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 City of East Liverpool Wastewater Treatment Plant (WWTP)

Public Notice No.: 13-09-010
Public Notice Date: September 16, 2013
Comment Period Ends: October 16, 2013

Ohio EPA Permit No.: 3PD00009*JD
Application No.: OH0024970

Name and Address of Applicant:
Mayor and Council
City of East Liverpool
110 West 6th Street
East Liverpool, Ohio 43290

Name and Address of Facility Where Discharge Occurs:
City of East Liverpool WWTP
500 West 4th Street Extension
East Liverpool, Ohio 43920
Columbiana County

Receiving Water: The Ohio River

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 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 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 most parameters are the same as in the current permit, although some monitoring frequencies have changed. No current limits or monitoring are proposed to be removed from the permit.

New water-quality-based limits are needed for copper and mercury because new data indicates these parameters have reasonable potential to exceed WQS. A schedule of compliance is included in Part I.C of the draft permit. New limits are proposed for *E. coli*; based on best engineering judgment, it is anticipated the facility will be able to comply with the limits without a compliance schedule.

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

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 (WET) testing; storm water compliance; outfall signage; and pretreatment program requirements.

Table of Contents

Page

Introduction 1

Summary of Permit Conditions 2

Procedures for Participation in the Formulation of Final Determinations 4

Location of Discharge/Receiving Water Use Classification 5

Facility Description 5

Description of Existing Discharge 6

Assessment of Impact on Receiving Waters 6

Development of Water-Quality-Based Effluent Limits 7

Reasonable Potential/ Effluent Limits/Hazard Management Decisions 9

Other Requirements 11

List of Figures

Figure 1. Approximate Location of East Liverpool WWTP 13

List of Tables

Table 1. Effluent Characterization Using Pretreatment Program Data 14

Table 2. Effluent Characterization Using Self-Monitoring Data 15

Table 3. Projected Effluent Quality Values for Outfall 001 17

Table 4. Summary of Acute Toxicity Results for Outfall 001 18

Table 5. Water Quality Criteria in the Study Area 19

Table 6. Instream Conditions and Discharger Flow 20

Table 7. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria 22

Table 8. Parameter Assessment for Outfall 001 23

Table 9. Final Effluent Limits and Monitoring Requirements for Outfall 001 24

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 and Compliance Section
P.O. Box 1049
Columbus, Ohio 43216-1049

The Ohio EPA permit number and Public Notice numbers should appear on each page of any submitted comments. All comments received no later than 30 days after the date of the Public Notice will be considered.

Citizens may conduct file reviews regarding specific companies or sites. Appointments are necessary to conduct file reviews, because requests to review files have increased dramatically in recent years. The first 250 pages copied are free. For requests to copy more than 250 pages, there is a five-cent charge for each page copied. Payment is required by check or money order, made payable to Treasurer State of Ohio.

For additional information about this fact sheet or the draft permit, contact Sara Hise, (614) 644-4824, sara.hise@epa.ohio.gov.

Location of Discharge/Receiving Water Use Classification

The City of East Liverpool WWTP discharges to the Ohio River at River Mile (RM) 936.9 (Ohio River Mile Point 44.6). Figure 1 shows the approximate location of the facility.

This segment of the Ohio River is described by Ohio EPA River Code: 25-700, U.S. EPA River Reach #: 05030101-002, County: Columbiana, Ecoregion: Western Allegheny Plateau. The Ohio River is designated for the following uses under Ohio's WQS (Ohio Administrative Code [OAC] 3745-1-32): Warmwater Habitat (WWH), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), Bathing Waters (BW), and Public Water Supply (PWS).

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 Clean Water Act. Ohio WQS also include aquatic life use designations for waterbodies which cannot meet the Clean Water Act 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. PWS designations apply near existing water intakes so that waters are safe to drink with standard treatment. Most other waters are designated for AWS and IWS.

Facility Description

The City of East Liverpool WWTP is a secondary treatment plant designed to treat an average daily flow rate of 3.1 million gallons per day (MGD) with a peak hydraulic capacity of 7.0 MGD. The WWTP was originally constructed in 1955 with the most recent major upgrade occurring in 1988. Processes and/or equipment include:

- Influent pumping
- Comminution
- Grit removal
- Flow equalization
- Pre-aeration
- Primary settling
- Rotating biological contractors (RBC)
- Secondary clarification; and
- Ultraviolent disinfection

Sludge is processed by anaerobic digestion and sent to a belt press to increase the percent of solids. Processed sludge is sent to a landfill for disposal.

The WWTP and collection system serves the City of East Liverpool, East Liverpool Township, and St. Clair Township for a total population served of 23,199. The City of East Liverpool is not solely responsible for maintenance of the collection system; the Columbiana County Water and Sewer District maintains part of the

system. The collection system consists of 100% separate sanitary sewers. There is an estimated 0.2 MGD per day of infiltration/inflow (I/I) to the collection system. The overflow for the equalization basin functions as a bypass at the head of the WWTP during substantial rain events. The bypass was used once in 2011.

