National Pollutant Discharge Elimination System (NPDES) Permit Program

FACT SHEET

Regarding an NPDES Permit to Discharge to Waters of the State of Ohio
for **Marathon Petroleum Company LP**

Public Notice No.: 209106
Public Notice Date: January 15, 2025
Comment Period Ends: February 14, 2025

Ohio EPA Permit No.: **3IG00000*OD**
Application No.: **OH0005657**

Name and Address of Applicant:

Marathon Petroleum Company LP
2408 Gambrinus Avenue SW
Canton, Ohio 44706

Name and Address of Facility Where Discharge Occurs:

Marathon Petroleum Company Canton Refinery
2408 Gambrinus Avenue SW
Canton, Ohio 44706
Stark County

Receiving Water: **Tuscarawas River**

Subsequent Stream Network: **Muskingum River to 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.

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

Limits from the current permit are proposed to continue at Outfall 3IG00000003. These limits are more restrictive than BCT/BAT values and water quality-based limits. Loading values are based on the existing discharge flow rate of 1.7 MGD.

Chronic Whole Effluent Toxicity (WET) tests for *Pimephales promelas* (fathead minnow) and *Ceriodaphnia dubia* (water flea), with the determination of acute toxicity endpoints, are being continued at a reduced frequency of 2/year.

Based on the reasonable potential analyses, the existing monitoring requirement for barium is recommended to be removed.

Outfall 3IG00000001 is being continued as an emergency Wastewater Treatment Plant (WWTP) final effluent outfall to Hurford Run.

The operator certification requirement for the Wastewater Treatment Plant has been reclassified from a Class III to a Class II Operator.

In Part II of the permit, conditions are included that address the following: operator certification, minimum staffing and operator of record, incidental release of treated effluent, whole effluent toxicity (WET) testing; diffuser inspection and maintenance, and outfall signage.

Stormwater requirements are included in Parts IV - VI of the permit.

This permit renewal is proposed for a term of approximately 5 years.

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PROCEDURES FOR PARTICIPATION IN THE FORMULATION OF FINAL DETERMINATIONS

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

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

Requests for public meetings shall be in writing and shall state the action of the Director objected to, the questions to be considered, and the reasons the action is contested. Such requests should be emailed to HClerk@epa.ohio.gov or mailed to:

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

Interested persons are invited to submit written comments upon the discharge permit. Comments should be submitted by email to epa.dswcomments@epa.ohio.gov (preferred method) or delivered in person or by mail no later than 30 days after the date of this Public Notice. Deliver or mail all comments to:

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

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

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

For additional information about this fact sheet or the draft permit, contact John Schmidt, 330-963-1175, John.Schmidt@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 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

Marathon Petroleum Canton Refinery is authorized to discharge, via a 10-mile dedicated force main and Outfall 3IG00000003 diffuser, to the Tuscarawas River at River Mile (RM) 80.51. Prior to 2016, the facility discharged treated process water to Hurford Run at RM 1.9 through Outfall 3IG00000001. While the discharge has since been rerouted to the larger receiving stream, Outfall 3IG00000001 has been retained as an "Emergency" outfall. The facility also discharges storm water from non-process areas to Hurford Run. Figure 1 shows the approximate location of the facility. The path of the force main and general location of the Outfall 3IG00000003 diffuser are shown in Figure 2 and Figure 3.

The Tuscarawas River mainstem is described by Ohio EPA River Code: 17-500, Large River Assessment Unit (LRAU): 050400019001, Watershed Assessment Unit (WAU): 050400011203 - Wolf Creek-Tuscarawas River, County: Stark, Ecoregion: Erie-Ontario Lake Plain. The Tuscarawas River is designated for the following uses under Ohio's Water Quality Standards (OAC 3745-1-24): Warmwater Habitat (WWH), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), and Primary Contact Recreation (PCR).

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

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

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

Water supply uses are defined by the actual or potential use of the waterbody. Public Water Supply designations apply near existing water intakes so that waters are safe to drink with standard treatment. Most other waters are designated for agricultural water supply and industrial water supply.

FACILITY DESCRIPTION

The Marathon Petroleum Canton Refinery ("Marathon Canton") was built in 1931 and employs cracking technology to process foreign and domestic crude oil, including condensate from shale oil, into petroleum products. The facility currently has maximum operating capacity of approximately 100,000 barrels per day (bpd); nominal production generally is in the range of 86,400 - 98,500 bpd. Process operations include crude oil desalting, atmospheric distillation, vacuum distillation, fluid catalytic cracking, hydrotreating, catalytic reforming, asphalt production, and sulfur recovery. Refined products include gasoline, diesel fuel, heating oil, kerosene, asphalt, roofing flux, propane, slurry and sulfur.

The process operations at this facility are defined by the standard industrial classification (SIC) category 2911 - Petroleum Refining. Process wastewaters from these operations, and contaminated runoff that is commingled or treated with process wastewater, are regulated under the Federal Effluent Limitation Guidelines (ELGs) listed in 40 CFR Part 419, "Petroleum Refining Point Source Category". The requirements in Subpart B - Cracking Subcategory (40 CFR 419.20 - 27) apply to this facility. 40 CFR 419.22 lists the applicable Best Practicable Control Technology Currently Available (BPT) limits for biochemical oxygen demand (BOD5), chemical oxygen demand (COD), total suspended solids (TSS), oil & grease (O&G), ammonia, sulfide, total phenolics, total chromium, hexavalent chromium. and pH. Best Available Technology Economically Achievable (BAT) limits for COD, ammonia (as N), sulfide, total phenolics, total chromium, and hexavalent chromium are contained in 40 CFR 419.23. Best Conventional Pollutant Control Technology (BCT) standards for BOD5, COD, TSS, O&G, and pH are listed in 40 CFR 419.24.

A water balance diagram for Marathon Canton is depicted in Figure 4. The primary source of water for the facility is the groundwater aquifer. The facility currently has four wells which withdraw water for process purposes (e.g. cooling water, boiler feed water, etc.). If necessary, potable water from the City of Canton can be used to supplement this water supply. The facility does not use surface water, nor does it produce its own potable water.

The regulated process outfalls and/or monitoring stations are listed in Table 1. Table 2 lists the storm water outfalls that are associated with industrial activity.

Process wastewater results from: 1) the desalting process in which salts and minerals are removed from crude oil, and 2) the foul water stripping process which removes light hydrocarbons, hydrogen sulfide, and ammonia. The process wastewater from the refining operations combines with process and non-process area storm water runoff, non-contact cooling water and boiler blowdown prior to being directed to the facility's industrial wastewater treatment system.

The preliminary wastewater treatment units at Marathon Canton include oil/water separation, pH adjustment, polymer addition, and dissolved air flotation. The equalized wastewater is then treated via an activated sludge biological treatment process followed by clarification. Additional treatment includes polymer addition followed by dual media filters for final solids removal and activated carbon columns for removal of residual hydrocarbons. The treated effluent is pumped, via a 10-mile force main and diffuser, to the Tuscarawas River at Outfall 3IG00000003.

Outfall 3IG00000001 is an "emergency overflow" or contingency outfall from the wastewater treatment plant to Hurford Run. The use of this outfall would represent the same treated effluent discharge as Outfall 3IG00000003. Outfall 3IG00000001 is only authorized for use in the event of an operational or maintenance issue associated with the effluent pump station and/or force main. Diversion valves in the "effluent clear well" allow flow to be redirected from the Outfall 3IG00000003 pump station to Outfall 3IG00000001. Notification is required within 24 hours of a discharge event at Outfall 3IG00000001. Approximately 3.6 million gallons was discharged via this station on September 15-16, 2021.

Outfalls 3IG00000005 and 3IG00000006 are intended to designate intermittent discharges of any hydrostatic test waters from existing tanks that are not processed thru the industrial wastewater treatment system. The stormwater outfalls are 3IG00000007 - 3IG00000011.

DESCRIPTION OF EXISTING DISCHARGE

Marathon Canton's average annual effluent flow rate for the previous five years is presented in Table 3.

Table 4 presents chemical specific data compiled from the NPDES renewal application.

Table 5 presents a summary of unaltered Discharge Monitoring Report (DMR) data for the facility. Data are presented for the period August 2018 - July 2023; the current permit limits are provided for comparison.

Table 6 summarizes the chemical specific data for Outfall 3IG00000003 by presenting the average and maximum PEQ values.

Table 7 summarizes the results of acute and chronic Whole Effluent Toxicity (WET) tests of the final effluent Outfall 3IG00000003, utilizing *Ceriodaphnia dubia* (water flea) and *Pimephales promelas* (fathead minnow) as the test organisms.

ASSESSMENT OF IMPACT ON RECEIVING WATERS

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 include, 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.

Comprehensive chemical, physical, and biological monitoring of the Tuscarawas River were conducted in 2003, 2004, and 2005. Ohio EPA has previously conducted biological and water quality surveys on the Tuscarawas River mainstem in 1983, 1988, 1993, and 1995. The following causes of stream impairment were identified: unknown toxicity, salinity/TDS/chlorides, suspended solids, organic enrichment/DO, and nutrients. These causes were attributed to the following possible sources: non-irrigated crop production, industrial land treatment, and major industrial and municipal point sources. Based on these findings, the Tuscarawas River Mainstem (Chippewa Creek to Sandy Creek) large river assessment unit 050400019001 was listed as "impaired" for aquatic life, recreation, and human health uses pursuant to Section 303(d) of the Clean Water Act. PCBs and hexachlorobenzene, in particular, are listed as causes of the impairment. However, the section which includes the Tuscarawas River in the vicinity of the Marathon Canton Outfall 3IG00000003, WAU 050400011203, remains in "full attainment" of the aquatic life criteria. Hence, it is not on the 303(d) list.

Pursuant to Section 303(d) of the Clean Water Act (CWA), each state is required to develop and submit a list to US EPA of its impaired and threatened waters (e.g. stream/river segments, lakes). For each water on the list, the state identifies the pollutant(s) causing the impairment, when known. Ohio EPA's biennial "*Integrated Water Quality Monitoring and Assessment Report*" (Integrated Report) summarizes the general condition of Ohio's waters and identifies waters that are not meeting water quality goals. The report satisfies the CWA requirements for both Section 305(b) for biennial reports on the condition of the State's waters and Section 303(d) for a prioritized list of impaired waters. For each impaired water, Ohio EPA typically prepares a Total Maximum Daily Load (TMDL) analysis.

The TMDL program focuses on identifying and restoring polluted rivers, streams, lakes and other surface water bodies. A TMDL is a written quantitative assessment of water quality problems in a water body and contributing sources of pollution. It specifies the amount a pollutant needs to be reduced to meet water quality standards (WQS), allocates pollutant load reductions, and provides the basis for taking actions needed to restore a water body. Ohio EPA typically focuses on watersheds in preparing TMDLs.

