pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0024694**
Facility Type	**Municipal**	APS ID	**321676**
Major / Minor	**Major**	Authorization ID	**1292010**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Beaver Borough Municipal Authority**	Facility Name	**Beaver Borough STP**
Applicant Address	469 Third Street	Facility Address	Beaver Street at River Road
	Beaver, PA 15009-2226		Beaver, PA 15009
Applicant Contact	Daniel Martone	Facility Contact	Scott Snyder
Applicant Phone	(412) 292-6199	Facility Phone	724-773-6700
Client ID	619	Site ID	263560
Ch 94 Load Status	Not Overloaded	Municipality	Beaver Borough
Connection Status	No Limitations	County	Beaver
Date Application Received	October 11, 2019	EPA Waived?	No
Date Application Accepted	October 15, 2019	If No, Reason	Major Facility
Purpose of Application	Application for renewal of an NPDES Permit.		

Summary of Review

The permittee has applied for a renewal of NPDES Permit No. PA0024694. NPDES Permit No. PA0024694 was previously issued by the PA Department of Environmental Protection (DEP) on October 21, 2014. That permit expired on October 31, 2019. The permit was granted an administrative extension.

Sewage from this facility is treated with primary solids removal followed by extended aeration with activated sludge, clarification, and UV disinfection prior to discharging to the Ohio River (ID 32317), which is classified as a Warm Water Fishery (WWF) per Chapter 93 Designated Use and is located in State Watershed No. 20-B.

Outfall Number	Receiving Stream	Discharge Type	Outfall Purpose
001	Ohio River	Treated Sewage Effluent	Main outfall from the STP
002	Ohio River	Separate	Emergency Bypass
003	Ohio River	Separate	Emergency Bypass

Outfall 002 and 003 are emergency bypasses. Discharge from these bypasses is considered to be a Separate Sewer Outfall (SSO) and is prohibited by law. Operations is notified of overflows and will take action if needed.

Sewage sludge is treated by thickening in a gravity thickener followed by a belt filter press prior to disposal in Brunner Landfill.

The applicant has complied with Act 14 Notifications with letters dated October 1, 2020 and sent to Beaver Borough and Beaver County. No comments were received.

Approve	Deny	Signatures	Date
X		Stephanie Conrad / Environmental Engineering Specialist	January 24, 2023
x		Mahbuba Iasmin, Ph.D., P.E. / Environmental Engineer Manager	March 1, 2023

Summary of Review

The applicant is currently enrolled in and will continue to use eDMR.

Beaver Borough STP does not have any industrial users.

Changes since the last permit renewal include:

- Relocation of the outfall from 40° 41' 34", -80° 17' 59" to 40° 41' 35.2", -80° 17' 41.4"
- Addition of monthly *E. coli* monitoring
- Addition of quarterly total dissolved solids monitoring
- Increase in monitoring frequency of total nitrogen and total phosphorus to twice a week

Anti-Backsliding

Section 402(o) of the Clean Water Act (CWA), enacted in the Water Quality Act of 1987, establishes anti-backsliding rules governing two situations. The first situation occurs when a permittee seeks to revise a Technology-Based effluent limitation based on BPJ to reflect a subsequently promulgated effluent guideline which is less stringent. The second situation addressed by Section 402(o) arises when a permittee seeks relaxation of an effluent limitation which is based upon a State treatment standard of water quality standard.

Previous limits can be used pursuant to EPA's anti-backsliding regulation 40 CFR 122.44 **(l) Reissued permits. (1) Except as provided in paragraph (l)(2) of this section when a permit is renewed or reissued. Interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit (unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification or revocation and reissuance under §122.62). (2) In the case of effluent limitations established on the basis of Section 402(a)(1)(B) of the CWA, a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under section 304(b) subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.**

The facility is not seeking to revise the previously permitted effluent limits.

2018 Corrective Acton Plan

In 2018, Beaver Borough Municipal Authority (BBMA) reported a hydraulic overload in its 2017 Annual Wasteload Management Report. As a result, the Department requested BBMA submit a Corrective Action Plan (CAP). BBMA submitted a CAP consisting of six tasks including smoke testing and sewer repairs. The work proposed in the CAP has been completed and BBMA continues to perform work and investigations aimed at reducing inflow and infiltration in the conveyance system.

Summary of Whole Effluent Toxicity (WET) Tests

The 2014 permit required Beaver Borough to collect discharge samples and perform WET tests to generate chronic survival and reproduction data for *Cladoceran* (water flea) and *Ceriodaphnia dubia,* and chronic survival and growth data for *Pimephales promelas* (fathead minnow). The dilution series for these tests was: 1%, 2%, 30%, 60%, and 100%. The Target Instream Waste Concentration (TIWC) used to analyze the results was 1%.

Beaver Borough passed three of its last four annual WET tests conducted in June 2018, July 2019, July 2020, and July 2021. Beaver Borough Municipal Authority (BBMA) failed for reproduction of *Ceriodaphnia dubia* in the test dated July 6, 2021 and BBMA conducted confirmation testing on December 21, 2021. The confirmation test evaluated all four end points and all tests passed. In accordance with Appendix D of the Department's SOP for *Whole Effluent Toxicity* [SOP No. BPNPSM-PMT-031] if a passing result is determined for all endpoints in the re-test, then the facility may resume annual monitoring.

The Target In-Stream Waste Concentration (TIWC) in this permit will again be 1% and the dilution series 1%, 2%, 30%, 60%, and 100%.

Public Participation

Summary of Review
DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	1.045
Latitude	40º 41' 35.2"	Longitude	-80º 17' 41.4"
Quad Name	Beaver	Quad Code	1303
Wastewater Description:	Sewage Effluent		
Receiving Waters	Ohio River	Stream Code	32317
NHD Com ID	134396159	RMI	954.8
Drainage Area	22,800	Yield (cfs/mi^2)	0.258
Q_{7-10} Flow (cfs)	5,880	Q_{7-10} Basis	US Army Corp of Engineers
Elevation (ft)	682	Slope (ft/ft)	
Watershed No.	20-B	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	ORGANIC ENRICHMENT, SILTATION		
Source(s) of Impairment	HABITAT MODIFICATION - OTHER THAN HYDROMODIFICATION, HIGHWAY/ROAD/BRIDGE RUNOFF (NON-CONSTRUCTION RELATED), RURAL (RESIDENTIAL AREAS)		
TMDL Status		Name	

Background/Ambient Data		Data Source
pH (SU)		
Temperature (°F)		
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake	Center Township Water Authority		
PWS Waters	Ohio River	Flow at Intake (MGD)	3.0
PWS RMI	953.49	Distance from Outfall (mi)	1.53

Changes Since Last Permit Issuance: BBMA has submitted a WQM Permit amendment application to move the outfall location from 40º 41’ 34”, -80º 17’ 59” to 40º 41’ 35.2”, -80º 17’ 41.4”. Permit limits for this renewal were modeled at the new location and the location change did not affect any permit limits.

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	002	Design Flow (MGD)	NA
Latitude	40° 41’ 10”	Longitude	-80° 19’ 2”
Quad Name	Beaver	Quad Code	1303
Wastewater Description:	Emergency Bypass		
Receiving Waters	Ohio River	Stream Code	32317

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	003	Design Flow (MGD)	NA
Latitude	40° 41’ 34”	Longitude	-80° 17’ 59”
Quad Name	Canonsburg	Quad Code	1303
Wastewater Description:	Emergency Bypass		
Receiving Waters	Ohio River	Stream Code	32317

Treatment Facility Summary

Treatment Facility Name: Beaver Borough STP

WQM Permit No.	Issuance Date	Purpose
0469403	June 6, 1969	Permit issued to Beaver Borough by PADEP for construction of a sewage treatment plant consisting of: • One (1) Manually Cleaned Bar Screen • One (1) 2.3 MGD comminutor • Four (4) 252,000-gallon Aeration Tank • Two (2) 30' Diameter Final settling tank • One (1) Chlorine Contact Tank with gas chlorination at a rate of 12 mg/L at 1 MGD • One (1) Sludge holding tank • On (1) 600 gal/hr Vacuum Filter • Ferric Chloride and Lime Chemical Addition
0483402	January 2, 1985	Permit issued to Beaver Borough by PADEP approving plant modifications including: • Replacement of the existing pump station with a dry well and wet well • Installation of two 450 gpm pumps • Replacement of existing bar screen with a mechanically cleaned bar screen • Replacement of the existing comminutor with a 1.6 MGD comminutor • Conversion of a settling tank to a sludge thickener • Installation of one (1) 14 x 10.5 ft aerated grit chamber • Installation of two, 97,750 gal final clarifiers • Installation of a 94-gallon digester • Installation pf a 70-gal sludge holding tank • Installation of two 15,000-gal chlorine contact tanks and two gas chlorine disinfection units • Installation of a 6.5 ton/day belt filter press • Installation of a new operations building • Polymer addition to stilling well and belt press
0483402 A-1	April 17, 2018	Permit issued to Beaver Borough by PADEP approving the replacement of the gaseous chlorine disinfection with UV disinfection.
0483402 A-2	Pending	Permit application to move the outfall location from 40° 41' 34", -80° 17' 59" to 40° 41' 35.2", -80° 17' 41.4".

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Extended Aeration and activated sludge	Ultraviolet	1.045

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
1.045	1741	Not Overloaded	Gravity Thickening	Landfill

Changes Since Last Permit Issuance: The department issued 0483402 A-1 which approved installation of UV treatment and removed the chlorine disinfection units.

