National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for **Cleveland-Cliffs Corporation Zanesville Works**

Public Notice No.: 161742
Public Notice Date: October 4, 2022
Comment Period Ends: November 4, 2022

Ohio EPA Permit No.: **0ID00002*LD**
Application No.: **OH0006858**

Name and Address of Applicant:
Cleveland-Cliffs Corporation
1724 Linden Avenue
Zanesville, OH 43701

Name and Address of Facility Where Discharge Occurs:
Cleveland-Cliffs Corporation Zanesville Works
1724 Linden Avenue
Zanesville, OH 43701
Muskingum County

Receiving Water: **Muskingum River**

Subsequent Stream Network: **Ohio River**

INTRODUCTION

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

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

No antidegradation review was necessary.

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

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

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

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

SUMMARY OF PERMIT CONDITIONS

Revised effluent limits are included for internal monitoring station 612 due to changes in production at the facility.

A monitoring requirement for intake flow has been added at new intake station 800 to verify that Best Technology Available requirements for the intake are being maintained.

Monitoring requirements are proposed to be removed for acute toxicity at Outfall 001 because the facility discharge has not exhibited acute toxicity during the last two permit cycles. Monitoring requirements for hexavalent chromium are also proposed to be removed at Outfall 001 because the Station 612 monitoring requirements adequately track any hexavalent chromium discharges.

In Part II of the permit, special conditions are included that address storm water compliance; Section 316(b) compliance, treatment additive approval; 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 sent 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 Eric Nygaard at (614) 644-2024 (eric.nygaard@epa.ohio.gov) or Kurt McGinnis at (740) 380-5423 (kurt.mcginnis@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 email epa.dswcomments@epa.ohio.gov (preferred method), 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

Cleveland-Cliffs Corporation Zanesville Works (Cleveland-Cliffs Zanesville Works) discharges to the Muskingum River at River Mile 78.0. Figure 1 shows the approximate location of the facility.

This segment of the Muskingum River is described by Ohio EPA River Code: 17-001, Hydrologic Unit Code: 05040004-03-05, County: Muskingum, Ecoregion: Western Allegheny Plateau. The Muskingum River is designated for the following uses under Ohio's WQS (OAC 3745-1-24): 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

Cleveland-Cliffs Zanesville is a steel finishing mill. The industrial processes at the facility include:

- Salt bath descaling
- Acid pickling
- Cold rolling
- Alkaline cleaning
- Other finishing of silicon steel and stainless steel

The process operations at Cleveland-Cliffs Zanesville are classified in the Standard Industrial Classification (SIC) category 3316, Cold-Rolled Steel Sheet, Strip, and Bars. The process wastewaters generated from these operations are regulated under 40 CFR 420, "Iron and Steel Manufacturing Point Source Category:"

- Subpart H, Salt Bath Descaling Subcategory
- Subpart I, Acid Pickling Subcategory
- Subpart J, Cold Forming Subcategory
- Subpart K, Alkaline Cleaning Subcategory

Cleveland-Cliffs Zanesville obtains water from the Muskingum River for process operations and non-contact cooling water (NCCW).

Cleveland-Cliffs Zanesville Works is covered under the following additional NPDES permit(s): a PSD Air Pollution Control Permit from Ohio EPA and an indirect discharge permit from the City of Zanesville for sanitary wastewater.

DESCRIPTION OF EXISTING DISCHARGE

Cleveland-Cliffs Zanesville Works has 2 final outfalls to the Muskingum River (Outfalls 001 and 002) and one in-plant monitoring point (Outfall 612) that discharges via Outfall 001. Process wastewater (Outfall 612) is treated by the following processes:

- Reduction
- Precipitation
- Coagulation
- Flocculation
- Clarification
- Sand filtration
- Sludge dewatering

The average flow rate of the WWTP is 0.450 million gallons per day (MGD). Sanitary waste is discharged to the Zanesville WWTP collection system. All storm water is discharged through either outfall 001 or 002.

There have been no violations reported at this plant during the last five years.

Table 3 presents data compiled from the NPDES permit renewal application Form 2C.

Table 4 presents storm water data compiled from NPDES permit renewal application Form 2F.

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

Table 7 summarizes the chemical specific data for outfalls 001 and 002 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

The Muskingum River watershed assessment unit, which includes the river segment in the vicinity of Cleveland-Cliffs Zanesville Works, is listed as impaired for recreation (due to E. coli. Levels) and human health (PCBs in fish tissue) on Ohio's 303(d) list. Cleveland-Cliffs is not a source of these pollutants and is not considered to be contributing to these impairments.

The attainment status of the Muskingum River is reported in the final 2020 *Ohio Integrated Water Quality Monitoring and Assessment Report*. 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 7-1). These criteria apply to rivers and streams outside of mixing zones. Numerical biological criteria are based on measuring several characteristics of the fish and macroinvertebrate communities; these characteristics are combined into multimetric biological indices including the Index of Biotic Integrity and modified Index of Well-Being, which indicate the response of the fish community, and the Invertebrate Community Index, which indicates the response of the macroinvertebrate community. Numerical criteria are broken down by ecoregion, use designation, and stream or river size. Ohio has five ecoregions defined by common topography, land use, potential vegetation and soil type.

Three attainment status results are possible at each sampling location -full, partial, or non-attainment. Full attainment means that all of the applicable indices meet the biocriteria. Partial attainment means that one or more of the applicable indices fails meet the biocriteria. Nonattainment means that either none of the applicable indices meet the biocriteria or one of the organism groups indicates poor or very poor performance. An aquatic life use attainment table (see Table 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, and comments and observations for each sampling location.

The most recent data available for the Muskingum River is from 2006 and 2009. A large-scale biological and water quality survey of the Muskingum River in 2006 showed full attainment of the WWH use designation both upstream and downstream of the Cleveland-Cliffs - Zanesville discharge. In 2009, a more localized sampling effort to assess any potential impacts from Gould National Battery, found the river to be partial attainment both upstream and downstream of the Gould discharge with the cause attributed to impacts associated with an impoundment on the Muskingum River. The Muskingum River showed full attainment of WWH criteria upstream and immediately downstream of the Cleveland-Cliffs discharge.

More information on the 2006 and 2009 sampling can be found in the following technical support documents (TSDs): *"Biological and Water Quality Study of the Muskingum River, 2006"*, OEPA, March 2007 and *"Biological and Water Quality Assessment of the Muskingum River, Gould National Battery, 2009"*, OEPA, December 2009. These documents are available through the OEPA, Division of Surface Water website https://epa.ohio.gov/divisions-and-offices/surface-water/reports-data/biological-and-water-quality-reports

The full Integrated Report is available through the Ohio EPA, Division of Surface Water website at: https://epa.ohio.gov/divisions-and-offices/surface-water/reports-data/ohio-integrated-water-quality-monitoring-and-assessment-report

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.

