National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for General Motors LLC

Public Notice No.: 208687
Public Notice Date: 12/27/2024
Comment Period Ends: 1/26/2025

Ohio EPA Permit No.: 2IN00004*KD
Application No.: OH0002666

Name and Address of Applicant:
General Motors LLC - Defiance
26427 State Route 281 E
Defiance, OH 43512

Name and Address of Facility Where Discharge Occurs:
General Motors LLC
26427 State Route 281 E
Defiance, OH 43512
Defiance 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.

Outfall 2IN00004001

New effluent limits are proposed for mercury because recent sampling data indicates reasonable potential to exceed WQS. Part I, C of the permit contains a 36-month schedule to meet the new limits and a schedule to evaluate the need for a mercury variance.

Lower loading limits are proposed for ammonia based on the updated wasteload allocation (WLA) and discharge flow. The monthly average summer limits are proposed to be removed because the daily maximum limits are protective of average aquatic life WQS.

Higher technology-based concentration limits are proposed for total suspended solids and oil and grease. The loading limits will remain the same for these parameters due to the anti-backsliding provisions in OAC 3745-33-05.

New monitoring is proposed for oil and grease severity. The purpose of this requirement is to ensure that technology-based limits for oil and grease are protective of the aesthetic water quality criteria.

The technology-based limits are proposed to be removed for copper and zinc because the categorical effluent limitations no longer apply to this discharge. Monitoring is proposed to continue at a reduced frequency. The technology-based limits and monitoring requirements are proposed to be removed for lead and phenolics because the categorical effluent limitations no longer apply to this discharge. Recent effluent data does not indicate reasonable potential to exceed applicable WQS.

New benchmarks for copper and zinc are proposed based on the stormwater requirements.

Monitoring requirements are proposed to be removed for total filterable residue because recent effluent data does not indicate reasonable potential to exceed applicable WQS.

Whole Effluent Toxicity (WET) monitoring is proposed to be removed because the chemical applications which previously triggered these monitoring requirements have been discontinued. Effluent toxicity is not expected to result from regular process wastewater discharges at this outfall.

Stormwater Outfalls 2IN00004004 and 2IN00004005

The monitoring requirements for stormwater outfalls 2IN00004004 and 2IN00004005 are proposed to be removed because it has been determined that runoff routed to these stations is not exposed to materials associated with the industrial sector which the facility's SIC code applies. The stormwater requirements in Parts IV, V, and VI of the permit still apply to these discharges.

In Part II of the permit, special conditions are included that address limits below quantification 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 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 Chris Monroe, (614) 644-2007, Christopher.monroe@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

General Motors LLC (GM Defiance) discharges to the Maumee River at River Mile 62.04. Figure 1 shows the approximate location of the facility.

This segment of the Maumee River is described by Ohio EPA River Code: 04-001, Large River Assessment Unit Code: 04100009-90-01, County: Defiance, Ecoregion: Huron-Erie Lake Plain. 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, 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

GM Defiance is a metal casting plant that manufactures aluminum castings, mostly for the automotive industry. Process water is discharged from the following casting processes:

- Precision Sand (producing aluminum engine blocks)
- Semi-Permanent Mold (producing aluminum engine heads)

Both processes employ one-time-use sand molds comprised of sand and binders. The molds are broken up following the casting process in order to remove them from the cast parts. Sand molds are set upon reusable metal molds to complete the mold package that then receives molten aluminum. Process details are presented in Figure 2.

The facility produces approximately 132 tons of product each day.

The process operations at GM Defiance are classified in the Standard Industrial Classification (SIC) category 3365, Aluminum Foundries. The process wastewaters generated from these operations are regulated under 40 CFR 464, "Metal Molding and Casting" Subpart A, "Aluminum Casting." Historically, the processes at the plant were also classified under regulations for iron casting wastewaters (SIC code 3321 and ELGs under 40 CFR 464, Subpart C). Since the issuance of the previous NPDES permit, GM Defiance has ceased all iron casting

activities. In addition to the exclusion of effluent limitation guideline (ELG) limits associated with iron casting, the facility has also demonstrated that previously imposed limits for aluminum casting are not applicable. Currently, the facility does not discharge any process water for which ELGs are established in 40 CFR 464. Technology-based limits have been developed based on Best Professional Judgement (see Attachment 1).

GM Defiance purchases potable water from the City of Defiance for cooling water purposes.

The GM Defiance North Perimeter Area (NPA) landfill system wastewater discharge is covered under NPDES permit 2IN00202. The system collects and treats water build up behind the landfill membrane.

DESCRIPTION OF EXISTING DISCHARGE

GM Defiance has one primary wastewater outfall and two stormwater outfalls. Outfall 2IN00004001 discharges recycled process wastewater and stormwater to the Maumee River. Wastewater sources tributary to outfall 2IN00004001 include:

- AC Condensate/Make-Up Air Units
- Evaporative Cooler
- Emission Control Collection
- Core Tool Cleaning
- Floor Washdown Water
- Fire Water Leaks/Flush
- Mold Dip Process Water
- COC Blowdown
- Landfill Leachate

The effluent is treated by settling, ion exchange, precipitation, filtration and carbon adsorption.

Outfall 2IN00004002 is an emergency bypass station used only during significant precipitation events. A summary of bypasses from outfall 2IN00004002 is shown in Table 2. Figure 2 provides a flow schematic of the wastewater sources and supplies associated with GM Defiance.

The facility utilizes a first flush pump system for stormwater from the ditch on the west end of the property to the river. During the initial flush of a storm event (first 30 minutes of flow), stormwater is pumped to the west secondary settling basin. Water from the basin is ultimately treated by the treatment system and discharged via outfall 2IN00004001. After the initial flush, stormwater from this area is discharged directly via outfall 2IN00004004.

The facility had one effluent violation for total residual chlorine in 2019 and four violations for ammonia between 2018 and 2019. No effluent limit violations have been reported since 2019.

The flow rates for the permit cycle for outfall 2IN00004001 are shown on Table 1.

Table 3 presents the annual total phosphorus data for outfall 2IN00004001.

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

Table 5 presents chemical specific data compiled from data collected by Ohio EPA.

Table 6 presents a summary of unaltered Discharge Monitoring Report (DMR). Data are presented for the period June 2018 to May 2023, and current permit limits are provided for comparison.

Table 7 summarizes the chemical specific data for outfall 2IN00004001 by presenting the average and maximum PEQ values.

ASSESSMENT OF IMPACT ON RECEIVING WATERS

The Maumee River mainstem large river assessment unit, which includes the Maumee River in the vicinity of GM Defiance, is listed as impaired for aquatic life, recreation, and human health (PCBs) on Ohio's 303(d) list.

