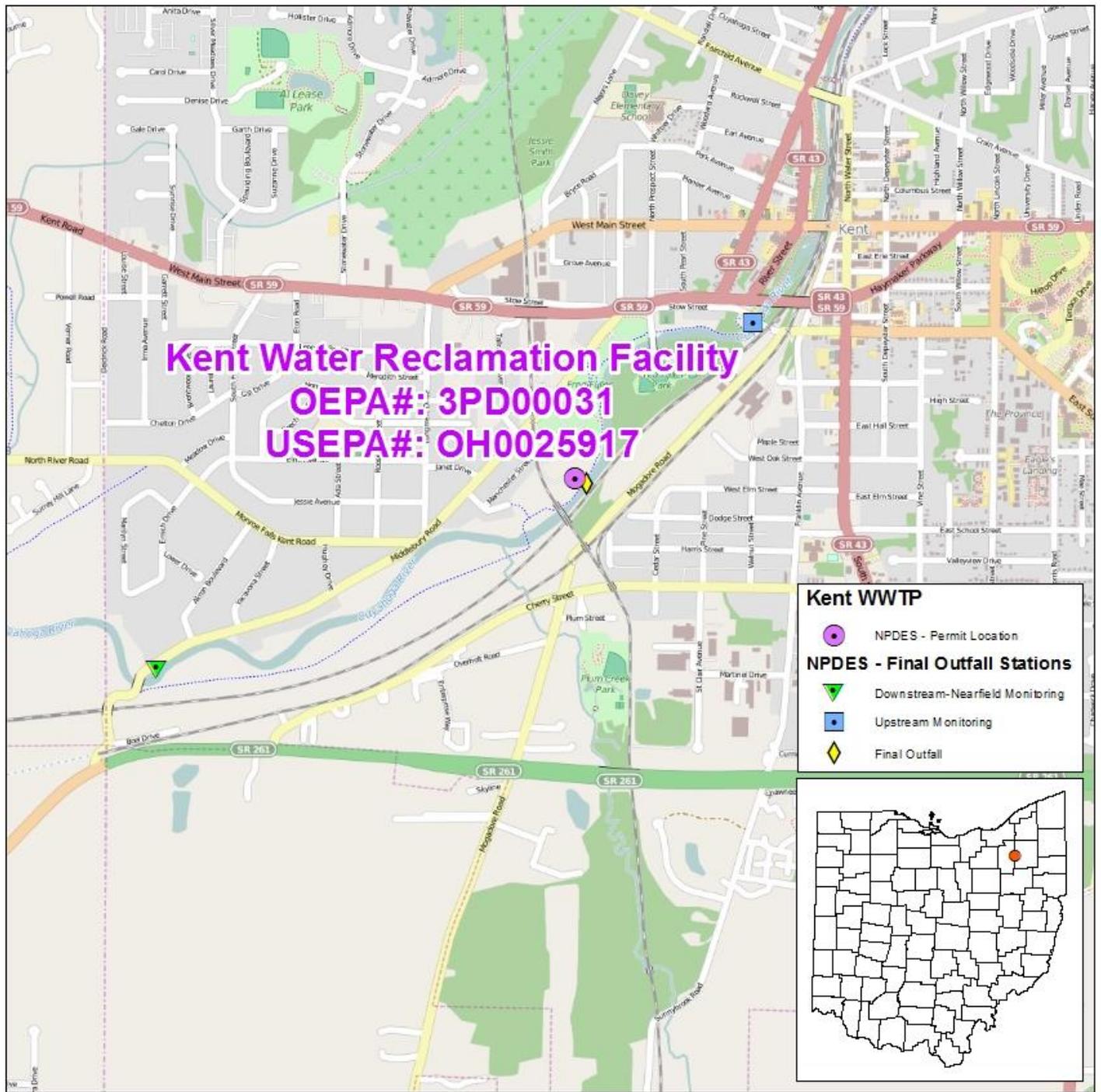
New NPDES permits no longer authorize the use of method 4500 CN-I from Standard Methods for free cyanide testing. The new permits require permittees to begin using one of these approved methods as soon as possible. If a permittee must use method 4500 CN-I during the transition to an approved method,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

