

Application Type Renewal
Facility Type Municipal
Major / Minor Major

**NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE**

Application No. PA0039004
APS ID 989284
Authorization ID 1266503

Applicant and Facility Information

Applicant Name	<u>Towamencin Municipal Authority</u>	Facility Name	<u>Towamencin Municipal Authority STP</u>
Applicant Address	<u>2225 Kriebel Road</u> <u>Lansdale, PA 19446-5019</u>	Facility Address	<u>2225 Kriebel Road</u> <u>Lansdale, PA 19446-5019</u>
Applicant Contact	<u>Michael McGann</u>	Facility Contact	<u>Ralph Jacoby</u>
Applicant Phone	<u>(215) 855-8165</u>	Facility Phone	<u>(215) 855-8165</u>
Client ID	<u>322637</u>	Site ID	<u>451588</u>
Ch 94 Load Status	<u>Not Overloaded</u>	Municipality	<u>Towamencin Township</u>
Connection Status	<u>No Limitations</u>	County	<u>Montgomery</u>
Date Application Received	<u>March 1, 2019</u>	EPA Waived?	<u>No</u>
Date Application Accepted	<u>April 19, 2019</u>	If No, Reason	<u>Major Facility, Pretreatment</u>
Purpose of Application	<u>Permit Renewal.</u>		

Summary of Review

The PA Department of Environmental Protection (PADEP/Department) received an NPDES permit renewal application from Towamencin Municipal Authority (permittee) on March 1, 2019 for permittee's STP located in Towamencin Township, Montgomery County. This is a Major facility with design flow of 6.5 MGD. The treated effluent discharges through Outfall 003 into Towamencin Creek, TSF/MF. The existing permit expired on August 31, 2019. The terms and conditions were automatically extended since the renewal application was received at least 180 days prior to permit expiration date. Renewal NPDES permit applications under Clean Water program are not covered by PADEP's PDG per 021-2100-001. The permit was drafted on December 11, 2019 and published in PA Bulletin on January 4, 2020. This fact sheet is prepared to accompany the re-draft permit to address the revised Copper BLM requirement, additional sample results, and change in waste stream.


This fact sheet is developed in accordance with 40 CFR §124.56

Changes in this renewal: Limits with schedule applied for few pollutants, WETT limits replaced by monitoring, monitoring requirements applied for few metals, benchmark values applied at representative stormwater outfall, new IMP 101 is created, and limits applied at this IMP.

Sludge use and disposal description and location(s): Stabilized biosolids are land applied as Class B biosolids

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
√		Reza H. Chowdhury, E.I.T. / Project Manager 	March 22, 2021
X		Pravin Patel Pravin C. Patel, P.E. / Environmental Engineer Manager	03/22/2022

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	003	Design Flow (MGD)	6.5
Latitude	40° 13' 45"	Longitude	-75° 21' 38.58"
Quad Name	Lansdale	Quad Code	1743
Wastewater Description: Sewage Effluent			
Receiving Waters	Towamencin Creek (TSF, MF)	Stream Code	01066
NHD Com ID	25979000	RMI	1.41
Drainage Area	10.0 mi ²	Yield (cfs/mi ²)	0.0434
Q ₇₋₁₀ Flow (cfs)	0.434	Q ₇₋₁₀ Basis	USGS StreamStats
Elevation (ft)	176.89	Slope (ft/ft)	
Watershed No.	3-E	Chapter 93 Class.	TSF, MF
Existing Use	TSF	Existing Use Qualifier	
Exceptions to Use	None	Exceptions to Criteria	N/A
Assessment Status	Impaired		
Cause(s) of Impairment	ALGAE, ALGAE, FLOW REGIME MODIFICATION, FLOW REGIME MODIFICATION		
Source(s) of Impairment	MUNICIPAL POINT SOURCE DISCHARGES, MUNICIPAL POINT SOURCE DISCHARGES, RURAL (RESIDENTIAL AREAS), RURAL (RESIDENTIAL AREAS)		
TMDL Status	Final 04/09/2005, withdrawn	Name	Skippack Creek Watershed TMDL
Background/Ambient Data	Data Source		
pH (SU)	7.97	Data collected by DEP from April'19 to June'19	
Temperature (°F)	20	Default per 391-2000-007	
Hardness (mg/L)	121.63	Data collected by DEP from April'19 to June'19	
Other:			
Nearest Downstream Public Water Supply Intake	Aqua PA Main System on Perkiomen Creek		
PWS Waters	Perkiomen Creek	Flow at Intake (cfs)	
PWS RMI	0.924	Distance from Outfall (mi)	11

Other Comments: Outfall 003 primary, gravity sanitary sewer outfall for treated effluent from Stage I & II plants.

Streamflow:

Streamflow will be correlated with the USGS's web-based GIS application (<https://streamstats.usgs.gov/ss/>) accessed on August 5, 2019. Q₇₋₁₀ and Q₃₀₋₁₀ values at Outfall 003 were found to be 0.434 cfs and 0.739 cfs respectively. The drainage area at Outfall 003 was found to be 10.0 mi² from StreamStats.

$$Q_{7-10} \text{ runoff rate} = 0.434 \text{ cfs} / 10.0 \text{ mi}^2 = 0.0434 \text{ cfs/mi}^2$$

$$Q_{30-10}/Q_{7-10} = 0.739 \text{ cfs}/0.434 \text{ cfs} = 1.7$$

Default Q₁₋₁₀: Q₇₋₁₀ of 0.64 from 391-2000-007 will be used in modeling, if needed.

PWS Intake:

The nearest downstream public water supply is Aqua PA Main System on Perkiomen Creek at RMI 0.924 which is approximately 11 miles downstream of the Outfall 003. Because of the distance, dilution with much larger stream, and effluent limits, the discharge is expected not to affect the intake. The distance is calculated as follows:

+ Outfall 003 RMI at Towamencin Creek (01066) ----- 1.41 mi
 + RMI on Skippack Creek (01024) at confluence with 01066 ----- 7.6 mi
 + RMI on Perkiomen Creek (01017) at confluence with 01024 ----- 2.91 mi
 - PWS RMI at 01017 ----- 0.92 mi

Total 11.0 miles

Wastewater Characteristics:

A median pH of 7.16 from daily DMR during dry months July through September for the years 2014 to 2018 and a default temperature of 20°C (per 391-2000-013) will be used for modeling, if needed. The application data indicated an average Total Hardness of 100 mg/l out of 12 samples.

Background data:

The nearby downstream Water Quality Network Station 21PA_WQX-WQN0116 is located on Arcola Road Bridge near Lower Providence Township, Montgomery County which is approximately 33 miles downstream of the outfall 003 and is not considered as representative. In absence of site-specific temperature data, a default temperature of 20°C (per 391-2000-007) will be used in modeling, if needed. PADEP has collected some samples from Towamencin Creek above and below the outfall 003 as a part of ongoing site-specific study within the duration of April 24, 2019 and June 12, 2019. The sampling results indicated an average upstream pH of 7.97 S.U. The permit application indicated an upstream hardness (upstream of outfall 003) to be 160 mg/l for the sampling period of September 2016 through December 2017.

303d Listed Streams:

The discharge from this facility is in Towamencin Creek in state watershed 3-E at RMI 1.41, which is attaining Fish Consumption use but is Aquatic Life use impaired due to water flow variability and excessive algal growth from municipal point source and small residential runoff. A TMDL has been developed for the watershed, nutrient portion of which was withdrawn.

Skippack Creek Total Maximum Daily Load (TMDL):

Skippack Creek is a 15.2-mile stream located in sub-sub-basin 03E, Montgomery County, PA. it is a tributary to Perkiomen Creek whose drainage basin is composed of urban, suburban, agricultural, and rural components. Skippack Creek begins within Souderton Borough limits and flows generally southwest to its confluence with Perkiomen Creek at RMI 3.0. The Skippack Creek TMDL was finalized in April 9, 2005 for Sediments and Nutrients. There were 11 active NPDES permitted point source discharges in the watershed including 7 STPs, 1 meat packing plant, 1 dairy farm, and 2 manufacturers. No reduction for sediment load from point sources were proposed in the final TMDL. The nutrient portion of the TMDL was withdrawn in summer of 2007. No WLA was assigned to this treatment plant. The effluent limitations in the permit will be applied in a way that the discharge from this facility will not add to the existing impairment of the receiving stream.

Antidegradation (93.4):

The effluent limits for this discharge have been developed to ensure that existing in-stream water uses and the level of water quality necessary to protect the existing uses are maintained and protected. The receiving streams are designated as Trout Stocking (TSF) and Migratory Fishes (MF.)

Class A Wild Trout Fisheries:

No Class A Wild Trout Fisheries are impacted by this discharge. The secondary receiving stream, Skippack Creek, is a stocked trout water. The existing permit has a minimum DO limit of 6.0 mg/l as minimum to protect the stocked trout. This requirement will be carried over during this renewal.

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001 and 002	Design Flow (MGD)	6.5
Latitude	40° 13' 46"	Longitude	-75° 21' 6"
Quad Name	Lansdale	Quad Code	1743
Wastewater Description:	Sewage Effluent		
Receiving Waters	Towamencin Creek (TSF)	Stream Code	01066
NHD Com ID	25978996	RMI	1.97

Other Comments: The Outfalls 001 and 002 are the permittee's secondary discharge points which discharge only during high flow events.

Stormwater Outfalls:

The renewal application indicated that there are four stormwater outfalls associated with this WWTP. The details are below:

Outfall	Latitude			Longitude			Receiving Stream	Designated use	Drainage Area (sft)
004	40	13	47	-75	21	3	Towamencin Creek	TSF, MF	91,781
005	40	13	46	-75	21	4	Towamencin Creek	TSF, MF	9,104
006	40	13	08	-75	21	8	Towamencin Creek	TSF, MF	31,625
007	40	13	47	-75	21	10	Towamencin Creek	TSF, MF	70,393

The current permit has listed stormwater parameters in Part A of the permit. The part C of the current permit indicated that Outfall 005 has been determined to be representative of stormwater outfalls 004, 006, and 007. This condition will be carried over in this renewal. The permittee routinely trains employees on housekeeping & spill prevention practices and conducts periodic visual inspections of chemical containments and pumping equipment as ongoing BMP implementation.

Treatment Facility Summary				
Treatment Facility Name: Towamencin STP				
WQM Permit No.	Issuance Date			
4619403	07/01/2019			
4602408 A-2	09/19/2018			
4616402 A-1	03/19/2018			
4616402	08/16/2016			
4615414	05/31/2015			
4602408 A-1	03/23/2015			
4612408	02/13/2013			
Waste Type	Degree of Treatment		Process Type	Avg Annual Flow (MGD)
Sewage	Secondary with Ammonia and Phosphorus Tertiary		Trickling Filter With Settling, Activated Sludge with Solids Removal	Gas Chlorine 6.5
Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)		Load Status	Biosolids Treatment
7.3	16263		Not Overloaded	Biosolids Use/Disposal Land Application

Changes Since Last Permit Issuance: In 2019, a new WQM permit was issued to authorize installation of new rag compactor in biosolids process. The September 2018 WQM permit amendment authorized addition of Polyaluminum Chloride (PACL 300) to remove Phosphorus. The PACL 300 was installed after a pilot study between January 30, 2017 through November 30, 2017. The PACL 300 was added to the effluent trough of the Aeration Tank nos. 5 and 6 in stage 1 of the treatment train. Two flow paced 1,400 gallons above ground tanks were installed for this purpose. In October 7, 2015, the TMA was separated from Upper Gwynedd Towamencin Municipal Authority.

Treatment Plant Description

Towamencin Municipal Authority WWTP is a 6.5 MGD Major Sewer Facility (MASF2) located in Towamencin Township, Montgomery County which discharges treated sewage through outfall 001, 002, and 003 into Towamencin Creek in watershed 3-E. The plant has two treatment trains namely Stage 1 and Stage 2 that essentially comingles prior to discharge. The stage 1 provides secondary treatment through trickling filters, and stage 2 provides tertiary treatment through activated sludge system. The flow is split at the influent box and combines again in the effluent box. Outfall 003 is the primary processed wastewater gravity outfall that runs approximately 0.5 miles downstream of the treatment plant. The process wastewater outfalls 001 and 002 discharge during high flow/wet weather events along with Outfall 003 and discharge by the aid of effluent pumps. The existing permit requires reporting for Outfalls 001 and 002 when discharging. As stated at the top of this page, there are four stormwater outfalls (004 to 007) with Outfall 005 as representative.

The facility receives flows mostly from Towamencin Township and Upper Gwynedd Township and small contributions from few other townships as listed in the next page.

Municipalities served	Flow contribution (%)	Type of Sewer System		Population
		Separate (%)	Combined (%)	
Towamencin Township	72.06	100	0	18,355
Upper Gwynedd Township	27.94	100	0	15,975
Lansdale Borough	<1	100	0	16,521
Hatfield Township	<1	100	0	17,557
Worcester Township	<1	100	0	10,486
Lower Salford Township	<1	100	0	14,959

Per the renewal application, there are several Categorical/non-categorical and Significant Industrial Users (SIUs) contributing to the treatment plant. They are listed in the following table:

Industry Name	Categorical industry?	Applicable pretreatment standard	SIU?	Subpart Letter	Subpart title	Wastewater flow (GPD)			
						Process	NCCW	Sanitary	Total
Merck & Co.	Yes	40 CFR Part 439	Yes	B D	Extraction Products Mixing/Compounding & Formulation	47,510	0	17,490	65,000
Accupac, Inc.	Yes	40 CFR Part 439	Yes	E C D	Research Chemical Synthesis Products Mixing/Compounding & Formulation	62,320	0	0	62,320
Lehigh Valley Dairies, Inc.	No	40 CFR Part 405	Yes	A B C	Receiving Station Fluid Products Cultured Products	160,320	0	0	160,320
Clemens Food Group (Hatfield Quality Meats)	No	40 CFR Part 432	Yes	B D F G H	Complex Slaughterhouses High-Processing Packinghouse Meat Cutters Sausage & Luncheon Meats Processors Ham Processors	649,660	0	31,140	680,800

All the SIUs have industrial user permit issued by TMA. Clemens Food Group is under a five-year consent order to reduce TDS, which shall be completed by September 2022. TMA is implementing an approved pretreatment program administrated by EPA and most recent approval of local limits by EPA was on April 12, 2017.

Per DEP's recent visit to the site on August 25, 2021, the treatment facility consists of the following units:

- Four Muffin Monsters
- Two raw influent wells
- Eight Rotostrainers
- Eight pre-aeration tanks
- Eight aeration tanks
- Four trickling filters
- Eight secondary clarifiers
- Eight pre-aeration tanks
- Thirteen chlorine contact tanks
- Three aerated sludge holding tanks
- Two sludge centrifuges

Junction Box at the head of the treatment plant receives flows from influent sewers where the influent sample is collected. The flow is sent to influent box which sends flows to two raw influent wells through a set of two muffin monsters in each side. The flow from two wells follow the following flow paths:

For Stage 1 (2.17 MGD): wet well → (pumped) flow meter → series of four Rotostrainers in parallel → Pre-aeration tanks → aeration tanks → (PACL 300 added) Distribution Box → intermediate settling tanks → recirculation pump station → (pumped) primary trickling filter → secondary trickling filter → Final settling tanks → NaOCl addition → Chlorine Contact Tanks → either pumped to Outfall 002 during high flow event or goes to effluent discharge box and discharged through Outfall 001 or 003

For Stage 2 (4.33 MGD): wet well → (pumped) flow meter → series of four Rotostrainers in parallel → Pre-aeration tanks → flow meters → Aeration tanks → Intermediate settling tanks → recirculation pump station → (pumped) primary trickling filter → secondary trickling filter → FeCl₃ and alum addition → flocculation mixer → flocculation tanks → final settling tanks → NaOCl addition → chlorine contact tanks → Junction box → Flow meter → NaHSO₃ addition → Effluent box → either pumped through 001 or gravity discharge through 003.

The process flow diagrams for liquid and solids handling are attached in the appendix.

The following chemicals are used at the plant as wastewater treatment chemicals:

Chemical name	Purpose	Maximum use rate	Units	Treatment Phase
Ferric Chloride	Charge neutralization of suspended solids	160	GPD	Stage 2
Polyaluminum Chloride (PACL)	Phosphorus removal	10	GPD	Stage 1
Sodium Acrylate & Acrylamide	Polymer used as suspended solids binder in solution	16	Lbs./day	Stage 2
Sodium Hypochlorite	Effluent disinfection	350	GPD	Stages 1 & 2
Sodium Bisulfite	Dechlorination	70	GPD	Stages 1 & 2

Biosolids Management:

Secondary waste sludges and screenings are blended in a sludge day tank. The blended sludges are processed through two centrifuges and are then lime stabilized for pathogen and vector attraction reduction. Ultimate disposal is primarily via land application with landfill disposal as an alternative. End product is a Class B biosolids. The WQM permit 4619403 (issued July 1, 2019) authorized installation of a rag compactor to replace the existing ejector pots to handle rags more efficiently while keeping one ejector pot as backup for the rag compactor. The facility produced 1,007 dry tons of sewage sludge/biosolids in previous year that included 22.86 dry tons of sludge from Lower Salford Township WWTP. TMA holds a beneficial use permit PAG080008 and land application sites are located in Berks, Chester, Lebanon, Lehigh, Lancaster, Montgomery, and Northampton counties. Landfill disposal is applied when filter cake is insufficiently stabilized, or land application is not permitted. No landfill disposal utilized in 2017.

