

National Pollutant Discharge Elimination System (NPDES) Permit Program

F A C T S H E E T

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for the Easterly Wastewater Treatment Plant

Public Notice No.: 11-09-009
Public Notice Date: September 5, 2011
Comment Period Ends: October 5, 2011

OEPA Permit No.: 3PF00001*LD
Application No.: OH0024643

Name and Address of Applicant:

Northeast Ohio Regional Sewer District
3900 Euclid Avenue
Cleveland, Ohio 44115

Name and Address of Facility Where
Discharge Occurs:

Easterly Wastewater Treatment Plant
14021 Lakeshore Boulevard
Cleveland, Ohio 44110

Receiving Water: Lake Erie

Introduction

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

This Fact Sheet is prepared in order to document the technical basis and risk management decisions that are considered in the determination of water quality based NPDES Permit effluent limitations. The technical basis for the Fact Sheet may consist of evaluations of promulgated effluent guidelines, existing effluent quality, instream biological, chemical and physical conditions, and the relative risk of alternative effluent limitations. This Fact Sheet details the discretionary decision-making process empowered to the Director by the Clean Water Act and Ohio Water Pollution Control Law (ORC 6111). Decisions to award variances to Water Quality Standards 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 U.S. EPA in the effluent guideline regulations (a.k.a. categorical regulations) for industry categories in 40 CFR Parts 405-499. Technology-based regulations for publicly-owned treatment works are listed in the Secondary Treatment Regulations (40 CFR Part 133). If regulations have not been established for a category of dischargers, the director may establish technology-based limits based on best professional judgment (BPJ).

Ohio EPA reviews the need for water-quality-based limits on a pollutant-by-pollutant basis. Wasteload allocations are used to develop these limits based on the pollutants that have been detected in the discharge, and the receiving water's assimilative capacity. The assimilative capacity depends on the flow in the water receiving the discharge, and the concentration of the pollutant upstream. The greater the upstream flow, and the lower the upstream concentration, the greater the assimilative capacity is. Assimilative capacity may represent dilution (as in allocations for metals), or it may also incorporate the break-down of pollutants in the receiving water (as in allocations for oxygen-demanding materials).

The need for water-quality-based limits is determined by comparing the wasteload allocation for a pollutant to a measure of the effluent quality. The measure of effluent quality is called PEQ - Projected Effluent Quality.

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

Summary of Permit Conditions

The effluent limits and monitoring requirements proposed for the following parameters are the same as in the current permit, although some monitoring frequencies have changed: flow, temperature, dissolved oxygen, CBOD₅, total suspended solids, ammonia-nitrogen, total phosphorus, nitrite+nitrate-nitrogen, oil and grease, maximum pH, total residual chlorine, free cyanide, cadmium, chromium, dissolved hexavalent chromium, copper, lead, nickel and zinc.

New final effluent limits are proposed for *Escherichia coli*. New water quality standards for *E. coli* became effective in March 2010. A compliance schedule is proposed for meeting these new final effluent limits. Based on best engineering judgment, it is proposed that the plant comply with its current fecal coliform limits during the interim period.

A new minimum pH limit is proposed based on the results of a July 2011 mixing study conducted by NEORS and reviewed by Ohio EPA.

New final effluent limits are proposed for mercury. Effluent data show that it has the reasonable potential to cause or contribute to violations of water quality standards. The Agency is proposing to grant coverage under Ohio's general mercury variance.

New final effluent limits are proposed for acute and chronic whole effluent toxicity using *Ceriodaphnia dubia* as the test organisms. Annual monitoring for acute and chronic toxicity using fathead minnows is proposed

A new monitoring requirement is proposed for total dissolved solids (total filterable residue).

Current monitoring requirements for silver and bis(2-ethylhexyl)phthalate are being removed from the permit because effluent data show that they do not pose an environmental hazard in the Easterly plant 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 testing; 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 and Compliance Section
P.O. Box 1049
Columbus, Ohio 43216-1049**

The OEPA 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 Erm Gomes (Northeast District Office), (330) 963-1196, Erm.Gomes@epa.ohio.gov, or Gary Stuhlfauth (Central Office), (614) 644-2026, Gary.Stuhlfauth@epa.ohio.gov.

Location of Discharge/Receiving Water Use Classification

The Easterly wastewater treatment plant is located near the Lake Erie shore approximately 1.5 miles southwest of Euclid Creek. Figure 1 shows the approximate location of the facility.

This segment of Lake Erie is described by Ohio EPA River Code: 24-600, HUC 12: 041100030504, County: Cuyahoga, and Ecoregion: Eastern Great Lakes and Hudson Lowlands. Lake Erie is designated for the following uses under Ohio's Water Quality Standards (OAC 3745-1-31): Exceptional Warmwater Habitat (EWH), Superior High Quality Water, Public Water Supply (PWS), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), and Bathing Waters (BW).

