Pennsylvania Department of Environmental Protection

Northcentral Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0035599**
Facility Type	**Non-Municipal**	APS ID	**1103667**
Major / Minor	**Minor**	Authorization ID	**1467126**

Applicant and Facility Information

Applicant Name	**PA DOT Bureau of Project Delivery**	Facility Name	**PA DOT Site 35 I 80 East Rest Area**
Applicant Address	400 North Street Floor 6	Facility Address	I-80 East
	Harrisburg, PA 17120-0206		Liberty Twp, PA 17821
Applicant Contact	Nicholaus Sahd	Facility Contact	Nicholaus Sahd
Applicant Phone	(717) 886-5395	Facility Phone	(717) 886-5395
Client ID	62162	Site ID	480815
Ch 94 Load Status	Not Overloaded	Municipality	Liberty Township
Connection Status	No Limitations	County	Montour
Date Application Received	January 2, 2024	EPA Waived?	Yes
Date Application Accepted	January 17, 2024	If No, Reason	

Purpose of Application: Application for the renewal of the existing individual NPDES permit.

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.

Approve	Deny	Signatures	Date
X		Jonathan P. Peterman / Project Manager	March 7, 2025
X		Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	March 10, 2025

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.007
Latitude	40º 59' 15.99"	Longitude	-76º 44' 32.90"
Quad Name	Riverside	Quad Code	1132
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary to Beaver Run (WWF, MF)	Stream Code	18739
NHD Com ID	66919903	RMI	0.4100
Drainage Area	n/a	Yield (cfs/mi^2)	n/a
Q_{7-10} Flow (cfs)	0	Q_{7-10} Basis	Intermittent stream
Elevation (ft)	600	Slope (ft/ft)	n/a
Watershed No.	10-D	Chapter 93 Class.	WWF, MF
Existing Use	WWF	Existing Use Qualifier	n/a
Exceptions to Use	None	Exceptions to Criteria	None
Assessment Status	Impaired		
Cause(s) of Impairment	SILTATION		
Source(s) of Impairment	AGRICULTURE		
TMDL Status		Name	
Nearest Downstream Public Water Supply Intake	Sunbury Municipal Authority		
PWS Waters	Susquehanna River	Flow at Intake (cfs)	1740
PWS RMI	124	Distance from Outfall (mi)	17.5

Changes Since Last Permit Issuance: None.
Other Comments: No modeling was previously conducted or this facility. However, discharge should be evaluated to ensure that the effluent limits are protective of water quality where the effluent meets Beaver Run. The Q_{7-10} calculations, for this stream are attached in Appendix A.
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Chesapeake Bay Requirements

Since this facility's annual average design flow is 0.007 MGD, the permittee was required to monitor and report TN and TP throughout the permit term at a frequency no less than annually in accordance with the Phase III WIP Chesapeake Bay Strategy for Phase V facilities (0.002 MGD to 0.2 MGD) unless 1) the facility has already conducted at least two years of nutrient monitoring and 2) a summary of the monitoring results are included in the next permit's fact sheet. During previous permit cycles, the required sampling was conducted. Since the permittee conducted this monitoring in a previous permit term and the data is summarized in the fact sheet below, the conditions have been met and Chesapeake Bay monitoring will not be required.

Parameter	Instantaneous Maximum (mg/l)	Total Annual (lbs)
Total Nitrogen (TN)	160	704
Total Phosphorus (TP)	5.6	28

Anti-Backsliding

In accordance with 40 CFR 122.44(l)(1) and (2), this permit does not contain effluent limitations, standards, or conditions that are less stringent than the previous permit.

Treatment Facility Summary

Treatment Facility Name: PA DOT - Rest Area 35 - I-80 East

WQM Permit No.	Issuance Date	Comments
4790403 A-1	4/21/2022	Replacement of existing tablet chlorinator with a new liquid sodium hypochlorite feed.
4790403	1/30/1991	Original construction.