The following dischargers to the Muskingum River were considered interactive:

- Cleveland-Cliffs - Zanesville
- Zanesville WWTP

These outfalls were allocated together for most parameters due to the size of the plant discharges, the flows of the Muskingum River and tributaries, and the relatively proximity of the discharge points. The exception was the wasteload allocations (WLAs) for ammonia toxicity, which were evaluated separately for each facility because ammonia is considered a non-conservative parameter.

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.

Parameter Selection

Effluent data for the Cleveland-Cliffs - Zanesville was 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 2016 through March 2021
Form 2-C Data	2021

Statistical Outliers and Other Non-representative Data

The data were examined and one value of 463 µg/L for zinc was removed from the evaluation as non-representative data.

For more information on PEQ calculations, see Modeling Guidance #1 at the following webpage: https://www.epa.ohio.gov/portals/35/guidance/model1.pdf

The average and maximum projected effluent quality (PEQ) values are presented in Table 6. For a summary of the screening results, refer to the parameter groupings in Tables 12 and 13.

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 10).

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 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-N	Average	Summer/winter 30Q10
Agricultural Water Supply		Harmonic mean flow
Human Health (nondrinking)		Harmonic mean flow

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

The data used in the WLA are listed in Tables 9 and 10. The wasteload allocation results to maintain all applicable criteria are presented in Table 11.

Thermal Wasteload
Ohio EPA screened the plant temperatures against a model using a fraction of the Muskingum River flow. Neither outfall had the reasonable potential to exceed temperature standards in the River.

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 Cleveland-Cliffs Zanesville Works, the WLA values are:

Outfall 001; 1.0 TU_a and 185 TU_c
Outfall 002; 1.0 TU_a and 677 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 12. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 7, 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 13 and 13.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 15 presents the final effluent limits and monitoring requirements proposed for Cleveland-Cliffs Zanesville Works outfalls 001 and 002 and internal monitoring station 612 and the basis for their recommendation. Unless otherwise indicated, the monitoring frequencies proposed in the permit are continued from the existing permit.

Outfall 001

pH

Limits proposed for pH are based on Ohio WQS.

Zinc

The Ohio EPA risk assessment (Table 13) places zinc in group 3. This placement, as well as the data in Tables 3-6, support that zinc does not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Ohio EPA is retaining the zinc monitoring requirement as a benchmark pollutant to assess storm water discharges at the facility.

Ammonia-N, arsenic, barium, boron, chromium, hexavalent chromium, fluoride, iron, nickel, nitrate/nitrite-N

The Ohio EPA risk assessment (Table 13) places ammonia-N, arsenic, barium, boron, chromium, hexavalent chromium, fluoride, iron, nickel and nitrate/nitrite-N in groups 2 and 3. This placement, as well as the data in Table 3-6Table 7, 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 hexavalent chromium is proposed to be removed. No new monitoring is proposed for the other parameters.

Hardness, oil & grease, total suspended solids

Based on best technical judgment, monitoring is proposed for hardness, oil & grease and total suspended solids to assess storm water discharges from the outfall. Benchmark concentrations for TSS and zinc are proposed to be continued in the new permit.

Outfall 002

pH
Limits proposed for pH are based on Ohio WQS.

Temperature
This discharge consists mostly of non-contact cooling water and temperatures are considerably higher than ambient river temperatures. While the discharge does not have the reasonable potential to exceed temperature standards in the Muskingum River, temperature monitoring is proposed to continue in the draft permit.

Zinc
The Ohio EPA risk assessment (Table 13) places zinc in group 4. This placement, as well as the data in Tables 3-6, support that zinc does not have the reasonable potential to contribute to WQS exceedances, and limits are not necessary to protect water quality. Ohio EPA is retaining the zinc monitoring requirement as a benchmark pollutant to assess storm water discharges at the facility. Monitoring for Group 4 pollutants (where PEQ exceeds 50 percent of the WLA) is required by OAC 3745-33-07(A)(2).

Ammonia-N, arsenic, barium, boron, fluoride, iron, nitrate/nitrite-N
The Ohio EPA risk assessment (Table 13) places ammonia-N, arsenic, barium, boron, fluoride, iron and nitrate/nitrite-N in groups 2 and 3. This placement, as well as the data in Table 3-6Table 7, 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.

Hardness, oil & grease, total suspended solids
Based on best technical judgment, monitoring is proposed for hardness, oil & grease and total suspended solids to assess storm water discharges from the outfall. Benchmark concentrations for TSS are proposed to be continued in the new permit.

Internal Monitoring Station 612
Federal effluent guideline limitations (ELGs) are based on available treatment technology. Federal and State laws and regulations require that dischargers meet both the ELGs and any standards need to comply with state WQS. Permit limits are based on the more stringent of the two. Consistent with 40 CFR 122.45(h), the current permit includes monitoring and limits at internal station 612. 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, chromium and nickel
The limits recommended for total suspended solids, oil & grease, chromium and nickel are based on the federal effluent limitation guidelines (ELGs) found in 40 CFR Part 420 and Best Professional Judgment based on the 1982 U.S. EPA Development Document for the Iron & Steel industry. All limits are shown in Attachment 1. An example calculation is provided below:

For average TSS:
Production-based limits for Salt Bath Descaling (as well as Acid Pickling and Alkaline Cleaning) are calculated as: 0.0413 kg/kkg x 804 tons/day x 0.908 kkg/ton = 30.15 kg/day.

The Acid Pickling Fume Scrubber ELGs are simply kg/day for each scrubber. As Cleveland-Cliffs Zanesville has 2 of these fume scrubbers the TSS avg load is: 2.45 kg/d x 2 = 4.9 kg/day.

This plant also has a brush scrubber process wastewater that is not covered by Iron & Steel ELGs. To set TSS limits for this discharge, we used a TSS concentration typical of these wastewaters and multiplied by the scrubber flow to get a kg/day load: 30 mg/l x 0.259 MGD x 3.785 l/gal = 29.4 kg/day.

The TSS loadings for each process are totaled to get the discharge limit for Outfall 612. ELG loadings for oil & grease, chromium and nickel are calculated in the same way.

Oil&grease

The existing oi&grease loading limit is being continued based on antibacksliding/antidegradation considerations. This limit was requested by the company during the *ID modification of the permit to meet an exclusion from the antidegradation rule. The limit was continued in the current *JD version of the permit and is included in this draft renewal.

Hexavalent chromium

In addition to these requirements, the draft permit would continue a monitoring requirement for hexavalent chromium at this monitoring point. The processes at this mill contain hexavalent chromium reduction treatment. and monitoring of hexavalent chromium is proposed to continue as a check on the operation of this treatment.

pH

Monitoring for pH would be continued in this permit. While effluent guidelines set limits of 6.0-9.0 standard units for pH, the rules also allow for limits to be omitted if the final outfall has limits for pH. Because Outfall 001 is limited for pH, limits are not required at Station 612.