Compliance History

DMR Data for Outfall 001 (from October 1, 2020 to September 30, 2021)

Parameter	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20
Flow (MGD) Average Monthly	4.148						GG			5.197		
Flow (MGD) Daily Maximum	12.7						GG			12.237		
pH (S.U.) Instantaneous Minimum	7.33						7.22			7.02		
pH (S.U.) Instantaneous Maximum	7.94						7.81			8.80		
DO (mg/L) Minimum	7.77						9.71			8.58		
TRC (mg/L) Average Monthly	< 0.014						< 0.014			0.001		
TRC (mg/L) IMAX	< 0.014						< 0.014			0.014		
CBOD5 (lbs/day) Average Monthly	119						382			156		
CBOD5 (lbs/day) Raw Sewage Influent Average Monthly	4630						10322			4417		
CBOD5 (lbs/day) Weekly Average	187						751			227		
CBOD5 (mg/L) Average Monthly	3						6			3		
CBOD5 (mg/L) Raw Sewage Influent Average Monthly	163						228			120		
CBOD5 (mg/L) Weekly Average	4						9			3		
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	5249						10780			8739		
BOD5 (mg/L) Raw Sewage Influent Average Monthly	181						264			238		
TSS (lbs/day) Average Monthly	353						437			286		

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TSS (lbs/day) Raw Sewage Influent Average Monthly	5066						10635			8109		
TSS (lbs/day) Weekly Average	841						1202			559		
TSS (mg/L) Average Monthly	6						8			5		
TSS (mg/L) Raw Sewage Influent Average Monthly	176						231			218		
TSS (mg/L) Weekly Average	11						14			8		
TDS (mg/L) Average Monthly	1446						1196			1244		
TDS (mg/L) Daily Maximum	1800						1530			1640		
Osmotic Pressure (mOs/kg) Average Monthly	42						38			25		
Osmotic Pressure (mOs/kg) Daily Maximum	42						38			25		
Fecal Coliform (CFU/100 ml) Geometric Mean	14						10			6		
Fecal Coliform (CFU/100 ml) IMAX	520						162			46		
Ammonia (lbs/day) Average Monthly	25						57			49		
Ammonia (mg/L) Average Monthly	0.42						0.76			0.78		
Total Phosphorus (lbs/day) Average Monthly	10						15			9		
Total Phosphorus (mg/L) Average Monthly	0.36						0.29			0.23		
Total Aluminum (lbs/day) Average Monthly	15.61						3.08			2.47		
Total Aluminum (lbs/day) Daily Maximum	21.79						10.49			6.31		

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Total Aluminum (mg/L)												
Average Monthly	0.49						0.067			0.06		
Total Aluminum (mg/L)												
Daily Maximum	0.52						0.18			0.11		
Total Copper (lbs/day)												
Average Monthly	0.12						0.44			0.31		
Total Copper (lbs/day)												
Daily Maximum	0.18						1.22			0.82		
Total Copper (mg/L)												
Average Monthly	0.004						0.010			0.009		
Total Copper (mg/L)												
Daily Maximum	0.004						0.021			0.024		
Total Iron (lbs/day)												
Average Monthly	7.5						50.0			42.5		
Total Iron (lbs/day)												
Daily Maximum	12.3						62.9			55.1		
Total Iron (mg/L)												
Average Monthly	0.23						1.29			1.14		
Total Iron (mg/L)												
Daily Maximum	0.27						1.58			1.40		
Sulfate (lbs/day)												
Average Monthly	1405						1366			1793		
Sulfate (lbs/day)												
Daily Maximum	1865						1654			2850		
Sulfate (mg/L)												
Average Monthly	45						35			49		
Sulfate (mg/L)												
Daily Maximum	47						41			90		
Chloride (lbs/day)												
Average Monthly	23471						24812			27552		
Chloride (lbs/day)												
Daily Maximum	28077						30412			41881		
Chloride (mg/L)												
Average Monthly	774						638			730		
Chloride (mg/L)												
Daily Maximum	989						839			910		
Bromide (lbs/day)												
Average Monthly	16						40			38		
Bromide (lbs/day)												
Daily Maximum	45						58			57		
Bromide (mg/L)												
Average Monthly	0.47						1			1		

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Bromide (mg/L) Daily Maximum	1.0						1			1		
Chronic WET - Ceriodaphnia Survival (TUc) Daily Maximum				1.00			1.00					
Chronic WET - Ceriodaphnia Reproduction (TUc) Daily Maximum				1.00			1.00					
Chronic WET - Pimephales Survival (TUc) Daily Maximum				1.00			1.00					
Chronic WET - Pimephales Growth (TUc) Daily Maximum				1.00			1.00					

DMR Data for Outfall 002 (from October 1, 2020 to September 30, 2021)

Parameter	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20
Flow (MGD) Average Monthly	4.148						GG			5.197		
Flow (MGD) Daily Maximum	12.766						GG			12.237		
pH (S.U.) Instantaneous Minimum	7.33						7.22			7.02		
pH (S.U.) IMAX	7.94						7.81			8.80		
DO (mg/L) Minimum	7.77						9.71			8.58		
TRC (mg/L) Average Monthly	< 0.014						< 0.014			0.001		
TRC (mg/L) IMAX	< 0.014						< 0.014			0.014		
CBOD5 (lbs/day) Average Monthly	119						382			156		
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TSS (lbs/day) Average Monthly	353						437			286		
TSS (lbs/day) Raw Sewage Influent Average Monthly	5066						10635			8109		
TSS (lbs/day) Weekly Average	841						1202			559		
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Fecal Coliform (CFU/100 ml) Instantaneous Maximum	520						162			46		
Ammonia (lbs/day) Average Monthly	25						57			49		

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Ammonia (mg/L) Average Monthly	0.42						0.76			0.78		
Total Phosphorus (lbs/day) Average Monthly	10						15			9		
Total Phosphorus (mg/L) Average Monthly	0.36						0.29			0.23		
Total Aluminum (lbs/day) Average Monthly	15.61						3.08			2.47		
Total Aluminum (lbs/day) Daily Maximum	21.79						10.49			6.31		
Total Aluminum (mg/L) Average Monthly	0.49						0.067			0.06		
Total Aluminum (mg/L) Daily Maximum	0.52						0.18			0.11		
Total Copper (lbs/day) Average Monthly	0.12						0.44			0.31		
Total Copper (lbs/day) Daily Maximum	0.18						1.22			0.82		
Total Copper (mg/L) Average Monthly	0.004						0.010			0.009		
Total Copper (mg/L) Daily Maximum	0.004						0.021			0.024		
Total Iron (lbs/day) Average Monthly	7.5						50.0			42.5		
Total Iron (lbs/day) Daily Maximum	12.3						62.9			55.1		
Total Iron (mg/L) Average Monthly	0.23						1.29			1.14		
Total Iron (mg/L) Daily Maximum	0.27						1.58			1.40		
Sulfate (lbs/day) Average Monthly	1405						1366			1793		
Sulfate (lbs/day) Daily Maximum	1865						1654			2850		
Sulfate (mg/L) Average Monthly	45						35			49		
Sulfate (mg/L) Daily Maximum	47						41			90		

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Chloride (lbs/day) Average Monthly	23471						24812			27552		
Chloride (lbs/day) Daily Maximum	28077						30412			41881		
Chloride (mg/L) Average Monthly	774						638			730		
Chloride (mg/L) Daily Maximum	989						839			910		
Bromide (lbs/day) Average Monthly	16						40			38		
Bromide (lbs/day) Daily Maximum	45						58			57		
Bromide (mg/L) Average Monthly	0.47						1			1		
Bromide (mg/L) Daily Maximum	1.0						1			1		
Chronic WET - Ceriodaphnia Survival (TUc) Daily Maximum				1.00			1.00					
Chronic WET - Ceriodaphnia Reproduction (TUc) Daily Maximum				1.00			1.00					
Chronic WET - Pimephales Survival (TUc) Daily Maximum				1.00			1.00					
Chronic WET - Pimephales Growth (TUc) Daily Maximum				1.00			1.00					

DMR Data for Outfall 003 (from October 1, 2020 to September 30, 2021)

Parameter	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20
Flow (MGD) Average Monthly	4.148	3.641	3.125	3.439	3.254	3.436	5.292	4.777	3.900	5.197	3.735	3.278
Flow (MGD) Daily Maximum	12.766	6.651	3.907	5.349	7.079	4.739	13.270	11.087	7.054	12.237	5.603	7.014
pH (S.U.) Instantaneous Minimum	7.33	7.02	7.15	7.45	6.83	6.99	7.22	7.05	6.77	7.02	6.78	7.39
pH (S.U.) IMAX	7.94	7.85	7.82	7.98	8.57	7.54	7.81	7.88	8.05	8.80	8.61	8.48

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DO (mg/L) Minimum	7.77	7.29	7.71	7.90	7.91	8.7	9.71	9.72	9.58	8.58	8.56	7.92
TRC (mg/L) Average Monthly	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	< 0.014	0.001	< 0.014	< 0.014
TRC (mg/L) IMAx	< 0.014	0.003	0.0018	< 0.014	< 0.047	< 0.014	< 0.014	< 0.014	< 0.014	0.014	< 0.014	< 0.014
CBOD5 (lbs/day) Average Monthly	119	74	60	60	71	146	382	< 236	111	156	62	51
CBOD5 (lbs/day) Raw Sewage Influent Average Monthly	4630	5674	4400	5397	4557	6427	10322	5833	5839	4417	2311	2765
CBOD5 (lbs/day) Weekly Average	187	94	73	68	94	287	751	640	247	227	83	58
CBOD5 (mg/L) Average Monthly	3	2	2	2	3	5	6	< 4	4	3	2	2
CBOD5 (mg/L) Raw Sewage Influent Average Monthly	163	187	164	190	167	230	228	147	200	120	76	108
CBOD5 (mg/L) Weekly Average	4	3	3	2	4	11	9	9	FF	3	2	FF
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	5249	5488	5433	6496	6983	7487	10780	6318	6248	8739	4830	4345
BOD5 (mg/L) Raw Sewage Influent Average Monthly	181	181	205	225	261	272	264	165	212	238	182	168
TSS (lbs/day) Average Monthly	353	94	75	76	187	174	437	278	149	286	144	96
TSS (lbs/day) Raw Sewage Influent Average Monthly	5066	6514	4543	5802	5886	7319	10635	9589	6475	8109	6553	6122
TSS (lbs/day) Weekly Average	841	139	89	151	273	274	1202	563	285	559	206	209
TSS (mg/L) Average Monthly	6	3	3	3	7	6	8	6	5	5	4	4
TSS (mg/L) Raw Sewage Influent Average Monthly	176	216	169	200	215	262	231	227	225	218	213	235
TSS (mg/L) Weekly Average	11	5	3	4	10	9	14	8	7	8	6	8
TDS (mg/L) Average Monthly	1446	1674	1660	1562	1735	1608	1196	1606	1440	1244	1808	2040
TDS (mg/L) Daily Maximum	1800	2240	1920	1900	2000	1740	1530	1940	1680	1640	2110	2320

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Osmotic Pressure (mOs/kg) Average Monthly	42	35	28	36	37	25	38	56	30	25	36	54
Osmotic Pressure (mOs/kg) Daily Maximum	42	35	28	36	37	25	38	56	30	25	36	54
Fecal Coliform (CFU/100 ml) Geometric Mean	14	3	3	3	4	7	10	72	18	6	14	19
Fecal Coliform (CFU/100 ml) IMAX	520	16	48	20	256	70	162	891	62	46	200	109
Ammonia (lbs/day) Average Monthly	25	5	3	11	12	8	57	< 53	9	49	5	5
Ammonia (mg/L) Average Monthly	0.42	0.16	0.1	0.36	0.40	0.3	0.76	< 0.82	0.28	0.78	0.17	0.2
Total Phosphorus (lbs/day) Average Monthly	10	11	16	9	13	8	15	14	8	9	9	11
Total Phosphorus (mg/L) Average Monthly	0.36	0.37	0.62	0.32	0.48	0.29	0.29	0.26	0.29	0.23	0.30	0.4
Total Aluminum (lbs/day) Average Monthly	15.61	15	10.33	5.74	3.63	0.66	3.08	< 2.04	1.22	2.47	6.4	6.5
Total Aluminum (lbs/day) Daily Maximum	21.79	19.2	14.22	8.76	8	0.80	10.49	3.67	1.57	6.31	11.05	11.4
Total Aluminum (mg/L) Average Monthly	0.49	0.50	0.388	0.198	0.14	0.024	0.067	< 0.044	0.040	0.06	0.24	0.26
Total Aluminum (mg/L) Daily Maximum	0.52	0.58	0.530	0.34	0.32	0.030	0.18	0.060	0.050	0.11	0.43	0.45
Total Copper (lbs/day) Average Monthly	0.12	0.13	0.28	0.28	0.18	0.26	0.44	0.47	0.23	0.31	0.17	0.13
Total Copper (lbs/day) Daily Maximum	0.18	0.18	0.34	0.36	0.20	0.38	1.22	1.18	0.25	0.82	0.23	0.15
Total Copper (mg/L) Average Monthly	0.004	0.004	0.010	0.010	0.007	0.009	0.010	0.010	0.008	0.009	0.006	0.005
Total Copper (mg/L) Daily Maximum	0.004	0.007	0.013	0.014	0.007	0.013	0.021	0.016	0.009	0.024	0.008	0.006
Total Iron (lbs/day) Average Monthly	7.5	4.5	10.8	25.0	29.7	47.4	50.0	53.6	41.9	42.5	11.6	3.2
Total Iron (lbs/day) Daily Maximum	12.3	5.4	25.5	34.3	35.5	52.9	62.9	74.2	47.6	55.1	28.8	4.2

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Total Iron (mg/L) Average Monthly	0.23	0.15	0.39	0.82	1.08	1.71	1.29	1.31	1.39	1.14	0.40	0.12
Total Iron (mg/L) Daily Maximum	0.27	0.16	0.80	1.12	1.20	1.82	1.58	1.49	1.57	1.40	1.02	0.17
Sulfate (lbs/day) Average Monthly	1405	1470	1363	1469	1374	1255	1366	1425	1251	1793	1119	990
Sulfate (lbs/day) Daily Maximum	1865	1560	1718	1904	1450	1308	1654	2115	1400	2850	1305	1161
Sulfate (mg/L) Average Monthly	45	50	51	49	51	45	35	35	42	49	41	39
Sulfate (mg/L) Daily Maximum	47	55	54	52	55	49	41	41	46	90	48	46
Chloride (lbs/day) Average Monthly	23471	26252	24378	24972	26018	24047	24812	38599	23789	27552	27003	30118
Chloride (lbs/day) Daily Maximum	28077	33231	31095	28665	28235	25286	30412	58760	26078	41881	29540	35565
Chloride (mg/L) Average Monthly	774	910	907	849	963	871	638	943	803	730	986	1180
Chloride (mg/L) Daily Maximum	989	1300	1090	1030	1130	946	839	1140	951	910	1150	1400
Bromide (lbs/day) Average Monthly	16	30	27	30	27	28	40	< 43	31	38	27	26
Bromide (lbs/day) Daily Maximum	45	36	32	40	33	30	58	< 73	39	57	32	29
Bromide (mg/L) Average Monthly	0.47	1	1	1	1	1	1	< 1	1	1	1	1
Bromide (mg/L) Daily Maximum	1.0	1	1	1	1	1	1	< 1	1	1	1	1
Chronic WET - Ceriodaphnia Survival (TUc) Daily Maximum	1.00			1.00			1.00			1.04		
Chronic WET - Ceriodaphnia Reproduction (TUc) Daily Maximum	1.04			1.00			1.00			1.04		
Chronic WET - Pimephales Survival (TUc) Daily Maximum	1.00			1.00			1.00			1.00		
Chronic WET - Pimephales Growth (TUc) Daily Maximum	1.00			1.00			1.00			1.00		

**NPDES Permit Fact Sheet
Towamencin Municipal Authority STP**

NPDES Permit No. PA0039004

DMR Data for Outfall 004 (from October 1, 2020 to September 30, 2021)

No discharge from Outfall 004

DMR Data for Outfall 005 (from October 1, 2020 to September 30, 2021)

Parameter	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20
pH (S.U.) Annual Average										8.93		
pH (S.U.) IMAX										8.93		
CBOD5 (mg/L) Annual Average										3.7		
CBOD5 (mg/L) IMAX										3.7		
COD (mg/L) Annual Average										32		
COD (mg/L) IMAX										32		
TSS (mg/L) Annual Average										32		
TSS (mg/L) IMAX										32		
Oil and Grease (mg/L) Annual Average										< 5		
Oil and Grease (mg/L) IMAX										< 5		
Fecal Coliform (CFU/100 ml) Annual Average										118		
Fecal Coliform (CFU/100 ml) IMAX										118		
TKN (mg/L) Annual Average										0.64		
TKN (mg/L) IMAX										0.64		
Total Phosphorus (mg/L) Annual Average										0.24		
Total Phosphorus (mg/L) IMAX										0.24		
Dissolved Iron (mg/L) Annual Average										< 0.02		
Dissolved Iron (mg/L) IMAX										< 0.02		

DMR Data for Outfall 006 (from October 1, 2020 to September 30, 2021)

No discharge from Outfall 006

DMR Data for Outfall 007 (from October 1, 2020 to September 30, 2021)

No discharge from Outfall 007

Summary of Inspection:

August 25, 2021: RTPT conducted. No violations were noted during inspection.

