pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northcentral Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0032824**
Facility Type	**Non-Municipal**	APS ID	**1117499**
Major / Minor	**Minor**	Authorization ID	**1491667**

Applicant and Facility Information

Applicant Name	**PA DOT Bureau of Project Delivery**	Facility Name	**PA DOT Safety Rest 38**
Applicant Address	400 North Street 6th Floor	Facility Address	I-80 Westbound
	Harrisburg, PA 17105		Mifflin Twp, PA 17814
Applicant Contact	Nicholaus Sahd	Facility Contact	Michael McWilliams
Applicant Phone	(717) 951-8685	Facility Phone	(570) 387-4250
Client ID	62162	Site ID	263256
Ch 94 Load Status	Not Overloaded	Municipality	Mifflin Township
Connection Status	No Limitations	County	Columbia
Date Application Received	July 3, 2024	EPA Waived?	Yes
Date Application Accepted	July 11, 2024	If No, Reason	

Purpose of Application: Renewal of a NPDES Permit

Summary of Review

The subject treated sewage discharge serves Rest Areas 37 and 38 along I-80 in Mifflin Township, Columbia County. A map of the discharge location is attached.

Sludge use and disposal description and location(s): The facility's digested sludge in sent to other facilities for further processing. Per the application 2 dry tons were disposed in the previous year.

Public Participation

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
✓		Keith C. Allison Keith C. Allison / Project Manager	February 5, 2025
✓		N. W. H. Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	February 5, 2025

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.013
Latitude	41º 0' 49.76"	Longitude	-76º 15' 8.29"
Quad Name	Mifflinville, PA	Quad Code	1035
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary to Nescopeck Creek (CWF)	Stream Code	28103
NHD Com ID	65639891	RMI	2.5
Drainage Area	1.07	Yield (cfs/mi^2)	0.0822
Q_{7-10} Flow (cfs)	0.0879	Q_{7-10} Basis	Gage No. 1538000. Wapwallopen Creek@ Wapwallopen, PA
Elevation (ft)	824	Slope (ft/ft)	0.018
Watershed No.	5-D	Chapter 93 Class.	CWF
Existing Use	N/A	Existing Use Qualifier	N/A
Exceptions to Use	None	Exceptions to Criteria	None
Assessment Status	Attaining Use(s)		
TMDL Status	Final	Name	Little Nescopeck Creek
Nearest Downstream Public Water Supply Intake	Danville Municipal Water Authority		
PWS Waters	Susquehanna River	Flow at Intake (cfs)	1511
PWS RMI	138.06	Distance from Outfall (mi)	27.9

Changes Since Last Permit Issuance: None. The above existing stream and drainage characteristics are adequate and unchanged.

Other Comments: No downstream water supply is expected to be affected by the discharge at this time with the limitations and monitoring proposed.

Treatment Facility Summary

Treatment Facility Name: PA DOT Rest Area 38 - I-80 West

WQM Permit No.	Issuance Date	Permit Coverage:
1993401	Original - 4/30/93	Flow Equalization Tank
	A-1 – 12/23/21	Dechlorination
	A-2 – 4/22/24	Plant upgrades
1972401	2/8/07	Liquid Chlorine Disinfection

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Extended Aeration	Chlorine With Dechlorination	0.013

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.013	66.7	Not Overloaded	Holding Tank	Landfill

Changes Since Last Permit Issuance: WQM Permit No. 1993401 A-2 was issued on April 22, 2024 for replacing the existing treatment process including comminutor, bar screen, two 8,475-gallons EQ tanks, two 10,510-gallon anoxic tanks, two 8,019-gallon aeration tanks, two final clarifiers, tertiary filtration, UV disinfection, post aeration, and aerated sludge storage.

Other Comments: The existing treatment process consists of equalization, two aeration basins, two clarifiers, two sand filters, chlorination, and two aerated sludge digesters.