Compliance History

Operations Compliance Check Summary Report

Facility: Beaver Borough STP

NPDES Permit No.: PA0024694

Compliance Review Period: 9/1/2017-9/22/2022

Inspection Summary

INSPECTED DATE	INSP TYPE	AGENCY	INSPECTION RESULT DESC
05/23/2022	Compliance Evaluation	PA Dept of Environmental Protection	Violation(s) Noted
06/17/2021	Compliance Evaluation	PA Dept of Environmental Protection	Violation(s) Noted
05/24/2021	Administrative/File Review	PA Dept of Environmental Protection	No Violations Noted
08/23/2019	Compliance Evaluation	PA Dept of Environmental Protection	Violation(s) Noted
08/15/2018	Compliance Evaluation	PA Dept of Environmental Protection	Violation(s) Noted

Violation Summary

VIOL ID	VIOLATION DATE	VIOLATION TYPE	VIOLATION TYPE DESC	RESOLVED DATE
956350	05/23/2022	92A.41(A)5	NPDES - Failure to properly operate and maintain all facilities which are installed or used by the permittee to achieve compliance	6/30/2022
920795	06/17/2021	92A.44	NPDES - Violation of effluent limits in Part A of permit	06/18/2021
920796	06/17/2021	92A.41(A)5	NPDES - Failure to properly operate and maintain all facilities which are installed or used by the permittee to achieve compliance	06/18/2021
862635	08/23/2019	92A.41(A)13B	NPDES - Unauthorized bypass occurred	09/12/2019
862636	08/23/2019	92A.61(C)	NPDES - Failure to monitor pollutants as required by the NPDES permit	09/12/2019
862637	08/23/2019	92A.44	NPDES - Violation of effluent limits in Part A of permit	09/12/2019
841277	08/15/2018	92A.41(A)13B	NPDES - Unauthorized bypass occurred	01/13/2019
841279	08/15/2018	92A.44	NPDES - Violation of effluent limits in Part A of permit	01/13/2019
841280	08/15/2018	92A.44	NPDES - Violation of effluent limits in Part A of permit	01/13/2019

Open Violations by Client ID:

No open violations for Client ID 619

Enforcement Summary

ENF TYPE	EXECUTED DATE	VIOLATIONS	ENF FINAL STATUS	ENF CLOSED DATE
NOV	06/30/2022	92A.41(A)5	Administrative Close Out	9/22/2022
NOV	06/28/2021	92A.41(A)5; 92A.44	Administrative Close Out	07/29/2022
NOV	09/12/2019	92A.41(A)13B; 92A.44; 92A.61(C)	Administrative Close Out	04/12/2021
NOV	01/15/2019	92A.41(A)13B; 92A.44	Comply/Closed	12/09/2019

Effluent Violation Summary

Mon Pd End Date	PARAMETER	SAMPLE	PERMIT	UNITs	STAT_BASE_CODE
10/31/19	Fecal Coliform	1820	400	No./100 ml	Instantaneous Maximum
4/30/19	Fecal Coliform	1040	400	No./100 ml	Instantaneous Maximum
1/31/18	Total Suspended Solids	448.2	392.4	lbs/day	Weekly Average
1/31/18	Total Suspended Solids	97	45	mg/L	Weekly Average

Compliance Status:

Facility does not currently have any open violations or pending enforcements but was under a CAP in recent years for wet weather bypasses from River Road Pump Station. Hydraulic or Organic loading is not indicated in the 2021 Chapter 94 report, though additional bypasses have been reported since the CAP was completed in 2018. Plans to continue with investigatory work in the collection system, and improve operation of the pump station, are indicated in the 2021 Chapter 94 report. To address Operation & Maintenance Violations for failure of the grit removal system, the Authority is in the process of having a new headworks facility designed. It is anticipated that the new facility will be online in 2024. Operations will continue to monitor bypasses and pursue another CAP if needed.

Completed by: Amanda Schmidt

Completed date: 9/22/22

Compliance History

DMR Data for Outfall 001 (from August 1, 2021 to July 31, 2022)

Parameter	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21
Flow (MGD) Average Monthly	0.369	0.404	0.502	0.496	0.533	0.751	0.454	0.481	0.407	0.441	0.431	0.473
pH (S.U.) Instantaneous Minimum	7.07	7.2	7.06	7.03	6.96	6.76	7.1	7.14	7.15	7.14	7.17	7.14
pH (S.U.) Instantaneous Maximum	7.4	7.43	7.31	7.33	7.33	7.51	7.35	7.3	7.31	7.41	7.38	7.52
DO (mg/L) Instantaneous Minimum	4.3	4.8	6.1	7.1	7.3	6.1	8.1	6.0	5.9	5.1	5.0	4.9
$CBOD_5$ (lbs/day) Average Monthly	24.0	20.2	26.8	27.3	21.8	33.8	22.7	22.5	19.35	25.75	26.95	26.8
$CBOD_5$ (lbs/day) Weekly Average	28.9	25.8	33.1	31.0	38.2	39.2	24.99	24.1	22.91	31.45	30.01	35.3
$CBOD_5$ (mg/L) Average Monthly	7.8	6.0	6.4	6.6	4.9	5.4	6.0	5.6	5.7	7.0	7.5	6.8
$CBOD_5$ (mg/L) Weekly Average	9.4	7.65	7.9	7.75	8.6	6.26	6.6	6.0	6.75	8.55	8.35	8.95
BOD_5 (lbs/day) Raw Sewage Influent Average Monthly	1363.3	1445.5	1540.7	1423.0	1284.7	1590.9	1120.8	966.8	1093.0	1202.7	1240.1	1136.1
BOD_5 (lbs/day) Raw Sewage Influent Daily Maximum	2105.0	2163.0	2251.0	2287.0	1620.0	2159.0	1812.0	1656.0	1348.0	1340.0	2135.0	1565.0
BOD_5 (mg/L) Raw Sewage Influent Average Monthly	443.0	429.0	368.0	344.0	289.0	254.0	296.0	241.0	322.0	327	345.0	288.0
TSS (lbs/day) Average Monthly	58.5	47.2	37.7	28.9	26.7	62.6	22.7	44.1	40.73	66.2	64.7	47.3
TSS (lbs/day) Raw Sewage Influent Average Monthly	790.9	1128.7	983.87	976.2	844.6	1434.3	954.2	657.9	780.7	1151.2	934.6	836.3

TSS (lbs/day) Raw Sewage Influent Daily Maximum	1192.0	2874.0	1785.0	1794.0	1146.0	2073.0	1706.0	1108.0	1085.0	1457.0	1263.0	2428.0
TSS (lbs/day) Weekly Average	107.7	82.5	52.3	45.5	71.1	115.9	37.9	82.2	52.6	85.3	80.87	80.9
TSS (mg/L) Average Monthly	19.0	14.0	9.0	7.0	6.0	10.0	6.0	11.0	12.0	18.0	18.0	12.0
TSS (mg/L) Raw Sewage Influent Average Monthly	257.0	335.0	235.0	236.0	190.0	229.0	252.0	164	230.0	313.0	260.0	212
TSS (mg/L) Weekly Average	35.0	24.5	12.5	11.0	16.0	18.5	10.0	20.5	15.5	23.2	22.5	20.5
Fecal Coliform (No./100 ml) Geometric Mean	6.21	3.62	3.61	1.71	1	6.06	2.5	1.94	3.21	3.73	11.41	8.46
Fecal Coliform (No./100 ml) Instantaneous Maximum	240.0	20.0	30.0	6.0	1	2420.0	6.0	8.0	9.0	14.0	45.0	29.0
UV Transmittance (%) Daily Minimum	57	51	55	85	91	64	98	98	94	94	68	78
UV Transmittance (%) Average Monthly	88	68	74	95	96	92	99	99	99	99	80	97
Total Nitrogen (mg/L) Daily Maximum		19.9			21.0			24.36			19.85	
Ammonia (lbs/day) Average Monthly	0.95	1.0	1.26	1.24	1.3	4.8	1.14	1.3	1.2	1.14	1.15	1.2
Ammonia (mg/L) Average Monthly	0.31	0.3	0.3	0.3	0.3	0.77	0.3	0.33	0.35	0.31	0.32	0.3
Total Phosphorus (mg/L) Daily Maximum		2.95			2.09			2.69			3.88	

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 1.045
Latitude 40º 41' 35.2" **Longitude** -80º 17' 41.4"
Wastewater Description: Sewage Effluent

Technology-Based Limitations (TBELs)

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	IMAX	-	92a.47(a)(4)
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geo Mean	-	92a.47(a)(5)
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	IMAX	-	92a.47(a)(5)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Water Quality-Based Limitations (WQBELs)

Pursuant to EPA's approval of Pennsylvania's 2017 Triennial Review of Water Quality Standards and corresponding regulatory changes published in the Pennsylvania Bulletin on July 11, 2020, new water quality criteria for ammonia-nitrogen apply to waters of the commonwealth. Therefore, WQBELs for Outfall 001 are being re-evaluated even though there have been no changes to the STP.

WQM 7.0 Water Quality Modeling

DEP's WQM 7.0 version 1.1 model is a Microsoft Access Program used for sewage dischargers to determine whether TBELs are sufficient to meet in-stream water quality criteria for ammonia-nitrogen, carbonaceous biochemical oxygen demand ($CBOD_5$), and dissolved oxygen (DO). To accomplish this, the model simultaneously simulates mixing and degradation of ammonia-nitrogen and mixing and consumption of DO through $CBOD_5$ and ammonia-nitrogen degradation. WQM 7.0 determines the highest pollutant loadings that the stream can assimilate while still meeting water quality criteria under design conditions.

The model is a two-step process. The discharge is first modeled for the summer period (May through October) because warm temperatures are more likely to result in critical loading conditions. Reduced DO levels likely also play a role in ammonia toxicity and solubility of DO decreases at increased water temperature. If summer modeling determines that WQBELs are appropriate for the summer period, then modeling is completed for the winter period (November through April). This is in accordance with DEP's "*Implementation Guidance of Section 93.7 Ammonia Criteria"* [Doc. No. 391-2000-013] (Ammonia Guidance).

River Mile Index (RMI) was measured in eMAP PA as the distance from the facility's outfall to the mouth of the Ohio River. Elevation was read by applying a topomap in eMAP PA. Discharge point and downstream drainage areas were generated by USGS Stream Stats. Q_{7-10} flow is regulated in the vicinity of the outfall at 5,880 cfs by the US Army Corps of Engineers. In the absence of site-specific data, discharge temperature, stream temperature, and stream pH were assumed to be 20, 25, and 7 in accordance with the Ammonia Guidance. Stream width was measured in Google Earth to be 1171 ft and depth was assumed to be 12 ft.

WQM 7.0 modeling inputs are documented in the table below:

Discharge Characteristics		Basin/Stream Characteristics	
Parameter	**Value**	**Parameter**	**Value**
River Mile Index (RMI)	954.8	Drainage Area	22800
Discharge Flow (MGD)	1.045	Q_{7-10} (cfs)	5,880
Discharge Temp (°C)	20	Low-flow yield (cfs/mi^2)	0.258
Ammonia-Nitrogen (mg/L)	25	Elevation (ft)	680
$CBOD_5$ (mg/L)	25	Stream Width (ft)	1171
		Stream Depth (ft)	12
		Stream Temp (°C)	25
		Stream pH (s.u.)	7

The discharge was evaluated using WQM 7.0 to evaluate the $CBOD_5$, ammonia-nitrogen and DO parameters. The modeling results show technology based effluent limitations for $CBOD_5$, ammonia-nitrogen, and DO are appropriate. WQBELs for DO, $CBOD_5$, and ammonia-nitrogen will not be imposed to this facility during the permit cycle. WQM 7.0 modeling output files are included in Attachment A.

In accordance with Section 1.A. Note 4. of the Department's SOP *Establishing Effluent Limitations for Individual Sewage Permits* [SOP no. BCW-PMT-033 Version 1.9], for existing permits where WQM modeling results for summer indicate that an average monthly limit of 25 mg/L is acceptable, a year-round monitoring requirement will be imposed for ammonia-nitrogen as a minimum. Year-round monitoring is imposed at a sampling frequency of 2/week in accordance with Table 6.3, Self-Monitoring Requirements for Sewage Dischargers, from the Department's *Technical Guidance for the Development and Specification of Effluent Limitations* [Doc no.362-0400-001]. This requirement is not changing from the previous permit.