March 19, 2021: RTPT conducted. No violations were noted during inspection.

December 9, 2020: CEI conducted. No violations were noted during inspection.

August 5, 2020: RTPT conducted in response to the WWTP being flooded due to the tropical storm. The facility lost power for four hours, but the emergency generator functioned to keep the plant running. Final effluent was slightly cloudy but overall clear. No violations were noted during inspection.

April 27, 2020: RTPT conducted in response to a sludge overflow from the WWTP. The overflow was from the sludge hauler leaving the valve open after leaving the plant. Most of the sludge went to a drain that goes to the head of the plant, but some discharged onto the pavement and to the grass. A cleanup company vacuumed the materials from the ground and applied lime.

February 19, 2020: CEI conducted. No violations were noted during inspection.

March 12, 2019: CEI conducted. No violations were identified during inspection. The treatment plant appeared well maintained and dept good housekeeping practices.

June 14, 2018: CEI conducted for biosolids land application. Pollutants, vector attraction reduction and pathogen reduction requirements were all met. No violations were noted during the inspection or review of the 2017 annual report.

February 27, 2018: CEI conducted. No violations were identified during the inspection. Recommendation was made to clean the weirs more frequently during heavy algae growth. The plant appeared to maintain good housekeeping practices.

July 27, 2017: CEI conducted. No violations were observed during the inspection. Some recommendations were made including keeping the thermometers within certification dates, keeping the waste oil tank in double walled or secondary containment, cover influent sample line to prevent rapid growth of organism etc. The operator informed the inspector on August 7, 2017 that all new thermometers were put in samplers, the sampler line was replaced covered, and a new double walled waste oil tank was installed to replace the old one.

January 19, 2016: Incidental inspection was conducted to respond to a fish kill. Violations noted including unpermitted discharge of sewage, failure to properly notify the Department, and a potential violation related to unrepresentative sampling. The potential cause of fish kill may be high residual chlorine discharge caused from frozen bisulfite line. The bisulfite line was heat taped and the operator was planning to insulate the line. The inspector noticed 9 dead fishes and foam downstream of the outfall. An NOV was issued on January 26, 2016 for this incident. A Consent Assessment of Civil Penalty (CACP) was issued on June 20, 2016 for this incident.

No on-site samples were taken from 2016 till March 2019.

Existing Effluent Limitations and Monitoring Requirements

The table below summarizes effluent limitations and monitoring requirements specified in the existing final NPDES permit that was in effect between September 1, 2014 to August 31, 2019.

For Outfall 001, 002, and 003:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) ⁽¹⁾		Concentrations (mg/L)				Minimum ⁽²⁾ Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	6.0	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.014	XXX	0.047	1/day	Grab
CBOD5 Influent	Report	XXX	XXX	Report	XXX	XXX	3/week	24-Hr Composite
CBOD5 May 1 - Oct 31	540	815 Wkly Avg	XXX	10	15 Wkly Avg	20	3/week	24-Hr Composite
CBOD5 Nov 1 - Apr 30	1,085	1,625 Wkly Avg	XXX	20	30 Wkly Avg	40	3/week	24-Hr Composite
BOD5 Influent	Report	XXX	XXX	Report	XXX	XXX	2/month	24-Hr Composite
Total Suspended Solids Influent	Report	XXX	XXX	Report	XXX	XXX	3/week	24-Hr Composite
Total Suspended Solids	1,625	2,440 Wkly Avg	XXX	30	45 Wkly Avg	60	3/week	24-Hr Composite
Total Dissolved Solids	XXX	XXX	XXX	Report	Report	XXX	1/week	24-Hr Composite
Osmotic Pressure (mOs/kg)	XXX	XXX	XXX	Report	XXX	52	1/month	Grab
Fecal Coliform (CFU/100 ml)	XXX	XXX	XXX	200 Geo Mean	XXX	1,000 (*)	3/week	Grab
Ammonia-Nitrogen May 1 - Oct 31	54	XXX	XXX	1.0	XXX	2.0	3/week	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	108	XXX	XXX	2.0	XXX	4.0	3/week	24-Hr Composite
Total Phosphorus Apr 1 - Oct 31	51	XXX	XXX	1.0	XXX	2.0	3/week	24-Hr Composite

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Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) ⁽¹⁾		Concentrations (mg/L)				Minimum ⁽²⁾ Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Total Phosphorus Nov 1 - Mar 31	102	XXX	XXX	2.0	XXX	4.0	3/week	24-Hr Composite
Total Aluminum	Report	Report	XXX	Report	Report	XXX	See Permit (**)	24-Hr Composite
Total Copper	1.14	1.73	XXX	0.021	0.032	0.042	1/week	24-Hr Composite
Total Iron	84.5	132	XXX	1.56	2.44	3.12	1/week	24-Hr Composite
Sulfate	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite
Chloride	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite
Bromide	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite
Chronic Toxicity - Ceriodaphnia Survival (TUc)	XXX	XXX	XXX	XXX	1.04	XXX	See Permit	See Permit
Chronic Toxicity - Ceriodaphnia Reproduction (TUc)	XXX	XXX	XXX	XXX	1.04	XXX	See Permit	See Permit
Chronic Toxicity - Pimephales Survival (TUc)	XXX	XXX	XXX	XXX	1.04	XXX	See Permit	See Permit
Chronic Toxicity - Pimephales Growth (TUc)	XXX	XXX	XXX	XXX	1.04	XXX	See Permit	See Permit

For Outfall 004, 005, 006, and 007:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) ⁽¹⁾		Concentrations (mg/L)				Minimum ⁽²⁾ Measurement Frequency	Required Sample Type
	Average Monthly		Minimum	Annual Average		Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	Report	XXX	Report	Upon Request	Grab
CBOD5	XXX	XXX	XXX	Report	XXX	Report	Upon Request	Grab
Chemical Oxygen Demand	XXX	XXX	XXX	Report	XXX	Report	Upon Request	Grab
Total Suspended Solids	XXX	XXX	XXX	Report	XXX	Report	Upon Request	Grab
Oil and Grease	XXX	XXX	XXX	Report	XXX	Report	Upon Request	Grab
Fecal Coliform (CFU/100 ml)	XXX	XXX	XXX	Report	XXX	Report	Upon Request	Grab
Total Kjeldahl Nitrogen	XXX	XXX	XXX	Report	XXX	Report	Upon Request	Grab
Total Phosphorus	XXX	XXX	XXX	Report	XXX	Report	Upon Request	Grab
Dissolved Iron	XXX	XXX	XXX	Report	XXX	Report	Upon Request	Grab

Development of Effluent Limitations

Outfall No.	003	Design Flow (MGD)	6.5
Latitude	40° 13' 45.00"	Longitude	-75° 21' 38.81"
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)

Water Quality-Based Limitations

WQM 7.0:

The following data were used in the attached computer model (WQM 7.0) of the stream:

- Discharge pH 7.16 (median July-Sep, 2014-2018, DMR data)
- Discharge Temperature 20°C (Default per 391-2000-013)
- Discharge Hardness 100 mg/l (Application data)
- Stream pH 7.97 (PADEP samples, April 24, 2019-June 12, 2019)
- Stream Temperature 20°C (Default per 391-2000-007)
- Stream Hardness 160 mg/l (Application data between Sep'16 – Dec'17)

The following two nodes were used in modeling:

Node 1: At Outfall 003 on Towamencin Creek (01066) at RMI 1.41
Elevation: 176.89 ft (USGS TNM 2.0 viewer, 08/05/2019)
Drainage Area: 10.0 mi² (StreamStat Version 3.0, 08/05/2019)
River Mile Index: 1.41 (PA DEP eMapPA)
Low Flow Yield: 0.0434 cfs/mi²
Discharge Flow: 6.5 MGD

Node 2: At confluence with Skippack Creek (01024)
Elevation: 154.3 ft (USGS TNM 2.0 viewer, 08/05/2019)
Drainage Area: 11.1 mi² (StreamStat Version 3.0, 08/05/2019)
River Mile Index: 0.0 (PA DEP eMapPA)
Low Flow Yield: 0.0434 cfs/mi²
Discharge Flow: 0.0 MGD

Ammonia (NH₃-N), Carbonaceous Biochemical Oxygen Demand (CBOD₅), & Dissolved Oxygen (DO):

WQM 7.0 version 1.0b is a water quality model designed to assist DEP to determine appropriate effluent limits for CBOD₅, NH₃-N and DO. The model simulates two basic processes. In the NH₃-N module, the model simulates the mixing and degradation of NH₃-N in the stream and compares calculated instream NH₃-N concentrations to NH₃-N water

quality criteria. In the D.O. module, the model simulates the mixing and consumption of D.O. in the stream due to the degradation of CBOD₅ and NH₃-N and compares calculated instream D.O. concentrations to D.O. water quality criteria. The model was utilized for this permit renewal by using Q₇₋₁₀ and current background water quality levels of the stream.

NH₃-N:

WQM 7.0 suggested NH₃-N limit of 1.0 mg/l as monthly average and 2.0 mg/l as IMAX limit during summer to protect water quality standards. These values are the same as existing permitted limits. Recent DMR data show that the plant is meeting the permit limits. The average monthly mass loading is calculated to be 54 lbs./day. The existing winter season limits of 2.0 mg/l as average monthly and 4.0 mg/l as IMAX limit will be carried over in this renewal. Winter average monthly mass limit was calculated as 108 lbs./day, which is the same as in the existing permit and will remain unchanged.

CBOD₅:

The WQM 7.0 model suggests a monthly average CBOD₅ limit of 10 mg/l. The average monthly and average weekly mass loadings were calculated as 542.1 lbs/day and 813.15 lbs/day respectively. These values are rounded down to 540 lbs/day and 810 lbs/day, respectively ⁽¹⁾. The current permit has weekly average mass loading limit of 815 lbs./day, which is corrected by this updated limit of 810 lbs./day. The current permit has seasonal limit for CBOD₅ with a multiplier of 2.0 which will be carried over in this renewal. Seasonal limit for CBOD₅ is allowed in PADEP's guidance ⁽²⁾. The mass limit for winter season is calculated to be 1084.2 lbs./day as monthly average and 1626.3 lbs./day as weekly average which are rounded down to 1080 lbs./day and 1625 lbs./day, respectively ⁽¹⁾. Minimum monitoring frequency will remain the same as 3/week, 24-hr composite sampling.

Dissolved Oxygen (DO):

A minimum of 6.0 mg/L for D.O. is an existing effluent limit and is supported by the output from WQM 7.0 modeling. The existing limit will remain unchanged in the draft permit.

Toxics:

The permit drafted in December 11, 2019 included some new parameters with limits/monitoring requirements. The permit couldn't be finalized due to outstanding BLM issues with EPA/CO. The PADEP prepared a re-draft permit package and sent a pre-draft survey form to TMA on November 24, 2021 that listed new pollutants of concerns (new/more stringent) based on a RP analysis with updated eDMR data. TMA indicated that the waste-stream was changed due to approximately 90% withdrawal of wastewater from Upper Gwynedd Township's contribution, or 0.81 MGD. TMA believed that their influent quality is improved and offered to conduct additional testing for those POC. The response on the pre-draft was received by the PADEP on March 3, 2022. Accordingly, PADEP conducted a new RP analysis based on the updated results. A summary of the new TMS recommendation is provided below:

☒ **Recommended WQBELs & Monitoring Requirements**

No. Samples/Month: **4**

Pollutants	Mass Limits		Concentration Limits				Governing WQBEL	WQBEL Basis	Comments
	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units			
Total Aluminum	Report	Report	Report	Report	Report	µg/L	750	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Copper	0.54	0.81	9.94	14.9	14.9	µg/L	9.94	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Dissolved Iron	Report	Report	Report	Report	Report	µg/L	313	THH	Discharge Conc > 10% WQBEL (no RP)
Total Iron	84.8	132	1,565	2,441	3,912	µg/L	1,565	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Nickel	Report	Report	Report	Report	Report	µg/L	55.6	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Silver	Report	Report	Report	Report	Report	µg/L	3.95	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	122	AFC	Discharge Conc > 10% WQBEL (no RP)
Chlorodibromomethane	0.059	0.11	1.08	1.98	2.71	µg/L	1.08	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Chloroform	Report	Report	Report	Report	Report	µg/L	7.73	CRL	Discharge Conc > 25% WQBEL (no RP)
Dichlorobromomethane	0.07	0.13	1.29	2.36	3.22	µg/L	1.29	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Osmotic Pressure	XXX	XXX	50.0	51.8	51.8	mOs/kg	50.0	AFC	Discharge Conc ≥ 50% WQBEL (RP)

(1) 362-0400-001 /10/1/97 /Chapter 5/Page 9

(2) Determining Water-Quality Based Effluent Limits, 391-2000-003, December 9, 1997

Each of the parameters are discussed below:

Total Aluminum: TMS suggests monitoring for Total Aluminum. The existing permit has monitoring for Total Aluminum only when the TMA uses Alum or other aluminum salts in the treatment process. Polyaluminum Chloride (PACL) is used in the treatment process to aid for removal of phosphorus. Existing monitoring requirement will be continued.

Total Copper: Total Copper is an existing parameter in the current permit. The Average Monthly limit (AML) is 0.021 mg/l which was based on site specific Biotic Ligand Model (BLM) study conducted in 2011. A new BLM study was conducted and the final report was submitted to PADEP on April 24 2018 which recommended site-specific total copper criteria of 32 µg/l (CMC) and 20 µg/l (CCC). It was decided that existing limit of 0.021 mg/l as AML, 0.032 mg/l as MDL, and 0.042 mg/l as IMAX will be continued for this permit term along with their respective mass loadings for AML and MDL of 1.14 lbs./day and 1.73 lbs./day, respectively. The permittee will be required to conduct a BLM study during this permit term and will submit the results with the next permit renewal application.

Dissolved Iron: This is a new parameter with monitoring recommendation on this renewal. The permittee will be required to collect monthly samples for this pollutant and the data will be used for RP analysis in next permit renewal.

Total Iron: Total Iron is an existing parameter in the current permit. The AML and MDL suggested by TMS is 1.56 mg/l and 2.44 mg/l, respectively, which are the same as current limits. The existing limits will be carried over in this renewal. The existing minimum monitoring frequency of 1/week will be carried over as well.

Total Nickel: This is a new parameter with monitoring recommendation on this renewal. The permittee will be required to collect monthly samples for this pollutant and the data will be used for RP analysis in next permit renewal.

Total Silver: This is a new parameter with monitoring recommendation on this renewal. The permittee will be required to collect monthly samples for this pollutant and the data will be used for RP analysis in next permit renewal.

Total Zinc: This is a new parameter with monitoring recommendation on this renewal. The permittee will be required to collect monthly samples for this pollutant and the data will be used for RP analysis in next permit renewal.

Chlorodibromomethane: The model suggested 1.08 µg/l as AML, 1.98 µg/l as MDL, and 2.71 µg/l as IMAX. The mass-based limits for AML and MDL are calculated to be 0.059 lbs./day and 0.11 lbs./day, respectively. It is a Disinfection-by-products (DBP) such as Trihalomethanes (THMs) which may be formed when chlorine (or bromine) used as a disinfectant which react with Natural Organic Materials (NOM). Since the facility uses chlorine as disinfectant, the formation of DBPs are likely. Per the returned pre-draft permit survey, TMA believes that they will be unable to attain or consistently attain compliance with this pollutant without a process modification or change and requested a compliance schedule for 59 months from permit effective date. PADEP agrees with this schedule and proposes that the new limits will be effective from 60th month of the permit effective date.

Chloroform: This is a new parameter with monitoring recommendation on this renewal. The permittee will be required to collect monthly samples for this pollutant and the data will be used for RP analysis in next permit renewal.