The attainment status of the Tuscarawas River is reported in the 2022 Integrated Report and can be accessed via the following link:

https://epa.ohio.gov/static/Portals/35/tmdl/2022intreport/Full-2022-IR.pdf

A TMDL for pollutants impairing the designated aquatic life uses in the Tuscarawas River basin (excluding the Sugar, Sandy, Conotton, and Stillwater basins) was approved by the U.S. EPA on September 15, 2009. The TMDL report is available via the Tuscarawas River tab at:

https://epa.ohio.gov/divisions-and-offices/surface-water/reports-data/muskingum-river-watershed

TMDL recommendations were developed for total phosphorus, bacteria, habitat and sediment control. At the time of the 2009 TMDL report, however, Marathon Canton was not discharging directly to the Tuscarawas River. Hence, there are no site-specific recommendations at this time for Outfall 3IG00000003.

During 2017, Ohio EPA conducted a comprehensive chemical, physical and biological survey of 31 sites on the Tuscarawas River and select tributaries. As evidenced by information in Table 8, all of the mainstem sites upstream and downstream of the Marathon discharge continue to be in "full" attainment of the aquatic life criteria. The complete study results are contained in the Ohio EPA Technical Report,

Biological and Water Quality Study of Tuscarawas River and Select Tributaries February 2024, and are available via the following link:

https://dam.assets.ohio.gov/image/upload/epa.ohio.gov/Portals/35/tmdl/2017-Tuscarawas-TSD/2017-Tuscarawas-TSD.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 Marathon Canton were used to determine what parameters should undergo WLA. The parameters discharged are identified by the data available to Ohio EPA DMR data submitted by the permittee, compliance sampling data collected by Ohio EPA, and any other data submitted by the permittee, such as priority pollutant scans required by the NPDES application or by pretreatment, or other special conditions in the NPDES permit. The sources of effluent data used in this evaluation are as follows:

Self-monitoring data (DMR)	August 2018 through July 2023
NPDES Form 2C Application data	2023

This data is evaluated statistically, and PEQ values are calculated for each pollutant. Average PEQ (PEQ_{avg}) values represent the 95th percentile of monthly average data, and maximum PEQ (PEQ_{max}) values represent the 95th percentile of all data points (see Table 6).

The following values were removed from the evaluation as non-representative data:

Parameter	Date	Value	Units	Comment
Ammonia-Nitrogen (Summer)	8/1/2018	3.93	mg/L	Non-Representative High Value (> 10 times PEQavg)
	8/3/2018	7.64	mg/L	"
	6/22/2021	5.6	mg/L	"
Ammonia-Nitrogen (Winter)	1/4/2022	7.1	mg/L	Non-Representative High Value (> 10 times PEQavg)
	2/15/2022	7.4	mg/L	"
	12/27/2022	9.9	mg/L	"
	12/28/2022	9.7	mg/L	"
Total Filterable Residue (Total Dissolved Solids)	8/6/2018	504	mg/L	Non-Representative Low Value
	8/9/2018	500	mg/L	"
	6/23/2022	AA	mg/L	"

The primary methods for calculating PEQs are outlined in "*Modeling Guidance 1 - Calculating PEQ: determining a discharger's effluent quality"* (Ohio EPA Division of Surface Water, 2006, Rev. 1). The method selected is dependent on case-specific facts, i.e., determined on a pollutant-specific basis using knowledge of the characteristics of the available data. For more information on PEQ calculations, see Modeling Guidance #1 at the following webpage:

https://epa.ohio.gov/static/Portals/35/guidance/npdes_permit_guidance%201.pdf

The PEQ values are used according to Ohio rules to compare to applicable WQS and allowable WLA values for each pollutant evaluated. Initially, PEQ values are compared to the applicable average and maximum WQS. If both PEQ values are less than 25 percent of the applicable WQS, the pollutant does not have the reasonable potential to cause or contribute to exceedances of WQS, and no WLA is done for that parameter. If either PEQ_{avg} or PEQ_{max} is greater than 25 percent of the applicable WQS, a WLA is conducted to determine whether the parameter exhibits reasonable potential and needs to have a limit or if monitoring is required (see Table 9).

Wasteload Allocation

For those parameters that require a 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. Discharger WLAs are divided by the discharge flow so that the allocations are expressed as concentrations. 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 such as the Tuscarawas River, 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).

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

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

Allocations are developed using a percentage of stream design flow as specified in Table 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 tests measure survival and mortality of the test organism over a short time period (48- or 96-hours). Chronic WET tests measure survival and mortality, as well as effects on growth and reproduction over a longer period of the test organism's life.

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 (i.e. TUa and TUc) for use in NPDES permits by the associated WQS Implementation Rule (OAC 3745-2-09). The translation results in numeric values of 0.3 TUa and 1.0 TUc. WLAs can then be calculated using these values as if they were water quality 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 3745-2-08, 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)].

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. 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.

For Marathon Canton's discharge to the Tuscarawas River, the calculated WLA values for WET are 1.0 TU_a and 31.14 TU_c.

REASONABLE POTENTIAL/EFFLUENT LIMITS/MANAGEMENT DECISIONS

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

average and maximum WLAs are selected from Table 11. The average PEL (PEL_{avg}) is compared to the average PEQ (PEQ_{avg}) from Table 6, and the PEL_{max} is compared to the PEQ_{max}. Based on the calculated percentage of the allocated value [($PEQ_{avg} \div PEL_{avg}$) X 100, or ($PEQ_{max} \div PEL_{max}$) X 100)], the parameters are assigned to group 3, 4, or 5. The groupings are listed in Table 12.

The final effluent limits are determined by evaluating the groupings in conjunction with other applicable rules and regulations. Table 13 presents the final effluent limits and monitoring requirements proposed for Marathon Canton outfalls 3IG00000003, 3IG00000005, and 3IG00000006 and the basis for their recommendation. Unless otherwise indicated, the monitoring frequencies proposed in the permit are continued from the existing permit.

Outfall 3IG00000003

Federal and State laws and regulations require that dischargers meet both treatment-technology-based limits and any more stringent standards needed to comply with state WQS. Permit limits are based on the more restrictive of the two.

As part of the Petroleum Refining Industry, Treatment-technology-based limits from 40 CFR Part 419, Subpart B – Cracking, apply to the wastewater discharged from outfall 3IG00000003. The regulations on process water discharges are based on the mass (pounds) of pollutant allowed to be discharged per 1000 barrels of petroleum throughput, the size of the refinery, and the process configuration of the refinery. Production and process information were supplied by Marathon Canton as part of the application. The plant production rate, i.e. 98,500 barrels per day, represents an increase from 86,400 barrels per day used in the previous permit.

The effluent guidelines also contain allowances for contaminated storm water treated with the process wastewaters. These are expressed as pounds of pollutant per 1000 gallons of storm water treated. Based on the application information, Marathon Canton treats approximately 0.14 MGD of process area storm water through the treatment plant.

BPT/BCT limits are calculated by multiplying the refinery throughput (in thousand barrels/day) by the effluent guideline factor (pounds/thousand barrels) by a size factor (i.e., 1.13) and a process factor (i.e., 1.89) to obtain the allowable kilograms/day that can be discharged. A summary of all effluent guideline limitations is shown in Attachment 2. A sample calculation is shown below:

Lower Tier BPT/BCT:

Total Suspended Solids (TSS) 30-day average loading limit calculation:

$$\textit{TSS Load (kg/day)} = A * B * \textit{Size Factor} * \textit{Process Factor} * \textit{Conversion Factor}$$
$$= 98.5\ \textit{kbbl/day} * 4.4\ \textit{lbs./kbbl} * 1.13 * 1.89 * 0.454\ \textit{kg/lb.} = 420.23\ \textit{kg/day}$$

Where: A = Production Rate, 1000 barrels/day (kbbl)
B = Effluent Guideline Factor, pounds/thousand barrels (lbs./kbbl)

BAT limits for COD, ammonia-N and sulfide are calculated in the same way as BPT/BCT. BAT limits for phenolics, chromium and hexavalent chromium are based on guideline allowances for each type of process in the refinery. For these last three pollutants, the BAT limits are calculated

by multiplying the crude oil production totals by the crude guideline value, multiplying the cracking/coking production by the cracking/coking guideline value, multiplying the catalytic reforming production by the reforming guideline value, multiplying the asphalt production by the asphalt guideline factor, and then adding the four loads to get the total load allowable by the guidelines. A sample of this calculation for phenolics in the lower tier:

Phenolics 30-day average lower tier loading limit calculation:

Process Limit = Crude Process Allocation + Cracking and Coking Process Allocation + Asphalt Process Allocation + Reforming and Alkylation Process Allocation

Phenolics Load (kg/day) = *[(98.5 kbbl/day ∗ 0.003 lbs./kbbl) + (80.5 kbbl/day ∗ 0.036 lbs./kbbl) + (16.4 kbbl/day ∗ 0.019 lbs./kbbl) + (20 kbbl/day ∗ 0.032 lbs/kbbl)] ∗ 0.454 kg/lb.*
= 1.88 kg/day (30-day average)

The effluent guidelines also contain allowances for storm water that is treated. In this permit the upper tier limits contain these allowances. The storm water allowances are calculated by multiplying the guideline factor by the storm water flow (in thousand gallons). The storm water allowance is added to the lower tier limit to obtain the upper tier limit.

For phenolics, the storm water allowance is calculated as follows:

Storm Water Allowance = Guideline Factor ∗ Storm water ∗ Conversion Factor

Phenolics with storm = *0.0014 lbs./kgal ∗ 140 kgal ∗ 0.454 kg/lb.*
= 0.09 kg/day (30-day average)

The resultant total allowance is:

Phenolics with storm = 1.88 kg/day + 0.09 kg/day = 1.97 kg/day (30-day average)

In general, the BCT/BAT limits are less restrictive than the current permit limits. Therefore, they are not used as a basis for any effluent limits because Marathon Canton did not request an increase in limits with the renewal application. Ohio rules require that the design flow for industrial discharges be based on "a reasonable measure of average wastewater flow" and "shall represent a reasonable measure of actual production, projected to occur during the next NPDES permit period. Typically, this value is based on the 95th percentile of monthly average flows. The flow value calculated for Marathon Canton during the previous permit, i.e. 1.7 MGD, remains representative and therefore will be continued.

Flow Rate, Water Temperature, Total Precipitation, and Dissolved Oxygen

The monitoring of these indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.

Ammonia (as Nitrogen), Biochemical Oxygen Demand - 5 Day (BOD5), Chemical Oxygen Demand (COD), Total Suspended Solids, Oil & Grease, Total Sulfide, Total Phenolics, Chromium (Total), and Dissolved Hexavalent Chromium.

The existing concentration limits are being continued from the current permit because they are more restrictive than the applicable effluent guidelines. Based on the Antibacksliding Rule, OAC 3745-33-05(F), "Ohio NPDES permits may not be renewed, reissued or modified to contain effluent limitations that are less stringent than the comparable final effluent limitations in the previous permit" unless specific conditions have been satisfied. In the case of Marathon Canton, none of those conditions have been satisfied. The loading limits correspond to a flow value of 1.7 MGD.

pH Minimum, pH Maximum, and pH Range Excursions

Limits recommended for pH, i.e. 6.5 - 9.0 S.U., are based on Ohio's Water Quality Standards (OAC 3745-1).