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 8) 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 biological and water quality study for the Maumee River was conducted in 2012 and 2013. This survey identified impairment for aquatic life, recreation, and human health. The recreational impairment is based on *E. coli* criteria exceedances, resulting primarily from agricultural (livestock) runoff, failing household sewage systems, and waterfowl. Concentrations of PCBs in fish tissue samples contributed to the large river assessment unit impairment for human health in the segment of the river from the Tiffin River to Beaver Creek. A subsequent large river assessment conducted in 2020 and 2021 provided more recent aquatic life data for the

Maumee River. This study showed an impairment in the river based on partial attainment at a site over 35 miles downstream of GM Defiance. It is not believed that the facility is substantially contributing to any impairments.

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, which experiences frequent and extensive harmful algal blooms due to nutrient contributions, much of which is delivered by the Maumee River. The TMDL assigned an individual wasteload allocation to GM Defiance of 200 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, GM Defiance 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. Additional 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. Ohio EPA will continue to revisit phosphorus contributions in the watershed to assure that increased loadings from dischargers do not impact existing allocations.

The TMDL is available through the Ohio EPA, Division of Surface Water website at:
https://epa.ohio.gov/divisions-and-offices/surface-water/reports-data/maumee-river-watershed

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.

The most recent biological and water quality report is available through the Ohio EPA, Division of Surface Water website at:
https://epa.ohio.gov/static/Portals/35/documents/MaumeeTSD_2014.pdf

The *Summary of Findings from the 2020-2021 Aquatic Life and Water Quality Survey of Ohio's Large Rivers* is available through the Ohio EPA, Division of Surface Water website at:
https://epa.ohio.gov/static/Portals/35/tmdl/LargeRiverSurvey-DataSummary-2023.pdf

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 GM Defiance 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)	June 2018 through May 2023
Ohio EPA compliance sampling data	2021
NPDES application Form 2C data	November 2015 through October 2020

Statistical Outliers and Other Non-representative Data
The data were examined and the following value was removed from the evaluation to give a more reliable PEQ:

Total Filterable Residue – 151 mg/L; 12/1/2020; uncharacteristically low value.

Pentachlorophenol – 9.4 µg/L; 11/26/2018. This sample was split and analyzed by both GM Defiance and Ohio EPA. While the Ohio EPA sample returned this result, the sample contracted out by GM Defiance was reported as below detection. A confirmation sample was taken by GM Defiance on 4/21/2025, also yielding no detection of the pollutant.

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 11).

Wasteload Allocation
For those parameters that require a WLA, the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. Dischargers are allocated pollutant loadings/concentrations based on the Ohio WQS (OAC 3745-1). Most pollutants are allocated by a mass-balance method because they do not degrade in the receiving water. By rule, mixing zones are not authorized for pollutants, such as mercury, which have been designated as bioaccumulative chemicals of concern (BCCs). For BCCs, the WLA is set equal to the respective WQS value.

The methodology employed generally depends on whether the facility is considered a direct discharger to a (1) free-flowing receiving water/stream or (2) non-flowing receiving water/Lake.

For free flowing streams, WLAs for both average and maximum criteria are performed using the following general equation:

Discharger WLA = (Downstream Flow x WQS) - (Upstream Flow x Background Concentration).

Discharger WLAs are divided by the discharge flow so that the allocations are expressed as concentrations.

The following dischargers in the Maumee River were considered interactive:

- General Motors LLC – 2IN00004
- General Motors LLC NPA System – 2IN00202
- Defiance WWTP – 2PD00013

The facilities above were allocated together for most parameters due to the size of the discharges, the flows of the Maumee River and the relatively close proximity of the facilities. The following parameters were allocated separately because the pollutants are not believed to be present in all the facilities' discharges: aluminum, ammonia, barium, boron, chlorides, fluoride, iron, manganese, mercury, phenolics, strontium, sulfates, and toluene.

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

Aquatic life (Warmwater Habitat)		
Toxics (metals, organics, etc.)	Average	Annual 7Q10
	Maximum	Annual 1Q10
Ammonia	Average	Summer 30Q10
		Winter 30Q10
Wildlife		Annual 90Q10
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 (IMZM) criteria.

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

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. Numeric WQS for WET are listed in the Ohio WQS [OAC 3745-1-44]. This rule lists numeric values of 0.3 TUa and 1.0 TUc. WLAs are calculated using these criteria.

There are two separate reasonable potential procedures in Ohio - one for the Lake Erie watershed and one for the Ohio River watershed. Dischargers in the Ohio River watershed are assessed using OAC 3745-33-07(B). Dischargers in the Lake Erie watershed are assessed in accordance with the "Great Lakes Water Quality Initiative Implementation Procedures" contained in 40 CFR Part 132, Appendix F, Procedure 6.

The WLA calculations for WET are similar to those for aquatic life criteria - using the chronic toxicity unit (TUc) and 7Q10 flow for the average and the acute toxicity unit (TUa) and 1Q10 flow for the maximum. WET WLAs are based on meeting the values of 0.3 TUa and 1.0 TUc downstream of the discharge, and include any available dilution. These values are the levels of effluent toxicity that should not cause instream toxicity during critical low-flow conditions. WLAs for acute toxicity are capped at 1.0 TUa unless the discharger demonstrates that an Area-of-Initial-Mixing (AIM) exists under OAC 3745-1-06, or that one of the factors in OAC 3745-33-07(B)(5)-(9) allows a higher TUa limit to be granted. For the purposes of establishing WET limitations, the values of 1.0 TUa and 1.0 TUc are the most restrictive limitations that can be applied in NPDES permits [OAC 3745-33-07(B)(10)].

For GM Defiance, the WLA values are: 1.0 TUa and 18.3 TUc

The chronic toxicity unit (TUc) is defined as 100 divided by the estimate of the effluent concentration which causes a 25% reduction in growth or reproduction of test organisms (IC25):

$$TUc = 100/IC25$$

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):

TUc = 100/geometric mean of No Observed Effect Concentration and Lowest Observed Effect Concentration

The acute toxicity unit (TUa) is defined as 100 divided by the concentration in water having 50% chance of causing death to aquatic life (LC50) for the most sensitive test species:

$$TUa = 100/LC50$$

This equation applies outside the mixing zone for all designated waters. Based on the above, a value of 1.0 TUa is the lowest value that can be calculated using the equation. TUa values between 0.2 and 1.0 are based on an interpolation of toxic effects where an LC50 cannot be identified.

