National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for North Ridgeville French Creek WWTP

Public Notice No.: 16-11-002
Public Notice Date: November 4, 2016
Comment Period Ends: December 4, 2016

Ohio EPA Permit No.: 3PD00043*ND
Application No.: OH044512

Name and Address of Applicant:
City of North Ridgeville
7307 Avon Belden Road
Sheffield, Ohio 44054

Name and Address of Facility Where Discharge Occurs:
French Creek WWTP
2350 Abbe Road
Sheffield, Ohio 44054
Lorain County

Receiving Water: French Creek

Subsequent Stream Network: Black River to Lake Erie

Introduction

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

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

In accordance with the Antidegradation Rule, Ohio Administrative Code (OAC) 3745-1-05, Ohio EPA has determined that a lowering of water quality in French Creek is necessary. This decision was reached only after examining a series of technical alternatives, reviewing social and economic issues related to the degradation, and considering all public and appropriate intergovernmental comments.

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 (WQBELs) 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: flow, water temperature, dissolved oxygen, oil and grease, total Kjeldahl nitrogen (TKN), nitrite + nitrate, phosphorus, selenium, nickel, silver, zinc, cadmium, chromium, copper, dissolved hexavalent chromium, and pH.

New final effluent limits are proposed for *Escherichia coli.* New WQS (OAC 3745-1-07, Table 7-13) for *E. coli* became effective in April 2016. An 18-month compliance schedule is proposed for meeting these new final effluent limits. Based on best technical judgment (BTJ), it is proposed that the plant comply with its existing *E. coli* limits during the interim period.

Increased limits are proposed for mercury because the request for increased loading was approved through the procedures in OAC 3745-1-05. The monitoring frequency for mercury shall also increase to a biweekly schedule because plant data shows that there is still reasonable potential for the discharge to exceed WQS.

New monitoring without limits is proposed for total filterable residue (total dissolved solids), total residual chlorine, dissolved orthophosphate (as P), and total nitrogen nitrate (NO_3). Total filterable residue, total residual chlorine, and total nitrogen nitrate are being added because of BTJ. Monitoring for dissolved orthophosphate is required by Senate Bill 1, which was signed by the Governor on April 2, 2015. Starting three months from the effective date of the permit, dissolved orthophosphate shall be monitored on a monthly basis without limits.

Limits are proposed to be removed for lead because plant data shows that there is no reasonable potential for the discharge to exceed WQS. Monthly monitoring is to remain for the life of this permit.

Monitoring for di-n-butylphthalate is proposed to be removed because plant data shows that there is no reasonable potential for the discharge to exceed WQS.

The monitoring frequency for free cyanide shall increase because plant data shows that there is still a reasonable potential for the discharge to exceed WQS. Biweekly monitoring is proposed free cyanide, though limits shall remain the same. In addition, 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.

The monitoring frequency for carbonaceous biochemical oxygen demand ($CBOD_5$), total suspended solids, and ammonia (summer and winter) shall decrease. Based on BTJ, it has been determined that lower monitoring frequencies are adequate to capture representable data for a plant of this size. In addition, plant data demonstrates a low risk of these parameters exceeding WQS. Monitoring for $CBOD_5$ shall decrease from a daily basis to three times per week; monitoring for total suspended solids shall decrease from a daily basis to four times per week; monitoring for ammonia (summer and winter) shall decrease from a daily basis to five times per week. Limits for these parameters shall remain the same.

Annual chronic toxicity monitoring with the determination of acute endpoints is proposed for the life of this permit. Specimens to be used for toxicity testing are *Ceriodaphnia dubia* and *Pimephales promelas*. This satisfies the minimum testing requirements of OAC 3754-33-07(B)(11) and will adequately characterize toxicity in the plant's effluent.

In Part I.B, influent monitoring station 601 is proposed to decrease monitoring frequencies for $CBOD_5$ and total suspended solids. Selenium has also been added. In addition, the monitoring frequency for total cyanide and mercury shall increase to biweekly. The monitoring requirements are to be consistent with the changes in effluent monitoring station 001.

In Part I.B, TKN is being added to upstream monitoring station 801 in order to gauge French Creek WWTP's nutrient contribution to the receiving stream. In addition, the following parameters are being added to upstream monitoring station 801: 7-day chronic testing of *P. promelas* and *C. dubia*, 96-hour acute toxicity of *P. promelas*, and 48-hour acute toxicity of *C. dubia*. These data points will be compared to the toxicity tests at the effluent in order to gauge the effects of the POTW's discharge.

In Part I.B, the following parameters are being added to downstream monitoring station 901: total phosphorus, TKN, and nitrite+nitrate. These new requirements are necessary to determine the effects of plant effluent into the stream. Also, monitoring for the following parameters is no longer required: cadmium, chromium, dissolved hexavalent chromium, total cyanide, copper, lead, nickel, and zinc.

In Part I.B, station 581 will now contain limits for *Fecal coliform*. This was a requirement which was overlooked in the previous permit renewal.

In Part I.B, station 586 will be removed from the list of stations required for routine monitoring. Instead, sludge will only be discharged to a landfill as an emergency condition. Sludge data will only be recorded for this station if this occurs.

Part I.C includes requirements for a compliance schedule for *E. coli* limits, a municipal pretreatment schedule, a satellite sewer discharge control program, and a phosphorus discharge optimization evaluation plan.

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

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; storm water compliance; and outfall signage.

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Procedures for Participation in the Formulation of Final Determinations

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

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

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

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

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

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

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

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

For additional information about this fact sheet or the draft permit, contact Phoebe Low, 614-644-2134, Phoebe.Low@epa.ohio.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

French Creek WWTP discharges to French Creek at River Mile (RM) 2.53. Figure 1 shows the approximate location of the facility.

This segment of French Creek is described by Ohio EPA River Code: 20-002, 12-Digit Hydrologic Unit Code (HUC): 04110001-06-01, County: Lorain, Ecoregion: Erie/Ontario Lake Plain (EOLP). French Creek is designated for the following uses under Ohio's WQS (OAC 3745-1-27): Warmwater Habitat (WWH), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), and Primary Contact Recreation (PCR).

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

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

Recreation uses are defined by the depth of the waterbody and the potential for wading or swimming. Uses are defined for bathing waters, swimming/canoeing (PCR) 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 AWS and IWS.

Facility Description

French Creek WWTP was constructed in 1975 and last upgraded in 2008 with a new grit removal system. The average design flow is 11.250 million gallons per day (MGD) and the peak hydraulic capacity is 18 MGD. French Creek WWTP serves the City of North Ridgeville, City of Avon, and Village of Sheffield for a total of 56,400 customers. French Creek WWTP has the following treatment processes which are shown in Figure 2:

- Automatic Screening
- Flow Equalization
- Grit Removal
- Activated Sludge
- Ferrous Chloride Addition
- Secondary Clarification
- Sand Filters
- Filtration by Aqua Discs
- Ultraviolet Disinfection
- Post Aeration

French Creek WWTP has one bypass. Flow bypasses the equalization basin, is chlorinated, dechlorinated, and is combined with fully treated flow after ultraviolet disinfection. The City of North Ridgeville does have an

approved pretreatment program. French Creek WWTP has a total of 13 industrial users which discharge a total of 1.165 MGD to the facility. The significant industrial users include one metal finishing categorical user that discharges 0.100 MGD of flow and one significant non-categorical user that discharges 0.035 MGD of flow.

French Creek WWTP currently accepts the following industrial process wastewaters through its Outside Flow Program: leachate/run-off wastewaters, water and wastewater treatment plant sludges, and septage waste. These wastewaters are delivered by tanker trucks to the facility.

French Creek WWTP utilizes the following sewage sludge treatment processes which are shown in Figure 3:

- Aerobic Digestion
- Polymer Addition
- Dewatering by Centrifuge
- Air Drying

Treated sludge is primarily transferred to another NPDES permit holder (Three Creek Bioenergy Anaerobic Digestion Facility). The sludge is also permitted to be land applied. Under emergency situations the sludge can be sent to a landfill. Table 1 shows the last five years of sludge removed from French Creek WWTP.

French Creek WWTP is covered under the industrial storm water general permit 3GR01056.

Description of Existing Discharge

French Creek WWTP had several effluent violations which are shown on
Table 2. These violations were most likely caused by wet weather conditions. The plant's mercury violations were likely caused by the hauled waste; since then, the plant has limited the amount of hauled waste and the frequency of mercury violations has improved.

French Creek WWTP has an infiltration/inflow (I/I) rate of 1.140 MGD. The City of North Ridgeville had completed a camera study in 2013 and has scheduled an interceptor relining, sealing, and manhole rehabilitation projects in 2015. The average annual effluent flow rate for French Creek for the previous five years is presented on Table 3.

French Creek WWTP reports SSOs at station 300. Two SSO events were reported - one on 2/28/2011 and another on 12/27/2015. French Creek WWTP reports bypasses at station 602. The number of bypasses and dates reported is presented on

Table 4.

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.

Table 5 presents chemical specific data compiled from data reported in annual pretreatment reports.

Table 6 presents a summary of unaltered Discharge Monitoring Report (DMR) data for outfall 001. Data are presented for the period January 2009 to December 2013, and current permit limits are provided for comparison.

Table 7 summarizes the chemical specific data for outfall 001 by presenting the average and maximum PEQ values.

Table 8 summarizes the results of acute and chronic WET tests of the final effluent.

Assessment of Impact on Receiving Waters

French Creek has been identified as a priority impaired water on Ohio's 303(d) list.

