National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for Jackson Pike Wastewater Treatment Plant (WWTP)
(Revised 3/2/16)

Public Notice No.: 15-12-047
Public Notice Date: December 30, 2015
Comment Period Ends: January 30, 2015

Ohio EPA Permit No.: 4PF00000*PD
Application No.: OH0024732

Name and Address of Applicant:
City of Columbus
1250 Fairwood Avenue
Columbus, OH 43206

Name and Address of Facility Where Discharge Occurs:
Jackson Pike Wastewater Treatment Plant
2104 Jackson Pike
Columbus, OH 43223
Franklin County

Receiving Water: Scioto River

Subsequent Stream Network: Ohio River

Introduction

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

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

No antidegradation review was necessary.

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

Ohio EPA reviews the need for water-quality-based limits on a pollutant-by-pollutant basis. Wasteload allocations (WLAs) are used to develop these limits based on the pollutants that have been detected in the

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

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

Summary of Permit Conditions

The effluent limits and monitoring requirements proposed for the following parameters are the same as in the previous permit, although some monitoring frequencies have changed: flow, temperature, dissolved oxygen, 5-day carbonaceous biochemical oxygen demand ($CBOD_5$), total suspended solids (TSS), ammonia-nitrogen, total phosphorus, nitrite+nitrate-nitrogen, total Kjeldahl nitrogen, oil and grease, pH, *Escherichia coli*, total residual chlorine, free cyanide, cadmium, chromium, dissolved hexavalent chromium, copper, lead, mercury, nickel, zinc, silver, total filterable residue, 2,4,6-trichlorophenol and whole effluent toxicity.

New monthly monitoring is proposed for dissolved orthophosphate (as P). Monitoring will be done by grab sample, which must be filtered within 15 minutes of collection using a 0.45-micron filter. The filtered sample must be analyzed within 48 hours. This monitoring is required by Ohio Senate Bill 1, which was signed by the Governor on April 2, 2015.

Peak flow rate is a new parameter proposed to allow reporting of flows that exceed the plant's normal operating capacity at times of excessive or extended wet weather flow from the combined sewer system. Flow reported under the peak flow rate reporting code, 50047, is not utilized in mass loading calculations.

Limits and monitoring are proposed to be removed for bis(2-ethylhexyl)phthalate because data show that its levels in the plant effluent do not pose an environmental hazard

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

Proposed monitoring for plant bypass stations and combined sewer overflows (CSO) is the same as in the current permit. The City has eliminated CSO stations 016, 042 and 050, and they have been removed from the permit.

A new CSO station has been added to the permit: station number 4PF00000052; relief location is at Rich and Fifth Streets; discharge location is to the Scioto River through a storm sewer at Bicentennial Park. Recent sewer improvement projects and associated new storm sewers, which are part of the City's on-going wet weather management plan and downtown development projects, have made it possible for the overflow from two existing combined sewer relief points to flow to the Scioto River instead of flowing back into a downstream combined sewer. The relief points will overflow through a new relief structure into a storm sewer. Modeling indicates this overflow will activate infrequently, maybe not more than once in 20 years

Monitoring for metals and free cyanide at downstream station 901 has been removed from the permit.

In Part II of the permit, special conditions are included that address sanitary sewer overflow (SSO) reporting; operator certification, minimum staffing and operator of record; whole effluent toxicity (WET) testing; the nine minimum control measures for CSOs; wet weather operations and peak flow reporting; pretreatment program requirements; and outfall signage.

Table of Contents

List of Figures

List of Tables

Procedures for Participation in the Formulation of Final Determinations

The draft action shall be issued as a final action unless the Director revises the draft after consideration of the record of a public meeting or written comments, or upon disapproval by the Administrator of the U.S. Environmental Protection Agency.

Within thirty days of the date of the Public Notice, any person may request or petition for a public meeting for presentation of evidence, statements or opinions. The purpose of the public meeting is to obtain additional evidence. Statements concerning the issues raised by the party requesting the meeting are invited. Evidence may be presented by the applicant, the state, and other parties, and following presentation of such evidence other interested persons may present testimony of facts or statements of opinion.

Requests for public meetings shall be in writing and shall state the action of the Director objected to, the questions to be considered, and the reasons the action is contested. Such requests should be addressed to:

Legal Records Section
Ohio Environmental Protection Agency
P.O. Box 1049
Columbus, Ohio 43216-1049

Interested persons are invited to submit written comments upon the discharge permit. Comments should be submitted in person or by mail no later than 30 days after the date of this Public Notice. Deliver or mail all comments to:

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

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

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

For additional information about this fact sheet or the draft permit, contact John Owen, CDO, (614) 728-3849, john.owen@ohio.epa.gov or Gary Stuhlfauth, (614) 644-2026, gary.stuhlfauth@ohio.epa.gov .

Information Regarding Certain Water Quality Based Effluent Limits

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

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

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

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

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

Should the applicant determine that compliance with the proposed WQBELs for parameters other than the priority pollutants is technically and/or economically unattainable, the permittee may submit an application for a variance to the applicable WQS used to develop the proposed effluent limitation in accordance with the terms and conditions set forth in OAC 3745-33-07(D). The permittee shall submit this application to the above address no later than 30 days after the Public Notice Date.

Alternately, the applicant may propose the development of site-specific WQS pursuant to OAC 3745-1-35. The permittee shall submit written notification regarding their intent to develop site specific WQS for parameters that are not priority pollutants to the above address no later than 30 days after the Public Notice Date.

Location of Discharge/Receiving Water Use Classification

The Jackson Pike wastewater treatment plant discharges at river mile 127.1 to the Scioto River, which flows into the Ohio River. Figure 1 shows the approximate location of this facility.

This segment of the Scioto River is described by Ohio EPA River Code: 02-001, U.S. EPA River Reach #: 05060001-027, County: Franklin, Ecoregion: Eastern Corn Belt Plains. The Scioto River is designated for the following uses under Ohio's Water Quality Standards (OAC 3745-1- 09): Warmwater Habitat, Agricultural Water Supply, Industrial Water Supply, and Class A Primary Contact Recreation.

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

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

Recreation uses are defined by the depth of the waterbody and the potential for wading or swimming. Uses are defined for bathing waters, swimming/canoeing (Primary Contact Recreation) and wading only (Secondary Contact which are 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 water supply and industrial water supply.

Facility Description

The Jackson Pike WWTP was constructed in 1935 and last upgraded in 2010. The average design flow is 68.0 million gallons per day (MGD). In 2010, the plant's wet weather treatment capacity was increased to 150 MGD as part of the City's implementation of its Wet Weather Management Plan. The Jackson Pike and Southerly treatment plants serve the city of Columbus, neighboring cities, villages and township areas in Franklin, Delaware Licking and Union counties. The service population projected for 2014 was 1,216,405. The Jackson Pike plant has the following wet stream treatment processes (Figure 2):

- Bar screens and fine screens
- Influent pumping
- Grit removal
- Primary settlings with scum removal
- Combined biological nitrification and CBOD reduction
- Secondary clarification
- Chlorination
- Post aeration
- Dechlorination
- Outfall pumping (when needed)

There are two bypasses at the Jackson Pike plant - Station 002 (gravity flow at wet well) and Station 003 (pumped flow at headworks). Discharges through station 002 were reported on one day in 2011 and one day in 2014 and on one day through June in 2015. No discharges were reported in 2010, 2012 and 2013. Discharges through station 003 were reported on four days in 2010, five days in 2011, one day in 2012 and 2014, and on two days through June in 2015. No discharges were reported in 2013.

The Jackson Pike WWTP has 90 percent separate sanitary sewers and 10 percent combined sewers in the collection system. There are 31 combined sewer overflows (CSOs) on the Columbus collection system. Thirty (30) of these are authorized in the Jackson Pike NPDES permit. The other one is authorized in the NPDES permit for the Southerly wastewater treatment plant (permit number 4PF00001). An interactive map showing the locations of Columbus' CSOs is available at the following Ohio EPA Web page: http://wwwapp.epa.ohio.gov/dsw/gis/cso/index.php . Select "Columbus" from the drop down list.

