Pennsylvania Department of Environmental Protection

Northwest Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0102326**
Facility Type	**Non-Municipal**	APS ID	**1075353**
Major / Minor	**Minor**	Authorization ID	**1416982**

Applicant and Facility Information

Applicant Name	**PA Department of Corrections**	Facility Name	**Mercer State Correctional Institution**
Applicant Address	801 Butler Pike, P.O. Box 6747	Facility Address	801 Butler Pike Box 6747
	Mercer, PA 16137-5653		Mercer, PA 16137-5653
Applicant Contact	Melinda Adams	Facility Contact	Melinda Adams
Applicant Phone	(724) 662-1837	Facility Phone	(724) 662-1837
Client ID	43607	Site ID	478111
Ch 94 Load Status	Not Overloaded	Municipality	Findley Township
Connection Status	No Limitations	County	Mercer
Date Application Received	November 8, 2022	EPA Waived?	Yes
Date Application Accepted	November 15, 2022	If No, Reason	

Purpose of Application: Renewal of a NPDES Permit for an existing discharge of treated sewage.

Summary of Review

The facility is an adult male State Correctional Institution. Wastewater consists of domestic sewage generated onsite. Discharge flow is listed as 0.28 MGD. Only the 0.25 MGD SBR system is in operation currently with the separate 0.06 MGD not in operation. Since there is no indication that the 0.06 MGD plant will be dismantled in the current future, effluent limitations were determined based on the existing combined treatment capacity of 0.28 MGD (limited by the UV disinfection unit).

There are currently seven (7) open violations listed in EFACTS for this client (3/3/2025).

Sludge use and disposal description and location(s): Sludge is hauled offsite for disposal at Seneca Landfill in Butler County.

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
X		Adam J. Pesek Adam J. Pesek, E.I.T. / Project Manager	March 3, 2025
X		Adam Olesnanik Adam Olesnanik, P.E. / Environmental Engineer Manager	March 6, 2025

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.28
Latitude	41º 11' 58"	Longitude	-80º 13' 39"
Quad Name	Mercer	Quad Code	0904
Wastewater Description:	Domestic Sewage		
Receiving Waters	Neshannock Creek (TSF)	Stream Code	35515
NHD Com ID	130031795	RMI	23.5
Drainage Area	107.5	Yield (cfs/mi^2)	0.056
Q_{7-10} Flow (cfs)	6.02	Q_{7-10} Basis	Coolspring Crk near Mercer &Neshannock Crk @ E. Brook Station
Elevation (ft)	1075	Slope (ft/ft)	0.00066
Watershed No.	20-A	Chapter 93 Class.	TSF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	

Background/Ambient Data		Data Source
pH (SU)	7.86	Median of Dept.-taken samples upstream between 7/11 and 8/1 of 2017
Temperature (°C)	25	Default (TSF)
Hardness (mg/L)	100	Default
Other: NH_3-N	0.1	Default

Nearest Downstream Public Water Supply Intake		PA American Water Company – Ellwood District	
PWS Waters	Beaver River	Flow at Intake (cfs)	450
PWS RMI	12.5	Distance from Outfall (mi)	35.1

Changes Since Last Permit Issuance:

Other Comments:

Treatment Facility Summary

Treatment Facility Name: Mercer State Corr Institution

WQM Permit No.	Issuance Date
4308401 A-2	5/07/2014

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary with Ammonia Reduction	SBR and Activated Sludge	Hypochlorite	0.28

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.28	625.5	Not Overloaded	Aerobic Digestion	

Changes Since Last Permit Issuance: Activated sludge plant is currently not in operation. It previously received sewage from the Mercer County Jail, which has been redirected to the Neshannock Creek Watershed Joint MA WWTP.

Other Comments:

Compliance History	
Summary of DMRs:	There have been four effluent violations at this facility in the last five years. Three for ammonia nitrogen (July, August 2020) and one for fecal coliform (April 2021).
Summary of Inspections:	The last Compliance Evaluation Inspection (CEI) was conducted on 10/27/2022. No violations were noted. The permittee was notified during the inspection that sample analysis time should be listed on bench sheets in addition to sample collection time(s) in the future.