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Tertiary	Activated Sludge With Solids Removal	Hypochlorite	0.007
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.007	--	Not Overloaded	Aerobic Digestion	Other WWTP

Treatment System Components:
- One (1) Equalization Tank with Manual Screen.
- One (1) Splitter Box.
- Two (2) Aeration Tanks.
- Two (2) Clarifiers.
- One (1) Dosing Tank.
- Two (2) Sand Filters.
- One (1) Chlorine Disinfection System.
- One (1) Chlorine Contact Tank.
- One (1) Flow Meter.
- One (1) Outfall 001.

- One (1) Aerobic Digester.

Existing Effluent Limitations and Monitoring Requirements

Existing Limits

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	Report Daily Min	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	1.6	XXX	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	XXX	XXX	XXX	10.0	20.0	XXX	2/month	Grab
Total Suspended Solids	XXX	XXX	XXX	10.0	20.0	XXX	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab

*The existing effluent limits for Outfall 001 were based on a design flow of 0.007 MGD.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.007
Latitude 40º 59' 26" **Longitude** -76º 44' 21.8"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

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	10,000 / 100 ml	IMAX	-	92a.47(a)(5)

(10/1 – 4/30)				
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Water Quality-Based Limitations
To establish whether or not water-quality based effluent limitations (WQBELs) are required, the Department models in-stream conditions. In order to determine limitations for CBOD5, ammonia-N and dissolved oxygen, the Department utilizes the WQM 7.0 v1.0b model and in order to determine limitations for toxics, the Department utilizes Toxics Management Spreadsheet (TMS). The TMS was not utilized or this review.

WQM 7.0 for Windows, Version 1.0b, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen
The model was run using the Q7-10 stream flow, background water quality, average annual design flow, and other discharge characteristics. The existing technology based effluent limit (advanced treatment standards) for $CBOD_5$ (10 mg/l) and the technology-based effluent limits for NH3-N (25.0 mg/l) were used as inputs for the modeling. The DO minimum daily average criterion from §93.7 (5.0 mg/L for WWF) was used for the in-stream objective for the model. The summary of the output is as follows:

Parameter	Effluent Limit		
	30 Day Average	Maximum	Minimum
CBOD5	10	N/A	N/A
Ammonia-N	25	50	N/A
Dissolved Oxygen	N/A	N/A	3

The model did not recommend water-quality based effluent limitations with regards to $CBOD_5$, ammonia, and dissolved oxygen. Refer to the Appendix B for the previous WQM 7.0 inputs and results. The existing effluent limits will remain.

Best Professional Judgment (BPJ) Limitations
See the D.O. section below.
Comments: None.

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 the abovementioned 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) 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	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	Report Daily Min	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	1.6	XXX	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	XXX	XXX	XXX	10.0	20.0	XXX	2/month	Grab

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Total Suspended Solids	XXX	XXX	XXX	10.0	20.0	XXX	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Ammonia-Nitrogen	XXX	XXX	XXX	Report	XXX	Report	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab

*The proposed effluent limits for Outfall 001 were based on a design flow of 0.007 MGD.

General Information
All of the limits proposed above are consistent with other permits issued for wastewater treatment plants in the region. The associated mass-based limits (lbs/day) for all parameters were based on the formula: design flow (average annual) (MGD) x concentration limit (mg/L) at design flow x conversion factor (8.34). All effluent limits were then rounded down in accordance with the rounding rules established in the *Technical Guidance for the Development and Specification of Effluent Limitations (362-0400-001)*, Chapter 5 - Specifying Effluent Limitations in NPDES Permits.

Flow
Reporting of the average monthly flow and daily maximum is consistent with monitoring requirements for other treatment plants of this size.

Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)
The results of the WQM 7.0 model show that the existing advanced treatment requirements for $CBOD_5$ as stipulated in the *Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers* (391-2000-014**)** are protective of water quality and will remain.

Total Suspended Solids (TSS)
The previously applied advanced treatment requirements stipulated in the *Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers* (391-2000-014**)** for TSS will remain as well.

pH
CFR Title 40 §133.102(c) and 25 PA Code §95.2(1) provide the basis of effluent limitations for pH. The existing limits will remain.

Total Residual Chlorine (TRC)
In accordance with 25 Pa. Code 92a.48(b)(2), a best available technology (BAT) value of 0.5 mg/l was used in the TRC Spreadsheet. This is also the existing effluent limit. The attached TRC model indicates that the technology based effluent limit of 0.5 mg/L (Average Monthly) and 1.6 mg/L (Instantaneous Maximum) are still protective of water quality and will remain.