#### *Storm Water Compliance*

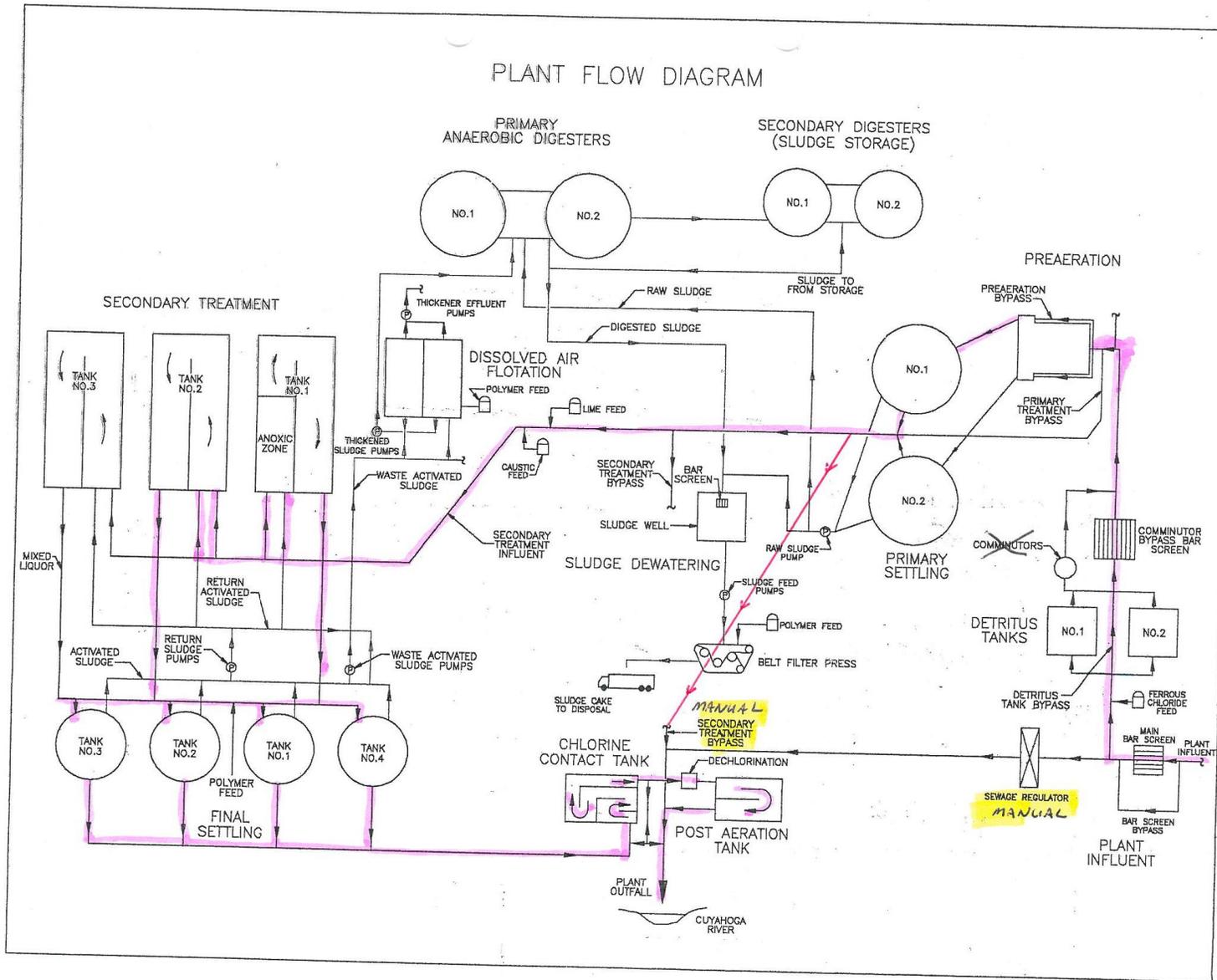
Parts IV, V, and VI have been included with the draft permit to ensure that any storm water flows from the facility site are properly regulated and managed. As an alternative to complying with Parts IV, V, and VI, the Kent WWTP may seek permit coverage under the general permit for industrial storm water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