Description of Existing Discharge

The City of East Liverpool has a total of 19 industrial users that discharge approximately 0.4 MGD to the collection system. Three of these dischargers are classified as non-categorical significant industrial users (SUI) (SUIs are defined as any industry discharging more than 25000 gallons per day, industries subject to federal categorical standards for wastewater discharges, or any other industry classified as "significant" by the local pretreatment program due to the nature of the effluent from the industry) who contribute 0.2 MGD of the industrial flow rate. The City of East Liverpool's pretreatment program was approved on September 26, 1985. The most recent revision of local pretreatment limits occurred in 2013.

There have been only two recorded effluent violations; one in October 2008 for copper and one in October 2009 for oil and grease. There were also 14 recorded sanitary sewer overflows (SSOs). However, the pretreatment program is deficient in several aspects. The most recent audit, which was performed in 2010, cited several deficiencies including the need to update the Sewer Use Ordinance to reflect changes in the federal and state regulations, a missing Enforcement Response Plan, a lack of procedures to identify new industries or changes in operations at existing industries, and SIU permits that lacked required language, local limits, inspections, and adequate reporting.

Table 1 presents chemical specific data compiled from annual pretreatment reports.

Table 2 presents a summary of unaltered Discharge Monitoring Report (DMR) data. Data are presented for the period of January 2008 through December 2012, and current permit limits are provided for comparison.

Table 3 presents the average and maximum PEQ values.

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

The City of East Liverpool discharges to the Ohio River in the New Cumberland Dam Pool. The Ohio River Valley Water Sanitation Commission (ORSANCO) performs biological and chemical sampling in the Ohio River on a regular basis. The New Cumberland Dam Pool was last assessed for aquatic life criteria in 2011. The pool was assessed as "fair," which is a lower quality than the in 2005 when the pool was assessed as "good." However, there are no identifiable environmental factors contributing to this decrease. The flow rate in 2005 was much lower than the normal, which may have biased the biological data and the 2011 assessment may be a more accurate representation of the biological condition of the pool. The complete pool report can be found at this website:
http://216.68.102.178/data/pool/2011combinedpoolreport.pdf

ORSANCO's *Biennial Assessment of Ohio River Water Quality Conditions (305b)* also details the chemical and biological condition of the entire Ohio River. The 305b report states the river near the City of East Liverpool meets aquatic life use assessment; however, bacteria sampling shows that section of the river does not support

recreational contact during the summer months. The entire length of the river is designated as impaired for fish consumption use. The complete report can be found at this website:
http://www.orsanco.org/images/stories/files/publications/305b/docs/2012/2012ohioriver305breport.pdf

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 City of East Liverpool 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 2008 through December 2012
Pretreatment data	2008-2012

Outliers
The data were examined, and the following values were removed from the evaluation to give a more reliable PEQ: phosphorus - 236.6 mg/L on 5/6/10.

This data is evaluated statistically, and PEQ values are calculated for each pollutant. Average PEQ (PEQ_{avg}) values represent the 95th percentile of monthly average data, and maximum PEQ (PEQ_{max}) values represent the 95th percentile of all data points. The average and maximum PEQ values are presented in Table 3.

The PEQ values are used according to Ohio rules to compare to applicable WQS and allowable WLA values for each pollutant evaluated. Initially, PEQ values are compared to the applicable average and maximum WQS. If both PEQ values are less than 25 percent of the applicable WQS, the pollutant does not have the reasonable potential to cause or contribute to exceedances of WQS, and no WLA is done for that parameter. If either PEQ_{avg} or PEQ_{max} is greater than 25 percent of the applicable WQS, a WLA is conducted to determine whether the parameter exhibits reasonable potential and needs to have a limit or if monitoring is required. See Table 8 for a summary of the screening results.

Wasteload Allocation
For those parameters that require a WLA, the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. Dischargers are allocated pollutant loadings/concentrations based on the Ohio WQS (OAC 3745-1). Most pollutants are allocated by a mass-balance method because they do not degrade in the receiving water. Wasteload allocations 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	10% of Annual 7Q10
	Maximum	1% Annual 1Q10
AWS		10% of Harmonic mean flow
Human Health (nondrinking)		10% of Harmonic mean flow

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

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

The data used in the WLA are listed in Tables 5 and 6. The WLA results to maintain all applicable criteria are presented in Table 7.

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

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

The WLA calculations for WET are similar to those for aquatic life criteria - using the chronic toxicity unit (TU_c) and 7Q10 flow for the average and the acute toxicity unit (TU_a) and 1Q10 flow for the maximum. These values are the levels of effluent toxicity that should not cause instream toxicity during critical low-flow conditions. For East Liverpool WWTP, the WLA values are 1.0 TU_a and 123 TU_c.

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

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

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

TU_c = 100/geometric mean of No Observed Effect Concentration and Lowest Observed Effect Concentration

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

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

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

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

Dilution Ratio (downstream flow to discharger flow)	Allowable Effluent Toxicity (percent effects in 100% effluent)
up to 2 to 1	30

greater than 2 to 1 but less than 2.7 to 1	40
2.7 to 1 to 3.3 to 1	50

The acute WLA is 30% percent mortality in 100 percent effluent based on the dilution ratio of 1 to 1.