Toxics Management Spreadsheet Water Quality Modeling Program and Procedure for Evaluating Reasonable Potential

DEP's Toxics Management Spreadsheet Version 1.3 (TMS) is a Microsoft Excel ® spreadsheet that facilitates the evaluation of a single discharger by performing the calculations necessary to complete a Reasonable Potential Analysis and determine WQBELs for discharges of toxic and nonconventional pollutants.

The TMS evaluates each pollutant by computing a Wasteload Allocation for each applicable criterion, determining the most stringent governing WQBEL, and comparing that governing WQBEL to the input discharge concentration to determine whether permit requirements apply in accordance with the following reasonable potential thresholds as documented in the Department's SOP *Establishing Water Quality-Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers* [SOP no. BCW-PMT-037] :

- Establish limits in the permit where the maximum reported effluent concentration or calculated average monthly effluent concentration equals or exceeds 50% of the WQBEL. Use the average monthly, maximum daily, and instantaneous maximum (IMAX) limits for the permit as recommended by the TMS.

- For non-conservative pollutants, establish monitoring requirements where the maximum reported effluent concentration or calculated average monthly effluent concentration is between 25% - 50% of the WQBEL.

- For conservative pollutants, establish monitoring requirements where the maximum reported effluent concentration or calculated average monthly concentration is between 10% - 50% of the WQBEL.

TMS requires input data including stream code, RMI, elevation, drainage area, low flow yield, discharge hardness and pH, and stream hardness and pH. The same discharge and basin characteristic values are used as for the WQM 7.0. Discharge pH and hardness are taken from the effluent sample results reported in the application. In the absence of site-specific data, stream pH and hardness defaults to 7.0 s.u. and 100 mg/L in accordance with DEP's *DEP Toxics Management Spreadsheet (TMS) Instructions.* When known, additional information may be filled in to further define the

model. In this case, a velocity rate of 0.42 fps was taken from the WQM 7.0 model output. Additionally, Acute and Chronic Mix factors were calculated for the WET Test to be 0.089 and 0.617.

A Reasonable Potential Analysis was conducted using TMS.

The Toxic Management Spreadsheet modeling results determined that limits may be necessary for Benzidine, Benzo(a)Anthracene, Benzo(a)Pyrene, Dibenzo(a,h)Anthracene, Hexachlorobenzene, and Indeno(1,2,3,-cd)Pyrene.

When modeling for toxics, Department policy is to evaluate a 'Non-Detect' sample as being the value reported for the method detection limit (MDL). For all of the parameters listed above, the MDL was greater than 50% of the governing WQBEL and greater than the Department's target qualification limit (QL), thus a limit was suggested despite all tests being 'Non-detect.'

A Pre-Draft Letter/Survey for Toxic Pollutants was emailed to BBMA on November 23, 2021 and BBMA responded on December 29, 2021. Their response is included in Attachment B.

As part of the pre-draft survey, BBMA chose to take additional samples. The new sample results were all 'Non-Detect" with the MDL equal to the Department's QL's. A Reasonable Potential Analysis was conducted with the new test results and no WQBELs are suggested for Toxic Pollutants. The output files from this analysis are included in Attachment C.

ORSANCO Pollution Control Standards

The Ohio River Valley Water Sanitation Commission (ORSANCO) sets water quality standards for the Ohio River, to which Beaver Borough STP is a direct discharger. DEP will implement ORSANCO's water quality standards pursuant to Chapter 93.2(b).

ORSANCO set water quality criteria in the 2019 revision of *Pollution Control Standards for Discharges to the Ohio River.* ORSANCO criteria for conventional pollutants are summarized in the table below.

Parameter	Average Monthly	Weekly Average
TSS (mg/L)	30	45
$CBOD_5$ (mg/L)	25	40
Fecal Coliform (No./100 mL)	2,000 (geometric mean)	____

ORSANCO criteria for TSS and $CBOD_5$ are equal to the criteria set in 25 PA Code Chapter 92a.47(a). Fecal Coliform criteria established in 25 Pa Code 92a.47(a)(4) are more restrictive than those defined by ORSANCO and will therefore be imposed for this permit.

According to *Pollution Control Standards for Discharges to the Ohio River,* the maximum allowable level for *E. coli* for contact recreation from April- October is a monthly average of 130/100 mL (90-day geometric mean) and a weekly average of 240/100 mL. The 90-day geometric mean must be based on not less than five samples per month.

In a correlation equation developed by the Ohio EPA, concentrations of *E. Coli* and Fecal Coliform bacteria can be interchanged. The equation is as follows:

$$E.coli = 0.403(Fecal\ Coliform)^{1.028}$$

Using the equation to convert the ORSANCO *E. coli* water quality limits to fecal coliform values, it is apparent that DEP fecal coliform standards, imposed as TBELs, are more stringent. Previously imposed summer fecal limits of 200 No./100ml Average Monthly and 400 No./100ml Instantaneous Max and winter fecal limits of 2,000 No./100ml Average Monthly and 10,000 No./100mlwill remain in effect during this permit cycle. The limits were developed in accordance with the Department's SOP *Establishing Effluent Limitations for individual Sewage Permits* [SOP no. BCW-PMT-033 Version 1.9].

In addition to conventional pollutants, ORSANCO also defines criteria for several toxic pollutants. These are evaluated using TMS and engaging the ORSANCO function. This evaluation determined that limits may be necessary for Benzo(k)Flouranthene, Chrysene, and Hexachlorobutadiene. For both Benzo(k)Flouranthene and Chrysene, the MDL was greater than 25% of the governing WQBEL and greater than ORSANCO's criteria and the Department's target QL, thus monitoring is suggested despite all tests being 'Non-detect." For Hexachlorobutadiene, the MDL was greater than

50% of the governing WQBEL and greater than ORSANCO's criteria and the Department's target QL, thus a limit was suggested despite all tests being 'Non-detect.'

A Pre-Draft Letter/Survey for Toxic Pollutants was emailed to BBMA on September 1, 2022 and BBMA responded in an email on September 6, indicating that they intended to re-sample. Their response is included in Attachment D. The Authority did not indicate an estimated time needed for compliance with the new Hexachlorobutadiene limit, therefore a three year compliance schedule will be imposed in accordance with DEP SOP *Establishing Water Quality-Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers* [SOP No. BCW-PMT-037].

As part of the pre-draft survey, the Authority chose to take additional samples. For all parameters of concern, all sample results were non-detect with the MDL being less than or equal to the Department's QL. A Reasonable Potential Analysis was conducted with the new test results and no WQBELs are suggested for Benzo(k)Flouranthene, Chrysene, and Hexachlorobutadiene. The output files from this analysis are included in Attachment C.

Total Dissolved Solids (TDS)

TDS and its major constituents including sulfate, chloride, and bromide have emerged as contaminants of concern throughout the Commonwealth. These solids are conservative in nature, accumulating in surface waters and in the case of drinking water treatment, bromide has been linked with formation of disinfection byproducts. In response to the growing concern, the DEP promulgated PA Code 25 Chapter 95.10 on August 21, 2010 which establishes treatment requirements for new and expanding discharges. Chapter 95.10 (a)(1) documents that "discharge loads of TDS or specific conductivity that were authorized by DEP prior to August 21, 2010" are exempt from the standards. Beaver Borough STP was originally permitted September 29, 1995 and the facility is therefore exempt from Chapter 95.10 treatment requirements.

When the concentration of TDS in the effluent exceeds 1,000 mg/L and the design flow exceeds 0.1 MGD (1,000 mg/L x 0.1 MGD x 8.34 = 834 lbs/day), there is determined to be reasonable potential for the effluent to exceed the TDS concentrations defined in Chapter 92.10 (c). Beaver Borough STP has a design flow of 1.045 MGD and reported a maximum TDS concentration of 1,350 mg/L, therefore, reasonable potential exists. In accordance with the Department's *Policy and Procedure for NPDES Permitting of Discharges of Total Dissolved Solids (TDS)* [Doc no. 385-2100-002], Department SOP *Establishing Effluent Limitations for Individual Sewage Permits* [SOP no. BCW-PMT-033 Version 1.9], and Chapter 92.a.61, a quarterly monitoring requirement will be imposed for TDS.

Ohio River TMDL

A TMDL for the Ohio River was approved by the EPA on April 9, 2001 for the control of PCBs and chlordane. This TMDL applies to RMI 981 – 940.74 on the Ohio River. In accordance with 40 CFR § 122.44(d)(1)(vii)(B), when developing WQBELs, the permitting authority shall ensure that effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with the assumptions and requirements of any available waste load allocation (WLA) for the discharge prepared by the State and approved by the EPA pursuant to 40 CFR § 130.7. The TMDL document states that the production and use of PCBs were banned in the US in July 1979 and the use of chlordane in the US has been banned since April 1988. Therefore, there are no new point sources for either of these pollutants. Known, existing point sources of PCBs and/or chlordane have obtained NPDES permits with WQBELs for those pollutants. PCBs and chlordane in the Ohio River are expected to be present primarily in the sediment due to historic use and improper disposal practices. Natural attenuation is expected to reduce PCB and chlordane contamination in the Ohio River over time. The TMDL is monitoring the concentrations of PCBs and Chlordane in fish therefore Beaver Borough STP will not be assigned waste load allocations or monitoring for PCBs and Chlordane.

Mass Loading Limitations

Section 1.A of Department's SOP, *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 Version 1.9] and table 5.3 of the Department's *Technical Guidance for the Development and Specification of Effluent Limitations* [Doc No. 362-0400-001] establish mass loading limits for Publicly Owned Treatment Works (POTWs) for $CBOD_5$, TSS, and ammonia-nitrogen. Average monthly and average weekly limits will be assigned for $CBOD_5$ and TSS. Only a monitor and report average monthly requirement will be imposed for ammonia-nitrogen. Mass loading limits are calculated according to the following equation:

$$mass\ loading\ limit\ \left(\frac{lbs}{day}\right) = average\ annual\ flow\ (MGD) * concentration\ limit\ \left(\frac{mg}{L}\right) * 8.34\ (conversion\ factor)$$

The following mass loading limits are being imposed:

Parameter	Average Monthly (lbs/day)	Weekly Average (lbs/day)
TSS (mg/L)	260	390
$CBOD_5$ (mg/L)	215	325
Ammonia-Nitrogen	Report	---

Best Professional Judgment (BPJ) Limitations

In accordance with Section 1.A. Note 6 of the Department's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 Version 1.9] and 25 Pa. Code §93, a dissolved oxygen minimum of 4.0 mg/L will be imposed based on BPJ to ensure adequate operation and maintenance.