The Jackson Pike WWTP has an approved industrial pretreatment program. Based on information in the 2015 NPDES renewal application, 22 categorical industrial users discharge 0.71 MGD to the plant, and 30 significant noncategorical industrial users discharge 3.02 MGD to the plant.

The potable water supply for the Jackson Pike service area comes from various sources including surface water impoundments on the Scioto River, Big Walnut Creek and Alum Creek; surface water (Alum Creek and the Olentangy River); and groundwater wells. The sources are owned by the City of Columbus, City of Westerville, Village of Groveport, Del-Co Water Company and Aqua Ohio.

The Jackson Pike plant utilizes the following treatment processes for primary sludge (Figure 3):

- Gravity thickening followed by either
- Dewatering by centrifugation, or
- Anaerobic digestion and dewatering by centrifugation

The following processes are utilized for waste activated sludge:

- Thickening by centrifugation
- Anaerobic digestion
- Dewatering by centrifugation

Treated sludge is disposed by land application at agronomic rates (2743 dry tons during most recent year), and transfer to third parties for offsite composting, treatment or blending (5314 dry tons during most recent year). Table 1 shows the last five years of sludge removed from the plant. Sludge disposal by incineration has ended at the Jackson Pike plant.

A new sludge station, 583, has been added to the permit. It is for reporting sludge that is disposed by use in deep-row hybrid poplar tree farming.

Storm water discharges from the Jackson Pike plant are covered under Ohio EPA's industrial storm water general permit, permit number 4GR00606*DG. Coverage was issued on April 13, 2012, and the permit expires December 31, 2016.

Storm water discharges from the City' collection system are regulated under an individual MS4 storm water permit. The Ohio EPA permit number is 4PI00000*CD. U.S. EPA's permit number is OH0106267. The

current permit is available at the following Ohio EPA Internet site:
http://epa.ohio.gov/dsw/storm/ms4_index.aspx .

Abatement of CSOs and SSOs (Sanitary Sewer Overflows)
On March 3, 2008, the City of Columbus submitted to Ohio EPA a "Combined Sewer Long Term Control Plan - Interim (2010) Plan update" pursuant to the requirements of Consent Decree Case Numbers 02-CVH-05-5768 and 04-CVH-05-5336, filed in Franklin County Common Pleas Court. This plan was approved by the Director on March 7, 2008 as Plan Approval number 650187.

On July 1, 2005, the City Columbus submitted a "Wet Weather Management Plan" (July 1, 2005) pursuant to the "Combined Sewer Overflow" Consent Order (Court of Common Pleas, Franklin County, Ohio; Case No. 04-CVH-05-5336; September 17, 2004) and the "Sanitary Sewer Overflow" Consent Order, (Court of Common Pleas, Franklin County, Ohio; Case No. 02-CVH-05-5768; August 1, 2002). This plan was approved by the Director on January 26, 2009 as Plan Approval number PTI 01-302-PW.

The current NPDES permit requires that the City implement both of these approved plans.

In addition, the City submitted an "Overflow Emergency Response and Notification Plan (March 31, 2009)" on April 23, 2009. This plan was approved by the Director on July 8, 2009, and the City is required to implement this plan consistent with the provisions of this NPDES permit.

On September 15, 2015 the City submitted "The Integrated Plan and WWMP Update Report" to Ohio EPA. This is an update to the City's Wet Weather Management Plan that proposes a revised approach for storm water and CSO/SSO control.

The Integrated Plan incorporates significant green infrastructure and focused public and private inflow and infiltration (I/I) source reduction, combined with a revised set of collection system improvements from the original plan to achieve the CSO/SSO reductions required by the two consent decrees. Implementation of the green infrastructure and I/I reduction along with specific conventional infrastructure improvements is projected to provide greater reduction of overflows with improved storm water quality, relative to implementation of an updated conventional infrastructure-only alternative.

The OSIS Augmentation and Relief Sewer (OARS) storage tunnel, currently under construction and expected to be completed in 2017, will significantly reduce CSO discharges. A Chemically Enhanced Primary Treatment (CEPT) project for the Southerly WWTP, which will provide an additional 110 MGD of treatment capacity for flows in excess of the plant's existing 330 MGD wet weather treatment capacity, is currently in design and is expected to be operational by the end of 2019. The CEPT system will further reduce untreated wet weather discharges from the City's collection system.

The Integrated Plan was approved by the Director on December 1, 2015 as Plan Approval Number 1055439. The City is required to implement this Integrated Plan consistent with the requirements of the two consent decrees and this NPDES permit.

Description of Existing Discharge

The City of Columbus has an estimated infiltration/inflow (I/I) rate of 53 MGD to its collection. The City has performed intensive studies to evaluate the entire system and locate problem areas with high I/I. The City is also completing annual projects to line the mainline sewers. Lining sanitary sewers to reduce I/I is part of Blueprint Columbus. The annual effluent flow rate for the Jackson Pike treatment plant for the previous five years is presented on Table 2

The Jackson Pike plant reports SSOs at station 300. The number of SSOs reported each year from January 2010 through June 2015 is presented on Table 3.

Information on the bypasses reported for station 003 for the period January 2010 through June 2015 is presented on Table 4.

Summary data on the CSOs that are authorized in the Jackson Pike permit is presented on Table 5.

Table 6 presents chemical specific data compiled from data collected by Ohio EPA and data reported in annual pretreatment reports.

Table 7 presents a summary of unaltered Discharge Monitoring Report (DMR). Data are presented for the period January 2010 through December 2014, and current permit limits are provided for comparison.

Table 8 summarizes the chemical specific data for outfall 001 by presenting the average and maximum PEQ values.

Table 9 summarizes the results of acute and chronic WET tests of the final effluent.

Table 10 summarizes the screening results of Ohio EPA bioassay sampling 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 Ohio EPA effluent testing conducted.

Assessment of Impact on Receiving Waters

The Scioto River Mainstem (Olentangy River to Big Darby Creek) large river assessment unit, which includes the Scioto River in the vicinity Columbus is listed as impaired for recreation and human health on Ohio's 2014 303(d) list. A TMDL (total maximum daily loads) report is in preparation. The most recent data available for the middle Scioto River is in the *Biological and Water Quality Study of the Middle Scioto River and Select Tributaries, 2010 (Ohio EPA).* This report is available at the following Ohio EPA web page: http://epa.ohio.gov/dsw/document_index/psdindx.aspx .

The attainment status of the middle Scioto River is reported in the draft *Ohio 2014 Integrated Water Quality Monitoring and Assessment Report,* which is available at this Ohio EPA web page: http://epa.ohio.gov/dsw/tmdl/OhioIntegratedReport.aspx . An assessment of the impact of a permitted point source on the immediate receiving waters includes an evaluation of the available chemical/physical, biological, and habitat data which have been collected by Ohio EPA pursuant to the Five-Year Basin Approach for Monitoring and NPDES Reissuance. Other data may be used provided it was collected in accordance with Ohio EPA methods and protocols as specified by the Ohio WQS and Ohio EPA guidance documents. Other information which may be evaluated includes, but is not limited to: NPDES permittee self-monitoring data; effluent and mixing zone bioassays conducted by Ohio EPA, the permittee, or U.S. EPA.

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

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

Three attainment status results are possible at each sampling location -full, partial, or non-attainment. Full attainment means that all of the applicable indices meet the biocriteria. Partial attainment means that one or more of the applicable indices fails meet the biocriteria. Nonattainment means that either none of the applicable indices meet the biocriteria or one of the organism groups indicates poor or very poor performance. An aquatic life use attainment table (see Table 11) is constructed based on the sampling results and is arranged from upstream to downstream and includes the sampling locations indicated by river mile, the applicable biological indices, the use attainment status (i.e., full, partial, or non), the Qualitative Habitat Evaluation Index, and comments and observations for each sampling location.

