Pennsylvania Department of Environmental Protection

Northcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0209384**
Facility Type	**Municipal**	APS ID	**1128239**
Major / Minor	**Minor**	Authorization ID	**1511104**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Lawrence Township Municipal Authority Tioga County**	Facility Name	**Lawrence Township Municipal Authority Sewer System**
Applicant Address	173 School Road	Facility Address	173 School Road
	Tioga, PA 16946-8402		Tioga, PA 16946-8402
Applicant Contact	Nathan Rundell	Facility Contact	Nathan Rundell
Applicant Phone	(570) 827-0970	Facility Phone	(570) 827-0970
Client ID	91556	Site ID	464425
Ch 94 Load Status	Not Overloaded	Municipality	Lawrence Township
Connection Status	No Limitations	County	Tioga
Date Application Received	January 2, 2025	EPA Waived?	Yes
Date Application Accepted	January 2, 2025	If No, Reason	

Purpose of Application: Renewal of a NPDES Permit

Summary of Review

The subject facility is a POTW serving the area of Tioga Junction in Lawrence Township, Tioga County. A map of the discharge location is attached.

Sludge use and disposal description and location(s): The facility's sludge disposed by landfill.

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	June 16, 2025
✓		N. W. H. Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	June 16, 2025

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.13
Latitude	41º 57' 21.34"	Longitude	-77º 6' 56.16"
Quad Name	Jackson Summit, PA	Quad Code	0329
Wastewater Description:	Sewage Effluent		
Receiving Waters	Tioga River (WWF)	Stream Code	30990
NHD Com ID	133069764	RMI	16.51
Drainage Area	442.06 mi2	Yield (cfs/mi^2)	0.068
Q_{7-10} Flow (cfs)	30.3	Q_{7-10} Basis	USGS Stream Gage 01518700
Elevation (ft)	1000	Slope (ft/ft)	Undetermined
Watershed No.	4-A	Chapter 93 Class.	WWF
Existing Use	N/A	Existing Use Qualifier	N/A
Exceptions to Use	None	Exceptions to Criteria	None
Assessment Status	Impaired		
Cause(s) of Impairment	MERCURY		
Source(s) of Impairment	SOURCE UNKNOWN		
TMDL Status		Name	
Nearest Downstream Public Water Supply Intake	PA-NY Border		
PWS Waters	Tioga River	Distance from Outfall (mi)	16.51

Changes Since Last Permit Issuance: None. The above stream and drainage characteristics were determined for previous reviews and remain adequate.

Other Comments: There is no expectation that the discharge is contributing to the impairment to the Tioga River by Mercury.

The Department considers the Pennsylvania-New York state line to be the nearest downstream water supply when no other nearer water supply exists.

Treatment Facility Summary

Treatment Facility Name: Lawrence Township Munic Authority Sewer System

WQM Permit No.	Issuance Date	Permit Coverage:
5996404	Original - 7/30/96 A-1 – 10/22/12	Original Plant Design Amendments including fine screen, fine bubble diffusers in digester, and other minor modifications.

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Extended Aeration	No Disinfection	0.13

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.13	470	Not Overloaded	Aerobic Digestion	Landfill

Changes Since Last Permit Issuance: None.

Other Comments: The treatment as permitted under WQM Permit No. 5996404 Amendment No. 1 consists of grit removal, extended aeration, clarification, chlorination, aerobic digestion, and sludge press.

Compliance History

DMR Data for Outfall 001 (from May 1, 2024 to April 30, 2025)