Dichlorobromomethane: The model suggested 1.29 µg/l as AML, 2.36 µg/l as MDL, and 3.22 µg/l as IMAX. The mass-based limits for AML and MDL are calculated to be 0.07 lbs./day and 0.13 lbs./day, respectively. It is a Disinfection-by-products (DBP) such as Trihalomethanes (THMs) which may be formed when chlorine (or bromine) used as a disinfectant which react with Natural Organic Materials (NOM). Since the facility uses chlorine as disinfectant, the formation of DBPs are likely. Per the returned pre-draft permit survey, TMA believes that they will be unable to attain or consistently attain compliance with this pollutant without a process modification or change and requested a compliance schedule for 59 months from permit effective date. PADEP agrees with this schedule and proposes that the new limits will be effective from 60th month of the permit effective date.

Osmotic Pressure: The existing permit has osmotic pressure limit of 52 mOs/kg as IMAX. A site-specific criteria (SSC) study by the Department above the TMA discharge point in 2019 indicated an instream osmotic pressure of 8.86 mOs/kg. The average discharge for last 12 months is 36.83 mOs/kg. The model output indicated AML of 50 mOs/kg, MDL and IMAX of 51.8 mOs/kg. TMA indicated the facility may not meet the limit on the permit effective date and requested a compliance schedule of 1 year from permit effective date. PADEP agrees with this request and proposes that the existing limits will be carried over for 1st year and more stringent limits will be effective from 2nd year of the permit issuance date.

Whole Effluent Toxicity Testing (WETT):

The permittee submitted seven (7) WET Test results during the submission of the renewal application and one (1) through eDMR system. The tests were performed on February, April, July, December of 2015, July of 2016, August of 2017, October of 2018, and June 2019. The first five (5) tests were performed by Eurofins QC. Since all WET tests performed by Eurofins QC from at least 2012 are invalid, the Department didn't accept first five (5) test results. Since only three (3) valid test results were available now, the permittee was requested to perform another WET test. The new WET test was initiated on November 5, 2019 and the test results were submitted to the eDMR system on December 4, 2019. All four valid WET test results showed "Pass" for all end points. The dilution series is updated. The TIWCC was calculated to be 96% to evaluate the test results for a stream flow of 0.434 cfs, discharge flow of 6.5 MGD, and PMFc of 1. The WET tests are discussed in detail on pages 29-30 of this report.

Additional Considerations

Fecal Coliform:

The recent coliform guidance in 25 Pa. code § 92a.47.(a)(4) requires a summer technology limit of 200/100 ml as a geometric mean and an instantaneous maximum not greater than 1,000/100ml and § 92a.47.(a)(5) requires a winter limit of 2,000/100ml as a geometric mean and an instantaneous maximum not greater than 10,000/100ml. Delaware River Basin Commission's (DRBC's) Water Quality Regulations at Section 4.30.4.A requires that during winter season from October through April, the instantaneous maximum concentration of fecal coliform organisms shall not be greater than 1,000 per 100 milliliters in more than 10 percent of the samples tested. Therefore, the summer limit is governed by DEP's regulation while winter limit is governed by DRBC's regulation.

E. Coli:

DEP's SOP titled "Establishing Effluent Limitations for Individual Sewage Permits (BCW-PMT-033, revised March 24, 2021) recommends monthly E. Coli monitoring for major sewage dischargers. This requirement will be applied from this permit term.

pH:

The TBEL for pH is above 6.0 and below 9.0 S.U. (40 CFR §133.102(c) and Pa Code 25 § 95.2(1)) which are existing limits and will be carried over.

Total Suspended Solids (TSS):

There is no water quality criterion for TSS. The existing limits of 30 mg/L average monthly, 45 mg/l average weekly, and 60 mg/L instantaneous maximum will remain in the permit based on the minimum level of effluent quality attainable by secondary treatment, 25 Pa. Code § 92a.47 and 40CFR 133.102(b). The mass based average monthly and weekly average limits are calculated to be 1626.3 lbs./day and 2439.45 lbs./day respectively, which are rounded down to 1625 lbs./day and 2435 lbs./day, respectively (362-0400-001). The average monthly mass loading is the same as existing permit, but the weekly average mass limit is 5 lbs./day less than existing permit.

Total Residual Chlorine (TRC):

The attached computer printout utilizes the equation and calculations as presented in the Department's 2003 Implementation Guidance for Total Residual Chlorine (TRC) (ID#391-2000-015) for developing chlorine limitations. The attached printout indicates that a water quality limit of 0.015 mg/l would be needed to prevent toxicity concerns at the discharge point for Outfall 003. The Instantaneous Maximum (IMAX) limit is 0.049 mg/l. The existing permit has AML limit of 0.014 mg/l and IMAX limit of 0.047 which are a little more stringent and will be carried over due to anti-backsliding policy. DMR data from July 2018 to June 2019 indicates that the plant is discharging below 0.014 mg/l as AML and IMAX year-round. The minimum monitoring frequency is 1/day.

Flow and Influent BOD₅, CBOD₅, and TSS Monitoring Requirement:

The requirement to monitor the volume of effluent will remain in the draft permit per 40 CFR § 122.44(i)(1)(ii). Influent BOD₅ and TSS monitoring requirements are established in the permit per the requirements set in Pa Code 25 Chapter 94. To show compliance with percentage removal efficiency of CBOD₅, reporting for influent CBOD₅ is established in the permit.

Total Dissolved Solids (TDS):

The recent TMS model output indicates no concern for TDS and its constituents. The current permit has monitoring requirements for TDS, Sulfate, Chloride, and Bromide. The Delaware River Basin Commission's (DRBC's) recently issued Docket No. D-2002-029 CP-4 maintained monitoring requirement for TDS. Therefore, monitoring requirements for Sulfate, Chloride, and Bromide will be removed and monitoring requirement for TDS will be continued.

Best Professional Judgement (BPJ):

Total Phosphorus:

The receiving stream is impaired for nutrients and the nutrient portion of the approved TMDL was withdrawn. In absence of an approved nutrient TMDL, Pa Code 25 chapter 96.5 is applied. The existing permit has seasonal Total Phosphorus limit of 1.0 mg/l for summer and 2.0 mg/l for winter. The mass-based limits are calculated to be 54.21 lbs./day for summer and 108.42 lbs./day for winter. These values are rounded down to 54 lbs./day and 108 lbs./day, respectively. The mass-based limits are a little less stringent compared to existing limit which was may be due to miscalculation in the previous permit, which qualifies for anti-backsliding exception as listed in 402(o)(2).

Monitoring Frequency and Sample Types:

Otherwise specified above, the monitoring frequency and sample type of compliance monitoring for existing parameters are recommended by DEP's SOP and Permit Writers Manual and/or on a case-by-case basis using best professional judgment (BPJ).

Request to eliminate eDMR submission/sampling requirements for Outfall 001 and Outfall 002:

The permittee requested removal of eDMR report submission requirements for outfalls 001 and 002. Irrespective of the flow conditions, treated effluent from the TMA Stage I & II Plants is uniformly blended in the Effluent Junction Box prior to final discharge. The effluent sample is drawn from the box and is therefore a common, representative composite sample of the treated effluent from the TMA Stage I & II Plants. The flows through all three outfalls are recorded automatically. Currently, TMA collects one sample from the box and reports duplicate results for all three outfalls during wet weather flow condition. Permitting section along with the assigned inspector visited the site for this renewal and it seemed unnecessary to keep the current practice of reporting duplicate numbers. To avoid this situation, it was decided to create an Internal Monitoring Point (IMP) 101 at the Effluent Box where the actual sample is drawn. All parameters, except flow, from all three outfalls will be assigned to this IMP 101. The Outfalls 001, 002, and 003 will have effluent flow monitoring requirements only. This was discussed with TMI and their assigned consultant and was agreed upon.

Anti-Backsliding

The proposed limits are at least as stringent as are in existing permit, unless otherwise stated; therefore, anti-backsliding is not applicable.

Development of Effluent Limitations

Outfall No.	001	Design Flow (MGD)	6.5
Latitude	40° 13' 46.00"	Longitude	-75° 21' 6.00"
Wastewater Description:	Sewage Effluent		

Development of Effluent Limitations

Outfall No.	002	Design Flow (MGD)	6.5
Latitude	40° 13' 46.00"	Longitude	-75° 21' 6.00"
Wastewater Description:	Sewage Effluent		

Other comments: These outfalls discharge treated effluent during high wet weather flow. The effluent is sampled in a common junction box for both treatment trains that discharge through any/all final effluent outfalls. As discussed in page 29 of this report, eDMR reporting requirements are removed for these outfalls.

Development of Effluent Limitations

Outfall No.	004	Design Flow (MGD)	0
Latitude	40° 13' 47"	Longitude	-75° 21' 3"
Wastewater Description:	Stormwater		

Development of Effluent Limitations

Outfall No.	005	Design Flow (MGD)	0
Latitude	40° 13' 46"	Longitude	-75° 21' 4"

Wastewater Description: Stormwater

Development of Effluent Limitations

Outfall No. 006
Latitude 40° 13' 45.60"
Wastewater Description: Stormwater

Design Flow (MGD) 0
Longitude -75° 21' 8"

Development of Effluent Limitations

Outfall No. 007
Latitude 40° 13' 47"
Wastewater Description: Stormwater

Design Flow (MGD) 0
Longitude -75° 21' 10.00"

Other Comments: Outfalls 004, 005, 006, and 007 are stormwater only outfalls. Outfall 005 has been determined to be representative of outfalls 004, 006, and 007. The existing permit has the following limitations/monitoring requirements:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) ⁽¹⁾		Concentrations (mg/L)				Minimum ⁽²⁾ Measurement Frequency	Required Sample Type
	Average Monthly		Minimum	Annual Average		Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
CBOD5	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
Chemical Oxygen Demand	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
Total Suspended Solids	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
Oil and Grease	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
Fecal Coliform (CFU/100 ml)	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
Total Kjeldahl Nitrogen	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
Dissolved Iron	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab

These effluent limitations will be carried over in this renewal with 1/year monitoring frequency. Since the "treatment works treating domestic sewage" is considered as an "Industrial Activity" per 40 CFR §122.26(b)(14)(ix), the stormwater related to industrial activity under individual permit shall contain benchmark values. Therefore, the following benchmark values will be applied at representative outfall:

Parameter	Benchmark Value (mg/L)
Chemical Oxygen Demand	120
Total Suspended Solids	100

Whole Effluent Toxicity (WET)

For Outfall 003, ☐ **Acute** ☒ **Chronic** WET Testing was completed:

- ☐ For the permit renewal application (4 tests).
☐ Quarterly throughout the permit term.
☐ Quarterly throughout the permit term and a TIE/TRE was conducted.
☒ Other: **Quarterly on 1st year, then annually**

The dilution series used for the tests was: 100%, 96%, 72%, 48%, and 24%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 96%.

Summary of Four Most Recent Test Results

(NOTE – Enter results into one table, depending on which data analysis method was used).

TST Data Analysis

(NOTE – In lieu of recording information below, the application manager may attach the DEP WET Analysis Spreadsheet).

Test Date	Ceriodaphnia Results (Pass/Fail)		Pimephales Results (Pass/Fail)	
	Survival	Reproduction	Survival	Growth
8/29/2017	Pass	Pass	Pass	Pass
10/9/2018	Pass	Pass	Pass	Pass
6/11/2019	Pass	Pass	Pass	Pass
11/12/2019	Pass	Pass	Pass	Pass

* A “passing” result is that in which the replicate data for the TIWC is not statistically significant from the control condition. This is exhibited when the calculated *t* value (“T-Test Result”) is greater than the critical *t* value. A “failing” result is exhibited when the calculated *t* value (“T-Test Result”) is less than the critical *t* value.

Is there reasonable potential for an excursion above water quality standards based on the results of these tests? (NOTE – In general, reasonable potential is determined anytime there is at least one test failure in the previous four tests).

☐ YES ☒ NO

Comments: None

Evaluation of Test Type, IWC and Dilution Series for Renewed Permit

Acute Partial Mix Factor (PMFa): 1

Chronic Partial Mix Factor (PMFc): 1

1. Determine IWC – Acute (IWCa):

$$(Q_d \times 1.547) / ((Q_{7-10} \times \text{PMFa}) + (Q_d \times 1.547))$$

$$[(6.5 \text{ MGD} \times 1.547) / ((0.434 \text{ cfs} \times 1) + (6.5 \text{ MGD} \times 1.547))] \times 100 = 95.86\%$$

Is IWCa < 1%? ☐ YES ☒ NO **(YES - Acute Tests Required OR NO - Chronic Tests Required)**

If the discharge is to the tidal portion of the Delaware River, indicate how the type of test was determined:

N/A

Type of Test for Permit Renewal: Chronic

2a. Determine Target IWCa (If Acute Tests Required)

$$\text{TIWCa} = \text{IWCa} / 0.3 = \text{ } \%$$

2b. Determine Target IWCc (If Chronic Tests Required)

$$(Q_d \times 1.547) / (Q_{7-10} \times PMFc) + (Q_d \times 1.547)$$

$$[(6.5 \text{ MGD} \times 1.547) / ((0.434 \text{ cfs} \times 1) + (6.5 \text{ MGD} \times 1.547))] \times 100 = \mathbf{95.86\%}$$

3. Determine Dilution Series

(NOTE – check Attachment C of WET SOP for dilution series based on TIWCa or TIWCc, whichever applies).

Dilution Series = 100%, 96%, 72%, 48%, and 24%.

WET Limits

Has reasonable potential been determined? ☐ YES ☒ NO

Will WET limits be established in the permit? ☐ YES ☒ NO

If WET limits will be established, identify the species and the limit values for the permit (TU).

N/A

If WET limits will not be established, but reasonable potential was determined, indicate the rationale for not establishing WET limits:

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" (362-0400-001), SOPs and/or BPJ.

IMP 101, 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	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	6.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.014	XXX	0.047	1/day	Grab
CBOD5 Nov 1 - Apr 30	1080	1625 Wkly Avg	XXX	20.0	30.0 Wkly Avg	40	3/week	24-Hr Composite
CBOD5 Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	3/week	24-Hr Composite
CBOD5 May 1 - Oct 31	540	810 Wkly Avg	XXX	10.0	15.0 Wkly Avg	20	3/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	2/month	24-Hr Composite
TSS	1625	2435 Wkly Avg	XXX	30.0	45.0 Wkly Avg	60	3/week	24-Hr Composite
TSS Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	3/week	24-Hr Composite
Total Dissolved Solids	XXX	XXX	XXX	Report	Report	XXX	1/week	24-Hr Composite
Osmotic Pressure (mOs/kg) (interim)	XXX	XXX	XXX	52.0	Report	XXX	1/month	Grab
Osmotic Pressure (mOs/kg) (final)	XXX	XXX	XXX	50.0	51.8	51.8	1/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	200 Geo Mean	1000 90%SAMPLES	XXX	3/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	3/week	Grab

IMP 101 , Continued (from 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	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
E-coli	XXX	XXX	XXX	Report	Report	XXX	1/month	Grab
Ammonia Nov 1 - Apr 30	108	XXX	XXX	2.0	XXX	4	3/week	24-Hr Composite
Ammonia May 1 - Oct 31	54	XXX	XXX	1.0	XXX	2	3/week	24-Hr Composite
Total Phosphorus Nov 1 - Mar 31	108	XXX	XXX	2.0	XXX	4	3/week	24-Hr Composite
Total Phosphorus Apr 1 - Oct 31	54	XXX	XXX	1.0	XXX	2	3/week	24-Hr Composite
Chloroform	XXX	XXX	XXX	Report	Report	XXX	1/month	Grab
Chlorodibromo-methane (interim)	XXX	XXX	XXX	Report	Report	XXX	1/week	Grab
Dichlorobromo-methane (interim)	XXX	XXX	XXX	Report	Report	XXX	1/week	Grab
Chlorodibromo-methane (final)	XXX	XXX	XXX	0.00108	0.00198	XXX	1/week	Grab
Dichlorobromo-methane (final)	XXX	XXX	XXX	0.00129	0.00236	XXX	1/week	Grab
Total Aluminum	Report	Report	XXX	Report	Report	XXX	1/month	24-Hr Composite
Total Copper	1.14	1.73	XXX	0.021	0.032	0.041	1/week	24-Hr Composite
Dissolved Iron	Report	Report	XXX	Report	Report	XXX	1/month	24-Hr Composite
Total Iron	84.5	132	XXX	1.56	2.44	3.12	1/week	24-Hr Composite
Total Nickel	Report	Report	XXX	Report	Report	XXX	1/month	24-Hr Composite
Total Silver	Report	Report	XXX	Report	Report	XXX	1/month	24-Hr Composite
Total Zinc	Report	Report	XXX	Report	Report	XXX	1/month	24-Hr Composite
Chronic WET - Ceriodaphnia Survival (TUC)	XXX	XXX	XXX	Report Daily Max	XXX	XXX	See permit	24-Hr Composite

IMP 101 , Continued (from 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	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Chronic WET - Ceriodaphnia Reproduction (TUc)	XXX	XXX	XXX	Report Daily Max	XXX	XXX	See permit	24-Hr Composite
Chronic WET - Pimephales Survival (TUc)	XXX	XXX	XXX	Report Daily Max	XXX	XXX	See permit	24-Hr Composite
Chronic WET - Pimephales Growth (TUc)	XXX	XXX	XXX	Report Daily Max	XXX	XXX	See permit	24-Hr Composite

Compliance Sampling Location: At IMP 101

Other Comments: none

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

Outfall 001, 002, and 003, 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	Annual Average	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Recorded

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" (362-0400-001), SOPs and/or BPJ.