Use designations define the goals and expectations of a waterbody. These goals are set for aquatic life protection, recreation use and water supply use, and are defined in the Ohio WQS (OAC 3745-1-07). The use designations for individual waterbodies are listed in rules -08 through -32 of the Ohio WQS. Once the goals are set, numeric water quality standards are developed to protect these uses. Different uses have different water quality criteria.

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

Recreation uses are defined by the depth of the waterbody and the potential for wading or swimming. Uses are defined for bathing waters, swimming/canoeing (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 Easterly wastewater treatment plant has an average daily design flow of 155 MGD (million gallons per day). The current peak capacities are 400 MGD through primary treatment and 300 MGD through secondary treatment. Wet stream processes include screening and grit removal, primary settling, grease removal, phosphorus removal, activated sludge aeration, final clarification, chlorination and dechlorination. Both primary sludge and waste activated sludge are pumped to the Southerly wastewater treatment plant for processing.

The Easterly plant has two bypasses. Station 002 is a raw influent bypass, and station 003 is a bypass of primary treatment effluent. Discharges from station 002 that occur during wet weather periods when the flow in the sewer system exceeds the capacity of the wastewater treatment system are currently regulated under the terms and conditions of Ohio EPA permit number 3PA00002 (see below) as combined sewer overflow 001 (CSO 001). These wet-weather overflow events at station 002, which emanate from CSO 001, will now be regulated under the Easterly permit.

The Easterly collection system includes both separate sanitary sewers and combined sewers. The system's combined sewers are regulated under Ohio EPA Permit number 3PA00002. A consent decree, civil action number 1:10CV2895-DCN, was filed on July 7, 2011. It addresses the long-term plan that will enable the District to control discharges of untreated sewage during wet weather and comply with Clean Water Act standards.

The decree includes the following control measures at the Easterly plant:

- Increase secondary treatment capacity from 300 MGD to a sustained capacity of 400 MGD;
- Pilot test chemically enhanced high rate treatment (CEHRT) and disinfection at CSO 001, and if performance criteria are met, construction of 400 MGD CEHRT and disinfection system; or
- If CEHRT does not meet performance criteria, construction of 400 MGD ballasted flocculation and disinfection system.

The District implements an Ohio EPA-approved industrial pretreatment program. Based on information on the program's 2010 annual report, 43 categorical industrial users and 9 significant noncategorical industrial users discharge to the Easterly plant.

Description of Existing Discharge

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

Table 2 presents a summary of unaltered Discharge Monitoring Report (DMR) data for outfall 3PF00001001. Data are presented for the period April 2006 through March 2011, and current permit limits are provided for comparison.

Table 3 summarizes the chemical specific data for outfall 001 by presenting the average and maximum Projected Effluent Quality (PEQ) values.

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

Table 5 summarizes DMR data for bypass stations 002 and 003 for the period April 2006 through March 2011.

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 *Ohio 2010 Integrated Water Quality Monitoring and Assessment Report* states that there hasn't been any Ohio EPA near-shore lake monitoring since 2002. Monitoring is scheduled for 2012 and a TMDL is scheduled for 2015 to address water quality impairments.

The *Integrated Report* is available at the following Ohio EPA internet site:

<http://epa.ohio.gov/dsw/tmdl/OhioIntegratedReport.aspx> .

Development of Water-Quality-Based Effluent Limits

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

Parameter Selection Effluent data for the Easterly plant were used to determine what parameters should undergo wasteload allocation. 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)	April 2006 through March 2011
Pretreatment data	2006 - 2010

The data were examined, and the following values were removed from the evaluation to give a more reliable projection of effluent quality: total residual chlorine – one high value of 2.05 mg/l.

This data is evaluated statistically, and Projected Effluent Quality (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 water quality standards (WQS) and allowable wasteload allocation (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 wasteload allocation is done for that parameter. If either PEQ_{avg} or PEQ_{max} is greater than 25 percent of the applicable WQS, a wasteload allocation is conducted to determine whether the parameter exhibits reasonable potential and needs to have a limit or if monitoring is required. See Table 9 for a summary of the screening results.

Wasteload Allocation For those parameters that require a WLA, the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. Dischargers are allocated pollutant loadings/concentrations based on the Ohio Water Quality Standards (OAC 3745-1). Most pollutants are allocated by a mass-balance method because they do not degrade in the receiving water.

Wasteload allocations for direct discharges to lakes are done using the following equation for average criteria:

$$WLA = (11 \times \text{Water Quality Criteria}) - (10 \times \text{Background Concentration}).$$

Allocations for maximum criteria are set equal to the Inside Mixing Zone Maximum values.

Ohio's water quality standard 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 water quality standards at the end-of-pipe, which is a monthly average of 1.3 ng/l in the Lake Erie basin.