Reasonable Potential/ Effluent Limits/Hazard Management Decisions

After appropriate effluent limits are calculated, the reasonable potential of the discharger to violate the WQS must be determined. Each parameter is examined and placed in a defined "group". Parameters that do not have a WQS or do not require a WLA based on the initial screening are assigned to either group 1 or 2. For the allocated parameters, the preliminary effluent limits (PEL) based on the most restrictive average and maximum WLAs are selected from Table 7. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 3, and the PEL_{max} is compared to the PEQ_{max}. Based on the calculated percentage of the allocated value [($PEQ_{avg} \div PEL_{avg}$) X 100, or ($PEQ_{max} \div PEL_{max}$) X 100)], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 8.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 9 presents the final effluent limits and monitoring requirements proposed for outfall 001 and the basis for their recommendation.

Temperature and Flow Rate
Monitoring is proposed to continue for temperature and flow rate in order to assist in the evaluation of effluent quality and treatment plant performance.

Oil and Grease and pH
Limits for oil and grease and pH are based on WQS and are proposed to continue.

Fecal Coliform and E. coli
New E. coli limits are being proposed based on ORSANCO's 2012 pollution control standards. These limits will be in effect from April to October. The winter fecal coliform limits are based on WQS and are proposed to continue for the months of November through March. Based on BPJ, it is anticipated that East Liverpool WWTP will be able to meet the new limits next summer and will not require a schedule of compliance.

Total Suspended Solids, 5-day Carbonaceous Biochemical Oxygen Demand, and Dissolved Oxygen
Loading limits for total suspended solids (TSS), and 5-day carbonaceous biochemical oxygen demand (CBOD5), and the concentration limits for dissolved oxygen (DO) are based on treatment plant design. Limits and monitoring requirements are proposed to continue.

Ammonia, Nitrate+Nitrite, Phosphorus, Orthophosphate, and Total Kjeldahl Nitrogen
Monitoring for ammonia, nitrate+nitrite, phosphorus, orthophosphate, and total Kjeldahl nitrogen (TKN) are proposed to continue. ORSANCO and the U.S. EPA have recommended that major municipal dischargers to the Ohio River monitor for these parameters. The monitoring frequency for phosphorus is proposed to be increased to be consistent with Ohio EPA guidance for a plant with an average design flow of greater than 1 MGD.

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 dissolved solids in the East Liverpool WWTP's effluent.

Chloroform and Bis(2-ethylhexyl) phthalate
Ohio EPA risk assessment (Table 8) places these parameters in groups 2 and 3. This placement, as well as the data in Tables 1, 2 and 3, support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. No monitoring is proposed.

Cadmium, Chromium, Chromium+6 (dissolved), Cyanide- Free, Lead, and Nickel
Ohio EPA risk assessment (Table 8) places these parameters in groups 2 and 3. This placement, as well as the data in Tables 1, 2 and 3, support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring is proposed to continue in order to document that these pollutants continue to remain at low levels.

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

Copper
The Ohio EPA risk assessment (Table 8) places this parameter in group 5. This placement, as well as the data in Tables 1, 2 and 3, indicates that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality. For this parameter, the PEQ is greater than 100 percent of the WLA. Pollutants that meet this requirement must have permit limits under OAC 3745-33-07(A)(1). A daily maximum limit is proposed.

Mercury
The Ohio EPA risk assessment (Table 8) places this parameter in group 5. This placement, as well as the data in Tables 1, 2 and 3, indicates that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality. For this parameter, the PEQ is greater than 100 percent of the WLA. Pollutants that meet this requirement must have permit limits under OAC 3745-33-07(A)(1). Average monthly and daily maximum limits are proposed.

Whole Effluent Toxicity Reasonable Potential
Annual acute toxicity monitoring is proposed for the life of the permit. Evaluating the toxicity data presented in Table 4 and other pertinent data under the provisions of OAC 3745-33-07(B) placed the East Liverpool WWTP in Category 4 with respect to WET. While this indicates that the plant's effluent does not currently pose a toxicity problem, annual toxicity testing is proposed consistent with the minimum monitoring requirements at OAC 3754-33-07(B)(11). The proposed monitoring will adequately characterize toxicity in the plant's effluent.

Sewage Sludge
Limits and monitoring requirements proposed for the disposal of sewage sludge by the following management practices are based on OAC 3745-40: 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
A schedule of compliance is included for copper is detailed in Part I.C.

A schedule of compliance to incorporate recent rules revisions into the approved pretreatment program is included in Part I.C.