Other Comments:

Compliance History

DMR Data for Outfall 001 (from February 1, 2024 to January 31, 2025)

Parameter	JAN-25	DEC-24	NOV-24	OCT-24	SEP-24	AUG-24	JUL-24	JUN-24	MAY-24	APR-24	MAR-24	FEB-24
Flow (MGD) Average Monthly	0.131	0.135	0.130	0.133	0.128	0.131	0.125	0.127	0.135	0.146	0.133	0.124
pH (S.U.) Daily Minimum	6.97	7.08	6.63	6.99	7.17	7.40	7.32	6.6	6.41	6.51	6.61	6.43
pH (S.U.) Daily Maximum	8.35	8.15	7.92	7.7	8.16	8.09	7.94	7.87	6.91	7.22	7.39	7.29
DO (mg/L) Daily Minimum	9.45	8.77	7.45	7.74	7.05	5.78	6.41	6.35	7.88	8.75	8.52	8.23
CBOD5 (lbs/day) Average Monthly	< 5.0	7.0	< 4.0	< 4.0	< 3.0	< 3.0	< 2.0	< 3.0	< 5.0	6.0	< 6.0	6.0
CBOD5 (mg/L) Average Monthly	< 4.96	6.48	< 3.34	< 3.76	< 2.49	< 3.32	< 2.1	< 2.86	< 4.95	5.23	< 4.63	5.51
TSS (lbs/day) Average Monthly	20.0	22.0	15.0	9.0	11.0	9.0	8.0	6.0	13.0	18.0	13	17.0
TSS (mg/L) Average Monthly	18.4	19.1	13.9	8.4	10.8	8.0	8.3	5.5	12.0	14.0	11.1	15.9
Fecal Coliform (No./100 ml) Geometric Mean	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	FF	FF	< 1.0	< 1.0	< 1.0	< 1.0
Fecal Coliform (No./100 ml) Instantaneous Maximum	< 1.0	1.0	< 1.0	< 1.0	< 1.0	< 1.0	FF	FF	< 1.0	< 1.0	< 1.0	< 1.0
UV Intensity (µw/cm²) Average Monthly	8.2	8.9	10.6	11.5	12.3	13.0	12.1	11.4	12.2	10.2	9.8	8.7
Total Nitrogen (lbs/day) Average Quarterly		< 2.90			< 4.36			< 6.30			< 7.29	
Total Nitrogen (mg/L) Average Quarterly		< 3.25			< 4.358			< 5.0			< 7.341	
Ammonia (lbs/day) Average Monthly	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1
Ammonia (mg/L) Average Monthly	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1124	< 0.1769	< 0.1	< 0.1	< 0.2	< 0.1	< 0.1
Total Phosphorus (lbs/day) Average Quarterly		2.10			3.00			2.52			1.94	
Total Phosphorus (mg/L) Average Quarterly		2.35			3.00			2.0			1.95	

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.28
Latitude 41º 11' 58" **Longitude** -80º 13' 39"
Wastewater Description: Domestic sewage

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)
E. Coli	Report (No./100 ml)	IMAX	-	

Comments: TRC limits are not applicable because chlorine disinfection is not used in treatment.

Monitoring for E. Coli is placed in the permit in accordance with the Department's SOP entitled "Establishing Effluent Limitations for Individual Sewage Permits."

Water Quality-Based Limitations

The following limitations were determined through water quality modeling (output files attached):

Parameter	Limit (mg/l)	SBC	Model
$CBOD_5$	14.0	Average Monthly	WQM 7.0 Version 1.1
Ammonia Nitrogen May 1 - Oct 31	4.2	Average Monthly	WQM 7.0 Version 1.1

Comments: Ammonia nitrogen limits will receive a seasonal multiplier of "3" in accordance with the Department's SOP entitled "Establishing Effluent Limitations for Individual Sewage Permits.

The D.O. (WQM) modeling indicated the need for more stringent effluent limits for $CBOD_5$ and ammonia nitrogen in the proposed draft permit. Based on a review of DMR data, the permittee should easily be able to meet these new limits currently. Therefore, a compliance schedule will not be added to the permit.