#### *Outfall Signage*

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

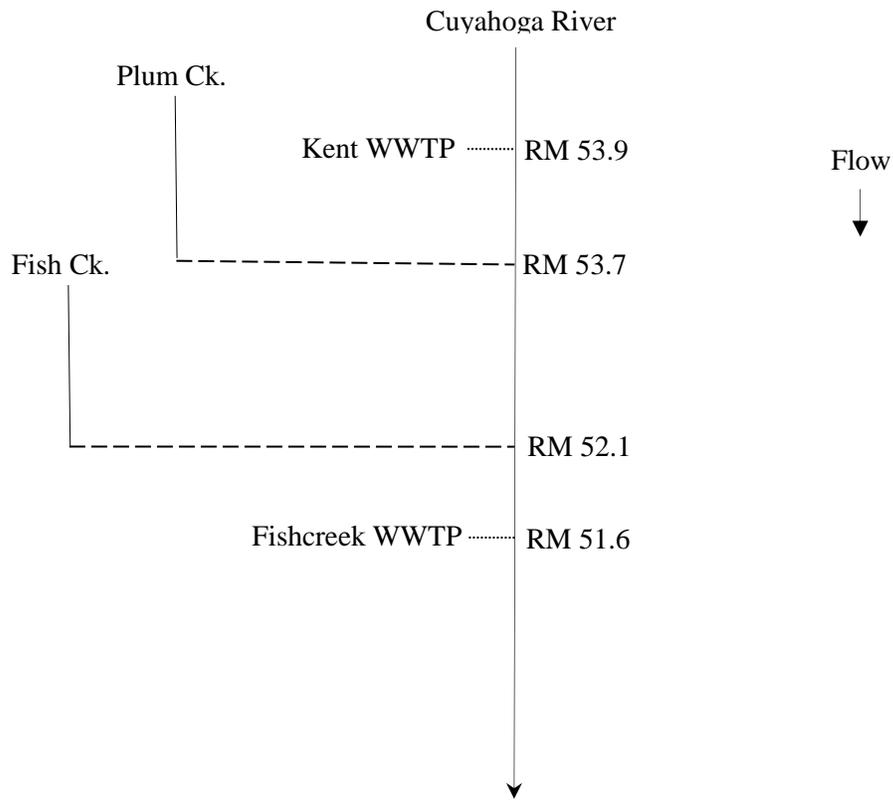


**Figure 1. Location of Kent WWTP.**



**Figure 2. Process Flow Diagram for Kent WWTP**

*Fact Sheet for NPDES Permit Renewal, Kent WWTP, 2015*



**Figure 3. Cuyahoga River Study Area.**

**Table 1. Summary of the Cuyahoga River Use Designation Status, and Causes/Sources of Impairment.**

Watershed Stream Segment	Aquatic Life Use Designation	Attainment Status			Causes of Impairment	Sources of Impairment
		Full	Partial	NON		
<b>Cuyahoga River (2007)</b> RMs: 54.6/54.4 RMs: 51.8/52.0	WWH	X	X		Nutrients Nutrients, Habitat	Municipal Point Source Discharge Dam Removal Recovery

RM – river mile

WWH – warmwater habitat

**Table 2. Effluent Flow Rates for Kent WWTP.**

Year	Annual Flow (MGD)		
	50 <sup>th</sup> Percentile	95 <sup>th</sup> Percentile	Maximum
2009	2.1	4.4	10.7
2010	2	2.78	3.7
2011	2.1	3.7	7.2
2012	1.9	2.975	5.4
2013	2.3	2.8	4.9

**Table 3. Outfall 001 Effluent Characterization for Kent WWTP.**

Parameter	Result (MDL)	
	Pretreatment Data	
	3/23/2011	3/7/2012
Arsenic (µg/L)	AA (5.0)	AA (5.0)
Copper (µg/L)	3.9	AA (8)
Nickel (µg/L)	9.5	AA (10)
Zinc (µg/L)	66	39