As the East Liverpool WWTP may have difficulty complying with the limits for mercury and because cost effective measures for reducing mercury discharge concentrations may not be available for the permittee, a schedule to meet mercury limits has been incorporated in the draft permit in Part I.C and a pollutant minimization program (PMP) has been included in Part II. The schedule requires the WWTP to determine if meeting the water quality-based effluent limits (WQBELs) for mercury will be possible. If the permittee believes that complying with the WQBELs is not possible, they may apply for a variance by submitting a mercury variance application. Ohio EPA would then review the application, and if approved, would proceed to modify the permit to incorporate variance-based mercury limits and conditions associated with the mercury variance. East Liverpool is required to make the determination described above and submit a mercury variance application (if needed) no later than 12 months after the effective date of the permit. If East Liverpool does not apply for a mercury variance and the permit is not modified, WQBELs for mercury will become effective at the end of the compliance schedule. Collecting and analyzing the samples for mercury must be done using U.S. EPA Method 1631 or 245.7 and utilized proper clean sampling procedures.

Sanitary Sewer Overflow Reporting
Provisions for reporting SSOs are again proposed in this permit. These provisions include: the reporting of the system-wide number of SSO occurrences on monthly operating reports; telephone notification of Ohio EPA and the local health department, and 5-day follow up written reports for certain high risk SSOs; and preparation of an annual report that is submitted to Ohio EPA and made available to the public. Many of these provisions were already required under the “Noncompliance Notification”, “Records Retention”, and “Facility Operation and Quality Control” general conditions in Part III of Ohio NPDES permits.

Operator Certification and Operator of Record
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 East Liverpool WWTP to have a Class III WWTP operator in charge of the sewage treatment plant operations discharging through outfall 001. These rules also require the permittee to designate one or more operator of record to oversee the technical operation of the treatment works.

Public Water Supply Notification
An addition to rule 3745-33-08 of the OAC requires that permittees discharging wastewater within ten miles of a downstream public water supply intake located on the same waterway, must develop spill (or bypass) notification procedures in conjunction with the downstream public water supply operator. Since the East Liverpool WWTP operates a public water supply intake less than ten miles downstream from the Buckeye Water District, Part II of the draft permit requires the development of notification procedures within six months after the effective date of the permit.

Storm Water Compliance
Parts IV, V, and VI have been included with the draft permit in order to ensure that any storm water flows from the facility site are properly regulated and managed. As an alternative to complying with Parts IV, V, and VI, the East Liverpool WWTP may seek permit coverage under the general permit for industrial stormwater (permit # OHR000005) or submit a “No Exposure Certification.” Parts IV, V, and VI will be removed from the final permit if: 1) the East Liverpool WWTP submits a Notice of Intent (NOI) for coverage under the general permit for industrial stormwater or submits a No Exposure Certification, 2) Ohio EPA determines that the facility is

eligible for coverage under the general permit or meets the requirements for a No Exposure Certification, and 3) the determination by Ohio EPA can be made prior to the issuance of the final permit.