The Toxics Management Spreadsheet recommended monitoring for total copper and total lead be placed in the proposed draft permit. The new monitoring requirements are based on DEP's determination that reasonable potential exists to exceed water quality criteria under Chapter 93 in the downstream receiving waters during design flow conditions. Please note that the monitoring for total copper and total lead are the result of the Permittee's attainment of analytical detection levels that are less stringent (i.e., higher) than DEP's target quantitation limits (4.0 µg/L for Total Copper and 1.0 µg/L for Total Lead). Even though the results were reported as less than analytical reporting limits, the reporting limits are too high to rule out the possibility that discharges will result in excursions above Pennsylvania's water quality criterion. You may elect to collect a minimum of three (3) additional effluent samples, and have the samples analyzed for total copper and

total lead using a quantitation limit (QL) that is no greater than the Department's Target QL. The samples should be collected at least one week apart. DEP will re-evaluate the need for monitoring for total copper and total lead based on any new analytical results. If the samples come back indicating that the parameters are non-detect at the Department's QLs, the monitoring requirements may be removed from the Final Permit.

Best Professional Judgment (BPJ) Limitations

Comments: A dissolved oxygen limit of a minimum of 4.0 mg/l, and monitoring for total nitrogen, total phosphorus, and UV intensity are being placed in the permit in accordance with the Department's SOP entitled "Establishing Effluent Limitations for Individual Sewage Permits."

Anti-Backsliding

N/A

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	Daily Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	4.0	XXX	XXX	XXX	1/day	Grab
CBOD5	32.0	XXX	XXX	14.0	XXX	28	1/week	24-Hr Composite
TSS	70	XXX	XXX	30.0	XXX	60	1/week	24-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
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
UV Intensity (µw/cm²)	XXX	XXX	Report	Report	XXX	XXX	1/day	Measured
Total Nitrogen	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Ammonia Nov 1 - Apr 30	29.4	XXX	XXX	12.6	XXX	25.2	1/week	24-Hr Composite
Ammonia May 1 - Oct 31	9.80	XXX	XXX	4.2	XXX	8.4	1/week	24-Hr Composite
Total Phosphorus	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Total Copper (ug/L)	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/month	24-Hr Composite
Total Lead (ug/L)	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/month	24-Hr Composite

Compliance Sampling Location: Outfall 001 (after disinfection)

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
20A	35515	NESHANNOCK CREEK	**25.750**	1085.00	99.00	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	0.056	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.86	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
Mercer Muni STP	pa0025356	1.5680	0.0000	0.0000	0.000	20.00	7.20

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	4.00	7.54	0.00	0.00
NH3-N	25.00	0.10	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
20A	35515	NESHANNOCK CREEK	**23.500**	1075.00	107.50	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	0.056	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.86	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
Mercer Corr FAC	PA0102326	0.2800	0.0000	0.0000	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	7.54	0.00	0.00
NH3-N	25.00	0.10	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
20A	35515	NESHANNOCK CREEK	**22.930**	1073.00	108.10	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	0.056	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.86	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
NCWJMA WWTP	PA0272779	0.1500	0.0000	0.0000	0.000	20.00	6.50

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	4.00	7.54	0.00	0.00
NH3-N	25.00	0.10	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
20A	35515	NESHANNOCK CREEK	**20.360**	1051.00	122.00	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	0.056	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.86	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	0.00	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
20A	35515	NESHANNOCK 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 (°C)	Analysis pH
Q7-10 Flow												
25.750	5.54	0.00	5.54	2.4257	0.00084	.778	48.56	62.39	0.21	0.652	23.48	7.54
23.500	6.02	0.00	6.02	2.8589	0.00066	.798	51.6	64.69	0.22	0.161	23.39	7.50
22.930	6.05	0.00	6.05	3.0909	0.00162	.778	49.87	64.13	0.24	0.666	23.31	7.41
Q1-10 Flow												
25.750	3.55	0.00	3.55	2.4257	0.00084	NA	NA	NA	0.18	0.766	22.97	7.47
23.500	3.85	0.00	3.85	2.8589	0.00066	NA	NA	NA	0.18	0.189	22.87	7.43
22.930	3.87	0.00	3.87	3.0909	0.00162	NA	NA	NA	0.20	0.776	22.78	7.33
Q30-10 Flow												
25.750	7.54	0.00	7.54	2.4257	0.00084	NA	NA	NA	0.24	0.575	23.78	7.59
23.500	8.19	0.00	8.19	2.8589	0.00066	NA	NA	NA	0.24	0.143	23.71	7.55
22.930	8.23	0.00	8.23	3.0909	0.00162	NA	NA	NA	0.27	0.591	23.64	7.47