The data used in the WLA are listed in Tables 6 and 7. The wasteload allocation results to maintain all applicable criteria are presented in Table 8.

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.

Water quality standards 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). Wasteload allocations can then be calculated using TUs as if they were water quality criteria.

The wasteload allocation calculations for WET are similar to those for aquatic life criteria, above. For the Easterly plant, the wasteload allocation values are 1.0 TU_a and 11 TU_c.

The chronic toxicity unit (TU_c) is defined as 100 divided by the IC₂₅:

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

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

$$TU_c = 100/\text{geometric mean of NOEC and LOEC}$$

The acute toxicity unit (TU_a) is defined as 100 divided by the LC_{50} for the most sensitive test species:

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

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

Reasonable Potential/ Effluent Limits/Hazard Management Decisions

After appropriate effluent limits are calculated, the reasonable potential of the discharger to violate the water quality standards must be determined. Each parameter is examined and placed in a defined "group". Parameters that do not have a water quality standard or do not require a wasteload allocation 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 wasteload allocations are selected from Table 8. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 3, and the PEL_{max} is compared to the PEQ_{max} . Based on the calculated percentage of the allocated value [$(PEQ_{avg} \div PEL_{avg}) \times 100$, or $(PEQ_{max} \div PEL_{max}) \times 100$], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 9.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 10 presents the final effluent limits and monitoring requirements proposed for Easterly outfall 3PF00001001 and the basis for their recommendation.

Based on best engineering judgment, the limits proposed for total suspended solids and $CBOD_5$ and the monitoring of dissolved oxygen and ammonia-nitrogen are a continuation of existing permit conditions.

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

Water quality standards for *E. coli* became effective in March 2010, and a compliance schedule is proposed for meeting these new final effluent limits no later than May 1, 2013. The schedule provides time during the summer disinfection season for the plant to evaluate the ability of its existing disinfection system to achieve the new limits and to make operational changes or equipment upgrades if necessary. Based on best engineering judgment, it is proposed that the plant comply with its current fecal coliform limits during the interim period.

The maximum limit proposed for pH, 9.0 SU, is based on Ohio water quality standards (OAC 3745-1-07) and is a continuation of the existing limit. Based on best engineering judgment, the limit proposed for minimum pH, 6.0 SU, is based on the results of a July 2011 mixing study conducted by NEORS and reviewed by Ohio EPA. That study showed the proposed limit is protective of the minimum water quality standard of 6.5 SU.

The proposed limit for total residual chlorine is based on wasteload allocation as limited by the inside mixing zone maximum (IMZM). The IMZM is a value calculated to avoid rapidly lethal conditions in the effluent mixing zone. 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.

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

Mercury Reasonable Potential and Mercury Variance The Ohio EPA risk assessment (Table 9) places mercury in group 5. This placement as well as the data in Tables 2 and 3 indicate that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality.

To comply with mercury limits, the permittee has applied for coverage under the general mercury variance, Rule 3745-33-07(D)(10) of the Ohio Administrative Code. Based on the results of low-level mercury monitoring, the

permittee has determined that its wastewater treatment plant cannot meet the 30-day average water quality-based effluent limit (WQBEL) of 1.3 nanograms per liter (ng/l). However, the permittee believes that the plant will be able to achieve an annual average mercury effluent concentration of 12 ng/l. The variance application 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 on these factors, the permittee is eligible for coverage under the general mercury variance.

Ohio EPA has reviewed the mercury variance application and has determined that it meets the requirements of the Ohio Administrative Code. Items S, T and U in Part II of the draft NPDES permit list the provisions of the mercury variance, and includes the following requirements:

- A variance-based monthly average effluent limit of 4.5 ng/l, which was developed from sampling data submitted by the permittee;
- A requirement that the permittee 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 (PMP);
- Low-level mercury monitoring of the plant's influent and effluent;
- A requirement that the annual average mercury effluent concentration 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 to submit an annual report on implementation of the PMP; and
- A requirement for submittal of a certification stating that all permit conditions related to implementing the plan of study and the PMP have been satisfied, but that compliance with the monthly average water quality-based effluent limit for mercury has not been achieved.

Ohio EPA risk assessment (Table 9) places free cyanide, cadmium, total chromium, dissolved hexavalent chromium, copper, lead, nickel, zinc and total dissolved solids (total filterable residue) in groups 2 and 3. This placement as well as the data in Tables 1, 2 and 3 support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring at a low frequency is proposed to document that these pollutants continue to remain at low levels.

Additional monitoring requirements proposed at the final effluent, influent and sludge 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 water quality studies.