Additional Considerations

In accordance with Section 1.A. of the Department's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 Version 1.9], pursuant to EPA's approval of Pennsylvania's 2017 Triennial Review of Water Quality Standards and corresponding regulatory changes published in the *Pennsylvania Bulletin* on July 11, 2020, and under the authority of 25 Pa. Code § 93.7(a) and § 92.a.61, sewage discharges will include monitoring for *E. coli.* For new and reissued permits, a monitoring frequency of 1/month will be imposed for facilities with a design flow >= 1 MGD.

In accordance with Section 1.A. of the Department's SOP for *Clean Water Program Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 Version 1.9], and under the authority of 25 Pa. Code § 92a.61(b), nutrient monitoring for total nitrogen and total phosphorus will be imposed. The intent of this monitoring is to establish the nutrient load of the wastewater and evaluate the impact that load may have on the quality of the receiving stream. The SOP states that a monitoring frequency shall be imposed equivalent to that imposed or conventional pollutants if the facility discharges to a nutrient impaired stream or a lesser frequency if the receiving water is not nutrient-impaired. The receiving stream, the Ohio River is impaired for organic enrichment, therefore, a monitoring frequency of 2/week will be imposed.

In accordance with Section IV.F.2 of DEP's SOP for *New and Reissuance Sewage Individual NPDES Permit Applications* [SOP No. BCW-PMT-002 Version 2.0]. For POTWs with design flows greater than 2,000 GPD, influent BOD_5 and TSS monitoring must be established in the permit at a frequency and sample type equivalent to that imposed for the effluent parameters.

Monitoring frequency for the proposed effluent limits are based upon Table 6-3, Self-Monitoring Requirements for Sewage Dischargers, from the Department's *Technical Guidance for the Development and Specification of Effluent Limitations* [Doc No. 362-0400-001]. Please note that Monitoring Requirements were changed for Flow to 1/day Metered to be consistent with the guidance.

In accordance with Section I.A. of DEP's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP no. BCW-PMT-033 Version 1.9], ultraviolet (UV) disinfection is used. Therefore, Total Residual Chlorine (TRC) limits are not applicable. Routine monitoring of UV transmittance will be imposed at the same monitoring frequency that is used for TRC.

Whole Effluent Toxicity (WET)

The 2014 permit required Beaver Borough to collect discharge samples and perform WET tests to generate chronic survival and reproduction data for *cladoceran* (water flea) and *Ceriodaphnia dubia,* and chronic survival and growth data for *Pimephales promelas* (fathead minnow). The dilution series for these tests was: 1%, 2%, 30%, 60%, and 100%. The Target Instream Waste Concentration (TIWC) used to analyze the results was 1%.

Beaver Borough passed three of its last four annual WET tests conducted in June 2018, July 2019, July 2020, and July 2021. Beaver Borough failed for reproduction of *Ceriodaphnia dubia* in the test dated July 6, 2021 and the authority

conducted confirmation testing on December 21, 2021. In accordance with Part C. III. B. 3 and 4 of the 2014 permit, the permittee shall resume annual testing and no additional action is required.

Complete mix time is calculated as a function of discharge flow rate, and receiving stream characteristics ($Q_{7\text{-}10}$ flow, velocity, width, depth, and slope). Stream characteristics are the same as those used in the WQM and TMS models. Complete mixing time was calculated to be 1892 minutes.

The complete mix time is greater than 15 minutes, therefore Acute Partial Mix Factor is calculated using the following equation:

$$PMF_a = \left(\frac{15}{Complete\ mix\ time}\right)^{0.5}$$

The Acute Partial Mix Factor was calculated to be 8.90%.

Acute instream waste concentration (IWCa) is calculated as a function of discharge flow, stream flow, PMFa according to the following equation:

$$IWC_a = \left(\frac{Q_d * 1.547}{Q_{7-10} * PMF_a}\right) + (Q_d * 1.547)$$

IWCa was calculated to be 0.0032, which is less than 1%, therefore, Acute Tests will again be imposed in the permit.

Target Acute Instream Waste Concertation is calculated as a function of IWCa using the following equation:

$$TIWC_a = \frac{IWC_a}{0.3}$$

TIWCa was calculated to be 1%.

The dilution series was determined using Attachment D of the Department's SOP *Whole Effluent Toxicity (WET)* [SOP No. BPNPSM-PMT-031]. Based on a TIWCa of 1%, the dilution series imposed in the permit will again be 1%, 2%, 30%, 60%, and 100%.

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

Outfall 001, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Daily Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	XXX	XXX	XXX	XXX	XXX	1/day	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	4.0 Inst Min	XXX	XXX	XXX	1/day	Grab
$CBOD_5$	215.0	325.0	XXX	25.0	37.5	50	2/week	24-Hr Composite
BOD_5 Raw Sewage Influent	XXX	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
TSS Raw Sewage Influent	XXX	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
TSS	260.0	390.0	XXX	30.0	45.0	60	2/week	24-Hr Composite
Total Dissolved Solids	XXX	Report	XXX	XXX	Report	XXX	1/quarter	24-Hr Composite
Fecal Coliform (No./100 ml) Nov 1 - Mar 31	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/week	Grab
Fecal Coliform (No./100 ml) Apr 1 - Oct 31	XXX	XXX	XXX	200 Geo Mean	XXX	400	2/week	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/month	Grab
UV Transmittance (%)	XXX	XXX	Report	Report Wkly Avg	XXX	XXX	1/day	Recorded
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	2/week	24-Hr Composite

Outfall 001, Continued (from Permit Effective Date through Permit Expiration Date)

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Daily Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Ammonia-Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	2/week	24-Hr Composite

Compliance Sampling Location: Outfall #001

Other Comments:

ATTACHMENT A

WQM 7.0 Modeling Results

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
20E	32317	OHIO RIVER	954.800	682.00	22800.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.258	0.00	0.00	0.000	0.000	0.0	1171.00	12.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Beaver Borough	PA0024694	0.0000	1.0450	0.0000	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
20E	32317	OHIO RIVER	949.000	664.50	23000.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.258	0.00	0.00	0.000	0.000	0.0	0.00	12.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
20E	32317	OHIO RIVER

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
954.800	5882.40	0.00	5882.40	1.6166	0.00057	12	1171	97.58	0.42	0.846	25.00	7.00
Q1-10 Flow												
954.800	3764.74	0.00	3764.74	1.6166	0.00057	NA	NA	NA	0.27	1.322	25.00	7.00
Q30-10 Flow												
954.800	8000.06	0.00	8000.06	1.6166	0.00057	NA	NA	NA	0.57	0.622	25.00	7.00

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
20E	32317	OHIO RIVER

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
954.800	Beaver Borough	11.08	50	11.08	50	0	0

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
954.800	Beaver Borough	1.37	25	1.37	25	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
954.80	Beaver Borough	25	25	25	25	3	3	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20E	32317	OHIO RIVER

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
954.800	1.045	24.999	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
1171.000	12.000	97.583	0.419
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.01	0.003	0.01	1.028
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.242	0.226	O'Connor	5
Reach Travel Time (days)			
0.846			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.085	2.01	0.01	7.54
0.169	2.01	0.01	7.54
0.254	2.00	0.01	7.54
0.339	2.00	0.00	7.54
0.423	2.00	0.00	7.54
0.508	2.00	0.00	7.54
0.593	2.00	0.00	7.54
0.677	2.00	0.00	7.54
0.762	2.00	0.00	7.54
0.846	2.00	0.00	7.54

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
20E	32317	OHIO RIVER

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
954.800	Beaver Borough	PA0024694	0.000	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			3

ATTACHMENT B

Authority's Response to November 2021 Pre-draft Letter

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Clean Water

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
PRE-DRAFT PERMIT SURVEY FOR TOXIC POLLUTANTS

Permittee Name: **Beaver Borough Municipal Authority** Permit No.: **PA0024694**

Pollutant(s) identified by DEP that may require WQBELs:

Is the permittee aware of the source(s) of the pollutant(s)? ☐ Yes ☒ No ☐ Suspected

If Yes or Suspected, describe the known or suspected source(s) of pollutant(s) in the effluent.

Has the permittee completed any studies in the past to control or treat the pollutant(s)? ☐ Yes ☒ No

If Yes, describe prior studies and results:

Does the permittee believe it can achieve the proposed WQBELs now? ☒ Yes ☐ No ☐ Uncertain

If No, describe the activities, upgrades or process changes that would be necessary to achieve the WQBELs, if known.

Estimated date by which the permittee could achieve the proposed WQBELs: Samples will be completed after 1/1/22 ☐ Uncertain

Will the permittee conduct additional sampling for the pollutant(s) to supplement the application? ☒ Yes ☐ No

Check the appropriate box(es) below to indicate site-specific data that have been collected by the permittee in the past. If any of these data have not been submitted to DEP, please attach to this survey.

☐	Discharge pollutant concentration coefficient(s) of variability	Year(s) Studied:
☐	Discharge and background Total Hardness concentrations (metals)	Year(s) Studied:
☐	Background / ambient pollutant concentrations	Year(s) Studied:
☐	Chemical translator(s) (metals)	Year(s) Studied:
☐	Slope and width of receiving waters	Year(s) Studied:
☐	Velocity of receiving waters at design conditions	Year(s) Studied:
☐	Acute and/or chronic partial mix factors (mixing at design conditions)	Year(s) Studied:
☐	Volatilization rates (highly volatile organics)	Year(s) Studied:
☐	Site-specific criteria (e.g., Water Effect Ratio or related study)	Year(s) Studied:

Please submit this survey to the DEP regional office that is reviewing the permit application within 30 days of receipt.