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 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 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 GM Defiance outfall 2IN00004001 and the basis for their recommendation. Unless otherwise indicated, the monitoring frequencies proposed in the permit are continued from the existing permit.

Outfall 2IN00004001

pH

Limits proposed for pH are based on the provisions in OAC 3745-1-35.

Oil and Grease and Total Suspended Solids (TSS)

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. Ohio EPA has conducted a thorough review of GM Defiance's processes, as well as the ELG applicability, and determined that the categorical effluent limits in 40 CFR 464 do not apply to the wastewaters generated and discharged. To ensure that treatment technologies are maintained for the non-ELG process waters at the facility, limits are proposed for oil and grease and TSS based on Best Professional Judgement (BPJ). The recommended limits are based on the federal effluent limitation guidelines (ELGs) found in 40 CFR Parts 423, 438, and 464. All limits and calculations are shown in Attachment 1.

The new BPJ calculated limits for oil and grease and TSS are higher than the current permit limits. Anti-backsliding provisions in OAC 3745-33-05(F)(1) prevent the imposition of less stringent limits than those in the existing permit unless specific conditions have been satisfied. Based on the forementioned determination that ELGs don't apply to the discharge from GM Defiance, the facility meets the "information is available that was not available at the time of permit issuance that justifies less stringent concentration limits" exemption from the antidegradation rule. Additionally, the loading limitations are not proposed to increase and therefore any antidegradation requirements in OAC 3745-1-05 are not applicable.

Higher concentration limits are proposed for oil and grease and TSS based on the new BPJ calculations.

Ammonia
The Ohio EPA risk assessment (Table 12) places ammonia in group 5. This placement, as well as the data in Table 4, Table 5, and Table 6 indicates that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality. For this parameter, the PEQ is greater than 100 percent of the WLA. Pollutants that meet this requirement must have permit limits under OAC 3745-33-07(A)(1). The daily maximum summer concentration limits is based on the wasteload allocation. The loading limits are based on the respective concentration limits and the representative discharge flow. Effluent data indicates that the facility is currently able to comply with the lower loading limits for ammonia.

Although the current WLA would allow a slightly higher winter limit for ammonia, 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 GM Defiance, 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.

The monthly average summer limits are proposed to be removed because the daily maximum limits are more stringent and, therefore, protective of the average criteria.

Mercury
The Ohio EPA risk assessment (Table 12) places mercury in group 5. This placement, as well as the data in Table 4, Table 5, and Table 6 indicates that the reasonable potential to exceed WQS exists and limits are necessary to protect water quality. For this parameter, the PEQ is greater than 100 percent of the WLA. Pollutants that meet this requirement must have permit limits under OAC 3745-33-07(A)(1). The thirty-day average and daily maximum concentration limits are based on the wasteload allocation. The loading limits are based on the respective concentration limits and the representative discharge flow. A 36-month compliance schedule for GM Defiance to meet the new mercury limits is included in Part I, C of the permit.

As GM Defiance may have difficulty complying with the limits for mercury and because cost effective measures for reducing mercury discharge concentrations may not be available for the permittee, they may apply for a variance by submitting a mercury variance application. Ohio EPA would then review the application, and if approved, would proceed to modify the permit to incorporate variance-based mercury limits and conditions associated with the mercury variance. GM Defiance is required to submit a mercury variance application (if needed) no later than 12 months after the effective date of the permit. If GM Defiance does not apply for a mercury variance and the permit is not modified, WQBELs for mercury will become effective 36 months after the effective date of the permit. Collecting and analyzing the samples for mercury must be done using U.S. EPA Method 1631.

Zinc
The Ohio EPA risk assessment (Table 12) places zinc in group 4. This placement, as well as the data in Table 4, Table 5, and Table 6, support that this parameter does 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).

Total Residual Chlorine
The proposed limit for total residual chlorine is based on WLA as limited by the IMZM. The IMZM is a value calculated to avoid rapidly lethal conditions in the effluent mixing zone. The effluent limit for chlorine is less

than the quantification level of 0.050 mg/L. However, a pollutant minimization program is not required because the dosing rate of dechlorination chemicals ensures that the water quality based effluent limit is being met. Details on determining compliance with the limit are in Part II of the permit.

Aluminum, Antimony, Arsenic, Barium, Boron, Chromium, Free Cyanide, Fluoride, Iron, Lead, Manganese, Molybdenum, Nickel, Nitrate Plus Nitrite, Selenium, Strontium, Toluene, and Total Filterable Residue
The Ohio EPA risk assessment (Table 12) places these parameters in groups 2 and 3. This placement, as well as the data in Table 4, 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 and limits for lead, as well as monitoring for selenium and total filterable residue are proposed to be removed.

Flow Rate
Monitoring for this parameter is proposed to continue in order to evaluate the performance of the treatment plant.

Oil and Grease Severity
Monitoring is proposed for oil and grease severity in lieu of a water quality-based limit to affirm that the discharge is not contributing to adverse aesthetic conditions in the receiving stream. Details are in Part II of the permit.

Copper
Monitoring is proposed to continue for copper based on best technical judgement. Sector-specific benchmark monitoring is required for this pollutant by the Multi-Sector General Permit for industrial stormwater.

Total Phosphorus
The *2022 Ohio Integrated Water Quality Monitoring and Assessment Report* (Ohio EPA) lists the Maumee River watershed as impaired for aquatic life. Nutrients and organic enrichment/dissolved oxygen are listed as "high magnitude" causes. Considering this information and the fact that the facility has historically discharged notable loads of phosphorus to the river, monitoring and limits are proposed to continue. The purpose of the monitoring and limits is to ensure that assumptions of the Maumee Watershed Nutrient TMDL are maintained and ensure that discharges of phosphorus from GM Defiance are controlled within past/current levels.

Whole Effluent Toxicity Reasonable Potential
Previously, WET monitoring was required in conjunction with biocide treatments at the facility. No such treatments have occurred in several years, so no recent WET data is available. As the permittee has discontinued the use of biocides on their process water, the WET monitoring requirement is no longer necessary.

Additional Monitoring Requirements
WET monitoring is proposed to be removed from the upstream sampling station because the chemical applications that triggered this requirement have been discontinued. As a result, station 2IN00004801 has been removed from the permit.

Additional monitoring requirements proposed at the final effluent station are included for all facilities in Ohio and vary according to the type and size of the discharge. In addition to permit compliance, this data is used to assist in the evaluation of effluent quality and treatment plant performance and for designing plant improvements and conducting future stream studies.