Marathon Canton continuously measures the pH of wastewater discharged via Outfall 3IG00000003. Pursuant to 40 CFR 401.17, permittees that continuously measure pH are required to maintain the pH of such wastewater within the specified permit range, except that excursions from the range are permitted subject to the following limitations and conditions:

> *(1) The total time during which the pH values are outside the required range of pH values shall not exceed 7 hours and 26 minutes in any calendar month; and*
>
> *(2) No individual excursion from the range of pH values shall exceed 60 minutes.*

An excursion is defined as "*an unintentional and temporary incident in which the pH value of discharge wastewater exceeds the range set forth*" in the NPDES permit.

Phosphorus

Based on an analysis of the Tuscarawas River TMDL report and a review of Marathon Canton's DMR data, the discharge should not have the reasonable potential to contribute to WQS exceedances. However, monitoring for total phosphorus is included in permits for all major dischargers in this segment of the Tuscarawas River to track any trends in point source contributions of nutrients.

Selenium

Ohio EPA risk assessment (Table 12) places this parameter 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).

Arsenic, Boron, Total Filterable Residue (Total Dissolved Solids), Fluoride, Methylene-Blue Active Substances (Surfactants/Foaming Agents), and Mercury

Ohio EPA risk assessment (Table 12) places these parameters in Group 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. Monitoring is proposed to continue for total filterable residue, fluoride, and mercury in order to document that these pollutants continue to remain at low levels, particularly during an emergency discharge to Hurford Run. No new monitoring requirements are being recommended for the other parameters.

Aluminum, Antimony, Barium, Boron, Chloroform (aka Trichloromethane), Cobalt, Molybdenum, Nickel, and Zinc

Ohio EPA risk assessment (Table 12) places these parameters in groups 1 and 2. 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. Based on this placement, the existing monitoring requirement for barium is recommended to be removed. No new monitoring requirements are being recommended for the other parameters.

Total Chloride

Chlorides were identified in the TMDL as one of the potential sources of impairment in the Tuscarawas River basin. Based on best technical judgement, quarterly monitoring is recommended to continue.

Total Residual Chlorine and Escherichia (E.) coli

Sewage generated at Marathon Canton is directed to the City of Canton's sanitary sewer system for collection and treatment at the Canton Water Reclamation Facility. The industrial treatment process is not designed with a chlorine disinfection system. Consequently, these parameters are not being recommended for inclusion in the permit.

Whole Effluent Toxicity Reasonable Potential

Based on evaluating the whole effluent toxicity (WET) data presented in Table 7 and other pertinent data under the provisions of OAC 3745-33-07(B), the Marathon Canton Outfall 3IG0000003 discharge is placed in Category 4 with respect to whole effluent toxicity for *Pimephales promelas* and *Ceriodaphnia dubia*. This placement indicates that reasonable potential for toxicity is not demonstrated with respect to *P. promelas and C. dubia.*

Given the nature of the industrial discharge and the need to better assess the long-term impacts on the Tuscarawas River, continued monitoring with *Ceriodaphnia dubia* and *Pimephales promelas* is appropriate. Based on a review of the discharge data, it is recommended that the monitoring frequency for chronic toxicity tests be reduced to semi-annual. Acute toxicity endpoints will continue to be determined from the chronic tests.

Outfall 3IG00000005 and Outfall 3IG00000006

Monitoring requirements and associated limits are being included for the intermittent discharges of hydrostatic test waters that are not processed and discharged via Outfall 3IG00000003. With the exception of total residual chlorine (TRC), these requirements are the same as those contained in Ohio EPA Hydrostatic Test Water General Permit OHH000004. Monitoring includes dissolved oxygen, pH, total suspended solids, oil and grease, iron, toluene, benzene, ethylbenzene, TRC, and total xylene.

OTHER REQUIREMENTS

Operator Certification and Operator of Record

Operator certification requirements for Marathon Canton's activated sludge biological wastewater treatment system have been included in Part II of the permit in accordance with rules effective August 15, 2018 (OAC 3745-7). These rules require the permittee to designate one or more operator(s) of record to oversee the technical operation of the treatment plant with a valid certification of a class equal to or greater than the classification of the treatment plant.

In accordance with OAC 3745-7-04, Marathon Canton has requested that Ohio EPA redesignate the applicable operator certification requirement from a Class III to a Class II treatment plant. Ohio EPA has reviewed the request and determined that re-classification to a Class II facility should be granted

Treatment and Maintenance Chemicals

OAC 3745-33-03 (C) states that "the applicant shall attach to the application a list of treatment additives proposed to be discharged including, but not limited to, maintenance chemicals and chemicals used to aid in the treatment of the wastewater." The list of chemicals provided by Marathon Canton is included as Attachment 3.

Outfall Force Main and Diffuser Performance Verification and Maintenance

Part II of the permit includes a requirement for the permittee to perform routine inspections and necessary maintenance of the Outfall 3IG00000003 force main and diffuser.

Outfall Signage

Part II of the permit includes requirements for the permittee to maintain a sign at each outfall to the receiving stream(s) 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 associated with industrial activity" are properly regulated and managed. As an alternative to complying with Parts

IV, V, and VI, the Marathon Canton may seek permit coverage under the general permit for industrial storm water (permit # OHR000007 or subsequent renewals) or submit a "No Exposure Certification." Parts IV, V, and VI will be removed from the final permit if: 1) Marathon Canton 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.

Figure 1. Location of Marathon Petroleum Canton Refinery

Note: Station 3IG00000-003 is a designation for the onsite sampling station, and not the physical outfall (See Figs. 2 and 3).