Whole Effluent Toxicity Reasonable Potential

Evaluating the acute and chronic toxicity results for *Ceriodaphnia dubia* in Table 4 under the provisions of 40 CFR Part 132, Appendix F, Procedure 6, gives an acute PEQ value of 0 TU_a and an chronic PEQ of 14.1 TU_c. Reasonable potential for toxicity is demonstrated, since the chronic PEQ exceeds the wasteload allocation value of 11.0 TU_c. Consistent with Procedure 6 and OAC 3745-33-07(B), a monthly average limit of 11.0 TU_c and a daily maximum limit of 1.0 TU_a are proposed for *C. dubia*. Twice per year testing is proposed.

To meet the minimum testing requirements for whole effluent toxicity [OAC 3745-33-07(B)(11)], once per year monitoring with the determination of acute endpoints using fathead minnows is also proposed for the life of the permit.

Other Requirements

Compliance Schedule

A six month compliance schedule is proposed for the District 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 District must also submit a pretreatment program modification request.

A six month compliance schedule is proposed for the District to submit a pretreatment program modification request for implementing changes required by Ohio's pretreatment rules and U.S. EPA's pretreatment streamlining rule.

Sanitary Sewer Overflow Reporting

Provisions for reporting sanitary sewer overflows (SSOs) are proposed in this permit. These provisions include: reporting the number of SSO occurrences from sewers owned or operated by the District 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 Easterly plant 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 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.

Storm Water Compliance

The Easterly wastewater treatment plant is covered under Ohio EPA's general permit for industrial storm water (permit # OHR000004). At the appropriate time, the District will submit a Notice of Intent to renew this coverage.

Outfall Signage

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



Figure 1. Location of NEORSD wastewater treatment plants.

Table 1. Effluent Characterization Using Pretreatment Data

Summary of analytical results for Easterly outfall 3PF00001001. Units ug/l unless otherwise noted; PT = data from pretreatment program reports; ND = not detected (detection limit).

PARAMETER	PT 08/10/10	PT 08/13/09	PT 08/26/08	PT 09/24/07	PT 08/17/06	OEPA 05/17/11
Antimony	3.21	4.1	ND(0.4)	ND(10)	ND(10)	NA
Arsenic	ND(0.66)	1.98	ND(0.4)	ND(20)	ND(10)	NA
Cadmium	0.18	ND(0.15)	ND(0.2)	ND(1.0)	ND(1.0)	NA
Chromium	1.185	2.26	ND(0.5)	ND(10)	11.9	NA
Copper	4.395	1.79	2.4	ND(10)	ND(10)	NA
Dissolved solids, total (mg/l)	NA	NA	NA	NA	NA	576
Lead	0.675	ND(0.22)	ND(0.3)	ND(10)	ND(10)	NA
Nickel	3.3	4.41	3.5	11.7	25.4	NA
Selenium	1.535	1.56	8.5	ND(10)	ND(10)	NA
Thallium	3.335	1.69	8.3	ND(20)	ND(20)	NA
Zinc	34.08	14.25	34.9	18.5	34.6	NA
Bis(2-ethylhexyl)- phthalate	ND(10)	ND(20)	ND(10)	ND(10)	19	ND(10.6)
Bromodichloromethane	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	0.63
Chloroform	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	1.33

Table 2. Effluent Characterization Using Self-Monitoring Data

Summary of current permit limits and unaltered discharge monitoring report data for Easterly outfall 3PF00001001 (April 2006 – March 2011). All values are based on annual records unless otherwise indicated. * = For minimum pH, 5th percentile shown in place of 50th percentile; ** = For dissolved oxygen, 5th percentile shown in place of 95th percentile; a = weekly average.