OTHER REQUIREMENTS

Compliance Schedule

A 36-month compliance schedule is proposed for GM Defiance to meet the new concentration and loading limits for mercury. Details are in Part I, C of the permit.

Mercury Variance Evaluation - The permittee will evaluate the need for a mercury variance. Details are in Part I, C of the permit.

Cooling Water Intake Structure Compliance
GM Defiance previously operated a cooling water intake structure on the Maumee River. The intake has been decommissioned and no longer has the ability to supply raw water to the facility.

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.

Stormwater Compliance
Parts IV, V, and VI have been included with the draft permit to ensure that any stormwater flows from the facility site are properly regulated and managed. As an alternative to complying with Parts IV, V, and VI, GM Defiance may seek permit coverage under the general permit for industrial stormwater (permit # OHR000007). Parts IV, V, and VI will be removed from the final permit if: 1) GM Defiance submits a Notice of Intent (NOI) for coverage under the general permit for industrial stormwater, 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 copper and zinc for outfall 2IN00004001 is proposed in accordance with the stormwater language. See Part V for more details.

Figure 1. Location of GM Defiance

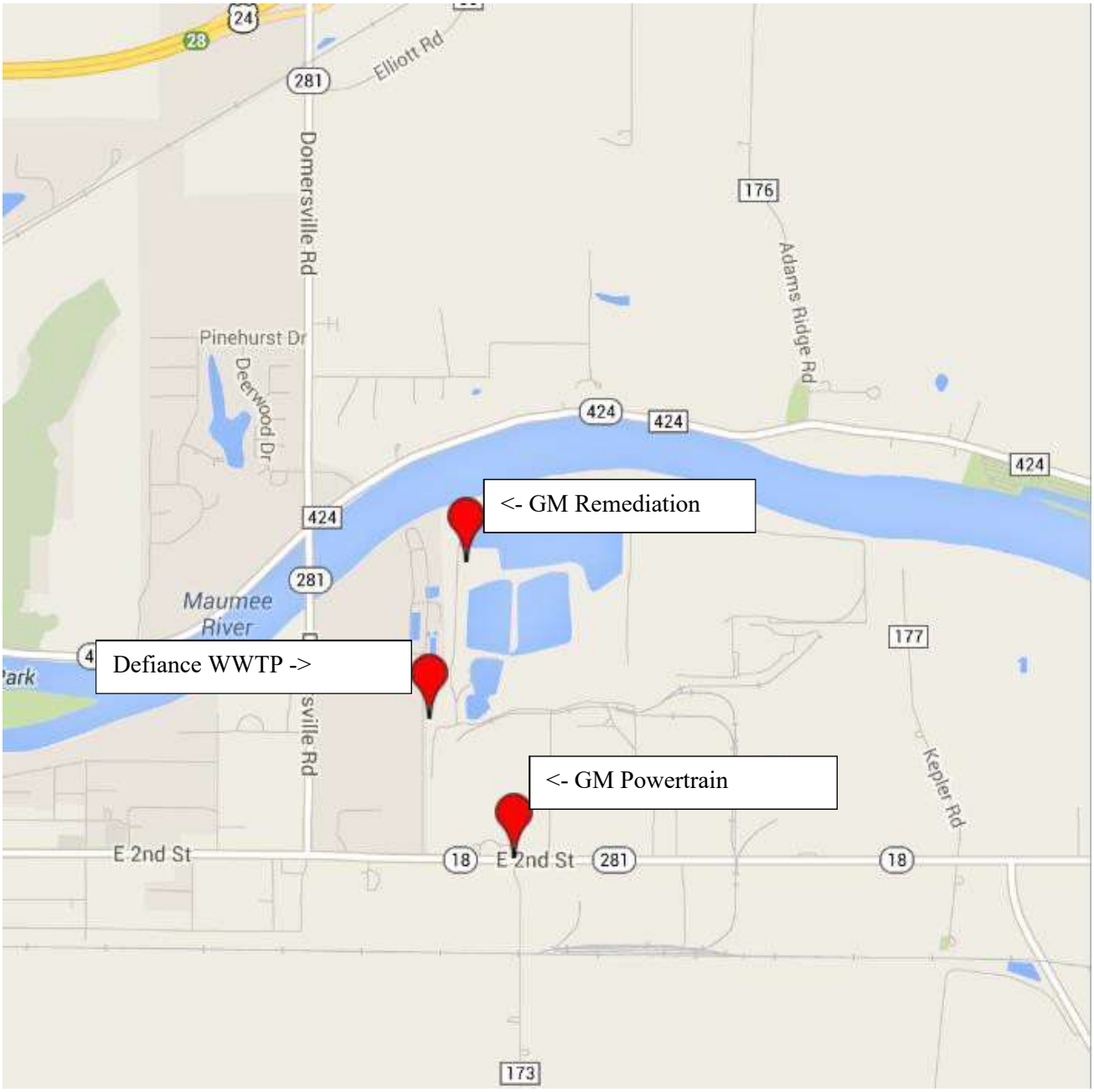


Figure 2. Water Balance Diagram

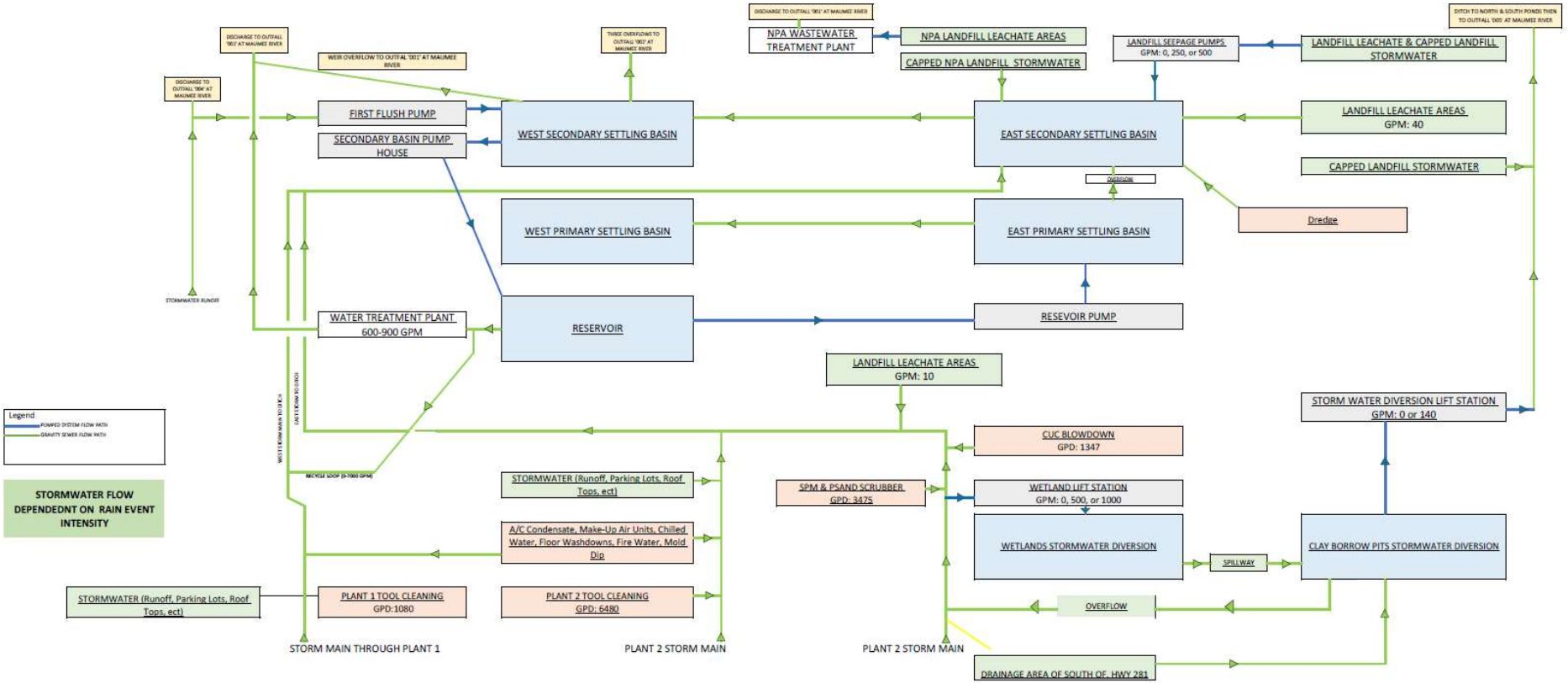


Table 1. Annual Flow Rates for Outfall 2IN00004001

Flow Rate (Million Gallons per Day)					
Year	**# obs**	**Average**	**Median**	**95th Percentile**	**Maximum**
2018	132	0.84303	0.755	1.639	1.97
2019	299	0.777435	0.74	1.631	2.34
2020	284	0.694009	0.707	1.1485	1.66
2021	239	0.906454	0.887	1.4231	1.668
2022	222	0.915659	0.9995	1.51735	1.746
2023	115	0.746314	0.7417	1.03196	1.4144

*DMR flow data reported from June 2018 to May 2023

Table 2. Bypass Discharges from Outfall 2IN00004002

Year	Days with reported bypass flow	Annual Bypass Volume (Millions of Gallons)	Median Bypass Volume (Millions of Gallons)	Median TSS (mg/L)	Median CBOD (mg/L)
2018	1	--	--	--	--
2019	1	0.18	0.18	--	--

Table 3. Annual Phosphorus Loadings

Year	Obs.	Median Phosphorus (mg/L)	Median Flow (MGD)	Median Loading (kg/day)
2019	14	0.1585	0.74	0.3662
2020	8	0.137	0.707	0.1737
2021	7	0.213	0.887	0.4343
2022	8	0.198	1.0	0.2278
2023	12	0.162	0.654	0.2607

Table 4. Effluent Characterization Based on Form 2C Data

Parameter	Units	Concentration
Aluminum	µg/L	577
Barium	µg/L	26.5
Boron	µg/L	459