Figure 2. Marathon Canton Outfall 3IG00000003 Force Main Alignment

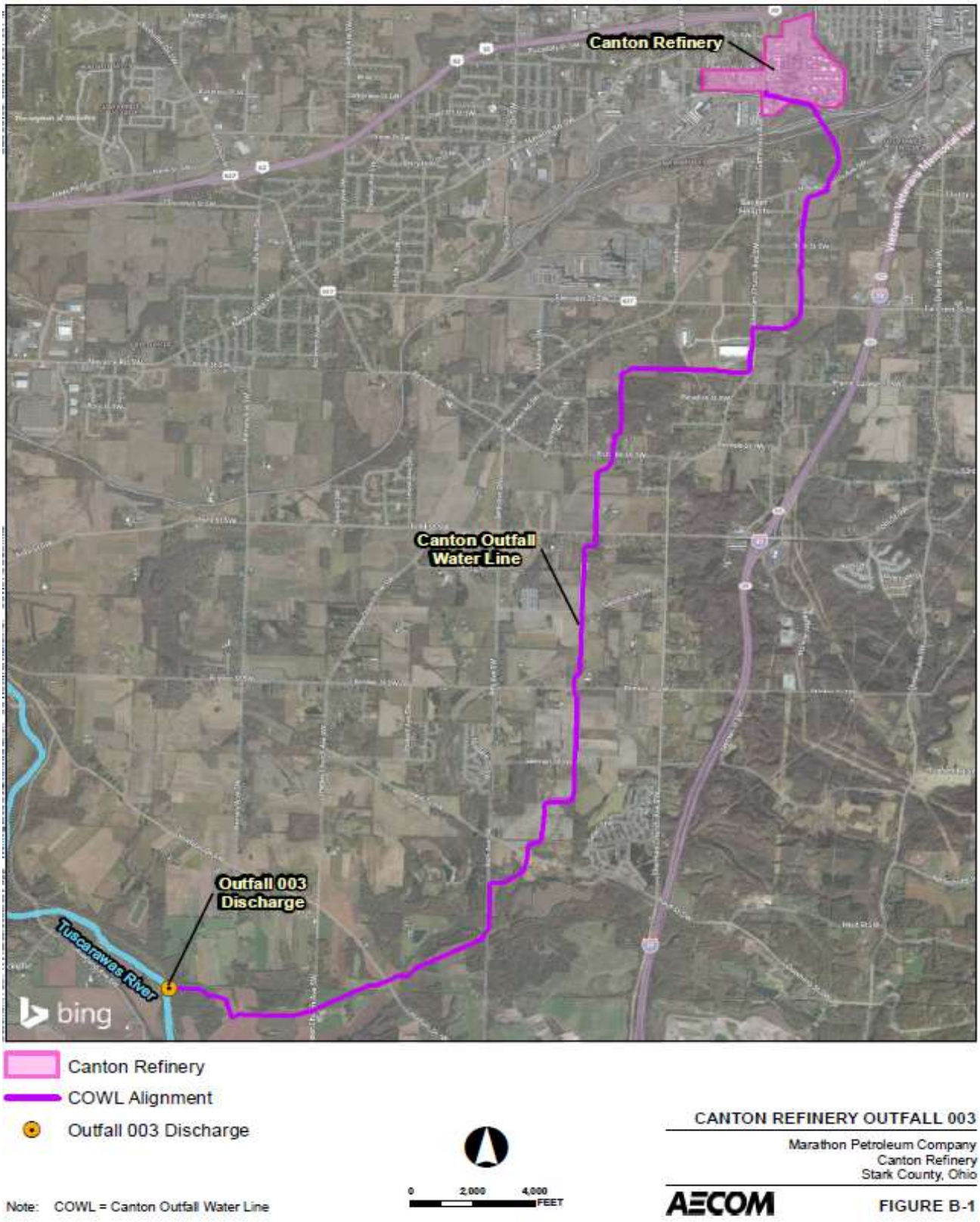

Figure 3. Marathon Canton Outfall 3IG00000003 Diffuser Location

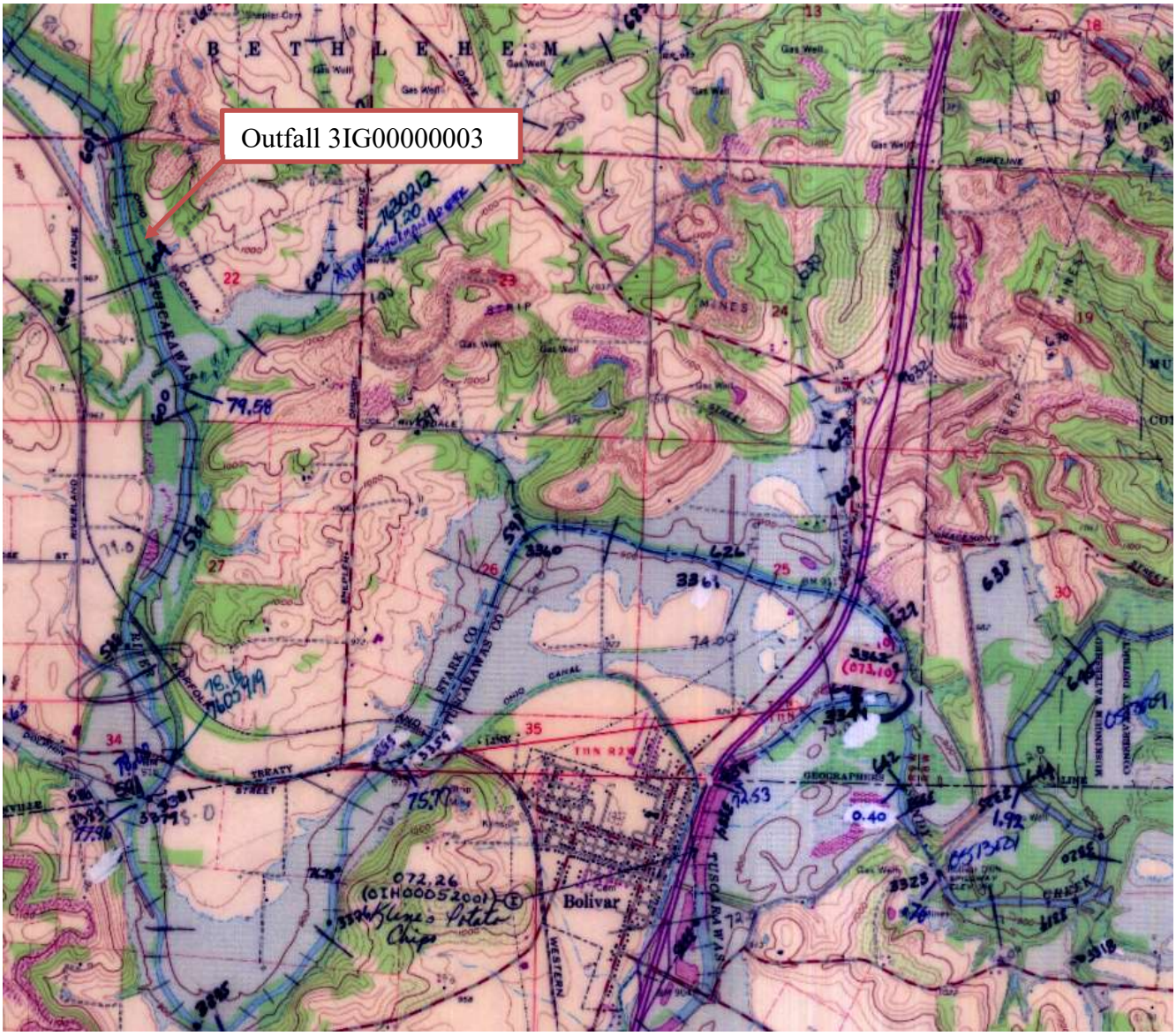

Figure 4. Water Balance Diagram

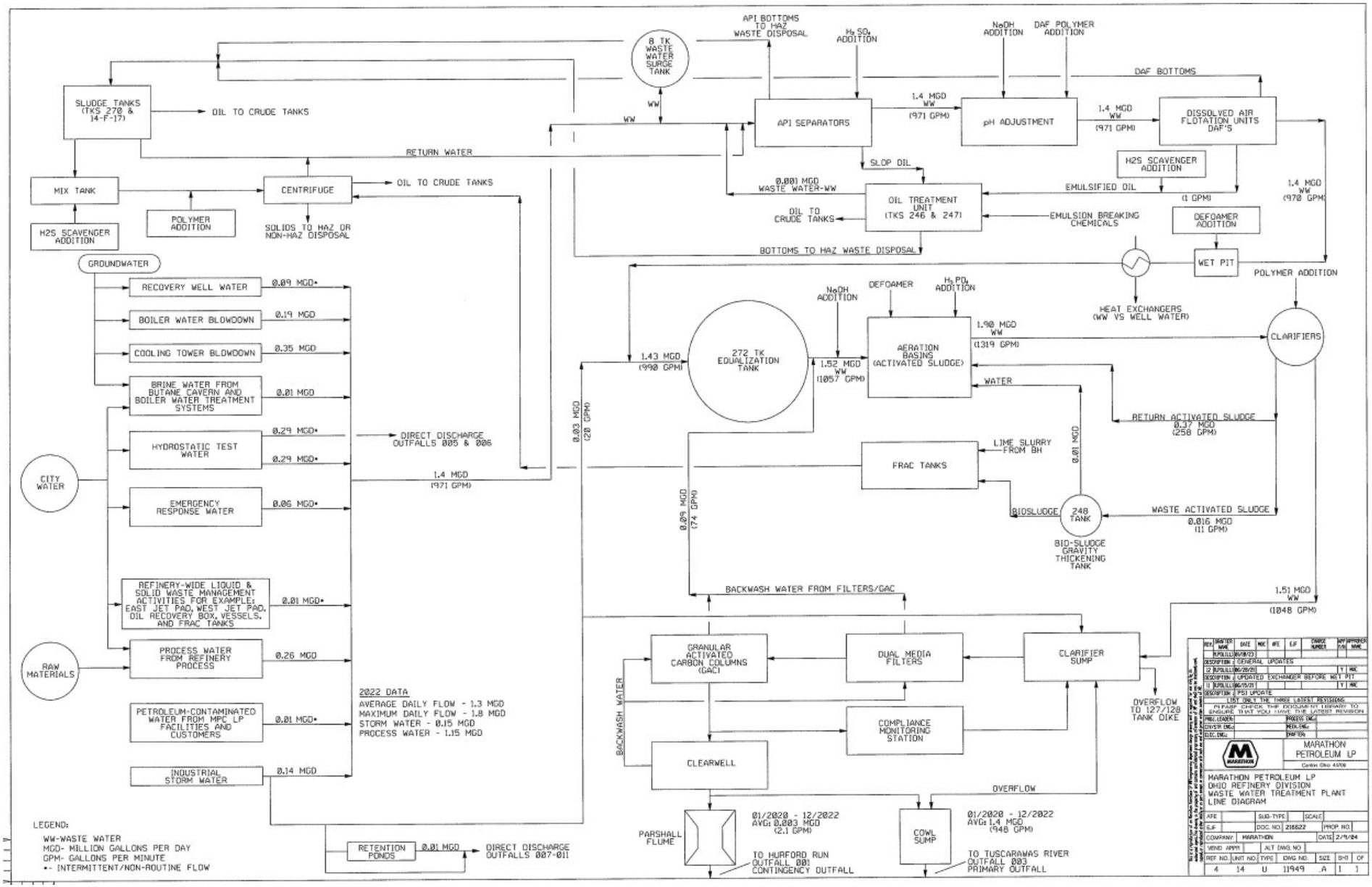

Table 1. Monitoring Stations, Wastewater Sources, Treatment Processes, Discharge Points, and Flow Rates

Outfall No.	Wastewater Source	Source Flow (MGD)	Treatment Systems Used	Discharge Point	Flow Rate (MGD)
3IG00000003	Refining Process Wastewater	0.260	• Oil/Water Separation • pH Adjustment • Metals Precipitation • Dissolved Air Flotation • Flow Equalization • Activated Sludge Biological Treatment • Clarification • Dual Media Filtration • Activated Carbon Adsorption	Tuscarawas River	1.7 MGD (*)
	Industrial Storm Water	0.140			
	Non-Contact Cooling Water	0.280			
	Brine Water	0.01			
	Hydrostatic Test Water	0.10			
	Boiler Blowdown	0.072			
	Recovery Wells	0.1			
	Petroleum Contaminated Water	0.01			
	Deluge System	0.40			
	Waste Management	0.01			
3IG00000001	(**)	**	(**)	Hurford Run	(**)
3IG00000005	Hydrostatic Test Water – HS01	***	NA	Hurford Run	Variable (***)
3IG00000006	Hydrostatic Test Water – HS02	***	NA	Hurford Run	Variable (***)

* = Based on current NPDES Application (Max. 30-day Average).
** =This outfall is only authorized for use under "Emergency" situations. Wastewater sources and treatment systems are the same as for Outfall 3IG00000003.
*** = Intermittent Discharge

Table 2. Stormwater Outfalls at Marathon Petroleum Canton Refinery

Storm Water Outfall No.	Facility Designation	Total (Imperious) Drainage Area, Acres	General Location/Description	Receiving Stream
3IG00000007	SW01	5.3 (3.6)	Warehouse/G Gate Area	Hurford Run
3IG00000008 [a]	SW02	25.7 (8.1)	North Laydown/Contractor Yard	Hurford Run
3IG00000009	SW03	6.5 (1.7)	South Retention Pond Overflow	Hurford Run
3IG00000010[b]	SW04	7.5 (1.7)	South Retention Pond	Hurford Run
3IG00000011	SW05	0.4 (0)	Asphalt Plant Rail Spur	Hurford Run

[a] = Designated as a representative sampling outfall in the permit for 3IG00000007.
[b] = Designated as a representative sampling outfall in the permit for 3IG00000009 and 3IG00000011.

Table 3. Annual Effluent Flow Rates (August 2018 - July 2023)

Outfall	Flow Rate (Million Gallons per Day)					
	Year	# Observations	Average	Median	95th Percentile	Maximum
3IG00000003	2018	153	1.30	1.38	1.62	1.74
	2019	365	1.37	1.42	1.64	1.72
	2020	366	1.35	1.37	1.60	1.70
	2021	365	1.27	1.26	1.59	1.67
	2022	365	1.33	1.36	1.58	1.63
	2023	212	1.39	1.46	1.54	1.63
3IG00000007	2018	92	0.0097	0.0010	0.0536	0.0730
	2019	365	0.0114	0.0000	0.0698	0.1260
	2020	366	0.0097	0.0000	0.0475	0.1570
	2021	365	0.0095	0.0000	0.0518	0.2790
	2022	365	0.0064	0.0000	0.0368	0.1430
	2023	212	0.0046	0.0000	0.0275	0.0600
3IG00000008	2018	92	0.0191	0.0000	0.1134	0.2120
	2019	365	0.0186	0.0000	0.1394	0.3370
	2020	335	0.0173	0.0000	0.1050	0.4330
	2021	334	0.0130	0.0000	0.0854	0.7270
	2022	242	0.0108	0.0000	0.0950	0.4530
	2023	181	0.0074	0.0000	0.0700	0.1580
3IG00000010	2018	30	0.0050	0.0000	0.0341	0.0890
	2019	122	0.0039	0.0000	0.0000	0.1060
	2020	93	0.0044	0.0000	0.0000	0.1240
	2021	62	0.0061	0.0000	0.0000	0.1420
	2022	92	0.0027	0.0000	0.0000	0.1770
3IG00000011	2018	92	0.0001	0.0000	0.0010	0.0010
	2019	365	0.0002	0.0000	0.0010	0.0020
	2020	366	0.0001	0.0000	0.0010	0.0030
	2021	334	0.0002	0.0000	0.0010	0.0050
	2022	365	0.0004	0.0000	0.0030	0.0160
	2023	212	0.0014	0.0000	0.0080	0.0180