A Total Daily Maximum Load (TMDL) report was approved for Black River Watershed in August 2008. The March 24, 2015, Supreme Court of Ohio decision *Fairfield Cty. Bd. Of Commrs. v. Nally, Slip Opinion No. 2015-Ohio-991* vacated all previously approved TMDLs. As of October 2016, this TMDL is considered a technical guidance document pending final TMDL approval.

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 (IBI) and modified Index of Well-Being (MIwb), which indicate the response of the fish community, and the Invertebrate Community Index (ICI), which indicates the response of the macroinvertebrate community. Numerical criteria are broken down by ecoregion, use designation, and stream or river size. Ohio has five ecoregions defined by common topography, land use, potential vegetation and soil type.

Three attainment status results are possible at each sampling location -full, partial, or non-attainment. Full attainment means that all of the applicable indices meet the biocriteria. Partial attainment means that one or more of the applicable indices fails to 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 9) is constructed based on the sampling results and is arranged from upstream to downstream and includes the sampling locations indicated by river mile, the applicable biological indices, the use attainment status (i.e., full, partial, or non), the Qualitative Habitat Evaluation Index (QHEI), and comments and observations for each sampling location.

According to the TMDL, the segment of the Black River Watershed relevant to the French Creek WWTP is impaired due to the following: unknown toxicity, priority organics, nutrients, dissolved oxygen, and bacteria.

Table 4-19 of the TMDL recommends that French Creek WWTP have loading limits for total suspended solids and nitrate. Ohio EPA proposes that limits continue for total suspended solids because effluent data (Table 6) demonstrates that French Creek WWTP regularly meets the TMDL's recommended limit of 135 kg/day. Ohio EPA also recommends biweekly monitoring for total nitrogen nitrate (NO_3) because no data for this parameter is available at the effluent. Before limits are considered for nitrate, Ohio EPA recommends that data be collected at the effluent.

The full TMDL report can be found at this website:
http://epa.ohio.gov/dsw/tmdl/BlackRockyRivers.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 French Creek WWTP 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 2009 through December 2013

Although data from priority pollutant scans were supposed to be considered for the WLA, this data was not included because French Creek WWTP did not submit this information to Ohio EPA. In October 2014, French Creek WWTP submitted the missing reports, though the WLAs were already calculated by that time.

Outliers
The data were examined and no values were removed from the evaluation.

This data is evaluated statistically, and PEQ values are calculated for each pollutant. Average PEQ (PEQ_{avg}) values represent the 95th percentile of monthly average data, and maximum PEQ (PEQ_{max}) values represent the 95th percentile of all data points (see Table 7).

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 14 for a summary of the screening results.

Wasteload Allocation
For those parameters that require a WLA, the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. Dischargers are allocated pollutant loadings/concentrations based on the Ohio WQS (OAC 3745-1). Most pollutants are allocated by a mass-balance method because they do not degrade in the receiving water. WLAs using this method are done using the following general equation: Discharger WLA = (downstream flow x WQS) - (upstream flow x background concentration). Discharger WLAs are divided by the discharge flow so that the allocations are expressed as concentrations. The following dischargers in Black River were considered interactive (see Figure 4):

- Elyria WWTP
- Lorain Black River WWTP
- Republic Engineered Products
- US Steel Lorain Tubular Operations

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 (WWH)		
Toxics (metals, organics, etc.)	Average	Annual 7Q10
	Maximum	Annual 1Q10
Ammonia	Average	Summer 30Q10
		Winter 30Q10
Wildlife		Annual 90Q10
AWS		Harmonic mean flow
Human Health (nondrinking)		Harmonic mean flow

Allocations are developed using a percentage of stream design flow as specified in Table 16 and allocations cannot exceed the Inside Mixing Zone Maximum (IMZM) criteria.

Table 10 through Table 15 represent the water quality criteria of multiple sections of the Black River. Each segment was allocated independently for parameters that have hardness-dependent criteria. These parameters include cadmium, total chromium, copper, lead, nickel, silver, and zinc. These WLAs presented in Table 18 are protective of all of the stream segments.

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

The data used in the WLA are listed in Table 15. The WLA results to maintain all applicable criteria are presented in Table 18.

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 French Creek WWTP, the WLA values are 0.30 TU_a and 1.0 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

According to the information on Table 17, the dilution ratio of French Creek is approximately 1 to 1.

$$Stream\ Dilution\ Ratio = \frac{1Q10 + French\ Creek\ WWTP\ Flow}{French\ Creek\ WWTP\ Flow} = \frac{0.26\ cfs + 17.41 cfs}{17.41\ cfs} = 1.015\ \approx 1{:}1$$

The acute WLA for French Creek WWTP is 30 percent mortality in 100 percent effluent based on the dilution ratio of 1 to 1.

Reasonable Potential/ Effluent Limits/Hazard Management Decisions

After appropriate effluent limits are calculated, the reasonable potential of the discharger to violate the WQS must be determined. Each parameter is examined and placed in a defined "group". Parameters that do not have a WQS or do not require a WLA based on the initial screening are assigned to either Group 1 or 2. For the allocated parameters, the preliminary effluent limits (PEL) based on the most restrictive average and maximum

WLAs are selected from Table 7. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 18, 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 20.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Tables 21-22 presents the initial and final effluent limits and monitoring requirements proposed for French Creek WWTP outfall 001 and the basis for their recommendation. Unless otherwise indicated, the monitoring frequencies proposed in the permit are continued from the existing permit.

Flow Rate and Water Temperature
Monitoring for flow rate and water temperature is proposed to continue in order to evaluate the performance of the treatment plant.

Dissolved Oxygen
The limits proposed for dissolved oxygen is based on plant design criteria. This limit is protective of WQS.

Total Suspended Solids, Phosphorus, and $CBOD_5$
The limits proposed for these parameters are proposed to continue based on anti-backsliding rules in OAC 3745-33-05(F). Although the provisions of OAC 3745-33-06(C) would allow higher phosphorus limits, the anti-backsliding rules prevent the imposition of less stringent limits than those in the existing permit unless specific conditions have been satisfied. Anti-backsliding rules also apply to total suspended solids and $CBOD_5$ even though secondary treatment technology-based limits suggest higher limits.

Oil and Grease, pH, and E. coli
Limits proposed for these parameters are based on WQS (OAC 3745-1-07). Limits for *E. coli* are proposed to decrease in order to reflect the updated standards in Table 7-13 of OAC 3745-1-07 (revised 1/4/16). Based on the facility's numerous *E. coli* limit violations, French Creek WWTP is not capable of meeting these lower limits by May 2017. Therefore, based on BTJ, the decreased *E. coli* limits shall be effective within 18 months of the effective date of the permit. A compliance schedule has been included in Part I.C. for the *E. coli* limits.

Total Residual Chlorine
Based on the information in Figure 2, a limit for total residual chlorine is required in order to document the amount of chlorine discharged during a bypass event. Although Table 20 classifies this pollutant in Group 2, monitoring is still necessary because total residual chlorine is a plant design parameter [OAC 3745-33-07(A)(1)(b)]. Monitoring shall be on a monthly basis.

Free Cyanide and Mercury
The Ohio EPA risk assessment (Table 20) places mercury and free cyanide in Group 5. These placements, as well as the data in Tables 5 – 7, indicate that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality. For these parameters, the PEQ is greater than 100 percent of the WLA. Pollutants that meet this requirement must have permit limits under OAC 3745-33-07(A)(1). These parameters will be monitored on a biweekly schedule.

The thirty-day average and daily maximum concentration limits are based on the WLA. The thirty-day average and daily maximum loading limits are based on the plant average daily design flow.

In August 2016, French Creek WWTP submitted an Antidegradation request to increase the concentration and loading limits for mercury. Mercury limits in previous permits 3PD00043*LD and 3PD00043*MD were reflective of an average daily design flow of 7.5 MGD because the facility did not request a loading increase during the plant expansion.

Although the "Ohio Sport Fish Consumption Advisory" (July 2016) lists the Black River under an advisory due to mercury, data suggests that French Creek WWTP is not a significant contributor to the mercury level in the Black River. This is supported by the fact that French Creek WWTP is more than two river miles away from the Black River and that the French Creek is in full attainment downstream of the plant (Table 9). In addition, French Creek WWTP no longer accepts hauled wastes in an effort to lower mercury in the effluent. This has had a positive impact on the discharge, as French Creek has not violated mercury limits in 2015 (Table 2) and its average annual mercury discharge has decreased over the years (Attachment 1).

Cadmium, Chromium, Dissolved Hexavalent Chromium, Copper, Lead, Nickel, Nitrite+Nitrate, Selenium, Silver, and Zinc

The Ohio EPA risk assessment (Table 20) places these parameters in Groups 2 and 3. This placement, as well as the data in Table 7 and Table 18, support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Continued monitoring at a reduced frequency is proposed to document that these pollutants remain at low levels. Limits for lead, however, are proposed to be removed but monitoring will continue at the same frequency.

Arsenic, Di-n-butylphthalate, and Molybdenum

The Ohio EPA risk assessment (Table 20) places these parameters in Group 2. This placement, as well as the data in Table 7 and Table 18, 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 of these parameters is not necessary. As a result, monitoring requirements for di-n-butylphthalate shall be removed.

Total Filterable Residue

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

Ammonia, Nitrite+Nitrate, TKN, and Total Nitrogen Nitrate (NO_3)

Based on BTJ, ammonia, nitrite+nitrate, and TKN are to remain at their current monitoring frequencies. The *2014 Ohio Integrated Water Quality Monitoring and Assessment Report* (Ohio EPA) lists French Creek as impaired for aquatic life. Nutrients and organic enrichment/dissolved oxygen are listed as "high magnitude" causes, and major municipal point sources are listed among the "high magnitude" sources. The purpose of the monitoring is to maintain a nutrient data set for use in the future TMDL study. Limits for ammonia are protective of WQS and are proposed to continue for the life of the permit.