Parameter	APR-25	MAR-25	FEB-25	JAN-25	DEC-24	NOV-24	OCT-24	SEP-24	AUG-24	JUL-24	JUN-24	MAY-24
Flow (MGD) Average Monthly	0.0711	0.0759	0.0753	0.0708	0.0703	0.064	0.0635	0.0558	0.0626	0.0565	0.0547	0.0596
Flow (MGD) Daily Maximum	0.1014	0.1051	0.1115	0.0959	0.1079	0.0930	0.085	0.0906	0.0965	0.0872	0.0665	0.0856
pH (S.U.) Instantaneous Minimum	6.63	6.51	6.63	6.56	6.69	6.59	6.82	6.68	6.78	6.81	6.80	6.77
pH (S.U.) Instantaneous Maximum	7.13	7.85	7.36	7.17	7.10	7.12	7.33	7.24	7.16	7.04	7.20	7.13
DO (mg/L) Instantaneous Minimum	6.1	6.0	6.5	5.7	6.4	4.9	4.4	3.4	3.7	3.6	3.7	4.0
TRC (mg/L) Average Monthly	0.21	0.35	0.49	0.45	0.27	0.37	0.33	0.39	0.44	0.22	0.36	0.34
TRC (mg/L) Instantaneous Maximum	0.48	0.91	0.96	0.97	0.47	0.59	0.75	0.70	0.83	0.52	0.91	0.61
CBOD5 (lbs/day) Average Monthly	2.7	3.0	2.3	1.9	2.2	2.4	1.9	1.6	1.8	1.9	2.4	2.3
CBOD5 (lbs/day) Weekly Average	3.5	< 6.9	3.0	2.3	2.9	3.7	3.2	2.8	3.2	2.8	3.1	3.7
CBOD5 (mg/L) Average Monthly	4.4	5.2	3.8	3.3	3.7	5.1	3.5	2.9	3.3	3.7	5.2	4.5
CBOD5 (mg/L) Weekly Average	7.0	< 12.4	4.8	4.0	5.3	8.8	5.1	4.1	4.9	5.7	6.2	6.6
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	60	74	88	63	84	34	53	53	56	57	71	99
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	71	107	116	85	137	52	142	79	65	85	96	126
BOD5 (mg/L) Raw Sewage Influent Average Monthly	98	121	142	104	132	67	102	101	108	103	154	185
TSS (lbs/day) Average Monthly	3.1	4.2	6.1	6.0	3.8	3.9	3.4	5.2	6.8	2.6	3.4	3.9
TSS (lbs/day) Raw Sewage Influent Average Monthly	49	85	86	70	69	72	86	78	64	64	75	98
TSS (lbs/day) Raw Sewage Influent Daily Maximum	71	121	95	85	82	91	156	104	86	103	91	133

TSS (lbs/day) Weekly Average	4.7	6.6	8.8	8.5	4.0	3.8	6.3	8.5	11.4	3.9	6.7	4.6
TSS (mg/L) Average Monthly	5.0	7.0	10.0	10.0	6.0	7.2	6.2	9.8	12.6	5.0	8.0	7.4
TSS (mg/L) Raw Sewage Influent Average Monthly	82	138	138	118	111	127	149	150	126	115	154	185
TSS (mg/L) Weekly Average	6.0	10.0	14.0	15.0	7.0	11.0	9.0	1.3	20.0	8.0	14.0	9.0
Fecal Coliform (No./100 ml) Geometric Mean	77.7	81	28	181	124	2.0	1.14	22	72	124	2.2	5.7
Fecal Coliform (No./100 ml) Instantaneous Maximum	816	2420	1203	2421	2420	2.0	2.0	2420	68	2420	5.2	49
Ammonia (lbs/day) Average Monthly	0.05	0.066	< 0.06	0.05	E	0.06	< 0.05	0.040	0.065	0.04	0.05	0.04
Ammonia (mg/L) Average Monthly	< 0.10	< 0.10	< 0.10	0.10	E	0.1	< 0.10	0.10	0.10	< 0.10	0.10	0.10

Compliance History

Effluent Violations for Outfall 001, from: May 1, 2024 to: April 30, 2025

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Fecal Coliform	09/30/24	IMAX	2420	No./100 ml	1000	No./100 ml
Fecal Coliform	07/31/24	IMAX	2420	No./100 ml	1000	No./100 ml

Compliance History	
Summary of Inspections:	The most recent inspection of the facility by the Department on May 9, 2025 noted eDMR effluent violations but no operational violations at the time of inspection.
Other Comments:	A query in WMS found open violations in eFACTS for Lawrence Township Municipal Authority 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	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	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	27	43	XXX	25.0	40.0	50	1/week	8-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
TSS	32	48	XXX	30.0	45.0	60	1/week	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
Ammonia	Report	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.13
Latitude 41º 57' 21.30" **Longitude** -77º 6' 55.20"
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 (10/1 – 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 limitations 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.