ATTACHMENT C

TMS Modeling Output File

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Beaver Borough STP** NPDES Permit No.: **PA0024694** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Treated Sewage Effluent**

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
1.045	413	7.28	0.089	0.617				

					0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		1350									
	Chloride (PWS)	mg/L											
	Bromide	mg/L											
	Sulfate (PWS)	mg/L											
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L	<	0.2									
	Total Antimony	µg/L	<	0.002									
	Total Arsenic	µg/L	<	0.003									
	Total Barium	µg/L		0.102									
	Total Beryllium	µg/L	<	0.0016									
	Total Boron	µg/L		0.232									
	Total Cadmium	µg/L	<	0.0006									
	Total Chromium (III)	µg/L	<	0.004									
	Hexavalent Chromium	µg/L	<	0.15									
	Total Cobalt	µg/L	<	0.001									
	Total Copper	µg/L		0.037									
	Free Cyanide	µg/L		0.006									
	Total Cyanide	µg/L	<	0.01									
	Dissolved Iron	µg/L	<	0.2									
	Total Iron	µg/L		0.0816									
	Total Lead	µg/L		0.001									
	Total Manganese	µg/L		0.026									
	Total Mercury	µg/L	<	0.0002									
	Total Nickel	µg/L		0.005									
	Total Phenols (Phenolics) (PWS)	µg/L	<	0.0056									
	Total Selenium	µg/L		0.002									
	Total Silver	µg/L	<	0.001									
	Total Thallium	µg/L	<	0.0002									
	Total Zinc	µg/L		0.093									
	Total Molybdenum	µg/L	<	0.01									
	Acrolein	µg/L	<	10									
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<	5									
	Benzene	µg/L	<	1									
	Bromoform	µg/L	<	1									

Group 3	Carbon Tetrachloride	µg/L	<	1										
	Chlorobenzene	µg/L	<	1										
	Chlorodibromomethane	µg/L	<	1										
	Chloroethane	µg/L	<	1										
	2-Chloroethyl Vinyl Ether	µg/L	<	5										
	Chloroform	µg/L	<	1										
	Dichlorobromomethane	µg/L	<											
	1,1-Dichloroethane	µg/L	<	1										
	1,2-Dichloroethane	µg/L	<	1										
	1,1-Dichloroethylene	µg/L	<											
	1,2-Dichloropropane	µg/L	<	1										
	1,3-Dichloropropylene	µg/L	<											
	1,4-Dioxane	µg/L	<	100										
	Ethylbenzene	µg/L	<	1										
	Methyl Bromide	µg/L	<											
	Methyl Chloride	µg/L	<											
	Methylene Chloride	µg/L	<	1										
	1,1,2,2-Tetrachloroethane	µg/L	<	1										
	Tetrachloroethylene	µg/L	<											
	Toluene	µg/L	<	1										
	1,2-trans-Dichloroethylene	µg/L	<											
	1,1,1-Trichloroethane	µg/L	<	1										
	1,1,2-Trichloroethane	µg/L	<	1										
	Trichloroethylene	µg/L	<											
	Vinyl Chloride	µg/L	<	1										
Group 4	2-Chlorophenol	µg/L	<	10.2										
	2,4-Dichlorophenol	µg/L	<	10.2										
	2,4-Dimethylphenol	µg/L	<	10.2										
	4,6-Dinitro-o-Cresol	µg/L	<											
	2,4-Dinitrophenol	µg/L	<	51										
	2-Nitrophenol	µg/L	<	10.2										
	4-Nitrophenol	µg/L	<	20.4										
	p-Chloro-m-Cresol	µg/L	<											
	Pentachlorophenol	µg/L	<	51										
	Phenol	µg/L	<	10.2										
	2,4,6-Trichlorophenol	µg/L	<	10.2										
Group 5	Acenaphthene	µg/L	<	10.4										
	Acenaphthylene	µg/L	<	10.2										
	Anthracene	µg/L	<	10.2										
	Benzidine	µg/L	<	12.8										
	Benzo(a)Anthracene	µg/L	<	2.5										
	Benzo(a)Pyrene	µg/L	<	2.5										
	3,4-Benzofluoranthene	µg/L	<											
	Benzo(ghi)Perylene	µg/L	<	10.2										
	Benzo(k)Fluoranthene	µg/L	<	2.5										
	Bis(2-Chloroethoxy)Methane	µg/L	<	10.2										
	Bis(2-Chloroethyl)Ether	µg/L	<	10.2										
	Bis(2-Chloroisopropyl)Ether	µg/L	<	10.2										
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	10.2										
	4-Bromophenyl Phenyl Ether	µg/L	<	10.2										
	Butyl Benzyl Phthalate	µg/L	<	10.2										
	2-Chloronaphthalene	µg/L	<	10.2										
	4-Chlorophenyl Phenyl Ether	µg/L	<	10.2										
	Chrysene	µg/L	<	2.5										
	Dibenzo(a,h)Anthrancene	µg/L	<	2.5										
	1,2-Dichlorobenzene	µg/L	<	10.2										
	1,3-Dichlorobenzene	µg/L	<	10.2										
	1,4-Dichlorobenzene	µg/L	<	10.2										
	3,3-Dichlorobenzidine	µg/L	<	20.4										
	Diethyl Phthalate	µg/L	<	10.2										
	Dimethyl Phthalate	µg/L	<	10.2										
	Di-n-Butyl Phthalate	µg/L	<	10.2										
	2,4-Dinitrotoluene	µg/L	<	10.2										

	2,6-Dinitrotoluene	µg/L	<	10.2										
	Di-n-Octyl Phthalate	µg/L	<	10.2										
	1,2-Diphenylhydrazine	µg/L	<	10.2										
	Fluoranthene	µg/L	<	10.2										
	Fluorene	µg/L	<	10.2										
	Hexachlorobenzene	µg/L	<	2.55										
	Hexachlorobutadiene	µg/L	<	0.5										
	Hexachlorocyclopentadiene	µg/L	<	20.4										
	Hexachloroethane	µg/L	<	10.2										
	Indeno(1,2,3-cd)Pyrene	µg/L	<	2.5										
	Isophorone	µg/L	<	10.2										
	Naphthalene	µg/L	<	10.2										
	Nitrobenzene	µg/L	<	10.2										
	n-Nitrosodimethylamine	µg/L	<											
	n-Nitrosodi-n-Propylamine	µg/L	<											
	n-Nitrosodiphenylamine	µg/L	<	10.2										
	Phenanthrene	µg/L	<	10.2										
	Pyrene	µg/L	<	10.2										
	1,2,4-Trichlorobenzene	µg/L	<	10.2										
Group 6	Aldrin	µg/L	<											
	alpha-BHC	µg/L	<											
	beta-BHC	µg/L	<											
	gamma-BHC	µg/L	<											
	delta BHC	µg/L	<											
	Chlordane	µg/L	<											
	4,4-DDT	µg/L	<											
	4,4-DDE	µg/L	<											
	4,4-DDD	µg/L	<											
	Dieldrin	µg/L	<											
	alpha-Endosulfan	µg/L	<											
	beta-Endosulfan	µg/L	<											
	Endosulfan Sulfate	µg/L	<											
	Endrin	µg/L	<											
	Endrin Aldehyde	µg/L	<											
	Heptachlor	µg/L	<											
	Heptachlor Epoxide	µg/L	<											
	PCB-1016	µg/L	<											
	PCB-1221	µg/L	<											
	PCB-1232	µg/L	<											
	PCB-1242	µg/L	<											
	PCB-1248	µg/L	<											
	PCB-1254	µg/L	<											
	PCB-1260	µg/L	<											
	PCBs, Total	µg/L	<											
	Toxaphene	µg/L	<											
	2,3,7,8-TCDD	ng/L	<											
Group 7	Gross Alpha	pCi/L												
	Total Beta	pCi/L	<											
	Radium 226/228	pCi/L	<											
	Total Strontium	µg/L	<											
	Total Uranium	µg/L	<											
	Osmotic Pressure	mOs/kg												

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Beaver Borough STP, NPDES Permit No. PA0024694, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Ohio River**

No. Reaches to Model: **1**

- ○ Statewide Criteria
- ○ Great Lakes Criteria
- ◉ ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	032317	954.8	692	22800	0.001		Yes
End of Reach 1	032217	953.49	682	22801	0.001		Yes

$Q_{7\text{-}10}$

Location	RMI	LFY (cfs/mi²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	954.8	0.1	4730			1171	12	0.42				100	7		
End of Reach 1	953.49	0.1	5800												

Q_h

Location	RMI	LFY (cfs/mi²)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	954.8														
End of Reach 1	953.49														

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Beaver Borough STP, NPDES Permit No. PA0024694, Outfall 001

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | ○ All ○ Inputs ○ Results ○ Limits

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ *AFC* CCT (min): 15 PMF: 0.089 Analysis Hardness (mg/l): 101.2 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	196,052	
Total Antimony	0	0		0	1,100	1,100	287,542	
Total Arsenic	0	0		0	340	340	88,877	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	5,489,445	
Total Boron	0	0		0	8,100	8,100	2,117,357	
Total Cadmium	0	0		0	2.037	2.16	564	Chem Translator of 0.944 applied
Total Chromium (III)	0	0		0	575.345	1,821	475,938	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	4,259	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	24,833	
Total Copper	0	0		0	13.591	14.2	3,701	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	22	22.0	5,751	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	65.424	82.9	21,668	Chem Translator of 0.789 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	431	Chem Translator of 0.85 applied
Total Nickel	0	0		0	472.975	474	123,884	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	3.283	3.86	1,010	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	16,991	
Total Zinc	0	0		0	118.368	121	31,638	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	784	
Acrylonitrile	0	0		0	650	650	169,911	
Benzene	0	0		0	640	640	167,297	

Bromoform	0	0		0	1,800	1,800	470,524	
Carbon Tetrachloride	0	0		0	2,800	2,800	731,926	
Chlorobenzene	0	0		0	1,200	1,200	313,683	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	4,705,238	
Chloroform	0	0		0	1,900	1,900	496,664	
1,2-Dichloroethane	0	0		0	15,000	15,000	3,921,032	
1,2-Dichloropropane	0	0		0	11,000	11,000	2,875,424	
Ethylbenzene	0	0		0	2,900	2,900	758,066	
Methylene Chloride	0	0		0	12,000	12,000	3,136,826	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	261,402	
Toluene	0	0		0	1,700	1,700	444,384	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	784,206	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	888,767	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	146,385	
2,4-Dichlorophenol	0	0		0	1,700	1,700	444,384	
2,4-Dimethylphenol	0	0		0	660	660	172,525	
2,4-Dinitrophenol	0	0		0	660	660	172,525	
2-Nitrophenol	0	0		0	8,000	8,000	2,091,217	
4-Nitrophenol	0	0		0	2,300	2,300	601,225	
Pentachlorophenol	0	0		0	8.730	8.73	2,282	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	120,245	
Acenaphthene	0	0		0	83	83.0	21,696	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	78,421	
Benzo(a)Anthracene	0	0		0	0.5	0.5	131	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	30,000	30,000	7,842,064	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	1,176,310	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	70,579	
Butyl Benzyl Phthalate	0	0		0	140	140	36,596	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	820	820	214,350	
1,3-Dichlorobenzene	0	0		0	350	350	91,491	
1,4-Dichlorobenzene	0	0		0	730	730	190,824	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	1,045,609	
Dimethyl Phthalate	0	0		0	2,500	2,500	653,505	
Di-n-Butyl Phthalate	0	0		0	110	110	28,754	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	418,243	
2,6-Dinitrotoluene	0	0		0	990	990	258,788	
1,2-Diphenylhydrazine	0	0		0	15	15.0	3,921	

Fluoranthene	0	0		0	200	200	52,280	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	10	10.0	2,614	
Hexachlorocyclopentadiene	0	0		0	5	5.0	1,307	
Hexachloroethane	0	0		0	60	60.0	15,684	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	2,614,021	
Naphthalene	0	0		0	140	140	36,596	
Nitrobenzene	0	0		0	4,000	4,000	1,045,609	
n-Nitrosodiphenylamine	0	0		0	300	300	78,421	
Phenanthrene	0	0		0	5	5.0	1,307	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	33,982	