AA - below detectable limit

**Table 4. Effluent Data Using Self-Monitoring Reports for Kent WWTP.**

Parameter	Season	Units	Current Permit Limits		Current Permit Loading Limits		# Obs.	Percentiles		Data Range
			30 day	Daily	30 day	Daily		50 <sup>th</sup>	95 <sup>th</sup>	
<b>Outfall 001</b>										
Water Temperature	Annual	°C	--	--	--	--	2069	18	23	9-25
Dissolved Oxygen	Summer	mg/L	--	7.0 <sup>a</sup>	--	--	1043	8.5	9.9	7.4-10
Dissolved Oxygen	Winter	mg/L	--	7.0 <sup>a</sup>	--	--	1026	9.3	10	5-10
Total Suspended Solids	Annual	mg/L	12	18 <sup>b</sup>	152	228 <sup>b</sup>	876	1	5	0-13
Oil and Grease	Annual	mg/L	--	10.0	--	--	148	0	0	0-6.7
Ammonia	Summer	mg/L	1.0	1.5 <sup>b</sup>	19.0	28.4 <sup>b</sup>	442	0	0.3	0-1.85
Ammonia	Winter	mg/L	--	--	--	--	435	0	3.4	0-9.4
Total Kjeldahl Nitrogen	Annual	mg/L	--	--	--	--	69	1	3.64	0-7.2
Nitrite + Nitrate	Annual	mg/L	--	--	--	--	68	26.6	33.9	13.6-41.5
Phosphorus	Annual	mg/L	1.0	1.5 <sup>b</sup>	19.0	28.4 <sup>b</sup>	295	0.69	0.91	0.24-1.48
Cyanide, Free	Annual	mg/L	--	--	--	--	5	0	0	0-0
Nickel	Annual	µg/L	--	--	--	--	22	0	12	0-17.9
Zinc	Annual	µg/L	--	--	--	--	22	32.2	49.6	0-70
Cadmium	Annual	µg/L	--	--	--	--	22	0	0	0-0
Lead	Annual	µg/L	16	492	0.3028	9.311	54	0	1.37	0-4.2
Chromium	Annual	µg/L	--	--	--	--	22	0	1	0-1.25
Copper	Annual	µg/L	30	48	0.57	0.91	22	3.55	5.49	0-6.4
Chromium VI	Annual	µg/L	--	--	--	--	5	0	0	0-0
E. coli	Annual	#/100 ml	126	284 <sup>b</sup>	--	--	313	9	58.5	0-1200
Bis(2-ethylhexyl) Phthalate	Annual	µg/L	12	1870	0.228	35.4	71	0	0	0-41.5
Flow Rate	Summer	MGD	--	--	--	--	1043	2	2.7	1-5.5
Flow Rate	Winter	MGD	--	--	--	--	1026	2.3	4.2	1-10.7
Flow Rate	Annual	MGD	--	--	--	--	2069	2.1	3.7	1-10.7

**Table 4, Continued.**

Parameter	Season	Units	Current Permit Limits		Current Permit Loading Limits		# Obs.	Percentiles		Data Range
			30 day	Daily	30 day	Daily		50 <sup>th</sup>	95 <sup>th</sup>	
Chlorine	Annual	mg/L	0.015	0.032	--	--	720	0	0	0-0.023
Mercury	Annual	ng/L	2.4	1700	0.000046	0.0322	70	0.563	3.06	0-5.8
Acute Toxicity, Ceriodaphnia dubia	Annual	TUa	--	--	--	--	4	0	0	0-0
Chronic Toxicity, Ceriodaphnia dubia	Annual	TUc	--	--	--	--	4	0.67	1.4	0-1.41
Acute Toxicity, Pimephales promelas	Annual	TUa	--	--	--	--	4	0.1	0.2	0-0.2
Chronic Toxicity, Pimephales promelas	Annual	TUc	--	--	--	--	4	0	3.77	0-4.44
pH, Maximum	Annual	S.U.	9.0	--	--	--	2069	7.6	8.2	6.8-8.8
pH, Minimum	Annual	S.U.	--	6.5	--	--	2069	7.3	7.9	6.6-8.4
CBOD 5 day	Summer	mg/L	10	15 <sup>b</sup>	190	284 <sup>b</sup>	435	0	2	0-4
CBOD 5 day	Winter	mg/L	10	15 <sup>b</sup>	190	284 <sup>b</sup>	427	2	3	0-8