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

Figure 1. Approximate Location of East Liverpool WWTP

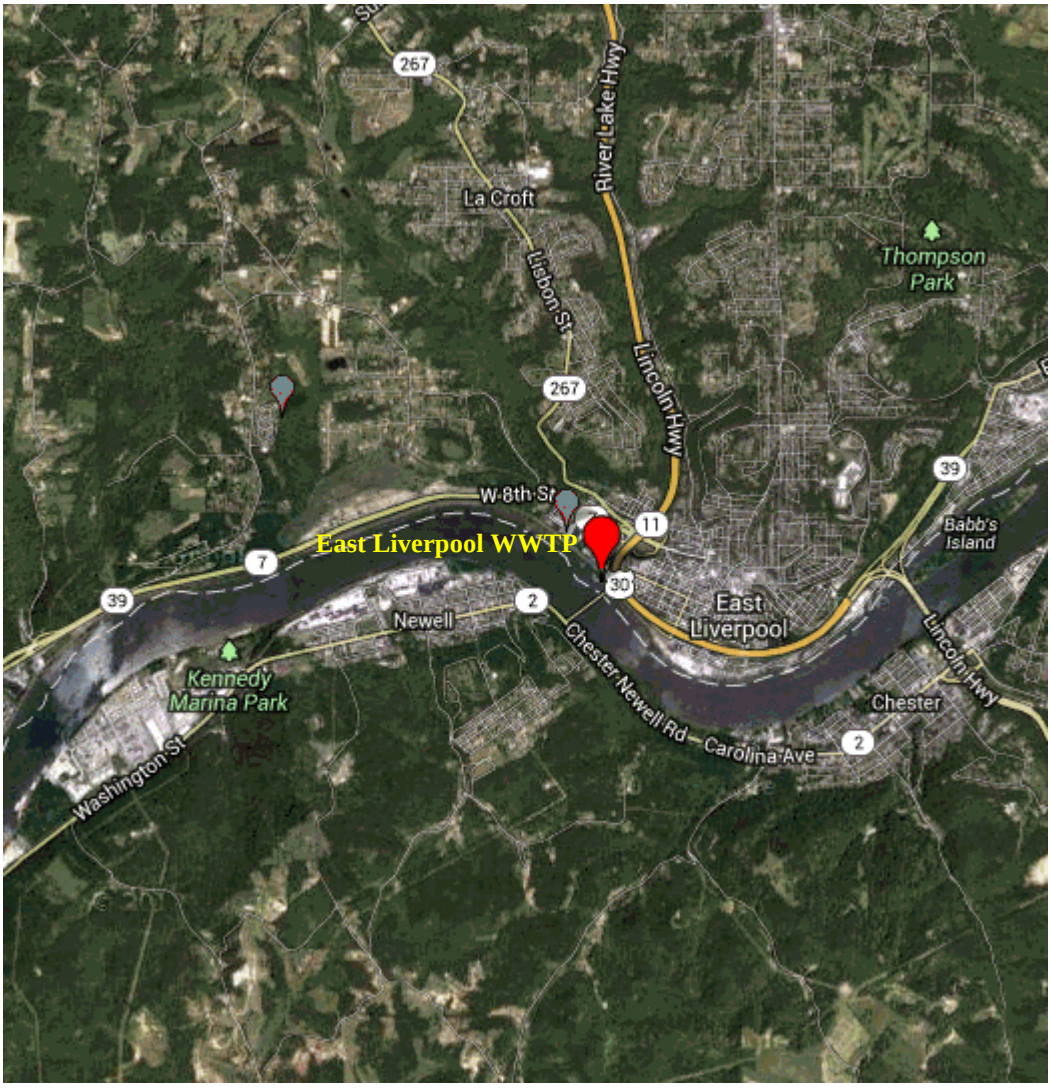

Table 1. Effluent Characterization Using Pretreatment Program Data

Parameter	Pretreatment Data (µg/L)				
	6/6/2008	4/19/2009	4/19/2010	4/20/2011	4/26/2012
Antimony	AA (40)	AA (2)	AA (2)	AA (2)	AA (10)
Arsenic	AA (40)	AA (1)	AA (1)	AA (1)	AA (10)
Beryllium	AA (5)	AA (0.2)	AA (0.2)	AA (0.2)	AA (10)
Bis(2-ethylhexyl) phthalate	AA (10)	1.6	2.3	1.7	AA (4)
Cadmium	AA (5)	AA (0.5)	AA (0.5)	AA (0.5)	AA (10)
Chloroform	AA (2)	AA (1)	1.7	AA (1)	AA (5)
Chromium	AA (10)	AA (2)	AA (2)	AA (2)	AA (10)
Copper	AA (10)	12	2.8	AA (2)	10
Lead	AA (20)	AA (2)	AA (2)	AA (2)	AA (10)
Mercury	AA (0.2)	AA (0.2)	AA (0.2)	AA (0.2)	AA (10)
Nickel	AA (10)	AA (0.2)	37	AA (0.2)	AA (10)
Selenium	AA (50)	AA (1)	AA (1)	AA (1)	AA (10)
Silver	AA (10)	AA (0.2)	AA (0.2)	AA (0.2)	AA (10)
Thallium	AA (50)	AA (2)	AA (2)	AA (2)	AA (10)
Zinc	AA (10)	AA (4)	18	AA (4)	40

AA = not detected (method detection limit)

Table 2. Effluent Characterization Using Self-Monitoring Data

Parameter	Season	Units	Current Permit Limits 30 day	Daily	# Obs.	Percentiles 50th	95th	Data Range
Outfall 001								
Water Temperature	Annual	°C	Monitor		1827	16	23	7-24
Dissolved Oxygen	Summer	mg/L	5.0 Minimum		919	6.3	7.2	5-65
Dissolved Oxygen	Winter	mg/L	5.0 Minimum		907	7.1	7.8	5.5-8.9
Total Suspended Solids	Annual	mg/L	26.1	39.2[a]	783	5	10.9	1-24
Oil and Grease	Annual	mg/L	10 Maximum		96	2	6	0-11
Ammonia	Summer	mg/L	Monitor		394	10.5	17.7	2.5-36.1
Ammonia	Winter	mg/L	Monitor		389	9.9	17.6	2.1-30
Total Nitrogen Kjeldahl	Annual	mg/L	Monitor		60	9.68	27.4	0-32.4
Nitrite + Nitrate	Annual	mg/L	Monitor		60	6.7	12.4	0-18.6
Orthophosphate	Annual	mg/L	Monitor		48	2.15	3.7	0-8.85
Phosphorus	Annual	mg/L	Monitor		48	2.55	7.28	0.91-237
Cyanide, Free	Annual	mg/L	Monitor		60	0	0	0-0
Nickel	Annual	µg/L	Monitor		60	0	0	0-10
Zinc	Annual	µg/L	Monitor		60	57	130	0-226
Cadmium	Annual	µg/L	Monitor		60	0	0	0-0
Lead	Annual	µg/L	Monitor		60	0	0	0-0
Chromium	Annual	µg/L	Monitor		60	0	0	0-0
Copper	Annual	µg/L	Monitor		60	0	20.5	0-64
$Chromium^{+6}$ (dissolved)	Annual	µg/L	Monitor		60	0	0	0-0
Fecal Coliform	Summer	#/100 mL	200	400[a]	261	50	220	2-496
Fecal Coliform	Winter	#/100 mL	1000	2000[a]	194	80	445	4-886
Flow Rate	Annual	MGD	Monitor		1827	1.97	4.48	1.09-7.57
Mercury	Annual	ng/L	Monitor		50	12	44.8	1.91-75.9
Acute Toxicity, *Ceriodaphnia dubia*	Annual	TU_a	Monitor		4	0	0	0-0
Acute Toxicity, *Pimephales promelas*	Annual	TU_a	Monitor		4	0	0	0-0
pH, Maximum	Annual	S.U.	--	9.0	1827	7.2	7.4	6.8-7.6
pH, Minimum	Annual	S.U.	--	6.5	1827	7.1	7.3	6.6-7.5
Carbonaceous Biochemical Oxygen Demand (5 day)	Summer	mg/L	21.8	34.9[a]	394	6	10	1-17
Carbonaceous Biochemical Oxygen Demand (5 day)	Winter	mg/L	21.8	34.9[a]	388	6	10	1-17
Outfall 002								
Bypass Occurrence	Annual	No./Day	Monitor		1	1	1	1-1
Bypass Total Hours Per Day	Annual	Hrs/Day	Monitor		1	7	7	7-7
Total Suspended Solids	Annual	mg/L	Monitor		1	30	30	30-30

