pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northeast Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0086673**
Facility Type	**Municipal**	APS ID	**274797**
Major / Minor	**Minor**	Authorization ID	**1428623**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Marklesburg Borough Authority Huntingdon County**	Facility Name	**Marklesburg STP**
Applicant Address	3322 Old Mountain Road, Suite B PO Box 24 James Creek, PA 16657-0024	Facility Address	3230 Aitch Road James Creek, PA 16657
Applicant Contact	Max Byers	Facility Contact	Christopher Hamilton
Applicant Phone	(814) 658-2538	Facility Phone	(814) 635-4131
Client ID	90089	Site ID	254967
Ch 94 Load Status	Not Overloaded	Municipality	Marklesburg Borough
Connection Status	No Limitations	County	Huntingdon
Date Application Received	February 24, 2023	EPA Waived?	Yes
Date Application Accepted	March 2, 2023	If No, Reason	
Purpose of Application	NPDES permit renewal.		

Summary of Review

Stiffler-McGraw & Associates, Inc., on behalf of the Marklesburg Borough Authority, applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of the NPDES permit. The permit was reissued on August 30, 2018 and became effective on September 1, 2018. The permit expires on August 31, 2023.

The facility has an average annual design flow and a hydraulic design capacity of 0.0315 MGD. The authorized discharge of treated sewage is from the existing treatment plant located in Marklesburg Borough, Huntingdon County into UNT to James Creek. This facility serves 100% of Markllesburg Borough.

The WQM Part II Permit No. 3195403 was issued on May 22, 1996.

Sludge use and disposal description and location(s): N/A

Changes from the previous permit: The E. Coli. monitoring and report requirements will add to the permit. Summer Ammonia-Nitrogen limits of 3.5 mg/L AML & 7.0 mg/L IMAX and winter Ammonia-Nitrogen limits of 10.0 mg/L AML & 21.0 mg/L IMAX are place in the proposed permit.

Based on the review outline in this fact sheet, it is recommended that the permit be drafted and published in the Pennsylvania Bulletin for public comments for 30 days.

Approve	Deny	Signatures	Date
X		*Hilaryle* Hilary H. Le / Environmental Engineering Specialist	July 14, 2023
X		Maria D. Bebenek for Daniel W. Martin Daniel W. Martin, P.E. / Environmental Engineer Manager	July 18, 2023

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.0315
Latitude	40º 22' 44.18"	Longitude	-78º 10' 0.53"
Quad Name	Williamsburg	Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary to James Creek (WWF)	Stream Code	13424
NHD Com ID	65840311	RMI	1.73 miles
Drainage Area	1.57 mi.^{2}	Yield (cfs/mi^2)	0.03
Q_{7-10} Flow (cfs)	0.048	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	804.34	Slope (ft/ft)	
Watershed No.	11-D	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	
Nearest Downstream Public Water Supply Intake	Mifflintown Water System, Juniata County		
PWS Waters	Juniata River	Flow at Intake (cfs)	
PWS RMI	37.37 miles	Distance from Outfall (mi)	Approximate 78.0 miles

Changes Since Last Permit Issuance: none

Drainage Area
The discharge is to Conewago Creek at RMI 1.73 miles. A drainage area upstream of the discharge is estimated to be 1.57 mi.^{2}, according to USGS PA StreamStats available at https://streamstats.usgs.gov/ss/.

Stream Flow
According to StreamStats, the point of first use has a Q_{7-10} of 0.048 cfs and a drainage area of 1.57 mi.^{2}, which results in a Q_{7-10} low flow yield of 0.03 cfs/mi.^{2}. This information is used to obtain a chronic or 30-day (Q_{30-10}), and an acute or 1-day (Q_{1-10}) exposure stream flow for the discharge point as follows (Guidance No. 391-2000-023):

Q_{7-10} = 0.048 cfs
Low Flow Yield = 0.048 cfs / 1.57 mi.^{2} = 0.03 cfs/mi.^{2}
Q_{30-10} = 1.36 * 0.048 cfs = 0.065 cfs
Q_{1-10} = 0.64 * 0.048 cfs = 0.03 cfs

UNT to James Creek to Raystown Branch Juniata River
25 Pa. Code § 93.9n classifies UNT to James Creek as Warm Water Fishes & Migratory Fishes (WWF & MF) surface water. Based on the 2022 Integrated Report, UNT to James Creek, assessment unit ID 6987, is not impaired. A TMDL currently does not exist for this stream segment, therefore, no TMDL has been taken into consideration during this review.