<sup>a</sup> minimum

<sup>b</sup> weekly limit

CBOD – carbonaceous  
biochemical oxygen demand

**Table 5. Summary of Acute and Chronic Toxicity Results for Kent WWTP.**

Date	Ceriodaphnia dubia		Pimephales promelas	
	Acute Toxicity (TU <sub>a</sub> )	Chronic Toxicity (TU <sub>c</sub> )	Acute Toxicity (TU <sub>a</sub> )	Chronic Toxicity (TU <sub>c</sub> )
9/17/2010	AA	AA	0.2	4.44
9/16/2011	AA	1.34	0.2	AA
9/7/2012	AA	1.41	AA	AA
9/22/2013	AA	AA	AA	AA

**Table 6. Effluent Data and Summary of PEQs for Kent WWTP.**

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
Ammonia – Summer	mg/L	298	41	0.971	1.330
Ammonia – Winter	mg/L	217	94	2.493	4.264
Arsenic	µg/L	2	0	--	--
Bis(2-ethylhexyl)phthalate	µg/L	71	2	30.30	41.50
Cadmium	µg/L	22	0	--	--
Chlorine	mg/L	720	1	0.010	0.014
Chromium	µg/L	4	4	2.380	3.260
Chromium VI	µg/L	5	0	--	--
Copper	µg/L	24	18	5.7541	8.485
Cyanide – free	mg/L	5	0	--	--
Lead	µg/L	54	6	1.868	2.323
Mercury	ng/L	70	38	2.92	4.483
Nickel	µg/L	24	11	12.14	16.46
Nitrate + Nitrite	mg/L	68	68	32.61	39.05
Phosphorus	mg/L	295	295	0.830	0.968
Zinc	µg/L	24	23	51.58	73.61

MDL – Method detection limit

PEQ – Projected effluent quality

**Table 7. Water Quality in the Study Area for Kent WWTP.**

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum Aquatic Life	
		Human Health	Agri-culture	Aquatic Life		
Arsenic	µg/L	580.	100.	150.	340.	680.
Bis(2-ethylhexyl)phthalate <sup>c</sup>	µg/L	32	--	8.4	1100.	2100.
Cadmium	µg/L	730.	50.	3.3	7.0	14
Chlorine	mg/L	--	--	0.011	0.019	0.038
Chromium	µg/L	14000.	100.	120.	2500.	5000.
Chromium VI	µg/L	14000.	--	11	16	31
Copper	µg/L	64000.	500.	13	20.	41
Cyanide - free	mg/L	48.	--	0.0052	0.022	0.044
Lead	µg/L	--	100.	11	200.	400.
Mercury <sup>AB</sup>	ng/L	3.1	10000.	910.	1700.	3400.
Molybdenum	µg/L	10000.	--	20000.	190000.	370000.
Nickel	µg/L	43000.	200.	73	650.	1300.
Nitrate + Nitrite	mg/L	--	100.	--	--	--
Selenium	µg/L	3100.	50.	5	--	--
Silver	µg/L	11000.	--	1.3	3.1	6.3
Total Filterable Residue	mg/L	--	--	1500.	--	--
Zinc	µg/L	35000.	25000.	170.	170.	330.

<sup>A</sup> Bioaccumulative Chemical of Concern (BCC)

