pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0060208**
Facility Type	**Municipal**	APS ID	**1100434**
Major / Minor	**Minor**	Authorization ID	**1460923**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Nelson Township Authority Tioga County**	Facility Name	**Nelson Township Authority Sewer Plant**
Applicant Address	PO Box 100 328 Bliss Road Nelson, PA 16940-0100	Facility Address	328 Bliss Road Nelson, PA 16940-0100
Applicant Contact	Vicky Wiles	Facility Contact	Michael Patrick, Operator
Applicant Phone	(814) 302-4112	Facility Phone	(814) 302-4112
Client ID	77763	Site ID	496639
Ch 94 Load Status	Not Overloaded	Municipality	Nelson Township
Connection Status	No Limitations	County	Tioga
Date Application Received	October 31, 2023	EPA Waived?	Yes
Date Application Accepted	November 8, 2023	If No, Reason	

Purpose of Application: Renewal of a minor POTW NPDES Permit

Summary of Review

The subject facility is a publicly owned treatment works serving the area of Nelson Village in Nelson Township, Tioga County. A map indicating the discharge location is attached.

Sludge use and disposal description and location(s): The facility's sludge is disposed by landfill. Per the application 4.97 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	May 1, 2024
✓		N. W. H. Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	May 3, 2024

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.05
Latitude	41º 58' 41.32"	Longitude	-77º 14' 18.61"
Quad Name	Tioga, PA	Quad Code	
Wastewater Description:	Sewage Effluent		

Receiving Waters	Cowanesque River (WWF)	Stream Code	30995
NHD Com ID	57349839	RMI	7.62
Drainage Area	281	Yield (cfs/mi^2)	0.0159
Q_{7-10} Flow (cfs)	4.47	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	1069	Slope (ft/ft)	N/A
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	Attaining Use(s)		

Nearest Downstream Public Water Supply Intake	PA-NY border		
PWS Waters	Cowanesque River	Distance from Outfall (mi)	7.62

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

Other Comments: This discharge is to the upstream end of the Cowanesque Reservoir.

No downstream water supply is expected to be affected by this discharge at this time with the limitations and monitoring proposed. The Department considers the Pennsylvania-New York Border to serve as the nearest downstream water supply when no nearer water supply exists

Treatment Facility Summary

Treatment Facility Name: Nelson Township Authority Sewer Plant

WQM Permit No.	Issuance Date
5903401	10/22/2003

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary With Ammonia And Phosphorus	Activated Sludge	Hypochlorite	0.05

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.075	91.7	Not Overloaded	Aerobic Digestion	Land Application

Changes Since Last Permit Issuance: None

Other Comments: Treatment as permitted under WQM No. 5903401 is an A^2O process consisting of bar screen, influent pump station, anaerobic zone, anoxic zone, aerobic zone, clarification, chlorination, aerobic digestion, and reed beds.

Compliance History

DMR Data for Outfall 001 (from April 1, 2023 to March 31, 2024)