Biweekly monitoring for total nitrogen nitrate is proposed for the life of the permit is proposed based on BTJ. Though Table 4-19 recommends limits for nitrate, no monitoring data for nitrate is available at the plant's effluent. Prior to considering any limits for this parameter, Ohio EPA recommends that monitoring data be collected.

Dissolved Orthophosphate

New monthly monitoring is proposed for dissolved orthophosphate (as P). This monitoring is required by Ohio Senate Bill 1 (ORC 6111.03), 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. 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.

Additional Monitoring Requirements

New monitoring for selenium is being proposed at influent monitoring station 601 due to monitoring requirements for pretreatment programs. New monitoring for total phosphorus, TKN, and nitrate+nitrite are being proposed to downstream monitoring station 901 because the Black River was found to be nutrient-impaired.

7-day acute and chronic testing of *P. promelas* and *C. dubia*, 96-hour acute toxicity of *P. promelas*, and 48-hour acute toxicity of *C. dubia* are proposed for the upstream monitoring station 801. These data points will be compared to the toxicity tests at the effluent in order to gauge the effects of the POTW's discharge.

The downstream station 901 will now include the following parameters: total phosphorus, TKN, and nitrite+nitrate. Monitoring for these parameters will gauge how discharge from French Creek WWTP affects the nutrients in the receiving stream.

Whole Effluent Toxicity Reasonable Potential
There is only one toxicity test result available for evaluation (

Table **8**). 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 and meet the minimum monitoring requirements described in OAC 3745-33-07(B)(11).

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, landfill, and hauling off site for treatment in another NPDES permitted facility. The primary method of disposal is by transportation to another NPDES permitted facility; sludge may also be land applied. During emergency situations, the sludge may be disposed in a landfill during emergency situations.

Other Requirements

Compliance Schedule
E. coli Limits – A 18 month compliance schedule is proposed for French Creek WWTP to meet the new monthly and weekly colony count limits for *E. coli*. In the interim, the facility will continue to comply with the existing *E. coli* limits. Details are in Part I.C of the permit.

Pretreatment Local Limits Review - A six month compliance schedule is proposed for the City of North Ridgeville 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 of North Ridgeville must also submit a pretreatment program modification request. Details are in Part I.C of the permit.

Satellite Sewer Discharge Control Program – The permittee shall submit annual reports documenting the compliance of each satellite system during the previous year. Details are in Part I.C of the permit.

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

These methods will allow Ohio EPA make more reliable water quality-related decisions regarding free cyanide. Because the quantification levels are lower than any water quality-based effluent limits, it will also be possible to directly evaluate compliance with free cyanide limits.

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

Method Detection Limit

Table 19 shows a list of parameters and the accompanying MDLs compared to the appropriate water quality criteria minimum values. The method detection limit should be approximately one third of the most stringent water quality criteria from Table 18. To ensure that data is obtained that allows Ohio EPA to make water quality-related decisions regarding copper, hexavalent chromium, and lead, a special condition is proposed Part II, Item Y of the permit that provides guidance on the MDL the permittee should use in analyzing these contaminants.

Storm Water Compliance
To comply with industrial storm water regulations, the permittee requested coverage under the industrial storm water general permit. Permit 3GR01056 became effective on 4/4/2012. No later than 4/4/2017, 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 French Creek providing information about the discharge. Signage at outfalls is required pursuant to OAC 3745-33-08(A).