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	Uniform Treatme	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 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
20A	35515	NESHANNOCK 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
25.750	Mercer Muni STP	NA	50	7.54	18.42	1	63
23.500	Mercer Corr FAC	NA	50	8.07	50	0	0
22.930	NCWJMA WWTP	NA	50	9.26	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
25.750	Mercer Muni STP	NA	25	1.01	3.82	1	85
23.500	Mercer Corr FAC	NA	25	1.05	11.85	3	53
22.930	NCWJMA WWTP	NA	25	1.13	11.85	3	53

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)		
25.75	Mercer Muni STP	25	8.43	3.82	2.53	4	4	2	56
23.50	Mercer Corr FAC	25	14.05	11.85	4.22	4	4	2	56
22.93	NCWJMA WWTP	25	25	11.85	11.85	4	4	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20A	35515	NESHANNOCK CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
25.750	1.568	23.478	7.541
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
48.564	0.778	62.393	0.211
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
3.96	0.305	0.84	0.915
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.463	1.831	Tsivoglou	6
Reach Travel Time (days)			
0.652			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.065	3.87	0.79	6.37
0.130	3.78	0.74	6.29
0.196	3.69	0.70	6.24
0.261	3.60	0.66	6.21
0.326	3.52	0.62	6.20
0.391	3.44	0.59	6.20
0.457	3.36	0.55	6.21
0.522	3.28	0.52	6.23
0.587	3.21	0.49	6.26
0.652	3.13	0.46	6.30

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
23.500	1.848	23.390	7.502
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
51.604	0.798	64.693	0.216
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
3.61	0.370	0.63	0.909
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.254	1.476	Tsivoglou	6
Reach Travel Time (days)			
0.161			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.016	3.58	0.62	6.23
0.032	3.56	0.61	6.21
0.048	3.53	0.60	6.19
0.065	3.51	0.59	6.17
0.081	3.48	0.58	6.15
0.097	3.46	0.57	6.14
0.113	3.43	0.56	6.12
0.129	3.41	0.56	6.11
0.145	3.39	0.55	6.10
0.161	3.36	0.54	6.08

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20A	35515	NESHANNOCK CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
22.930	1.998	23.310	7.413
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
49.865	0.778	64.130	0.236
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
3.91	0.453	0.83	0.903
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.037	3.930	Tsivoglou	6
Reach Travel Time (days)			
0.666			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.067	3.77	0.78	6.26
0.133	3.64	0.73	6.45
0.200	3.52	0.69	6.62
0.266	3.39	0.65	6.76
0.333	3.28	0.61	6.88
0.400	3.16	0.58	6.99
0.466	3.06	0.54	7.09
0.533	2.95	0.51	7.18
0.599	2.85	0.48	7.26
0.666	2.75	0.45	7.33

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
20A	35515	NESHANNOCK 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)
25.750	Mercer Muni STP	pa0025356	1.568	CBOD5	8.43		
				NH3-N	2.53	5.06	
				Dissolved Oxygen			4

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)
23.500	Mercer Corr FAC	PA0102326	0.280	CBOD5	14.05		
				NH3-N	4.22	8.44	
				Dissolved Oxygen			4

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)
22.930	NCWJMA WWTP	PA0272779	0.150	CBOD5	25		
				NH3-N	11.85	23.7	
				Dissolved Oxygen			4

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Discharge Information

Instructions | Discharge | Stream

Facility: **Mercer State Correctional Institution** NPDES Permit No.: **PA0102326** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Domestic Sewage**

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.28	100	7						

					0 if left blank		*0.5 if left blank*		*0 if left blank*			*1 if left blank*	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		289									
	Chloride (PWS)	mg/L		59.7									
	Bromide	mg/L	<	2									
	Sulfate (PWS)	mg/L		34.3									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L											
	Total Antimony	µg/L											
	Total Arsenic	µg/L											
	Total Barium	µg/L											
	Total Beryllium	µg/L											
	Total Boron	µg/L											
	Total Cadmium	µg/L											
	Total Chromium (III)	µg/L											
	Hexavalent Chromium	µg/L											
	Total Cobalt	µg/L											
	Total Copper	µg/L	<	10									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L											
	Total Lead	µg/L	<	8									
	Total Manganese	µg/L											
	Total Mercury	µg/L											
	Total Nickel	µg/L											
	Total Phenols (Phenolics) (PWS)	µg/L											
	Total Selenium	µg/L											
	Total Silver	µg/L											
	Total Thallium	µg/L											
	Total Zinc	µg/L	<	20									
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