Table 4. Supplemental Effluent Characterization Based on Select Form 2C Data for Outfall 3IG00000003

Parameter	Units		Maximum Daily Value		Maximum 30-day Value		No. of Analyses
	Conc	Mass	Conc	Mass	Conc	Mass	
Aluminum	µg/L	kg/d	44	0.23	44	0.23	3
Antimony	µg/L	kg/d	1.3	0.0066	1.3	0.0066	3
Arsenic	µg/L	kg/d	14	0.071	14	0.071	3
Boron	µg/L	kg/d	540	2.8	540	2.7	3
Cobalt	µg/L	kg/d	0.22	0.0011	0.22	0.0011	3
Magnesium	µg/L	kg/d	35000	200	35000	180	3
Molybdenum	µg/L	kg/d	100	0.5	100	0.5	3
Nickel	µg/L	kg/d	5.0	0.026	5.0	0.025	3
Zinc	µg/L	kg/d	22	0.11	22	0.11	3
Total Organic Carbon	mg/L	kg/d	8.2	42	8.2	41	3
Chloroform	µg/L	kg/d	0.54	0.003	0.54	0.003	3
Cyanide (Total)	µg/L	kg/d	4.2	0.022	4.2	0.021	3
Phenols (Total)	µg/L	kg/d	2.0	0.012	2.0	0.010	2
Surfactants (MBAS)	mg/L	kg/d	0.26	1.3	0.26	1.3	2

MBAS = Methylene-blue active substances

Table 5. Effluent Characterization Using Self-Monitoring DMR Data (August 2018 - July 2023)

Outfall	Parameter	Unit	Current Limits		# Obs.	Percentiles		Data Range
			30 Day	Daily		50th	95th	
001	Water Temperature	°C	Monitor		3	27	29.7	25 - 30
	Total Precipitation	Inches	Monitor		3	--	--	0 - 0
	Dissolved Oxygen	mg/L	Monitor		2	3.1	3.01*	3 - 3.2
	Biochemical Oxygen Demand, 5 Day	mg/L	Monitor		2	--	--	< 1.2
	Chemical Oxygen Demand	mg/L	Monitor		2	34	35.8	32 - 36
	Total Suspended Solids	mg/L	Monitor		2	--	--	< 1
	Oil and Grease, Total	mg/L	Monitor		2	--	--	< 4.2
	Nitrogen, Ammonia - All	mg/L	Monitor		2	--	--	< .076
	Phosphorus, Total	mg/L	Monitor		1	.77	.77	.77 - .77
	Sulfide, Total	mg/L	Monitor		1	--	--	< .013
	Chloride, Total	mg/L	Monitor		1	1500	1500	1500 - 1500
	Fluoride, Total (F)	mg/L	Monitor		1	1	1	1 - 1
	Selenium, TR	µg/L	Monitor		1	56	56	56 - 56
	Barium, TR	µg/L	Monitor		1	140	140	140 - 140
	Chromium, TR - All	µg/L	Monitor		1	--	--	< 2.5
	Chromium, Dissolved Hexavalent	µg/L	Monitor		1	--	--	< 7
	Phenolic 4AAP, Total	µg/L	Monitor		1	--	--	< 14
	Mercury, Total	ng/L	Monitor		1	1.37	1.37	1.37 - 1.37
	Flow Volume, Total	Million Gallons	Monitor		2	0	0	0 - 1.82
	pH Range Excursion, Maximum Duration	Minutes	Monitor		1	--	--	0 - 0
	pH, Maximum	S.U.	Monitor		3	7.2	7.2	7.2 - 7.2
	pH, Minimum	S.U.	Monitor		3	7	7*	7 - 7
	Residue, Total Filterable	mg/L	Monitor		1	2900	2900	2900 - 2900
	Duration of Discharge - All	Hours	Monitor		3	0	0	0 - 24
	pH Range Excursions, > 60 Minutes	Number /Day	Monitor		1	--	--	0 - 0
	pH Range Excursions, Monthly Total Duration	Minutes	Monitor		1	--	--	0 - 0
003	Water Temperature	°C	Monitor		1826	28	33	20 - 40
	Total Precipitation	Inches	Monitor		1765	0	.66	0 - 3.61
	Dissolved Oxygen	mg/L	Monitor		724	2.6	1.4*	1 - 7.7
	Biochemical Oxygen Demand, 5 Day - 2018-2023	kg/day	187	354	692	< 11.1	17.3	0 - 268

Outfall	Parameter	Unit	Current Limits		# Obs.	Percentiles		Data Range
			30 Day	Daily		50th	95th	
	Biochemical Oxygen Demand, 5 Day - 2018	kg/day	244	455	24	17.3	28.9	9.58 - 31.1
	Biochemical Oxygen Demand, 5 Day	mg/L	29	55	716	< 1.2	4	0 - 42
	Chemical Oxygen Demand - 2018-2023	kg/day	1229	2458	698	136	213	0 - 350
	Chemical Oxygen Demand - 2018	kg/day	1589	3178	24	145	209	0 - 243
	Chemical Oxygen Demand	mg/L	191	382	722	28	41	0 - 74
	Total Suspended Solids - 2018-2023	kg/day	154	245	697	4.82	72.5	0 - 180
	Total Suspended Solids - 2018	kg/day	197	314	24	--	--	< 29.3
	Total Suspended Solids	mg/L	24	38	721	1	14	0 - 35
	Oil and Grease, Total - 2018-2023	kg/day	58	84	696	< 20.9	15.4	0 - 52.4
	Oil and Grease, Total - 2018-2018	kg/day	73	109	24	--	--	< 29.3
	Oil and Grease, Total	mg/L	9	13	720	< 5	3	0 - 10
	Nitrogen, Ammonia - Summer - 2018-2023	kg/day	23	162	340	< .405	.823	0 - 23.1
	Nitrogen, Ammonia - Summer - 2018	kg/day	30	180	24	< .585	11.1	0 - 35.5
	Nitrogen, Ammonia - Summer	mg/L	3.6	25.2	364	< .076	.18	0 - 7.64
	Nitrogen, Ammonia - Winter	kg/day	--	170	360	< .421	1.83	0 - 54
	Nitrogen, Ammonia - Winter	mg/L	--	26.4	360	< .093	.411	0 - 9.9
	Phosphorus, Total	mg/L	Monitor		60	.335	.885	.027 - 1.2
	Sulfide, Total - All	kg/day	0.8	1.9	58	< .03	.199	0 - .397
	Sulfide, Total - All	mg/L	0.13	0.29	58	< .009	.0364	0 - .067
	Chloride, Total	mg/L	Monitor		19	1300	1710	840 - 1800
	Fluoride, Total (F)	mg/L	Monitor		35	1.9	5.95	.99 - 6.5
	Selenium, TR	µg/L	Monitor		28	36.5	51.6	0 - 57
	Barium, TR	µg/L	Monitor		22	170	279	67 - 340
	Chromium, TR - All	kg/day	0.5	4.2	63	< .00394	.00786	0 - .0863
	Chromium, TR - All	µg/L	77	650	63	< 2.5	1.4	0 - 16
	Chromium, Dissolved Hexavalent - All	kg/day	0.06	0.07	61	< .036	< .036	0 - .0735
	Chromium, Dissolved Hexavalent - All	µg/L	9	11	61	< 7	< 7	0 - 15
	Phenolic 4AAP, Total - All	kg/day	0.7	1.4	58	< .0000147	.155	0 - .515

Outfall	Parameter	Unit	Current Limits		# Obs.	Percentiles		Data Range
			30 Day	Daily		50th	95th	
	Phenolic 4AAP, Total - All	µg/L	108	216	58	< 14	34.8	0 - 110
	Flow Rate	MGD	Monitor		1826	1.38	1.61	0 - 1.74
	Mercury, Total	ng/L	Monitor		21	.694	3.5	0 - 7.97
	pH Range Excursion, Maximum Duration	Minutes	--	60	119	--	--	0 - 0
	Acute Toxicity, *Ceriodaphnia dubia*	TUa	Monitor		20	< .2	.61	0 - .8
	Chronic Toxicity, *Ceriodaphnia dubia*	TUc	Monitor		19	2.83	10	0 - 26.1
	Acute Toxicity, *Pimephales promelas*	TUa	Monitor		20	--	--	< .2
	Chronic Toxicity, *Pimephales promelas*	TUc	Monitor		19	--	--	< 1
	pH, Maximum	S.U.	Monitor		1825	7.2	7.5	6.9 - 8.3
	pH, Minimum	S.U.	Monitor		1825	7.1	6.9*	6.5 - 7.6
	Residue, Total Filterable	kg/day	33312	--	8	8090	12200	2010 - 12800
	Residue, Total Filterable - 2018-2018	mg/L	4000	--	8	1500	2240	500 - 2270
	Residue, Total Filterable - 2018-2023	mg/L	Monitor		236	2400	3330	0 - 6200
	pH Range Excursions, > 60 Minutes	Number /Day	--	0	119	--	--	0 - 0
	pH Range Excursions, Monthly Total Duration	Minutes	--	446	60	--	--	0 - 0
007	Flow Rate	MGD	Monitor		1765	0	.049	0 - .279
008	pH	S.U.	Monitor		51	.006	8.65	0 - 9.6
	Total Suspended Solids	mg/L	Monitor		20	44.5	619	0 - 780
	Flow Rate	MGD	Monitor		1549	0	.0976	0 - .727
010	pH	S.U.	Monitor		11	8.1	8.7	7.7 - 8.8
	Total Suspended Solids	mg/L	Monitor		11	51	118	9 - 136
	Flow Rate	MGD	Monitor		399	0	0	0 - .177
011	Flow Rate	MGD	Monitor		1734	0	.002	0 - .018

* = For pH minimum and dissolved oxygen, 5th percentile shown in place of 95th percentile.
TR = Total Recoverable

Table 6. Projected Effluent Quality for Outfall 3IG00000003 (August 2018 - July 2023)

Parameter	Units	Number of Samples	Number > MDL	PEQ Average	PEQ Maximum
Aluminum	µg/L	3	3	96.36	132
Ammonia (Summer)	mg/L	240	43	0.16	0.26
Ammonia (Winter)	mg/L	176	44	0.36	0.53
Antimony	µg/L	3	3	2.85	3.9
Arsenic - TR	µg/L	3	3	30.66	42
Barium	µg/L	25	25	266.3	386.3
Boron	µg/L	3	3	1182.6	1620
Chlorides	mg/L	19	19	1576.2	1917.8
Chloroform (Trichloromethane)	µg/L	3	3	1.18	1.62
Chromium - TR	µg/L	61	13	11.68	16
Hexavalent Chromium (Dissolved)	µg/L	61	2	10.95	15
Cobalt	µg/L	3	3	0.48	0.66
Total Filterable Residue (Total Dissolved Solids)	mg/L	241	241	2987.3	3562.2
Fluoride	mg/L	35	35	5.6	8.7
Magnesium	mg/L	3	3	76.65	105
MBAS (foaming agents)	mg/L	2	2	0.72	0.99
Mercury	ng/L	21	16	4.8	8.3
Molybdenum	µg/L	3	3	219	300
Nickel - TR	µg/L	3	3	10.95	15
Phenolics	µg/L	58	15	80.3	110
Selenium - TR	µg/L	31	27	67.2	103
Sulfide	mg/L	58	13	0.03	0.05
Zinc - TR	µg/L	3	3	48.18	66