Figure 1. Location of French Creek WWTP

Figure 2. Diagram of Wastewater Treatment System

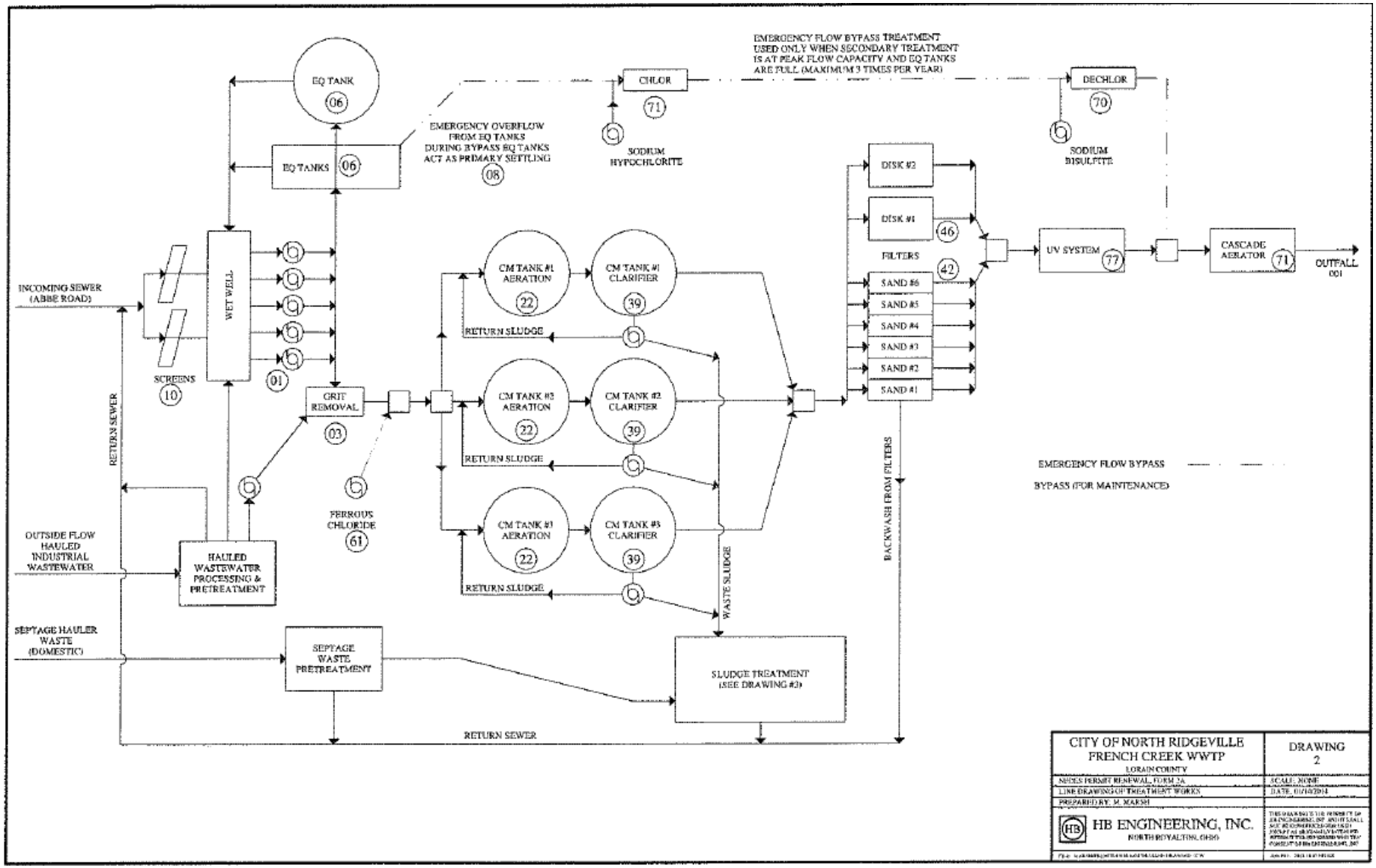


Figure 3. Diagram of Biosolids Processes

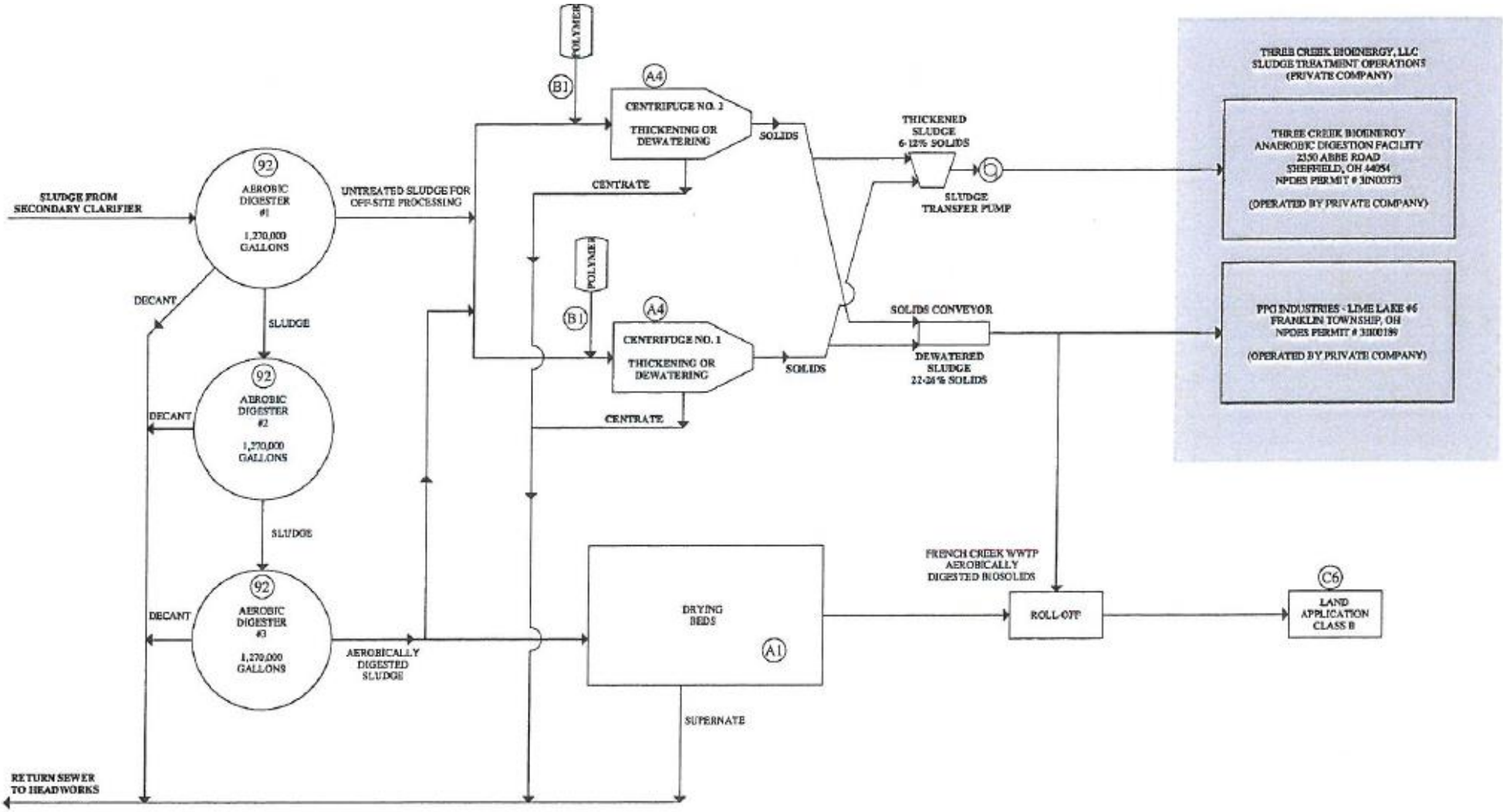
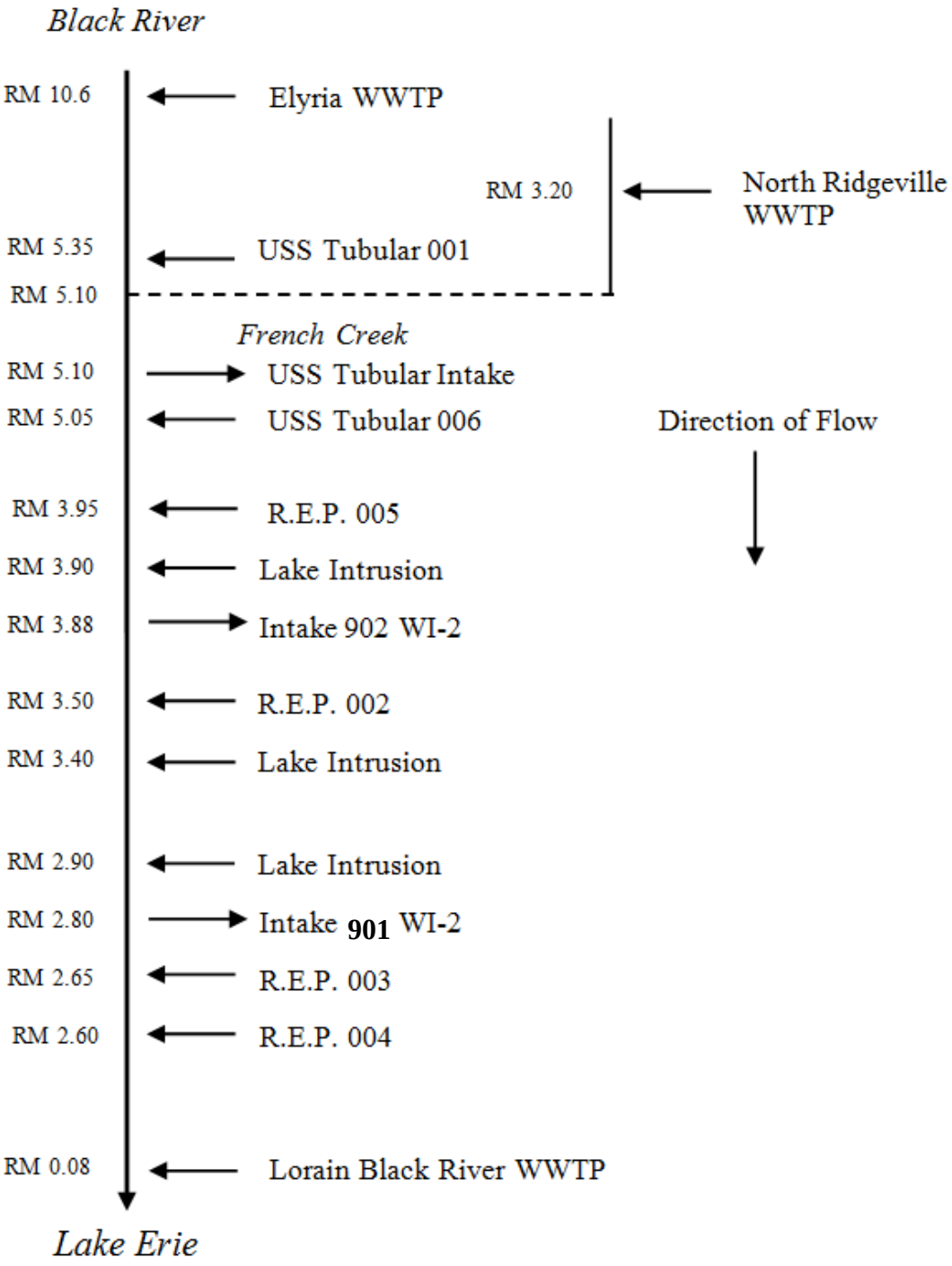


Figure 4. The Black River Study Area



WWTP = Wastewater Treatment Plant
R.E.P. = Republic Engineered Products

Table 1. Sewage Sludge Removal to Land Application

	Dry Tons Removed		
Year	**Land Application**	**Landfill**	**Transported to another Permitted Facility**
2011	391.15	0.00	0.00
2012	991.22	117.78	199.45
2013	0.00	0.00	1228.11
2014	0.00	0.00	958.46
2015	0.00	0.00	872.72

Table 2. Effluent Violations for Outfall 001

Parameter	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Carbonaceous Biochemical Oxygen Demand (5 day)	0	0	0	0	1	0
E. coli	0	1	1	5	1	4
Fecal coliform	0	1	0	0	0	0
Mercury	1	0	7	7	4	0
pH (minimum)	0	0	1	1	2	1
Phosphorus	0	0	0	0	1	0
Total Suspended Solids	1	0	0	2	4	0
Ammonia	0	0	0	0	0	3
Total	*2*	*2*	*9*	*15*	*13*	*8*

Table 3. Average Annual Effluent Flow Rates

Year	Flow in MGD		
	50th Percentile	95th Percentile	Maximum
2011	5.139	10.67	27.93
2012	4.711	8.036	30.07
2013	5.611	9.458	21.50
2014	4.819	8.882	27.66
2015	4.408	8.663	16.39

MGD = million gallons per day

Table 4. Bypass Discharges

Year	# of Bypasses	Bypass Volume (Million Gallons)			Total Suspended Solids (mg/L)		Carbonaceous Biochemical Oxygen Demand (5 day)	
		Average	Maximum	Total	Average	Maximum	Average	Maximum
2011	5	0.250	1.25	12.2	156	512	37.4	58.3
2012	3	6.38	14.5	19.1	39.3	42.0	39.7	47.0
2013	3	2.28	6.84	6.84	160	328	52.2	62.7
2014	3	0.708	2.13	10.2	369	658	59.7	84.0
2015	3	2.10	3.3	6.29	73.7	82.0	41.3	52

Table 5. Effluent Characterization Using Pretreatment Data

Parameter	Units	12/28/2009	9/30/2010	9/28/2011	12/20/2012	12/3/2013
Arsenic	µg/L	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Bis(2-ethylhexyl)phthalate	µg/L	ND(10)	ND(20)	ND(10)	ND(10)	ND(10)
Cadmium	µg/L	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)
Chromium, Total	µg/L	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Copper	µg/L	ND(5)	ND(5)	ND(5)	ND(5)	7.25
Cyanide, Total	mg/L	ND(0.010)	ND(0.010)	ND(0.010)	ND(0.010)	ND(0.010)
Lead	µg/L	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Mercury	µg/L	ND(0.20)	ND(0.20)	ND(0.05)	ND(0.025)	ND(0.025)
Nickel	µg/L	ND(5)	5.15	9.30	5.95	8.55
Selenium	µg/L	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Silver	µg/L	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)	ND(2.5)
Zinc	µg/L	28	28.2	28.4	43.2	52.2

ND = not-detected (analytical method detection limit)
*Note: these findings were not accounted for in the wasteload allocation