Fecal Coliforms
The existing fecal coliform limits with I-max limits were updated from the previous Chapter 92 code to correspond with what is specified in the updated 25 PA Code § 92a.47 (a)(4)&(5).

Dissolved Oxygen (DO)
Given results of the WQM 7.0 model, a discharge of effluent from this facility with a DO concentration of 3 mg/l would not result in an exceedance of water quality requirements for this stream. Therefore, based on BPJ, only monitoring will be required for this facility.

Ammonia-Nitrogen (NH3-N)
The results of the WQM 7.0 model show that the technology based effluent limits for ammonia-nitrogen are protective of water quality. Therefore, the permittee will only be required to monitor for ammonia-nitrogen. The sample type (Grab) for NH3-N corresponds with the *Technical Guidance for the Development and Specification of Effluent Limitations* (362-0400-001) Table 6-3.

E. Coli
25 PA Code § 92a.61 provide the basis of monitoring requirements for E. Coli. Yearly monitoring will be required going forward.

Compliance History

Summary of Inspections -The last inspection of the facility was conducted on 2/25/25 by the Department. This inspection revealed no issues with the facility.
WMS Query Summary - A WMS Query was run at *Reports - Violations & Enforcements – Open Violations for Client Report* to determine whether there are any unresolved violations associated with the client that will affect issuance of the permit (per CSL Section 609). This query revealed no open violations.
eDMRs Summary - Upon review of the eDMR results the facility has been operating within the required effluent limits.

Compliance History

DMR Data for Outfall 001 (from January 1, 2024 to December 31, 2024)

Parameter	DEC-24	NOV-24	OCT-24	SEP-24	AUG-24	JUL-24	JUN-24	MAY-24	APR-24	MAR-24	FEB-24	JAN-24
Flow (MGD) Average Monthly	0.000819	0.000846	0.000668	0.000768	0.001253	0.001418	0.000993	0.000916	0.000634	0.00028	0.000647	0.000727
Flow (MGD) Daily Maximum	0.001833	0.001353	0.001236	0.002425	0.004488	0.001908	0.001519	0.002428	0.002967	0.003246	0.001051	0.00332
pH (S.U.) Daily Minimum	7.9	7.9	7.9	7.8	7.8	7.5	7.7	7.6	7.7	7.7	7.9	7.8
pH (S.U.) Daily Maximum	8.1	8.1	8.1	8.0	8.0	8.1	7.9	8.0	8.0	7.9	8.0	8.0
DO (mg/L) Daily Minimum	10.58	9.19	8.39	7.87	7.46	7.27	7.50	7.71	9.35	9.69	10.97	10.33
TRC (mg/L) Average Monthly	0.08	0.07	0.05	0.04	0.04	0.04	0.05	0.05	0.06	0.09	0.14	0.16
TRC (mg/L) Daily Maximum	0.24	0.12	0.08	0.08	0.07	0.06	0.1	0.11	0.1	0.13	0.19	0.41
CBOD5 (mg/L) Average Monthly	< 3.00	< 3.00	< 3.00	< 3.00	< 3.00	< 3.00	6.7	< 3.00	3.00	< 3.00	4.29	< 3.00
CBOD5 (mg/L) Daily Maximum	< 3.00	< 3.00	< 3.00	< 3.00	< 3.00	< 3.00	10.4	< 3.00	3.00	< 3.00	5.55	< 3.00
TSS (mg/L) Average Monthly	2.6	3.40	2.40	2.60	1.8	2.80	< 1.60	3.00	2.2	< 1.60	2.4	< 1.60
TSS (mg/L) Daily Maximum	3.6	5.2	2.80	3.2	2.0	4.00	< 1.60	4.4	2.8	< 1.60	3.2	< 1.60
Fecal Coliform (No./100 ml) Geometric Mean	< 1.00	< 1.00	< 1.00	< 1.00	2.00	< 1.00	< 1.00	< 1.00	1.00	< 1.00	< 1.00	< 1.00
Fecal Coliform (No./100 ml) Instantaneous Maximum	< 1.00	< 1.00	< 1.00	< 1.00	3.1	< 1.00	< 1.00	< 1.00	1.00	< 1.00	< 1.00	< 1.00