Whole Effluent Toxicity Reasonable Potential

Based on evaluating the WET data presented in Table 8 and other pertinent data under the provisions of OAC 3745-33-07(B), the Cleveland-Cliffs Zanesville Works is placed in Category 4 with respect to WET. No monitoring is proposed at this time.

OTHER REQUIREMENTS

Cooling Water Intake Structure Compliance

Under Section 316(b) of the federal CWA, cooling water intake structures (CWISs) are required to use best technology available (BTA) to minimize adverse environmental impact resulting from the operation of the intake. The CWIS is considered an existing unit at an existing facility and therefore must comply with 40 CFR 125, Subpart J. Information supplied from the permittee regarding the CWIS and other pertinent data include the following:

- Design intake flow rate – 800 gallons per minute (gpm), or 1.15 MGD.
- Maximum design intake flow rate of pumps – 1199 gpm or 1.72 MGD.
- Percentage of intake flow rate used for cooling purposes – 75% is used for non-contact cooling water purposes (there is no contact cooling water used at this facility).
- Through-screen design intake velocity – not reported in this application; previous application reported 0.205 feet per second (fps).
- The facility utilizes a limited recycling system for cooling water; 10% of the water used for cooling is twice-through cooling water. Facility has substituted additional well water withdrawal for intake flow since April 2017.
- Impingement/entrainment data – data not required to be submitted.
- Operation of the cooling water system – may operate 24 hours a day, 365 days per year.
- Description of screens, technologies, and operations measures used to reduce impingement and entrainment – Intake screens are manufactured by Chain Belt Company. Design utilizes a 3/8 inch sized

screen mesh openings. Screens are automatically rotated every 12 hours and sprayed with water for eight minutes.

Ohio EPA has evaluated this information and at this time has determined based on best professional judgment (BPJ) that the CWIS represents BTA in accordance with Section 316(b) of the CWA. This BPJ conclusion has been reached based on the low intake flow rate (especially compared with the critical low flow of the Muskingum River), based on the low through-screen design intake velocity (which is less than the recommended compliance velocity of 0.5 fps in the rule), and based on the attainment status of the Muskingum River. Cleveland-Cliffs' operations are not indicated as contributing to the river's impairments.

In order to ensure that the facility remains compliant with Section 316(b), special conditions are included in Part II of the permit.

Sludge
A new monitoring requirement is proposed for the disposal of industrial sludge by the following management practices: removal to a solid waste landfill.

Outfall Signage
Part II of the permit includes requirements for the permittee to place and maintain a sign at each outfall to the Muskingum 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
Parts IV, V, and VI have been included with the draft permit to ensure that any storm water flows from the facility site are properly regulated and managed. As an alternative to complying with Parts IV, V, and VI, the Cleveland-Cliffs Zanesville Works may seek permit coverage under the general permit for industrial storm water (permit # OHR000005) or submit a "No Exposure Certification." Parts IV, V, and VI will be removed from the final permit if: 1) the Cleveland-Cliffs Zanesville Works submits a Notice of Intent (NOI) for coverage under the general permit for industrial storm water or submits a No Exposure Certification, 2) Ohio EPA determines that the facility is eligible for coverage under the general permit or meets the requirements for a No Exposure Certification, and 3) the determination by Ohio EPA can be made prior to the issuance of the final permit.

Benchmark monitoring for total suspended solids and zinc for outfalls 001 and 002 is proposed in accordance with the storm water language. See Part V for more details.

Figure 1. Location of Cleveland-Cliffs Zanesville Works



Figure 2. Water Balance Diagram

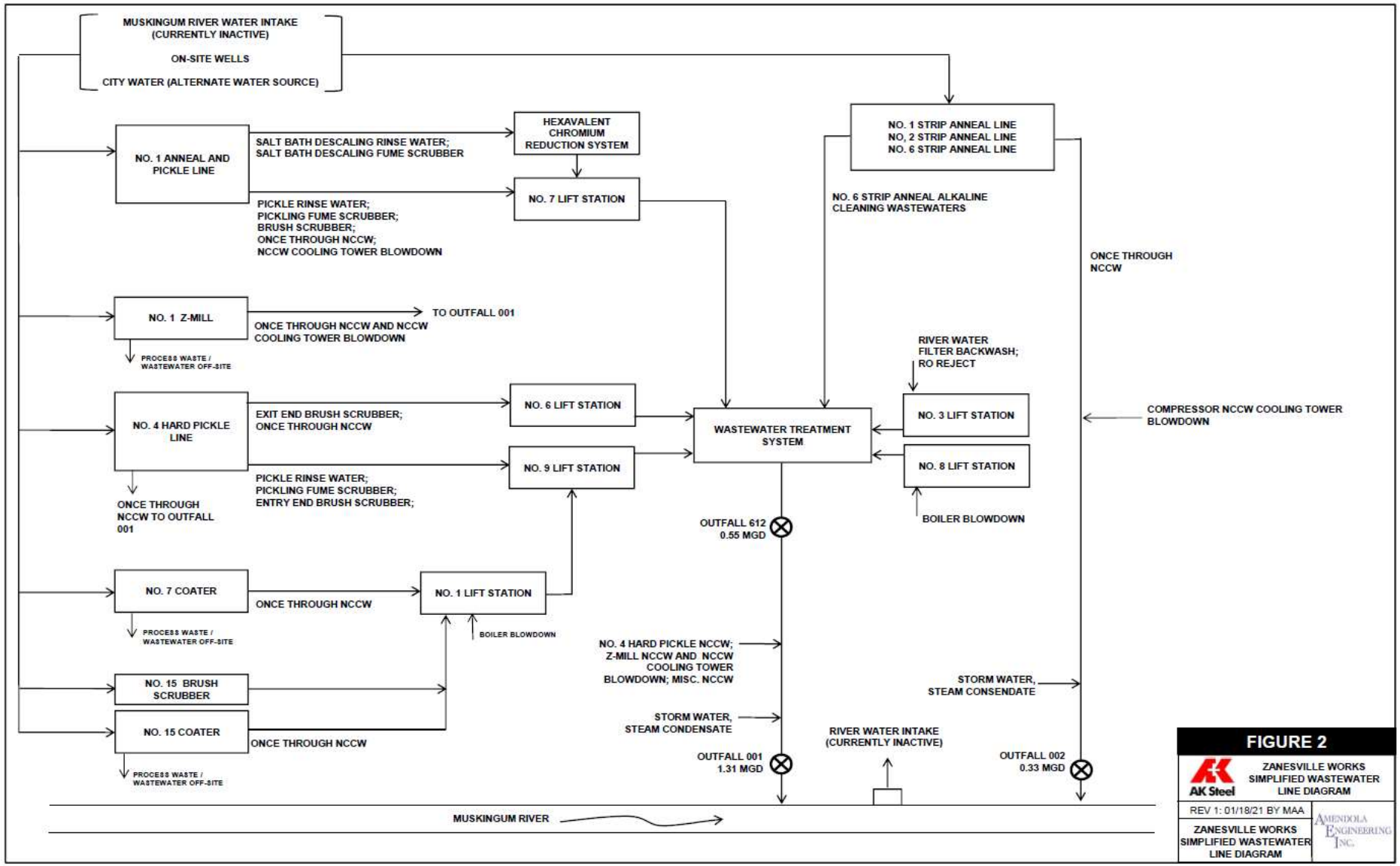


Figure 3. Water Balance Diagram

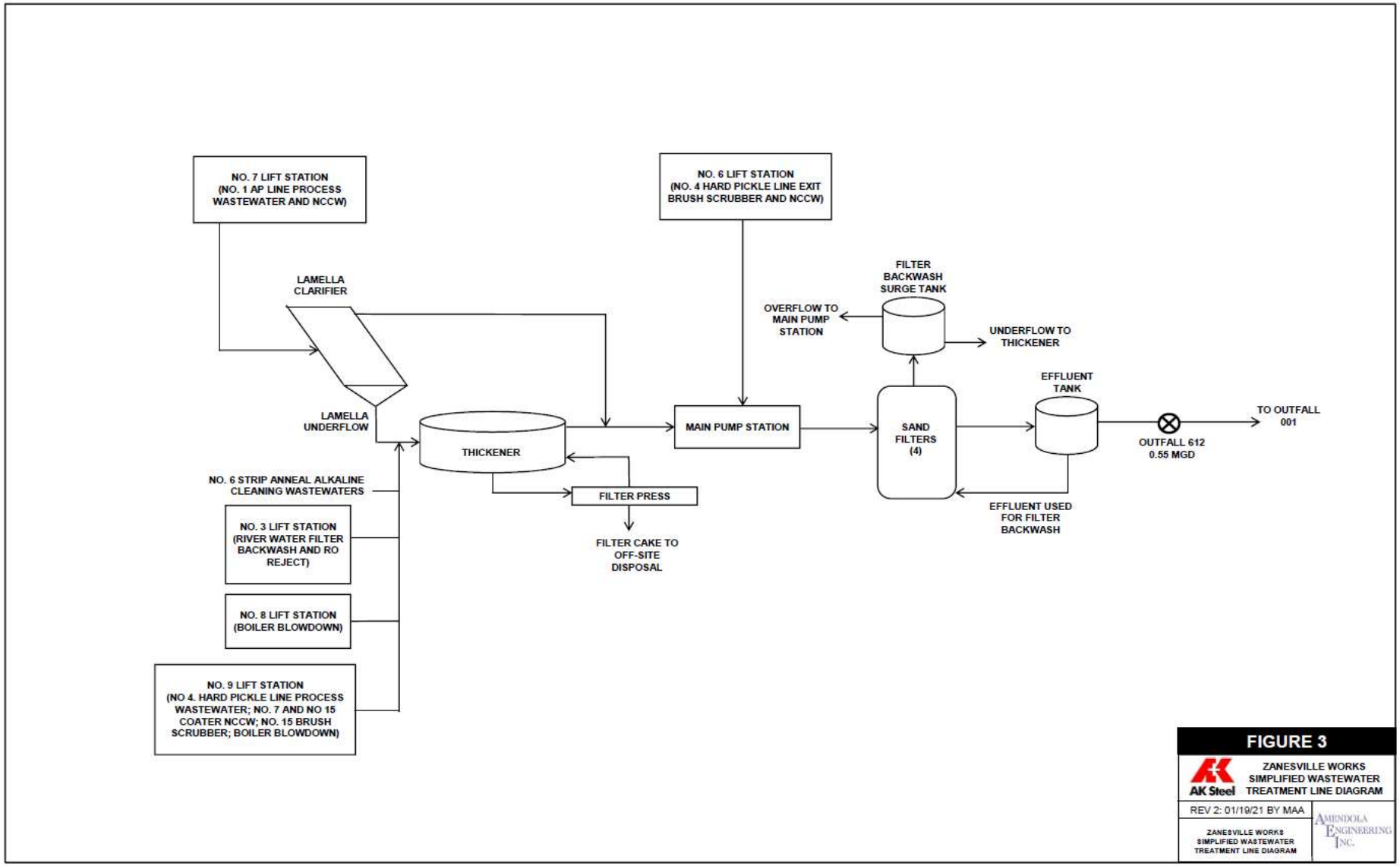


Figure 4. Muskingum River Study Area

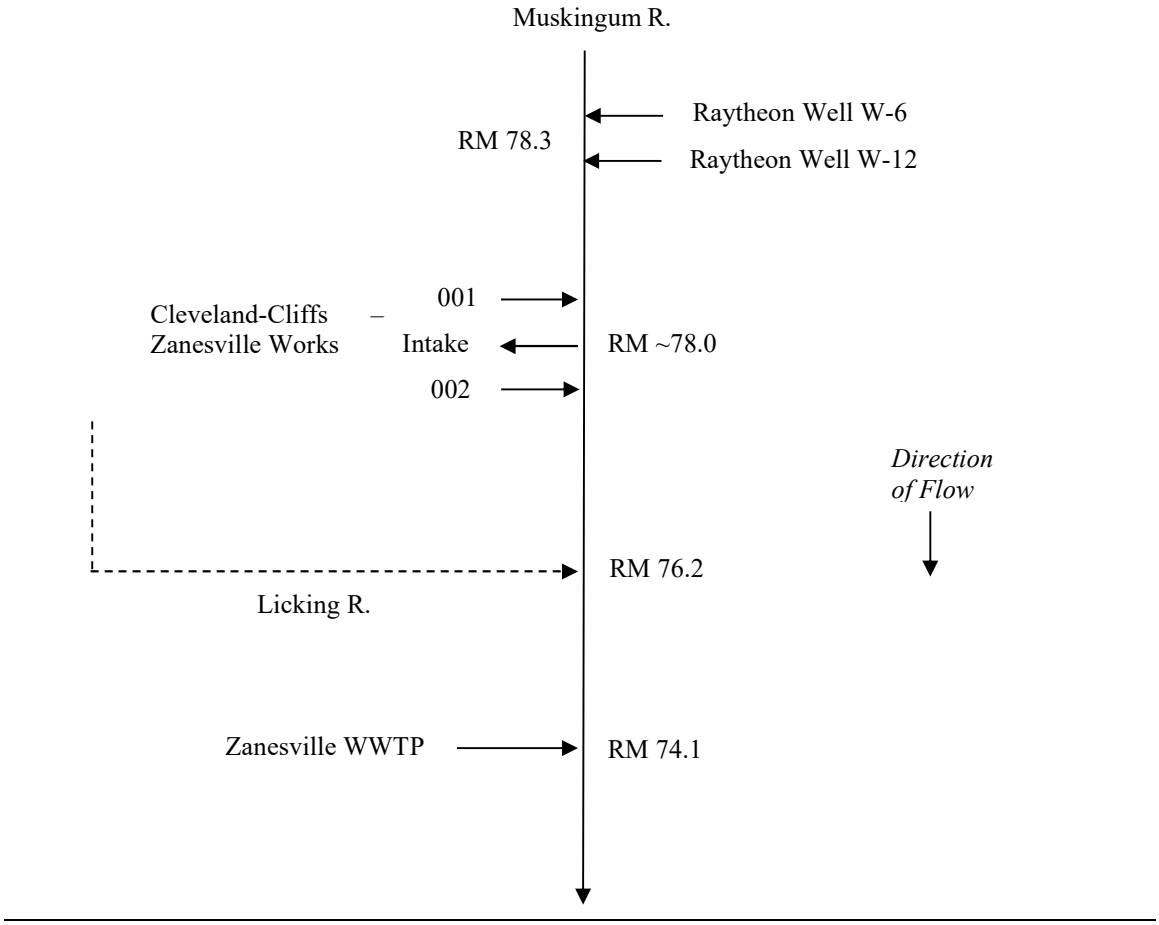


Table 1. Monitoring Stations, Wastewater Sources, Treatment Processes, Discharge Points, and Flow Rates

Station #	Wastewater Source	Treatment Utilized	Discharge/ Receiving Stream	Average Flow Rate (MGD)
001	Treated Process Wastewater (Station 612), Non-contact Cooling Water, Boiler Blowdown, Steam Condensate, and Storm Water	None	Muskingum River	1.31
002	Non-contact Cooling Water, Steam Condensate and Storm Water	None	Muskingum River	0.33
612	Salt Bath Descaling, Acid Pickling, Alkaline Cleaning, Acid Pickling Fume Scrubber, Brush Scrubber Wastewaters	Chemical Reduction, Precipitation, Coagulation, Flocculation, Clarification, Sand filtration Sludge dewatering	Muskingun River via 001	0.55

Table 2. Average Annual Effluent Flow Rates

			Flow Rate (Million Gallons per Day)			
Outfall	Year	# obs	Average	Median	95th Percentile	Maximum
1	2017	365	1.424237	1.5	2.2	2.83
1	2018	365	0.860274	0.83	1.448	2.1
1	2019	364	0.448352	0.3085	1.39	3.04
1	2020	366	0.22276	0.21	0.38	0.56
1	2021	365	0.277261	0.27	0.448	0.61
1	2022	90	0.352667	0.34	0.42	0.63
2	2017	359	0.55	0.55	0.55	0.55
2	2018	365	0.55	0.55	0.55	0.55
2	2019	363	0.357832	0.4	0.58994	1.08
2	2020	366	0.300645	0.32	0.5575	2
2	2021	365	0.312815	0.33	0.588	0.95
2	2022	90	0.393889	0.415	0.6055	0.92
612	2017	365	0.51349	0.5	0.8	1.05
612	2018	365	0.424685	0.4	0.61	0.86
612	2019	365	0.293389	0.26	0.65	1.38
612	2020	366	0.191694	0.18	0.36	0.46
612	2021	365	0.245022	0.24	0.41	0.51
612	2022 [a]	90	0.332111	0.32	0.4385	0.61

MGD = million gallons per day

[a] Data for January through March only

Table 3. Effluent Characterization Based on Form 2C Data

Parameter	Units	Outfall 001		Outfall 002		Outfall 612	