Table 6. Effluent Characterization Using Self-Monitoring Data

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
Outfall 001 - Effluent								
Water Temperature	Annual	℃	- - - Monitoring - - -		1823	15	21	6-24
Dissolved Oxygen	Summer	mg/L	6.0 Minimum		918	7.9	9	5.9-10.2
	Winter	mg/L			906	9.3	10.5	6.4-11.8
Total Suspended Solids	Annual	mg/L	8	12a	1244	1.6	4.97	0-72
		kg/day	341	511	1244	32.1	138	0-3040
Oil and Grease	Annual	mg/L	10 Maximum		174	0	2.36	0-7
Ammonia	Summer	mg/L	1	1.5 [a]	641	0.06	0.94	0-4.28
		kg/day	42.6	63.9 [a]	641	1.23	18.4	0-101
	Winter	mg/L	2.7	4.0 [a]	601	0.05	0.6	0-2.74
		kg/day	114	170 [a]	601	1.04	16.3	0-56
Nitrogen Kjeldahl, Total	Annual	mg/L	- - - Monitoring - - -		120	1.6	2.51	0.75-3.2
Nitrite Plus Nitrate, Total	Annual	mg/L	- - - Monitoring - - -		207	15.1	22.2	6.2-26.6
Phosphorus, Total (P)	Annual	mg/L	0.67	1.0 [a]	1244	0.33	0.6	0.08-1.55
		kg/day	28.4	42.6 [a]	1244	6.37	13.6	1.53-84.1
Cyanide, Free	Annual	mg/L	0.0052	0.022	60	0	0	0-0.01
		kg/day	0.222	0.937	60	0	0	0-0.184
Selenium, Total Recoverable	Annual	µg/L	- - - Monitoring - - -		41	0	0	0-0
Nickel, Total Recoverable	Annual	µg/L	- - - Monitoring - - -		79	0	7.44	0-13
Silver, Total Recoverable	Annual	µg/L	- - - Monitoring - - -		79	0	0	0-0
Zinc, Total Recoverable	Annual	µg/L	- - - Monitoring - - -		79	33	59.8	6.46-132
Cadmium, Total Recoverable	Annual	µg/L	- - - Monitoring - - -		79	0	0	0-0
Lead, Total Recoverable	Annual	µg/L	0.023	0.538	79	0	0.226	0-3.76
		kg/day	0.00098	0.023	79	0	0.00416	0-0.105
Chromium, Total Recoverable	Annual	µg/L	- - - Monitoring - - -		79	0	0	0-2.34
Copper, Total Recoverable	Annual	µg/L	- - - Monitoring - - -		79	0	4.08	0-12

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
Chromium, Dissolved Hexavalent	Annual	µg/L	- - - Monitoring - - -		60	0	0	0-0
E. coli	Annual	#/100 mL	161	362 [a]	429	0	262	0-18500
Di-N-Butylphthalate	Annual	µg/L	- - - Monitoring - - -		47	0	0	0-0
Flow Rate	Annual	MGD	- - - Monitoring - - -		1826	5.15	9.23	2.18-4970
Mercury, Total (Low Level)	Annual	ng/L	0.87	700	60	0	3.4	0-8.51
		kg/day	0.00004	0.03	60	0	0.0000714	0-0.000205
pH, Maximum	Annual	S.U.	9.0 Maximum		1826	7	7.5	6-7.9
pH, Minimum	Annual	S.U.	6.5 Minimum		1826	6.9	7.4	6.2-7.8
5-day Carbonaceous Biochemical Oxygen Demand	Annual	mg/L	6.7	10.0 [a]	1236	2.8	4.4	0-27
		kg/day	284	426 [a]	1236	55.3	125	0-1590
Outfall 300 – Sanitary Sewer Overflow								
Overflow Occurrence	Annual	No./Month	- - - Monitoring - - -		1825	0	0	0-512
Outfall 581 – Sludge Monitoring (Land Application)								
pH	Annual	S.U.	- - - Monitoring - - -		109	6.77	8	5.6-8.43
Ammonia (NH3) In Sludge	Annual	mg/kg	- - - Monitoring - - -		26	6170	13700	396-15900
Nitrogen Kjeldahl, Total In Sludge	Annual	mg/kg	- - - Monitoring - - -		26	43000	54100	28100-62500
Phosphorus, Total In Sludge	Annual	mg/kg	- - - Monitoring - - -		26	23400	91800	949-610000
Potassium In Sludge	Annual	mg/kg	- - - Monitoring - - -		14	2150	4020	1220-5970
Arsenic, Total In Sludge	Annual	mg/kg	--	75	18	3.87	8.18	0-14.8
Cadmium, Total In Sludge	Annual	mg/kg	--	85	18	3.01	4.18	0-4.38
Copper, Total In Sludge	Annual	mg/kg	--	4300	18	518	932	9.69-2650
Lead, Total In Sludge	Annual	mg/kg	--	840	18	27.3	41.9	0-52.9
Nickel, Total In Sludge	Annual	mg/kg	--	420	18	35.5	73.4	0-205
Zinc, Total In Sludge	Annual	mg/kg	--	7500	18	1300	1860	23.2-2110
Selenium, Total In Sludge	Annual	mg/kg	--	100	18	0	14.7	0-45.6
Fecal Coliform in Sludge	Annual	MPN/G	- - - Monitoring - - -		8	370000	8220000	852-10000000
Sludge Fee Weight	Annual	Dry Tons	- - - Monitoring - - -		14	174	816	0-1360

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
Sludge Weight	Annual	Dry Tons	- - - Monitoring - - -		134	33.8	447	0-1360
Mercury, Total In Sludge	Annual	mg/kg	--	57	18	0.586	1.07	0-1.21
Molybdenum In Sludge	Annual	mg/kg	--	75	18	9.3	14.1	0-19.3
Outfall 586 – Sludge Monitoring (Landfill)								
Sludge Fee Weight	Annual	dry tons	- - - Monitoring - - -		2	673	1170	118-1230
Outfall 588 – Sludge Monitoring (Haul to another Facility)								
Sludge Weight	Annual	Dry Tons	- - - Monitoring - - -		2	714	1180	199-1230
Outfall 601 – Influent Monitoring								
Water Temperature	Annual	°C	- - - Monitoring - - -		1823	15	20	5-25
pH	Annual	S.U.	- - - Monitoring - - -		1822	7.3	7.6	6.3-75
Total Suspended Solids	Annual	mg/L	- - - Monitoring - - -		1244	264	517	70-1320
Cyanide, Total	Annual	mg/L	- - - Monitoring - - -		60	0	0	0-0.033
Nickel, Total Recoverable	Annual	µg/L	- - - Monitoring - - -		79	11.8	28.2	0-131
Silver, Total Recoverable	Annual	µg/L	- - - Monitoring - - -		79	1.46	3.88	0-19.8
Zinc, Total Recoverable	Annual	µg/L	- - - Monitoring - - -		79	225	568	63.6-1060
Cadmium, Total Recoverable	Annual	µg/L	- - - Monitoring - - -		79	0	1.81	0-3.6
Lead, Total Recoverable	Annual	µg/L	- - - Monitoring - - -		79	0	18.2	0-29.8
Chromium, Total Recoverable	Annual	µg/L	- - - Monitoring - - -		79	0	15.7	0-34.2
Copper, Total Recoverable	Annual	µg/L	- - - Monitoring - - -		79	107	209	12.8-464
Outfall 601 – Influent Monitoring (continued)								
Chromium, Dissolved Hexavalent	Annual	µg/L	- - - Monitoring - - -		59	0	0	0-20
Mercury, Total (Low Level)	Annual	ng/L	- - - Monitoring - - -		40	91.7	747	0.0892-2540
5-Day Carbonaceous Biochemical Oxygen Demand	Summer	mg/L	- - - Monitoring - - -		641	174	258	20-420
	Winter				596	152	230	10-345
Outfall 602 – Bypass Monitoring								
Total Suspended Solids	Annual	mg/L	- - - Monitoring - - -		11	52	420	35-512
Bypass Volume	Annual	MGAL	- - - Monitoring - - -		11	1.67	625000	0.593-1250000

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
5-Day Carbonaceous Biochemical Oxygen Demand	Summer	mg/L	- - - Monitoring - - -		7	37	58.8	24-59
	Winter				4	43.5	62	17.8-62.7
Bypass Occurrence	Annual	No./Month	- - - Monitoring - - -		11	1	1	1-1
Bypass Duration	Annual	Hr/Month	- - - Monitoring - - -		11	8.75	24	2.5-24
Outfall 801 – Upstream Monitoring								
Water Temperature	Annual	°C	- - - Monitoring - - -		60	11	22.1	1-23
Dissolved Oxygen	Summer	mg/L	- - - Monitoring - - -		30	7.85	9.56	6.9-9.6
	Winter				30	12.3	13.4	7.6-13.8
pH	Annual	S.U.	- - - Monitoring - - -		60	8.1	8.5	7.5-8.9
Ammonia	Summer	mg/L	- - - Monitoring - - -		30	0	0.0955	0-0.14
	Winter				30	0	0.183	0-0.35
Nitrite Plus Nitrate, Total	Annual	mg/L	- - - Monitoring - - -		60	1.33	3.92	0.25-12.5
Phosphorus, Total (P)	Annual	mg/L	- - - Monitoring - - -		60	0.13	0.375	0-0.49
Fecal Coliform	Annual	#/100 mL	- - - Monitoring - - -		9	280	9880	92-11000
E. coli	Annual	#/100 mL	- - - Monitoring - - -		19	700	4030	180-4300
Outfall 901 – Downstream Monitoring								
Water Temperature	Annual	°C	- - - Monitoring - - -		60	12.5	21.1	0-23
Dissolved Oxygen	Summer	mg/L	- - - Monitoring - - -		30	8.05	9.21	6.8-9.7
	Winter				30	11.1	12.8	8-12.9
pH	Annual	S.U.	- - - Monitoring - - -		60	8	8.1	7.7-8.3
Ammonia	Summer	mg/L	- - - Monitoring - - -		30	0.06	0.493	0-1.04
	Winter				30	0.06	0.289	0-0.93
Nitrite Plus Nitrate, Total	Annual	mg/L	- - - Monitoring - - -		19	6.43	14	1.25-19.1
Phosphorus, Total (P)	Annual	mg/L	- - - Monitoring - - -		19	0.16	0.418	0-0.58
Cyanide, Total	Annual	mg/L	- - - Monitoring - - -		41	0	0	0-0
Hardness, Total (CaCO3)	Annual	mg/L	- - - Monitoring - - -		60	258	356	126-384
Nickel, Total Recoverable	Annual	µg/L	- - - Monitoring - - -		60	0	10.3	0-25.4
Silver, Total Recoverable	Annual	µg/L	- - - Monitoring - - -		19	0	0	0-0