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50 th	95 th	
Water Temperature	Annual	C	Monitor		1826	16.7	23.6	7.6-25
Dissolved Oxygen	Summer	mg/l	Monitor		920	7.7	6.1**	3-10.1
Dissolved Oxygen	Winter	mg/l	Monitor		906	8.8	7.05**	4.7-11.8
Total Suspended Solids	Annual	mg/l	20	30 ^a	1813	4	13.4	0-100
Oil and Grease, Hexane	Annual	mg/l		10	130	0	2.4	0-6.3
Nitrogen, Ammonia (NH3)	Summer	mg/l	Monitor		912	0.76	4.89	0.06-8.82
Nitrogen, Ammonia (NH3)	Winter	mg/l	Monitor		873	1.59	4.77	0.03-10.5
Nitrite Plus Nitrate, Total	Annual	mg/l	Monitor		1786	3.86	7.18	0.39-10.2
Phosphorus, Total (P)	Annual	mg/l	1.0	1.5 ^a	1783	0.39	0.97	0.04-2.51
Cyanide, Free	Annual	mg/l	Monitor		127	0.0011	0.00447	0-0.0109
Nickel, Total Recoverable	Annual	ug/l	Monitor		256	3.7	9.13	1.9-17.9
Silver, Total Recoverable	Annual	ug/l	Monitor		256	0	0.105	0-0.4
Zinc, Total Recoverable	Annual	ug/l	Monitor		256	22	33	11.8-81.2
Cadmium, Total Recoverable	Annual	ug/l	Monitor		256	0.2	0.5	0-2.8
Lead, Total Recoverable	Annual	ug/l	Monitor		256	0	1	0-3.5
Chromium, Total Recoverable	Annual	ug/l	Monitor		256	1.1	2.53	0-8.3
Copper, Total Recoverable	Annual	ug/l	Monitor		256	8.8	13.1	3.7-28
Chromium, Dissolved Hexavalent	Annual	ug/l	Monitor		130	3.3	5	0-6.76
Fecal Coliform	Annual	#/100/ml	1000	2000 ^a	915	46	2160	0-320000
Bis(2-ethylhexyl) Phthalate	Annual	ug/l	Monitor		18	0	11.5	0-20
Flow Rate	Summer	MGD	Monitor		920	70.6	152	56.3-278
Flow Rate	Winter	MGD	Monitor		906	85.4	199	57.7-286
Flow Rate	Annual	MGD	Monitor		1826	77.2	178	56.3-286
Chlorine, Total Residual	Annual	mg/l		0.038	943	0	0	0-2.05
pH, Maximum	Annual	S.U.		9.0	1826	7.2	7.4	6.9-8.6
pH, Minimum	Annual	S.U.		6.5	1826	6.8	7.2	6.5-7.4
Mercury, Total Recoverable	Annual	ng/l	Monitor		60	2	4.56	0.7-11.2
CBOD 5 day	Summer	mg/l	15	22.5 ^a	911	2	6	0-39
CBOD 5 day	Winter	mg/l	15	22.5 ^a	880	3	6	0-15

Table 3. Projected Effluent Quality Values

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
Antimony - TR	ug/l	3	2	8.979	12.3
Arsenic - TR	ug/l	3	1	4.3362	5.94
Bis(2-ethylhexyl)phthalate	ug/l	24	5	18.98	26
Bromodichloromethane	ug/l	1	1	2.85	3.91
Cadmium - TR	ug/l	256	178	0.437	0.655
Chlorine - TRes	mg/l	942	7	0.021462	0.0294
Chloroform	ug/l	1	1	6.02	8.25
Chromium - TR	ug/l	256	233	1.96	2.74
Chromium VI - Diss	ug/l	130	127	4.81	6.44
Copper - TR	ug/l	256	256	11.3	14
Cyanide - free	mg/l	127	113	0.0042	0.0064
Dissolved solids, total	mg/l	1	1	2607	3571
Lead - TR	ug/l	256	54	0.796	1.12
Mercury - TR	ng/l	60	60	3.77	5.45
Nickel - TR	ug/l	256	256	6.12	8.04
Nitrate-N + Nitrite-N	mg/l	1786	1786	4.45884	6.108
Selenium - TR	ug/l	5	3	16.79	23
Silver - TR	ug/l	256	32	0.111	0.159
Thallium - TR	ug/l	3	3	18.177	24.9
Zinc - TR	ug/l	256	256	28.2	34.3

Table 4. Summary of acute and chronic toxicity test results.

Test Date(a)	<i>Ceriodaphnia dubia</i> 48 hours	<i>Fathead Minnows</i> 96 hours	<i>Ceriodaphnia dubia</i> 7 days	<i>Fathead Minnows</i> 7 days
	TUa ^b	TUa ^b	TUc ^b	TUc ^b
02/07/06(E)	BD	BD	BD	BD
08/08/06(E)	BD	BD	5.65	BD
02/05/07(E)	BD	BD	BD	BD
08/14/07(E)	BD	BD	BD	BD
02/04/08(E)	BD	BD	BD	BD
08/04/08(E)	BD	BD	BD	BD
02/04/09(E)	BD	BD	1.4	BD
08/04/09(E)	BD	BD	8.3	BD
02/03/10(E)	BD	BD	--	BD
03/04/10(E)	BD*	--	BD*	--
08/12/10(E)	BD	BD	7.9	BD
02/09/11(E)	BD	BD	BD	BD
05/17, 18/11(O) [#]	BD	BD	--	--