Outfall 004, 005, 006, 007, Effective Period: Permit Effective Date through Permit Expiration Date.

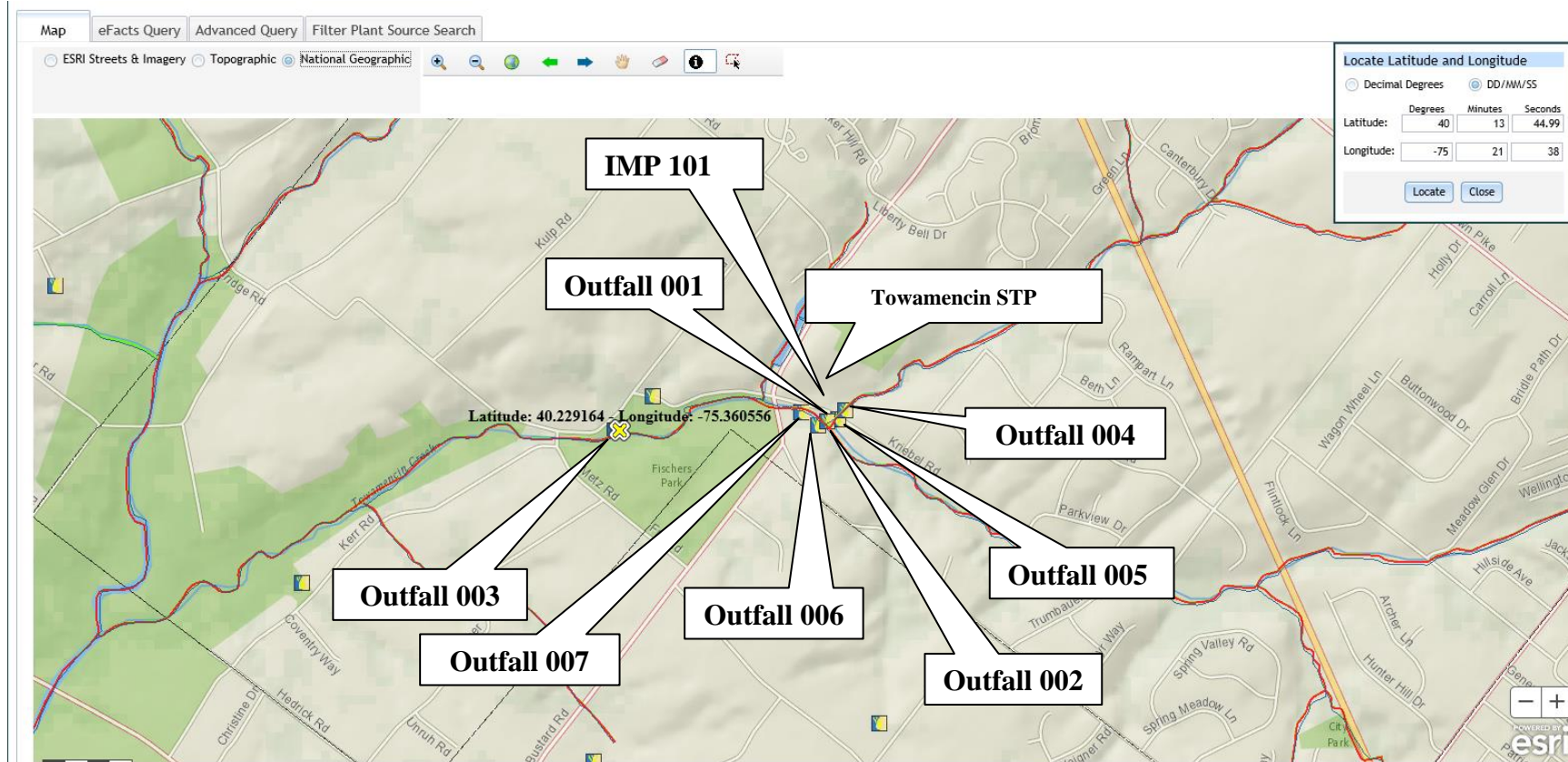
Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) ⁽¹⁾		Concentrations (mg/L)				Minimum ⁽²⁾ Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Annual Average	Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
CBOD5	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
COD	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
TSS	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
Oil and Grease	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
Fecal Coliform (No./100 ml)	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
TKN	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
Dissolved Iron	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab

Compliance Sampling Location: At Outfall 004, 005, 006, 007. Outfall 005 is representative.

Other Comments: none

Tools and References Used to Develop Permit	
<input checked="" type="checkbox"/>	WQM for Windows Model (see Attachment)
<input checked="" type="checkbox"/>	Toxics Management Spreadsheet (see Attachment)
<input checked="" type="checkbox"/>	TRC Model Spreadsheet (see Attachment)
<input type="checkbox"/>	Temperature Model Spreadsheet (see Attachment)
<input type="checkbox"/>	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
<input type="checkbox"/>	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
<input type="checkbox"/>	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
<input type="checkbox"/>	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
<input type="checkbox"/>	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
<input type="checkbox"/>	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
<input type="checkbox"/>	Pennsylvania CSO Policy, 385-2000-011, 9/08.
<input type="checkbox"/>	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
<input type="checkbox"/>	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
<input type="checkbox"/>	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
<input type="checkbox"/>	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
<input type="checkbox"/>	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004.
<input checked="" type="checkbox"/>	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997.
<input type="checkbox"/>	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99.
<input type="checkbox"/>	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004.
<input checked="" type="checkbox"/>	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
<input type="checkbox"/>	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
<input type="checkbox"/>	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
<input type="checkbox"/>	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
<input checked="" type="checkbox"/>	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 10/97.
<input type="checkbox"/>	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, 391-2000-019, 10/97.
<input type="checkbox"/>	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 3/99.
<input type="checkbox"/>	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, 391-2000-022, 3/1999.
<input type="checkbox"/>	Design Stream Flows, 391-2000-023, 9/98.
<input type="checkbox"/>	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98.
<input type="checkbox"/>	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
<input type="checkbox"/>	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
<input type="checkbox"/>	SOP:
<input type="checkbox"/>	Other:

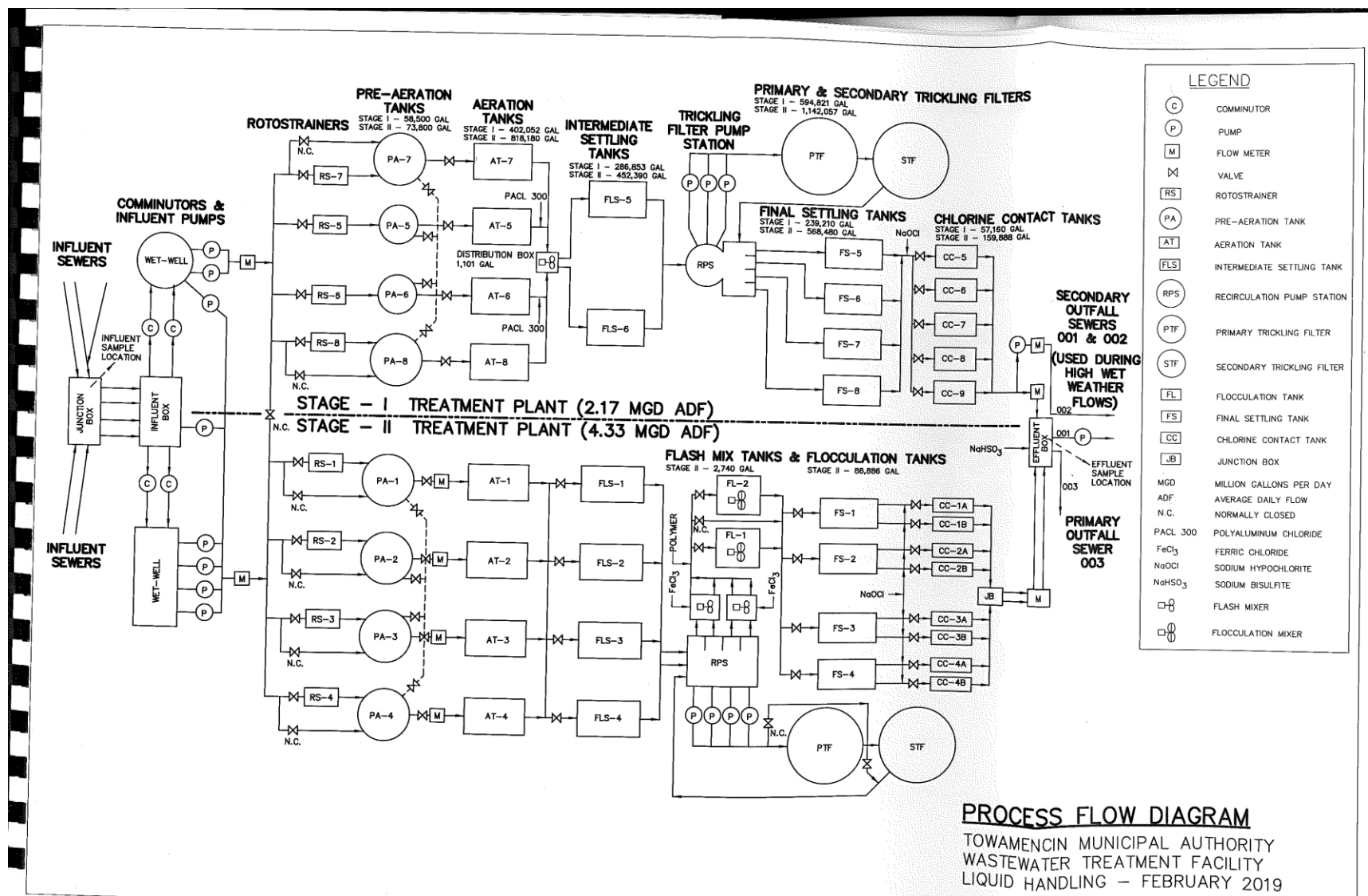
Towamencin MA STP, Towamencin Township, Montgomery County



Towamencin Municipal Authority
NPDES Permit #: PA0039004; Towamencin MA STP
Towamencin Township, Montgomery County



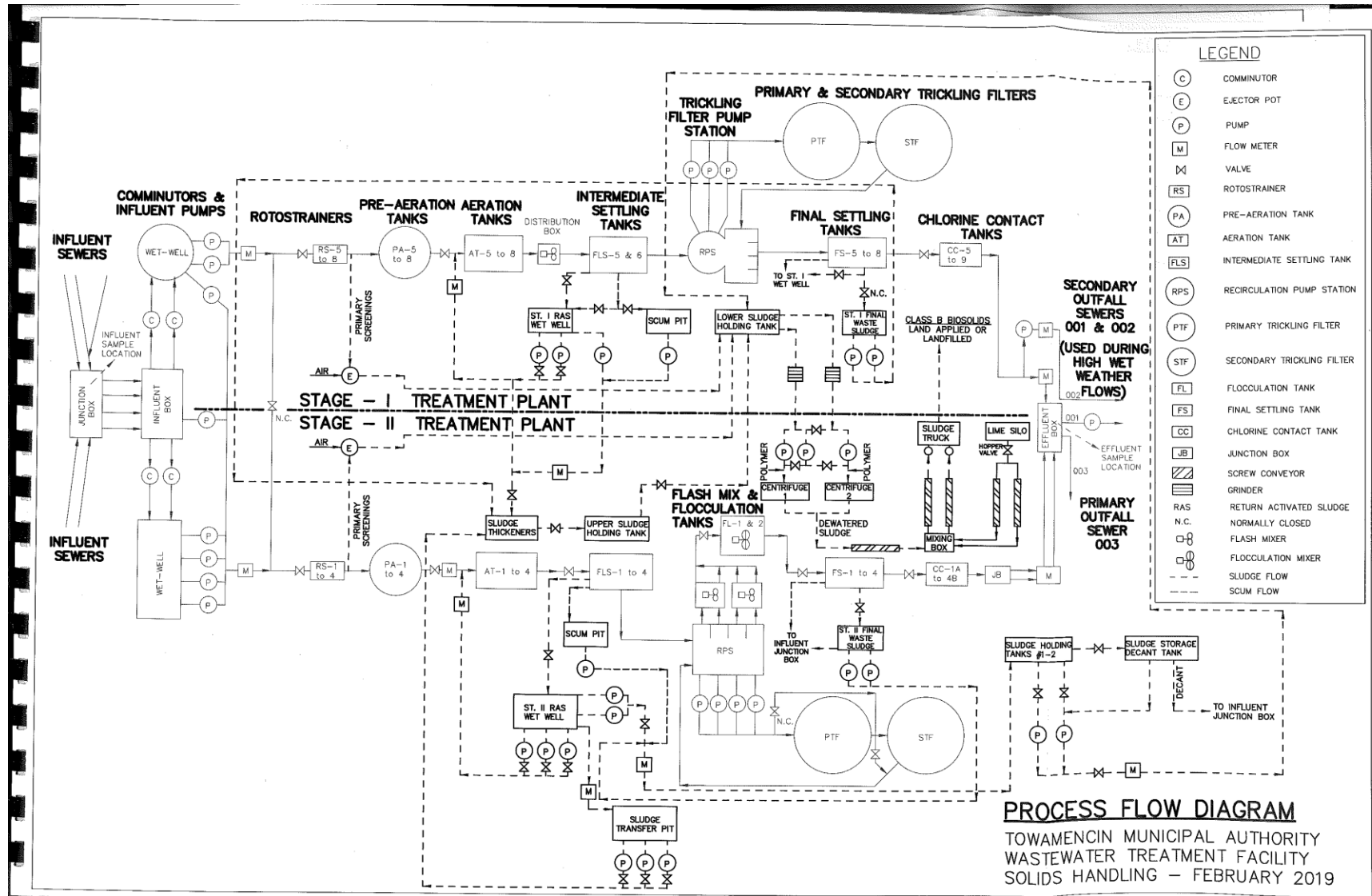
Reza H Chowdhury
Environmental Engineer
March 9, 2022



Towamencin Municipal Authority
NPDES Permit #: PA0039004; Towamencin MA STP
Towamencin Township, Montgomery County



Reza H Chowdhury
Environmental Engineer
March 9, 2022



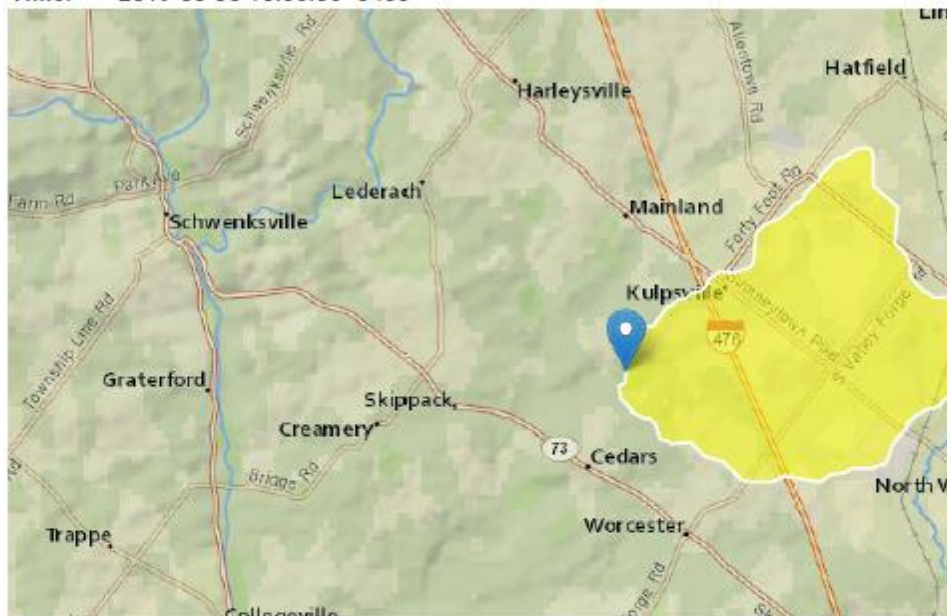
Towamencin Municipal Authority
NPDES Permit #: PA0039004; Towamencin MA STP
Towamencin Township, Montgomery County



Reza H Chowdhury
Environmental Engineer
March 9, 2022

At Outfall 003

Region ID: PA
Workspace ID: PA20190805140620658000
Clicked Point (Latitude, Longitude): 40.22904, -75.36048
Time: 2019-08-05 10:06:36 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	10	square miles
BSLOPD	Mean basin slope measured in degrees	2.1	degrees
ROCKDEP	Depth to rock	4.2	feet
URBAN	Percentage of basin with urban development	60	percent

Low-Flow Statistics Parameters^[Low Flow Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	10	square miles	4.78	1150
BSLOPD	Mean Basin Slope degrees	2.1	degrees	1.7	6.4
ROCKDEP	Depth to Rock	4.2	feet	4.13	5.21
URBAN	Percent Urban	60	percent	0	89

Low-Flow Statistics Flow Report^[Low Flow Region 1]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp
7 Day 2 Year Low Flow	1.1	ft ³ /s	46	46
30 Day 2 Year Low Flow	1.81	ft ³ /s	38	38
7 Day 10 Year Low Flow	0.434	ft ³ /s	51	51
30 Day 10 Year Low Flow	0.739	ft ³ /s	46	46
90 Day 10 Year Low Flow	1.72	ft ³ /s	41	41

Low-Flow Statistics Citations

Stuckey, M.H., 2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (<http://pubs.usgs.gov/sir/2006/5130/>)

USGS Data Disclaimer: Unless otherwise stated, all data, metadata and related materials are considered to satisfy the quality standards relative to the purpose for which the data were collected. Although these data and associated metadata have been reviewed for accuracy and completeness and approved for release by the U.S. Geological Survey (USGS), no warranty expressed or implied is made regarding the display or utility of the data for other purposes, nor on all computer systems, nor shall the act of distribution constitute any such warranty.