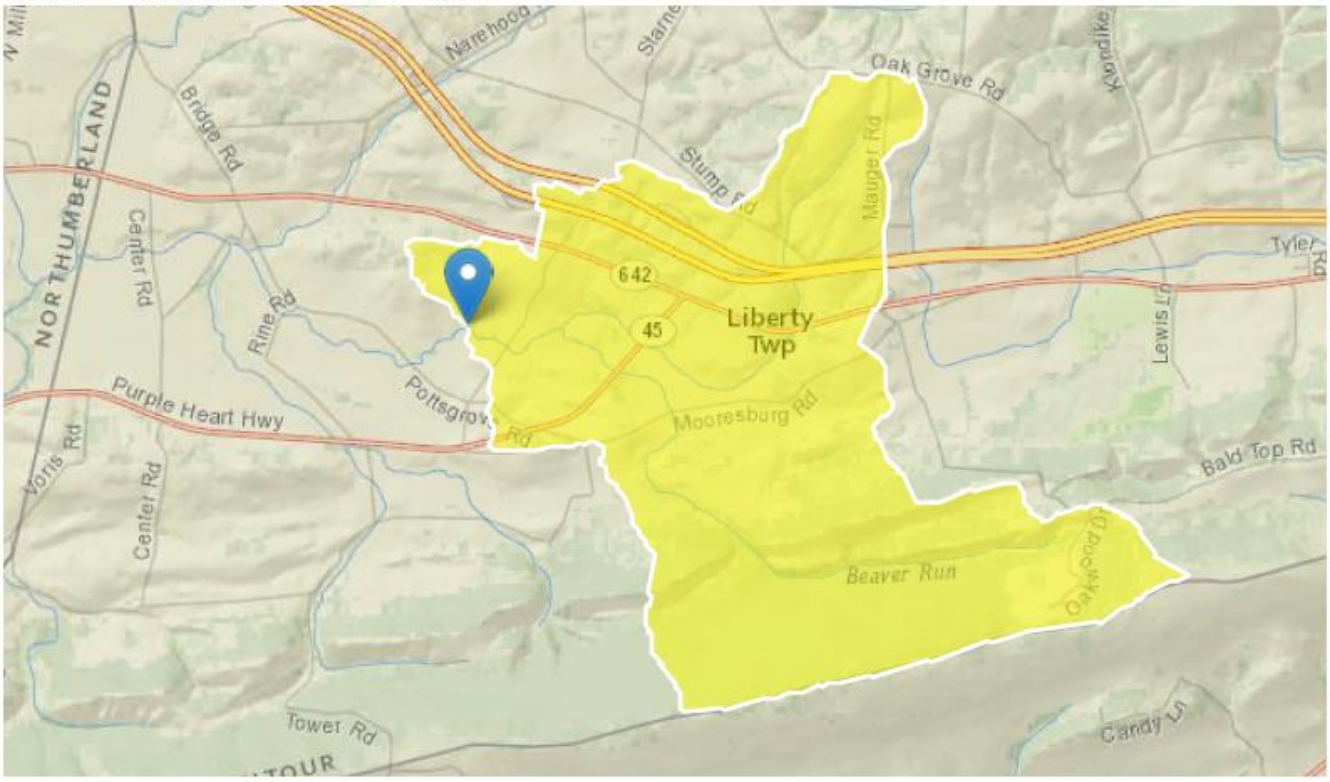
Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment **B**)
☐	Toxics Management Spreadsheet (see Attachment)
☒	TRC Model Spreadsheet (see Attachment **C**)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☒	Technical Guidance for the Development and Specification of Effluent Limitations, 386-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 386-2000-019, 3/98.
☒	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 386-2000-018, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 386-2183-001, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 386-2183-002, 12/97.
☐	Pennsylvania CSO Policy, 386-2000-002, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 386-2000-008, 4/97.
☐	Determining Water Quality-Based Effluent Limits, 386-2000-004, 12/97.
☐	Implementation Guidance Design Conditions, 386-2000-007, 9/97.
☒	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 386-2000-016, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 386-2000-012, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 386-2000-009, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 386-2000-015, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 386-2000-022, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 386-2000-013, 4/2008.
☒	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 386-2000-011, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 386-2000-001, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 386-2000-021, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 386-2000-020, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 386-2000-005, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 386-2000-010, 3/1999.
☒	Design Stream Flows, 386-2000-003, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 386-2000-006, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 386-3200-001, 6/97.
☒	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☐	SOP:
☐	Other:

APPENDIX A

Q7-10 ANALYSIS AND STREAM DATA

StreamStats Report

Region ID: PA
Workspace ID: PA20250306185526158000
Clicked Point (Latitude, Longitude): 40.98257, -76.74386
Time: 2025-03-06 13:55:59 -0500



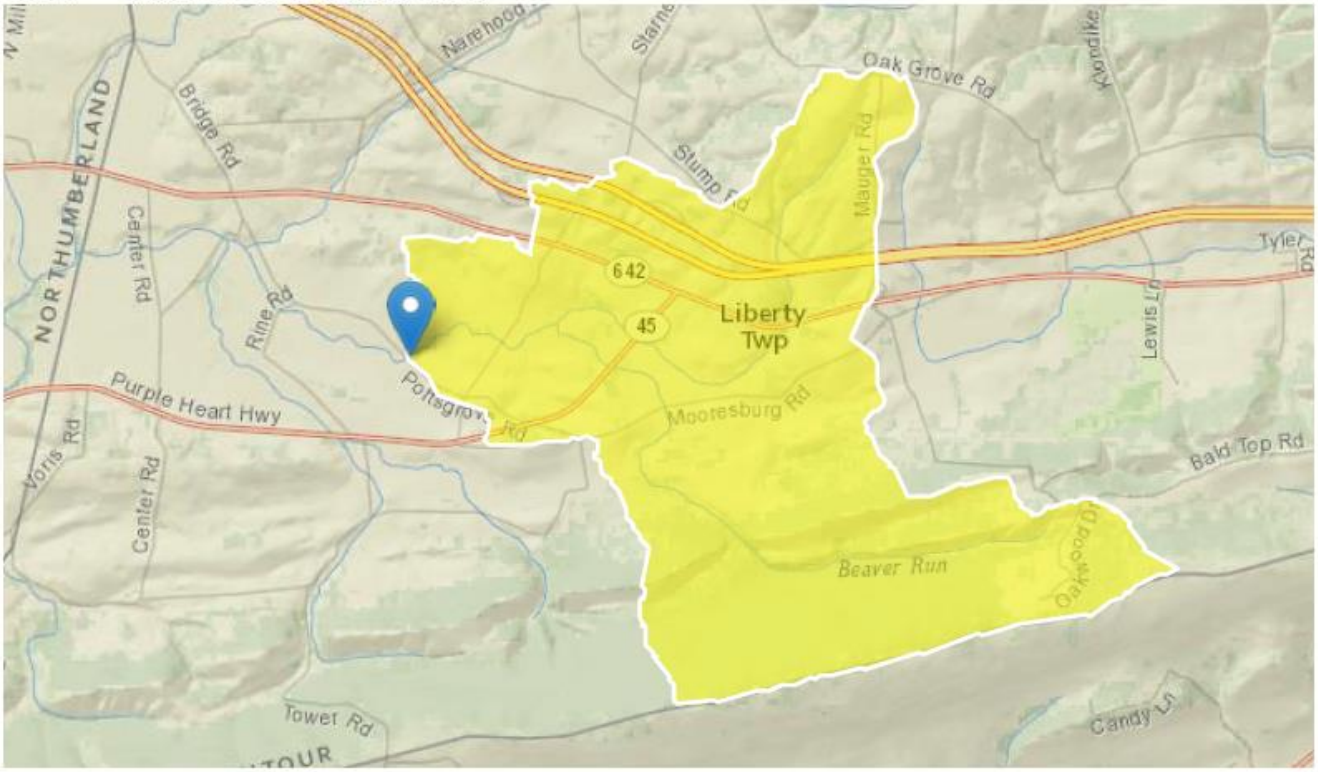
Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	7.88	percent
DRNAREA	Area that drains to a point on a stream	4.69	square miles
PRECIP	Mean Annual Precipitation	41	inches
ROCKDEP	Depth to rock	3.9	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	2.24	miles per square mile