Table 2. Effluent Characterization Using Self-Monitoring Data

Parameter	Season	Units	Current Permit Limits 30 day	Daily	# Obs.	Percentiles 50th	95th	Data Range
Bypass Volume	Annual	MGAL	Monitor		1	0.05	0.05	0.05-0.05
Carbonaceous Biochemical Oxygen Demand (5 day)	Summer	mg/L	Monitor		0	0	0	0-0
Carbonaceous Biochemical Oxygen Demand (5 day)	Winter	mg/L	Monitor		1	5	5	5-5
Outfall 300								
Overflow Occurrence	Annual	No./Month	Monitor		34	0	2.7	0-7
Outfall 586								
Sludge Fee Weight	Annual	dry tons	Monitor		4	498	624	103-635
Outfall 588								
Sludge Weight	Annual	dry tons	Monitor		3	141	168	108-172
Sludge Volume	Annual	Gals	Monitor		3	33700	40400	26000-41100
Outfall 601								
Water Temperature	Annual	°C	Monitor		1827	16	22	6.9-23
Total Suspended Solids	Annual	mg/L	Monitor		783	114	222	9.5-354
Cyanide, Total	Annual	mg/L	Monitor		60	0	0	0-0
Nickel	Annual	µg/L	Monitor		60	0	0	0-12
Zinc	Annual	µg/L	Monitor		60	116	248	0-319
Cadmium	Annual	µg/L	Monitor		60	0	0	0-0
Lead	Annual	µg/L	Monitor		60	0	0	0-43
Chromium	Annual	µg/L	Monitor		60	0	0	0-14
Copper	Annual	µg/L	Monitor		60	26	56.1	0-228
Chromium^{+6} (dissolved)	Annual	µg/L	Monitor		60	0	0	0-0
Mercury	Annual	ng/L	Monitor		49	48.9	145	11.8-891
pH, Maximum	Annual	S.U.	Monitor		1827	7.4	7.6	7-8
pH, Minimum	Annual	S.U.	Monitor		1827	7.3	7.4	6.9-7.6
Carbonaceous Biochemical Oxygen Demand (5 day)	Summer	mg/L	Monitor		394	86	143	23-198
Carbonaceous Biochemical Oxygen Demand (5 day)	Winter	mg/L	Monitor		388	68	123	15-185

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."

Table 3. Projected Effluent Quality Values for Outfall 001

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
Ammonia (summer)	mg/L	262	262	13.65	21.01
Ammonia (winter)	mg/L	193	193	13.12	20.89
Bis(2-ethylhexyl) phthalate	µg/L	3	3	5.04	6.90
Cadmium	µg/L	60	0	--	--
Chloroform (Trichloromethane)	µg/L	3	1	3.72	5.10
Chromium	µg/L	60	0	--	--
Chromium^{+6} (dissolved)	µg/L	60	0	--	--
Copper	µg/L	64	14	26.35	37.30
Cyanide, free	mg/L	60	0	--	--
Lead	µg/L	60	0	--	--
Mercury	ng/L	50	50	38.66	61.64
Nickel	µg/L	65	2	27.01	37.00
Nitrate + Nitrite	mg/L	60	58	11.36	16.34
Orthophosphate	mg/L	48	43	3.86	5.80
Phosphorus	mg/L	47	47	4.211	5.998
Total Kjeldahl Nitrogen	mg/L	60	58	21.44	33.33
Zinc	µg/L	65	60	109.25	163.17