		Max 30-day	Daily max.	Max 30-day	Daily max.	Max 30-day	Daily max.
Chemical Oxygen Demand	mg/l	--	18	--	12	--	<10
Total Organic Carbon	mg/l	--	2.2	--	2.8	--	2.3
Total Suspended Solids	mg/l	28	43	87	87	6.25	14
Ammonia-nitrogen	mg/l	--	0.08	--	0.13	--	0.08
Temperature (sum)	oC	--	--	35.5	37.7	--	--
Temperature (win)	oC	--	22.2	47.2	48.9	--	23
Bromide	mg/l	--	0.156	--	0.156	--	0.154
Fluoride	mg/l	--	37	--	0.129	--	36.5
Nitrate/nitrite-nitrogen	mg/l	--	1.01	--	1.13	--	1.09
Oil & grease	mg/l	3	3	6	6	3	3
Phosphorus	mg/l	--	0.31	--	0.8	--	0.29
Sulfate	mg/l	--	520	--	93	--	640
Barium	ug/l	--	77	--	79	--	80
Boron	ug/l	--	170	--	170	--	170
Iron	ug/l	--	370	--	1000	--	570
Magnesium	mg/l	--	117	--	23.4	--	134
Manganese	ug/l	--	120	--	190	--	180
Tin	ug/l	--	<10	--	<10	--	11
Arsenic	ug/l	--	3.4	--	4	--	3.2
Chromium	ug/l	--	<10	--	<10	10	10
Nickel	ug/l	--	<10	--	<10	62	87
Zinc	ug/l	--	<10	--	11	--	11

Table 4. Storm Water Effluent Characterization Based on Form 2F Data

Parameter	Units	Grab 1	Grab 2	Grab 3	Grab 4	Calculated Composite
Outfall 001						
BOD5	mg/l	<4.0	<4.0	11	<4.0	4.7
COD	mg/l	<10	15	42	13	16
Hardness	mg/l	370	270	160	330	306
Nitrate/Nitrite-N	mg/l	0.62	0.68	1.06	0.52	0.6
Oil & grease	mg/l	<5.0	<5.0	<5.0	<5.0	<5.0
Phosphorus	mg/l	0.47	0.46	0.33	0.55	0.52
Total Kjeldahl N	mg/l	<0.5	<0.5	1.57	<0.5	0.6
Total Nitrogen	mg/l	0.62	0.68	2.63	0.52	0.74
Total Suspended Solids	mg/l	4.4	5.6	4.8	5.6	5.5
pH	S.U.	8.36	8.39	8.46	7.38	--
Chromium	ug/l	<10	<10	<10	<10	<10
Nickel	ug/l	11	18	<10	<13	13.4
Outfall 002						
BOD5	mg/l	<4.0	4.3	<4.0	<4.0	4.1
COD	mg/l	13	19	11	19	16
Hardness	mg/l	310	260	280	150	227
Nitrate/Nitrite-N	mg/l	0.84	0.77	0.74	0.40	0.63
Oil & grease	mg/l	<5.0	<5.0	<5.0	<5.0	<5.0
Phosphorus	mg/l	0.91	0.77	0.87	0.54	0.72
Total Kjeldahl N	mg/l	<0.5	<0.5	<0.5	<0.5	<0.5
Total Nitrogen	mg/l	0.84	0.77	0.74	0.40	0.63
Total Suspended Solids	mg/l	<4.0	<4.0	<4.0	21	10
pH	S.U.	8.08	8.26	8.38	8.41	--
Chromium	ug/l	<10	<10	<10	<10	<10
Nickel	ug/l	<10	<10	<10	<10	<10