StreamStats Report

Region ID: PA
Workspace ID: PA20250306185952517000
Clicked Point (Latitude, Longitude): 40.98017, -76.74886
Time: 2025-03-06 14:00:18 -0500



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Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	7.68	percent
DRNAREA	Area that drains to a point on a stream	4.81	square miles
PRECIP	Mean Annual Precipitation	41	inches
ROCKDEP	Depth to rock	3.8	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	2.28	miles per square mile

APPENDIX B

WQM 7.0 MODEL INPUT/OUTPUT

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
10D	18739	Trib 18739 to Beaver Run	**2.510**	498.00	4.69	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	0.100	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	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
PADOT REST EAST	PA0035599	0.0070	0.0070	0.0070	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	10.00	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
10D	18739	Trib 18739 to Beaver Run	**2.060**	492.00	4.81	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	0.100	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	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
10D	18739	Trib 18739 to Beaver Run

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												
2.510	0.47	0.00	0.47	.0108	0.00253	.461	11.1	24.06	0.09	0.294	20.11	7.00
Q1-10 Flow												
2.510	0.44	0.00	0.44	.0108	0.00253	NA	NA	NA	0.09	0.304	20.12	7.00
Q30-10 Flow												
2.510	0.55	0.00	0.55	.0108	0.00253	NA	NA	NA	0.10	0.269	20.10	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	0.94	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.17	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
10D	18739	Trib 18739 to Beaver Run

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
2.510	PADOT REST E	16.59	50	16.59	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
2.510	PADOT REST E	1.88	25	1.88	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)		
2.51	PADOT REST EAST	10	10	25	25	3	3	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
10D	18739	Trib 18739 to Beaver Run

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
2.510	0.007	20.113	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
11.103	0.461	24.062	0.094
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.18	0.128	0.56	0.706
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.125	18.619	Owens	5
Reach Travel Time (days)			
0.294			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.029	2.17	0.55	8.23
0.059	2.16	0.54	8.23
0.088	2.16	0.53	8.23
0.117	2.15	0.52	8.23
0.147	2.14	0.51	8.23
0.176	2.13	0.50	8.23
0.206	2.12	0.49	8.23
0.235	2.12	0.48	8.23
0.264	2.11	0.47	8.23
0.294	2.10	0.46	8.23

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
10D	18739	Trib 18739 to Beaver Run

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)
2.510	PADOT REST EAST	PA0035599	0.007	CBOD5	10		
				NH3-N	25	50	
				Dissolved Oxygen			3

APPENDIX C

TRC ANALYSIS

1A	B	C	D	E	F	G
2	**TRC EVALUATION**			**PA DOT Site 35 PA0035599**		
3	Input appropriate values in B4:B8 and E4:E7					
4	0.4	= Q stream (cfs)		0.6	= CV Daily	
5	0.007	= Q discharge (MGD)		0.6	= CV Hourly	
6	30	= no. samples		1	= AFC_Partial Mix Factor	
7	0.3	= Chlorine Demand of Stream		1	= CFC_Partial Mix Factor	
8	0	= Chlorine Demand of Discharge		15	= AFC_Criteria Compliance Time (min)	
9	0.6	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)	
	0	= % Factor of Safety (FOS)		0	=Decay Coefficient (K)	
10	Source	Reference	AFC Calculations		Reference	CFC Calculations
11	TRC	1.3.2.III	WLA afc =	11.802	1.3.2.III	WLA cfc = 11.499
12	PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc = 0.681
13	PENTOXSD TRG	5.1b	LTA_afc=	4.398	5.1d	LTA_cfc = 6.685
14						
15	Source		Effluent Limit Calculations			
16	PENTOXSD TRG	5.1f	AML MULT =	1.231		
17	PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) =	0.500	BAT/BPJ	
18			INST MAX LIMIT (mg/l) =	1.636		

WLA afc	(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...
	...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...
	...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)