MDL = method detection limit
PEQ = projected effluent quality

Table 4. Summary of Acute Toxicity Results for Outfall 001

	Ceriodaphnia dubia	*Pimephales promelas*
Date	Acute Toxicity (TU_a)	Acute Toxicity (TU_a)
9/8/2009	AA	AA
9/15/2010	AA	AA
9/7/2011	AA	AA
9/17/2012	AA	AA

AA = not detected; detection limit of 0.2 TU_a
TU_a = acute toxicity unit

Table 5. Water Quality Criteria in the Study Area

		Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum	
Parameter	Units	Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Ammonia (summer)	mg/L	--	--	--	--	--
Ammonia (winter)	mg/L	--	--	--	--	--
Bis(2-ethylhexyl) phthalate	µg/L	18	--	8.4	1100	2100
Cadmium	µg/L	--	50	2.8	5.5	11
Chloroform (Trichloromethane)	µg/L	57	--	140	1300	2600
Chromium	µg/L	--	100	100	2100	4200
Chromium^{+6} (dissolved)	µg/L	--	--	11	16	31
Copper	µg/L	1300	500	11	17	33
Cyanide, free	mg/L	0.7	--	0.0052	0.022	0.044
Lead	µg/L	--	100	8.1	150	310
Mercury	ng/L	12	10000	910	1700	3400
Nickel	µg/L	610	200	61	550	1100
Nitrate + Nitrite	mg/L	10	100	--	--	--
Orthophosphate	mg/L	--	--	--	--	--
Phosphorus	mg/L	--	--	--	--	--
Total Kjeldahl Nitrogen	mg/L	--	--	--	--	--
Zinc	µg/L	9100	25000	140	140	280

Table 6. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
Stream Flows				
1Q10	cfs	annual	5880	ORSANCO, Montgomery Dam to Willow Island Dam
7Q10	cfs	annual	5880	ORSANCO, Montgomery Dam to Willow Island Dam
		summer	0	
		winter	0	
Harmonic Mean	cfs	annual	20500	ORSANCO, Montgomery Dam to Willow Island Dam
Mixing Assumption	%	average	10	WLAs for non-carcinogens are developed using 100 percent of the 7Q10
		maximum	1	
Hardness	mg/L	annual	120	ORSANCO, Montgomery Dam to Willow Island Dam
East Liverpool flow	cfs	annual	4.8	Reported average design flow
Background Water Quality				
Ammonia (summer)	mg/L		0.055	ORSANCO; 2000-2008; n=14; 0<MDL; Bimonthly sampling - New Cumberland Dam
Ammonia (winter)	mg/L		0.102	ORSANCO; 2000-2008; n=6; 1<MDL; Bimonthly sampling - New Cumberland Dam
Bis(2-ethylhexyl)phthalate	µg/L		0	No representative data available.
Cadmium	µg/L		0.05	ORSANCO; 2006-11; n=30; 28<MDL; Clean Metals Program - New Cumberland Dam
Chloroform (Trichloromethane)	µg/L		0	No representative data available.
Chromium	µg/L		1.3	ORSANCO; 2006-11; n=30; 1<MDL; Clean Metals Program - New Cumberland Dam
Chromium^{+6} (dissolved)	µg/L		0	ORSANCO; 2000-2008; n=0; 0<MDL; Clean Metals Program - New Cumberland Dam
Copper	µg/L		3.46	ORSANCO; 2006-11; n=30; 0<MDL; Clean Metals Program - New Cumberland Dam
Cyanide, free	mg/L			No representative data available.
Lead	µg/L		0.51	ORSANCO; 2006-11; n=30; 1<MDL; Clean Metals Program - New Cumberland Dam
Mercury	ng/L		1.9	ORSANCO; 2006-11; n=30; 10<MDL; Clean Metals Program - New Cumberland Dam
Nickel	µg/L		3.1	ORSANCO; 2006-11; n=30; 0<MDL; Clean Metals Program - New Cumberland Dam
Nitrate + Nitrite	mg/L		0.92	ORSANCO; 2000-2008; n=38; 0<MDL; Bimonthly sampling - New Cumberland Dam
Orthophosphate	mg/L		0	No representative data available.

Table 6. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
Phosphorus	mg/L		0.0465	ORSANCO; 2000-2008; n=54; 8<MDL; Bimonthly sampling - New Cumberland Dam
Total Kjeldahl Nitrogen	mg/L		0.449	ORSANCO; 2000-2008; n=39; 0<MDL; Bimonthly sampling - New Cumberland Dam
Zinc	µg/L		6.56	ORSANCO; 2006-11; n=30; 0<MDL; Clean Metals Program - New Cumberland Dam

MDL = method detection limit
n = number of samples
ORSANCO = Ohio River Valley Water Sanitation Commission
WLA = wasteload allocation