^a O = EPA test; E = entity test

^b TUa = acute toxicity units, TUc = chronic toxicity units

BD = below detection

* = *C. dubia* retest

= 48 hour screening test

Table 5. Summary of DMR Data for Bypass Stations 002 and 003

Season	Year	# of Obs.	# Below Detection	Minimum	----- Percentiles -----						Maximum	Mean
					5th	25th	50th	75th	95th	99th		
Monitoring Station 002;		Reporting Code: 00530;				Parameter Name: Total Suspended Solids (mg/l)						
Annual	2010	1	0	91	91	91	91	91	91	91	91	91
Annual	2011	1	0	197	197	197	197	197	197	197	197	197
Annual Overall	2010-2011	2	0	91	96.3	117.5	144	170.5	191.7	195.94	197	144
Monitoring Station 002;		Reporting Code: 50050;				Parameter Name: Flow Rate (MGD)						
Annual	2006	1	0	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
Annual	2010	1	0	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7
Annual	2011	1	0	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7
Annual Overall	2006-2011	3	0	2.6	3.21	5.65	8.7	24.2	36.6	39.08	39.7	17
Monitoring Station 002;		Reporting Code: 80082;				Parameter Name: CBOD 5 day (mg/l)						
Annual	2011	1	0	28	28	28	28	28	28	28	28	28
Annual Overall	2011-2011	1	0	28	28	28	28	28	28	28	28	28
Monitoring Station 002;		Reporting Code: 80999;				Parameter Name: Bypass Duration, Hours per month (Hr/Month)						
Annual	2006	1	0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Annual	2010	1	0	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
Annual	2011	1	0	5.81	5.81	5.81	5.81	5.81	5.81	5.81	5.81	5.81
Annual Overall	2006-2011	3	0	0.8	1.301	3.305	5.81	6.055	6.251	6.2902	6.3	4.3033
Monitoring Station 003;		Reporting Code: 00530;				Parameter Name: Total Suspended Solids (mg/l)						
Annual	2006	35	0	45	49.5	64	75	97.5	132.9	152.3	154	81.114
Annual	2007	56	0	30	38	62	79.5	97.75	145.5	183.8	186	84.339
Annual	2008	55	0	19	38.5	56.5	67	81.5	104.2	131.42	146	70.195
Annual	2009	50	0	23	31.35	50.75	71.5	91.5	132.05	166.32	182	75.26
Annual	2010	37	0	42	44.4	85	100	136	187	194.04	198	107.14
Annual	2011	8	0	38	38.7	51.25	73.5	116.25	166.8	186.96	192	88.375
Annual Overall	2006-2011	241	0	19	39	58	77	99	150	187	198	82.393
Monitoring Station 003;		Reporting Code: 50050;				Parameter Name: Flow Rate (MGD)						
Annual	2006	36	0	0.31	0.335	2.2825	7.95	12.763	27.67	30.059	30.57	8.9113
Annual	2007	57	0	0.5	1.76	5.22	8.8	17.3	30.84	36.304	37.2	11.854
Annual	2008	57	0	1.6	1.86	4.1	8.5	13.6	41.24	47.24	49.2	12.344
Annual	2009	50	0	0.9	1.745	6.575	12.4	22.375	39.85	53.252	60.7	15.682
Annual	2010	37	0	0.7	0.96	2.8	8	15	32.08	38.192	38.3	10.654
Annual	2011	8	0	8.2	8.375	13.35	28.4	55.1	67.305	69.461	70	34.2
Annual Overall	2006-2011	245	0	0.31	1	4.1	8.8	17.4	37.86	57.18	70	12.865
Monitoring Station 003;		Reporting Code: 80082;				Parameter Name: CBOD 5 day (mg/l)						
Annual	2006	33	0	9	20.8	32	40	50	83.4	114.4	116	43.455
Annual	2007	56	0	10	14.75	21.75	29.5	60	76.75	94.6	99	39.964
Annual	2008	55	0	6.1	12.62	21.65	30.8	42.25	67.33	82.546	88	34.724
Annual	2009	49	0	10	13.4	21	39	72	113.6	142.72	148	50.204
Annual	2010	34	0	10	17.6	26	39.5	50.5	67.75	73.68	75	40.588
Annual	2011	8	0	17	17	25.25	28.5	32.25	41.45	45.09	46	28.75
Annual Overall	2006-2011	235	0	6.1	14	23	36	51.5	88.9	116	148	41.071
Monitoring Station 003;		Reporting Code: 80999;				Parameter Name: Bypass Duration, Hours per month (Hr/Month)						
Annual	2006	36	0	0.2	0.3475	1.52	4.9	8.13	13.233	17.433	18.43	5.4172
Annual	2007	57	0	0.56	0.97	2.34	4.58	8.69	13.086	16.027	16.38	5.8418
Annual	2008	57	0	0.77	0.946	2.05	3.8	6.8	13.286	21.79	23.75	5.4356
Annual	2009	50	0	0.52	0.8645	2.3525	4.375	7.8425	12.405	14.628	15.02	5.3064
Annual	2010	37	0	0.47	0.764	1.87	3	5.17	9.734	13.475	14.67	4.0422
Annual	2011	8	0	2.57	3.0425	6.8075	9.36	15.205	17.92	18.76	18.97	10.359
Annual Overall	2006-2011	245	0	0.2	0.782	2.1	4.07	8.08	14.58	18.732	23.75	5.4513