Table 5. Effluent Characterization Using Self-Monitoring Data

Parameter	Season	Units	Current Permit Limits		# Obs.	Percentiles		Data Range
			30 day	Daily		50th	95th	
Outfall 001								
pH	Annual	S.U.	6.5 to 9.0		261	7.95	8.38	7.07-8.82
Total Suspended Solids	Annual	mg/l	Monitor		68	0	9.74	0-28
Total Suspended Solids	Annual	kg/day	--	--	68	0	27.3	0-165
Oil and Grease, Hexane Extr Method	Annual	mg/l	Monitor		66	0	0	0-4
Oil and Grease, Hexane Extr Method	Annual	kg/day	--	--	66	0	0	0-3.79
Hardness, Total (CaCO3)	Annual	mg/l	Monitor		63	412	1130	44-1430
Zinc, Total (Zn)	Annual	ug/l	Monitor		2	39.5	53.5	24-55
Zinc, Total (Zn)	Annual	kg/day	--	--	2	0.236	0.286	0.181-0.291
Chromium, Dissolved Hexavalent	Annual	ug/l	Monitor		21	0	0	0-0
Chromium, Dissolved Hexavalent	Annual	kg/day	--	--	21	0	0	0-0
Flow Rate	Annual	MGD	Monitor		1915	0.37	1.83	0.0081-3.04
Acute Toxicity, Ceriodaphnia dubia	Annual	TUa	Monitor		5	0	0	0-0
Outfall 002								
Water Temperature	Annual	F	Monitor		261	93	117	49-128
pH	Annual	S.U.	6.5 to 9.0		261	7.87	8.32	6.96-8.56
Total Suspended Solids	Annual	mg/l	Monitor		65	0	12.4	0-87
Total Suspended Solids	Annual	kg/day	--	--	65	0	26.5	0-204
Oil and Grease, Hexane Extr Method	Annual	mg/l	Monitor		63	0	0	0-0
Oil and Grease, Hexane Extr Method	Annual	kg/day	--	--	63	0	0	0-0
Hardness, Total (CaCO3)	Annual	mg/l	Monitor		63	309	409	216-1000
Zinc, Total (Zn)	Annual	ug/l	Monitor		2	61	97.9	20-102
Zinc, Total (Zn)	Annual	kg/day	--	--	2	0.127	0.204	0.0416-0.212
Flow Rate	Annual	MGD	Monitor		1908	0.52	0.56	0.001-2

Table 6. Effluent Characterization Using Self-Monitoring Data (continued)

Outfall 612

pH	Annual	S.U.		Monitor	260	7.78	8.16	7.18-8.7
Total Suspended Solids	Annual	mg/l		Monitor	256	0	6.05	0-14
Total Suspended Solids	Annual	kg/day	208	485	256	0	10.4	0-17
Oil and Grease, Total	Annual	mg/l		Monitor	256	0	0	0-5.5
Oil and Grease, Total	Annual	kg/day	57	79	256	0	0	0-6.04
Chromium, Total (Cr)	Annual	ug/l		Monitor	256	0	0	0-0
Chromium, Total (Cr)	Annual	kg/day	2.65	6.64	256	0	0	0-0
Nickel, Total (Ni)	Annual	ug/l		Monitor	256	22	56	0-87
Nickel, Total (Ni)	Annual	kg/day	1.99	5.97	256	0.0164	0.106	0-0.165
Chromium, Dissolved Hexavalent	Annual	ug/l		Monitor	66	0	0	0-0
Chromium, Dissolved Hexavalent	Annual	kg/day	--	--	66	0	0	0-0
Flow Rate	Annual	MGD		Monitor	1916	0.31	0.68	0.0001-1.38

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	Number > MDL	PEQ Average	PEQ Maximum
Outfall 001					
Self-Monitoring (DMR) Data					
Chromium VI - Diss	µg/L	20	0	--	--
Self-Monitoring (DMR) Data/Form 2-C Data					
Zinc - TR	µg/L	3	3	121	165
Form 2-C Data					
Ammonia-N	mg/l	1	1	0.36	0.50
Arsenic - TR	µg/L	1	1	15.4	21.1
Barium - TR	µg/L	1	1	349	477
Boron - TR	µg/L	1	1	769	1054
Bromide	mg/L	1	1	0.706	0.967
Fluoride	mg/L	1	1	167	229
Iron - TR	µg/L	1	1	1675	2294
Magnesium	mg/L	1	1	530	725
Manganese - TR	µg/L	1	1	543	744
Nitrate-N + Nitrite-N	mg/L	1	1	4.57	6.26
Phosphorus	mg/L	1	1	1.43	1.92
Sulfates	mg/L	1	1	2354	3224
Outfall 002					
Self-Monitoring (DMR) Data / Form 2-C Data					
Zinc - TR	µg/L	3	3	223	306
Form 2-C Data					
Ammonia-N	mg/l	1	1	0.59	0.81
Arsenic – TR	µg/L	1	1	18.1	24.8
Barium – TR	µg/L	1	1	358	490
Boron - TR	µg/L	1	1	769	1054
Bromide	mg/L	1	1	0.706	0.967
Fluoride	mg/L	1	1	0.584	0.800
Iron - TR	µg/L	1	1	4526	6200
Magnesium	mg/L	1	1	106	145
Manganese - TR	µg/L	1	1	860	1178
Nitrate-N + Nitrite-N	mg/L	3	3	5.11	7.01
Phosphorus	mg/L	1	1	3.6	5.0
Sulfates	mg/L	1	1	421	577

DMR = Discharge Monitoring Report
PEQ = projected effluent quality TR = total recoverable

Table 8. Summary of Acute and Chronic Toxicity Results

	Ceriodaphnia Dubia		*Pimephales promelas*	
Date	TU_a	TU_c	TU_a	TU_c
6/7/2017	AA	--	--	--
6/12/2018	AA	--	--	--
6/10/2019	AA	--	--	--
6/18/2020	AA	--	--	--
6/22/2021	AA	--	--	--