Fluoride	µg/L	5.22
Iron	µg/L	233
Manganese	µg/L	97.7
Molybdenum	µg/L	47.3
Nitrate Plus Nitrite	mg/L	1.19
Sulfate	mg/L	86.3

Table 5. Effluent Characterization Using Ohio EPA Data

Parameter	Units	10/22/18	11/26/18
Aluminum	mg/L	145	94.9
Ammonia	mg/L	16.7	9.31
Antimony	µg/L	0.358	0.93
Arsenic	µg/L	3.32	2.77
Barium	µg/L	56.4	45.8
Chloride	mg/L	269	303
Chromium	µg/L	1.05	0.598
Copper	µg/L	2.35	3.32
Cyanide, Free	mg/L	3.57	AA(2.54)
Iron	mg/L	394	508
Lead	µg/L	2.32	6.13
Manganese	µg/L	416	733
Nickel	µg/L	4.47	5.52
Nitrate+Nitrite	mg/L	0.0873	0.971
Phosphorus	mg/L	0.229	0.191
Selenium	µg/L	1.7	1.84
Strontium	µg/L	626	551
Toluene	µg/L	AA(0.28)	0.344
Total Filterable Residue	mg/L	850	--
Zinc	µg/L	27.5	155

AA = not-detected (analytical method detection limit)

Table 6. Effluent Characterization Using Self-Monitoring Data (June 2018 - May 2023)

Outfall	Parameter	Unit	Current Limits		# Obs	Percentiles		Data Range
			30 Day	Daily		50th	95th	
001	pH	S.U.	--	6.5 - 9.0	221	7.78	8.65	6.97 - 8.9
	Total Suspended Solids	kg/day	97.7	247	233	21.2	63	0 - 94.5
	Total Suspended Solids	mg/L	15.0	38.0	235	8	18	0 - 27
	Oil and Grease, Total	kg/day	27.9	83.6	113	< 11.9	< 11.9	0 - 16.7
	Oil and Grease, Total	mg/L	11.6	20.0	116	< 5.1	< 5.1	0 - 7.1
	Nitrogen, Ammonia - All	mg/L	Monitoring Only		226	1.99	18.8	0 - 29.7
	Nitrogen, Ammonia - Summer	kg/day	96.5	102	108	1.55	51.2	0 - 91.5
	Nitrogen, Ammonia - Summer	mg/L	13.0	13.7	110	.5	13.6	0 - 21
	Nitrogen, Ammonia - Winter	kg/day	--	181	116	10.1	82.5	0 - 151
	Nitrogen, Ammonia - Winter	mg/L	--	24.3	116	3.62	22.5	0 - 29.7
	Phosphorus, Total	kg/day	7.42	11.2[w]	65	.363	1.68	0 - 3.37
	Phosphorus, Total	mg/L	1.0	1.5[w]	65	.142	.417	0 - 1.1
	Selenium, TR	µg/L	Monitoring Only		63	< 5	< 5	0 - 5.12
	Zinc, TR	kg/day	1.04	2.75	120	.231	.786	0 - 1.28
	Zinc, TR	µg/L	424	520	120	81.2	254	0 - 454
	Lead, TR	kg/day	0.729	1.49	119	< .00874	.0367	0 - .0543
	Lead, TR	µg/L	279	608	119	< 3	11	0 - 20.2
	Copper, TR	kg/day	0.36	0.52	119	--	--	< .0291
	Copper, TR	µg/L	68.0	75.0	119	--	--	< 10
	Phenolic 4AAP, Total - Summer	kg/day	0.33	0.5	108	< .0432	< .0432	0 - .15
	Phenolic 4AAP, Total - Winter	kg/day	0.827	2.37	116	< .109	.029	0 - .301
	Flow Rate	MGD	Monitoring Only		1269	.78	1.47	.01 - 2.34
	Chlorine, Total Residual	mg/L	--	0.038	221	.008	.023	0 - .286
	Mercury, Total	ng/L	Monitoring Only		60	.674	1.81	0 - 3.29
	Residue, Total Filterable	mg/L	Monitoring Only		20	891	1240	151 - 1310
002	Bypass Total Hours Per Day	Hrs/Day	Monitoring Only		2	.521	.952	.042 - 1
	pH	S.U.	--	6.5 - 9.0	3	7.21	7.26	7.08 - 7.27