WQM7.0 modeling was performed for the discharge to the Tioga River (see Attachment B) and showed that no limitations are necessary for these parameters beyond the existing technology-based limits.

Total Residual Chlorine

The Department uses a modeling spreadsheet to analyze the toxicity of a discharge's TRC in a receiving stream, accounting for available dilution. The attached results of the TRC spreadsheet (see Attachment C) show that the technology-based limit of 0.5 mg/l is adequate to protect the receiving stream.

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. The Lawrence Township Municipal Authority 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. Sampling for a previous permit term found Total Nitrogen and Total Phosphorus concentrations to average 24 and 6 mg/L, respectively. Because the permittee has adequately characterized the nutrient load from the facility no additional monitoring for these nutrients will be required at this time.

Water Quality Toxics Management

No "Reasonable Potential Analysis" was performed to determine additional parameters with the reasonable potential to violate water quality standards for this minor STP discharge with no industrial influent.

Best Professional Judgment (BPJ) Limitations

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

E. Coli

Quarterly e. coli monitoring will be included in the permit for this 0.13 MGD facility consistent with recent changes to Chapter 93 of the Department's regulations and Department policy.

Anti-Backsliding

No proposed limitations have been made less stringent consistent with the Anti-degradation requirements of The Clean Water Act and 40 CFR 122.44(I).

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	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	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	27	43	XXX	25.0	40.0	50	1/week	8-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
TSS	32	48	XXX	30.0	45.0	60	1/week	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
Ammonia	Report	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	Grab

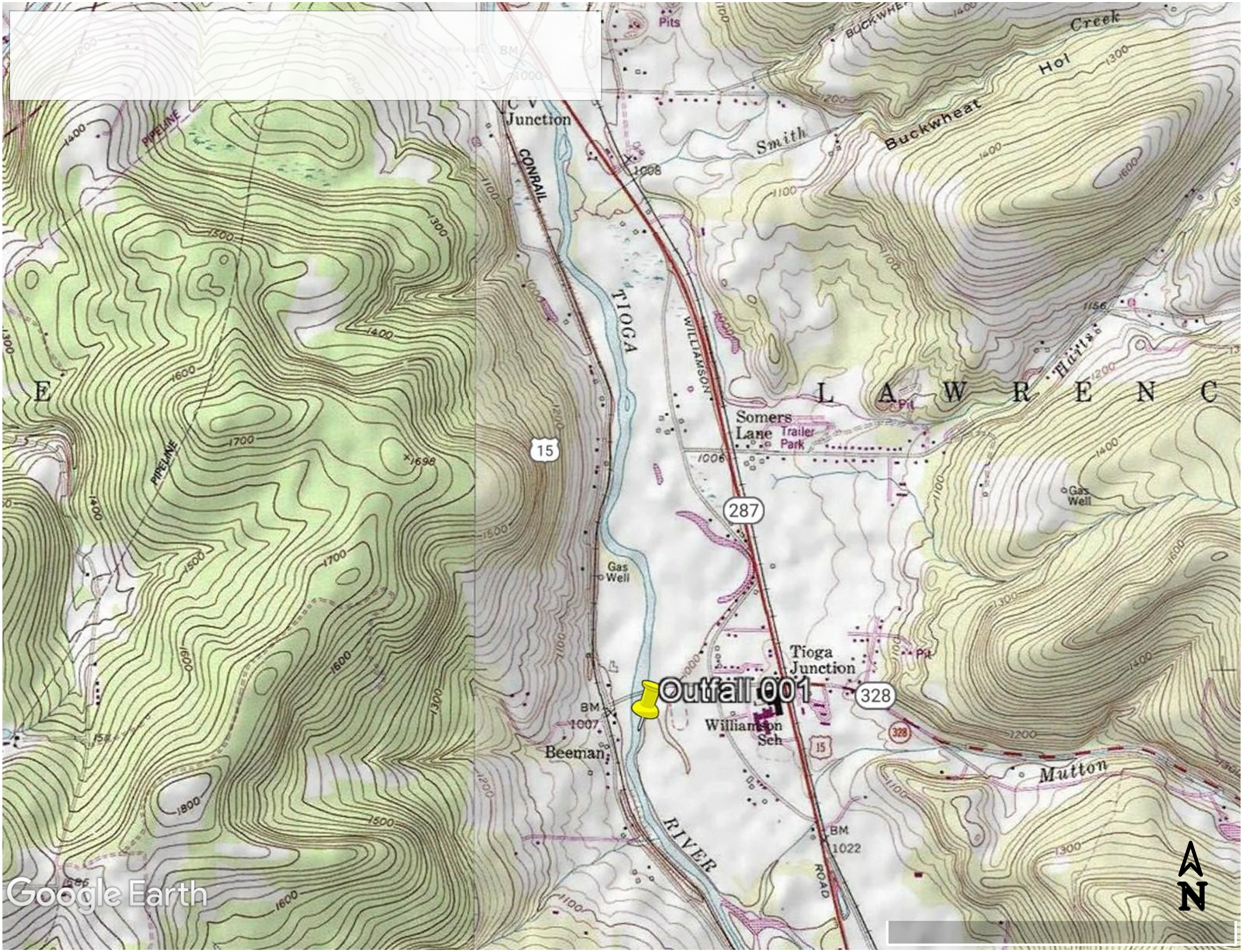
Compliance Sampling Location: Outfall 001