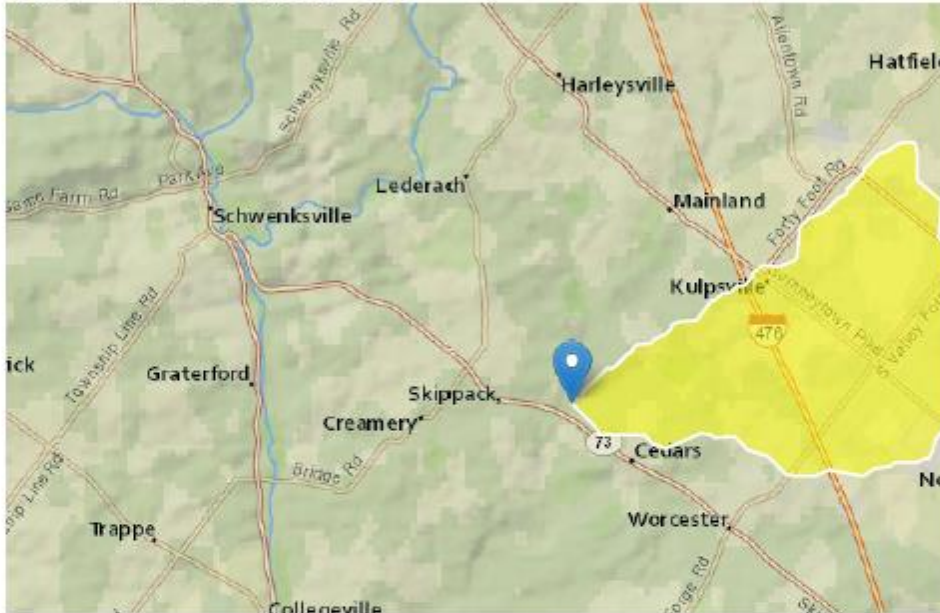
Permit No. PA0039004

StreamStats

Page 2 of 4

PA0039004 Node 2 for Outfall 003

Region ID: PA
Workspace ID: PA20190805143014707000
Clicked Point (Latitude, Longitude): 40.22258, -75.38252
Time: 2019-08-05 10:30:31 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	11.1	square miles
BSLOPD	Mean basin slope measured in degrees	2.1	degrees
ROCKDEP	Depth to rock	4.2	feet
URBAN	Percentage of basin with urban development	56	percent

Low-Flow Statistics Parameters^[Low Flow Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	11.1	square miles	4.78	1150
BSLOPD	Mean Basin Slope degrees	2.1	degrees	1.7	6.4
ROCKDEP	Depth to Rock	4.2	feet	4.13	5.21
URBAN	Percent Urban	56	percent	0	89

Low-Flow Statistics Flow Report^[Low Flow Region 1]

PII: Prediction Interval-Lower, PIu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp
7 Day 2 Year Low Flow	1.16	ft ³ /s	46	46
30 Day 2 Year Low Flow	1.91	ft ³ /s	38	38
7 Day 10 Year Low Flow	0.455	ft ³ /s	51	51
30 Day 10 Year Low Flow	0.774	ft ³ /s	46	46
90 Day 10 Year Low Flow	1.81	ft ³ /s	41	41

Low-Flow Statistics Citations

Stuckey, M.H., 2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (<http://pubs.usgs.gov/sir/2006/5130/>)

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Permit No. PA0039004



Prepared in cooperation with the Pennsylvania Department of Environmental Protection

Selected Streamflow Statistics for Streamgage Locations in and near Pennsylvania



Open-File Report 2011–1070

U.S. Department of the Interior
U.S. Geological Survey

10 Selected Streamflow Statistics for Streamgage Locations in and near Pennsylvania

Table 1. List of U.S. Geological Survey streamgage locations in and near Pennsylvania with updated streamflow statistics.—Continued

[Latitude and Longitude in decimal degrees; mi², square miles]

Streamgage number	Streamgage name	Latitude	Longitude	Drainage area (mi ²)	Regulated ¹
01465780	Poquessing Creek above Byberry Creek at Phila., Pa.	40.070	-74.975	13.2	N
01465798	Poquessing Creek at Grant Ave. at Philadelphia, Pa.	40.057	-74.985	21.4	N
01465850	South Branch Rancocas Creek at Vincentown, N.J.	39.94	-74.763	64.5	N
01466500	McDonalds Branch in Byrne State Forest, N.J.	39.885	-74.505	2.35	N
01467000	North Branch Rancocas Creek at Pemberton, N.J.	39.97	-74.684	118	N
01467042	Pennypack Creek at Pine Road, at Philadelphia, Pa.	40.090	-75.069	37.9	N
01467048	Pennypack Creek at Lower Rhawn St Bdg, Phila., Pa.	40.050	-75.033	49.8	N
01467050	Wooden Bridge Run at Philadelphia, Pa.	40.055	-75.022	3.35	N
01467081	South Branch Pennsauken Creek at Cherry Hill, N.J.	39.942	-75.001	8.98	N
01467086	Tacony Creek ab Adams Avenue, Philadelphia, Pa.	40.047	-75.111	16.7	N
01467087	Frankford Creek at Castor Ave, Philadelphia, Pa.	40.016	-75.097	30.4	N
01467089	Frankford Creek at Torresdale Ave., Phila., Pa.	40.007	-75.092	33.8	N
01467150	Cooper River at Haddonfield, N.J.	39.903	-75.021	17.0	N
01467500	Schuylkill River at Pottsville, Pa.	40.684	-76.186	53.4	N
01468500	Schuylkill River at Landingville, Pa.	40.629	-76.125	133	N
01469500	Little Schuylkill River at Tamaqua, Pa.	40.807	-75.972	42.9	N
01470500	Schuylkill River at Berne, Pa.	40.523	-75.998	355	N
01470756	Maiden Creek at Virginville, Pa.	40.514	-75.883	159	N
01470779	Tulpehocken Creek near Bernville, Pa.	40.413	-76.172	66.5	N
01470853	Furnace Creek at Robesonia, Pa.	40.340	-76.143	4.18	N
01470960	Tulpehocken Creek at Blue Marsh Damsite near Reading, Pa.	40.371	-76.025	175	Y
01471000	Tulpehocken Creek near Reading, Pa.	40.369	-75.979	211	Y
01471510	Schuylkill River at Reading, Pa.	40.335	-75.936	880	Y
01471875	Manatawny Creek near Spangsville, Pa.	40.340	-75.742	56.9	N
01471980	Manatawny Creek near Pottstown, Pa.	40.273	-75.680	85.5	N
01472000	Schuylkill River at Pottstown, Pa.	40.242	-75.652	1,147	Y
01472157	French Creek near Phoenixville, Pa.	40.151	-75.601	59.1	N
01472174	Pickering Creek near Chester Springs, Pa.	40.090	-75.630	5.98	N
01472198	Perkiomen Creek at East Greenville, Pa.	40.394	-75.515	38.0	N
01472199	West Branch Perkiomen Creek at Hillegass, Pa.	40.374	-75.522	23.0	N
01472500	Perkiomen Creek near Frederick, Pa.	40.275	-75.455	152	N
01472620	East Branch Perkiomen Creek near Dublin, Pa.	40.404	-75.234	4.05	LF
01472810	East Branch Perkiomen Creek near Schwenksville, Pa.	40.259	-75.429	58.7	LF
01473000	Perkiomen Creek at Graterford, Pa.	40.230	-75.452	279	LF
01473120	Skippack Creek near Collegeville, Pa.	40.165	-75.433	53.7	N
01473169	Valley Creek at Pa. Turnpike Br near Valley Forge, Pa.	40.079	-75.461	20.8	N
01473500	Schuylkill River at Norristown, Pa.	40.111	-75.347	1,760	N
01473900	Wissahickon Creek at Fort Washington, Pa.	40.124	-75.220	40.8	N
01473950	Wissahickon Creek at Bells Mill Rd, Phila., Pa.	40.080	-75.226	53.6	N
01473980	Wissahickon Creek at Livezey Lane, Phila., Pa.	40.050	-75.214	59.2	N
01474000	Wissahickon Creek at Mouth, Philadelphia, Pa.	40.015	-75.207	64.0	N
01474500	Schuylkill River at Philadelphia, Pa.	39.968	-75.189	1,893	N
01475000	Mantua Creek at Pitman, N.J.	39.737	-75.113	6.05	N
01475300	Darby Creek at Waterloo Mills near Devon, Pa.	40.023	-75.422	5.15	N
01475510	Darby Creek near Darby, Pa.	39.929	-75.272	37.4	N

Table 2 23

Table 2. Selected low-flow statistics for streamgage locations in and near Pennsylvania.—Continued

[ft³/s, cubic feet per second; —, statistic not computed; <, less than]

Streamgage number	Period of record used in analysis ¹	Number of years used in analysis	1-day, 10-year (ft ³ /s)	7-day, 10-year (ft ³ /s)	7-day, 2-year (ft ³ /s)	30-day, 10-year (ft ³ /s)	30-day, 2-year (ft ³ /s)	90-day, 10-year (ft ³ /s)
01472174	1969–1984	16	1.2	1.5	2.4	1.8	3.1	2.7
01472198	1983–2008	26	7.1	7.5	12.9	9.6	15.4	13.9
01472199	1983–2008	26	3.8	4.3	6.8	5.1	8.3	7.2
01472500	1886–1913	28	—	14.5	24.0	20.6	34.9	33.2
01472620	1985–2008	24	0	0	7.2	.1	7.3	.5
01472810	1992–2008	15	12.9	18.8	36.0	33.7	49.2	49.8
01473000	³ 1916–1956	41	9.5	14.8	32.1	24.1	44.7	41.4
01473000	² 1958–2008	51	28.5	33.9	61.6	42.5	77.4	53.3
01473120	1968–1994	27	1.4	1.9	4.4	3.2	6.8	5.6
01473169	1984–2008	25	8.5	9.2	13.2	10.5	15.5	13.2
01473500	1929–2008	9	182	220	422	247	518	328
01473900	1963–2008	14	5.2	6.1	11.3	7.6	14.2	9.9
01473950	1967–1981	15	9.1	11.1	19.1	14.5	24.0	19.7
01474000	1967–2008	42	13.7	16.6	25.6	21.4	32.9	30.4
01474500	1933–2008	76	58.7	108	376	180	515	320
01475000	1942–2006	37	3.5	4.1	6.1	4.8	7.0	5.7
01475300	1974–1997	24	1.0	1.2	2.1	1.6	2.9	2.4
01475510	1965–1990	26	9.3	11.5	18.8	15.5	24.2	22.6
01475530	1966–1981	19	1.2	1.3	2.0	1.8	2.8	2.7
01475550	1965–1990	25	.1	.6	4.4	2.9	8.5	8.9
01475850	1983–2008	26	1.5	2.2	4.6	3.4	6.5	5.4
01476480	1988–2008	19	2.3	3.5	8.5	5.8	11.5	9.0
01476500	1933–1954	22	3.9	4.9	11.4	6.4	14.4	9.7
01477000	1933–2007	73	10.4	12.4	24.9	15.7	31.0	22.8
01477120	1967–2008	42	6.5	7.1	12.9	8.5	15.0	11.2
01477800	1947–2008	62	.2	.2	.6	.5	1.2	1.4
01478000	1944–2008	65	.6	1.5	3.6	2.3	5.0	4.2
01478500	1953–1979	23	9.8	10.7	24.1	13.5	29.1	19.7
01479000	1933–2008	65	12.3	13.7	30.3	18.0	36.8	27.8
01479820	1989–2008	20	3.2	4.1	12.5	5.6	14.6	10.8
01480000	1944–2008	65	8.5	9.8	17.7	12.6	21.1	17.6
01480015	1990–2008	19	9.0	11.0	20.1	14.7	24.5	18.4
01480100	1965–1980	16	.3	.4	1.2	1.2	2.0	2.3
01480300	1962–2008	47	2.6	3.0	6.2	3.9	7.4	5.3
01480500	³ 1945–1993	30	7.3	8.3	14.5	10.4	18.4	14.5
01480500	² 1995–2008	14	4.8	5.2	12.3	6.6	14.8	9.6
01480617	1971–2008	38	12.1	14.0	23.3	16.6	27.8	22.0
01480675	1968–2008	41	.6	.6	1.7	.9	2.3	1.6
01480685	1975–2008	34	.5	.9	3.7	2.4	7.4	5.7
01480700	² 1975–2008	34	12.3	14.0	22.3	17.8	28.4	21.9
01480800	1960–1968	9	11.5	12.1	19.8	14.6	23.8	19.5
01480870	1973–2008	36	24.0	26.5	36.8	31.0	44.5	38.0
01481000	³ 1913–1973	51	—	68.5	117	79.0	136	102
01481000	² 1975–2008	34	60.0	63.8	117	76.9	138	106
01481500	² 1975–2008	34	64.2	68.3	128	84.5	154	117

Permit No. PA0039004



Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions Discharge Stream

Facility: Towamencin MA STP NPDES Permit No.: PA0039004 Outfall No.: 003
Evaluation Type: Major Sewage / Industrial Waste Wastewater Description: Treated 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
6.5	100	7.16						

Discharge Pollutant	Units	Max Discharge Conc	0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
			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	2108								
	Chloride (PWS)	mg/L									
	Bromide	mg/L									
	Sulfate (PWS)	mg/L									
	Fluoride (PWS)	mg/L									
Group 2	Total Aluminum	µg/L	330								
	Total Antimony	µg/L	0.5								
	Total Arsenic	µg/L	< 3								
	Total Barium	µg/L	50								
	Total Beryllium	µg/L	< 1								
	Total Boron	µg/L	< 200								
	Total Cadmium	µg/L	< 0.2								
	Total Chromium (III)	µg/L									
	Hexavalent Chromium	µg/L	< 0.25								
	Total Cobalt	µg/L	1								
	Total Copper	µg/L	16								
	Free Cyanide	µg/L									
	Total Cyanide	µg/L	7								
	Dissolved Iron	µg/L	120								
	Total Iron	µg/L	1240								
	Total Lead	µg/L	< 1								
	Total Manganese	µg/L	65								
	Total Mercury	µg/L	< 0.2								
	Total Nickel	µg/L	14								
	Total Phenols (Phenolics) (PWS)	µg/L	22								
	Total Selenium	µg/L	< 1								
	Total Silver	µg/L	< 1								
	Total Thallium	µg/L	< 1								
	Total Zinc	µg/L	46.93		0.2272						
	Total Molybdenum	µg/L	6								
	Acrolein	µg/L	< 2								
	Acrylamide	µg/L	< 2								
	Acrylonitrile	µg/L	< 0.5								
	Benzene	µg/L	< 1.3								
	Bromoform	µg/L									