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	0.00481	0.00464	0.0051	0.00766	0.008	0.00922	0.00727	0.0034	0.00718	0.0061	0.00497	0.00399
pH (S.U.) Instantaneous Minimum	7.19	7.4	7.0	6.51	6.94	6.3	7.0	7.14	6.4	6.4	6.9	6.9
pH (S.U.) Instantaneous Maximum	7.91	8.0	7.86	8.05	8.62	8.0	8.1	7.96	7.7	7.7	8.2	8.2
DO (mg/L) Instantaneous Minimum	7.65	8.63	8.13	7.72	7.61	7.75	5.58	6.0	6.26	6.26	7.06	6.4
TRC (mg/L) Average Monthly	0.1	0.069	0.088	0.21	0.21	0.17	0.06	0.08	0.5	0.07	0.07	0.09
TRC (mg/L) Instantaneous Maximum	0.93	0.35	0.55	0.92	0.94	1.6	0.29	0.34	1.6	0.44	0.5	0.63
CBOD5 (mg/L) Average Monthly	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.71	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
CBOD5 (mg/L) Instantaneous Maximum	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	4.42	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
TSS (mg/L) Average Monthly	< 2.2	< 1.8	< 2.6	2.4	< 3.4	< 1.6	< 1.6	< 1.6	< 1.8	3.14	< 1.6	2.4
TSS (mg/L) Instantaneous Maximum	2.8	2.0	3.6	2.4	< 1.6	1.6	4.42	< 1.6	< 2.0	4.67	1.6	3.2
Fecal Coliform (No./100 ml) Geometric Mean	< 1.0	< 1.0	< 1.0	< 156	2.0	4.0	< 13.0	3	7.0	< 2	< 1.0	< 1.0
Fecal Coliform (No./100 ml) Instantaneous Maximum	< 1.0	1.0	< 1.0	2419*	3.1	6.3	161.6	5.2	7.5	< 3	< 1.0	< 1.0
Ammonia (mg/L) Average Monthly	< 3.202	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1488	< 0.1	0.1	1.979	< 0.1	< 0.1	< 0.163
Ammonia (mg/L) Instantaneous Maximum	6.303	< 0.1	< 0.1	0.1	< 0.1	0.1975	< 0.1	0.1	2.08	< 0.1	< 0.1	0.225

*- Effluent Violation

Compliance History, Cont'd

Effluent Violations for Outfall 001, from: February 1, 2024 To: December 31, 2024

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Fecal Coliform	09/30/24	IMAX	2419	No./100 ml	1000	No./100 ml

Compliance History, Cont'd	
Summary of Inspections:	The facility has been inspected approximately annually by the Department over the past permit term. The most recent inspection on January 29, 2025 identified an eDMR effluent violation.
Other Comments:	A query in WMS found open violations for the permittee in eFACTS for the permittee as listed in Attachment B including at this facility for effluent violations.

Existing Effluent Limitations and Monitoring Requirements								
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**	**Maximum**	**Instant. Maximum**		
Flow (MGD)	Report	XXX	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	Report Inst Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50.0	2/month	Grab
TSS	XXX	XXX	XXX	30.0	XXX	60.0	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 Nov 1 - Apr 30	XXX	XXX	XXX	25.0	XXX	50.0	2/month	Grab
Ammonia May 1 - Oct 31	XXX	XXX	XXX	12.0	XXX	25.0	2/month	Grab

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.013
Latitude 41º 0' 53.00" **Longitude** -76º 15' 8.00"
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)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
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)

Comments: The above limits are applicable and are included in the existing permit.

Water Quality-Based Limitations

DO, CBOD5 and NH3-N

The WQM7.0 model allows the Department to evaluate point source discharges of dissolved oxygen (DO), carbonaceous BOD ($CBOD_5$), and ammonia-nitrogen (NH_3-N) into free-flowing streams and rivers. To accomplish this, the model simulates two basic processes: the mixing and degradation of NH_3-N in the stream and the mixing and consumption of DO in the stream due to the degradation of $CBOD_5$ and NH_3-N. The discharge has an existing water quality-based NH_3-N limitation of 12 mg/L. WQM7.0 modeling was performed (see Attachment C) for the discharge to the Unnamed Tributary to Nescopeck Creek and verified that no limitations are necessary beyond the existing limits.

Total Residual Chlorine

The attached modeling shows that the technology-based limit of 0.5 mg/L is adequate to protect the receiving waters (See Attachment D).

Water Quality Toxics Management

No additional reasonable potential analysis has been performed to determine additional parameters for limitations or monitoring for this minor treatment plant with no industrial flows.