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

Table 9. Use Attainment Table

Location	Year	RM	AL Use Designation	Attainment Status	Causes of Impairment	Sources of Impairment
Muskingum R. @ Ellis Dam Pool	2006	87.0	WWH	FULL		
Muskingum R. @ Ellis Dam Tailwaters	2006	84.6	WWH	FULL		
Muskingum R. @ Zanesville Dam Pool	2006	80.2	WWH	FULL		
Muskingum R. Dst Cleveland-Cliffs discharges	2006	77.6	WWH	FULL		
Muskingum R. @ Zanesville Dam tailwaters	2006	75.8	WWH	FULL		
Muskingum R. Upst Gould Nat'l Battery property	2009	74.7	WWH	FULL		
Muskingum R. Adj. Gould Nat'l Battery property	2009	74.2	WWH	Partial	Direct Habitat Alterations	Impoundment
Muskingum R. Dst. Gould Nat'l Battery property	2009	73.5	WWH	Partial	Direct Habitat Alterations	Impoundment
Muskingum R. Dst. Zanesville WWTP	2006	72.4	WWH	FULL		
Muskingum R. @ Philo Dam Tailwaters	2006	67.3	WWH	FULL		

* "Other" as a cause refers to not readily identified impacts associated with runoff from impervious surfaces and lawns in urban settings.
WWH = warmwater habitat

Table 10. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum	
		Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Aluminum	µg/L	--	--	--	--	--
Ammonia-N (sum)	mg/L	--	--	1.5	12.9	--
Ammonia-N (win)	mg/L	--	--	1.7	4.5	--
Arsenic	µg/L	--	100	150	340	680
Barium	µg/L	--	--	1400	6100	12000
Boron	µg/L	--	--	3900	33000	65000
Bromide	mg/l	--	--	--	--	--
Chromium – TR	µg/L	--	100	180	3700	7400
Chromium VI - Diss	µg/L	--	--	11	16	31
Fluoride [D]	mg/L	--	2	--	--	--
Iron - TR [D]	µg/L	--	5000	--	--	--
Magnesium	mg/L	--	--	--	--	--
Manganese - TR	µg/L	--	--	--	--	--
Nickel - TR [D]	µg/L	4600	200	110	980	2000
Nitrate-N + Nitrite-N [D]	mg/L	--	100	--	--	--
Phosphorus	mg/L	--	--	--	--	--
Sulfates	mg/L	--	--	--	--	--
Tin	µg/L	--	--	180	560	1100
Zinc	µg/L	26000	25000	250	250	500

[D] This parameter was found in the effluent of another discharger in this segment and was modeled interactively.
TR = Total Recoverable
BCC = Bioaccumulative Chemical of Concern

Table 11. Instream Conditions and Discharger Flow

Parameter	Units		Value	Basis
Muskingum River Flows				
1Q10	cfs	annual	531	USGS gage #03144500; 1953-2020 data
7Q10	cfs	annual	557	USGS gage #03144500; 1953-2020 data
30Q10	cfs	summer	629	USGS gage #03144500; 1953-2019 data
		winter	1251	USGS gage #03144500; 1952-2020 data
Harmonic Mean Flow	cfs	annual	2459	USGS gage #03144500; 1952-2020 data
Licking River Flows				
7Q10	cfs	annual	53.2	USGS gage #03147500; 1953-2020 data
1Q10	cfs	annual	63.5	USGS gage #03147500; 1953-2020 data
30Q10	cfs	summer	71.6	USGS gage #03147500; 1953-2019 data
		winter	154	USGS gage #03147500; 1953-2020 data
Harmonic Mean Flow	cfs	annual	247	USGS gage #03147500; 1953-2020 data
Mixing Assumption	%	ave	93	Stream-to-discharge ratio
	%	max	93	Stream-to-discharge ratio
Instream Hardness	mg/l	annual	240	DMR City of Zanesville 901; 58 values, 2016-21
Cleveland-Cliffs flow 001	cfs (mgd)	design	3.1 (2.0)	95th percentile monthly average flows
Cleveland-Cliffs flow 002	cfs (mgd)	design	0.85 (0.55)	95th percentile monthly average flows
Zanesville WWTP	cfs (mgd)	design	17.02 (11)	Design flow
Background Water Quality for the Muskingum River				
Arsenic - TR	µg/L	annual	2.62	EA3; 5 values, 1 <MDL, 2006
Bis(2-ethylhexyl) phthalate	µg/L	annual	2.2	EA3; 3 values, 2 <MDL, 2008
Cadmium - TR	µg/L	annual	0	EA3; 5 values, 5 <MDL, 2006
Chlorine - TRes	mg/L	annual	0	No representative data available.
Chloroform	µg/L	annual	0	No representative data available.
Chromium - TR	µg/L	annual	0	EA3; 5 values, 5 <MDL, 2006
Chromium VI - Diss	µg/L	annual	0	No representative data available.
Copper - TR	µg/L	annual	0	EA3; 5 values, 5 <MDL, 2006
Cyanide - free	µg/L	annual	0	No representative data available.
Fluoride	mg/L	annual	0	No representative data available.
Iron	µg/L	annual	1674	EA3; 5 values, 0 <MDL, 2006
Lead - TR	µg/L	annual	2.02	EA3; 5 values, 1 <MDL, 2006
Molybdenum	µg/L	annual	0	No representative data available.
Nickel	µg/L	annual	0	EA3; 5 values, 5 <MDL, 2006
Nitrate-N + Nitrite-N	mg/L	annual	1.73	EA3; 5 values, 0 <MDL, 2006
Selenium - TR	µg/L	annual	0	EA3; 5 values, 5 <MDL, 2006
Silver	µg/L	annual	0	No representative data available.
Total Filterable Residue	µg/L	annual	360	EA3; 5 values, 0 <MDL, 2006
Zinc - TR	µg/L	annual	10.2	EA3; 5 values, 0 <MDL, 2006

USGS = US Geological Survey
n = number of samples
MDL = analytical method detection limit
EA3 – Ohio EPA field data system

Table 12. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria

		Outside Mixing Zone Criteria				Inside Mixing
		Average			Maximum	
Parameter	Units	Human Health	Agri-culture	Aquatic Life	Aquatic Life	Zone Maximum
Outfall 001						
Chromium – TR [B]	µg/L	--	13295 [A]	5646	109625 [A]	7400
Fluoride	mg/L	--	1082	--	--	--
Iron - TR	µg/L	--	2127000	--	--	--
Nickel - TR [B]	µg/L	3455000 [A]	26556 [A]	3442 [A]	29029 [A]	2000
Total Filterable Residue [B]	mg/L	--	--	37803	--	--
Zinc - TR	µg/L	3455000 [A]	3322000 [A]	7542 [A]	7124 [A]	500
Outfall 002						
Fluoride	mg/L	--	1082	--	--	--
Iron - TR	µg/L	--	2125000	--	--	--
Zinc - TR	µg/L	3453000 [A]	3320000 [A]	7520 [A]	7102 [A]	500

[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 Permits Group.
TR = Total Recoverable

Table 13. Parameter Assessment – Outfall 001

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

Aluminum	Bromide	Chemical Oxygen Demand
Magnesium	Manganese - TR	Organic Carbon, Total
Phosphorus	Sulfates	Total Suspended Solids

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

Ammonia-N	Arsenic – TR	Barium - TR
Boron	Chromium - TR	Chromium VI - Diss
Nitrate-N + Nitrite-N	Total Filterable Residue	

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

Fluoride	Iron - TR	Nickel - TR
Zinc - TR		

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

No parameters meet the criteria of this group.