☑ *CFC* CCT (min): 720 PMF: 0.617 Analysis Hardness (mg/l): 100.17 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	397,377	
Total Arsenic	0	0		0	150	150	270,939	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	7,405,665	
Total Boron	0	0		0	1,600	1,600	2,890,016	
Total Cadmium	0	0		0	0.246	0.27	489	Chem Translator of 0.909 applied
Total Chromium (III)	0	0		0	74.220	86.3	155,884	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	18,776	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	34,319	
Total Copper	0	0		0	8.969	9.34	16,875	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	5.2	5.2	9,393	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	4,390,300	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.521	3.19	5,759	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	1,636	Chem Translator of 0.85 applied
Total Nickel	0	0		0	52.083	52.2	94,358	Chem Translator of 0.997 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	4.600	4.99	9,012	Chem Translator of 0.922 applied
Total Silver	0	0		0	N/A	N/A	N/A	Chem Translator of 1 applied
Total Thallium	0	0		0	13	13.0	23,481	
Total Zinc	0	0		0	118.312	120	216,737	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	5,419	
Acrylonitrile	0	0		0	130	130	234,814	
Benzene	0	0		0	130	130	234,814	
Bromoform	0	0		0	370	370	668,316	

Carbon Tetrachloride	0	0		0	560	560	1,011,505	
Chlorobenzene	0	0		0	240	240	433,502	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	6,321,909	
Chloroform	0	0		0	390	390	704,441	
1,2-Dichloroethane	0	0		0	3,100	3,100	5,599,405	
1,2-Dichloropropane	0	0		0	2,200	2,200	3,973,771	
Ethylbenzene	0	0		0	580	580	1,047,631	
Methylene Chloride	0	0		0	2,400	2,400	4,335,023	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	379,315	
Toluene	0	0		0	330	330	596,066	
1,1,1-Trichloroethane	0	0		0	610	610	1,101,818	
1,1,2-Trichloroethane	0	0		0	680	680	1,228,257	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	198,689	
2,4-Dichlorophenol	0	0		0	340	340	614,128	
2,4-Dimethylphenol	0	0		0	130	130	234,814	
2,4-Dinitrophenol	0	0		0	130	130	234,814	
2-Nitrophenol	0	0		0	1,600	1,600	2,890,016	
4-Nitrophenol	0	0		0	470	470	848,942	
Pentachlorophenol	0	0		0	6.698	6.7	12,098	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	164,370	
Acenaphthene	0	0		0	17	17.0	30,706	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	106,569	
Benzo(a)Anthracene	0	0		0	0.1	0.1	181	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	6,000	6,000	10,837,559	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	1,643,696	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	97,538	
Butyl Benzyl Phthalate	0	0		0	35	35.0	63,219	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	160	160	289,002	
1,3-Dichlorobenzene	0	0		0	69	69.0	124,632	
1,4-Dichlorobenzene	0	0		0	150	150	270,939	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	1,445,008	
Dimethyl Phthalate	0	0		0	500	500	903,130	
Di-n-Butyl Phthalate	0	0		0	21	21.0	37,931	
2,4-Dinitrotoluene	0	0		0	320	320	578,003	

2,6-Dinitrotoluene	0	0		0	200	200	361,252	
1,2-Diphenylhydrazine	0	0		0	3	3.0	5,419	
Fluoranthene	0	0		0	40	40.0	72,250	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	2	2.0	3,613	
Hexachlorocyclopentadiene	0	0		0	1	1.0	1,806	
Hexachloroethane	0	0		0	12	12.0	21,675	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	3,793,145	
Naphthalene	0	0		0	43	43.0	77,669	
Nitrobenzene	0	0		0	810	810	1,463,070	
n-Nitrosodiphenylamine	0	0		0	59	59.0	106,569	
Phenanthrene	0	0		0	1	1.0	1,806	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	46,963	

☑ ***THH*** CCT (min): 720 PMF: 0.710 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	11,637	
Total Arsenic	0	0		0	10	10.0	20,780	
Total Barium	0	0		0	1,000	1,000	2,077,990	
Total Boron	0	0		0	3,100	3,100	6,441,769	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	1,300	1,300	2,701,387	
Free Cyanide	0	0		0	4	4.0	8,312	
Dissolved Iron	0	0		0	300	300	623,397	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	1,000	1,000	2,077,990	
Total Mercury	0	0		0	0.012	0.012	24.9	
Total Nickel	0	0		0	610	610	1,267,574	
Total Phenols (Phenolics) (PWS)	0	0		0	5	5.0	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	0.24	0.24	499	
Total Zinc	0	0		0	7,400	7,400	15,377,127	
Acrolein	0	0		0	3	3.0	6,234	

Acrylonitrile	0	0		0	N/A	N/A	N/A	
Benzene	0	0		0	N/A	N/A	N/A	
Bromoform	0	0		0	N/A	N/A	N/A	
Carbon Tetrachloride	0	0		0	N/A	N/A	N/A	
Chlorobenzene	0	0		0	100	100.0	207,799	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	11,845	
1,2-Dichloroethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	N/A	N/A	N/A	
Ethylbenzene	0	0		0	68	68.0	141,303	
Methylene Chloride	0	0		0	N/A	N/A	N/A	
1,1,2,2-Tetrachloroethane	0	0		0	N/A	N/A	N/A	
Toluene	0	0		0	57	57.0	118,445	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	20,779,901	
1,1,2-Trichloroethane	0	0		0	N/A	N/A	N/A	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	30	30.0	62,340	
2,4-Dichlorophenol	0	0		0	10	10.0	20,780	
2,4-Dimethylphenol	0	0		0	100	100.0	207,799	
2,4-Dinitrophenol	0	0		0	10	10.0	20,780	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	N/A	N/A	N/A	
Phenol	0	0		0	4,000	4,000	8,311,961	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	145,459	
Anthracene	0	0		0	300	300	623,397	
Benzidine	0	0		0	N/A	N/A	N/A	
Benzo(a)Anthracene	0	0		0	N/A	N/A	N/A	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroisopropyl)Ether	0	0		0	200	200	415,598	
Bis(2-Ethylhexyl)Phthalate	0	0		0	N/A	N/A	N/A	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	0.1	0.1	208	
2-Chloronaphthalene	0	0		0	800	800	1,662,392	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	420	420	872,756	
1,3-Dichlorobenzene	0	0		0	7	7.0	14,546	
1,4-Dichlorobenzene	0	0		0	63	63.0	130,913	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	1,246,794	

Dimethyl Phthalate	0	0		0	2,000	2,000	4,155,980	
Di-n-Butyl Phthalate	0	0		0	20	20.0	41,560	
2,4-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
2,6-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
1,2-Diphenylhydrazine	0	0		0	N/A	N/A	N/A	
Fluoranthene	0	0		0	20	20.0	41,560	
Fluorene	0	0		0	50	50.0	103,900	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	N/A	N/A	N/A	
Hexachlorocyclopentadiene	0	0		0	4	4.0	8,312	
Hexachloroethane	0	0		0	N/A	N/A	N/A	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	34	34.0	70,652	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	20,780	
n-Nitrosodiphenylamine	0	0		0	N/A	N/A	N/A	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	20	20.0	41,560	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	145	

☑ *CRL* CCT (min): 720 PMF: 0.968 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	N/A	N/A	N/A	
Total Arsenic	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	N/A	N/A	N/A	
Total Boron	0	0		0	N/A	N/A	N/A	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Free Cyanide	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	50	50.0	362,181	

Total Thallium	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	0.051	0.051	369	
Benzene	0	0		0	0.58	0.58	4,201	
Bromoform	0	0		0	4.3	4.3	31,148	
Carbon Tetrachloride	0	0		0	0.4	0.4	2,897	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	0.4	0.4	2,897	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	0.38	0.38	2,753	
1,2-Dichloropropane	0	0		0	0.5	0.5	3,622	
Ethylbenzene	0	0		0	N/A	N/A	N/A	
Methylene Chloride	0	0		0	4.6	4.6	33,321	
1,1,2,2-Tetrachloroethane	0	0		0	0.17	0.17	1,231	
Toluene	0	0		0	N/A	N/A	N/A	
1,1,1-Trichloroethane	0	0		0	N/A	N/A	N/A	
1,1,2-Trichloroethane	0	0		0	0.55	0.55	3,984	
Vinyl Chloride	0	0		0	0.02	0.02	145	
2-Chlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dichlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dimethylphenol	0	0		0	N/A	N/A	N/A	
2,4-Dinitrophenol	0	0		0	N/A	N/A	N/A	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	0.030	0.03	217	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.4	1.4	10,141	
Acenaphthene	0	0		0	N/A	N/A	N/A	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	0.000086	0.00009	0.62	
Benzo(a)Anthracene	0	0		0	0.001	0.001	7.24	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.72	
Benzo(k)Fluoranthene	0	0		0	0.0038	0.004	27.5	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	217	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	2,318	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	N/A	N/A	N/A	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	0.0038	0.004	27.5	
Dibenzo(a,h)Anthrancene	0	0		0	0.0001	0.0001	0.72	
1,2-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,3-Dichlorobenzene	0	0		0	N/A	N/A	N/A	

1,4-Dichlorobenzene	0	0	0	N/A	N/A	N/A	
3,3-Dichlorobenzidine	0	0	0	0.021	0.021	152	
Diethyl Phthalate	0	0	0	N/A	N/A	N/A	
Dimethyl Phthalate	0	0	0	N/A	N/A	N/A	
Di-n-Butyl Phthalate	0	0	0	N/A	N/A	N/A	
2,4-Dinitrotoluene	0	0	0	0.05	0.05	362	
2,6-Dinitrotoluene	0	0	0	0.05	0.05	362	
1,2-Diphenylhydrazine	0	0	0	0.03	0.03	217	
Fluoranthene	0	0	0	N/A	N/A	N/A	
Fluorene	0	0	0	N/A	N/A	N/A	
Hexachlorobenzene	0	0	0	0.00008	0.00008	0.58	
Hexachlorobutadiene	0	0	0	0.01	0.01	72.4	
Hexachlorocyclopentadiene	0	0	0	N/A	N/A	N/A	
Hexachloroethane	0	0	0	0.1	0.1	724	
Indeno(1,2,3-cd)Pyrene	0	0	0	0.001	0.001	7.24	
Isophorone	0	0	0	N/A	N/A	N/A	
Naphthalene	0	0	0	N/A	N/A	N/A	
Nitrobenzene	0	0	0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0	0	3.3	3.3	23,904	
Phenanthrene	0	0	0	N/A	N/A	N/A	
Pyrene	0	0	0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0	0	N/A	N/A	N/A	

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments

☑ ***Other Pollutants without Limits or Monitoring***

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	N/A	N/A	PWS Not Applicable
Total Aluminum	N/A	N/A	Discharge Conc < TQL
Total Antimony	N/A	N/A	Discharge Conc < TQL
Total Arsenic	N/A	N/A	Discharge Conc < TQL
Total Barium	2,077,990	µg/L	Discharge Conc ≤ 10% WQBEL