Chesapeake Bay/Nutrient Requirements

A portion of the Chesapeake Bay and many of its tidal tributaries have been listed as impaired under Section 303(d) of the Water Pollution Control Act, 33 U.S.C. §1313(d). Total Nitrogen and Total Phosphorus cap loads have been established for significant dischargers in Pennsylvania to reduce the total nutrient load to the Bay and meet State of Maryland Water Quality Standards. This facility is considered a Phase V, non-significant Chesapeake Bay discharger and as such no nutrient cap loadings have been established for the facility pursuant to the Phase III Watershed Implementation Plan. Because no recent nutrient data is available for the discharge annual nutrient monitoring will be required at this time.

Best Professional Judgment (BPJ) Limitations

Comments: No additional BPJ limits are necessary at this time beyond the water quality and technology-based limits noted above.

E. Coli

Annual e. coli monitoring will be required at this time due to changes to Chapter 93 of the Department's regulations and Department policy.

Anti-Backsliding

No limitations in this proposed draft permit have been made less stringent consistent with the anti-backsliding requirements of the Clean Water Act and 40 CFR 122.44(l).

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" (386-0400-001), 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	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	XXX	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	Report Inst Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50.0	2/month	Grab
TSS	XXX	XXX	XXX	30.0	XXX	60.0	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 Nov 1 - Apr 30	XXX	XXX	XXX	25.0	XXX	50.0	2/month	Grab
Ammonia May 1 - Oct 31	XXX	XXX	XXX	12.0	XXX	25.0	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab

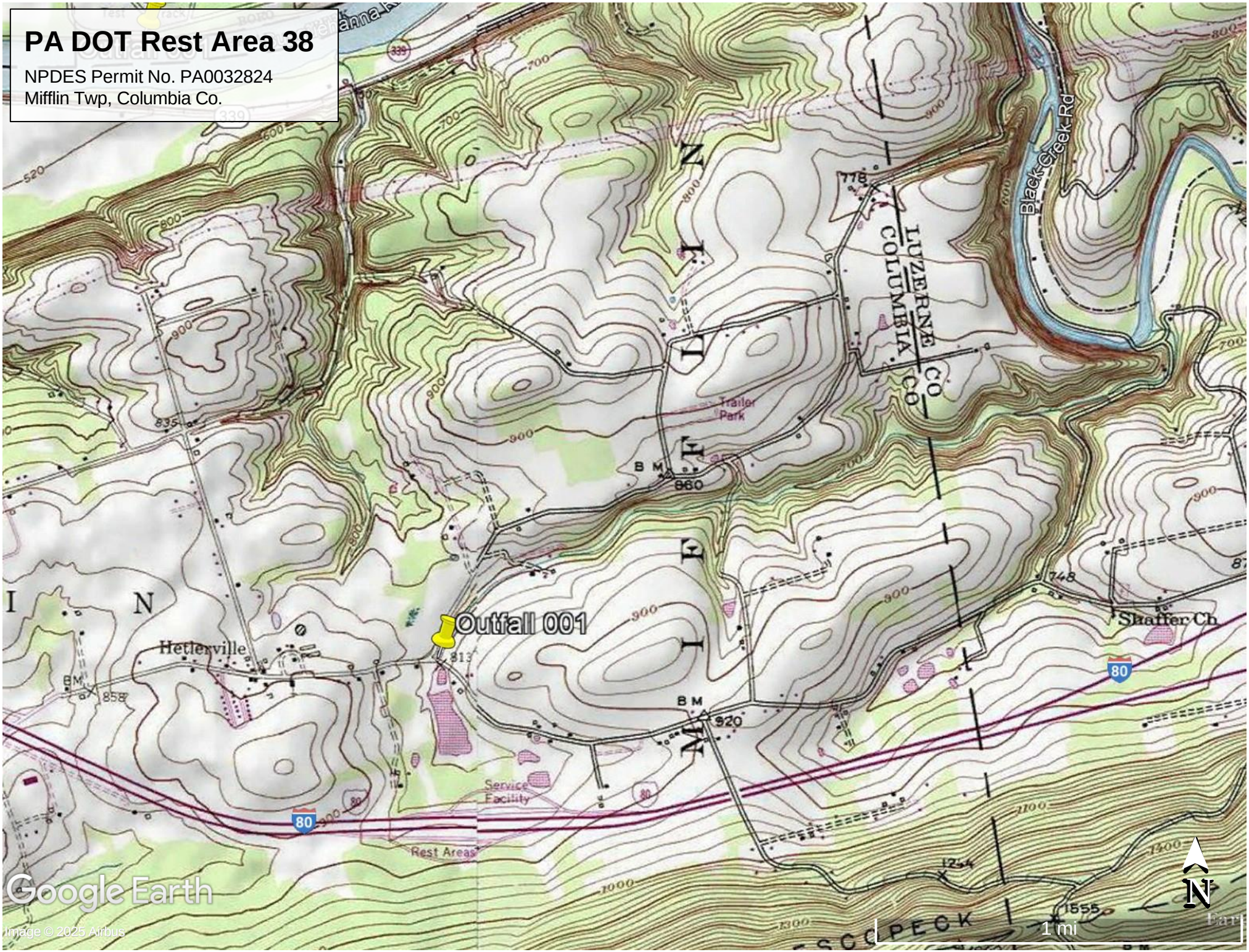
Compliance Sampling Location: Outfall 001