Outfall	Parameter	Unit	Current Limits		# Obs	Percentiles		Data Range
			30 Day	Daily		50th	95th	
	Nitrogen, Ammonia	mg/L	Monitoring Only		3	4.54	5.49	1.2 - 5.59
	Phosphorus, Total	mg/L	Monitoring Only		3	.252	.349	.175 - .36
	Selenium, TR	µg/L	Monitoring Only		3	--	--	< 5
	Zinc, TR	µg/L	Monitoring Only		3	709	845	123 - 860
	Lead, TR	µg/L	Monitoring Only		3	6.06	34.8	0 - 38
	Copper, TR	µg/L	Monitoring Only		3	< 10	58.5	0 - 65
	Mercury, Total	ng/L	Monitoring Only		3	3.27	5.73	.562 - 6
	Bypass Volume	MGAL	Monitoring Only		1	.18	.18	.18 - .18
004	Flow Rate	MGD	Monitoring Only		900	.01	.05	0 - 1.03
005	Flow Rate	MGD	Monitoring Only		1795	.298	.912	.01 - 1.89

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."

TR = Total recoverable

Table 7. Projected Effluent Quality

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
Aluminum	µg/L	3	3	1264	1731
Ammonia (Summer)	mg/L	77	63	14.84	16.99
Ammonia (Winter)	mg/L	59	59	18.33	29.14
Antimony	µg/L	2	2	2.58	3.534
Arsenic - TR	µg/L	2	2	9.21	12.62
Barium	µg/L	3	3	123.5	169.2
Boron	µg/L	1	1	2077	2846
Chlorides	mg/L	2	2	840.5	1151
Chlorine, Total Residual	mg/L	225	212	0.0233	0.0349
Chromium - TR	µg/L	2	2	2.913	3.99
Copper - TR	µg/L	113	2	5.84	8
Cyanide - free	µg/L	2	1	9.903	13.57
Fluoride	mg/L	1	1	23.63	32.36
Iron - TR	µg/L	3	3	1113	1524
Lead - TR	µg/L	123	56	9.242	14.18
Manganese - TR	µg/L	3	3	1605	2199
Mercury	ng/L	61	44	1.593	2.462
Molybdenum	µg/L	1	1	214.1	293.3
Nickel - TR	µg/L	2	2	15.31	20.98
Nitrate-N + Nitrite-N	mg/L	3	3	2.606	3.57
Oil and Grease	mg/L	118	1	4.146	5.68
Phenolics	µg/L	230	15	33.62	46.06
Phosphorus	mg/L	66	46	0.3479	0.5391
Selenium - TR	µg/L	65	3	3.738	5.12
Strontium	µg/L	2	2	1737	2379
Sulfates	mg/L	1	1	390.6	535.1
Toluene	µg/L	2	1	0.9543	1.307
Total Filterable Residue	mg/L	21	21	1167	1472
Zinc - TR	µg/L	124	118	210.9	322.2

MDL = analytical method detection limit
PEQ = projected effluent quality
TR = Total recoverable

Table 8. Use Attainment Table

Location	River Mile	Use	Status
Maumee R. W of Defiance, downstream Switzer Rd/Dowe Road	69.2	WWH	Full
Maumee R. near Defiance @ S.R. 281	62.3	MWH	Full
Maumee R. upstream Independence Dam	60.0	MWH	Full
Maumee R. E of Defiance, upstream Snyder Rd/Weichman Road	58.5	WWH	Full

MWH = modified warmwater habitat
WWH = warmwater habitat

Table 9. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria					Inside Mixing Zone Maximum
		Average				Maximum	
		Wildlife	Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Aluminum	µg/L	--	4500	--	--	--	--
Ammonia (Summer)	mg/L	--	--	--	1.1	--	--
Ammonia (Winter)	mg/L	--	--	--	4.8	--	--
Antimony	µg/L	--	780	--	190	900	1800
Arsenic - TR	µg/L	--	580	100	150	340	680
Barium	µg/L	--	160000	--	1300	5600	11000
Boron	µg/L	--	200000	--	3900	33000	65000
Chlorides	mg/L	--	--	--	--	--	--
Chlorine, Total Residual	mg/L	--	--	--	0.011	0.019	0.038
Chromium - TR	µg/L	--	14000	100	170	3500	7100
Copper - TR	µg/L	--	64000	500	19	30	61
Cyanide - free	µg/L	--	48000	--	5.2	22	44
Fluoride	mg/L	--	--	2	--	--	--
Iron - TR	µg/L	--	--	5000	--	--	--
Lead - TR	µg/L	--	--	100	18	350	700
Manganese - TR	µg/L	--	61000	--	--	--	--
Mercury	ng/L	1.3	3.1	10000	910	1700	3400
Molybdenum	µg/L	--	10000	--	20000	190000	370000
Nickel - TR	µg/L	--	43000	200	100	940	1900
Nitrate-N + Nitrite-N	mg/L	--	--	100	--	--	--
Phenolics	µg/L	--	--	--	--	--	--
Selenium - TR	µg/L	--	3100	50	5	62	120
Strontium	µg/L	--	1400000	--	61000	160000	320000
Sulfates	mg/L	--	--	--	--	--	--
Toluene	µg/L	--	51000	--	62	560	1100
Total Filterable Residue	mg/L	--	--	--	1500	--	--
Zinc - TR	µg/L	--	35000	25000	240	240	480