Permit No. PA0039004

Group 3	Carbon Tetrachloride	µg/L	<	0.5																
	Chlorobenzene	µg/L	<	0.5																
	Chlorodibromomethane	µg/L		3.604					1.003											
	Chloroethane	µg/L	<	0.5																
	2-Chloroethyl Vinyl Ether	µg/L	<	5																
	Chloroform	µg/L		2.395					0.876											
	Dichlorobromomethane	µg/L		2.767					1.02											
	1,1-Dichloroethane	µg/L	<	0.5																
	1,2-Dichloroethane	µg/L	<	0.5																
	1,1-Dichloroethylene	µg/L	<	0.5																
	1,2-Dichloropropane	µg/L	<	0.5																
	1,3-Dichloropropylene	µg/L	<	0.5																
	1,4-Dioxane	µg/L	<	5																
	Ethylbenzene	µg/L	<	0.5																
	Methyl Bromide	µg/L	<	0.5																
	Methyl Chloride	µg/L	<	0.5																
	Methylene Chloride	µg/L	<	0.5																
	1,1,2,2-Tetrachloroethane	µg/L	<	0.5																
	Tetrachloroethylene	µg/L	<	0.5																
	Toluene	µg/L	<	0.5																
	1,2-trans-Dichloroethylene	µg/L	<	0.5																
	1,1,1-Trichloroethane	µg/L	<	0.5																
	1,1,2-Trichloroethane	µg/L	<	0.5																
	Trichloroethylene	µg/L	<	0.5																
	Vinyl Chloride	µg/L	<	0.5																
Group 4	2-Chlorophenol	µg/L	<	10																
	2,4-Dichlorophenol	µg/L	<	10																
	2,4-Dimethylphenol	µg/L	<	10																
	4,6-Dinitro-o-Cresol	µg/L	<	10																
	2,4-Dinitrophenol	µg/L	<	10																
	2-Nitrophenol	µg/L	<	10																
	4-Nitrophenol	µg/L	<	10																
	p-Chloro-m-Cresol	µg/L	<	10																
	Pentachlorophenol	µg/L	<	10																
	Phenol	µg/L	<	10																
	2,4,6-Trichlorophenol	µg/L	<	10																
Group 5	Acenaphthene	µg/L	<	2.5																
	Acenaphthylene	µg/L	<	2.5																
	Anthracene	µg/L	<	2.5																
	Benazidine	µg/L	<	50																
	Benzo(a)Anthracene	µg/L	<	2.5																
	Benzo(a)Pyrene	µg/L	<	2.5																
	3,4-Benzofluoranthene	µg/L	<	2.5																
	Benzo(ghi)Perylene	µg/L	<	2.5																
	Benzo(k)Fluoranthene	µg/L	<	2.5																
	Bis(2-Chloroethoxy)Methane	µg/L	<	5																
	Bis(2-Chloroethyl)Ether	µg/L	<	5																
	Bis(2-Chloroisopropyl)Ether	µg/L	<	5																
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	5																
	4-Bromophenyl Phenyl Ether	µg/L	<	5																
	Butyl Benzyl Phthalate	µg/L	<	5																
	2-Chloronaphthalene	µg/L	<	5																
	4-Chlorophenyl Phenyl Ether	µg/L	<	5																
	Chrysene	µg/L	<	2.5																
	Dibenzo(a,h)Anthracene	µg/L	<	2.5																
	1,2-Dichlorobenzene	µg/L	<	0.5																
	1,3-Dichlorobenzene	µg/L	<	0.5																
	1,4-Dichlorobenzene	µg/L	<	0.5																
	3,3-Dichlorobenzidine	µg/L	<	5																
	Diethyl Phthalate	µg/L	<	5																
	Dimethyl Phthalate	µg/L	<	5																
	Di-n-Butyl Phthalate	µg/L	<	5																
	2,4-Dinitrotoluene	µg/L	<	5																

Page 3

Permit No. PA0039004



Stream / Surface Water Information

Towamencin MA STP, NPDES Permit No. PA0039004, Outfall 003

Instructions Discharge **Stream**

Receiving Surface Water Name: **Towamencin 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	001066	1.41	176.89	10			Yes
End of Reach 1	001066	0	154.3	11.1			Yes

Q₇₋₁₀

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	1.41	0.0434										160	7.97		
End of Reach 1	0	0.0434										160	7.97		

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	1.41														
End of Reach 1	0														

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Model Results

Towamencin MA STP, NPDES Permit No. PA0039004, Outfall 003

Instructions

Results

RETURN TO INPUTS

SAVE AS PDF

PRINT

☒ All

☐ Inputs

☐ Results

☐ Limits

☐ Hydrodynamics

☒ Wasteload Allocations

☒ AFC

CCT (min): 0.077

PMF: 1

Analysis Hardness (mg/l): 102.48

Analysis pH: 7.18

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	
Total Aluminum	0	0		0	750	750	782	
Total Antimony	0	0		0	1,100	1,100	1,147	
Total Arsenic	0	0		0	340	340	355	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	21,906	
Total Boron	0	0		0	8,100	8,100	8,450	
Total Cadmium	0	0		0	2.062	2.19	2.28	Chem Translator of 0.943 applied
Hexavalent Chromium	0	0		0	16	16.3	17.0	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	99.1	
Total Copper	0	0		0	13.753	14.3	14.9	Chem Translator of 0.96 applied
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	66.328	84.2	87.9	Chem Translator of 0.787 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	1.72	Chem Translator of 0.85 applied
Total Nickel	0	0		0	478.051	479	500	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	3.355	3.95	4.12	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	67.8	
Total Zinc	0	0		0	119.641	122	128	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	3.13	
Acrylonitrile	0	0		0	650	650	678	
Benzene	0	0		0	640	640	668	
Bromoform	0	0		0	1,800	1,800	1,878	
Carbon Tetrachloride	0	0		0	2,800	2,800	2,921	

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Chlorobenzene	0	0		0	1,200	1,200	1,252
Chlorodibromomethane	0	0		0	N/A	N/A	N/A
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	18,777
Chloroform	0	0		0	1,900	1,900	1,982
Dichlorobromomethane	0	0		0	N/A	N/A	N/A
1,2-Dichloroethane	0	0		0	15,000	15,000	15,647
1,1-Dichloroethylene	0	0		0	7,500	7,500	7,824
1,2-Dichloropropane	0	0		0	11,000	11,000	11,475
1,3-Dichloropropylene	0	0		0	310	310	323
Ethylbenzene	0	0		0	2,900	2,900	3,025
Methyl Bromide	0	0		0	550	550	574
Methyl Chloride	0	0		0	28,000	28,000	29,208
Methylene Chloride	0	0		0	12,000	12,000	12,518
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	1,043
Tetrachloroethylene	0	0		0	700	700	730
Toluene	0	0		0	1,700	1,700	1,773
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	7,093
1,1,1-Trichloroethane	0	0		0	3,000	3,000	3,129
1,1,2-Trichloroethane	0	0		0	3,400	3,400	3,547
Trichloroethylene	0	0		0	2,300	2,300	2,399
Vinyl Chloride	0	0		0	N/A	N/A	N/A
2-Chlorophenol	0	0		0	560	560	584
2,4-Dichlorophenol	0	0		0	1,700	1,700	1,773
2,4-Dimethylphenol	0	0		0	660	660	688
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	83.5
2,4-Dinitrophenol	0	0		0	660	660	688
2-Nitrophenol	0	0		0	8,000	8,000	8,345
4-Nitrophenol	0	0		0	2,300	2,300	2,399
p-Chloro-m-Cresol	0	0		0	160	160	167
Pentachlorophenol	0	0		0	10,406	10,4	10,9
Phenol	0	0		0	N/A	N/A	N/A
2,4,6-Trichlorophenol	0	0		0	460	460	480
Acenaphthene	0	0		0	83	83.0	86.6
Anthracene	0	0		0	N/A	N/A	N/A
Benzidine	0	0		0	300	300	313
Benzo(a)Anthracene	0	0		0	0.5	0.5	0.52
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A
Bis(2-Chloroethyl)Ether	0	0		0	30,000	30,000	31,295
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	4,694
4-Bromophenyl Phenyl Ether	0	0		0	270	270	282
Butyl Benzyl Phthalate	0	0		0	140	140	146
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A
Chrysene	0	0		0	N/A	N/A	N/A
Dibenzo(a,h)Anthracene	0	0		0	N/A	N/A	N/A
1,2-Dichlorobenzene	0	0		0	820	820	855

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1,3-Dichlorobenzene	0	0		0	350	350	365
1,4-Dichlorobenzene	0	0		0	730	730	762
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A
Diethyl Phthalate	0	0		0	4,000	4,000	4,173
Dimethyl Phthalate	0	0		0	2,500	2,500	2,608
Di-n-Butyl Phthalate	0	0		0	110	110	115
2,4-Dinitrotoluene	0	0		0	1,600	1,600	1,669
2,6-Dinitrotoluene	0	0		0	990	990	1,033
1,2-Diphenylhydrazine	0	0		0	15	15.0	15.6
Fluoranthene	0	0		0	200	200	209
Fluorene	0	0		0	N/A	N/A	N/A
Hexachlorobenzene	0	0		0	N/A	N/A	N/A
Hexachlorobutadiene	0	0		0	10	10.0	10.4
Hexachlorocyclopentadiene	0	0		0	5	5.0	5.22
Hexachloroethane	0	0		0	60	60.0	62.6
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A
Isophorone	0	0		0	10,000	10,000	10,432
Naphthalene	0	0		0	140	140	146
Nitrobenzene	0	0		0	4,000	4,000	4,173
n-Nitrosodimethylamine	0	0		0	17,000	17,000	17,734
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A
n-Nitrosodiphenylamine	0	0		0	300	300	313
Phenanthrene	0	0		0	5	5.0	5.22
Pyrene	0	0		0	N/A	N/A	N/A
1,2,4-Trichlorobenzene	0	0		0	130	130	136
Aldrin	0	0		0	3	3.0	3.13
alpha-BHC	0	0		0	N/A	N/A	N/A
beta-BHC	0	0		0	N/A	N/A	N/A
gamma-BHC	0	0		0	0.95	0.95	0.99
Chlordane	0	0		0	2.4	2.4	2.5
4,4-DDT	0	0		0	1.1	1.1	1.15
4,4-DDE	0	0		0	1.1	1.1	1.15
4,4-DDD	0	0		0	1.1	1.1	1.15
Dieldrin	0	0		0	0.24	0.24	0.25
alpha-Endosulfan	0	0		0	0.22	0.22	0.23
beta-Endosulfan	0	0		0	0.22	0.22	0.23
Endosulfan Sulfate	0	0		0	N/A	N/A	N/A
Endrin	0	0		0	0.086	0.086	0.09
Endrin Aldehyde	0	0		0	N/A	N/A	N/A
Heptachlor	0	0		0	0.52	0.52	0.54
Heptachlor Epoxide	0	0		0	0.5	0.5	0.52
Toxaphene	0	0		0	0.73	0.73	0.76
Osmotic Pressure	8.86	0		0	50	50.0	51.8

☒ CFC

CCT (min): 0.077

PMF: 1

Analysis Hardness (mg/l): 102.48

Analysis pH: 7.18

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
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Model Results

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Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	229	
Total Arsenic	0	0		0	150	150	156	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	4,277	
Total Boron	0	0		0	1,600	1,600	1,669	
Total Cadmium	0	0		0	0.250	0.28	0.29	Chem Translator of 0.908 applied
Hexavalent Chromium	0	0		0	10	10.4	10.8	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	19.8	
Total Copper	0	0		0	9.145	9.53	9.94	Chem Translator of 0.96 applied
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	1,565	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.585	3.28	3.42	Chem Translator of 0.787 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	0.94	Chem Translator of 0.85 applied
Total Nickel	0	0		0	53.097	53.3	55.6	Chem Translator of 0.997 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	4.600	4.99	5.2	Chem Translator of 0.922 applied
Total Silver	0	0		0	N/A	N/A	N/A	Chem Translator of 1 applied
Total Thallium	0	0		0	13	13.0	13.6	
Total Zinc	0	0		0	120.619	122	128	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	3.13	
Acrylonitrile	0	0		0	130	130	136	
Benzene	0	0		0	130	130	136	
Bromoform	0	0		0	370	370	386	
Carbon Tetrachloride	0	0		0	560	560	584	
Chlorobenzene	0	0		0	240	240	250	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	3,651	
Chloroform	0	0		0	390	390	407	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	3,234	
1,1-Dichloroethylene	0	0		0	1,500	1,500	1,565	
1,2-Dichloropropane	0	0		0	2,200	2,200	2,295	
1,3-Dichloropropylene	0	0		0	61	61.0	63.6	
Ethylbenzene	0	0		0	580	580	605	
Methyl Bromide	0	0		0	110	110	115	
Methyl Chloride	0	0		0	5,500	5,500	5,737	
Methylene Chloride	0	0		0	2,400	2,400	2,504	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	219	
Tetrachloroethylene	0	0		0	140	140	146	
Toluene	0	0		0	330	330	344	
1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	1,460	
1,1,1-Trichloroethane	0	0		0	610	610	636	
1,1,2-Trichloroethane	0	0		0	680	680	709	

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Trichloroethylene	0	0		0	450	450	460
Vinyl Chloride	0	0		0	N/A	N/A	N/A
2-Chlorophenol	0	0		0	110	110	115
2,4-Dichlorophenol	0	0		0	340	340	355
2,4-Dimethylphenol	0	0		0	130	130	136
4,6-Dinitro-o-Cresol	0	0		0	16	16.0	16.7
2,4-Dinitrophenol	0	0		0	130	130	136
2-Nitrophenol	0	0		0	1,800	1,800	1,860
4-Nitrophenol	0	0		0	470	470	490
p-Chloro-m-Cresol	0	0		0	500	500	522
Pentachlorophenol	0	0		0	7.983	7.98	8.33
Phenol	0	0		0	N/A	N/A	N/A
2,4,6-Trichlorophenol	0	0		0	91	91.0	94.9
Acenaphthene	0	0		0	17	17.0	17.7
Anthracene	0	0		0	N/A	N/A	N/A
Benidine	0	0		0	59	59.0	61.5
Benzo(a)Anthracene	0	0		0	0.1	0.1	0.1
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A
Bis(2-Chloroethyl)Ether	0	0		0	6,000	6,000	6,250
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	949
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	56.3
Butyl Benzyl Phthalate	0	0		0	35	35.0	36.5
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A
Chrysene	0	0		0	N/A	N/A	N/A
Dibenzo(a,h)Anthracene	0	0		0	N/A	N/A	N/A
1,2-Dichlorobenzene	0	0		0	160	160	167
1,3-Dichlorobenzene	0	0		0	69	69.0	72.0
1,4-Dichlorobenzene	0	0		0	150	150	156
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A
Diethyl Phthalate	0	0		0	800	800	835
Dimethyl Phthalate	0	0		0	500	500	522
Di-n-Butyl Phthalate	0	0		0	21	21.0	21.9
2,4-Dinitrotoluene	0	0		0	320	320	334
2,6-Dinitrotoluene	0	0		0	200	200	209
1,2-Diphenylhydrazine	0	0		0	3	3.0	3.13
Fluoranthene	0	0		0	40	40.0	41.7
Fluorene	0	0		0	N/A	N/A	N/A
Hexachlorobenzene	0	0		0	N/A	N/A	N/A
Hexachlorobutadiene	0	0		0	2	2.0	2.09
Hexachlorocyclopentadiene	0	0		0	1	1.0	1.04
Hexachloroethane	0	0		0	12	12.0	12.5
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A

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Isophorone	0	0				0	2,100	2,100	2,191
Naphthalene	0	0				0	43	43.0	44.9
Nitrobenzene	0	0				0	810	810	845
n-Nitrosodimethylamine	0	0				0	3,400	3,400	3,547
n-Nitrosodi-n-Propylamine	0	0				0	N/A	N/A	N/A
n-Nitrosodiphenylamine	0	0				0	59	59.0	61.5
Phenanthrene	0	0				0	1	1.0	1.04
Pyrene	0	0				0	N/A	N/A	N/A
1,2,4-Trichlorobenzene	0	0				0	26	26.0	27.1
Aldrin	0	0				0	0.1	0.1	0.1
alpha-BHC	0	0				0	N/A	N/A	N/A
beta-BHC	0	0				0	N/A	N/A	N/A
gamma-BHC	0	0				0	N/A	N/A	N/A
Chlordane	0	0				0	0.0043	0.004	0.004
4,4-DDT	0	0				0	0.001	0.001	0.001
4,4-DDE	0	0				0	0.001	0.001	0.001
4,4-DDD	0	0				0	0.001	0.001	0.001
Dieldrin	0	0				0	0.056	0.056	0.058
alpha-Endosulfan	0	0				0	0.056	0.056	0.058
beta-Endosulfan	0	0				0	0.056	0.056	0.058
Endosulfan Sulfate	0	0				0	N/A	N/A	N/A
Endrin	0	0				0	0.036	0.036	0.038
Endrin Aldehyde	0	0				0	N/A	N/A	N/A
Heptachlor	0	0				0	0.0038	0.004	0.004
Heptachlor Epoxide	0	0				0	0.0038	0.004	0.004
Toxaphene	0	0				0	0.0002	0.0002	0.0002
Osmotic Pressure	8.86	0				0	N/A	N/A	N/A

☒ THH

CCT (min): 0.077

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	500,000	500,000	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	5.84	
Total Arsenic	0	0		0	10	10.0	10.4	
Total Barium	0	0		0	2,400	2,400	2,504	
Total Boron	0	0		0	3,100	3,100	3,234	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	300	300	313	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	