Total Beryllium	N/A	N/A	No WQS
Total Boron	1,357,141	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cadmium	N/A	N/A	Discharge Conc < TQL
Total Chromium (III)	155,884	µg/L	Discharge Conc < TQL
Hexavalent Chromium	2,730	µg/L	Discharge Conc < TQL
Total Cobalt	15,917	µg/L	Discharge Conc < TQL
Total Copper	2,372	µg/L	Discharge Conc ≤ 10% WQBEL
Free Cyanide	3,686	µg/L	Discharge Conc ≤ 25% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	623,397	µg/L	Discharge Conc < TQL
Total Iron	4,390,300	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	5,759	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	2,077,990	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	0.012	µg/L	Discharge Conc < TQL
Total Nickel	79,405	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	Discharge Conc < TQL
Total Selenium	9,012	µg/L	Discharge Conc ≤ 10% WQBEL
Total Silver	647	µg/L	Discharge Conc < TQL
Total Thallium	499	µg/L	Discharge Conc < TQL
Total Zinc	20,279	µg/L	Discharge Conc ≤ 10% WQBEL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	503	µg/L	Discharge Conc ≤ 25% WQBEL
Acrylonitrile	369	µg/L	Discharge Conc < TQL
Benzene	4,201	µg/L	Discharge Conc ≤ 25% WQBEL
Bromoform	31,148	µg/L	Discharge Conc ≤ 25% WQBEL
Carbon Tetrachloride	2,897	µg/L	Discharge Conc ≤ 25% WQBEL
Chlorobenzene	201,058	µg/L	Discharge Conc ≤ 25% WQBEL
Chlorodibromomethane	2,897	µg/L	Discharge Conc ≤ 25% WQBEL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	3,015,868	µg/L	Discharge Conc < TQL
Chloroform	11,845	µg/L	Discharge Conc ≤ 25% WQBEL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	2,753	µg/L	Discharge Conc ≤ 25% WQBEL
1,2-Dichloropropane	3,622	µg/L	Discharge Conc ≤ 25% WQBEL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	141,303	µg/L	Discharge Conc ≤ 25% WQBEL
Methylene Chloride	33,321	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,2,2-Tetrachloroethane	1,231	µg/L	Discharge Conc ≤ 25% WQBEL
Toluene	118,445	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,1-Trichloroethane	502,645	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,2-Trichloroethane	3,984	µg/L	Discharge Conc ≤ 25% WQBEL
Vinyl Chloride	145	µg/L	Discharge Conc ≤ 25% WQBEL
2-Chlorophenol	62,340	µg/L	Discharge Conc ≤ 25% WQBEL
2,4-Dichlorophenol	20,780	µg/L	Discharge Conc ≤ 25% WQBEL
2,4-Dimethylphenol	110,582	µg/L	Discharge Conc ≤ 25% WQBEL

2,4-Dinitrophenol	20,780	µg/L	Discharge Conc ≤ 25% WQBEL
2-Nitrophenol	1,340,386	µg/L	Discharge Conc ≤ 25% WQBEL
4-Nitrophenol	385,361	µg/L	Discharge Conc ≤ 25% WQBEL
Pentachlorophenol	217	µg/L	Discharge Conc ≤ 25% WQBEL
Phenol	8,311,961	µg/L	Discharge Conc ≤ 25% WQBEL
2,4,6-Trichlorophenol	10,141	µg/L	Discharge Conc ≤ 25% WQBEL
Acenaphthene	13,907	µg/L	Discharge Conc ≤ 25% WQBEL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	623,397	µg/L	Discharge Conc ≤ 25% WQBEL
Benzidine	0.62	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	7.24	µg/L	Discharge Conc < TQL
Benzo(a)Pyrene	0.72	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Benzo(k)Fluoranthene	27.5	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	217	µg/L	Discharge Conc ≤ 25% WQBEL
Bis(2-Chloroisopropyl)Ether	415,598	µg/L	Discharge Conc ≤ 25% WQBEL
Bis(2-Ethylhexyl)Phthalate	2,318	µg/L	Discharge Conc ≤ 25% WQBEL
4-Bromophenyl Phenyl Ether	45,238	µg/L	Discharge Conc ≤ 25% WQBEL
Butyl Benzyl Phthalate	208	µg/L	Discharge Conc ≤ 25% WQBEL
2-Chloronaphthalene	1,662,392	µg/L	Discharge Conc ≤ 25% WQBEL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	27.5	µg/L	Discharge Conc < TQL
Dibenzo(a,h)Anthrancene	0.72	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	137,390	µg/L	Discharge Conc ≤ 25% WQBEL
1,3-Dichlorobenzene	14,546	µg/L	Discharge Conc ≤ 25% WQBEL
1,4-Dichlorobenzene	122,310	µg/L	Discharge Conc ≤ 25% WQBEL
3,3-Dichlorobenzidine	152	µg/L	Discharge Conc ≤ 25% WQBEL
Diethyl Phthalate	670,193	µg/L	Discharge Conc ≤ 25% WQBEL
Dimethyl Phthalate	418,871	µg/L	Discharge Conc ≤ 25% WQBEL
Di-n-Butyl Phthalate	18,430	µg/L	Discharge Conc ≤ 25% WQBEL
2,4-Dinitrotoluene	362	µg/L	Discharge Conc ≤ 25% WQBEL
2,6-Dinitrotoluene	362	µg/L	Discharge Conc ≤ 25% WQBEL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	217	µg/L	Discharge Conc ≤ 25% WQBEL
Fluoranthene	33,510	µg/L	Discharge Conc ≤ 25% WQBEL
Fluorene	103,900	µg/L	Discharge Conc ≤ 25% WQBEL
Hexachlorobenzene	0.00008	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	0.01	µg/L	Discharge Conc < TQL
Hexachlorocyclopentadiene	838	µg/L	Discharge Conc ≤ 25% WQBEL
Hexachloroethane	724	µg/L	Discharge Conc ≤ 25% WQBEL
Indeno(1,2,3-cd)Pyrene	7.24	µg/L	Discharge Conc < TQL
Isophorone	70,652	µg/L	Discharge Conc ≤ 25% WQBEL
Naphthalene	23,457	µg/L	Discharge Conc ≤ 25% WQBEL
Nitrobenzene	20,780	µg/L	Discharge Conc ≤ 25% WQBEL

n-Nitrosodiphenylamine	23,904	µg/L	Discharge Conc ≤ 25% WQBEL
Phenanthrene	838	µg/L	Discharge Conc ≤ 25% WQBEL
Pyrene	41,560	µg/L	Discharge Conc ≤ 25% WQBEL
1,2,4-Trichlorobenzene	145	µg/L	Discharge Conc ≤ 25% WQBEL

ATTACHMENT D

Authority's Response to September 2022 Pre-draft Letter

Reply | Reply All | Forward | ...

Tue 9/6/2022 3:50 PM

Scott Snyder <ssnyder@beaverpa.us>
To Conrad, Stephanie
You replied to this message on 9/7/2022 9:08 AM.

Good Day Stephanie,
I have checked with our lab and we plan to sample once we have bottles. How many rounds of samples are required?
Thank you,

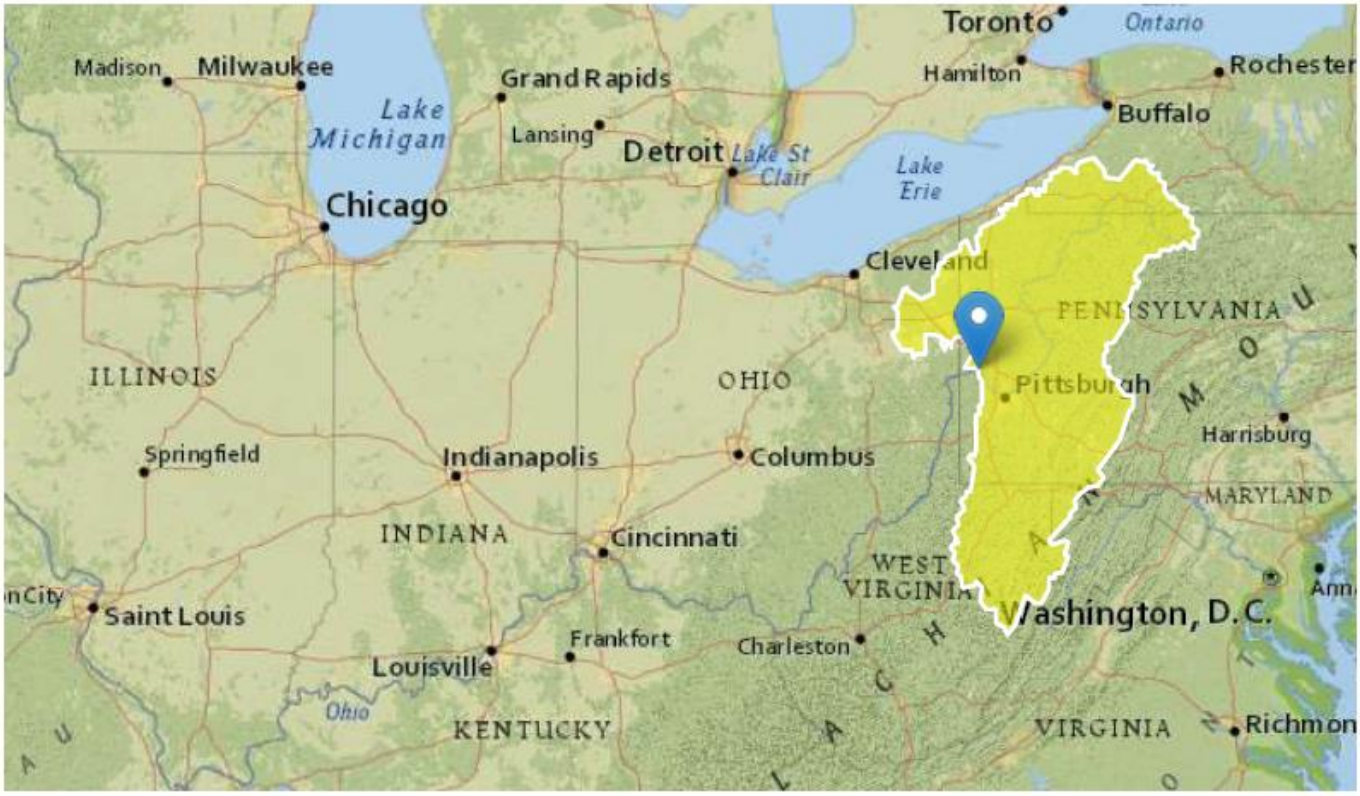
Scott A. Snyder
Coordinator of Operations
Beaver Borough Municipal Authority
724-624-4173 cell