TR = Total recoverable

Table 10. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
Stream Flows[a]				
1Q10	cfs	annual	109.64	USGS 04192500 adjusted; 1924-2023
7Q10	cfs	annual	134.6	USGS 04192500 adjusted; 1924-2023
		summer	134.6	USGS 04192500 adjusted; 1924-2023
		winter	318.6	USGS 04192500 adjusted; 1924-2023
30Q10	cfs	summer	163.6	USGS 04192500 adjusted; 1924-2023
		winter	487.6	USGS 04192500 adjusted; 1924-2023
90Q10	cfs	annual	293.6	USGS 04192500 adjusted; 1924-2023
Harmonic Mean	cfs	annual	611.6	USGS 04192500 adjusted; 1924-2023
Mixing Assumption	%	average	25	
		maximum	81.62	
Hardness, OMZ	mg/L	annual	228	EA3 201858; 2021; n=6; median
Hardness, IMZ	mg/L	annual	228	EA3 201858; 2021; n=6; median
pH	S.U.	summer	8.1	2PD00013901; n=20; 2018-2023; 75th%
		winter	7.8	2PD00013901; n=13; 2018-2023; 75th%
Temperature	ºC	summer	26	2PD00013901; n=20; 2018-2023; 75th%
		winter	5	2PD00013901; n=13; 2018-2023; 75th%
GM Defiance flow (2IN00004)	cfs	annual	1.942	95th Percentile of Monthly Flow Avgs.; 2018-2023
GM NPA flow (2IN00202)	cfs	annual	0.155	95th Percentile of Monthly Flow Avgs.; 2018-2023
Defiance WWTP flow	cfs	annual	9.28	NPDES Application Form 2A
Combined flows	cfs	annual	11.37	Sum of 2IN00004/2IN00202/2PD00013 flows
Background Water Quality				
Aluminum	µg/L		589.9	Ohio EPA; 2012-2013; n=8; 0<MDL; Station P09W32, mean
Ammonia (Summer)	mg/L	Summer	0.1436	DMR; 2018-2023; n=20; 8<MDL; 2PD00013901; median
Ammonia (Winter)	mg/L	Winter	0.0877	DMR; 2018-2023; n=13; 7<MDL; 2PD00013901; median
Antimony	µg/L		0	No representative data available.
Arsenic - TR	µg/L		3.871	Ohio EPA; 2012-2013; n=7; 0<MDL; Station P09W32, mean
Barium	µg/L		57	Ohio EPA; 2012-13; n=8; 0<MDL; Station P09W32, mean
Boron	µg/L		0	No representative data available.
Chlorides	mg/L		75.74	Ohio EPA; 2012-2013; n=7; 0<MDL; Station P09W32, mean
Chlorine, Total Residual	mg/L		0	No representative data available.
Chromium - TR	µg/L		0	Ohio EPA; 2012-2013; n=7; 7<MDL; Station P09W32

Parameter	Units	Season	Value	Basis
Copper - TR	µg/L		2.929	Ohio EPA; 2012-13; n=7; 0<MDL; Station P09W32, mean
Cyanide - free	µg/L		0	No representative data available.
Fluoride	mg/L		0	No representative data available.
Iron - TR	µg/L		838	Ohio EPA; 2012-13; n=8; 0<MDL; Station P09W32, mean
Lead - TR	µg/L		0	Ohio EPA; 2012-13; n=7; 7<MDL; Station P09W32
Manganese - TR	µg/L		81	Ohio EPA; 2012-13; n=8; 0<MDL; Station P09W32, mean
Mercury	ng/L		0	No representative data available.
Molybdenum	µg/L		0	No representative data available.
Nickel - TR	µg/L		5.129	Ohio EPA; 2012-2013; n=7; 0<MDL; Station P09W32, mean
Nitrate-N + Nitrite-N	mg/L		2.87	DMR; 2018-2023; n=58; 0<MDL; 2PD00013901; median
Phenolics	µg/L		0	No representative data available.
Selenium - TR	µg/L		0	Ohio EPA; 2012-13; n=7; 7<MDL; Station P09W32
Strontium	µg/L		1312	Ohio EPA; 2012-2013; n=7; 0<MDL; Station P09W32, mean
Sulfates	mg/L		0	No representative data available.
Toluene	µg/L		0	No representative data available.
Total Filterable Residue	mg/L		440.9	Ohio EPA; 2012-13; n=7; 0<MDL; Station P09W32; mean
Zinc - TR	µg/L		5.625	Ohio EPA; 2012-13; n=8; 7<MDL; Station P09W32, mean

[a] Upstream flows based on USGS gage 04192055 data, adjusted by excluding the representative flows from discharges 2IN00004001, 2IN00202001, and 2PD00013001.
DMR = Discharge Monitoring Report
MDL = analytical method detection limit
n = number of samples
NPDES = National Pollutant Discharge Elimination System
Ohio EPA = Ohio Environmental Protection Agency
TR = Total recoverable

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-culture	Aquatic Life		
Individually Allocated Parameters							
Aluminum	µg/L	--	312404	--	--	--	--
Ammonia (Summer)	mg/L	--	--	--	66.87[b]	--	13.7
Ammonia (Winter)	mg/L	--	--	--	970.5[b]	--	28.06
Barium	µg/L	--	12754852	--	22846[b]	260995	11000
Boron	µg/L	--	15949176	--	71502[b]	1553482	65000
Chlorides	mg/L	--	--	--	--	--	--
Fluoride	mg/L	--	--	159	--	--	--
Iron - TR	µg/L	--	--	332740	--	--	--
Manganese - TR	µg/L	--	4858120	--	--	--	--
Mercury	ng/L	1.3	3.1	10000	910	1700	--
Phenolics	µg/L	--	--	--	--	--	--
Strontium	µg/L	--	111540918	--	1095619[b]	7471584	320000
Sulfates	mg/L	--	--	--	--	--	--
Toluene	µg/L	--	4067040	--	1137	26362	1100
Interactive Parameters [a]							
Antimony	µg/L	--	11261	--	752	9521	1800
Arsenic - TR	µg/L	--	8321	1392	582	3560	680
Chlorine, Total Residual	mg/L	--	--	--	0.044[b]	0.2	0.038
Chromium - TR	µg/L	--	202113	1444	673	37028	7100
Copper - TR	µg/L	--	923904	7179	67[b]	289	61
Cyanide - free	µg/L	--	692958	--	21	233	44
Lead - TR	µg/L	--	--	1444	71	3703	700
Molybdenum	µg/L	--	144366	--	79154	2010072	370000
Nickel - TR	µg/L	--	620706	2818	381	9895	1900
Nitrate-N + Nitrite-N	mg/L	--	--	1405	--	--	--
Selenium - TR	µg/L	--	44754	722	20	656	120
Total Filterable Residue	mg/L	--	--	--	4633	--	--
Zinc - TR	µg/L	--	505206	360840	933[b]	2485	480