Table 6. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria					Inside Mixing Zone Maximum
		Wildlife	Average			Maximum	
			Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Antimony - TR	ug/l	--	780	--	190	900	1800
Arsenic - TR	ug/l	--	580	100	150	340	680
Bis(2-ethylhexyl)phthalate	ug/l	--	32 ^c	--	8.4	1100	2100
Bromodichloromethane	ug/l	--	180 ^c	--	340	3100	6200
Cadmium - TR	ug/l	--	730	50	3.2	6.6	13
Chlorine - TRes	mg/l	--	--	--	0.011	0.019	0.038
Chloroform	ug/l	--	1700 ^c	--	140	1300	2600
Chromium - TR	ug/l	--	14000	100	110	2400	4800
Chromium VI - Diss	ug/l	--	14000	--	11	16	31
Copper - TR	ug/l	--	64000	500	12	19	38
Cyanide - free	mg/l	--	48	--	0.0052	0.022	0.044
Dissolved solids (avg)	mg/l	--	--	--	1500	--	--
Lead - TR	ug/l	--	--	100	9.9	190	380
Mercury - TR	ng/l	1.3	3.1	10000	910	1700	3400
Nickel - TR	ug/l	--	43000	200	69	620	1200
Nitrate-N + Nitrite-N	mg/l	--	--	100	--	--	--
Selenium - TR	ug/l	--	3100	50	5	--	--
Silver - TR	ug/l	--	11000	--	1.3	2.9	5.7
Thallium - TR	ug/l	--	--	--	17	79	160
Zinc - TR	ug/l	--	35000	25000	160	160	320

c = carcinogen

Table 7. Instream Conditions and Discharger Flow

<u>Parameter</u>	<u>Units</u>	<u>Season</u>	<u>Value</u>	<u>Basis</u>
<i>Hardness</i>	mg/l	annual	140	DSW
<i>NEORSD Easterly flow</i>	cfs	annual	240	(155 MGD) 2A Application
<i>Background Water Quality</i>				
Antimony - TR	ug/l		0	No representative data available.
Arsenic - TR	ug/l		0	No representative data available.
Bis(2-ethylhexyl)phthalate	ug/l		0	No representative data available.
Bromodichloromethane	ug/l		0	No representative data available.
Cadmium - TR	ug/l		0.25	BWQR; 1988; n=1696; 1365<MDL; Statewide 50th percentile
Chlorine - TRes	mg/l		0	No representative data available.
Chloroform	ug/l		0	No representative data available.
Chromium - TR	ug/l		15	BWQR; 1988; n=1641; 1388<MDL; Statewide 50th percentile
Chromium VI - Diss	ug/l		0	No representative data available.
Copper - TR	ug/l		5	BWQR; 1988; n=2867; 1597<MDL; Statewide 50th percentile
Cyanide - free	mg/l		0	No representative data available.
Dissolved solids (avg)	mg/l		382	BWQR; 1988; n=3755; 0<MDL; Statewide 50 th percentile
Lead - TR	ug/l		2	BWQR; 1988; n=2814; 1458<MDL; Statewide 50th percentile
Mercury - TR	ng/l		0	No representative data available.
Nickel - TR	ug/l		20	BWQR; 1988; n=1259; 1105<MDL; Statewide 50th percentile
Nitrate-N + Nitrite-N	mg/l		0.73	BWQR; 1988; n=5852; 514<MDL; Statewide 50th percentile
Selenium - TR	ug/l		0	No representative data available.
Silver - TR	ug/l		0	No representative data available.
Thallium - TR	ug/l		0	No representative data available.
Zinc - TR	ug/l		15	BWQR; 1988; n=2284; 1117<MDL; Statewide 50th percentile

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

Parameter	Units	Outside Mixing Zone Criteria					Inside Mixing Zone Maximum
		Wildlife	Average			Maximum	
			Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Antimony - TR	ug/l	--	8580	--	2090	--	1800
Arsenic - TR	ug/l	--	6380	1100	1650	--	680
Bis(2-ethylhexyl)phthalate	ug/l	--	352	--	92	--	2100
Bromodichloromethane	ug/l	--	1980	--	3740	--	6200
Cadmium - TR	ug/l	--	8028	548	33	--	13
Chlorine - TRes	mg/l	--	--	--	0.12	--	0.038
Chloroform	ug/l	--	18700	--	1540	--	2600
Chromium - TR	ug/l	--	153850	950	1060	--	4800
Chromium VI - Diss	ug/l	--	154000	--	121	--	31
Copper - TR	ug/l	--	703950	5450	82	--	38
Cyanide - free	mg/l	--	528	--	0.057	--	0.044
Dissolved solids (avg)	mg/l	--	--	--	12680	--	--
Lead - TR	ug/l	--	--	1080	89	--	380
Mercury - TR	ng/l	1.3	3.1	10000	910	1700	3400
Nickel - TR	ug/l	--	472800	2000	559	--	1200
Nitrate-N + Nitrite-N	mg/l	--	--	1093	--	--	--
Selenium - TR	ug/l	--	34100	550	55	--	--
Silver - TR	ug/l	--	121000	--	14	--	5.7
Thallium - TR	ug/l	--	--	--	187	--	160
Zinc - TR	ug/l	--	384850	274850	1610	--	320