<sup>B</sup> Wildlife criteria is 1.3 ng/L

<sup>C</sup> Carcinogen

**Table 8. Instream Conditions and Discharger Flow for Kent WWTP.**

<b>Parameter</b>	<b>Units</b>	<b>Season</b>	<b>Value</b>	<b>Basis</b>
<i>Stream Flows</i>				
1Q10	cfs	annual	23.4	USGS 04206000, 1939-97 data
7Q10	cfs	annual	29.1	USGS 04206000, 1939-97 data
90Q10	cfs	annual	39.2	USGS 04206000, 1939-97 data
Harmonic Mean	cfs	annual	88.8	USGS 04206000, 1939-97 data
Mixing Assumption	%	average	25	Stream-to-discharge ratio
	%	maximum	100	Stream-to-discharge ratio
<i>Hardness</i>				
Downstream Kent WWTP	mg/L	annual	148	DMR, N=82, 0<MDL, 2009-2014
Downstream Fishcreek WWTP	mg/L	annual	161	DMR, N=68, 0<MDL, 2009-2014
<i>Kent WWTP flow</i>	cfs	annual	7.74	
<i>Fishcreek WWTP flow</i>	cfs	annual	12.38	
<i>Background Water Quality</i>				
<i>Cuyahoga River</i>				
Arsenic	µg/L	annual	3.4	STORET; 24 values, 19<MDL, 2001-2007
Bis(2-ethylhexyl)phthalate	µg/L	annual	0	No representative data available.
Cadmium	µg/L	annual	0.1	STORET; 24 values, 19<MDL, 2001-2007
Chlorine	mg/L	annual	0	No representative data available.
Chromium	µg/L	annual	0	STORET; 24 values, 24<MDL, 2001-2007
Chromium VI	µg/L	annual	0	No representative data available.
Copper	µg/L	annual	5	STORET; 24 values, 19<MDL, 2001-2007
Cyanide – free	mg/L	annual	0	No representative data available.
Lead	µg/L	annual	1	STORET; 24 values, 17<MDL, 2001-2007
Mercury	ng/L	annual	0	No representative data available.
Molybdenum	µg/L	annual	0	No representative data available.
Nickel	µg/L	annual	0	STORET; 24 values, 24<MDL, 2001-2007
Nitrate + Nitrite	mg/L	annual	0.93	Kent 801:21 values, 1<MDL, 2009-2014

**Table 8, Continued.**

<b>Parameter</b>	<b>Units</b>	<b>Season</b>	<b>Value</b>	<b>Basis</b>
Selenium	µg/L	annual	0	STORET; 11 values, 11<MDL, 2000-2007
Silver	µg/L	annual	0	No representative data available.
Total Filterable Residue	mg/L	annual	374	STORET; 24 values, 0<MDL, 2001-2007
Zinc	µg/L	annual	5	STORET; 11 values, 9<MDL, 2000-2007
<i>Plum Creek</i>				
Arsenic	µg/L	annual	3.3	STORET; 11 values, 0<MDL, 2000-2007
Bis(2-ethylhexyl)phthalate	µg/L	annual	0	No representative data available.
Cadmium	µg/L	annual	0	STORET; 11 values, 11<MDL, 2000-2007
Chlorine	mg/L	annual	0	No representative data available.
Chromium	µg/L	annual	0	STORET; 24 values, 24<MDL, 2001-2007
Chromium VI	µg/L	annual	0	No representative data available.
Copper	µg/L	annual	0	STORET; 11 values, 11<MDL, 2000-2007
Cyanide – free	mg/L	annual	0	No representative data available.
Lead	µg/L	annual	0	STORET; 11 values, 11<MDL, 2001-2007
Mercury	ng/L	annual	0	No representative data available.
Molybdenum	µg/L	annual	0	No representative data available.
Nickel	µg/L	annual	0	STORET; 11 values, 11<MDL, 2001-2007
Nitrate + Nitrite	mg/L	annual	0.12	STORET; 11 values, 0<MDL, 2000-2007
Selenium	µg/L	annual	0	STORET; 11 values, 11<MDL, 2001-2007
Silver	µg/L	annual	0	No representative data available.
Total Filterable Residue	mg/L	annual	362	STORET; 11 values, 0<MDL, 2000-2007
Zinc	µg/L	annual	5	STORET; 11 values, 9<MDL, 2000-2007
<i>Fish Creek</i>				
Arsenic	µg/L	annual	2.2	STORET; 16 values, 4<MDL, 2001-2007
Bis(2-ethylhexyl)phthalate	µg/L	annual	0	No representative data available.
Cadmium	µg/L	annual	0	STORET; 16 values, 16<MDL, 2001-2007
Chlorine	mg/L	annual	0	No representative data available.
Chromium	µg/L	annual	0	STORET; 16 values, 16<MDL, 2001-2007