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

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

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Toxics Management Spreadsheet
Version 1.4, May 2023

Stream / Surface Water Information

Mercer State Correctional Institution, NPDES Permit No. PA0102326, Outfall 001

Instructions | Discharge | Stream

Receiving Surface Water Name: **Neshannock Creek**

No. Reaches to Model: 1

- (●) Statewide Criteria
- ( ) Great Lakes Criteria
- ( ) ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi^2)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	035515	35.1	1075	107.5			Yes
End of Reach 1	035155	0.001	734	2250		1	Yes

Q_{7-10}

Location	RMI	LFY (cfs/mi^2)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	35.1	0.056										100	7.86		
End of Reach 1	0.001	0.1	450									100	7		

Q_h

Location	RMI	LFY (cfs/mi^2)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	35.1														
End of Reach 1	0.001														

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Toxics Management Spreadsheet
Version 1.4, May 2023

Model Results

Mercer State Correctional Institution, NPDES Permit No. PA0102326, Outfall 001

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

☑ ***Hydrodynamics***

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

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
35.1	6.02		6.02	0.433	0.002	0.748	43.967	58.807	0.196	10.926	83.151
0.001	450.00	1.547	448.453								

Q_h

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
35.1	35.67		35.67	0.433	0.002	1.595	43.967	27.567	0.515	4.166	29.934
0.001	1548.448	1.547	1546.90								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.425 Analysis Hardness (mg/l): 100 Analysis pH: 7.58

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	13.439	14.0	96.6	Chem Translator of 0.96 applied
Total Lead	0	0		0	64.581	81.6	564	Chem Translator of 0.791 applied
Total Zinc	0	0		0	117.180	120	827	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 83.151 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.71

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	

Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	8.956	9.33	139	Chem Translator of 0.96 applied
Total Lead	0	0		0	2.517	3.18	47.4	Chem Translator of 0.791 applied
Total Zinc	0	0		0	118.139	120	1,785	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): 83.151 THH PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A PWS PMF: 1

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	########	WQC applied at RMI 0.001 with a design stream flow of 450 cfs
Chloride (PWS)	0	0		0	250,000	250,000	########	WQC applied at RMI 0.001 with a design stream flow of 450 cfs
Sulfate (PWS)	0	0		0	250,000	250,000	########	WQC applied at RMI 0.001 with a design stream flow of 450 cfs
Total Copper	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 29.934 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

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

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Copper	Report	Report	Report	Report	Report	µg/L	61.9	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Lead	Report	Report	Report	Report	Report	µg/L	47.4	CFC	Discharge Conc > 10% WQBEL (no RP)

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

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

Pollutants	Governing WQBEL	Units	Comments

Total Dissolved Solids (PWS)	519,939	mg/L	Discharge Conc ≤ 10% WQBEL
Chloride (PWS)	259,969	mg/L	Discharge Conc ≤ 10% WQBEL
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	259,969	mg/L	Discharge Conc ≤ 10% WQBEL
Total Zinc	530	µg/L	Discharge Conc ≤ 10% WQBEL

Mercer Correctional Facility
Findley Township, Mercer County
PA0102326 Discharge pH

Outfall 001

Date	pH min	pH max	10^ -pH min	10^ -pH max	& pH max)	-Log (Ave pH)
Jul-22	6.87	7.61	1.35E-07	2.45E-08	7.97E-08	**7.1**
Aug-22	7.0	7.75	1E-07	1.78E-08	5.89E-08	**7.2**
Sep-22	6.95	7.73	1.12E-07	1.86E-08	6.54E-08	**7.2**
Jul-23	6.51	7.33	3.09E-07	4.68E-08	1.78E-07	**6.7**
Aug-23	6.53	7.25	2.95E-07	5.62E-08	1.76E-07	**6.8**
Sep-23	6.62	7.36	2.4E-07	4.37E-08	1.42E-07	**6.8**
Jul-24	7.32	7.94	4.79E-08	1.15E-08	2.97E-08	**7.5**
Aug-24	7.40	8.09	3.98E-08	8.13E-09	2.4E-08	**7.6**
Sep-24	7.17	8.16	6.76E-08	6.92E-09	3.73E-08	**7.4**
					Median:	**7.0**