Table 9. Parameter Assessment

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

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

Antimony - TR	Arsenic - TR	Cadmium - TR
Chromium - TR	Lead - TR	Nickel - TR
Nitrate-N + Nitrite-N	Silver - TR	Zinc - TR
Bromodichloromethane	Chloroform	

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

Bis(2-ethylhexyl)phthalate	Chromium VI - Diss	Copper - TR
Cyanide - free	Selenium - TR	Thallium - TR
Dissolved solids (avg)		

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.

Chlorine - TRes

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

Limits to Protect Numeric Water Quality Criteria

<u>Parameter</u>	<u>Units</u>	<u>Period</u>	<u>Recommended Effluent Limits</u>	
			<u>Average</u>	<u>Maximum</u>
Mercury - TR	ng/l	Annual	1.3	1700

Table 10. Final Effluent Limits and Monitoring Requirements

Parameter	Units	Effluent Limitations				Basis ^b
		Concentration		Loading (kg/day) ^a		
		Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	
Temperature	°C	----- Monitor -----				M
Dissolved Oxygen	mg/l	----- Monitor -----				BEJ, EP
Suspended Solids	mg/l	20	30 ^c	11734	17600 ^c	BEJ, EP
Oil and Grease	mg/l	--	10	--	--	WQS, EP
Ammonia-N	mg/l	----- Monitor -----				BEJ, EP
Nitrite(N) + Nitrate(N)	mg/l	----- Monitor -----				M, EP
Phosphorus, Total	mg/l	1.0	1.5 ^c	587	880 ^c	PT, EP
Cyanide, Free	mg/l	----- Monitor -----				M
Nickel, T. R.	µg/l	----- Monitor -----				M
Zinc, T. R.	µg/l	----- Monitor -----				M
Cadmium, T. R.	µg/l	----- Monitor -----				M
Lead, T. R.	µg/l	----- Monitor -----				M
Chromium, T. R.	µg/l	----- Monitor -----				M
Copper, T. R.	µg/l	----- Monitor -----				M
Hex. Chromium (Dissolved)	µg/l	----- Monitor -----				M
Fecal Coliform						
Summer Only (Interim)	#/100ml	1000	2000 ^c	--	--	BEJ, EP
<i>E. coli</i>						
Summer Only (Final)	#/100ml	126	284 ^c	--	--	WQS
Flow	MGD	----- Monitor -----				M
Chlorine, Total Residual	mg/l	--	0.038	--	--	WLA/IMZM
Mercury, T.	ng/l	4.5	1700	0.00264	1.00	VAR(avg), WLA(max)
Whole Effluent Toxicity						
<i>C. dubia</i> Chronic	TUc	11.0	--	--	--	WET-RP
<i>C. dubia</i> Acute	TUa	--	1.0	--	--	WET-RP
<i>P. promelas</i> Chronic	TUc	----- Monitor -----				WET
<i>P. promelas</i> Acute	TUa	----- Monitor -----				WET
pH	S.U.	6.0 minimum 9.0 maximum				BEJ WQS, EP
Total Filterable Residue (Dissolved Solids)	mg/l	----- Monitor -----				M
CBOD ₅	mg/l	15	22.5 ^c	8800	13200 ^c	BEJ, EP

^a Effluent loadings based on average design discharge flow of 155 MGD.

^b **Definitions:** BEJ = Best Engineering Judgment; EP = Existing Permit; M = BEJ of Permit Guidance 1: Monitoring Frequency Requirements for Sanitary Discharges; PD = Plant Design Criteria; PT = Phosphorus treatment required under OAC 3745-33-06(C); VAR = mercury variance-based limits, OAC 3745-33-07(D)(10); WET = Minimum testing requirements for whole effluent toxicity [OAC 3745-33-07(B)(11)]; WET-RP = Requiring water quality-based effluent limits and monitoring requirements for whole effluent toxicity in NPDES permits [40 CFR Part 132, Appendix F, Procedure 6 and OAC 3745-33-07(B)]; WLA/IMZM = Wasteload Allocation limited by Inside Mixing Zone Maximum; WQS = Ohio Water Quality Standards (OAC 3745-1-07).

^c Weekly average limit.