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

Self-monitoring data (DMR)	January 2010 through December 2014
Ohio EPA and Pretreatment data	May 2010 through May 2014

Statistical Outliers and Other Non-representative Data
The data were examined and the following values were removed from the evaluation to give a more reliable PEQ: free cyanide, 8 mg/l.

This data is evaluated statistically, and PEQ values are calculated for each pollutant. Average PEQ (PEQ_{avg}) values represent the 95^{th} percentile of monthly average data, and maximum PEQ (PEQ_{max}) values represent the 95^{th} percentile of all data points (see Table 8).

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 15).

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.

The Jackson Pike plant is considered interactive with the Columbus Southerly wastewater treatment plant. The available assimilative capacity was distributed among them using the conservative substance wasteload allocation (CONSWLA) water quality model for conservative parameters. CONSWLA is the model Ohio EPA typically uses in multiple discharger situations. CONSWLA model inputs for flow are fixed at their critical low levels and inputs for effluent flow are fixed at their design or 50th percentile levels. Background concentrations are fixed at a representative value (generally a 50th percentile). A mass balancing method is then used to allocate effluent concentrations that maintain WQS under these conditions. This technique is appropriate when data bases are unavailable to generate statistical distributions for inputs and if the parameters modeled are conservative.

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

Aquatic life (Warmwater Habitat)		
Toxics (metals, organics, etc.)	Average	Annual 7Q10
	Maximum	Annual 1Q10
Ammonia	Average	Summer 30Q10
		Winter 30Q10
Agricultural Water Supply		Harmonic mean flow
Human Health (nondrinking)		Harmonic mean flow

Allocations are developed using a percentage of stream design flow as specified in Table 13, and allocations cannot exceed the Inside Mixing Zone Maximum (IMZM) 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 for mercury are 12 ng/L (average) and 1700 ng/L (maximum) in the Ohio River basin.

The data used in the WLA are listed in Table 12 and Table 13. The WLA results to maintain all applicable criteria are presented in Table 14. The current permit limits for ammonia-nitrogen were evaluated and are adequate to maintain the WQS for ammonia toxicity.

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

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

The WLA calculations for WET are similar to those for aquatic life criteria - using the chronic toxicity unit (TU_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 the Jackson Pike facility, the WLA values are 0.33 TU_a and 1.12 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 for Jackson Pike is 30 percent mortality in 100 percent effluent based on the dilution ratio of 1.1 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 14. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 8, 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 15.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 16 presents the final effluent limits and monitoring requirements proposed for the Jackson Pike wastewater treatment plant outfall 001 and the basis for their recommendation. Unless otherwise indicated, the monitoring frequencies proposed in the permit are continued from the existing permit.

Water Temperature, Flow, Peak Flow
Monitoring for temperature and flow is proposed to continue to evaluate the performance of the treatment plant. Peak flow rate is a new parameter. It is proposed to allow reporting of flows that exceed the plant's normal operating capacity at times of excessive or extended wet weather flow from the combined sewer system. Flow reported under the peak flow rate reporting code, 50047, is not utilized in mass loading calculations.

Dissolved Oxygen, Total Suspended Solids, Ammonia-N, and $CBOD_5$
Based on best technical judgment, the current limits for dissolved oxygen, total suspended solids, ammonia and 5-day carbonaceous biochemical oxygen demand are proposed to continue. These limits represent plant design criteria. The ammonia-N limits were evaluated and are protective of water quality standards for ammonia toxicity. Reduced monitoring frequencies are proposed for total suspended solids and $CBOD_5$ (three per week) and for ammonia-N (five per week).

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

Total Residual Chlorine
It is proposed that the existing permit limit for total residual chlorine be continued. It is protective of water quality standards.

Total Kjeldahl Nitrogen, Nitrate+Nitrite-N and Total Phosphorus
Based on best technical judgment (BTJ), monitoring is proposed to continue for the following nutrient-related parameters: total Kjeldahl nitrogen, nitrate+nitrite-N and total phosphorus. The purpose of the monitoring is to maintain a data set on the point source nutrient load discharged to the receiving water. Considering the size of the Jackson Pike discharge and the level of total phosphorus in the effluent, the monitoring frequency proposed for total phosphorus is twice per week, an increase from the twice per month monitoring in the current permit.

Monitoring for phosphorus and nitrate + nitrite at the upstream and downstream stations is proposed to continue. The purpose of the monitoring is to maintain a nutrient data set for use in future water quality studies.

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

2,4,6-Trichlorophenol
The Ohio EPA risk assessment (Table 15) places 2,4,6-trichlorophenol in group 5, which recommends limits to protect water quality. Using the discretion allowed the Director under OAC 3745-33-07(A)(5), monitoring rather than limits is proposed for this parameter. The PEQ values calculated for this parameter (Table 8) may not be representative of its actual levels in the plant effluent.

Of the 58 sample results reported for 2,4,6-trichlorophenol from January 2010 through June 2015, 56 results were below detection using detection limits that are sufficiently sensitive to make water quality related decisions. The value reported in December 2010, 7.9 ug/l, was greater than the aquatic life wasteload allocation, 5.5 ug/l. The value reported in April 2014 was 1.4 ug/l. The human health WLA is 114 ug/l. Once per month monitoring is proposed to continue.

Nickel, Silver, Zinc, Cadmium, Lead, Chromium, Copper, Dissolved Hexavalent Chromium, Mercury, Free Cyanide and Total Filterable Residue
The Ohio EPA risk assessment (Table 15) places nickel, silver, zinc, cadmium, lead, chromium, copper, dissolved hexavalent chromium, mercury, free cyanide and total filterable residue in groups 2 and 3. This placement, as well as the data in Tables 7 and 8, support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Existing monitoring frequencies are proposed to continue, except for free cyanide where a reduction to once per month is proposed. The proposed monitoring will document that these pollutants continue to remain at low levels.

Parameters With No Proposed Monitoring
The Ohio EPA risk assessment (Table 15) places arsenic, beryllium, bis(2-ethylhexyl)phthalate, bromodichloromethane, chloroform, iron, gamma-BHC (lindane), methylene chloride, molybdenum, selenium, strontium and barium in groups 2 and 3. This placement, as well as the data in Tables 7 and 8, 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 new monitoring is proposed. Removal of the current monitoring and limits for bis(2-ethylhexyl)phthalate is proposed.

Evaluation of Carcinogen Additivity
Bis(2-ethylhexyl)phthalate and 2,4,6-trichlorophenol are carcinogens, which requires the evaluation of the additive effect of these pollutants. OAC 3745-33-07(A)(8) states that the additivity equation must be included in the permit and used to determine compliance unless certain conditions are met. One of the conditions in the rule referenced above states that a pollutant may be removed from the consideration of additivity if the preliminary effluent limit (PEL) for the pollutant is less than the quantification level for that pollutant. For bis(2-ethylhexyl)phthalate, the average PEL is less than the quantification level, so it can be removed from the additivity equation. Since only one parameter remains, the compliance equation in Table 15 does not need to be included in the permit.

Whole Effluent Toxicity Reasonable Potential
Based on evaluating the WET data presented in Table 9 and Table 10 and other pertinent data under the provisions of OAC 3745-33-07(B), the Jackson Pike wastewater plant is placed in Category 3 with respect to whole effluent toxicity to *Ceriodaphnia dubia.* Twice per year monitoring is proposed to continue for the life of the permit.

The Jackson Pike plant is placed in Category 4 with respect to whole effluent toxicity to fathead minnows. 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). Annual chronic toxicity monitoring with the determination of acute endpoints is proposed for the life of the permit. The proposed monitoring will adequately characterize toxicity in the plant's effluent.

Additional Monitoring Requirements
The monitoring for bypass stations 002 and 003 that is included in the current permit is proposed to continue.