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

		Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum	
Parameter	Units	Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Bis(2-ethylhexyl)phthalate	µg/L	7706	--	1037	14575	2100
Cadmium	µg/L	--	21383	340	72	11
Chloroform (Trichloromethane)	µg/L	24401	--	17290	17225	2600
Chromium	µg/L	--	42253	12191	27809	4200
Chromium^{+6} (dissolved)	µg/L	--	--	1358	212	31
Copper	µg/L	1589562	212564	935	183	33
Cyanide, free	mg/L	858	--	0.64	0.29	0.044
Lead	µg/L	--	42591	938	1981	310
Mercury	ng/L	12	10000	910	1700	3400
Nickel	µg/L	744062	84293	7154	7250	1100
Nitrate + Nitrite	mg/L	11133	42415	--	--	--
Orthophosphate	mg/L	--	--	--	--	--
Phosphorus	mg/L	--	--	--	--	--
Total Kjeldahl Nitrogen	mg/L	--	--	--	--	--
Zinc	µg/L	11148564	10699282	16486	1775	280

Table 8. Parameter Assessment for Outfall 001

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

Orthophosphate	Total Kjeldahl Nitrogen	Phosphorus

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

Cadmium	Chromium	Lead
Cyanide, free	Chromium+6 (dissolved)	
Chloroform (Trichloromethane)		

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

Nickel	Nitrate + Nitrite	Bis(2-ethylhexyl)phthalate

Group 4: PEQ_{max} >= 50 percent, but < 100 percent of the maximum PEL or PEQ_{avg} >= 50 percent, but < 100 percent of the average PEL. Monitoring is appropriate.

Zinc

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

		Recommended Effluent Limits	
Parameter	Units	Average	Maximum
Copper	µg/L	--	33
Mercury	ng/L	12	1700

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

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

Parameter	Units	Concentration 30 Day Average	Concentration Daily Maximum	Loading (kg/day)[a] 30 Day Average	Loading (kg/day)[a] Daily Maximum	Basis[b]
Temperature	°C	- - - - - - - - - - - - - - - Monitor - - - - - - - - - - - - -				M[c]
Flow Rate	MGD	- - - - - - - - - - - - - - - Monitor - - - - - - - - - - - - -				M[c]
Oil & Grease	mg/L	--	10.0	--	--	WQS
pH	S.U.	--	6.5 - 9.0	--	--	WQS
E. coli	#/100 mL	130	292[d]	--	--	ORS
Fecal Coliforms	#/100 mL	1000	2000[d]	--	--	WQS
Total Suspended Solids	mg/L	26.1	39.2[d]	306	460[d]	EP/PD
Carbonaceous Biochemical Oxygen Demand (5 day)	mg/L	21.8	34.9[d]	256	409[d]	EP/PD
Dissolved Oxygen	mg/L	--	5.0 Minimum	--	--	EP/PD
Ammonia	mg/L	- - - - - - - - - - - - - - - Monitor - - - - - - - - - - - - -				EP/M[c]
Nitrate+Nitrite	mg/L	- - - - - - - - - - - - - - - Monitor - - - - - - - - - - - - -				EP/M[c]
Phosphorus	mg/L	- - - - - - - - - - - - - - - Monitor - - - - - - - - - - - - -				EP/M[c]
Orthophosphate	mg/L	- - - - - - - - - - - - - - - Monitor - - - - - - - - - - - - -				EP/M[c]
Total Kjeldahl Nitrogen	mg/L	- - - - - - - - - - - - - - - Monitor - - - - - - - - - - - - -				EP/M[c]
Total Filterable Residue	mg/L	- - - - - - - - - - - - - - - Monitor - - - - - - - - - - - - -				BEJ
Cadmium	µg/L	- - - - - - - - - - - - - - - Monitor - - - - - - - - - - - - -				EP
Chromium	µg/L	- - - - - - - - - - - - - - - Monitor - - - - - - - - - - - - -				EP
Chromium^{+6} (dissolved)	µg/L	- - - - - - - - - - - - - - - Monitor - - - - - - - - - - - - -				EP
Cyanide, Free	mg/L	- - - - - - - - - - - - - - - Monitor - - - - - - - - - - - - -				EP
Lead	µg/L	- - - - - - - - - - - - - - - Monitor - - - - - - - - - - - - -				EP
Nickel	µg/L	- - - - - - - - - - - - - - - Monitor - - - - - - - - - - - - -				EP
Zinc	µg/L	- - - - - - - - - - - - - - - Monitor - - - - - - - - - - - - -				EP/RP
Copper	µg/L	--	33.0	--	0.388	WLA
Mercury	ng/L	12.0	1700	0.000141	0.02	WLA
Acute Toxicity						
Ceriodaphnia dubia	TU_a	- - - - - - - - - - - - - - - Monitor - - - - - - - - - - - - -				WET
Pimephales promelas	TU_a	- - - - - - - - - - - - - - - Monitor - - - - - - - - - - - - -				WET

[a] Effluent loadings based on average design discharge flow of 3.1 MGD.

[b] Definitions:

BEJ = Best Engineering Judgment
EP = Existing Permit
M = Division of Surface Water NPDES Permit Guidance 1: Monitoring frequency requirements for Sanitary Discharges
ORS = Ohio River Valley Sanitation Commission monitoring requirements
PD = Plant Design
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] Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.

[d] 7 day average limit.