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

Limits to Protect Numeric Water Quality Criteria

			Recommended Effluent Limits	
Parameter	Units	Period	Average	Maximum

No parameters meet the criteria of this group.

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

Table 14. Parameter Assessment – Outfall 002

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

Aluminum	Bromide	Chemical Oxygen Demand
Magnesium	Manganese - TR	Organic Carbon, Total
Phosphorus	Sulfates	Total Suspended Solids

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

Ammonia-N	Arsenic	Boron
Nitrate-N + Nitrite-N		

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

Barium	Fluoride	Iron - TR

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

Zinc - TR

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

Limits to Protect Numeric Water Quality Criteria

Parameter	Units	Period	Recommended Effluent Limits Average	Maximum
No parameters meet the criteria of this group.				

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

Table 15. Final Effluent Limits

Parameter	Units	Concentration 30 Day Average	Concentration Daily Maximum	Loading (kg/day) 30 Day Average	Loading (kg/day) Daily Maximum	Basis[b]
Outfall 001						
pH	S.U.	6.5 - 9.0		--	--	WQS
Flow Rate	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		M[c]
Total Suspended Solids	mg/L	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		M[c]
Oil & Grease	mg/L	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		M[c]
Hardness	mg/L	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		M[c]
Zinc	µg/L	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		M[c]
Outfall 002						
Water Temperature	°F	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		M[c]
pH	S.U.	6.5 - 9.0		--	--	WQS
Flow Rate	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		M[c]
Total Suspended Solids	mg/L	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		M[c]
Oil & Grease	mg/L	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		M[c]
Hardness	mg/L	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		M[c]
Zinc	µg/L	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		M[c]
Internal Monitoring Station 612						
pH	S.U.	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		M[c]
Total Suspended Solids	mg/L	--	--	228	531	BCT/BPJ
Oil & Grease	mg/L	--	--	57	79	ABS
Chromium	µg/L	--	--	2.92	7.31	BAT/BPJ
Nickel	µg/L	--	--	2.19	6.57	BAT/BPJ
Hexavalent Chromium	µg/L	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		M[c]
Flow Rate	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - -		M[c]

[b] Definitions:
ABS = Antibacksliding Rule (OAC 3745-33-05(F) and 40 CFR Part 122.44(l))
BAT = Best Available Technology Economically Achievable, 40 CFR Part 420
BCT = Best Conventional Pollutant Control Technology, 40 CFR Part 420
BPJ = Best Professional Judgment
M = BEJ of Permit Guidance 2: Determination of Sampling Frequency Formula for Industrial Waste Discharges
WET = Whole Effluent Toxicity (OAC 3745-33-07(B))
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

	Salt Bath Descaling		Salt Bath Descaling				Acid Pickling		Acid Pickling		
	Guidelines		Production	Loading			Guidelines		Production	Loading	
	420.83(a)(4), 420.87(a)(4)		tons/day:				420.93(c)(3), 420.97(c)(3)		tons/day:		
	kg/kkg		804	kg/day			kg/kkg		907	kg/day	
	30-day	Daily		30-day	Daily		30-day	Daily		30-day	Daily
TSS	0.0413	0.0964		30.150	70.375	TSS	0.188	0.438		154.829	360.718
O&G	0	0		0.000	0.000	O&G	0.0626	0.188		51.555	154.829
Cr	0.000551	0.00138		0.402	1.007	Cr	0.0025	0.00626		2.059	5.155
Ni	0.000413	0.00124		0.302	0.905	Ni	0.00188	0.00563		1.548	4.637
	Acid Pickle Fume Scrubber			Acid Pickle Fume Scrubber							
	Guidelines		# of scrubbers:	Loading			Brush Scrubber		Brush Scrubber	Brush Scubber	
	420.93(c)(6), 420.97(c)(6)		2				BPJ Limits		Flow (MGD)	Loading	
	kg/day			kg/day			mg/l		0.259	kg/day	
	30-day	Daily		30-day	Daily		30-day	Daily		30-day	Daily
TSS	2.45	5.72		4.9	11.44	TSS	30	70		29.41	68.62
O&G	0.819	2.45		1.638	4.9	O&G	10	30		9.80	29.41
Cr	0.0327	0.0819		0.0654	0.1638	Cr	0.4	1		0.39	0.98
Ni	0.0245	0.0735		0.049	0.147	Ni	0.3	0.9		0.29	0.88

Attachment 2. Applicable Federal Effluent Limitation Guidelines

	Alkaline Cleaning Guidelines 420.117(b) kg/kkg		Alkaline Cleaning Production tons/day: 219	Alkaline Cleaning Loading kg/day				Outfall 612 ELGs kg/day	
	30-day	Daily		30-day	Daily			30-day	Daily
TSS	0.0438	0.102		8.710	20.283		TSS	227.998	531.438
O&G	0.0146	0.0438		2.903	8.710		O&G	65.899	197.848
Cr	0	0		0.000	0.000		Cr	2.919	7.307
Ni	0	0		0.000	0.000		Ni	2.193	6.571

For limits based on production rates, the loading limit based on each ELG is:

$$Loading\ \left(\frac{kg}{day}\right) = ELG\ \left(\frac{lb}{1{,}000\ lbs}\right) * Production\ \left(\frac{tons}{day}\right) * \frac{2{,}000\ lbs}{ton} * \frac{1\ kg}{2.2\ lbs}.$$

For limits based on concentration limits, the loading limit is based on each FEG is:

$$Loading\ \left(\frac{kg}{day}\right) = ELG\left(\frac{mg}{L}\right) *\ Flow\ (MGD) * \frac{1\ kg}{10^6\ mg} * \frac{10^6\ gal}{1\ mil.gal} * \frac{3.785\ L}{gal}$$

Attachment 3. List of Approved Boiler/Cooling Water System Additives

This information should be included with the application. The permit writer may compile a table, or copy a provided table, or scanned page of additives.

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