MBAS = methylene-blue active substances
MDL = analytical method detection limit
PEQ = projected effluent quality
TR = Total Recoverable

Table 7. Summary of Acute and Chronic Toxicity Results for Outfall 3IG00000003

Date	*Ceriodaphnia dubia* (TUa)	*Ceriodaphnia dubia* (TUc)	*Pimephales promelas* (TUa)	*Pimephales promelas* (TUc)
8/6/2018	AA (0.2)	--	AA (0.2)	--
12/14/2018	AA (0.2)	2.83	AA (0.2)	AA (1.0)
3/22/2019	0.2	3.14	AA (0.2)	AA (1.0)
6/21/2019	AA (0.2)	26.09	AA (0.2)	AA (1.0)
9/17/2019	AA (0.2)	3.18	AA (0.2)	AA (1.0)
12/6/2019	AA (0.2)	AA (1.0)	AA (0.2)	AA (1.0)
3/20/2020	0.6	2.83	AA (0.2)	AA (1.0)
6/19/2020	AA (0.2)	1.54	AA (0.2)	AA (1.0)
9/18/2020	AA (0.2)	1.57	AA (0.2)	AA (1.0)
12/22/2020	AA (0.2)	8.21	AA (0.2)	AA (1.0)
3/19/2021	AA (0.2)	2.83	AA (0.2)	AA (1.0)
6/29/2021	0.8	1.93	AA (0.2)	AA (1.0)
9/28/2021	AA (0.2)	2.83	AA (0.2)	AA (1.0)
12/10/2021	0.5	3.39	AA (0.2)	AA (1.0)
3/25/2022	AA (0.2)	1.64	AA (0.2)	AA (1.0)
6/28/2022	AA (0.2)	1.61	AA (0.2)	AA (1.0)
9/16/2022	AA (0.2)	1.71	AA (0.2)	AA (1.0)
12/16/2022	0.4	1.95	AA (0.2)	AA (1.0)
3/17/2023	AA (0.2)	1.7	AA (0.2)	AA (1.0)
6/23/2023	AA (0.2)	3.12	AA (0.2)	AA (1.0)

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

Table 8. Tuscarawas River Aquatic Life Use Attainment Table (Based on 2017 Ohio EPA Data)

River Mile	Station	Station Location	Attainment Status	Beneficial Use
89.00	R06W79	Tuscarawas River 0.13 mile upstream Massillon WWTP	Full	WWH
88.40	R06W82	Tuscarawas River 0.47 mile downstream Massillon WWTP	Full	WWH
83.50	R06W90	Tuscarawas River 0.08 mile upstream Navarre WWTP	Full	WWH
83.00	R06W92	Tuscarawas River 0.42 mile upstream Navarre WWTP	Full	WWH
80.51	**Marathon Canton Outfall 3IG00000003 Location**			
78.16	R06A02	Tuscarawas River west of Bolivar @ Dolphin Street	Full	WWH
72.60	R06K03	Tuscarawas River near Bolivar downstream of Sandy Creek	Full	WWH
68.70	R06K01	Tuscarawas River downstream Zoar Dam at Twp. Route 387	Full	WWH

WWH = warmwater Habitat
WWTP = wastewater treatment plant

Table 9. Water Quality Criteria in the Study Area

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum Aquatic Life	
		Human Health	Agri-culture	Aquatic Life		
Aluminum	µg/L	--	--	--	--	--
Ammonia (Summer)	mg/L	--	--	1.5	--	--
Ammonia (Winter)	mg/L	--	--	4	--	--
Antimony	µg/L	640	--	190	900	1800
Arsenic - TR	µg/L	--	100	150	340	680
Barium	µg/L	--	--	1600	7000	14000
Boron	µg/L	--	--	3900	33000	65000
Chlorides	mg/L	--	--	--	--	--
Chloroform (Trichloromethane)	µg/L	20000 [c]	--	140	1300	2600
Chromium - TR	µg/L	--	100	210	4300	8700
Hexavalent Chromium (Dissolved)	µg/L	--	--	11	16	31
Cobalt	µg/L	--	--	24	220	440
Total Filterable Residue (Total Dissolved Solids)	mg/L	--	--	1500	--	--
Fluoride	mg/L	--	2	--	--	--
Magnesium	mg/L	--	--	--	--	--
MBAS (foaming agents)	mg/L	--	--	--	0.5	--
Mercury	ng/L	12	10000	910	1700	3400
Molybdenum	µg/L	--	--	20000	190000	370000
Nickel - TR	µg/L	4600	200	130	1200	2300
Phenolics	µg/L	--	--	--	--	--
Selenium - TR	µg/L	4200	50	5	62	120
Sulfide	mg/L	--	--	--	--	--
Zinc - TR	µg/L	26000	25000	300	300	600

[c] = carcinogen
MBAS = methylene-blue active substances
TR = total recoverable

Table 10. Instream Conditions and Discharger Flow

Parameter	Units	Season	Value	Basis
Stream Flows				
1Q10	cfs	annual	78.2	USGS Gage 03117000 + Upstream WWTP flows*
7Q10	cfs	annual	85.2	USGS Gage 03117000 + Upstream WWTP flows*
30Q10	cfs	summer	95.2	USGS Gage 03117000 + Upstream WWTP flows*
		winter	124.2	USGS Gage 03117000 + Upstream WWTP flows*
Harmonic Mean	cfs	annual	227.2	USGS Gage 03117000 + Upstream WWTP flows*
Mixing Assumption	%	average	93.06	WLA Procedure (OAC 3745-1-02)
		maximum	93.06	WLA Procedure (OAC 3745-1-02)
Hardness, OMZ	mg/L	annual	293	STORET Stations R06A02 & R06K03; 2017; N= 15 (Median Value)
Hardness, IMZ	mg/L	annual	293	STORET Stations R06A02 & R06K03; 2017; N= 15 (Median Value)
pH	S.U.	summer	7.8	Navarre WWTP DMR Station 3PC00009901 (Surrogate - 2018-2023) & STORET Stations R06A02 & R06K03; 2017; N= 34 (75th Percentile)
		winter	7.9	Navarre WWTP DMR Station 3PC00009901 (Surrogate - No Available Downstream Data); 2018 - 2023; N= 15 (75th Percentile)
Temperature	ºC	summer	22.9	Navarre WWTP DMR Station 3PC00009901 (Surrogate - 2018-2023) & STORET Stations R06A02 & R06K03; 2017; N= 34 (75th Percentile)
		winter	6	Navarre WWTP DMR 901 Station (Surrogate - No Available Downstream Data); 2018 - 2023; N= 15 (75th Percentile)
Marathon Petroleum Canton Refinery flow	cfs (mgd)	annual	2.63 (1.7)	NPDES Application (Outfall 3IG00000003)
Background Water Quality				
Aluminum	µg/L	annual	485	Ohio EPA; 2003-2021; n=15; 1<MDL; STORET Station R06P81; Median Value
Ammonia (Summer)	mg/L	Summer	0.1	Ohio EPA; 2003-2021; n=16; 1<MDL; STORET Station R06P81; Median Value
Ammonia (Winter)	mg/L	Winter	0.16	Navarre WWTP DMR Station 3PC00009901; 2018 - 2023; N= 15; 0<MDL; Median Value
Antimony	µg/L	annual	0	No representative data available.

Parameter	Units	Season	Value	Basis
Arsenic - TR	µg/L	annual	3.99	Ohio EPA; 2003-2021; n=15; 0<MDL; STORET Station R06P81; Median Value
Barium	µg/L	annual	76	Ohio EPA; 2003-2021; n=15; 0<MDL; STORET Station R06P81; Median Value
Boron	µg/L	annual	0	No representative data available.
Chlorides	mg/L	annual	146.5	Ohio EPA; 2003-2021; n=16; 0<MDL; STORET Station R06P81; Median Value
Chloroform (Trichloromethane)	µg/L	annual	0	No representative data available.
Chromium - TR	µg/L	annual	15	Ohio EPA; 2003-2021; n=15; 9<MDL; STORET Station R06P81; Median Value
Hexavalent Chromium (Dissolved)	µg/L	annual	0	No representative data available.
Cobalt	µg/L	annual	0	No representative data available.
Total Filterable Residue (Total Dissolved Solids)	mg/L	annual	534	Ohio EPA; 2003-2021; n=16; 0<MDL; STORET Station R06P81; Median Value
Fluoride	mg/L	annual	0	No representative data available.
Magnesium	mg/L	annual	18.6	Ohio EPA; 2003-2021; n=15; 0<MDL; STORET Station R06P81; Median Value
MBAS (foaming agents)	mg/L	annual	0	No representative data available.
Mercury	ng/L	annual	0	No representative data available.
Molybdenum	µg/L	annual	0	No representative data available.
Nickel - TR	µg/L	annual	20	Ohio EPA; 2003-2021; n=15; 9<MDL; STORET Station R06P81; Median Value
Phenolics	µg/L	annual	0	No representative data available.
Selenium - TR	µg/L	annual	1	Ohio EPA; 2003-2021; n=15; 10<MDL; STORET Station R06P81; Median Value
Sulfide	mg/L	annual	0	No representative data available.
Zinc - TR	µg/L	annual	16	Ohio EPA; 2003-2021; n=15; 4<MDL; STORET Station R06P81; Median Value

(*) - 17.2 cfs from City of Massillon WWTP and Village of Navarre WWTP.

cfs = cubic feet per second (1 mgd = 1.547 cfs)
DMR = Discharge Monitoring Report
MDL = analytical method detection limit
n = number of samples
STORET = US EPA Storage and Retrieval Database
STORET Station R06A02 = Tuscarawas River at River Mile (RM) 78.16 - State Route R 212
STORET Station R06K03 = Tuscarawas River at RM 72.60 - Downstream Sandy Creek
STORET Station R06P81 = Tuscarawas River at RM 81.46 - Riverland Avenue
TR = Total Recoverable
USGS = United States Geological Survey
WLA = Wasteload Allocation

Table 11. Summary of Effluent Limits to Maintain Applicable Water Quality Criteria (Outfall 3IG00000003)