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
Outfall 901 – Downstream Monitoring (continued)								
Zinc, Total Recoverable	Annual	µg/L	- - - Monitoring - - -		60	20.8	50.7	0-301
Cadmium, Total Recoverable	Annual	µg/L	- - - Monitoring - - -		60	0	0	0-0
Lead, Total Recoverable	Annual	µg/L	- - - Monitoring - - -		60	0	0	0-0
Chromium, Total Recoverable	Annual	µg/L	- - - Monitoring - - -		60	0	0	0-0
Copper, Total Recoverable	Annual	µg/L	- - - Monitoring - - -		60	0	12.2	0-26.3
Chromium, Dissolved Hexavalent	Annual	µg/L	- - - Monitoring - - -		60	0	0	0-0
E. coli	Annual	#/100 mL	- - - Monitoring - - -		19	170	2520	20-2700

All values are based on annual records unless otherwise indicated. * = For minimum pH, 5th percentile shown in place of 50th percentile; ** = For dissolved oxygen, 5th percentile shown in place of 95th percentile; a = weekly average."

Table 7. Projected Effluent Quality

Parameter	Units	Number of Samples	# > MDL	PEQ Average	PEQ Maximum
Ammonia (Summer)	mg/L	425	270	0.396	0.822
Ammonia (Winter)	mg/L	318	168	0.251	0.556
Cadmium	µg/L	80	0	---	---
Chromium, total	µg/L	15	1	2.562	3.51
Chromium, dissolved hexavalent	µg/L	61	0	---	---
Copper	µg/L	80	16	3.543	5.517
Cyanide, free	µg/L	61	1	7.3	10.0
Di-N-Butylphthalate	µg/L	48	0	---	---
Lead	µg/L	15	4	4.117	5.64
Mercury	ng/L	61	17	4.867	5.438
Nickel	µg/L	80	19	6.652	10.26
Nitrite+Nitrate	mg/L	209	209	19.48	24.22
Phosphorus	mg/L	1265	1265	0.404	0.658
Selenium	µg/L	41	0	---	---
Silver	µg/L	80	0	---	---
Zinc	µg/L	80	80	52.63	71.64

MDL = analytical method detection limit
PEQ = projected effluent quality

Table 8. Summary of Acute and Chronic Toxicity Results

Date	Acute Toxicity (TU_a)	
	C. dubia	***P. promelas***
12/18/2013	AA	AA

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

Table 9. Use Attainment Table

Aquatic Life Use

Location	River Mile	Use	Attainment Status	Causes	Sources
French Creek Near Lorain @ East River Road	0.54	WWH	FULL	-	-
French Creek Northeast of Lorain @ Abbe Road (State Route 301)	3.20	WWH	PARTIAL	Direct Habitat Alterations, Nutrient/Eutrophication Biological Indicators, Other	Channelization, On-Site Treatment Systems (septic system and similar decentralized systems), and other unknown sources
French Creek @ Bridge Pointe Trail	5.50	WWH	FULL	-	-
French Creek Southeast of Avon @ Riegelsberger Road	9.02	WWH	NON-ATTAINMENT	Direct Habitat Alterations, Nutrient/Eutrophication Biological Indicators, Other	Channelization, On-Site Treatment Systems (septic system and similar decentralized systems), and other unknown sources
French Creek East of Elyria @ Mills Road	10.41	WWH	PARTIAL	Direct Habitat Alterations, Nutrient/Eutrophication Biological Indicators, Other	Channelization, On-Site Treatment Systems (septic system and similar decentralized systems), and other unknown sources

Source: Final *Ohio 2014 Integrated Water Quality Monitoring and Assessment Report*, French Creek Watershed Assessment Unit Summary: http://www.epa.ohio.gov/dsw/tmdl/OhioIntegratedReport.aspx
* "Other" as a cause refers to not readily identified impacts associated with runoff from impervious surfaces and lawns in urban settings.
WWH = warmwater habitat
Note: French Creek WWTP discharges to the French Creek at River Mile 2.53.

Table 10. Water Quality Criteria for the Black River and French Creek (except hardness-based parameters)

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum[A]
		Average			Maximum	
		Human Health[A]	Agri-culture	Aquatic Life[A]	Aquatic Life[A]	
Acenaphthene	µg/L	890	---	15	19	38
Arsenic	µg/L	580	100	150	340	680
Barium	µg/L	160,000	---	220 [B]	2,000 [B]	4,000 [B]
Bis(2-ethylhexyl)phthalate	µg/L	32	---	8.4 [B]	1,100 [B]	2,100 [B]
Chlorine, total residual	µg/L	---	---	11	19	38
Chromium, dissolved hexavalent	µg/L	14,000	---	11	16	31
Cyanide, free	µg/L	48,000	---	5.2	22	44
Di-n-butyl phthalate	µg/L	31	---	---	---	---
Fluoranthene	µg/L	9.5	---	0.8	3.7	7.4
Fluorene	µg/L	320	---	19	110	220
Fluoride	µg/L	---	2,000	---	---	---
Mercury [C W]	ng/L	3.1	10,000	910	1700	3400
Molybdenum	µg/L	10,000	---	20,000 [B]	190,000 [B]	370,000 [B]
Napthalene	µg/L	1,200	---	21 [B]	170 [B]	340 [B]
Nitrate+Nitrite	mg/L	---	100	---	---	---
Phenanthrene	µg/L	---	---	2.3	31	61
Pyrene	µg/L	15	---	4.6	42	83
Selenium	µg/L	3,100	50	5.0	---	---
Silver	µg/L	11,000	---	1.3	8.3	17
Total Filterable Residue	mg/L	---	---	1,500	---	---

[A] Human Health and Aquatic Life criteria are Tier I unless otherwise indicated
[B] Tier II criterion
[C] Bioaccumulative Chemical of Concern (BCC)
[W] Wildlife Criteria applies (1.3 ng/L)

Table 11. Water Quality Criteria for the Black River Downstream of Republic Engineered Products Intake 901 (Hardness = 140 mg/L)

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum[A]
		Average			Maximum	
		Human Health[A]	Agri-culture	Aquatic Life[A]	Aquatic Life[A]	
Cadmium	µg/L	730	50	5.2	13	27
Chromium, total	µg/L	14,000	100	190	3,900	7,900
Copper	µg/L	64,000	500	21	34	69
Lead	µg/L	---	100	22	410	830
Nickel	µg/L	43,000	200	120	1,100	2,100
Silver	µg/L	11,000	---	1.3	8.3	17
Zinc	µg/L	35,000	25,000	270	270	540

[A] Human Health and Aquatic Life criteria are Tier I unless otherwise indicated

Table 12. Water Quality Criteria for the Black River from Republic Engineered Products Intake 902 to Republic Engineered Products Intake 901 (Hardness = 193 mg/L)

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum[A]
		Average			Maximum	
		Human Health[A]	Agri-culture	Aquatic Life[A]	Aquatic Life[A]	
Cadmium	µg/L	730	50	4.1	9.5	19
Chromium, total	µg/L	14,000	100	150	3,100	6,200
Copper	µg/L	64,000	500	16	26	52
Lead	µg/L	---	100	15	280	570
Nickel	µg/L	43,000	200	91	820	1,600
Silver	µg/L	11,000	---	1.3	5.0	9.9
Zinc	µg/L	35,000	25,000	210	210	420

[A] Human Health and Aquatic Life criteria are Tier I unless otherwise indicated

Table 13. Water Quality Criteria for the Black River Downstream U.S.S. Tubular Outfall 006 to Republic Engineered Products Intake 902 (Hardness = 233 mg/L)

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum[A]
		Average			Maximum	
		Human Health[A]	Agri-culture	Aquatic Life[A]	Aquatic Life[A]	
Cadmium	µg/L	730	50	4.1	9.5	19
Chromium, total	µg/L	14,000	100	150	3,100	6,200
Copper	µg/L	64,000	500	16	26	52
Lead	µg/L	---	100	15	280	570
Nickel	µg/L	43,000	200	91	820	1,600
Silver	µg/L	11,000	---	1.3	5.0	9.9
Zinc	µg/L	35,000	25,000	210	210	420

[A] Human Health and Aquatic Life criteria are Tier I unless otherwise indicated

Table 14. Water Quality Criteria for the Black River from Elyria WWTP to U.S.S. Tubular Outfall 006 (Hardness = 243 mg/L)

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum[A]
		Average			Maximum	
		Human Health[A]	Agri-culture	Aquatic Life[A]	Aquatic Life[A]	
Cadmium	µg/L	730	50	4.9	12	25
Chromium, total	µg/L	14000	100	180	3700	7500
Copper	µg/L	64000	500	20	32	65
Lead	µg/L	---	100	20	380	760
Nickel	µg/L	43000	200	110	990	2000
Silver	µg/L	11000	---	1.3	7.4	15
Zinc	µg/L	35000	25000	250	250	510

[A] Human Health and Aquatic Life criteria are Tier I unless otherwise indicated

Table 15. Water Quality Criteria for French Creek (Hardness = 260 mg/L)