Public Water Supply
The nearest downstream public water supply intake is the Mifflintown Water Systems in Juniata County, approximately 78.0 miles downstream of this discharge. Given the nature and dilution, the discharge is not expected to significantly impact the water supply.

Treatment Facility Summary				
Treatment Facility Name: Marklesburg STP				
WQM Permit No.	**Issuance Date**			
3195403	May 22, 1996			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Extended Aeration	Ultraviolet	0.0315
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.0315	63	Not Overloaded	Aerobic Digestion	Other WWTP

Changes Since Last Permit Issuance: none

Other Comments:
The treatment system consists of:

1. Two flow EQ units, approximately 14,000-gallons combined capacity
2. Three aerated activated sludge treatment units, approximately 31,500-gallons combined capacity
3. Two final settling units/clarifiers, 8,654-gallons combined capacity
4. Two waste sludge holding units, 15,600-gallons combined
5. Two UV disinfection units

Chemical used:
Aluminum Sulfate (Alum) is used for Phosphorus precipitation at 5-10 GPD.

Industrial/Commercial Users:
The permit application indicated there are six industrial/commercial contributors to the treatment plant, discharging sanitary sewage only. The contributors are:

Business name	Type of business	Average WW flow (GPD)
Marklesburg Volunteer Fire Company	Fire company	1 EDU
Marklesburg Borough Office	Municipal Office	1 EDU
James Creek Post Office	Post Office	1 EDU
James Creek Brethren Church	Church	1 EDU
St. Matthews Lutheran Church	Church	1 EDU
Don's Boat House	Boat Repair Shop	1 EDU

None of the industrial or commercial contributors are significant or categorical and the permittee doesn't have EPA approved pre-treatment program in place.

Compliance History	
Summary of DMRs:	A summary of past 12-month DMRs is presented on pages 4, 5, & 6.
Summary of Inspections:	**4/21/2022:** Mr. Clark, DEP's WQS, conducted a compliance evaluation inspection. No violation identified during inspection. Recommendations were post a valid operator certification in the control room, have sludge removal records for the past five years available at the plant for review, and locate the treatment plant bench sheet for February 2022. There was no effluent discharge during the inspection, no samples were taken. **10/18/2019:** Mr. Clark, DEP's WQS, conducted a compliance evaluation inspection. Effluent clear with small solids present and field tests within permit limits.
Other Comments:	There are no open violations against the facility or permittee.

Compliance History

DMR Data for Outfall 001 (from June 1, 2022 to May 31, 2023)

Parameter	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22	JUN-22
Flow (MGD) Average Monthly	0.006	0.007	0.007	0.005	0.007		0.007	0.006	0.006	0.006	0.006	0.006
Flow (MGD) Daily Maximum	0.009	0.009	0.013	0.008	0.010		0.012	0.009	0.009	0.009	0.009	0.009
pH (S.U.) Daily Minimum	7.2	7.2	7.3	7.3	7.4		7.1	7.1	7.0	7.0	7.1	7.1
pH (S.U.) Daily Maximum	7.8	7.9	8.0	7.9	7.8		7.8	7.8	7.9	7.8	7.8	8.2
DO (mg/L) Daily Minimum	5.2	5.4	5.2	6.4	6.4		5.8	6.1	5.6	5.2	5.1	5.02
CBOD5 (lbs/day) Average Monthly	1.0	1.0	3.0	1.0	0.6		< 0.9	< 0.1	< 0.3	0.3	< 0.1	0.4
CBOD5 (lbs/day) Weekly Average	2.0	2.0	3.0	3.0	1.0		2.0	< 0.1	0.4	0.3	< 0.2	0.6
CBOD5 (mg/L) Average Monthly	21.5	21.5	40.3	4.1	11.0		< 19.9	< 3.0	< 4.1	5.9	< 3.0	8.3
CBOD5 (mg/L) Weekly Average	37.6	38.7	41.4	23.0	16.7		36.7	< 3.0	5.1	6.0	< 3.0	10.7
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	7	12	17	25	12		10	9	15	11	12	14
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	10	14	18	39	19		12	12	16	11	16	17
BOD5 (mg/L) Raw Sewage Influent Average Monthly	212	208	251	416	235		221	240	268	255	269	276
TSS (lbs/day) Average Monthly	7.0	< 0.5	< 0.5	0.6	0.4		0.3	0.2	0.3	< 0.2	0.3	0.2
TSS (lbs/day) Raw Sewage Influent Average Monthly	5	20	26	22	14		14	6	5	6	15	5
TSS (lbs/day) Raw Sewage Influent Daily Maximum	8	23	36	40	25		20	7	6	8	26	6
TSS (lbs/day) Weekly Average	10.0	0.8	0.9	0.7	0.6		0.4	0.3	0.4	0.3	0.4	0.2
TSS (mg/L) Average Monthly	16.2	< 7.0	< 7.8	10.2	8.2		6.0	6.6	5.0	< 3.4	8.8	4.3