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
		Average			Maximum Aquatic Life	
		Human Health	Agri-culture	Aquatic Life		
Aluminum	µg/L	--	--	--	--	--
Ammonia (Summer)	mg/L	--	--	48.65	--	--
Ammonia (Winter)	mg/L	--	--	172.73	--	--
Antimony	µg/L	52085	--	5917	25800	1800
Arsenic - TR	µg/L	--	7817	4551	9636	680
Barium	µg/L	--	--	47538	198564	14000
Boron	µg/L	--	--	121459	946002	65000
Chlorides	mg/L	--	--	--	--	--
Chloroform (Trichloromethane)	µg/L	1627642	--	4360	37267	2600
Chromium - TR	µg/L	--	6932	6088	122852	8700
Hexavalent Chromium (Dissolved)	µg/L	--	--	343	459	31
Cobalt	µg/L	--	--	747	6307	440
Total Filterable Residue (Total Dissolved Solids)	mg/L	--	--	30618	--	--
Fluoride	mg/L	--	163	--	--	--
Magnesium	mg/L	--	--	--	--	--
MBAS (foaming agents)	mg/L	--	--	--	14	--
Mercury	ng/L	12	10000	910	1700	3400
Molybdenum	µg/L	--	--	622866	5446678	370000
Nickel - TR	µg/L	372750	14669	3446	33847	2300
Phenolics	µg/L	--	--	--	--	--
Selenium - TR	µg/L	341724	3989	126	1750	120
Sulfide	mg/L	--	--	--	--	--
Zinc - TR	µg/L	2114649	2033266	8861	8157	600

TR = total recoverable

Table 12. Parameter Assessment

Group 1:	Due to a lack of numeric criteria, the following parameters could not be evaluated at this time.		
	Aluminum	Chlorides	Magnesium
	Phenolics	Sulfide	
Group 2:	PEQ < 25 percent of WQS or all data below minimum detection limit. WLA not required. No limit recommended; monitoring optional.		
	Ammonia (Summer)	Ammonia (Winter)	Antimony
	Barium	Chloroform (Trichloromethane)	Chromium - TR
	Cobalt	Molybdenum	Nickel - TR
	Zinc - TR		
Group 3:	PEQmax < 50 percent of maximum PEL and PEQavg < 50 percent of average PEL. No limit recommended; monitoring optional.		
	Arsenic - TR	Boron	Hexavalent Chromium (Dissolved)
	Total Filterable Residue (Total Dissolved Solids)	Fluoride	MBAS (foaming agents)
	Mercury		
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.		
	Selenium - 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***
	No parameters placed in this group.		

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 3IG00000003						
Water Temperature	°C					M[c]
Total Precipitation	Inches	- - - - - - - - - - Monitor - - - - - - - - - - -				M[c]
Dissolved Oxygen	mg/L	- - - - - - - - - - Monitor - - - - - - - - - - -				M[c]
Biochemical Oxygen Demand, 5 Day	mg/L	29	55	187	354	ABS
Chemical Oxygen Demand (Low Level)	mg/L	191	382	1229	2458	ABS
Total Suspended Solids	mg/L	24	38	154	245	ABS
Oil and Grease, Total	mg/L	9	13	58	84	ABS
Ammonia (as N) - Summer	mg/L	3.6	25.2	23	162	ABS
Ammonia (as N) - Winter	mg/L	--	26.4	--	170	ABS
Phosphorus, Total (P)	mg/L					BTJ
Sulfide, Total	mg/L	0.13	0.29	0.8	1.9	ABS
Fluoride, Total (F)	mg/L	- - - - - - - - - - Monitor - - - - - - - - - - -				BTJ
Selenium, Total Recoverable	µg/L	- - - - - - - - - - Monitor - - - - - - - - - - -				BTJ
Chromium, Total Recoverable	µg/L	77	650	0.5	4.2	ABS
Chromium, Dissolved Hexavalent	µg/L	9	11	0.06	0.07	ABS
Phenolic 4AAP, Total	µg/L	108	216	0.7	1.4	ABS
Flow Rate	MGD	- - - - - - - - - - Monitor - - - - - - - - - - -				M[c]
Mercury, Total (Low Level)	ng/L	- - - - - - - - - - Monitor - - - - - - - - - - -				BTJ
Residue, Total Filterable	mg/L	- - - - - - - - - - Monitor - - - - - - - - - - -				BTJ
Chloride, Total	mg/L	- - - - - - - - - - Monitor - - - - - - - - - - -				BTJ
Chronic and Acute Toxicity, *Ceriodaphnia dubia*	TUc, TUa	- - - - - - - - - - Monitor - - - - - - - - - - -				BTJ
Chronic and Acute Toxicity, *Pimephales promelas*	TUc, TUa	- - - - - - - - - - Monitor - - - - - - - - - - -				BTJ
pH, Maximum (i.e. 9.0 S.U.)	S.U.	- - - - - - - - - - Monitor - - - - - - - - - - -				BTJ/WQS
pH, Minimum (i.e. 6.5 S.U.)	S.U.	- - - - - - - - - - Monitor - - - - - - - - - - -				BTJ/WQS
pH Range Excursion, Maximum Duration	Minutes	--	60	--	--	CFR

Parameter	Units	Concentration		Loading (kg/day)[a]		Basis[b]
		30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	
pH Range Excursions, > 60 Minutes	No./Day	--	0	--	--	CFR
pH Range Excursion, Monthly Total Duration	Minutes	--	446	--	--	CFR
Outfall 3G00000005 and 3IG00000006						
Dissolved Oxygen	mg/L					BTJ
pH	S.U.	--	6.5 - 9.0	--	--	WQS
Total Suspended Solids	mg/L	30	45	--	--	BPJ
Oil and Grease, Total	mg/L	--	10	--	--	WQS
Iron, Total Recoverable	µg/L	- - - - - - - - - - - Monitor - - - - - - - - - - - -				BTJ
Benzene	µg/L	--	5	--	--	BPJ
Ethylbenzene	µg/L	--	5	--	--	BPJ
Toluene	µg/L	--	5	--	--	BPJ
Xylene	µg/L	--	10	--	--	BPJ
Chlorine, Total Residual	mg/L	--	0.038	--	--	WQS/IMZM
Flow Rate		- - - - - - - - - - - Monitor - - - - - - - - - - - -				BTJ
Dissolved Oxygen	mg/L	- - - - - - - - - - - Monitor - - - - - - - - - - - -				BTJ

[a] Effluent loadings based on the following flow value(s): Outfall 3IG00000003 - 1.7 MGD.

[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
CFR = Code of Federal Regulations, 40 CFR 401.17
IMZM = Inside Mixing Zone Maximum
M = BEJ of Permit Guidance 2: Determination of Sampling Frequency Formula for Industrial Waste Discharges
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 (ELGs) - 40 CFR 419.22 - 419.24

Marathon Petroleum - Process Configuration					
Process	**Production Year**	**Capacity (1000 barrels)***	**Capacity Ratio**	**Weighting Factor**	**Process Config.**
Crude Processing					
Atmospheric Distillation	2021	98.5	1.00		
Vacuum Distillation	2019	31.2	0.32		
Crude Desalting	2019	85.4	0.87		
Sum			2.18	1	2.18
Cracking & Coking					
Fluid Catalytic Cracking	2021	20.1	0.20		
Hydrotreating	2019	80.5	0.82		
Sum			1.02	6	6.13
Asphalt Processes					
Asphalt Production	2019	16.4	0.17	12	2.00
Reforming/Alkylation					
Catalytic Reforming	2022	20	0.20	0	0.00
Total Process Configuration					**10.31**
Capacity (1000 barrels)		98.5			
Process Factor		**1.89**			
Size Factor		**1.13**			

* Capacity data is based on the highest annual value for the following period: 2019 - 2022; 2020 data was not utilized due to COVID-19 production slowdown.

419.22 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available (BPT).

Pollutant or pollutant property	BPT effluent limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
	Metric units (kilograms per 1,000 m^3 of feedstock)	
BOD*5*	28.2	15.6
TSS	19.5	12.6
COD	210.0	109
Oil and grease	8.4	4.5
Phenolic compounds	0.21	0.10
Ammonia as N	18.8	8.5
Sulfide	0.18	0.082
Total chromium	0.43	0.25
Hexavalent chromium	0.035	0.016
pH	([1])	([1])
	English units (pounds per 1,000 bbl feedstock)	
BOD*5*	9.9	5.5
TSS	6.9	4.4
COD	74.0	38.4
Oil and grease	3.0	1.6
Phenolic compounds	0.074	0.036
Ammonia as N	6.6	3.0
Sulfide	0.065	0.029
Total chromium	0.15	0.088
Hexavalent chromium	0.012	0.0056
pH	([2])	([2])

[1]Within the range of 6.0 to 9.0.

(1) Size factor.

1,000 bbl of feedstock per stream day	**Size factor**
Less than 24.9	0.91
25.0 to 49.9	0.95
50.0 to 74.9	1.04
75.0 to 99.9	**1.13**
100.0 to 124.9	1.23
125.0 to 149.9	1.35
150.0 or greater	1.41

(2) Process factor.

Process configuration	**Process factor**
Less than 2.49	0.58
2.5 to 3.49	0.63
3.5 to 4.49	0.74
4.5 to 5.49	0.88
5.5 to 5.99	1.00
6.0 to 6.49	1.09
6.5 to 6.99	1.19
7.0 to 7.49	1.29
7.5 to 7.99	1.41
8.0 to 8.49	1.53
8.5 to 8.99	1.67
9.0 to 9.49	1.82
9.5 or greater	**1.89**

Pollutant or pollutant property	BPT Effluent Limitations for Contaminated Runoff	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
	Metric units (kilograms per 1,000 m^3 of flow)	
BOD_5	48.	26.
TSS	33.	21.
COD	360.	180.
Oil and grease	15.	8.
Phenolic compounds (4AAP)	0.35	0.17
Total chromium	0.73	0.43
Hexavalent chromium	0.062	0.028
pH	([2])	([2])
	English units (pounds per 1,000 gallons of flow)	
BOD_5	0.40	0.22
TSS	0.28	0.18
COD	3.0	1.5
Oil and grease	0.13	0.067
Phenolic compounds (4AAP)	0.0029	0.0014
Total chromium	0.0060	0.0035
Hexavalent chromium	0.00052	0.00023
pH	([1])	([1])

[1]Within the range of 6.0 to 9.0.

419.23 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

Pollutant or pollutant property	BAT Effluent Limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
	Metric units (kilograms per 1,000 m^3 of feedstock)	
COD	210	109
Ammonia as N	18.8	8.5
Sulfide	0.18	0.082
	English units (pounds per 1,000 bbl of feedstock)	
COD	74.0	38.4
Ammonia as N	6.6	3.0
Sulfide	0.065	0.029

(1) Size factor.

1,000 bbl of feedstock per stream day	Size factor
Less than 24.9	0.91
25.0 to 49.9	0.95
50.0 to 74.9	1.04
75.0 to 99.9	1.13
100.0 to 124.9	1.23
125.0 to 149.9	1.35
150.0 or greater	1.41

(2) Process factor.

Process configuration	Process factor
Less than 2.49	0.58
2.5 to 3.49	0.63
3.5 to 4.49	0.74
4.5 to 5.49	0.88
5.5 to 5.99	1.00
6.0 to 6.49	1.09
6.5 to 6.99	1.19
7.0 to 7.49	1.29

7.5 to 7.99	1.41
8.0 to 8.49	1.53
8.5 to 8.99	1.67
9.0 to 9.49	1.82
9.5 or greater	1.89

Pollutant or pollutant property and process type	BAT Effluent Limitation Factor	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
	Metric units (kilograms per 1,000 cubic meters of feedstock)	
Phenolic compounds (4AAP):		
Crude	0.037	0.009
Cracking and coking	0.419	0.102
Asphalt	0.226	0.055
Lube	1.055	0.257
Reforming and alkylation	0.377	0.092
Total chromium:		
Crude	0.030	0.011
Cracking and coking	0.340	0.118
Asphalt	0.183	0.064
Lube	0.855	0.297
Reforming and alkylation	0.305	0.106
Hexavalent chromium:		
Crude	0.0019	0.0009
Cracking and coking	0.0218	0.0098
Asphalt	0.0117	0.0053
Lube	0.0549	0.0248
Reforming and alkylation	0.0196	0.0088
	English units (pounds per 1,000 bbl of feedstock)	
Phenolic compounds (4AAP):		
Crude	0.013	0.003
Cracking and coking	0.147	0.036

Asphalt	0.079	0.019
Lube	0.369	0.090
Reforming and alkylation	0.132	0.032
Total chromium:		
Crude	0.011	0.004
Cracking and coking	0.119	0.041
Asphalt	0.064	0.022
Lube	0.299	0.104
Reforming and alkylation	0.107	0.037
Hexavalent chromium:		
Crude	0.0007	0.0003
Cracking and coking	0.0076	0.0034
Asphalt	0.0041	0.0019
Lube	0.0192	0.0087
Reforming and alkylation	0.0069	0.0031

Pollutant or pollutant property	**BAT Effluent Limitations for Contaminated Runoff**	
	Maximum for any 1 day	**Average of daily values for 30 consecutive days shall not exceed**
	Metric units (kilograms per 1,000 m^3 of flow)	
Phenolic compounds (4AAP)	0.35	0.17
Total chromium	0.60	0.21
Hexavalent chromium	0.062	0.028
COD	360	180
	English units (pounds per 1,000 gallons of flow)	
Phenolic compounds (4AAP)	0.0029	0.0014
Total chromium	0.0050	0.0018
Hexavalent chromium	0.00052	0.00023
COD	3.0	1.5

419.24 Effluent limitations guidelines representing the degree of effluent reduction attainable by the application of the best conventional pollutant control technology (BCT).

Pollutant or pollutant property	BCT Effluent Limitations	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
	Metric units (kilograms per 1,000 (m^3 of feedstock)	
BOD_5	28.2	15.6
TSS	19.5	12.6
Oil and grease	8.4	4.5
pH	([1])	([1])
	English units (pounds per 1,000 bbl of feedstock)	
BOD_5	9.9	5.5
TSS	6.9	4.4
Oil and grease	3.0	1.6
pH	([1])	([1])

[1] Within the range of 6.0 to 9.0.

(1) Size factor.

1,000 bbl of feedstock per stream day	Size factor
Less than 24.9	0.91
25.0 to 49.9	0.95
50.0 to 74.9	1.04
75.0 to 99.9	1.13
100.0 to 124.9	1.23
125.0 to 149.9	1.35
150.0 or greater	1.41

(2) Process factor.

Process configuration	Process factor
Less than 2.49	0.58
2.5 to 3.49	0.63
3.5 to 4.49	0.74
4.5 to 5.49	0.88
5.5 to 5.99	1.00

6.0 to 6.49	1.09
6.5 to 6.99	1.19
7.0 to 7.49	1.29
7.5 to 7.99	1.41
8.0 to 8.49	1.53
8.5 to 8.99	1.67
9.0 to 9.49	1.82
9.5 or greater	1.89

Pollutant or pollutant property	BCT Effluent Limitations for Contaminated Runoff	
	Maximum for any 1 day	Average of daily values for 30 consecutive days shall not exceed
	Metric units (kilograms per 1,000 m^3 of flow)	
BOD_5	48	26
TSS	33	21
Oil and grease	15	8
pH	([1])	([1])
	English units (pounds per 1,000 gallons of flow)	
BOD_5	0.40	0.22
TSS	0.28	0.18
Oil and grease	0.13	0.067
pH	([1])	([1])

[1]Within the range of 6.0 to 9.0.

Attachment 2. Summary of ELG Calculated Limits

Marathon Petroleum - Applicable BCT/BAT limits				**Production Capacity (Barrels Per day) = 98,500 Process Factor = 1.89 Size Factor = 1.13**			
Process Wastewater		**40 CFR 419.22 - 24**		**Limits (w/o Storm Water)**		**Limits (with Storm Water)**	
Parameter	**1000 Barrels**	**30-Day Avg. (lbs./1000 barrels)**	**Daily Max. (lbs./1000 barrels)**	**30-Day Avg. (kg/day)**	**Daily Maximum (kg/day)**	**30-Day Avg. (kg/day)**	**Daily Maximum (kg/day)**
BOD5	98.5	5.5	9.9	525.29	945.51	**539.27**	**970.94**
TSS	98.5	4.4	6.9	420.23	658.99	**431.67**	**676.79**
Oil & Grease	98.5	1.6	3	152.81	286.52	**157.07**	**294.78**
COD	98.5	38.4	74	3667.44	7067.47	**3762.78**	**7258.15**
Ammonia	98.5	3	6.6	286.52	630.34	**286.52**	**630.34**
Sulfide	98.5	0.029	0.065	2.77	6.21	**2.77**	**6.21**
Phenolics							
Crude	98.5	0.003	0.013	0.13	0.58		
Cracking	80.5	0.036	0.147	1.32	5.37		
Asphalt	16.4	0.019	0.079	0.14	0.59		
Reforming/Alkylation	20	0.032	0.132	0.29	1.20		
Sum				1.88	7.74	**1.97**	**7.92**
Chromium							
Crude	98.5	0.004	0.011	0.18	0.49		
Cracking	80.5	0.041	0.119	1.50	4.35		
Asphalt	16.4	0.022	0.064	0.16	0.48		
Reforming/Alkylation	20	0.037	0.107	0.34	0.97		
Sum				2.18	6.29	**2.29**	**6.61**

Hexavalent Chromium							
Crude	98.5	0.0003	0.0007	0.01	0.03		
Cracking	80.5	0.0034	0.0076	0.12	0.28		
Asphalt	16.4	0.0019	0.041	0.01	0.31		
Reforming/Alkylation	20	0.0031	0.0069	0.03	0.06		
Sum				0.18	0.68	**0.19**	**0.71**
Storm Water		***419.22 - 24 (lbs./1000 gallons)***		***Storm Water Limits (kg/day)***			
		30-day Avg.	**Daily Max.**	**30-day Avg.**	**Daily Max.**		
BOD5		0.22	0.4	13.98	25.42		
TSS		0.18	0.28	11.44	17.80		
Oil & Grease		0.067	0.13	4.26	8.26		
COD		1.5	3	95.34	190.68		
Phenolics		0.0014	0.0029	0.09	0.18		
Chromium		0.0018	0.005	0.11	0.32		
Hexavalent chromium		0.00023	0.00052	0.01	0.03		
Storm Water Flow (MGD)	0.14						

Attachment 3. List of Approved Treatment Additives

Chemical Name	Use	Approval Date
Advantage Plus 1400	Boiler Feed Water	20-Oct-2005
Advantage Plus 1455	Boiler Feed Water	12-Sep-2008
Advantage Plus 6445	Boiler Feed Water	19-Feb-2004
Amercor CNA6230	Boiler Feed Water	28-Sep-2021
Amerzine 35	Boiler Feed Water	19-Feb-2004
Drewclean 2001	Boiler Feed Water	19-Feb-2004
Drewclean 38	Boiler Feed Water	19-Feb-2004
Drewcor 2130	Boiler Feed Water	19-Feb-2004
Drewfloc 2270	Boiler Feed Water	19-Feb-2004
Drewplex 505	Boiler Feed Water	20-Oct-2005
Drewplus ED 795	Boiler Feed Water	19-Feb-2004
MEKOR 6701	Boiler Feed Water	20-Oct-2005
MEKOR 70	Boiler Feed Water	30-Jun-2004
ECO 22-4NG	Centrifuge	1-Jun-2020
ECO 91NG	Centrifuge	1-Jun-2020
Hyperfloc CE 2084G	Centrifuge	18-Aug-2020
Hyperfloc CE 7064	Centrifuge	5-Jan-2022
Amersite 11	Cooling Water	10-May-2018
Amersite 2230	Cooling Water	31-Oct-2018
Amersite CHZ	Cooling Water	14-Dec-2006
Biosperse 250	Cooling Water	3-Mar-1992
Biosperse 254	Cooling Water	30-Apr-1993
Biosperse 257	Cooling Water	3-Mar-1992
Biosperse 261T	Cooling Water	13-Jul-2007
Biosperse 550	Cooling Water	6-Jun-2005
Biosperse CN7539	Cooling Water	19-Oct-2016
Biosperse CN8109	Cooling Water	13-Jul-2020
DiolTech 321	Cooling Water	18-Dec-1991
Drew 11-166	Cooling Water	31-Oct-2018
Drew 11-720	Cooling Water	19-Feb-2004
Drew 11-740	Cooling Water	21-Feb-2003
Drew 11-760	Cooling Water	19-Feb-2004
Drew 14-123	Cooling Water	21-May-1997
Drew 2301	Cooling Water	13-Jul-2007
Drew 2315	Cooling Water	15-Jul-2016
Drewchlor 4107	Cooling Water	19-Feb-2004
Drewgard 120	Cooling Water	18-Aug-2009
Drewgard 189C	Cooling Water	19-Feb-2004
Drewguard 189E	Cooling Water	30-Apr-1993
Drewplus L718	Cooling Water	13-Jul-2020
Drewsperse 6935	Cooling Water	18-Aug-2009

Chemical Name	Use	Approval Date
Millisperse 956	Cooling Water	19-Feb-2004
Performax 400	Cooling Water	2-Oct-1990
Performax 401	Cooling Water	18-Dec-1991
Performax 405	Cooling Water	19-Feb-2004
Performax 440	Cooling Water	30-Apr-1993
Performax CL4291	Cooling Water	13-Jul-2020
Performax DC5200	Cooling Water	13-Jul-2020
Performax MX1260	Cooling Water	13-Jul-2020
Performax PM3302	Cooling Water	29-Mar-2021
Performax SR5600 (formerly Drewsperse 739)	Cooling Water	19-Feb-2004
Protecscol 629P	Cooling Water	19-Feb-2004
WPD 11-166	Cooling Water	19-Jul-2007
WRICO ZM-105	Cooling Water	18-Dec-1991
Drewfloc 2449-VA	DAF Unit	4-Nov-2020
Drewplus ED750	WWTP	7-Jul-2021

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
OMZM	Outside mixing zone maximum
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