[a] Interactive parameters are allocated for the following discharges: 2IN00004001, 2IN00202001, and 2PD00013001/602.
[b] Allocation must not exceed the Inside Mixing Zone Maximum.
TR = Total recoverable

Table 12. Parameter Assessment

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

Chlorides	Phenolics	Sulfates

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

Antimony	Arsenic - TR	Barium
Chromium - TR	Iron - TR	Manganese - TR
Molybdenum	Nickel - TR	Nitrate-N + Nitrite-N
Strontium	Toluene	

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

Aluminum	Boron	Copper - TR
Cyanide - free	Fluoride	Lead - TR
Selenium - TR	Total Filterable Residue	

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

Chlorine, Total Residual	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

		Recommended Effluent Limits	
Parameter	*Units*	*Average*	*Maximum*
Ammonia (Summer)	mg/L	--	13.7
Ammonia (Winter)	mg/L	--	28.1
Mercury	ng/L	1.3	1700

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

Table 13. Final Effluent Limits

Parameter	Units	Concentration		Loading (kg/day)[a]		Basis[b]
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
Outfall 2IN00004001						
pH	S.U.	6.5 - 9.0		--	--	WQS
Total Suspended Solids	mg/L	28.2	92.6	97.7	247	BPJ/ABS
Oil and Grease	mg/L	14.4	21.3	27.9	83.6	BPJ/ABS
Ammonia (Summer)	mg/L	--	13.7	--	65.1	WLA/IMZM
Ammonia (Winter)	mg/L	--	24.3	--	133	IMZM/ABS
Phosphorus, Total	mg/L	1.0	1.5	7.42	11.2	WQS-N
Zinc	µg/L	- - - - - - - - - - - - Monitor - - - - - - - - - - - -				RP
Copper	µg/L	- - - - - - - - - - - - Monitor - - - - - - - - - - - -				BTJ
Oil and Grease Severity	Units	- - - - - - - - - - - - Monitor - - - - - - - - - - - -				BTJ
Flow Rate	MGD	- - - - - - - - - - - - Monitor - - - - - - - - - - - -				M[c]
Chlorine, Total Residual	mg/L	--	0.038	--	--	WLA/IMZM
Mercury	ng/L	1.3	1700	0.000006	0.008	WLA

[a] Effluent loadings based on:
Outfall 001 – 1.255 MGD.
*Phosphorus loadings based on previous permit flow (1.96 MGD) to maintain load contemplated in the TMDL.

[b] Definitions:
ABS = Antibacksliding Rule (OAC 3745-33-05(F) and 40 CFR Part 122.44(l))
BPJ = Best Professional Judgment
BTJ = Best Technical Judgment
M = Division of Surface Water NPDES Permit Guidance 2: Determination of Sampling Frequency Formula for Industrial Waste Discharges
RP = Reasonable Potential for requiring water quality-based effluent limits and monitoring requirements in permits (OAC 3745-33-07(A))
WLA = Wasteload Allocation procedures (OAC 3745-2)
WLA/IMZM = Wasteload Allocation limited by Inside Mixing Zone Maximum
WQS = Ohio Water Quality Standards (OAC 3745-1)
WQS-N = Ohio Water Quality Standards – Narrative Free From Rules (OAC 3745-1-4(E))

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

Attachment 1. BPJ Technology-based Effluent Limit Calculations

ELG	Process	Portion of Total Flow[a]	Categorical Limits (mg/L)				Final Calculated Limits (mg/L)			
			TSS		Oil & Grease		TSS		Oil & Grease	
			30-day	Max	30-day	Max	30-day	Max	30-day	Max
40 CFR 423.15(a)(3)	A/C Condensate, Make-Up Air Units, Chilled Water	0.0002%	30	100	15	20	0.00006	0.0002	0.00003	0.00004
40 CFR 423.15(a)(3)	Evaporative Cooler	0.26%	30	100	15	20	0.0774	0.2581	0.0387	0.0516
40 CFR 438.15	Emission Control Collection	0.69%	15[b]	62	10[a]	46	0.1042	0.4309	0.0695	0.3197
40 CFR 423.15(a)(3)	Core Tool Cleaning	1.51%	30	100	15	20	0.4527	1.509	0.2264	0.3018
40 CFR 423.15(a)(3)	Floor Washdowns	0.02%	30	100	15	20	0.006	0.0199	0.003	0.004
40 CFR 423.15(a)(3)	Landfill Leachate and Pumping Station	85.78%	30	100	15	20	25.73	85.78	12.87	17.16
40 CFR 423.15(a)(3)	Fire Water (Leaks, System Flush/Drain, Use)	0.2%	30	100	15	20	0.0596	0.1986	0.0298	0.0397
40 CFR 423.15(a)(3)	Mold Dip	0.02%	30	100	15	20	0.006	0.0199	0.003	0.004
40 CFR 464	Stormwater	11.52%	15	38	10	30	1.728	4.376	1.152	3.455
						Final Limits	*28.2*	*92.6*	*14.4*	*21.3*

[a] Flow proportions based on NPDES application Form 2C data.
[b] 40 CFR 438.15 does not contain 30-day average effluent limitations. Average limits considered for the emission control system are based on 40 CFR 464.

Summary of BPJ Limits

This permit excludes technology-based effluent limits previously included for wastewaters assigned categorical standards from the aluminum subcategory of the Metal Molding and Casting ELGs in 40 CFR 464. Limits have been removed because it has been determined that the wastewaters discharged from the facility do not fit the description of categories listed in the ELGs. To ensure that the facility is maintaining a standard of treatment consistent with available technology, new categorical limits are proposed based on BPJ. New limits are described below.

40 CFR 423.15(a)(3)

This regulation under the steam electric power generating point source category designates effluent limits for miscellaneous ancillary discharges commonly present at these facilities. Based on BPJ, these technology-based limits have been applied to similar wastestreams at GM Defiance.

Attachment 2. List of Approved Treatment Additives

Treatment Additive
ChemTreat RL-124
ChemTreat P-850
ChemTreat P-893
ChemTreat P-891
ChemTreat CL-215
Bleach
Acid/Caustic
ChemTreat CL-4892
ChemTreat CL-4123
ChemTreat CL-1432
ChemTreat CL-6033

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