TSS (mg/L) Raw Sewage Influent Average Monthly	173	334	390	359	255		303	150	100	144	306	109
TSS (mg/L) Weekly Average	20.4	12.4	14.0	10.8	9.2		6.8	9.2	5.6	5.2	12.4	5.5
Fecal Coliform (No./100 ml) Geometric Mean	48	626	11	19	39		< 4	1	< 1	< 4	< 36	< 1
Fecal Coliform (No./100 ml) IMAX	289	2420	119.8	344.8	96		17.6	1	2	16	1299.7	1
UV Intensity (mW/cm²) Daily Minimum	11.5	12.0	11.5	11.5	11.5		11.5	11.5	14.6	9.4	15.7	9.0
Nitrate-Nitrite (mg/L) Average Quarterly			< 26.47			< 25.84			< 0.107			< 28.25
Nitrate-Nitrite (lbs) Total Quarterly			< 0.8			< 0.9			1.2			< 1.4
Total Nitrogen (mg/L) Average Quarterly			< 26.77			< 26.34			36.32			< 28.75
Total Nitrogen (lbs) Total Quarterly			< 0.8			< 0.9			1.2			< 1.4
Total Nitrogen (lbs) Total Annual									< 346			
Ammonia (lbs/day) Average Monthly	0.3	< 0.8	< 0.009	< 0.005	< 0.005		< 0.005	< 0.004	< 0.0006	< 0.005	< 0.005	< 0.005
Ammonia (mg/L) Average Monthly	9.3	< 11.4	< 0.1	< 0.1	< 0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ammonia (mg/L) Average Quarterly			< 0.107			< 0.1			< 0.107			< 0.1
Ammonia (lbs) Total Quarterly			0.006			< 0.005			< 0.1			< 0.05
Ammonia (lbs) Total Annual									< 2			
TKN (mg/L) Average Quarterly			< 0.3			< 0.5			0.84			< 0.5
TKN (lbs) Total Quarterly			< 0.01			< 0.02			< 0.1			< 0.05
Total Phosphorus (lbs/day) Average Monthly	0.04	0.05	0.04	0.08	0.1		0.1	0.04	0.1	0.08	0.1	0.1
Total Phosphorus (mg/L) Average Monthly	1.1	0.8	0.6	1.5	1.4		1.7	1.2	1.1	1.7	2.0	2.0
Total Phosphorus (mg/L) Average Quarterly			1.263			1.365			1.63			2

Total Phosphorus (lbs) Total Quarterly			0.06			0.06			0.4			0.1
Total Phosphorus (lbs) Total Annual									36			

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.0315
Latitude 40º 22' 44.18" **Longitude** -78º 10' 0.53"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	IMAX	-	92a.47(a)(4)
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geo Mean	-	92a.47(a)(5)
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	IMAX	-	92a.47(a)(5)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Comments: Total Residual Chlorine is not applied.