Other Comments: E. Coli is new as mentioned above.

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:

Attachments:

A. Discharge Location Map
B. WQM7.0 Model
C. TRC Model



Outfall 001
C V Junction
CONRAIL
TIOGA RIVER
WILLIAMSON
ROAD
Smith
Buckwheat Hol Creek
Pits
PIPELINE
L A W R E N C
E
Somers Lane
Trailer Park
Gas Well
Tioga Junction
Williamson Sch
Beeman
BM 1007
BM 1022
Mutton
Pit
15
287
328
Google Earth
N

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
04A	30990	TIOGA RIVER	**16.510**	1000.00	442.06	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	0.068	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
Lawrence Twp MA	PA0209384	0.1300	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

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
04A	30990	TIOGA RIVER	**16.000**	999.00	443.40	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	0.068	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
04A	30990	TIOGA 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 (ºC)	Analysis pH
Q7-10 Flow												
16.510	30.06	0.00	30.06	.2011	0.00037	1.002	100.95	100.77	0.30	0.104	20.03	7.00
Q1-10 Flow												
16.510	19.24	0.00	19.24	.2011	0.00037	NA	NA	NA	0.23	0.133	20.05	7.00
Q30-10 Flow												
16.510	40.88	0.00	40.88	.2011	0.00037	NA	NA	NA	0.36	0.088	20.02	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 D.O.Simulation

SWP Basin	Stream Code	Stream Name
04A	30990	TIOGA RIVER

RMI	Total Discharge Flow (mgd)	Analysis Temperature (ºC)	Analysis pH
16.510	0.130	20.033	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
100.952	1.002	100.770	0.299
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.15	0.108	0.17	0.702
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.208	0.519	Tsivoglou	5
Reach Travel Time (days)			
0.104			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.010	2.15	0.16	8.20
0.021	2.15	0.16	8.20
0.031	2.15	0.16	8.20
0.042	2.14	0.16	8.19
0.052	2.14	0.16	8.19
0.062	2.14	0.16	8.18
0.073	2.14	0.16	8.18
0.083	2.13	0.16	8.18
0.094	2.13	0.16	8.17
0.104	2.13	0.15	8.17

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
04A	30990	TIOGA 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
16.510	Lawrence Twp M	16.69	50	16.69	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
16.510	Lawrence Twp M	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)		
16.51	Lawrence Twp MA	25	25	25	25	3	3	0	0

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
04A	30990	TIOGA 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)
16.510	Lawrence Twp MA	PA0209384	0.130	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			3

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

30.3	= Q stream (cfs)	0.5	= CV Daily
0.13	= 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 = 48.081	1.3.2.iii	WLA cfc = 46.867
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 17.916	5.1d	LTA_cfc = 27.247

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)