Other Comments: E. coli, Total Nitrogen, and Total Phosphorus monitoring is new as mentioned above.

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment **C**)
☐	Toxics Management Spreadsheet (see Attachment)
☒	TRC Model Spreadsheet (see Attachment **D**)
☐	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:

Attachments:

A. Discharge Location Map
B. List of Open Violations
C. WQM7.0 Model
D. TRC Model



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Open Violations for Client ID#62162

FACILITY	INSP PROGRAM	PROGRAM SPECIFIC ID	VIOLATION DATE	VIOLATION	INSP REGION
PA DOT WESTMORELAND CNTY RD SYS	WRM Water Obstructions & Encroachments	E65-556	1/14/2025	105.44 [693.9/693.18] Permittee has failed to perform work according to specifications as approved.	SWRO
PA DOT REST AREA 38 - I-80 WEST	WPC NPDES	PA0032824	1/29/2025	NPDES - Violation of effluent limits in Part A of permit	NCRO

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
05D	28103	Trib 28103 to Nescopeck Creek	**2.500**	824.00	1.07	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	0.082	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 38	PA0032824	0.0130	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	12.00	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
05D	28103	Trib 28103 to Nescopeck Creek	**1.500**	729.00	1.51	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 (ºC)	Tributary pH	Stream Temp (ºC)	Stream pH
Q7-10	0.082	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 (ºC)	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
05D	28103	Trib 28103 to Nescopeck Creek

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 (ºC)	Analysis pH
Q7-10 Flow												
2.500	0.09	0.00	0.09	.0201	0.01799	.354	4.61	13.02	0.07	0.923	20.93	7.00
Q1-10 Flow												
2.500	0.06	0.00	0.06	.0201	0.01799	NA	NA	NA	0.05	1.121	21.32	7.00
Q30-10 Flow												
2.500	0.12	0.00	0.12	.0201	0.01799	NA	NA	NA	0.08	0.799	20.72	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	6		

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
05D	28103	Trib 28103 to Nescopeck Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
2.500	0.013	20.931	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
4.610	0.354	13.023	0.066
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
6.28	0.867	2.23	0.752
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.267	24.572	Owens	6
Reach Travel Time (days)			
0.923			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.092	5.78	2.08	8.10
0.185	5.31	1.94	8.10
0.277	4.89	1.81	8.10
0.369	4.50	1.69	8.10
0.461	4.14	1.58	8.10
0.554	3.81	1.47	8.10
0.646	3.50	1.37	8.10
0.738	3.22	1.28	8.10
0.831	2.96	1.20	8.10
0.923	2.72	1.12	8.10

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
05D	28103	Trib 28103 to Nescopeck Creek

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
2.500	PADOT 38	15.03	24	15.03	24	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
2.500	PADOT 38	1.8	12	1.8	12	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)		
2.50	PADOT 38	25	25	12	12	3	3	0	0

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
05D	28103	Trib 28103 to Nescopeck Creek

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)
2.500	PADOT 38	PA0032824	0.013	CBOD5	25		
				NH3-N	12	24	
				Dissolved Oxygen			3

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.0879	= Q stream (cfs)	0.5	= CV Daily
0.013	= Q discharge (MGD)	0.5	= CV Hourly
30	= no. samples	1	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	1	= CFC_Partial Mix Factor
0	= Chlorine Demand of Discharge	15	= AFC_Criteria Compliance Time (min)
0.5	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)
0	= % Factor of Safety (FOS)		=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 1.413	1.3.2.iii	WLA cfc = 1.370
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.527	5.1d	LTA_cfc = 0.797

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500	BAT/BPJ
		INST MAX LIMIT (mg/l) = 1.635	

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)