ATTACHMENT E

USGS Stream Stats Output

StreamStats Report

Region ID: PA
Workspace ID: PA20210803122911344000
Clicked Point (Latitude, Longitude): 40.68816, -80.30354
Time: 2021-08-03 08:29:38 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	22800	square miles
ELEV	Mean Basin Elevation	1594	feet
PRECIP	Mean Annual Precipitation	44	inches

ATTACHMENT F

WET Test Analysis

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Survival
TIWC (decimal)	0.02
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name: Beaver Borough STP

Permit No.: PA0024694

Test Completion Date: 6/26/2018

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	0
10	1	1
11		
12		
13		
14		
15		
Mean	1.000	0.900
Std Dev.	0.000	0.316
# Replicates	10	10
T-Test Result		
Deg. of Freedom		
Critical T Value		
Pass or Fail	PASS	

Test Completion Date: 7/3/2019

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	10	10
T-Test Result		
Deg. of Freedom		
Critical T Value		
Pass or Fail	PASS	

Test Completion Date: 7/6/2020

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	0	1
4	1	1
5	1	1
6	1	0
7	1	1
8	1	1
9	1	1
10	0	1
11		
12		
13		
14		
15		
Mean	0.800	0.900
Std Dev.	0.422	0.316
# Replicates	10	10
T-Test Result		
Deg. of Freedom		
Critical T Value		
Pass or Fail	PASS	

Test Completion Date: 7/6/2021

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	0	1
8	1	0
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	0.900	0.900
Std Dev.	0.316	0.316
# Replicates	10	10
T-Test Result		
Deg. of Freedom		
Critical T Value		
Pass or Fail	PASS	

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Reproduction
TIWC (decimal)	0.02
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name: Beaver Borough STP

Permit No.: PA0024694

Test Completion Date: 6/26/2018

Replicate No.	Control	TIWC
1	35	34
2	38	34
3	31	38
4	33	37
5	38	35
6	35	35
7	39	33
8	36	35
9	38	35
10	37	39
11		
12		
13		
14		
15		
Mean	36.000	35.500
Std Dev.	2.539	1.900
# Replicates	10	10

T-Test Result	9.9923
Deg. of Freedom	17
Critical T Value	0.8633
Pass or Fail	**PASS**

Test Completion Date: 7/3/2019

Replicate No.	Control	TIWC
1	28	23
2	37	19
3	37	22
4	38	36
5	34	25
6	38	33
7	33	32
8	31	33
9	40	33
10	29	34
11		
12		
13		
14		
15		
Mean	34.500	29.000
Std Dev.	4.143	6.074
# Replicates	10	10

T-Test Result	1.4485
Deg. of Freedom	15
Critical T Value	0.8662
Pass or Fail	**PASS**

Test Completion Date: 7/6/2020

Replicate No.	Control	TIWC
1	24	27
2	27	27
3	8	23
4	19	34
5	31	29
6	26	0
7	26	31
8	28	30
9	30	27
10	4	28
11		
12		
13		
14		
15		
Mean	22.300	25.600
Std Dev.	9.250	9.454
# Replicates	10	10

T-Test Result	2.3933
Deg. of Freedom	16
Critical T Value	0.8647
Pass or Fail	**PASS**

Test Completion Date: 7/6/2021

Replicate No.	Control	TIWC
1	15	4
2	24	23
3	33	29
4	31	31
5	27	19
6	38	25
7	0	24
8	16	0
9	4	20
10		
11		
12		
13		
14		
15		
Mean	20.889	19.444
Std Dev.	13.081	10.643
# Replicates	9	9

T-Test Result	0.7830
Deg. of Freedom	15
Critical T Value	0.8662
Pass or Fail	**FAIL**

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Survival
TIWC (decimal)	0.02
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name: Beaver Borough STP

Permit No.: PA0024694

Replicate No.	Test Completion Date: 6/26/2018 Control	TIWC
1	1	1
2	1	0.9
3	1	1
4	0.8	0.9
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.950	0.950
Std Dev.	0.100	0.058
# Replicates	4	4
T-Test Result	9.5653	
Deg. of Freedom	5	
Critical T Value	0.7267	
Pass or Fail	PASS	

Replicate No.	Test Completion Date: 7/3/2019 Control	TIWC
1	1	1
2	0.9	1
3	0.778	0.9
4	1	0.7
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.920	0.900
Std Dev.	0.105	0.141
# Replicates	4	4
T-Test Result	5.0482	
Deg. of Freedom	5	
Critical T Value	0.7267	
Pass or Fail	PASS	

Replicate No.	Test Completion Date: 7/7/2020 Control	TIWC
1	1	1
2	1	1
3	1	0.7
4	1	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	1.000	0.925
Std Dev.	0.000	0.150
# Replicates	4	4
T-Test Result	4.9598	
Deg. of Freedom	3	
Critical T Value	0.7649	
Pass or Fail	PASS	

Replicate No.	Test Completion Date: 7/6/2021 Control	TIWC
1	1	1
2	0.9	0.9
3	1	1
4	1	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.975	0.975
Std Dev.	0.050	0.050
# Replicates	4	4
T-Test Result	14.8898	
Deg. of Freedom	5	
Critical T Value	0.7267	
Pass or Fail	PASS	

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Growth
TIWC (decimal)	0.02
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name: Beaver Borough STP

Permit No.: PA0024694

Replicate No.	Test Completion Date: 6/26/2018 Control	TIWC
1	0.335	0.364
2	0.317	0.388
3	0.325	0.315
4	0.302	0.299
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.320	0.342
Std Dev.	0.014	0.042
# Replicates	4	4
T-Test Result	4.7477	
Deg. of Freedom	4	
Critical T Value	0.7407	
Pass or Fail	PASS	

Replicate No.	Test Completion Date: 7/3/2019 Control	TIWC
1	0.408	0.98
2	0.444	0.416
3	0.3115	0.376
4	0.318	0.327
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.370	0.525
Std Dev.	0.066	0.306
# Replicates	4	4
T-Test Result	1.5951	
Deg. of Freedom	3	
Critical T Value	0.7649	
Pass or Fail	PASS	

Replicate No.	Test Completion Date: 7/7/2020 Control	TIWC
1	0.512	0.435
2	0.458	0.449
3	0.463	0.356
4	0.416	0.444
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.462	0.421
Std Dev.	0.039	0.044
# Replicates	4	4
T-Test Result	2.8188	
Deg. of Freedom	5	
Critical T Value	0.7267	
Pass or Fail	PASS	

Replicate No.	Test Completion Date: 7/6/2021 Control	TIWC
1	0.633	0.611
2	0.524	0.509
3	0.49	0.498
4	0.549	0.568
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.549	0.547
Std Dev.	0.061	0.053
# Replicates	4	4
T-Test Result	3.8553	
Deg. of Freedom	5	
Critical T Value	0.7267	
Pass or Fail	PASS	

WET Summary and Evaluation

Facility Name	Beaver Borough STP
Permit No.	PA0024694
Design Flow (MGD)	1.045
Q_{7-10} Flow (cfs)	5700
PMF_a	0.089
PMF_c	0.617

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	6/26/18	7/3/19	7/6/20	7/6/21
Ceriodaphnia	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	6/26/18	7/3/19	7/6/20	7/6/21
Ceriodaphnia	Reproduction	PASS	PASS	PASS	FAIL

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	6/26/18	7/3/19	7/7/20	7/6/21
Pimephales	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	6/26/18	7/3/19	7/7/20	7/6/21
Pimephales	Growth	PASS	PASS	PASS	PASS

Reasonable Potential? YES

Permit Recommendations

Test Type	**Chronic**
TIWC	**1** % Effluent
Dilution Series	**1, 2, 30, 60, 100** % Effluent
Permit Limit	**100.0** TUc
Permit Limit Species	**Ceriodaphnia dubia**

For Outfall 001, ☐ **Acute** ☒ **Chronic** WET Testing was completed:

☒ For the permit renewal application (4 tests).
☐ Quarterly throughout the permit term.
☐ Quarterly throughout the permit term and a TIE/TRE was conducted.
☐ Other:

The dilution series used for the tests was: 100%, 60%, 30%, 2%, and 1%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 2%.

Summary of Four Most Recent Test Results

TST Data Analysis

(NOTE – In lieu of recording information below, the application manager may attach the DEP WET Analysis Spreadsheet).

Test Date	*Ceriodaphnia* Results (Pass/Fail)		*Pimephales* Results (Pass/Fail)	
	Survival	Reproduction	Survival	Growth
6/26/2018	PASS	PASS	PASS	PASS
7/3/2019	PASS	PASS	PASS	PASS
7/6 through 7/7/2020	PASS	PASS	PASS	PASS
7/6/2021	PASS	FAIL	PASS	PASS
12/21/21	PASS	PASS	PASS	PASS

***** *A "passing" result is that in which the replicate data for the TIWC is not statistically significant from the control condition. This is exhibited when the calculated t value ("T-Test Result") is greater than the critical t value. A "failing" result is exhibited when the calculated t value ("T-Test Result") is less than the critical t value.*

Is there reasonable potential for an excursion above water quality standards based on the results of these tests? (*NOTE – In general, reasonable potential is determined anytime there is at least one test failure in the previous four tests).*

☒ **YES** ☐ **NO**

Comments: The WET Test completed on July 6, 2021 resulted in a failed test for *Ceriodaphnia* Reproduction. The facility re-tested all four end points on December 21, 2021 and all tests passed. In accordance with Appendix D of the Department's SOP for *Whole Effluent Toxicity* [SOP No. BPNPSM-PMT-031], if a passing result is determined for all endpoints in the re-test, then the facility may resume annual monitoring.

Evaluation of Test Type, IWC and Dilution Series for Renewed Permit

Acute Partial Mix Factor (PMFa):**0.089** Chronic Partial Mix Factor (PMFc): **0.617**

1. Determine IWC – Acute (IWCa):

$(Q_d \times 1.547) / ((Q_{7\text{-}10} \times PMFa) + (Q_d \times 1.547))$

[(1.045 MGD x 1.547) / ((5700 cfs x 0.089) + (1.045 MGD x 1.547))] x 100 = **0.32%**

Is IWCa < 1%? ☒ **YES** ☐ **NO (YES - Acute Tests Required OR NO - Chronic Tests Required)**

Type of Test for Permit Renewal: **Acute**

2a. Determine Target IWCa (If Acute Tests Required)

TIWCa = 0.05 / 0.3 = 1.06**%**

3. Determine Dilution Series

Dilution Series = 100%, 60%, 30%, 2%, and 1%.

WET Limits

Has reasonable potential been determined? ☐ YES ☒ NO

Will WET limits be established in the permit? ☐ YES ☒ NO

If WET limits will be established, identify the species and the limit values for the permit (TU).

If WET limits will not be established, but reasonable potential was determined, indicate the rationale for not establishing WET limits: