National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

Regarding an NPDES Permit to Discharge to Waters of the State of Ohio
for **Worthington Industries Inc.**

Public Notice No.: 193012
Public Notice Date: December 12, 2023
Comment Period Ends: January 11, 2024

Ohio EPA Permit No.: **2ID00014*GD**
Application No.: **OH0122271**

Name and Address of Applicant:

Worthington Industries Inc.
6303 County Road 10
Delta, Ohio 43515

Name and Address of Facility Where Discharge Occurs:

Worthington Industries Inc.
6303 County Road 10
Delta, Ohio 43515
Fulton County

Receiving Water: Maumee River

Subsequent Stream Network: Lake Erie

INTRODUCTION

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

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

Antidegradation provisions in Ohio Administrative Code (OAC) Chapter 3745-1 describe the conditions under which water quality may be lowered in surface waters. 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/or monitoring requirements proposed for all parameters are the same as in the current permit, except those listed below.

Lower maximum concentration limits are proposed for lead and zinc based on the updated waste load allocation. A new monthly limit for lead is also proposed. These limits are proposed because the federal effluent limit guidelines proposed at outfall 601 are less stringent than Ohio's Water Quality Standards.

Monitoring requirements are proposed to be removed for bis(2-ethylhexyl) Phthalate, bromomethane, pentachlorophenol, and silver because these parameters are below detection for the sampling and no reasonable potential was observed for these parameters.

Dioxin toxicity equivalent is being removed from the permit because there were no detections for pentachlorophenol and there was no reasonable potential observed.

Limits for mercury are proposed to be removed but a group 4 tracking requirement will be included in Part II of the permit.

In accordance with Ohio Administrative Code (OAC) 3745-33-07, it has been determined that the effluent from Worthington Industries shows acute toxicity to Ceriodaphnia dubia and Pimephales promelas. Limits are proposed to continue.

A compliance schedule to perform a toxicity reduction evaluation (TRE) is proposed to evaluate the observed whole effluent toxicity.

A compliance schedule to evaluate temperature discharge is proposed. In review of the discharge monitoring data an increase of temperature discharge over the last several years has been observed.

In Part II of the permit, special conditions are included that address stormwater compliance; whole effluent toxicity (WET) testing; the Maumee River Phosphorus TMDL, 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 emailed to HClerk@epa.ohio.gov or mailed 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 by email to epa.dswcomments@epa.ohio.gov (preferred method) or delivered 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 Alex Young, 419-373-3017, Alexander.Young@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: https://epa.ohio.gov/static/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 email to epa.dswcomments@epa.ohio.gov (preferred method) or 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, a written request 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 3745-1-39. 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

Worthington Industries discharges to the Maumee River at River Mile 42.51. Figure 1 shows the approximate location of the facility.

This segment of the Maumee River is described by Ohio EPA River Code: 04-001, Hydrologic Unit Code: 04100009-02-07, County: Fulton, Ecoregion: Huron/Erie Lake Plains. The Maumee River is designated for the following uses under Ohio's WQS (OAC 3745-1-11) Modified Warmwater Habitat, Agricultural Water Supply, Industrial Water Supply, and 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

Worthington Industries is a finished steel processing facility that manufactures galvanized steel strips. The facility has the capacity to process 3,600 tons of steel per day through acid pickling and 2,400 tons per day through hot-dip galvanizing. The effluent is discharged to the Maumee River via an eleven-mile county maintained sewer that contains combined effluents from Worthington Industries and North Star Bluescope Steel. Worthington Industries obtains water from the Village of Delta and uses the water in the cooling of the formed steel and in the pickling line and galvanizing operations. The industrial processes at the facility include (see Figure 2):

- Hydrochloric Acid Pickling
- Alkaline Cleaning
- Hot-Dip Zinc Galvanizing
- Slitting of Steel Coils

The process operations at Worthington Industries are classified under Standard Industrial Classification (SIC) category 3399, "Primary Metal Products" and 3479, "Metal Coating and Allied Service". The process wastewaters generated from these operations are regulated under 40 CFR Part 420, "Iron and Steel Manufacturing Point Source Category". The manufacturing processes are applicable to the following subparts:

- 420.94, "Acid Picking", Subpart I, (b) hydrochloric acid pickling, (2) Strip, sheet and plate;

- 420.114, “Alkaline Cleaning”, Subpart K, (a) batch and continuous; and,
- 420.124, “Hot Coating”, Subpart L, (a) galvanizing, terne coating and other coatings, (1) Strip, sheet and miscellaneous products.

Worthington Industries obtains water from the Village of Delta.

Worthington Industries is covered under the following additional NPDES permit(s): industrial storm water general permit 2GR00522*GG.

DESCRIPTION OF EXISTING DISCHARGE

Worthington Industries has one outfall and one internal monitoring station. The process wastewater from the equalization tank (transferred from the waste holding tank) goes through neutralization (by lime or caustic) and clarification before it is stored in clean water holding tanks. There is an internal monitoring station 601 for checking compliance with federal effluent guideline limits. After sampling point 601 the effluent combines with non-contact cooling water and is sampled at outfall 001 before finally entering the sewer line. Outfall 001 contains the 601 effluent, R.O. reject water, and non-contact cooling water blowdown. All of these waters are aerated prior to discharge. Outfall 001 effluent mixes with effluent from the adjacent North Star Bluescope Steel plant in the sewer that discharges to the Maumee River at River Mile 42.51. Sanitary waste is discharged to the Village of Delta's WWTP. Figure 2 provides a flow schematic of the wastewater sources and supplies associated with Worthington Industries. Process wastewater is treated by the following processes:

- Flocculation
- Mixing
- Sedimentation
- Chemical Oxidation
- Chemical Precipitation
- Neutralization

The average flow rates for the permit cycle for outfalls 001 and 601 are shown on Table 3.

Table 2 is a summary of the effluent violations.

Table 4 presents data compiled from the NPDES permit renewal application Form 2C.

Table 5 presents a summary of unaltered Discharge Monitoring Report (DMR). Data are presented for the period January 2017 through March 2022, and current permit limits are provided for comparison.

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

Table 7 summarizes the results of acute and chronic WET tests of the final effluent.

ASSESSMENT OF IMPACT ON RECEIVING WATERS

The Creager Cemetery-Maumee River watershed assessment unit, which includes the Maumee River in the vicinity of Worthington Industries discharge, is listed as impaired for recreation on Ohio’s 303(d) list.

A biological and water quality survey of the Maumee River in 2014 showed full attainment of the use designation both upstream and downstream of Worthington Industries discharge. The Maumee River in the study area covered by this report was evaluated by Ohio EPA staff for aquatic life and recreational use potential

during the 2012 and 2013 field seasons. This assessment included the collection of water chemistry and biological sampling at numerous sites in the Maumee and Auglaize Rivers. A summary of the results from this assessment for the interactive segment covered in this report can be found in Table 8. More information can be found in the following technical support document:
https://epa.ohio.gov/static/Portals/35/documents/MaumeeTSD_2014.pdf.

The attainment status of the Maumee River watershed is reported in the final Ohio 2022 Integrated Water Quality Monitoring and Assessment Report. The full Integrated Report is available through the Ohio EPA, Division of Surface Water website at:
https://epa.ohio.gov/static/Portals/35/tmdl/2022intreport/Full-2022-IR.pdf

A Total Maximum Daily Load (TMDL) report for the Maumee River is currently under development.

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 Worthington Industries were used to determine what parameters should undergo a 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 2017 through March 2022
Form 2C data	2022

Statistical Outliers and Other Non-representative Data

The data were examined and one value for iron of 7,070 µg/L on 4/6/17 was removed from the evaluation as non-representative data.

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 6).

The PEQ values are used according to Ohio rules to compare to applicable WQS and allowable WLA values for each pollutant evaluated. Initially, PEQ values are compared to the applicable average and maximum WQS. If both PEQ values are less than 25 percent of the applicable WQS, the pollutant does not have the reasonable potential to cause or contribute to exceedances of WQS, and no WLA is done for that parameter. If either PEQ_{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 9).

Wasteload Allocation

For those parameters that require a wasteload allocation (WLA), the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. The following dischargers in the Maumee River were considered interactive (see Figure 3):

- Worthington Industries
- North Star BlueScope Steel

The WLA for this segment of the Maumee River divided loads between the North Star and Worthington Steel discharges. Allocations were distributed on a flow-proportional basis, resulting in equal concentration WLAs for each discharge.

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) using available ambient stream data from upstream sampling stations. 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-N	Average	Summer 30Q10
		Winter 30Q10
Agricultural Water Supply		Harmonic mean flow
Human Health (nondrinking)		Harmonic mean flow
Wildlife		Annual 90Q10

Allocations are developed using a percentage of stream design flow (as specified in Table 10), and allocations cannot exceed the Inside Mixing Zone Maximum criteria.

Whole Effluent Toxicity Wasteload Allocation

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 Worthington Industries, the WLA values for outfall 001 are 1.0 TU_a and 30.29 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 all designated waters.

REASONABLE POTENTIAL/EFFLUENT LIMITS/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 11. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 6, 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 12.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 13 presents the final effluent limits and monitoring requirements proposed for Worthington Industries outfall 001 and internal monitoring station 601 and the basis for their recommendation. Unless otherwise indicated, the monitoring frequencies proposed in the permit are continued from the existing permit.

Final Outfall 001

Dissolved Oxygen, Oil and Grease and pH
Limits proposed for dissolved oxygen, oil and grease and pH. are based on Ohio's water quality standards. The water quality-based pH limits are protective of the federal effluent guideline limitations.

Chlorine
The Ohio EPA risk assessment (Table 12) places chlorine in group 5. This placement, as well as the data in Table 5 and Table 6, indicates that the reasonable potential to exceed WQS and limits are necessary to protect water quality. For these parameters, the PEQ is greater than 100 percent of the WLA and certain conditions exist that increase the risk to the environment. Pollutants that meet this requirement must have permit limits under OAC 3745-33-07(A)(1). The proposed limit for total residual chlorine is based on the WLA. The IMZM is a value calculated to avoid rapidly lethal conditions in the effluent mixing zone.

The effluent limit for total residual chlorine is lower than the quantification level of 0.050 mg/L.
However, a pollutant minimization program is not required because the dosing rate of dechlorination chemicals ensures that the water quality-based effluent limit is being met.

Phosphorus
The phosphorus limits are proposed to continue based on best technical judgment.

Lead and Zinc
To be protective of the Ohio WQS inside mixing zone maximum limits are being proposed for, zinc and lead. The limits are proposed because the calculated ELG loading limits for these parameters at outfall 601 exceeds the WQBEL and IMZM limits at outfall 001. Since the ELGs would allow a discharge greater than Ohio's Water quality standard from the internal outfall, limits are proposed at the final outfall to ensure that the water quality standard is not exceeded. Only a maximum limit is being proposed for Zinc because the calculated outside mixing zone average limits are greater than the inside mixing zone maximum for Zinc. Lower maximum concentration limits are proposed based on the updated wasteload allocation.

Although the current WLA would allow slightly higher loading limits for lead and zinc because the flow used to calculate the WLA has increase from the previous permit from 0.13 MGD to 0.22 MGD. Anti-backsliding provisions in the OAC prevent the imposition of less stringent limits than those in the existing permit unless specific conditions have been satisfied. In the case of the Worthington, none of those conditions have been satisfied, so the existing limits are proposed to continue. The anti-backsliding provisions of OAC 3745-33-05 require that an anti-degradation review must be completed before an existing permit limit can be made less stringent. The rule requires other conditions to be satisfied as well.

Copper and Mercury
The Ohio EPA risk assessment (Table 12) places copper and mercury in group 4. This placement, as well as the data in Table 5 and Table 6, 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 for Group 4 pollutants (where PEQ exceeds 50 percent of the WLA) is required by OAC 3745-33-07(A)(2).

In addition, the mercury effluent quality falls within 75 percent of the WLA. Under OAC 3745-33-07(A)(2), parameters in this range must have a tracking requirement in the permit that specifies reductions in pollutant concentrations if effluent concentrations exceed the WLA. The tracking/reduction requirements are included in Part II of the permit. Limits for mercury will be removed but monitoring will continue.

Ammonia, Chromium, Iron, Nickel, and Total Filterable Residue
The Ohio EPA risk assessment (Table 12) places ammonia, chromium, iron, nickel, and total filterable residue in groups 2 and 3. This placement, as well as the data in Table 5 and Table 6, support that these parameters do not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Monitoring at a is proposed to document that these pollutants continue to remain at low levels.

Barium, Bis(2-ethyhexyl) phthalate, Boron, Bromomethane, Free Cyanide, Chloroform, Dichlorobromomethane, Manganese, Molybdenum, Nitrate & Nitrite, Pentachlorophenol and Silver
The Ohio EPA risk assessment (Table 12) places barium, bis(2-ethyhexyl) phthalate, boron, bromomethane, free cyanide, chloroform, dichlorobromomethane, manganese, molybdenum, nitrate & nitrite, pentachlorophenol and silver in groups 2 and 3. This placement, as well as the data in Table 5 and Table 6, 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. Monitoring for bromomethane, bis(2-ethyhexyl) phthalate, pentachlorophenol, and silver is proposed to be removed.

Temperature, Flow Rate and Total Suspended Solids
Monitoring for these parameters is proposed to continue in order to evaluate the performance of the treatment plant.

Internal Monitoring Station 601

The internal station monitors the effluent from the process wastewater treatment facility. Technology-based limits from the federal effluent guideline limitations (ELGs) found in 40 CFR 420 are applied at this internal station. Consistent with 40 CFR 122.45(h), the current permit includes monitoring and limits at internal station 601. ELGs are applied at this outfall to ensure that these treatment standards are met prior to combining with other waste streams. If monitoring was not done at this location, it would not be possible to verify compliance with these standards due to dilution. Federal rules at 40 CFR 125.3(f) prohibit attaining these standards by dilution.

Total Suspended Solids, Oil and Grease, Zinc, and Lead
These limits are determined used the guideline numbers expressed in kilograms of pollutant per 1,000 kilograms of production. The currently daily production estimates are as follows:

- Hydrochloric Acid Pickling – 3,600 tons
- Hot Dip Galvanizing – 2,400 tons

An example of the 30-day limit calculation for total suspended solids for hydrochloric acid pickling is shown below:

L = [(P * C) / 1000] * ELG*K

Where:
L = the allowable load limit
P = production (in tons)
C = conversion factor from tons to lbs
ELG = federal effluent guideline limitation
K=conversion factor from lbs to kg

Therefore:

L = [(3,600 tons/day * 2,000 lb/ton) / 1,000 lb/lb] * 0.00501*0.45359 = 16.36 kg/day

Attachment 1 has a listing of all applicable ELGs and the resulting calculations. The calculated limits are the same as the limits in the previous permit.

Whole Effluent Toxicity Reasonable Potential

Evaluating the acute toxicity results in Table 7 under the provisions of 40 CFR Part 132, Appendix F, Procedure 6, gives an acute PEQ values of 2.16 TU_a for Ceriodaphnia dubia and 4.34 TU_a for Pimephales promelas. Reasonable potential for toxicity is demonstrated since these values exceed the WLA values of 1.0 TU_a. Consistent with Procedure 6 and OAC 3745-33-07(B), a daily maximum limit of 1.0 TU_a is proposed to continue. Attachment 2 provides additional information on the reasonable potential evaluation.

OTHER REQUIREMENTS

Compliance Schedule

***Toxicity Reduction Evaluation (TRE)* –** Within 6 months, the permittee shall initiate a TRE in order to reduce WET toxicity. Details are in Part I.C of the permit.

***Temperature Reduction Evaluation* –** Within 12 months, the permittee shall complete a study plan to evaluate the observed increase in temperature and measures that can be taken to reduce the temperature of the discharge.

Phosphorus
In September 2023, the Maumee Watershed Nutrient Total Maximum Daily Load (TMDL) Report was approved by US EPA. The TMDL was developed to restore full attainment of the designated uses in the Western Basin of Lake Erie. The TMDL assigned an individual wasteload allocation to Worthington of 8.2 kg of total phosphorus for the critical season (March through July). For many major sources of phosphorus in the watershed, compliance with this individual wasteload allocation will be regulated through the Maumee Watershed Total Phosphorus NPDES General Permit. However, due to the relatively small contribution of phosphorus load, Worthington has not been included in the general permit.

Facilities not proposed to join the group general permit together contribute less than 15 percent of the load from permitted facilities. These facilities may not have phosphorus-specific controls and the wasteload allocation in the TMDL is consistent with the existing loads. Therefore, phosphorus reductions are not proposed for these facilities. Existing efforts to promote optimization, regionalization, and onsite discharge will continue, but have not been accounted for as reductions needed to meet the wasteload allocation. Consistent with the assumptions of the TMDL, no TMDL based effluent limits based on the WLA are proposed for the permittee in this NPDES renewal. Ohio EPA will continue to evaluate phosphorus contributions from these permittees to ensure they remain at low levels. If Ohio EPA determines that the assumptions of the TMDL are no longer representative of the watershed, the TMDL may be modified to include a revised implementation approach. If this were to occur, the application of TMDL based total phosphorus effluent limits for this permittee may be re-evaluated.

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

Part III
Part III of the permit details standard conditions that include monitoring, reporting requirements, compliance responsibilities, and general requirements.

Storm Water Compliance
To comply with industrial storm water regulations, the permittee requested coverage under the industrial storm water general permit. Permit 2GR00522*GG became effective on 8/11/2022. No later than 5/31/2027, 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.

Figure 1. Location of Worthington Industries

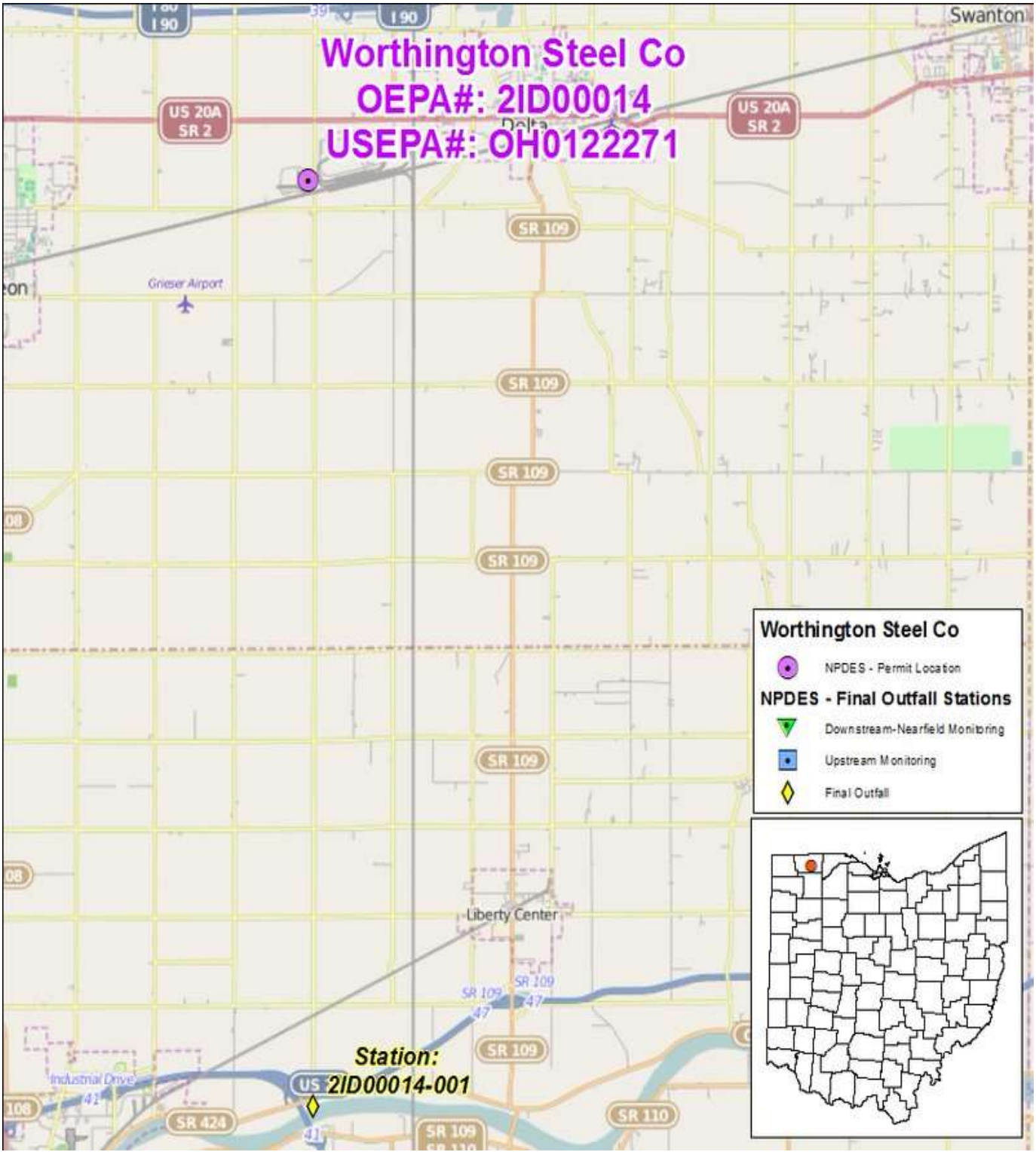


Figure 2. Water Balance Diagram

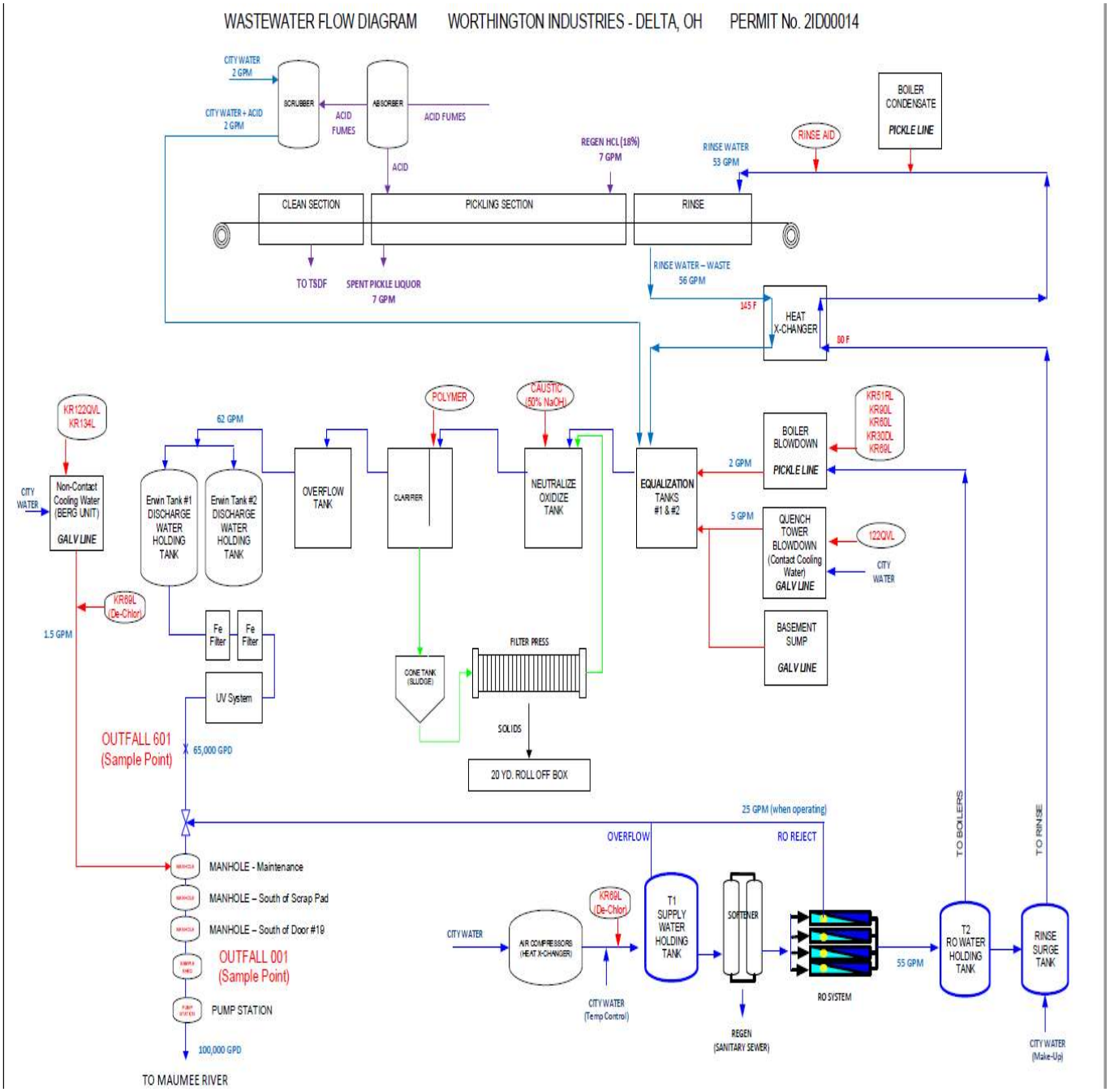
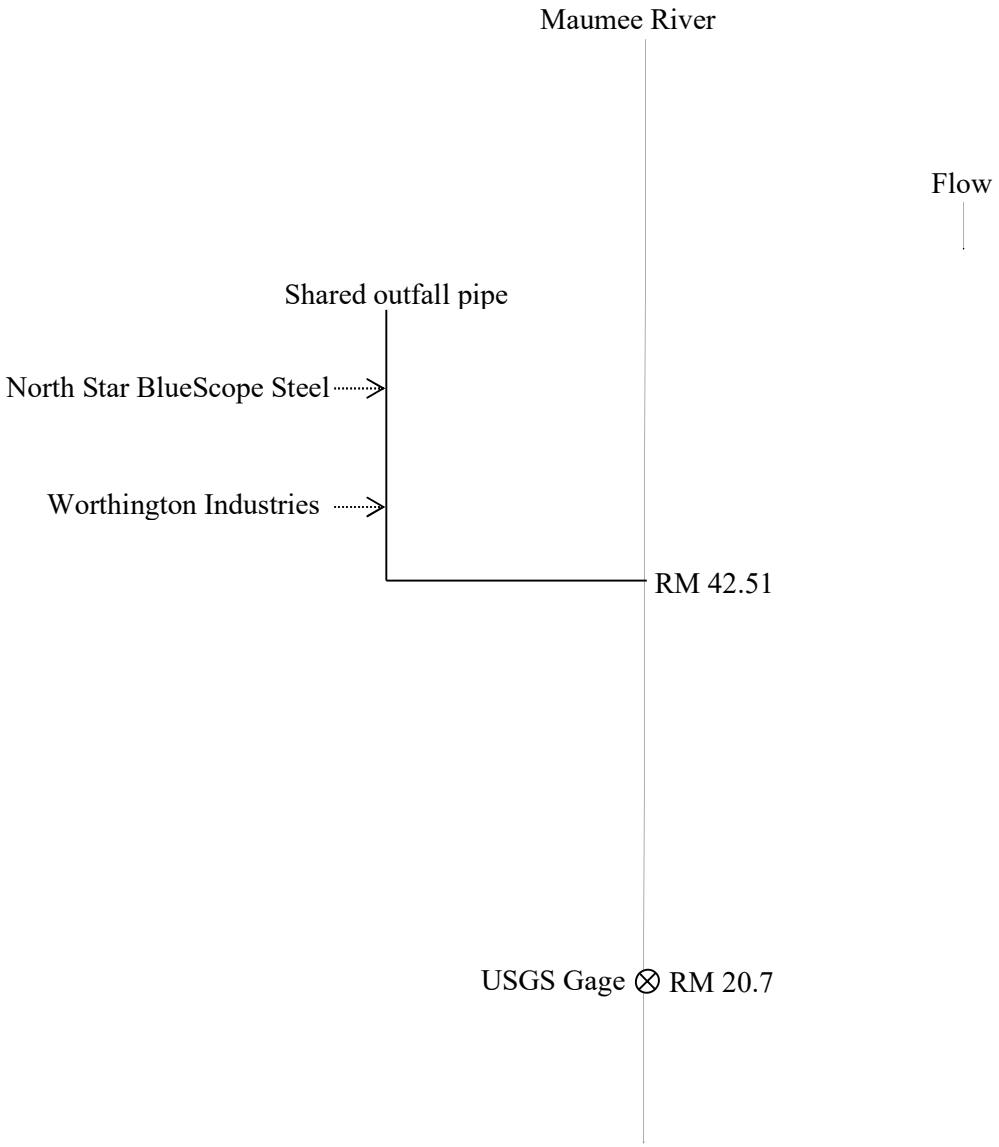


Figure 3. Maumee River Study Area



RM = River Mile
USGS = United States Geological Survey

Table 1. Monitoring Stations, Wastewater Sources, Treatment Processes, Discharge Points, and Flow Rates

Station #	Wastewater Source	Treatment Utilized	Discharge/ Receiving Stream	Average Flow Rate (MGD)
001	Pickling line rinse section, boiler blowdown, HCl fume scrubber, noncontact cooling water, quench tower blowdown, reverse osmosis reject	pH adjustment, chemical precipitation, flocculation, Sedimentation, for process wastewater	Maumee River	0.1
601	Pickle Line Rinse Section, Boiler Blowdown, HCl Fume Scrubber, Quench Tower Blowdown	Oil skimming, pH adjustment, chemical precipitation, flocculation, Sedimentation, for process wastewater	Internal Monitoring Station	0.07

Table 2. Effluent Violations for Outfall 001

PARAMETER	2017	2018	2019	2020	2021	2022
001 - Acute Toxicity, Ceriodaphnia	0	1	1	0	0	0
001 - Acute Toxicity, Pimephelas	2	1	3	1	0	0
001 - Chlorine, Total Residual	0	1	0	0	1	0
001 - Copper, Total Recoverable	1	0	0	0	0	0
001 - Dissolved Oxygen	9	5	0	0	6	0
001 - pH, Maximum	0	0	1	1	0	0
601 - pH, Maximum	0	0	1	0	0	0
Total	**12**	**8**	**6**	**2**	**7**	**0**

Time period: January 2017 to April 1, 2022

Table 3. Average Annual Effluent Flow Rates

	Flow Rate (Million Gallons per Day)					
Outfall	Year	# obs	Average	Median	95th Percentile	Maximum
001	2017	365	0.18	0.18	0.26	0.32
001	2018	365	0.16	0.16	0.24	0.26
001	2019	348	0.14	0.15	0.20	0.25
001	2020	366	0.12	0.13	0.17	0.20
001	2021	365	0.10	0.10	0.14	0.20
001	2022	90	0.10	0.10	0.14	0.16
601	2017	335	0.08	0.08	0.10	0.18
601	2018	318	0.08	0.08	0.10	0.68
601	2019	321	0.08	0.09	0.11	0.44
601	2020	336	0.08	0.09	0.11	0.12
601	2021	342	0.06	0.06	0.10	0.45
601	2022	84	0.07	0.07	0.10	0.11

Time period: January 2017 to April 1, 2022

Table 4. Effluent Characterization Based on Form 2C Data

PARAMETER (µg/L)	Form 2C Data		
	# of Samples	Average	Maximum
Chromium	3	AA (4)	AA (4)
Copper	48	27.5	38
Lead	48	AA (5)	AA (5)
Nickel	48	2.3	7
Silver	3	AA (4)	AA (4)
Barium	1	5	5
Iron	12	802	3480
Manganese	1	7	7
Molybdenum	1	21	21
Zinc	48	15.1	246
Mercury (ng/L)	3	AA (0.5)	AA (0.5)
Bromomethane (methyl bromide)	1	AA (1)	AA (1)
Pentachlorphenal	1	AA (5)	AA (5)
Nitrate + Nitrite (mg/L)	1	2.3	2.3
Chloroform	1	15	15
Dichlorobromomethane	1	3.7	3.7
Sulfate	1	51	51
Bis(2-ethylhexyl) Phthalate	1	AA (5)	AA (5)
Boron	1	48	48
Fluoride	1	1.66	1.66
Selenium	1	AA (8)	AA (8)

AA = below detection

Table 5. Effluent Characterization Using Self-Monitoring Data

Effluent Monitoring Data for 2ID00014*FD between 1/1/2017 and 4/1/2022								
			Current Limits			Percentiles		
Outfall	Parameter	Unit	30 Day	Daily	# Obs	50th	95th	Data Range
001	Water Temperature	°F	Monitoring Only		1899	87.4	102	60.4 - 111
	Dissolved Oxygen - 2017-2022	mg/L	--	4.0[m]	228	5.4	3.81*	1.1 - 10.2
	Dissolved Oxygen - 2017-2017	mg/L	--	5.0[m]	24	5.65	3.03*	2.1 - 8.6
	Total Suspended Solids	mg/L	Monitoring Only		252	7	24.5	0 - 1360
	Oil and Grease, Total	mg/L	--	10.0	252	--	--	< 5
	Nitrogen, Ammonia	mg/L	Monitoring Only		252	.15	.365	0 - .75
	Phosphorus, Total - 2017-2022	kg/day	--	0.40	225	.0424	.119	0 - .278
	Phosphorus, Total - 2017-2017	kg/day	--	0.48	24	.0301	.0889	0 - .131
	Phosphorus, Total	mg/L	--	1.0	252	.09	.235	0 - .48
	Cyanide, Free	mg/L	Monitoring Only		1	--	--	< .005
	Iron	µg/L	Monitoring Only		66	548	3350	53 - 7070
	Nickel	µg/L	Monitoring Only		10	< 4	3.85	0 - 7
	Silver	µg/L	Monitoring Only		10	--	--	< 4
	Zinc	kg/day	0.113	0.231	225	< .00591	.0137	0 - .104
	Zinc	µg/L	230	470	228	< 10	30.7	0 - 246
	Lead	kg/day	--	0.330	225	< .00254	< .00254	0 - .00462
	Lead 2017-2022	µg/L	--	670	228	< 5	< 5	0 - 12
	Lead 2017-2017	µg/L	Monitoring Only		24	< 5	< 5	0 - 10
	Chromium	µg/L	Monitoring Only		10	--	--	< 4

	Copper	kg/day	--	0.0259	24	.005	.0209	0 - .0305
	Copper 2017-2017	µg/L	--	53	24	8.5	26	0 - 36
	Copper 2017-2022	µg/L	Monitoring Only		228	13	27	0 - 44
	Bromomethane	µg/L	Monitoring Only		19	--	--	< 1
	Pentachlorophenol	µg/L	Monitoring Only		19	--	--	< 5
	Bis(2-ethylhexyl) Phthalate	µg/L	Monitoring Only		19	--	--	< 5
	Flow Rate	MGD	Monitoring Only		1899	.136	.231	.015 - .323
	Chlorine, Total Residual	mg/L	--	0.038	252	< .03	< .03	0 - .56
	Mercury, Total - 2017-2021	kg/day	0.0000005	0.0007	9	< .000000089	.000000275	0 - .000000458
	Mercury, Total - 2017-2017	kg/day	0.00000064	0.00083	1	.000000297	.000000297	.000000297 - .000000297
	Mercury, Total	ng/L	1.3	1700	10	< .5	.717	0 - .852
	Acute Toxicity, Ceriodaphnia dubia	TUa	--	1.0	21	< .2	1.22	0 - 1.35
	Acute Toxicity, Pimephales promelas	TUa	--	1.0	21	< .2	2.25	0 - 2.55
	pH, Maximum	S.U.	--	9.0	252	7.82	8.38	7.1 - 12.3
	pH, Minimum	S.U.	--	6.5[m]	252	7.82	7.42*	7.1 - 12.3
	Residue, Total Filterable	mg/L	Monitoring Only		252	1300	1920	158 - 2520
	Toxicity Equivalent	pg/L	Monitoring Only		19	--	--	0 - 0
601	Total Suspended Solids - 2017-2022	kg/day	57.4	134	214	1.82	5.39	0 - 7.9
	Total Suspended Solids - 2017-2017	kg/day	63.64	148.39	24	1.94	3.91	0 - 5.05
	Oil and Grease, Total - 2017-2022	kg/day	13.6	41	218	--	--	< 1.53

	Oil and Grease, Total - 2017-2017	kg/day	16.7	50.12	24	--	--	< 1.5
	Zinc 2017-2017	kg/day	0.34	1.022	24	< .00167	.00192	0 - .00333
	Zinc 2017-2022	kg/day	0.38	1.15	214	< .00178	.00396	0 - .0246
	Lead 2017-2017	kg/day	0.254	0.766	24	--	--	< .000833
	Lead 2017-2022	kg/day	0.29	0.86	214	--	--	< .00089
	Flow Rate	MGD	Monitoring Only		1736	.082	.105	.001 - .681
	pH, Maximum	S.U.	--	9.0	225	7.72	8.44	7.12 - 12.3
	pH, Minimum	S.U.	--	6.0[m]	225	7.72	7.3*	7.12 - 12.3

m = minimum
* = For pH minimum and dissolved oxygen, 5th percentile shown in place of 95th percentile

Table 6. Projected Effluent Quality

Parameter	Units	Number of Samples	Number >MDL	PEQ Average	PEQ Maximum
Self-Monitoring (DMR) Data					
Ammonia (summer)	mg/L	80	60	0.276	0.4
Ammonia (winter)	mg/L	68	58	0.313	0.451
Bis(2-ethylhexyl) phthalate	µg/L	19	0	--	--
Bromomethane	µg/L	19	0	--	--
Chlorine	mg/L	252	2	0.286	0.392
Chromium	µg/L	10	0	--	--
Copper	µg/L	252	244	21.7	30.15
Cyanide - free	µg/L	1	0	--	--
Iron	µg/L	65	65	2334	3685
Lead	µg/L	252	4	6.132	8.4
Mercury (BCC) [B]	ng/L	10	2	1.057	1.448
Nickel	µg/L	10	1	8.687	11.9
Pentachlorophenol	µg/L	19	0	--	--
Phosphorus	mg/L	252	222	0.175	0.254
Silver	µg/L	10	0	--	--
Total Filterable Residue	mg/L	252	252	1987	2771
Zinc	µg/L	228	61	33.58	43.47
Form 2C data					
Barium	µg/L	1	1	22.63	31
Boron	µg/L	1	1	217.3	297.6
Chloroform	µg/L	1	1	67.89	93
Dichlorobromomethane	µg/L	1	1	16.75	22.94
Manganese	µg/L	1	1	31.68	43.4
Molybdenum	µg/L	1	1	95.05	130.2
Nitrate-N + Nitrite-N	mg/L	1	1	10.41	14.26
Sulfates	mg/L	1	1	230.8	316.2

BCC = Bioaccumulative Chemical of Concern
MDL = analytical method detection limit
PEQ = projected effluent quality
[B] Bioaccumulative Chemical of Concern (BCC); no mixing zone allowed after 11/15/2010, WQS must be met at end-of-pipe, unless requirements for an exception are met as listed in OAC 3745-2-05(A)(2)(e)(ii)

Table 7. Summary of Acute Toxicity Results

Date	*Ceriodaphnia Dubia* Acute (Tu_a)	*Pimephales Promelas* Acute (Tu_a)
1/19/2017	AA (0.2)	AA (0.2)
3/16/2017	AA (0.2)	AA (0.2)
6/15/2017	AA (0.2)	1.22
7/13/2017	AA (0.2)	0.3
8/17/2017	AA (0.2)	0.5
12/14/2017	AA (0.2)	1.27
1/18/2018	AA (0.2)	AA (0.2)
3/15/2018	AA (0.2)	AA (0.2)
6/26/2018	1.22	0.4
7/26/2018	AA (0.2)	1.48
8/16/2018	.7	1.65
12/18/2018	AA (0.2)	AA (0.2)
3/7/2019	AA (0.2)	0.2
6/14/2019	1.35	2.55
8/27/2019	AA (0.2)	2.25
12/19/2019	AA (0.2)	1.7
3/5/2020	AA (0.2)	AA (0.2)
6/11/2020	AA (0.2)	1.18
8/13/2020	AA (0.2)	AA (0.2)
12/17/2020	AA (0.2)	AA (0.2)
3/10/2021	AA (0.2)	AA (0.2)
6/10/2021	AA (0.2)	AA (0.2)
8/12/2021	AA (0.2)	AA (0.2)
12/2/2021	AA (0.2)	AA (0.2)
3/17/2022	AA (0.2)	AA (0.2)

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

Table 8. Use Attainment Table

Location	River Mile	Use Designation	Attainment Status	Causes of Impairment	Sources of Impairment
Maumee River at water works intake	47.10	MWH	Full		
Maumee River upstream State Route 109	41.24	MWH	Full		
Maumee River upstream Grand Rapids Dam	32.60	MWH	Full		

Table from: Biological and Water Quality Study of the Maumee River and Auglaize River 2012-2013.
MWH = Modified Warmwater Habitat

Table 9. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria					Inside Mixing Zone Maximum [A]
		Average				Maximum Aquatic Life [A]	
		Wildlife	Human Health [A]	Agri-culture [A]	Aquatic Life [A]		
Ammonia (summer)	mg/L	--	--	--	0.5	--	--
Ammonia (winter)	mg/L	--	--	--	2.3	--	--
Barium	µg/L	--	160000	--	1200 [B]	5300 [B]	11000 [B]
Bis(2-ethylhexyl)phthalate[C]	µg/L	--	32	--	8.4	1100	2100
Boron	µg/L	--	200000	--	3900	33000	65000
Bromomethane	µg/L	--	2600	--	16 [B]	38 [B]	75 [B]
Chlorine - TRes	mg/L	--	--	--	0.011	0.019	0.038
Chloroform [C]	µg/L	--	1700	--	140 [B]	1300 [B]	2600 [B]
Chromium - TR	µg/L	--	14000	100	160	3300	6700
Copper - TR	µg/L	--	64000	500	18	29	57
Cyanide - free	µg/L	--	48000	--	5.2	22	44
Dichlorobromomethane [C]	µg/L	--	180	--	340 [B]	3100 [B]	6200 [B]
Iron - TR	µg/L	--	--	5000	--	--	--
Lead - TR	µg/L	--	--	100	17	320	640
Manganese - TR	µg/L	--	61000	--	--	--	--
Mercury – TR [E]	ng/L	1.3	3.1	10000	910	1700	3400
Molybdenum	µg/L	--	10000	--	20000	190000	370000
Nickel - TR	µg/L	--	43000	200	99	890	1800
Nitrate-N + Nitrite-N	mg/L	--	--	100	--	--	--
Pentachlorophenol [C]	µg/L	--	1.6	--	--	--	--
Phosphorus	mg/L	--	--	--	--	--	--
Silver	µg/L	--	11000	--	1.3	5.9	12
Sulfates	mg/L	--	--	--	--	--	--
Total Filterable Residue	mg/L	--	--	--	1500	--	--
Zinc - TR	µg/L	--	35000	25000	230	230	450

[A] Human Health and Aquatic Life Criteria are Tier I unless otherwise indicated.
[B] Tier II criteria
[C] Carcinogen
[E] Bioaccumulative Chemical of Concern (BCC)

Table 10. Instream Conditions and Discharger Flow

Parameter	Units		Value	Basis
Upstream flows:				
Maumee R. above North Star and Worthington Industries				
1Q10	cfs	annual	53.2	USGS gage #04193500, 1940-2021 data
7Q10	cfs	annual	91.9	USGS gage #04193500, 1940-2021 data
30Q10	cfs	summer	139.3	USGS gage #04193500, 1940-2020 data
	cfs	winter	351.1	USGS gage #04193500, 1939-2021 data
Harmonic Mean Flow	cfs	annual	750.2	USGS gage #04193500, 1939-2021 data
Mixing Assumption	%	average	25	Stream-to-discharge ratio
(Maumee R.)	%	maximum	66.8	Stream-to-discharge ratio
Worthington Industries				
Outfall 001 flow rate	cfs (MGD)	average	0.34 (0.22)	95 percentile of monthly average flows 2017-2022
North Star Steel				
Outfall 001 flow rate	cfs (MGD)	average	0.44 (0.29)	95 percentile of monthly average flows 2017-2022
Instream Hardness	mg/l	annual	213	STORET; 49 values, 2012-21
Background Water Quality for the Maumee River				
Aluminum	µg/L	annual	435.5	STORET; 12 values, 0<MDL, 2012-13
Ammonia	mg/L	summer	0.08	DMR; Napoleon 901, 20 values, 0<MDL,2017-22
Ammonia	mg/L	winter	0.181	DMR; Napoleon 901, 16 values, 0<MDL,2017-22
Antimony	µg/L	annual	0	No representative data available.
Arsenic - TR	µg/L	annual	2.35	STORET; 12 values, 4<MDL, 2012-13
Barium	µg/L	annual	51	STORET; 12 values, 0<MDL, 2012-13
Bis(2-ethylhexyl)phthalate	µg/L	annual	0	No representative data available.
Boron	µg/L	annual	0	No representative data available.
Bromide	mg/L	annual	0	No representative data available.
Bromoform	µg/L	annual	0	No representative data available.
Bromomethane	µg/L	annual	0	No representative data available.
Chlorine - TRes	mg/L	annual	0	No representative data available.
Chlorodibromomethane	µg/L	annual	0	No representative data available.
Chloroform	µg/L	annual	0	No representative data available.
Chromium - TR	µg/L	annual	1	STORET; 12 values, 10<MDL, 2012-13
Copper - TR	µg/L	annual	2.45	STORET; 12 values, 0<MDL, 2012-13
Dichlorobromomethane	µg/L	annual	0	No representative data available.
Fluoride	mg/L	annual	0	No representative data available.
Iron - TR	µg/L	annual	582.5	STORET; 12 values, 0<MDL, 2012-13
Lead - TR	µg/L	annual	1	STORET; 12 values, 11<MDL, 2012-13
Manganese - TR	µg/L	annual	0	No representative data available.
Mercury - TR	ng/L	annual	0	No representative data available.
Methyl bromide	µg/L	annual	0	No representative data available.
Methyl chloride	µg/L	annual	0	No representative data available.

Molybdenum	µg/L	annual	0	No representative data available.
Nickel - TR	µg/L	annual	4.85	STORET; 12 values, 0<MDL, 2012-13
Nitrate-N + Nitrite-N	mg/L	annual	1.4	STORET; 12 values, 4<MDL, 2012-13
Pentachlorophenol	µg/L	annual	0	No representative data available.
Phenol	µg/L	annual	0	No representative data available.
Silver	µg/L	annual	0	No representative data available.
Total Filterable Residue	mg/L	annual	392	STORET; 13 values, 0<MDL, 2012-13
trans-1,2-Dichloroethylene	µg/L	annual	0	No representative data available.
Zinc - TR	µg/L	annual	5	STORET; 12 values, 10<MDL, 2012-13

DMR = Discharge Monitoring Report
MDL = Method Detection Limit
NPDES = National Pollutant Discharge Elimination System
STORET = United States Environmental Protection Agency Storage and Retrieval Data Warehouse
USGS = United States Geological Survey

Table 11. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

Parameter	Units	Outside Mixing Zone Criteria					Inside Mixing Zone Maximum
			Average			Maximum Aquatic Life	
		Wildlife	Human Health	Agri Supply	Aquatic Life		
Ammonia (summer)	mg/L	--	--	--	50.31	--	--
Ammonia (winter)	mg/L	--	--	--	636	--	--
Barium [B]	µg/L	--	38610000 [A]	--	35051 [A]	243658 [A]	11000
Bis(2-ethylhexyl)phthalate	µg/L	--	17720 [A]	--	587	117118 [A]	2100
Boron [B]	µg/L	--	48280000 [A]	--	118800 [A]	1532000 [A]	65000
Bromomethane [B]	µg/L	--	1440000 [A]	--	1118 [A]	4046 [A]	75
Chlorine - TRes	mg/L	--	--	--	0.3351 [A]	0.882 [A]	0.038
Chloroform	µg/L	--	941400 [A]	--	9784 [A]	138412 [A]	2600
Chromium - TR [B]	µg/L	--	7752000 [A]	54825 [A]	11114 [A]	351249 [A]	6700
Copper - TR	µg/L	--	15450000 [A]	120103 [A]	476 [A]	1235 [A]	57
Dichlorobromomethane [B]	µg/L	--	43449 [A]	--	10357 [A]	143872 [A]	6200
Iron - TR	µg/L	--	--	1067000	--	--	--
Lead - TR	µg/L	--	--	23898 [A]	488	14806 [A]	640
Manganese - TR [B]	µg/L	--	33780000	--	--	--	--
Mercury - TR [C]	ng/L	1.3	3.1	10000 [A]	910	1700	3400
Molybdenum [B]	µg/L	--	2414000 [A]	--	609231 [A]	8818000 [A]	370000
Nickel - TR [B]	µg/L	--	10380000 [A]	47111 [A]	2873 [A]	41085 [A]	1800
Nitrate-N + Nitrite-N [B]	mg/L	--	--	54604	--	--	--
Pentachlorophenol [B]	µg/L	--	386	--	--	--	--
Silver [B]	µg/L	--	2655000 [A]	--	40 [A]	274 [A]	12
Total Filterable Residue	mg/L	--	--	--	34143	--	--
Zinc - TR	µg/L	--	8447000 [A]	6033000 [A]	6859 [A]	10447 [A]	450

[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 by permit staff.
[C] Bioaccumulative Chemical of concern (BCC).

Table 12. Parameter Assessment

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

Sulfates

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

Ammonia (winter)	Barium	Bis(2-ethylhexyl) phthalate
Boron	Bromomethane	Chromium - TR
Cyanide - free	Dichlorobromomethane	Manganese - TR
Molybdenum	Nickel - TR	Nitrate-N + Nitrite-N
Pentachlorophenol	Silver	Zinc - TR

Group 3: PEQmax < 50% of maximum PEL and PEQavg < 50% of average PEL. No limit recommended, monitoring optional.

Ammonia (summer)	Chloroform [B]	Total Filterable Residue
Iron - TR	Lead - TR	

Group 4: PEQmax > 50% but <100% of the maximum PEL or PEQavg > 50% but < 100% of the average PEL. Monitoring is appropriate.

Copper - TR Mercury – TR [A]

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

			Recommended Effluent Limits	
Parameter	Units	Period	Average	Maximum
Chlorine - TRes	mg/L	annual	--	0.038

PEL = preliminary effluent limit

PEQ = projected effluent quality

WLA = wasteload allocation

WQS = water quality standard

[A] = Requires a permit tracking requirement in accordance with OAC 3745-33-07(A)(2) since the PEQ is > or = 75 percent of the PEL.

Table 13. Final Effluent Limits

Parameter	Units	Concentration		Loading (kg/day)[a]		Basis[b]
		Daily Maximum	30 Day Average	Daily Maximum	30 Day Average	
Final Outfall 001						
Water Temperature	°F	- - - - - - - - - - - Monitor - - - - - - - - - - -				M[c]
Dissolved Oxygen	mg/L	4.0[m]	--	--	--	WQS
Total Suspended Solids	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M[c]
Oil & Grease	mg/L	10	--	--	--	WQS
Ammonia	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M[c]
Phosphorus	mg/L	1.0	--	0.4	--	BTJ
Iron	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Nickel	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Zinc	µg/L	450	--	0.22	--	IMZM/ABS
Lead	µg/L	640	488	0.31	0.24	IMZM/ABS
Chromium	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Copper	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Flow Rate	MGD	- - - - - - - - - - - Monitor - - - - - - - - - - -				M[c]
Chlorine	mg/L	0.038	--	--	--	WLA
Mercury	ng/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Acute Toxicity, *Ceriodaphnia dubia*	TUa	1.0				WET
Acute Toxicity, *Pimephales promelas*	TUa	1.0				WET
Total Filterable Residue	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
pH, maximum	SU	9.0	--	--	--	WQS
pH, minimum	SU	6.5[m]	--	--	--	WQS
Total Filterable Residue	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
Internal Monitoring Station 601						
Total Suspended Solids	mg/L	--	--	134	27.4	ELG NSPS
Oil and Grease	mg/L	--	--	41	13.6	ELG NSPS
Zinc	µg/L	--	--	1.15	0.38	ELG NSPS
Lead	µg/L	--	--	0.86	0.29	ELG NSPS
Flow Rate	MGD	- - - - - - - - - - - Monitor - - - - - - - - - - -				M
pH, maximum	S.U.	9.0				ELG NSPS
pH, minimum	S.U.	6.0[m]				ELG NSPS

[a] Effluent loadings at outfall 001 kept at previous loadings due to ABS. 0.13 MGD for Zinc and Lead and 0.104840 MGD for phosphorus as calculated from the previous permit cycle.

[b] Definitions:
ABS = Antibacksliding Rule (OAC 3745-33-05(F) and 40 CFR Part 122.44(l))
BPJ = Best Professional Judgment
ELG = Federal Effluent Limitation Guidelines, see Attachment 1 40 CFR 420
M = Determination of Sampling Frequency Formula for Industrial Waste Discharges
NSPS = New Source Performance Standards
WET = Whole Effluent Toxicity (OAC 3745-33-07(B))
WLA = Wasteload Allocation procedures (OAC 3745-2)
IMZM = Inside Mixing Zone Maximum
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.

Attachment 1. Applicable Federal Effluent Limitation Guidelines

Operation	Production (tons/day)	Regulation	Effluent Limit Guidelines					Loading Allowances				
			TSS Monthly Avg	TSS Daily Max	O&G monthly Avg	O&G Daily Max		TSS Monthly Avg	TSS Daily Max	O&G Monthly Avg	O&G Daily Max	Units
Acid Pickling	3,600	420.94(b)(2) NSPS	0.00501	0.0117	0*	0.000*		36.07	84.24	0.00*	0.00*	lb/day
Hot Coating	2,400	420.124(a)(1) NSPS	0.0188	0.0438	0.00626	0.0188		90.24	210.24	30.05	90.24	lb/day
Total Load								126.31	294.48	30.05	90.24	lb/day
								57.29	133.57	13.63	40.93	kg/day
Current Limits								57.4	134	13.6	41	kg/day

* Oil and Grease effluent guidelines only apply for Acid Pickling 420.94(b)(2) when treated with cold rolling wastewaters, set to 0 since the facility does not use cold rolling wastewaters

Operation	Production (tons/day)	Regulation	Effluent Limit Guidelines					Loading Allowances				
			Zinc Monthly Avg	Zinc Daily Max	Lead monthly Avg	Lead Daily Max		Zinc Monthly Avg	Zinc Daily Max	Lead Monthly Avg	Lead Daily Max	Units
Acid Pickling	3,600	420.94(b)(2) NSPS	0.0000334	0.000100	0.000025	0.0000751		0.24	0.72	0.18	0.54	lb/day
Hot Coating	2,400	420.124(a)(1) NSPS	0.000125	0.000376	0.0000939	0.000282		0.60	1.80	0.45	1.35	lb/day
Total Load								0.84	2.52	0.63	1.89	lb/day
								0.38	1.15	0.29	0.86	kg/day
Current Limits								0.382	1.15	0.286	0.86	kg/day

Attachment 2. Whole Effluent Toxicity Reasonable Potential Analysis

	Water Flea (*Ceriodaphnia dubia*)	**Fathead Minnow (*Pimephales promelas*)**
	Acute	**Acute**
WLA (TU)	1.0	1.0
Total # of Tests	25	25
Maximum Value (TU)	1.35	2.55
Coefficient of Variation[1]	1.57	1.66
Multiplying Factors[2]	1.6	1.7
PEQ (Maximum Value x Multiplying Factor)	2.16	4.34
Reasonable Potential Demonstrated? (Yes/No) (Yes if PEQ > WLA)	Yes	Yes

1 40 CFR Part 132, Appendix F, Paragraph D(3)
2 40 CFR Part 132, Appendix F, Table F6-1

Addendum 1. Acronyms

ABS	Anti-backsliding
BAT	Best Available Technology Economically Achievable
BCT	Best Conventional Pollutant Control Technology
BPJ	Best professional judgment
BPT	Best Practicable Control Technology Currently Available
BTJ	Best technical judgment
CFR	Code of Federal Regulations
CONSWLA	Conservative substance wasteload allocation
CWA	Clean Water Act
CWIS	Cooling water intake structure
DMR	Discharge Monitoring Report
DMT	Dissolved metal translator
ELG	Federal effluent limitation guideline
gpm	Gallons per minute
IMZM	Inside mixing zone maximum
MDL	Analytical method detection limit
MGD	Million gallons per day
NPDES	National Pollutant Discharge Elimination System
NSPS	New source performance standards
OAC	Ohio Administrative Code
Ohio EPA	Ohio Environmental Protection Agency
ORC	Ohio Revised Code
ORSANCO	Ohio River Valley Water Sanitation Commission
PEL	Preliminary effluent limit
PEQ	Projected effluent quality
PMP	Pollution Minimization Program
PPE	Plant performance evaluation
SIC	Standard Industrial Classification
TBEL	Technology-based effluent limit
TMDL	Total Daily Maximum Load
TRE	Toxicity reduction evaluation
TU	Toxicity unit
U.S. EPA	United States Environmental Protection Agency
WET	Whole effluent toxicity
WLA	Wasteload allocation
WQBEL	Water-quality-based effluent limit
WQS	Water Quality Standards