The monitoring for the 28 combined sewer overflows that are tributary to the Jackson Pike plant and authorized by this NPDES permit is proposed to continue as in the current permit. Descriptive information about the CSOs and their locations is available in Part II, Item D of the draft 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.

It is proposed that monitoring for free cyanide and metals be deleted from downstream station 901.

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

A new sludge station, 583, has been added to the permit. It is for reporting sludge that is disposed by use in deep-row hybrid poplar tree farming. The monitoring and reporting requirements proposed for this station are the same as for the land application station, 581.

Other Requirements

Compliance Schedule
A six month compliance schedule is proposed for the City to submit a technical justification for either revising its local industrial user limits or retaining its existing local limits. If revisions to local limits are required, the City must also submit a pretreatment program modification request. Details are in Part I.C of the permit.

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 of the permit in accordance with rules adopted in December 2006 (OAC 3745-7-02). These rules require the Jackson Pike plant to have a Class IV wastewater treatment plant 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.

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

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

Because the quantification levels are lower than any water quality-based effluent limits, it will be possible to directly evaluate compliance with free cyanide limits.

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

Storm Water Compliance
To comply with industrial storm water regulations, the permittee requested coverage under the industrial storm water general permit. The facility's permit number is 4GR00606*DG. Coverage was issued on April 13, 2012,

and the permit expires December 31, 2016. At the appropriate time the permittee must request renewed coverage under the industrial storm water general permit or make other provisions to comply with the industrial storm water regulations.

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

Senate Bill 1
Publicly owned treatment works with a design flow of 1MGD or more and that do not have effluent limits for total phosphorous must develop a study that evaluates the technical and financial capability of their existing treatment facilities to reduce total phosphorus to 1 mg/l or lower. This study is required by Ohio Senate Bill 1, which was signed by the Governor on April 2, 2015. The study must be submitted to Ohio EPA by December 1, 2017. Ohio EPA is implementing this Ohio Senate Bill 1 requirement outside of NPDES permits. Instead, Ohio EPA will send a letter instructing all applicable facilities how to comply with the evaluation study required by Ohio Senate Bill 1.

Figure 1. Location of Jackson Pike and Southerly Wastewater Treatment Plants

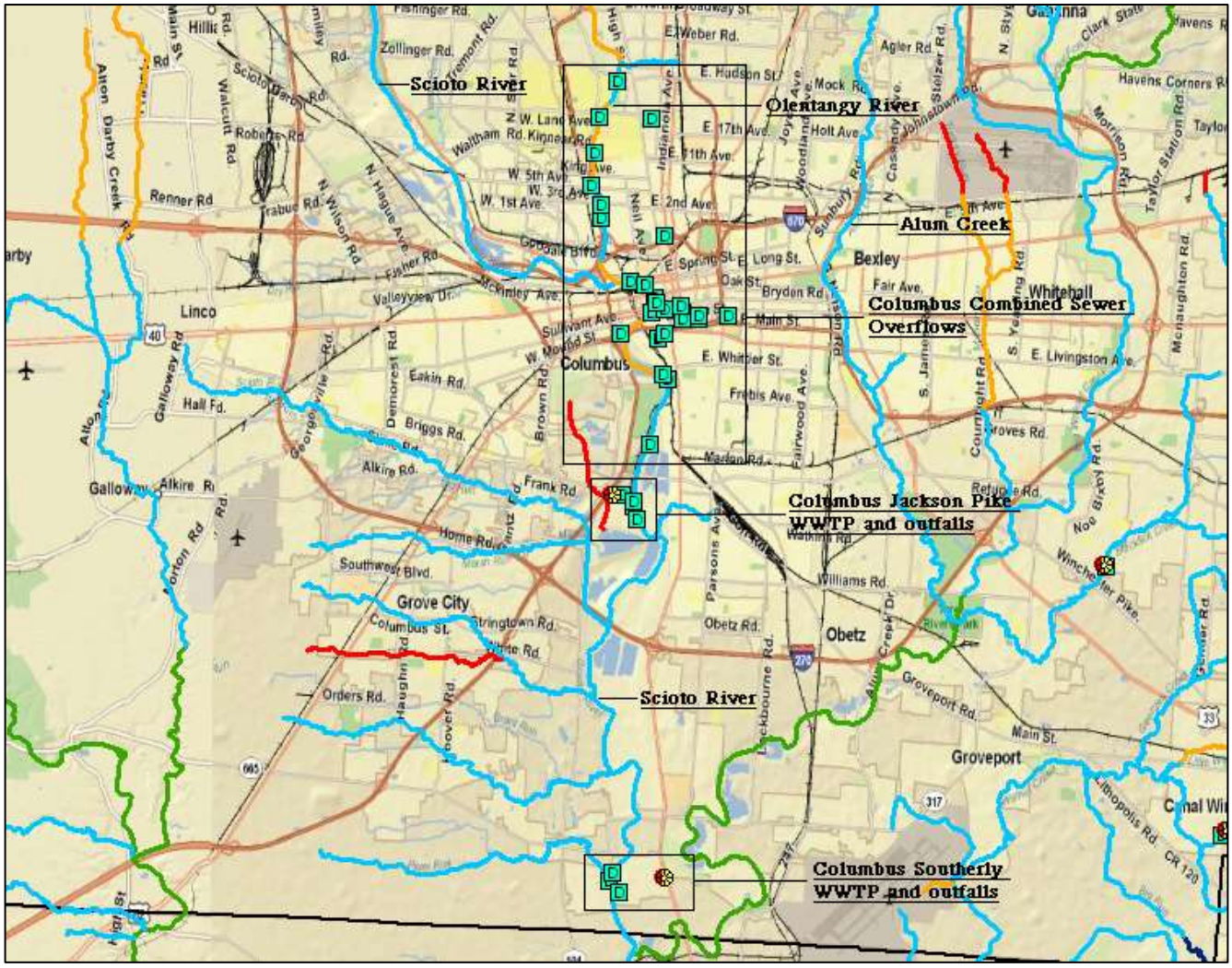

Figure 2. Diagram of Wastewater Treatment System – Wet Stream

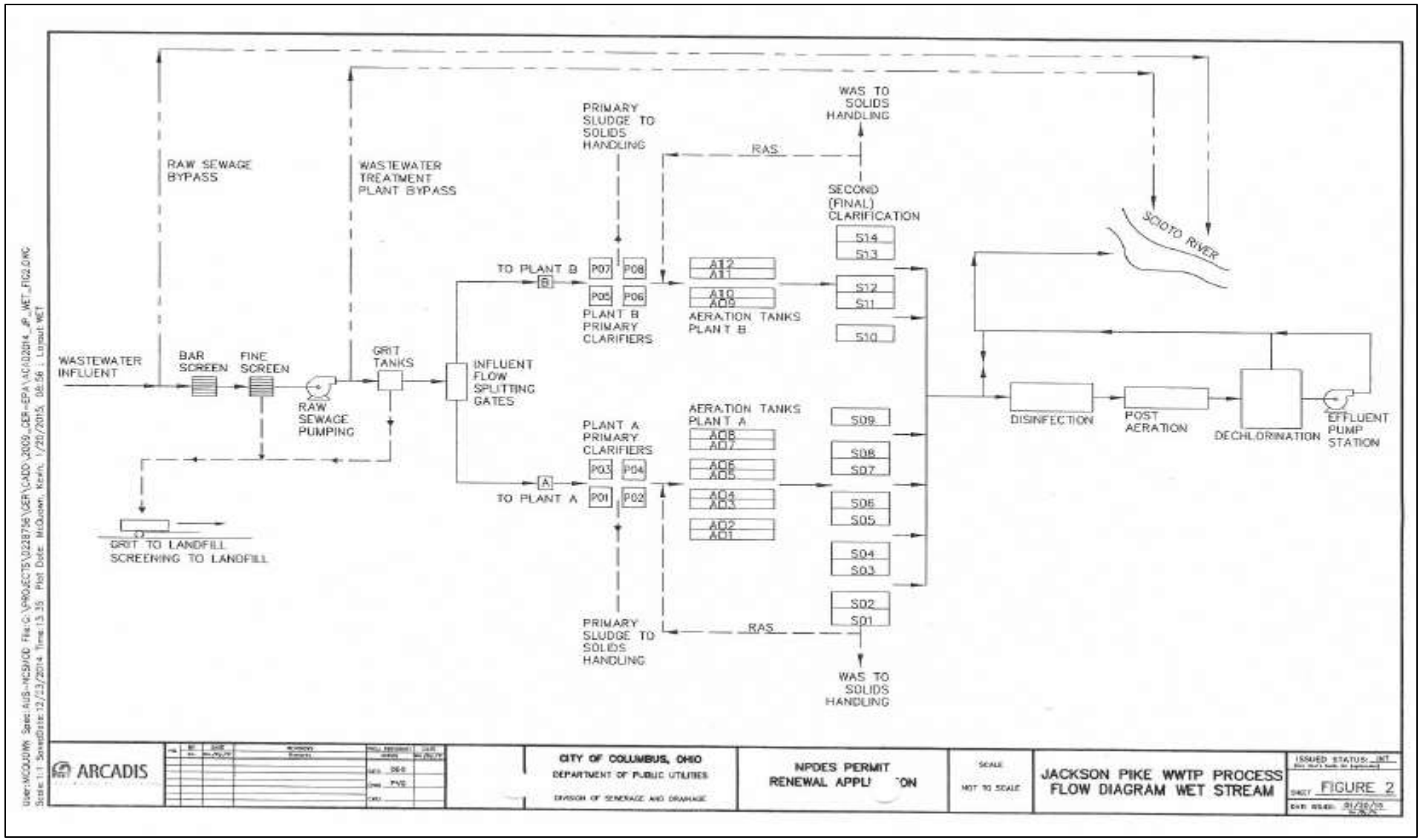

Figure 3. Diagram of Wastewater Treatment System – Sludge Processing

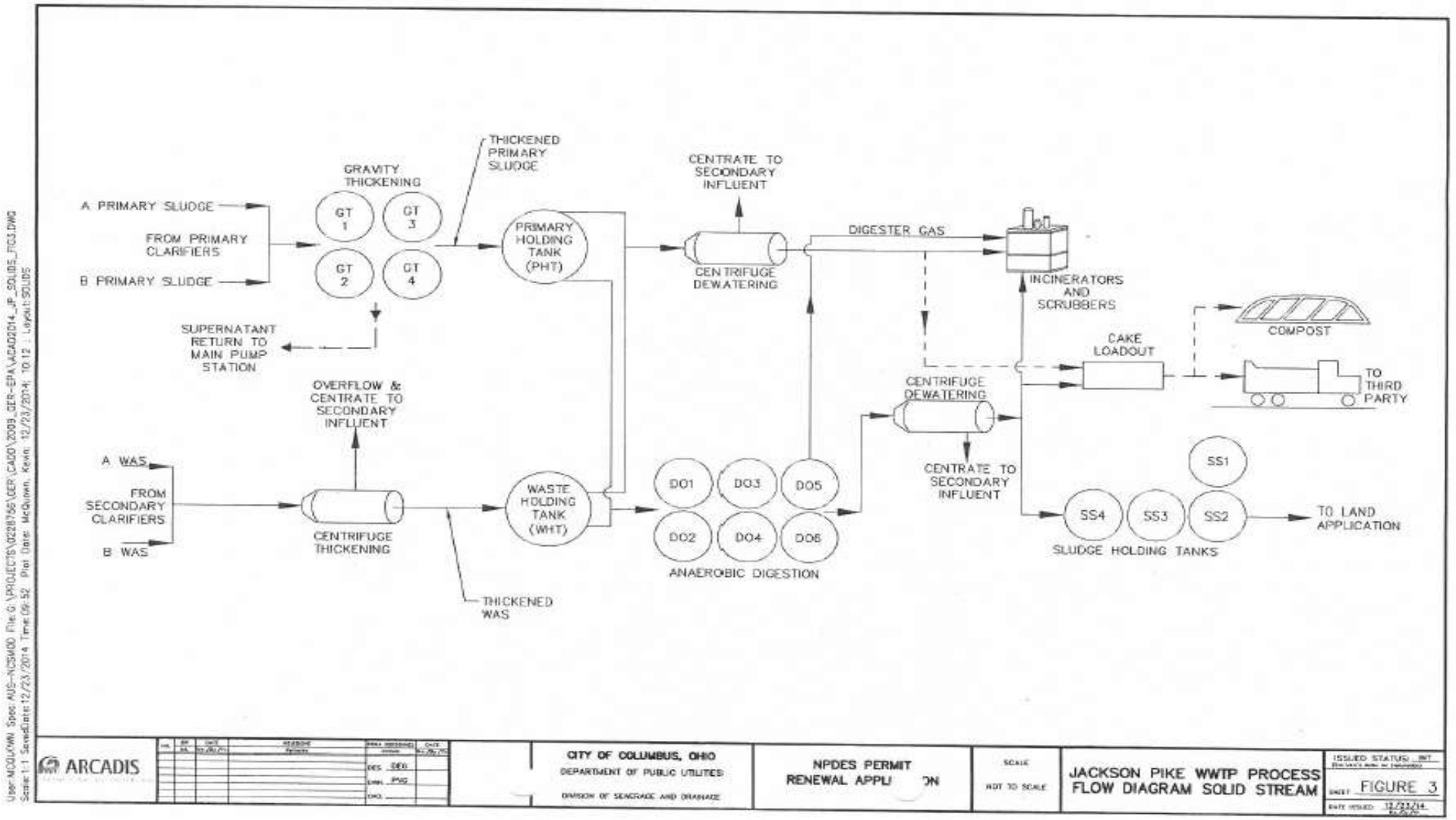

Table 1. Sewage Sludge Removal

Year	Dry Tons Removed			
Station	**581**	**585**	**586**	**588**
2010	2581	3286	75.7	2233
2011	1585	1300	65.1	6239
2012	2437	1127		5314
2013	2559			4769
2014	2743			5314

Station 581 = land application
585 = incineration (eliminated, 2015)
586 = landfill
588 = third party

Table 2. Annual Effluent Flow Rates

Year	Annual Flow in MGD		
	50th Percentile	**95th Percentile**	**Maximum**
2010	60.5	75.3	136
2011	79.1	137	148
2012	64.9	93.5	136
2013	69.4	95.2	151
2014	70.1	128	152

MGD = million gallons per day

Table 3. Sanitary Sewer Overflows Discharges

Year	Number
2010	31
2011	279
2012	94
2013	165
2014	190
2015*	125

* Through June

Table 4. Bypass Discharges – Station 003

	Bypass Total Hours	Bypass Volume	Total Suspended Solids	$CBOD_5$
Date	**Hrs/day**	**MGAL**	**mg/L**	**mg/L**
1/24/2010		12.2	61	110
1/25/2010		8.7	32	160
3/13/2010		21.22	100	88
3/14/2010		3.45	60	56
3/5/2011	6.5	21.5	86	48
3/6/2011	15.2	27.2	53	44
3/10/2011	12.1	9.53	52	
5/3/2011	6	13.7	34	
12/6/2011	7.3	7.37	210	110
1/27/2012	7.5	13.8	90	46
5/12/2014	6.3	7.6	78	59
6/20/2015	5.8	11.67	76	28
6/21/2015	2.5	5.07	26	110

$CBOD_5$ = five-day carbonaceous biochemical oxygen demand
MGAL = million gallons

Table 5. Combined Sewer Overflow Discharges

Station No.	2010		2011		2012		2013		2014		2015	
	No. of events	Volume MGD	No. of events	Volume MGD	No. of events	Volume MGD	No. of events	Volume MGD	No. of events	Volume MGD	No. of events	Volume MGD
004			3	0.344							1	0.060
005			2	0.613			2	1.703	2	1.187	1	3.580
006	7	8.785	6	12.157	3	0.411	3	11.112	4	6.487	1	
007	3	0.617	5	2.023	2	0.198	5	3.592	4	3.220	2	3.770
010	3	3.292	3	5.566			1	0.656				
011	1	0.120	3	0.751	1	0.005	3	0.192	2	0.291	2	0.460
012	19	3.033	16	3.823			1	0.035	2	0.274	1	0.430
017	1	0.025	1	0.313								
018	59	1144.449	28	1545.897	16	290.400	17	621.800	21	630.425	11	576.300
019	10	49.990	3	46.810			1	2.670	1	0.430	3	77.600
020	13	9.234	11	17.516			5	13.746	4	0.973	2	1.150
027	5	2.528	1	2.462			1	0.722	1	0.113	1	1.560
028	5	3.828	4	0.383	2	2.048	4	24.512	4	14.214	3	1.230
029	11	2.638	9	6.630	4	0.218	6	4.487	10	2.642	5	2.450
031	4	0.148	8	1.009	3	0.058	7	1.431	6	0.933	2	1.760
032	4	0.317	5	1.412	1	0.013	4	1.070	4	1.213	3	2.160
033	8	5.065	6	11.665			1	2.866			1	0.310
041	13	0.466	13	0.932	9	0.133	2	0.018				
042	2	0.015	2	0.225								
043	3	0.021	12	0.778	3	0.022						
044	7	8.872	5	3.693	4	2.340	8	16.880	10	15.175	8	14.560
045	25	5.136	36	8.901	42	9.495	39	16.135	2	0.278		
046	14	0.139	18	0.357	27	0.300	35	0.594	15	0.228	10	0.120
047	51	9.804	45	8.336	37	4.828	32	6.932	1	0.015	4	0.280
049	14	0.552	18	0.549	11	0.160	12	0.421	14	0.325	11	0.390
050	9	0.574	25	0.695	9	0.040						
Total	291	1259.648	288	1683.840	174	310.669	189	731.574	107	678.423	72	688.170

MGD = Million gallons per day

Table 6. Effluent Characterization Using Ohio EPA and Pretreatment Data

Summary of analytical results for Jackson Pike outfall 4PF00000001. Units ug/l unless otherwise noted; OEPA = data from analyses by Ohio EPA; PT = data from pretreatment program reports; NA = not analyzed; AA = not detected (detection limit).

PARAMETER	OEPA 05/25/10	OEPA 08/18/10	OEPA 05//07/14	PT 08/13/13	PT 08/16/12	PT 10/25/11	PT 10/21/10
Barium	41	34	49	NA	NA	NA	NA
Cadmium	AA(0.2)	AA(0.2)	AA(0.2)	0.20	0.26	AA(0.015)	AA(0.015)
Chromium	AA(2)	AA(2)	AA(2)	0.30	1.0	AA(0.068)	AA(0.095)
Copper	3.6	4.5	4.6	5.4	3.2	AA(0.078)	AA(0.292)
Cyanide, free	NA	NA	8	NA	NA	NA	NA
Filterable residue, total (mg/l)	582	556	636	NA	NA	NA	NA
Iron	81	53	80	NA	NA	NA	NA
Lead	AA(2)	AA(2)	AA(2)	0.61	AA(2.6)	AA(0.065)	AA(0.083)
Nickel	3.7	6	4.1	5.2	15.5	6.5	6.6
Nitrate+nitrite	12	8.36	2.48	NA	NA	NA	NA
Phosphorus, T (mg/l)	2.17	2.76	2.12	NA	NA	NA	NA
Selenium	AA(2)	AA(2)	AA(2)	0.45	AA(2.5)	AA(0.638)	AA(0.895)
Strontium	682	974	714	NA	NA	NA	NA
Zinc	75	53	75	62	81	62.9	84
Bis(2-ethylhexyl)phthalate	NA	NA	AA(12.2)	1.1	1.4	AA(0.84)	1.7
Bromodichloromethane	NA	NA	AA(0.5)	1.2	AA(0.23)	1.3	0.34
Chloroform	NA	NA	2.77	7.9	7.9	7.4	3.9
Methylene chloride	NA	NA	2.34	AA(0.27)	0.45	AA(0.27)	AA(0.15)

Table 7. Effluent Characterization Using Self-Monitoring Data

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
Water Temperature	Annual	C	Monitor		1826	19	25	12-27
Dissolved Oxygen	Summer	mg/l		7.0 min	920	9	10	7.4-10
Dissolved Oxygen	Winter	mg/l		7.0 min	906	10	10	5.8-10
Residue, Total Filterable	Annual	mg/l	Monitor		222	560	838	280-1200
Total Suspended Solids (TSS)	Annual	mg/l	*	*	1825	5.2	10	1.6-17
Oil and Grease, Hexane Method	Annual	mg/l		10	240	0.51	1.61	0-2.8
Nitrogen, Ammonia (NH3)	Summer	mg/l	*	*	919	0.13	0.65	0-4.3
Nitrogen, Ammonia (NH3)	Winter	mg/l	*	*	905	0.1	1.08	0-6.8
Nitrogen Kjeldahl, Total	Annual	mg/l	Monitor		120	1.3	2.41	0-4.1
Nitrite Plus Nitrate, Total	Annual	mg/l	Monitor		120	8.3	12	4.8-13
Phosphorus, Total (P)	Annual	mg/l	Monitor		138	2.3	3.6	0.7-6.4
Cyanide, Free	Annual	mg/l	Monitor		120	0	0.0044	0-0.034
Selenium, Total Recoverable	Annual	ug/l	--		14	1.05	2.11	0-2.3
Nickel, Total Recoverable	Annual	ug/l	Monitor		67	6	9.52	2.4-12.1
Silver, Total Recoverable	Annual	ug/l	Monitor		67	0	0.0752	0-0.18
Zinc, Total Recoverable	Annual	ug/l	Monitor		67	64.9	87.2	27.9-92.9
Cadmium, Total Recoverable	Annual	ug/l	Monitor		67	0	0.0567	0-0.12
Lead, Total Recoverable	Annual	ug/l	Monitor		67	0.47	0.949	0-1.4
Chromium, Total Recoverable	Annual	ug/l	Monitor		67	0.53	0.985	0-1.2
Copper, Total Recoverable	Annual	ug/l	Monitor		67	3.1	4.89	1.8-5.9
Chromium, Dissolved Hexavalent	Annual	ug/l	Monitor		60	0	0	0-0
Fecal Coliform	Annual	#/100 ml	--		267	110	782	12-12000
E. coli	Annual	#/100 ml	126	284[a]	818	49.5	540	3-3500
2,4,6-Trichlorophenol	Annual	ug/l	Monitor		53	0	0	0-7.9
Lindane	Annual	ug/l	--		2	0	0	0-0
Bis(2-ethylhexyl) Phthalate	Annual	ug/l	8.8	1139	55	0	2.92	0-9.6
Flow Rate	Summer	MGD	Monitor		920	63.2	95.6	7.51-151
Flow Rate	Winter	MGD	Monitor		906	72.7	126	19.6-152
Flow Rate	Annual	MGD	Monitor		1826	67.8	112	7.51-152
Chlorine, Total Residual	Annual	mg/l		0.019	912	0	0	0-0
Mercury, Total (Low Level)	Annual	ng/l	Monitor		67	0	4.46	0-7.2
pH, Maximum	Annual	S.U.		9.0	1824	7.1	7.4	6.5-7.9
pH, Minimum	Annual	S.U.		6.5	1824	6.9	7.2	6.5-7.8
CBOD 5 day	Summer	mg/l	*	*	891	2.1	3.8	0-8.5
CBOD 5 day	Winter	mg/l	*	*	840	2.3	5.2	0-9.4

a = weekly average limit

*Limits, all mg/l, monthly/weekly

	$CBOD_5$	TSS	Ammonia-N
June – October	8.0/12	16/24	1.0/1.5
Nov. – April	20/30	30/45	3.7/5.5
May	13/19.5	26/39	2.5/3.75

Table 8. Projected Effluent Quality

Parameter	Units	# of Samples	# > MDL	Average PEQ	Maximum PEQ
Self-Monitoring (DMR) Data					
Ammonia-S	mg/l	609	569	0.304	0.712
Ammonia-W	mg/l	420	392	0.614	1.524
Bis(2-ethylhexyl)phthalate [A]	µg/l	59	27	2.45	3.894
Cadmium - TR [A]	µg/l	73	17	0.107	0.129
Chlorine - TRes	mg/l	912	0	--	--
Chromium - TR [A]	µg/l	73	58	0.987	1.509
Chromium VI - Diss	µg/l	59	0	--	--
Copper - TR [A]	µg/l	73	71	4.196	5.243
Cyanide - free [A]	mg/l	118	29	0.005	0.007
Lead - TR [A]	µg/l	73	60	0.762	1.071
Lindane	µg/l	2	0	--	--
Mercury - TR	ng/l	66	5	5.256	7.2
Nickel - TR [A]	µg/l	73	73	8.004	9.994
Nitrate-N + Nitrite-N [A]	mg/l	121	121	10.45	12.76
Phosphorus [A]	mg/l	139	139	3.293	4.286
Selenium - TR [A]	µg/l	21	11	1.891	3.25
Silver - TR	µg/l	66	22	0.072	0.114
Total Filterable Residue [A]	mg/l	221	221	696.7	834.7
2,4,6-Trichlorophenol	µg/l	52	2	5.767	7.9
Zinc - TR [A]	µg/l	73	73	80.68	97.80
Ohio EPA and PT Data					
Barium	µg/l	3	3	107.3	147.
Bromodichloromethane	µg/l	5	3	2.183	2.99
Chloroform	µg/l	5	5	13.26	18.17
Iron - TR	µg/l	3	3	177.4	243.
Methylene chloride	µg/l	5	2	3.929	5.382
Strontium	µg/l	3	3	2133.	2922.

[A] DMR data combined with pretreatment data.

MDL = analytical method detection limit
PEQ = projected effluent quality

Table 9. Summary of Acute and Chronic Toxicity Results

Date	*Ceriodaphnia dubia*		*Pimephales promelas*	
	TU_a	TU_c	TU_a	TU_c
11/7/2010	AA	AA	AA	AA
5/1/2011	AA	AA	AA	AA
11/6/2011	AA	AA	AA	AA
5/6/2012	1	1.7	AA	AA
5/20/2012	0.6	1.8	--	--
11/4/2012	AA	AA	AA	AA
5/5/2013	AA	1.2	AA	AA
11/3/2013	AA	AA	AA	AA
5/4/2014	AA	AA	AA	AA
11/16/2014	AA	AA	AA	AA
5/31/2015	AA	AA	AA	AA

AA = non-detection; analytical method detection limit of 0.2 TU_a, 1.0 TU_c
TU_a = acute toxicity unit
TU_c = chronic toxicity unit

Table 10. Ohio EPA Toxicity Screening Results for Outfall 001

	Pimephales promelas		*Ceriodaphnia dubia*	
	%M		%M	
Date	*24 hours*	*48 hours*	*24 hours*	*48 hours*
5/6/2014	0	0	0	5
5/7/2014	0	0	0	0
5/6/14-5/7/14[a]	0	0	0	0

[a] = 24-hour composite sample
%M = percent mortality in 100% effluent

Table 11. Use Attainment Table

A Summary of the Scioto River Use Designation Status, and Causes/Sources of Impairment, 2009 and 2010 surveys.

Location	RM	Aquatic Life Use Desig.	Attain. Status	Causes of Impairment	Sources of Impairment
Scioto River at Frank Road	127.74	WWH	FULL		
Scioto River, 0.7 mile dst. Jackson Pike WWTP, dst. Kian Run	126.4	WWH	PARTIAL	Organic enrichment (sewage) biological indicators*	Columbus CSOs and municipal point source discharge; Jackson Pike WWTP (See note below)
Scioto River at State Route 665 in Shadeville	119.9	WWH	FULL		
Scioto River dst. Columbus Southerly WWTP	117.6	WWH	FULL		

WWH = Warmwater Habitat
* A small leak in a sewage force main was discovered and repaired in the vicinity of this sampling location.

Table 12. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum	
		Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Arsenic - TR	µg/l	--	100.	150.	340.	680.
Barium – TR	µg/l	--	--	220.	2000.	4000.
Beryllium	µg/l	280.	100.	54.	460.	920.
Bis (2-EHP) [C]	µg/l	59.	--	8.4	1100.	2100.
Bromodichloromethane [C]	µg/l	460.	--	--	--	--
Cadmium - TR	µg/l	--	50.	5.4	14.	28.
Chlorine - TRes	mg/l	--	--	0.011	0.019	0.038
Chloroform [C]	µg/l	4700.	--	140.	1300.	2600.
Chromium - TR	µg/l	--	100.	190.	4100.	8100.
Chromium VI - Diss	µg/l	--	--	11.	16.	31.
Copper – TR	µg/l	1300.	500.	22.	36.	71.
Cyanide - free	mg/l	220.	--	0.012	0.046	0.092
Dibromochloromethane [C]	µg/l	340.	--	--	--	--
Diethyl phthalate	µg/l	120000.	--	220.	980.	2000.
Lindane [A C]	µg/l	0.63	--	0.057	0.95	1.9
Iron – TR	µg/l	--	5000.	--	--	--
Lead - TR	µg/l	--	100.	23.	430.	870.
Mercury - TR [A]	ng/l	12.	10000.	910.	1700.	3400.
Methylene chloride [C]	µg/l	16000.	--	1900.	11000.	22000.
Molybdenum	µg/l	--	--	20000.	190000.	370000.
Nickel – TR	µg/l	4600.	200.	120.	1100.	2200.
Nitrate-N + Nitrite-N	mg/l	--	100.	--	--	--
Selenium - TR	µg/l	11000.	50.	5.	--	--
Silver – TR	µg/l	--	--	1.3	8.8	18.
Strontium – TR	µg/l	--	--	21000.	40000.	81000.
Total Filterable Residue	mg/l	--	--	1500.	--	--
2,4,6-Trichlorophenol [C]	µg/l	65.	--	4.9	39.	79.
Zinc – TR	µg/l	69000.	25000.	280.	280.	560.

[A] Bioaccumulative Chemical of Concern (BCC)
[C] Carcinogen

Table 13. Instream Conditions and Discharger Flow

Parameter	Units		Value	Basis
1Q10	cfs	annual	9.88	USGS gage #03226800, 1957-2014 data
7Q10	cfs	annual	12.66	USGS gage #03226800, 1957-2014 data
Harmonic Mean Flow	cfs	annual	79.63	USGS gage #03226800, 1957-2014 data
Mixing Assumption	%	average	100.	Stream-to-discharge ratio
	%	maximum	100.	Stream-to-discharge ratio
Instream Hardness	mg/l	annual	270.	DMR 901; 59 values, 2010-2014
Background Water Quality:				
Arsenic	µg/l	annual	0.5	STORET; 15 values, 8<MDL, 2010
Barium	µg/l	annual	57.	STORET; 15 values, 0<MDL, 2010
Beryllium	µg/l	annual	0.	No representative data available.
Bis (2-EHP)	µg/l	annual	0.	No representative data available.
Cadmium	µg/l	annual	0.	STORET; 15 values, 15<MDL, 2010
Chromium - TR	µg/l	annual	0.5	STORET; 15 values, 12<MDL, 2010
Chromium VI - Diss	µg/l	annual	0.	No representative data available.
Copper	µg/l	annual	2.9	STORET; 15 values, 0<MDL, 2010
Cyanide, free	mg/l	annual	0.	No representative data available.
Lead	µg/l	annual	0.5	STORET; 15 values, 10<MDL, 2010
Lindane	µg/l	annual	0.	No representative data available.
Mercury - TR	ng/l	annual	0.	No representative data available.
Molybdenum	µg/l	annual	0.	No representative data available.
Nickel	µg/l	annual	3.7	STORET; 15 values, 0<MDL, 2010
Selenium	µg/l	annual	0.5	STORET; 15 values, 14<MDL, 2010
Silver	µg/l	annual	0.	No representative data available.
Total Filterable Residue	mg/l	annual	388.	STORET; 15 values, 0<MDL, 2010
2,4,6-Trichlorophenol	µg/l	annual	0.	No representative data available.
Zinc	µg/l	annual	14.	STORET; 15 values, 5<MDL, 2010
Columbus Southerly WWTP flow:				
	cfs		176.4	Design
Columbus Jackson Pike WWTP flow:				
	cfs		105.2	Design

MDL = analytical method detection limit
USGS = United States Geological Survey

Table 14. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Average			Maximum	Inside
		Human Health	Agri Supply	Aquatic Life	Aquatic Life	Mixing Zone Maximum
Arsenic - TR [B]	µg/l	--	133.	158.	355.	680.
Barium – TR	µg/l	--	--	229.	2087.	4000.
Beryllium - TR [B]	µg/l	373.	133.	58.	493.	920.
Bis (2-EHP)	µg/l	104.	--	9.4	1203.	2100.
Cadmium - TR [B]	µg/l	--	67. [A]	5.7	15.	28.
Chromium - TR [B]	µg/l	--	133.	205.	4326.	8100.
Chromium VI - Diss [B]	µg/l	--	--	12.	17.	31.
Copper - TR [B]	µg/l	1731. [A]	665. [A]	23.	38.	71.
Cyanide, free	mg/l	293. [A]	--	0.013	0.048	0.092
Lead - TR [B]	µg/l	--	133.	25.	458.	870.
Mercury - TR [C]	ng/l	12.	10000. [A]	910.	1700.	3400.
Molybdenum - TR [B]	µg/l	--	--	2113.	198500.	370000.
Nickel - TR [B]	µg/l	6129. [A]	265.	127.	1149.	2200.
Selenium - TR	µg/l	14660.	66.	5.3	--	--
Silver - TR	µg/l	--	--	1.4	9.8	18.
Total Filterable Residue	mg/l	--	--	1563.	--	--
2,4,6-Trichlorophenol	µg/l	114. [A]	--	5.5	43.	79.
Zinc - TR	µg/l	91950. [A]	33310. [A]	299.	296.	560.

[A] Allocation must not exceed the Inside Mixing Zone Maximum.

[B] Parameter would not require a WLA based on reasonable potential procedures, but allocation requested for use in the pretreatment program.

[C] Bioaccumulative Chemical of concern (BCC); WQS must be met at end-of-pipe, unless the requirements for an exception are met as listed in 3745-2-08(L).

Table 15. Parameter Assessment

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

No parameters in this group.

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

Arsenic - TR	Beryllium	Bromodichloromethane
Cadmium – TR	Chloroform	Chlorine – Tres
Chromium – TR	$Chromium^{+6}$ – Diss	Copper – TR
Iron - TR	Lead – TR	Lindane
Methylene chloride	Molybdenum	Nickel – TR
NO_2+NO_3	Selenium	Silver
Strontium		

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

Barium	Bis (2-EHP) [A]	Cyanide – free
Mercury – TR	Selenium	Total Filterable Residue
Zinc – TR		

Group 4: $PEQ_{max} \geq$ 50% but <100% of the maximum PEL or $PEQ_{avg} \geq$ 50% but < 100% of the average PEL. Monitoring is appropriate.

No parameters fit the criteria of this group.

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

Limits to Protect Numeric Water Quality Criteria

Parameter	Units	Applicable Period	Recommended Effluent Limits	
			Average	Maximum
2,4,6-Trichlorophenol [A]	µg/l	annual	5.5	43.

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

Table 15. Continued

[A] Additivity of carcinogens. Following are the human health limits for the carcinogens:

Substance	Parameter	Limits for Human Health (µg/l)
A	Bis (2-EHP)	104.
B	2,4,6-Trichlorophenol	114.

The following equation will be used to calculate the additivity factor:

$$\frac{MAC_A}{104\ \mu g/l} + \frac{MAC_B}{114\ \mu g/l} \leq 1.0$$

where MAC = average concentration of all samples collected within the month.

Table 16. Final Effluent Limits 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]
Water Temperature	°C	- - - - - - - - - - - Monitor - - - - - - - - - - -				M, EP
Dissolved Oxygen	mg/L	7.0 minimum				BTJ, EP
Total Suspended Solids						
June – October	mg/L	16	24[c]	4120	6180[c]	BTJ, EP
November – April	mg/L	30	45[c]	7730	11600[c]	BTJ, EP
May	mg/L	26	39[c]	6700	10100[c]	BTJ, EP
Oil & Grease	mg/L	--	10	--	--	WQS, EP
Ammonia						
June – October	mg/L	1.0	1.5[c]	258	387[c]	BTJ, EP
November – April	mg/L	3.7	5.5[c]	953	1420[c]	BTJ, EP
May	mg/L	2.5	3.75[c]	644	966[c]	BTJ, EP
Total Kjeldahl Nitrogen	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				BTJ, EP
Nitrate+Nitrite	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				BTJ, EP
Phosphorus	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				BTJ, EP
Orthophosphate, Dissolved (as P)	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				SB1
Nickel	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M, EP
Silver	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M, EP
Zinc	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M, EP
Cadmium	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M, EP
Lead	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M, EP
Chromium	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M, EP
Copper	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M, EP
Hexavalent Chromium (Dissolved)	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M, EP
E. coli	#/100 mL	126	284[c]	--	--	WQS, EP
2,4,6-Trichlorophenol	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				RP
Peak Flow Rate	MGD	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Flow Rate	MGD	- - - - - - - - - - - Monitor - - - - - - - - - - -				M, EP
Chlorine, Total Residual	mg/L	--	0.019	--	--	EP
Mercury	ng/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M, EP
Free Cyanide	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M, EP
Toxicity						
Acute, *C. dubia, P. promelas*	TU_a	- - - - - - - - - - - Monitor - - - - - - - - - - -				WET
Chronic, *C. dubia, P. promelas*	TU_c	- - - - - - - - - - - Monitor - - - - - - - - - - -				WET
pH	SU	6.5 – 9.0				WQS, EP
Total Filterable Residue	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M, EP

Table 16. Continued

Carbonaceous Biochemical Oxygen Demand (5 day)						
June – October	mg/L	8.0	12 [c]	2060	3090 [c]	BTJ, EP
November – April	mg/L	20	30 [c]	5150	7730[c]	BTJ, EP
May	mg/L	13	19.5 [c]	3350	5020 [c]	BTJ, EP

[a] Effluent loadings based on average design discharge flow of 68.0 MGD.

[b] Definitions:
BTJ = Best Technical Judgment
EP = Existing Permit
M = BTJ of Division of Surface Water NPDES Permit Guidance 1: Monitoring Frequency Requirements for Sanitary Discharges
RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in permits [3745-33-07(A)]
SB1 = Implementation of Senate Bill 1 (ORC 6111.03)
WET = Minimum testing requirements for whole effluent toxicity [OAC 3745-33-07(B)(11)] and Reasonable potential for requiring water quality-based effluent limits and monitoring requirements for whole effluent toxicity in NPDES permits [OAC 3745-33-07(B)]
WQS = Ohio Water Quality Standards (OAC 3745-1)

[c] 7 day average limit.