Parameter	MAR-24	FEB-24	JAN-24	DEC-23	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23
Flow (MGD) Average Monthly	0.031	0.026	0.041	0.039	0.019	0.018	0.021	0.018	0.017	0.018	0.020	0.024
Flow (MGD) Daily Maximum	0.070	0.044	0.098	0.112	0.028	0.027	0.046	0.100	0.025	0.022	0.032	0.041
pH (S.U.) Instantaneous Minimum	6.9	7.0	6.9	6.9	7.2	7.1	7.1	7.0	7.2	7.1	7.2	7.3
pH (S.U.) Instantaneous Maximum	7.3	7.3	7.2	7.3	7.4	7.4	7.4	7.4	7.4	7.3	7.4	7.5
DO (mg/L) Instantaneous Minimum	5.09	5.01	4.73	4.83	3.92	3.36	3.04	3.01	3.05	3.02	3.75	4.11
TRC (mg/L) Average Monthly	0.40	0.44	0.41	0.39	0.44	0.37	0.26	0.34	0.30	0.33	0.34	0.42
TRC (mg/L) Instantaneous Maximum	0.68	0.67	0.64	1.50	0.61	0.70	0.32	0.56	0.50	0.60	0.60	0.61
CBOD5 (lbs/day) Average Monthly	< 0.92	< 0.63	< 0.701	< 0.62	< 0.42	< 0.42	< 0.42	< 0.49	< 0.43	< 0.58	< 1.03	< 0.58
CBOD5 (lbs/day) Weekly Average	< 1.35	0.67	< 0.776	< 0.65	< 0.48	< 0.43	< 0.43	< 0.55	< 0.43	0.73	1.37	0.75
CBOD5 (mg/L) Average Monthly	< 3.0	< 3.10	< 3.00	< 3.0	< 3.0	< 3.0	< 3.00	< 3.00	< 3.0	< 4.07	< 6.07	< 3.00
CBOD5 (mg/L) Weekly Average	< 3.0	3.10	< 3.00	< 3.0	< 3.0	< 3.0	< 3.00	< 3.00	< 3.0	5.13	9.13	3.00
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	28	25	47	24.11	25	38.56	25	24	31.55	32.68	28.67	39.91
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	37	28	54	33.61	28	47.35	33	30	40.69	40.97	30.62	55.79
BOD5 (mg/L) Raw Sewage Influent Average Monthly	137	124	200	116	188	279	183	156	223	231	157	202
TSS (lbs/day) Average Monthly	7.25	2.69	2.29	4.24	0.90	< 0.66	0.50	1.24	< 0.43	< 3.09	1.65	1.26

TSS (lbs/day) Raw Sewage Influent Average Monthly	77	18	63	26.38	34	48.39	37	61	35.66	30.49	25	30.43
TSS (lbs/day) Raw Sewage Influent Daily Maximum	122	22	72	31.66	49	84.50	43	112	56.29	39.70	38.28	36.03
TSS (lbs/day) Weekly Average	12.84	3.30	2.59	4.86	0.95	1.13	0.51	1.28	0.62	5.95	1.86	1.40
TSS (mg/L) Average Monthly	19.5	13.0	9.75	27	6.65	< 4.80	3.60	7.70	< 3.00	< 21.8	9.4	7
TSS (mg/L) Raw Sewage Influent Average Monthly	238	88	270	128	286	344	271	343	252	215	124	165
TSS (mg/L) Weekly Average	28.5	15.2	10.0	32	7.30	8.00	3.60	8.40	4.40	42.0	12.4	8.40
Fecal Coliform (No./100 ml) Geometric Mean	< 1.0	< 1.0	< 1.0	6.4	< 1.0	< 1.0	< 1.0	< 1.0	< 8.26	< 1.0	< 1.0	< 2.72
Fecal Coliform (No./100 ml) Instantaneous Maximum	< 1.0	1.0	< 1.0	40.4	< 1.0	< 1.0	< 1.0	< 1.0	68.3	< 1.0	< 1.0	7.4
Ammonia (lbs/day) Average Monthly	0.81	0.34	0.82	0.14	0.105	0.055	0.37	0.62	0.09	< 0.39	2.05	4.82
Ammonia (mg/L) Average Monthly	2.365	1.657	0.919	0.687	0.744	< 0.397	2.658	4.16	0.67	< 2.75	9.71	26.90
Total Phosphorus (lbs/day) Average Monthly	0.18	0.14	0.25	0.83	0.04	0.11	0.17	0.21	0.34	0.21	0.53	0.29
Total Phosphorus (mg/L) Average Monthly	0.565	0.668	1.02	4.13	0.308	0.81	1.23	1.27	2.39	1.44	3.19	1.31

Compliance History, Cont'd

Effluent Violations for Outfall 001, from: May 1, 2023 To: March 31, 2024

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Total Phosphorus	01/31/23	Avg Mo	0.995	lbs/day	0.8	lbs/day
Total Phosphorus	07/31/23	Avg Mo	2.39	mg/L	2.0	mg/L
Total Phosphorus	05/31/23	Avg Mo	3.19	mg/L	2.0	mg/L
Total Phosphorus	01/31/23	Avg Mo	2.34	mg/L	2.0	mg/L

Compliance History, Cont'd	
Summary of Inspections:	The facility has been inspected periodically by the Department over the past permit term. The most recent inspection on March 23, 2023 identified violations for inoperable blowers and eDMR effluent violations.
Other Comments:	A query in WMS found open violations in eFACTS for the Nelson Township Authority for Failure to Implement a Filter Bed Evaluation Program and Disinfection/Disinfection Byproducts Precursor Removal Violation.

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	10	16	XXX	25	40	50	2/month	Grab
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	Grab
TSS	12	18	XXX	30	45	60	2/month	Grab
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	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
Total Nitrogen	Report Annl Avg	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Grab
Ammonia	Report	XXX	XXX	Report	XXX	XXX	2/month	Grab
Total Phosphorus	0.8	XXX	XXX	2.0	XXX	4	2/month	Grab

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.05
Latitude 41º 58' 42.00" **Longitude** -77º 14' 19.00"
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)
	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 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. WQM7.0 modeling was performed (see Attachment B) for the discharge to the Cowanesque River and verifies that no limitations are necessary beyond the technology-based secondary treatment limits listed above.

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 C).

Water Quality Toxics Management

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

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 Nelson Township 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 II Watershed Implementation Plan. The Total Nitrogen and Total Phosphorus concentrations have averaged 8.4 and 1.0 mg/L, respectively.

The facility has an existing Phosphorus limit of 2.0 mg/L that was based on previous studies of the Cowanesque Reservoir. The limit remains protective and will remain. Annual Total Nitrogen monitoring will also remain.

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	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	10	16	XXX	25	40	50	2/month	Grab
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	Grab
TSS	12	18	XXX	30	45	60	2/month	Grab
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	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
Total Nitrogen	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/year	Grab
Ammonia	Report	XXX	XXX	Report	XXX	XXX	2/month	Grab
Total Phosphorus	0.8	XXX	XXX	2.0	XXX	4	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab

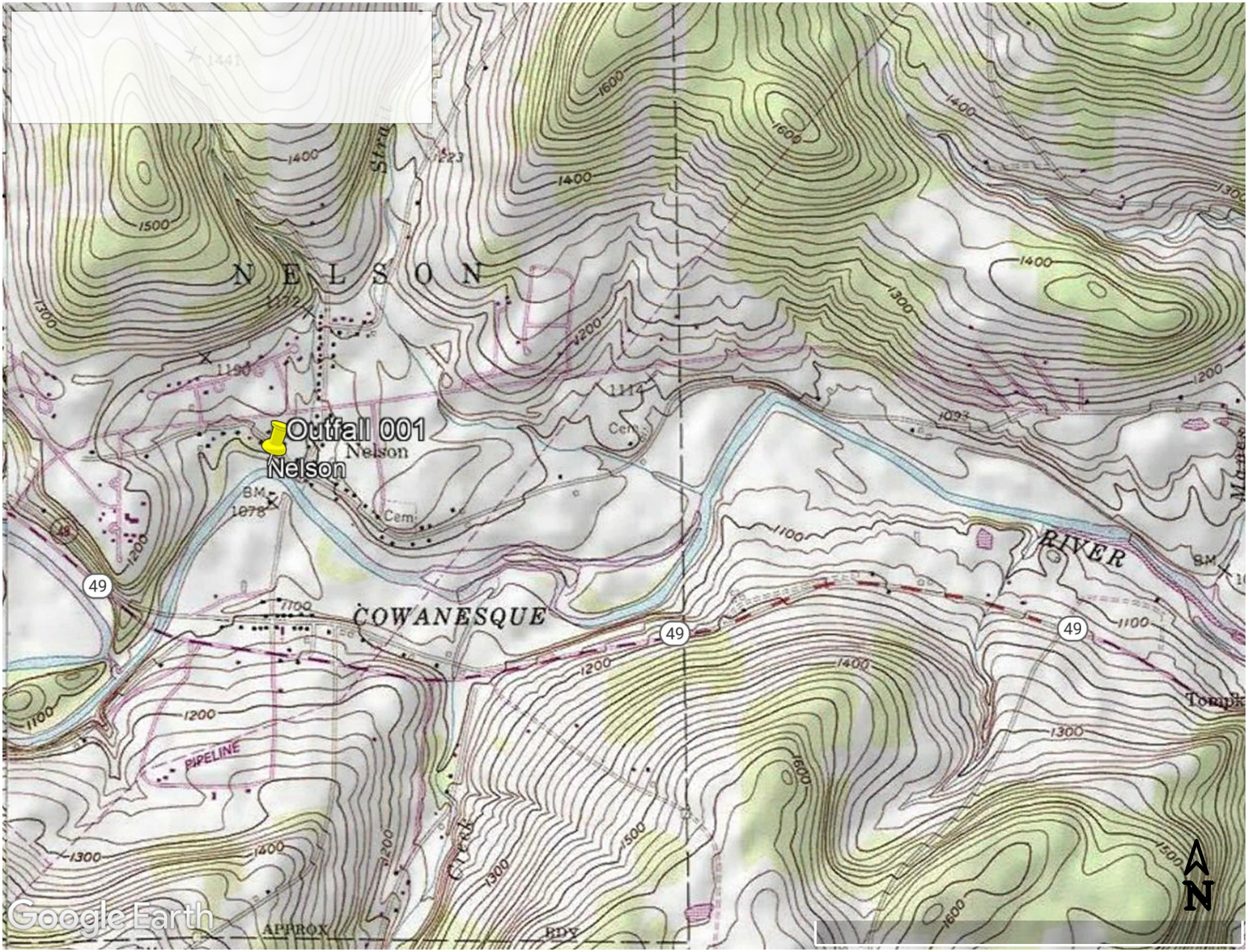
Compliance Sampling Location: Outfall 001

Other Comments: E. Coli monitoring is new as mentioned above. Total nitrogen monitoring is now listed as a daily maximum rather than annual average.

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
Nelson
NELSON
COWANESQUE
RIVER
PIPELINE
49
Google Earth

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	30995	COWANESQUE RIVER	**8.310**	1069.00	281.00	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	0.016	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
Nelson Twp Auth	PA0060208	0.0500	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	30995	COWANESQUE RIVER	**7.620**	1054.00	290.00	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	0.016	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 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 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
04A	30995	COWANESQUE 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												
8.310	4.50	0.00	4.50	.0773	0.00412	.766	42.63	55.66	0.14	0.301	20.08	7.00
Q1-10 Flow												
8.310	2.88	0.00	2.88	.0773	0.00412	NA	NA	NA	0.11	0.384	20.13	7.00
Q30-10 Flow												
8.310	6.11	0.00	6.11	.0773	0.00412	NA	NA	NA	0.17	0.254	20.06	7.00

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
04A	30995	COWANESQUE RIVER

RMI	Total Discharge Flow (mgd)	Analysis Temperature (ºC)	Analysis pH
8.310	0.050	20.085	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
42.627	0.766	55.664	0.140
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.39	0.221	0.42	0.705
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.154	5.492	Tsivoglou	5
Reach Travel Time (days)			
0.301			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.030	2.37	0.41	8.23
0.060	2.36	0.41	8.23
0.090	2.34	0.40	8.23
0.120	2.33	0.39	8.23
0.150	2.31	0.38	8.23
0.181	2.30	0.37	8.23
0.211	2.28	0.36	8.23
0.241	2.26	0.36	8.23
0.271	2.25	0.35	8.23
0.301	2.23	0.34	8.23

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
04A	30995	COWANESQUE 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
8.310	Nelson Twp Auth	16.58	50	16.58	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
8.310	Nelson Twp Auth	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)		
8.31	Nelson Twp Auth	25	25	25	25	3	3	0	0

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
04A	30995	COWANESQUE 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)
8.310	Nelson Twp Auth	PA0060208	0.050	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			3

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

4.47	= Q stream (cfs)	0.5	= CV Daily
0.05	= 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 = 18.454	1.3.2.iii	WLA cfc = 17.983
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 6.876	5.1d	LTA_cfc = 10.455

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)