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum[A]
		Average			Maximum	
		Human Health[A]	Agri-culture	Aquatic Life[A]	Aquatic Life[A]	
Cadmium	µg/L	730	50	5.2	13	27
Chromium, total	µg/L	14,000	100	190	3,900	7,900
Copper	µg/L	64,000	500	21	34	69
Lead	µg/L	---	100	22	410	830
Nickel	µg/L	43,000	200	120	1,100	2,100
Silver	µg/L	11,000	---	1.3	8.3	17
Zinc	µg/L	35,000	25,000	270	270	540

[A] Human Health and Aquatic Life criteria are Tier I unless otherwise indicated

Table 16. Instream Conditions and Discharger Flow for Black River and Mainstem

Parameter	Units		Value	Basis
Upstream flows				
7Q10	cfs	annual	4.29	USGS gage #04200500,1944-97 data
1Q10	cfs	annual	2.90	USGS gage #04200500,1944-97 data
30Q10	cfs	summer	5.3	USGS gage #04200500,1944-97 data
	cfs	winter	19.0	USGS gage #04200500,1944-97 data
90Q10	cfs	annual	9.55	USGS gage #04200500,1944-97 data
Harmonic Mean Flow	cfs	annual	30.48	USGS gage #04200500,1944-97 data
Lake Intrusion flows @ RM 3.9				
7Q10	cfs	annual	2.77	USS/Kobe
1Q10	cfs	annual	3.11	USS/Kobe
90Q10	cfs	annual	1.90	USS/Kobe
Harmonic Mean Flow	cfs	annual	0.32	USS/Kobe
Lake Intrusion flows @ RM 3.4				
7Q10	cfs	annual	9.18	USS/Kobe
1Q10	cfs	annual	10.47	USS/Kobe
90Q10	cfs	annual	6.17	USS/Kobe
Harmonic Mean Flow	cfs	annual	0.89	USS/Kobe
Lake Intrusion flows @ RM 2.9				
7Q10	cfs	annual	116.	USS/Kobe
1Q10	cfs	annual	117.11	USS/Kobe
90Q10	cfs	annual	110.29	USS/Kobe
Harmonic Mean Flow	cfs	annual	86.41	USS/Kobe
Mixing Assumption	%	average	25	Chronic criteria default
	%	maximum	100	Stream-to-discharge ratio
Instream Hardness	mg/l	annual		
downstream of intake 901			140.	STORET
from intake 902 to 901			193.	Calculated
from USS intake to intake 902			233.	STORET
from Elyria to USS intake			243.	Elyria DMR

Table 16. Instream Conditions and Discharger Flow for Black River Mainstem (continued)

Parameter	Units		Value	Basis
Background Water Quality for the Black River Mainstem:				
Arsenic	µg/l	annual	2.3	STORET: 17 values, 4<MDL, 2012
Barium	µg/l	annual	41.	STORET: 20 values, 0<MDL, 2012
Bis(2-EHP)	µg/l	annual	0.	STORET: 7 values, 7<MDL, 2012
Cadmium	µg/l	annual	0.1	STORET: 17 values, 9<MDL, 2012
Chlorine, tot. res.	µg/l	annual	0.	No representative data available.
Chromium total	µg/l	annual	1.	STORET: 17 values, 15<MDL, 2012
Chromium $^{+6}$ diss.	µg/l	annual	0.	No representative data available
Copper	µg/l	annual	5.	STORET: 17 values, 0<MDL, 2012
Cyanide, free	µg/l	annual	0.	No representative data available
Fluoride	µg/l	annual	0.	No representative data available
Lead	µg/l	annual	1.	STORET: 17 values, 13<MDL, 2012
Molybdenum	µg/l	annual	0.	No representative data available
Nickel	µg/l	annual	4.5	STORET: 17 values, 0<MDL, 2012
Nitrate+Nitrite	mg/l	annual	2.88	STORET: 19 values, 0<MDL, 2012
Selenium	µg/l	annual	0.	STORET: 17 values, 17<MDL, 2012
Silver	µg/l	annual	0.	No representative data available
TDS	µg/l	annual	426.	STORET: 17 values, 0<MDL, 2012
Zinc	µg/l	annual	5.	STORET: 17 values, 11<MDL, 2012
Background Water Quality for Lake Intrusion Flow				
note: unlisted parameters are the same as background for Black River Mainstem				
Cadmium	µg/l	annual	0.25	BWQR 1696 values, 1365<MDL
Chromium, total	µg/l	annual	15.	BWQR 1641 values, 1388<MDL
Copper	µg/l	annual	5.	BWQR 2867 values, 1597<MDL
Iron	µg/l	annual	650.	BWQR 3018 values, 15<MDL
Lead	µg/l	annual	2.	BWQR 2814 values, 1458<MDL
Nickel	µg/l	annual	20.	BWQR 1259 values, 1105<MDL
TDS	mg/l	annual	382.	BWQR 3755 values, 0<MDL
Zinc	µg/l	annual	15.	BWQR 2284 values, 1117<MDL
Effluent Flows				
Elyria WWTP		cfs (mgd)	20.11 (13.)	DSW
R.E.P. 002		cfs (mgd)	25.07 (16.2)	DSW
R.E.P. 003		cfs (mgd)	69.29 (44.78)	DSW
R.E.P. 004		cfs (mgd)	63.13 (40.8)	DSW
R.E.P. 005		cfs (mgd)	13.43 (8.68)	DSW
USS Tubular 001		cfs (mgd)	0.025 (0.016)	DSW
USS Tubular 006		cfs (mgd)	5.32 (3.44)	DSW
Lorain Black River WWTP		cfs (mgd)	23.21 (15.)	DSW

MDL = analytical method detection limit
WWTP = Wastewater Treatment Plant
USGS = United States Geological Survey
STORET = STOrage and RETrieval Data Warehouse, U.S. EPA
R.E.P. = Republic Engineered Products
BWQR = Background Water Quality Results
DSW = Division of Surface Water

Table 17. Instream Conditions and Discharger Flow for French Creek

Parameter	Units		Value	Basis
Upstream Flows				
7Q10	cfs	annual	0.39	USGS gage #04200500,1944-97 data
1Q10	cfs	annual	0.26	USGS gage #04200500,1944-97 data
90Q10	cfs	annual	0.87	USGS gage #04200500,1944-97 data
Harmonic Mean Flow	cfs	annual	2.78	USGS gage #04200500,1944-97 data
Mixing Assumption	%	average	25	Chronic criteria default
	%	maximum	100	Stream-to-discharge ratio
Instream Hardness	mg/l	annual	260.	DMR; 62 values, 0<MDL, 2009-2014
Background Water Quality for French Creek				
note: unlisted parameters are the same as background for Black River Mainstem				
Arsenic	µg/l	annual	3.25	STORET 7 values, 1<MDL, 2012
Barium	µg/l	annual	35.2	STORET 6 values, 6<MDL, 2012
Bis(2-EHP)	µg/l	annual	0.	No representative data available
Cadmium	µg/l	annual	0.	STORET 6 values, 6<MDL, 2012
Chromium, total	µg/l	annual	0.	STORET 6 values, 6<MDL, 2012
Chromium $^{+6}$ diss.	µg/l	annual	0.	No representative data available
Copper	µg/l	annual	5.1	STORET 6 values, 0<MDL, 2012
Cyanide, free	µg/l	annual	0.	No representative data available
Fluoride	µg/l	annual	0.	No representative data available
Lead	µg/l	annual	0.	STORET 6 values, 6<MDL, 2012
Molybdenum	µg/l	annual	0.	No representative data available
Nickel	µg/l	annual	4.35	STORET 6 values, 6<MDL, 2012
Nitrate+Nitrite	mg/l	annual	5.12	STORET 6 values, 0<MDL, 2012
Selenium	µg/l	annual	0.	STORET 7 values, 7<MDL, 2012
Silver	µg/l	annual	0.	No representative data available
TDS	µg/l	annual	535.	STORET: 6 values, 0<MDL, 2012
Zinc	µg/l	annual	0.	STORET 6 values, 6<MDL, 2012
Effluent Flows				
French Creek WWTP	cfs (mgd)		17.41 (11.25)	DSW

MDL = analytical method detection limit
Ohio EPA = Ohio Environmental Protection Agency
USGS = United States Geological Survey
STORET = STOrage and RETrieval Data Warehouse, U.S. EPA
R.E.P. = Republic Engineered Products
WWTP = Wastewater Treatment Plant
BWQR = Background Water Quality Results
DSW = Division of Surface Water

Table 18. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum[A]
		Average			Maximum	
		Human Health[A]	Agri-culture	Aquatic Life[A]	Aquatic Life[A]	
Arsenic [R]	µg/L	603	104	151	345	680
Cadmium [R]	µg/L	759 [A]	52 [A]	4.9	13	27
Chromium, total [R]	µg/L	14560 [A]	104	175	3906	7900
Chromium, dissolved hexavalent[R]	µg/L	14560 [A]	---	11	16	31
Copper [R]	µg/L	66570 [A]	520 [A]	19	33	69
Cyanide, free	µg/L	49930 [A]	---	5.2	22	44
Lead [R]	µg/L	---	104	16	316	830
Mercury [B W]	ng/L	3.1	10000[A]	910	1700	3400
Molybdenum [R]	µg/L	10400	---	20120	192800	370000
Nickel [R]	µg/L	44730 [A]	208	113	1036	2100
Selenium [R]	µg/L	3225	52	5	---	---
Silver [R]	µg/L	11440 [A]	---	1.3	8.4	17
Zinc	µg/L	36410 [A]	26010[A]	227	235	540

[A] Human Health and Aquatic Life criteria are Tier I unless otherwise indicated
[B] Tier II criterion
[C] Bioaccumulative Chemical of Concern (BCC)
[W] Wildlife Criteria applies (1.3 ng/L)
[R] Parameter would not require a WLA based on reasonable potential procedures; allocation requested for use in pretreatment program

Table 19. French Creek WWTP Method Detection Limit Analysis

Parameter	Current MDL (µg/L)	Water Quality Criteria Minimum (µg/L)	Proposed MDL (µg/L)
Chromium, dissolved hexavalent	20	11	4.0
Copper	10	19	5.0
Cyanide. free	10	5.2	2.0
Lead	10	16	5.0

MDL = Method Detection Limit

Table 20. Parameter Assessment

Group 1: Due to a lack of numeric criteria, the following parameters were not evaluated at this time. The facility may be required to generate toxicity data so that the parameters may be reevaluated.