**Table 8, Continued.**

<b>Parameter</b>	<b>Units</b>	<b>Season</b>	<b>Value</b>	<b>Basis</b>
Chromium VI	µg/L	annual	0	No representative data available.
Copper	µg/L	annual	0	STORET; 16 values, 16<MDL, 2000-2007
Cyanide – free	mg/L	annual	0	No representative data available.
Lead	µg/L	annual	0	STORET; 16 values, 16<MDL, 2001-2007
Mercury	ng/L	annual	0	No representative data available.
Molybdenum	µg/L	annual	0	No representative data available.
Nickel	µg/L	annual	0	STORET; 16 values, 16<MDL, 2001-2007
Nitrate + Nitrite	mg/L	annual	0.22	STORET; 15 values, 0<MDL, 2000-2007
Selenium	µg/L	annual	0	STORET; 16 values, 16<MDL, 2001-2007
Silver	µg/L	annual	0	No representative data available.
Total Filterable Residue	mg/L	annual	559	STORET; 15 values, 0<MDL, 2000-2007
Zinc	µg/L	Annual	5	STORET; 16 values, 14<MDL, 2000-2007

DMR – Discharge Monitoring Report

MDL – Method detection limit

STORET – EPA Storage and Retrieval data repository

USGS – United States Geological Survey

**Table 9. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria for Kent WWTP.**

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum Aquatic Life	
		Human Health	Agri-culture	Aquatic Life		
Arsenic <sup>B</sup>	µg/L	1362 <sup>A</sup>	231	209	758 <sup>A</sup>	680
Bis(2-ethylhexyl)phthalate	µg/L	75	--	12	2465 <sup>A</sup>	2100
Cadmium <sup>B</sup>	µg/L	1719 <sup>A</sup>	118 <sup>A</sup>	4.8	16 <sup>A</sup>	14
Chlorine	mg/L	--	--	0.021	0.076 <sup>A</sup>	0.038
Chromium <sup>B</sup>	µg/L	32980 <sup>A</sup>	236	176	5769 <sup>A</sup>	5000
Chromium VI <sup>B</sup>	µg/L	32970 <sup>A</sup>	--	14	30	31
Copper	µg/L	150700 <sup>A</sup>	1172 <sup>A</sup>	17	42 <sup>A</sup>	41
Cyanide – free <sup>B</sup>	mg/L	113 <sup>A</sup>	--	0.007	0.048 <sup>A</sup>	0.044
Lead	µg/L	--	234	16	479 <sup>A</sup>	400
Mercury <sup>C,D</sup>	ng/L	3.1	10000 <sup>A</sup>	910	1700	3400
Molybdenum <sup>B</sup>	µg/L	23550	--	28030	414700 <sup>A</sup>	370000
Nickel <sup>B</sup>	µg/L	101300 <sup>A</sup>	471	106	1497 <sup>A</sup>	1300
Nitrate + Nitrite	mg/L	--	384	--	--	--
Selenium <sup>B</sup>	µg/L	7302	118	7	--	--
Silver <sup>B</sup>	µg/L	25910 <sup>A</sup>	--	1.8	7.5 <sup>A</sup>	6.3
Total Filterable Residue <sup>B</sup>	mg/L	--	--	2102	--	--
Zinc	µg/L	82430 <sup>A</sup>	58880 <sup>A</sup>	244	391 <sup>A</sup>	330

<sup>A</sup> Allocation must not exceed the Inside Mixing Zone Maximum.

<sup>B</sup> Parameter would not require a WLA based on reasonable potential procedures, but allocation requested for use in the pretreatment program.

<sup>C</sup> Bioaccumulative Chemical of concern (BCC); no mixing zone allowed after 11/15/2010, WQS must be met at end-of-pipe, unless the requirements for an exception are met as listed in 3745-2-08(L).

<sup>D</sup> Wildlife allocation is 1.3 ng/L

**Table 10. Parameter Assessment for Kent WWTP.**

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

Phosphorus

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

Arsenic	Cadmium	Chromium
Chromium VI	Cyanide – free	Lead
Molybdenum	Nickel	Selenium
Silver	Total Filterable Residue	

*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.

Chlorine	Copper	Nitrate + Nitrite
Zinc		

*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.

No parameters fit the criteria of this group

*Group 5:* Maximum PEQ >= 100 percent of the maximum PEL or average PEQ >= 100 percent of the average PEL, or either the average or maximum PEQ is between 75 and 100 percent of the PEL and certain conditions that increase the risk to the environment are present. Limit recommended.

Limits to Protect Numeric Water Quality Criteria

<u>Parameter</u>	<u>Units</u>	<u>Period</u>	<u>Recommended Effluent Limits</u>	
			<u>Average</u>	<u>Maximum</u>
Bis(2-ethylhexyl)phthalate	µg/L	Annual	12	2100.
Mercury	mg/L	Annual	1.3	1700.