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Total Manganese	0	0		0	1,000	1,000	1,043
Total Mercury	0	0		0	0.050	0.05	0.052
Total Nickel	0	0		0	610	610	636
Total Phenols (Phenolics) (PWS)	0	0		0	5	5.0	N/A
Total Selenium	0	0		0	N/A	N/A	N/A
Total Silver	0	0		0	N/A	N/A	N/A
Total Thallium	0	0		0	0.24	0.24	0.25
Total Zinc	0	0		0	N/A	N/A	N/A
Acrolein	0	0		0	3	3.0	3.13
Acrylonitrile	0	0		0	N/A	N/A	N/A
Benzene	0	0		0	N/A	N/A	N/A
Bromoform	0	0		0	N/A	N/A	N/A
Carbon Tetrachloride	0	0		0	N/A	N/A	N/A
Chlorobenzene	0	0		0	100	100.0	104
Chlorodibromomethane	0	0		0	N/A	N/A	N/A
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A
Chloroform	0	0		0	N/A	N/A	N/A
Dichlorobromomethane	0	0		0	N/A	N/A	N/A
1,2-Dichloroethane	0	0		0	N/A	N/A	N/A
1,1-Dichloroethylene	0	0		0	33	33.0	34.4
1,2-Dichloropropane	0	0		0	N/A	N/A	N/A
1,3-Dichloropropylene	0	0		0	N/A	N/A	N/A
Ethylbenzene	0	0		0	68	68.0	70.9
Methyl Bromide	0	0		0	100	100.0	104
Methyl Chloride	0	0		0	N/A	N/A	N/A
Methylene Chloride	0	0		0	N/A	N/A	N/A
1,1,2,2-Tetrachloroethane	0	0		0	N/A	N/A	N/A
Tetrachloroethylene	0	0		0	N/A	N/A	N/A
Toluene	0	0		0	57	57.0	59.5
1,2-trans-Dichloroethylene	0	0		0	100	100.0	104
1,1,1-Trichloroethane	0	0		0	10,000	10,000	10,432
1,1,2-Trichloroethane	0	0		0	N/A	N/A	N/A
Trichloroethylene	0	0		0	N/A	N/A	N/A
Vinyl Chloride	0	0		0	N/A	N/A	N/A
2-Chlorophenol	0	0		0	30	30.0	31.3
2,4-Dichlorophenol	0	0		0	10	10.0	10.4
2,4-Dimethylphenol	0	0		0	100	100.0	104
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	2.09
2,4-Dinitrophenol	0	0		0	10	10.0	10.4
2-Nitrophenol	0	0		0	N/A	N/A	N/A
4-Nitrophenol	0	0		0	N/A	N/A	N/A
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A
Pentachlorophenol	0	0		0	N/A	N/A	N/A
Phenol	0	0		0	4,000	4,000	4,173
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A

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Acenaphthene	0	0		0	70	70.0	73.0
Anthracene	0	0		0	300	300	313
Benzidine	0	0		0	N/A	N/A	N/A
Benzo(a)Anthracene	0	0		0	N/A	N/A	N/A
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A
Bis(2-Chloroethyl)Ether	0	0		0	N/A	N/A	N/A
Bis(2-Chloroisopropyl)Ether	0	0		0	200	200	209
Bis(2-Ethylhexyl)Phthalate	0	0		0	N/A	N/A	N/A
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A
Butyl Benzyl Phthalate	0	0		0	0.1	0.1	0.1
2-Chloronaphthalene	0	0		0	800	800	835
Chrysene	0	0		0	N/A	N/A	N/A
Dibenzo(a,h)Anthracene	0	0		0	N/A	N/A	N/A
1,2-Dichlorobenzene	0	0		0	1,000	1,000	1,043
1,3-Dichlorobenzene	0	0		0	7	7.0	7.3
1,4-Dichlorobenzene	0	0		0	300	300	313
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A
Diethyl Phthalate	0	0		0	600	600	626
Dimethyl Phthalate	0	0		0	2,000	2,000	2,086
Di-n-Butyl Phthalate	0	0		0	20	20.0	20.9
2,4-Dinitrotoluene	0	0		0	N/A	N/A	N/A
2,6-Dinitrotoluene	0	0		0	N/A	N/A	N/A
1,2-Diphenylhydrazine	0	0		0	N/A	N/A	N/A
Fluoranthene	0	0		0	20	20.0	20.9
Fluorene	0	0		0	50	50.0	52.2
Hexachlorobenzene	0	0		0	N/A	N/A	N/A
Hexachlorobutadiene	0	0		0	N/A	N/A	N/A
Hexachlorocyclopentadiene	0	0		0	4	4.0	4.17
Hexachloroethane	0	0		0	N/A	N/A	N/A
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A
Isophorone	0	0		0	34	34.0	35.5
Naphthalene	0	0		0	N/A	N/A	N/A
Nitrobenzene	0	0		0	10	10.0	10.4
n-Nitrosodimethylamine	0	0		0	N/A	N/A	N/A
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A
n-Nitrosodiphenylamine	0	0		0	N/A	N/A	N/A
Phenanthrene	0	0		0	N/A	N/A	N/A
Pyrene	0	0		0	20	20.0	20.9
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	0.073
Aldrin	0	0		0	N/A	N/A	N/A
alpha-BHC	0	0		0	N/A	N/A	N/A
beta-BHC	0	0		0	N/A	N/A	N/A
gamma-BHC	0	0		0	4.2	4.2	4.38

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Chlordane	0	0		0	N/A	N/A	N/A
4,4-DDT	0	0		0	N/A	N/A	N/A
4,4-DDE	0	0		0	N/A	N/A	N/A
4,4-DDD	0	0		0	N/A	N/A	N/A
Dieldrin	0	0		0	N/A	N/A	N/A
alpha-Endosulfan	0	0		0	20	20.0	20.9
beta-Endosulfan	0	0		0	20	20.0	20.9
Endosulfan Sulfate	0	0		0	20	20.0	20.9
Endrin	0	0		0	0.03	0.03	0.031
Endrin Aldehyde	0	0		0	1	1.0	1.04
Heptachlor	0	0		0	N/A	N/A	N/A
Heptachlor Epoxide	0	0		0	N/A	N/A	N/A
Toxaphene	0	0		0	N/A	N/A	N/A
Osmotic Pressure	8.86	0		0	N/A	N/A	N/A

☒ CRL

CCT (min): 2.616

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	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	N/A	N/A	N/A	
Total Arsenic	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	N/A	N/A	N/A	
Total Boron	0	0		0	N/A	N/A	N/A	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	0.06	0.06	0.081	
Benzene	0	0		0	0.58	0.58	0.79	
Bromoform	0	0		0	7	7.0	9.49	
Carbon Tetrachloride	0	0		0	0.4	0.4	0.54	

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Chlorobenzene	0	0		0	N/A	N/A	N/A
Chlorodibromomethane	0	0		0	0.8	0.8	1.08
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A
Chloroform	0	0		0	5.7	5.7	7.73
Dichlorobromomethane	0	0		0	0.95	0.95	1.29
1,2-Dichloroethane	0	0		0	9.9	9.9	13.4
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A
1,2-Dichloropropane	0	0		0	0.9	0.9	1.22
1,3-Dichloropropylene	0	0		0	0.27	0.27	0.37
Ethylbenzene	0	0		0	N/A	N/A	N/A
Methyl Bromide	0	0		0	N/A	N/A	N/A
Methyl Chloride	0	0		0	N/A	N/A	N/A
Methylene Chloride	0	0		0	20	20.0	27.1
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	0.27
Tetrachloroethylene	0	0		0	10	10.0	13.6
Toluene	0	0		0	N/A	N/A	N/A
1,2-trans-Dichloroethylene	0	0		0	N/A	N/A	N/A
1,1,1-Trichloroethane	0	0		0	N/A	N/A	N/A
1,1,2-Trichloroethane	0	0		0	0.55	0.55	0.75
Trichloroethylene	0	0		0	0.6	0.6	0.81
Vinyl Chloride	0	0		0	0.02	0.02	0.027
2-Chlorophenol	0	0		0	N/A	N/A	N/A
2,4-Dichlorophenol	0	0		0	N/A	N/A	N/A
2,4-Dimethylphenol	0	0		0	N/A	N/A	N/A
4,6-Dinitro-o-Cresol	0	0		0	N/A	N/A	N/A
2,4-Dinitrophenol	0	0		0	N/A	N/A	N/A
2-Nitrophenol	0	0		0	N/A	N/A	N/A
4-Nitrophenol	0	0		0	N/A	N/A	N/A
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A
Pentachlorophenol	0	0		0	0.030	0.03	0.041
Phenol	0	0		0	N/A	N/A	N/A
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	2.03
Acenaphthene	0	0		0	N/A	N/A	N/A
Anthracene	0	0		0	N/A	N/A	N/A
Benzidine	0	0		0	0.0001	0.0001	0.0001
Benzo(a)Anthracene	0	0		0	0.001	0.001	0.001
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.0001
3,4-Benzofluoranthene	0	0		0	0.001	0.001	0.001
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	0.014
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	0.041
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	0.43
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A
Butyl Benzyl Phthalate	0	0		0	N/A	N/A	N/A
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A

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Chrysene	0	0		0	0.12	0.12	0.16
Dibenzo(a,h)Anthracene	0	0		0	0.0001	0.0001	0.0001
1,2-Dichlorobenzene	0	0		0	N/A	N/A	N/A
1,3-Dichlorobenzene	0	0		0	N/A	N/A	N/A
1,4-Dichlorobenzene	0	0		0	N/A	N/A	N/A
3,3-Dichlorobenzidine	0	0		0	0.05	0.05	0.068
Diethyl Phthalate	0	0		0	N/A	N/A	N/A
Dimethyl Phthalate	0	0		0	N/A	N/A	N/A
Di-n-Butyl Phthalate	0	0		0	N/A	N/A	N/A
2,4-Dinitrotoluene	0	0		0	0.05	0.05	0.068
2,6-Dinitrotoluene	0	0		0	0.05	0.05	0.068
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	0.041
Fluoranthene	0	0		0	N/A	N/A	N/A
Fluorene	0	0		0	N/A	N/A	N/A
Hexachlorobenzene	0	0		0	0.00008	0.00008	0.0001
Hexachlorobutadiene	0	0		0	0.01	0.01	0.014
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A
Hexachloroethane	0	0		0	0.1	0.1	0.14
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	0.001
Isophorone	0	0		0	N/A	N/A	N/A
Naphthalene	0	0		0	N/A	N/A	N/A
Nitrobenzene	0	0		0	N/A	N/A	N/A
n-Nitrosodimethylamine	0	0		0	0.0007	0.0007	0.0009
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	0.007
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	4.48
Phenanthrene	0	0		0	N/A	N/A	N/A
Pyrene	0	0		0	N/A	N/A	N/A
1,2,4-Trichlorobenzene	0	0		0	N/A	N/A	N/A
Aldrin	0	0		0	0.0000008	8.00E-07	0.000001
alpha-BHC	0	0		0	0.0004	0.0004	0.0005
beta-BHC	0	0		0	0.008	0.008	0.011
gamma-BHC	0	0		0	N/A	N/A	N/A
Chlordane	0	0		0	0.0003	0.0003	0.0004
4,4-DDT	0	0		0	0.00003	0.00003	0.00004
4,4-DDE	0	0		0	0.00002	0.00002	0.00003
4,4-DDD	0	0		0	0.0001	0.0001	0.0001
Dieldrin	0	0		0	0.000001	0.000001	0.000001
alpha-Endosulfan	0	0		0	N/A	N/A	N/A
beta-Endosulfan	0	0		0	N/A	N/A	N/A
Endosulfan Sulfate	0	0		0	N/A	N/A	N/A
Endrin	0	0		0	N/A	N/A	N/A
Endrin Aldehyde	0	0		0	N/A	N/A	N/A
Heptachlor	0	0		0	0.000006	0.000006	0.000008
Heptachlor Epoxide	0	0		0	0.00003	0.00003	0.00004
Toxaphene	0	0		0	0.0007	0.0007	0.0009

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Osmotic Pressure	8.86	0				0	N/A	N/A	N/A	
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☒ Recommended WQBELs & Monitoring Requirements

No. Samples/Month: 4

Pollutants	Mass Limits		Concentration Limits				Governing WQBEL	WQBEL Basis	Comments
	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units			
Total Aluminum	Report	Report	Report	Report	Report	µg/L	750	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Copper	0.54	0.81	9.94	14.9	14.9	µg/L	9.94	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Dissolved Iron	Report	Report	Report	Report	Report	µg/L	313	THH	Discharge Conc > 10% WQBEL (no RP)
Total Iron	84.8	132	1,565	2,441	3,912	µg/L	1,565	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Nickel	Report	Report	Report	Report	Report	µg/L	55.6	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Silver	Report	Report	Report	Report	Report	µg/L	3.95	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	122	AFC	Discharge Conc > 10% WQBEL (no RP)
Chlorodibromomethane	0.059	0.11	1.08	1.98	2.71	µg/L	1.08	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Chloroform	Report	Report	Report	Report	Report	µg/L	7.73	CRL	Discharge Conc > 25% WQBEL (no RP)
Dichlorobromomethane	0.07	0.13	1.29	2.36	3.22	µg/L	1.29	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Osmotic Pressure	XXX	XXX	50.0	51.8	51.8	mOs/kg	50.0	AFC	Discharge Conc ≥ 50% WQBEL (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)	N/A	N/A	PWS Not Applicable
Total Antimony	5.84	µg/L	Discharge Conc ≤ 10% WQBEL
Total Arsenic	N/A	N/A	Discharge Conc < TQL
Total Barium	2,504	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	N/A	N/A	Discharge Conc < TQL
Total Cadmium	N/A	N/A	Discharge Conc < TQL
Hexavalent Chromium	N/A	N/A	Discharge Conc < TQL
Total Cobalt	19.8	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS
Total Lead	3.42	µg/L	Discharge Conc < TQL
Total Manganese	1,043	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	0.052	µg/L	Discharge Conc < TQL
Total Phenols (Phenolics) (PWS)		µg/L	PWS Not Applicable
Total Selenium	5.2	µg/L	Discharge Conc < TQL
Total Thallium	0.25	µg/L	Discharge Conc < TQL

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Total Molybdenum	N/A	N/A	No WQS
Acrolein	3.0	µg/L	Discharge Conc < TQL
Acrylonitrile	0.081	µg/L	Discharge Conc < TQL
Benzene	0.79	µg/L	Discharge Conc < TQL
Bromoform	9.49	µg/L	Discharge Conc ≤ 25% WQBEL
Carbon Tetrachloride	0.64	µg/L	Discharge Conc < TQL
Chlorobenzene	104	µg/L	Discharge Conc < TQL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	3,651	µg/L	Discharge Conc < TQL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	13.4	µg/L	Discharge Conc < TQL
1,1-Dichloroethylene	34.4	µg/L	Discharge Conc < TQL
1,2-Dichloropropane	1.22	µg/L	Discharge Conc < TQL
1,3-Dichloropropylene	0.37	µg/L	Discharge Conc < TQL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	70.9	µg/L	Discharge Conc < TQL
Methyl Bromide	104	µg/L	Discharge Conc < TQL
Methyl Chloride	5,737	µg/L	Discharge Conc < TQL
Methylene Chloride	27.1	µg/L	Discharge Conc < TQL
1,1,2,2-Tetrachloroethane	0.27	µg/L	Discharge Conc < TQL
Tetrachloroethylene	13.6	µg/L	Discharge Conc < TQL
Toluene	59.5	µg/L	Discharge Conc < TQL
1,2-trans-Dichloroethylene	104	µg/L	Discharge Conc < TQL
1,1,1-Trichloroethane	636	µg/L	Discharge Conc < TQL
1,1,2-Trichloroethane	0.75	µg/L	Discharge Conc < TQL
Trichloroethylene	0.81	µg/L	Discharge Conc < TQL
Vinyl Chloride	0.027	µg/L	Discharge Conc < TQL
2-Chlorophenol	31.3	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	10.4	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	104	µg/L	Discharge Conc < TQL
4,6-Dinitro-o-Cresol	2.09	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	10.4	µg/L	Discharge Conc < TQL
2-Nitrophenol	1,669	µg/L	Discharge Conc < TQL
4-Nitrophenol	490	µg/L	Discharge Conc < TQL
p-Chloro-m-Cresol	160	µg/L	Discharge Conc < TQL
Pentachlorophenol	0.041	µg/L	Discharge Conc < TQL
Phenol	4,173	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	2.03	µg/L	Discharge Conc < TQL
Acenaphthene	17.7	µg/L	Discharge Conc < TQL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	313	µg/L	Discharge Conc < TQL
Benzidine	0.0001	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	0.001	µg/L	Discharge Conc < TQL
Benzo(a)Pyrene	0.0001	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	0.001	µg/L	Discharge Conc < TQL

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Facility:	Towamencin MA
NPDES #:	PA0039004
Outfall No:	003
n (Samples/Month):	4

[illegible]

Permit No. PA0039004