Phosphorus

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

Arsenic	Cadmium	Chlorine, total residual
Chromium, dissolved hexavalent	Chromium, total	Copper
Di-N-Butylphthalate	Lead	Molybdenum
Nickel	Nitrite+Nitrate	Silver
Selenium		

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

Zinc

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
Cyanide, free	µg/l	annual	5.2	22.
Mercury	ng/l	annual	1.3	1700.

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

Table 21. Initial Effluent Limits for Outfall 001

Parameter	Units	Effluent Limits				Basis[b]
		Concentration		Loading (kg/day)[a]		
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Flow	MGD	---------- Monitor ----------				M[c]
Temperature	°C	---------- Monitor ----------				M[c]
Dissolved Oxygen	mg/L	---------- 6.0 Minimum ----------				PD
$CBOD_5$	mg/L	6.7	10.0 [d]	284	426 [d]	ABS
Total Suspended Solids	mg/L	8.0	12.0 [d]	341	511 [d]	ABS
Ammonia (Summer)	mg/L	1.0	1.5 [d]	42.6	63.9 [d]	M, BTJ
Ammonia (Winter)	mg/L	2.7	4.0 [d]	114	170 [d]	M, BTJ
Oil & Grease	mg/L	---------- Not to exceed 10 at any time ----------				WQS
pH	S.U.	---------- 6.5 to 9.0 ----------				WQS
E. Coli (Summer only)	#/100mL	161	362 [d]	---	---	BTJ
TKN	mg/L	---------- Monitor ----------				BTJ
Nitrite + Nitrate	mg/L	---------- Monitor ----------				BTJ
Nitrogen Nitrate, Total (NO_3)	mg/L	---------- Monitor ----------				BTJ
Phosphorus	mg/L	0.67	1.0 [d]	28.4	42.6 [d]	ABS
Orthophosphate, dissolved (as P)	mg/L	---------- Monitor ----------				SB1
Cadmium	µg/L	---------- Monitor ----------				M
Chromium, total	µg/L	---------- Monitor ----------				M
Chromium, dissolved hexavalent	µg/L	---------- Monitor ----------				M
Copper	µg/L	---------- Monitor ----------				M
Cyanide, free	µg/L	5.20	22.0	0.937	0.222	WLA
Chlorine, total residual	mg/L	---------- Monitor ----------				BTJ
Lead	µg/L	---------- Monitor ----------				M
Mercury	ng/L	1.3	1,700	0.000056	0.0724	WLA
Nickel	µg/L	---------- Monitor ----------				M
Selenium	µg/L	---------- Monitor ----------				M
Silver	µg/L	---------- Monitor ----------				M
Zinc	µg/L	---------- Monitor ----------				M
Total Filterable Residue	mg/L	---------- Monitor ----------				BTJ
Whole Effluent Testing						
Chronic, *P. promelas*	TU_c	---------- Monitor w/o Trigger ----------				WET
Chronic, *C. dubia*	TU_c	---------- Monitor w/o Trigger ----------				WET
Acute, *P. promelas*	TU_a	---------- Monitor w/o Trigger ----------				WET
Acute, *C. dubia*	TU_a	---------- Monitor w/o Trigger ----------				WET

$CBOD_5$ 5-day carbonaceous biochemical oxygen demand
TKN Total Tjedkahl Nitrogen

[a] Effluent loadings for free cyanide and mercury are based on average design discharge flow of 11.25 MGD. For all other parameters, effluent loadings are based on limitations in the previous permit (3PD00043*MD).

[b] Definitions:

ABS = Antibacksliding Rule (OAC 3745-33-05(F) and 40 CFR Part 122.44(I))
BTJ = Best Technical Judgment
EP = Existing Permit
M = Division of Surface Water NPDES Permit Guidance 1: Monitoring frequency requirements for Sanitary Discharges
PD = Plant Design
SB1 = Implementation of Senate Bill 1 [ORC 6111.03]
WET = Whole Effluent Toxicity (OAC 3745-33-07(B)(11))
WLA = Wasteload Allocation procedures (OAC 3745-2)
WQS = Ohio Water Quality Standards (OAC 3745-1)

[c] Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.

[d] 7 day average limit

Table 22. Final Effluent Limits for Outfall 001

Parameter	Units	Effluent Limits				Basis[b]
		Concentration		Loading (kg/day)[a]		
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Flow	MGD	---------- Monitor ----------				M[c]
Temperature	°C	---------- Monitor ----------				M[c]
Dissolved Oxygen	mg/L	---------- 6.0 Minimum ----------				PD
$CBOD_5$	mg/L	6.7	10.0 [d]	284	426 [d]	ABS
Total Suspended Solids	mg/L	8.0	12.0 [d]	341	511 [d]	ABS
Ammonia (Summer)	mg/L	1.0	1.5 [d]	42.6	63.9 [d]	M, BTJ
Ammonia (Winter)	mg/L	2.7	4.0 [d]	114	170 [d]	M, BTJ
Oil & Grease	mg/L	---------- Not to exceed 10 at any time ----------				WQS
pH	S.U.	---------- 6.5 to 9.0 ----------				WQS
E. Coli (Summer only)	#/100mL	126	284 [d]	---	---	WQS
TKN	mg/L	---------- Monitor ----------				BTJ
Nitrite + Nitrate	mg/L	---------- Monitor ----------				BTJ
Nitrogen Nitrate, Total (NO_3)	mg/L	---------- Monitor ----------				BTJ
Phosphorus	mg/L	0.67	1.0 [d]	28.4	42.6 [d]	ABS
Orthophosphate, dissolved (as P)	mg/L	---------- Monitor ----------				SB1
Cadmium	µg/L	---------- Monitor ----------				M
Chromium, total	µg/L	---------- Monitor ----------				M
Chromium, dissolved hexavalent	µg/L	---------- Monitor ----------				M
Copper	µg/L	---------- Monitor ----------				M
Cyanide, free	µg/L	5.20	22.0	0.937	0.222	WLA
Chlorine, total residual	mg/L	---------- Monitor ----------				BTJ
Lead	µg/L	---------- Monitor ----------				M
Mercury	ng/L	1.3	1,700	0.000056	0.0724	WLA
Nickel	µg/L	---------- Monitor ----------				M
Selenium	µg/L	---------- Monitor ----------				M
Silver	µg/L	---------- Monitor ----------				M
Zinc	µg/L	---------- Monitor ----------				M
Total Filterable Residue	mg/L	---------- Monitor ----------				BTJ
Whole Effluent Testing						
Chronic, *P. promelas*	TU_c	---------- Monitor w/o Trigger ----------				WET
Chronic, *C. dubia*	TU_c	---------- Monitor w/o Trigger ----------				WET
Acute, *P. promelas*	TU_a	---------- Monitor w/o Trigger ----------				WET
Acute, *C. dubia*	TU_a	---------- Monitor w/o Trigger ----------				WET

$CBOD_5$ 5-day carbonaceous biochemical oxygen demand
TKN Total Tjedkahl Nitrogen

[a] Effluent loadings for free cyanide and mercury are based on average design discharge flow of 11.25 MGD. For all other parameters, effluent loadings are based on limitations in the previous permit (3PD00043*MD).

[b] Definitions:

ABS = Antibacksliding Rule (OAC 3745-33-05(F) and 40 CFR Part 122.44(I))
BTJ = Best Technical Judgment
EP = Existing Permit
M = Division of Surface Water NPDES Permit Guidance 1: Monitoring frequency requirements for Sanitary Discharges
PD = Plant Design
SB1 = Implementation of Senate Bill 1 [ORC 6111.03]
WET = Whole Effluent Toxicity (OAC 3745-33-07(B)(11))
WLA = Wasteload Allocation procedures (OAC 3745-2)
WQS = Ohio Water Quality Standards (OAC 3745-1)

[c] Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.

[d] 7 day average limit

Attachment 1. Mercury Discharge

Year	Number of Observations	Observations Above Detection	Average Mercury Concentration (ng/L)	Average Mercury Loading (kg/day)	Maximum Mercury Concentration (ng/L)	Maximum Mercury Loading (kg/day)
2011	12	2	0.10708	0.0000028	0.699	0.0000224
2012	12	9	1.6949	0.0000319	8.51	0.000143
2013	12	5	1.1208	0.0000311	5.28	0.000205
2014	15	8	0.79913	0.0000156	5.65	0.000117
2015	12	6	0.3365	0.00000653	0.829	0.0000257
2016*	8	7	0.68488	0.0000135	1.15	0.0000244

* Limited to January – August 2016

Note: French Creek WWTP no longer accepted hauled waste by 2014