PEQ – Projected effluent Quality  
 PEL - Preliminary effluent limit  
 WLA – Waste load allocation  
 WQS – Water quality standard

**Table 11. Final Effluent Limits and Monitoring Requirements for Kent WWTP Outfall 001.**

Parameter	Units	Effluent Limits				Basis <sup>b</sup>
		Concentration		Loading (kg/day) <sup>a</sup>		
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Flow	MGD	----- Monitor -----				M <sup>c</sup>
Temperature	°C	----- Monitor -----				M <sup>c</sup>
Dissolved Oxygen	mg/L	----- Not less than 7.0 -----				EP
Carbonaceous biochemical oxygen demand (5-day)	mg/L	10	15 <sup>d</sup>	190	284 <sup>d</sup>	EP
Total Suspended Solids	mg/L	12.0	18.0 <sup>d</sup>	227	341 <sup>d</sup>	BTJ
Ammonia – Summer	mg/L	1.0	1.5 <sup>d</sup>	19.0	28.4 <sup>d</sup>	EP
Ammonia – Winter	mg/L	----- Monitor -----				EP
Total Kjeldahl Nitrogen	mg/L	----- Monitor -----				EP/M <sup>c</sup>
Nitrite + Nitrate	mg/L	----- Monitor -----				EP/M <sup>c</sup>
Phosphorus	mg/L	1.0	1.5 <sup>d</sup>	19.0	28.4 <sup>d</sup>	PTS
Oil and Grease	mg/L	----- Not greater than 10.0 -----				WQS
pH	S.U.	6.5 - 9.0				WQS
<i>E. coli</i> – Summer	#/100mL	126	284 <sup>d</sup>	--	--	WQS
Bis(2-ethylhexy)phthalate	µg/L	12	1870	0.228	35.4	WLA/ABS
Cyanide, Free	µg/L	----- Monitor -----				M
Cadmium	µg/L	----- Monitor -----				EP/M
Chromium	µg/L	----- Monitor -----				EP/M
Chromium VI	µg/L	----- Monitor -----				M
Copper	µg/L	----- Monitor -----				EP/M
Lead	µg/L	----- Monitor -----				M
Mercury	ng/L	2.4	1700	0.000046	0.0322	VAR/WLA
Nickel	µg/L	----- Monitor -----				EP/M
Zinc	µg/L	----- Monitor -----				EP/M
Chlorine – Summer	mg/L	0.015	0.032	--	--	EP
Total Filterable Residue	mg/L	----- Monitor -----				M
Whole Effluent Toxicity						
Acute, <i>Ceriodaphnia dubia</i>	TU <sub>a</sub>	----- 1.0 -----				WET
Chronic, <i>Ceriodaphnia dubia</i>	TU <sub>c</sub>	----- 1.94 -----				WET
Acute, <i>Pimephales promelas</i>	TU <sub>a</sub>	----- 1.0 -----				WET
Chronic, <i>Pimephales promelas</i>	TU <sub>c</sub>	----- 1.94 -----				WET

<sup>a</sup> Effluent loadings based on average design discharge flow of 5.0 MGD.

- <sup>b</sup> Definitions:      **ABS** = Antibacksliding Rule (OAC 3745-33-05(E) and 40 CFR Part 122.44(l))  
                              **BTJ** = Best Technical Judgement  
                              **EP** = Existing Permit  
                              **M** = Division of Surface Water NPDES Permit Guidance 1: Monitoring frequency requirements for Sanitary Discharges  
                              **PTS** = Phosphorus Treatment Standards (OAC 3745-33-06 (C))  
                              **RP** = Reasonable Potential (Risk Assessment Group 4 or 5)  
                              **VAR** = Mercury variance (OAC 3745-33-07(D)(10)(a))  
                              **WET** = Whole Effluent Toxicity (OAC 3745-33-07(B) and 40 CFR Part 132, Appendix F, Procedure 6)  
                              **WLA** = Wasteload Allocation procedures (OAC 3745-2)  
                              **WQS** = Ohio Water Quality Standards (OAC 3745-1)
- <sup>c</sup> Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.
- <sup>d</sup> 7 day average limit.