Water Quality-Based Limitations

Ammonia (NH_3-N):
NH_3-N calculations were based on the Department's Implementation Guidance of Section 93.7 Ammonia Criteria, dated 11/4/97 (ID No. 391-2000-013). The following data is necessary to determine the in-stream NH_3-N criteria used in the attached computer model of the stream:

*	Discharge pH	7.0	(Default)
*	Discharge Temperature	20°C	(Default)
*	Stream pH	7.0	(Default)
*	Stream Temperature	25°C	(Default)
*	Background NH_3-N	0 mg/L	(Assumed since no nearby upstream WWTPs)

Regarding NH_3-N limits, the attached computer printout of the WQM 7.0 stream model (version 1.1) indicates that a limit of 3.64 (3.5) mg/L NH_3-N as a monthly average (AML) and 7.28 (7.0) mg/L NH_3-N instantaneous maximum (IMAX) are necessary to protect the aquatic life from toxicity effects. These limits are more stringent and will place in the proposed permit. Winter limits are calculated by multiplying summer limits with a factor of 3. Mass limits are calculated as follows:

Summer Average monthly mass limit: 3.5 mg/L x 0.0315 MGD x 8.34 = 0.919 (0.9) lbs/day
Winter Average monthly mass limit: 10.0 mg/L x 0.0315 MGD x 8.34 = 2.63 (2.5) lbs/day

Recent DMRs indicate the facility is discharging at around < 0.1 mg/L year-round, with exception of one month. The average monthly mass-based limits for summer and winter seasons are calculated to be 0.919 lbs/day and 2.63 lbs/day, respectively. These values are rounded down to 0.9 lbs/day and 2.5 lbs/day, respectively per 362-0400-001.

Dissolved Oxygen (D.O.):
The D.O. goal is 6.0 mg/L. However, a minimum D.O. of 5.0 mg/L is required per 25 Pa. Code § 93.7. It is recommended that this limit be maintained in the proposed permit to ensure the protection of water quality standards. This approach is consistent with DEP's current Standard Operating Procedure (SOP) No. BCW-PMT-033, version 1.9 revised March 22, 2021, and has been applied to other point source dischargers throughout the state.

$CBOD_5$:
The attached computer printout of the WQM 7.0 stream model (ver. 1.1) indicates that a monthly average limit (AML) of 25.0 mg/L, 40.0 mg/L AWL, & 50.0 mg/L IMAX will remain in the proposed permit. Recent DMRs and inspection reports show that the facility has typically been achieving concentrations below this limit. Mass limits are calculated as follows:

Average monthly mass limit: 25.0 mg/L x 0.0315 MGD x 8.34 = 6.57 (6.5) lbs/day
Average weekly mass limit: 40.0 mg/L x 0.0315 MGD x 8.34 = 10.5 (10.0) lbs/day

pH:
The effluent discharge pH should remain above 6.0 and below 9.0 standard units according to 25 Pa. Code § 95.2(1).

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 25 Pa. Code § 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.

E. Coli:
As recommended by DEP's SOP No. BCW-PMT-033, version 1.9 revised March 22, 2021, a routine monitoring for E. Coli will be included in the permit under 25 Pa. Code § 92a.61. This requirement applies to all sewage dischargers greater than 0.002 MGD in their new and reissued permits. A monitoring frequency of 1/year will be included in the permit to be consistent with the recommendation from this SOP.

UV:
The UV system daily monitor and report the UV light intensity (mW/cm^2) will be added in the proposed permit.

Raw Sewage Influent Monitoring:
As a result of negotiation with EPA, influent monitoring of TSS and BOD_5 are required for any POTWs; therefore, influent sampling of BOD_5 and TSS will be remain in the proposed permit. A 24-hr composite sample type will be required to be consistent with the proposed sampling frequency for TSS and BOD_5 in the effluent.

Total Suspended Solids (TSS):
The existing limits of 30.0 mg/L average monthly, 45.0 mg/L weekly average, and 60.0 mg/L IMAX will remain in the proposed permit. Recent DMRs and inspection reports show that the facility has been consistently achieving concentrations below these limits. Mass limits are calculated as follows:

Average monthly mass limit: 30.0 mg/L x 0.0315 MGD x 8.34 = 7.88 (7.5) lbs/day
Average weekly mass limit: 45.0 mg/L x 0.0315 MGD x 8.34 = 11.8 (11.0) lbs/day

Total Phosphorus:
The existing permit limits of 2.0 mg/L as a monthly average and 4.0 mg/L as an IMAX are being continued in this renewal, consistent with DEP's Technical Guidance for Phosphorus (391-2000-018) and 25 Pa. Code § 96.5. Mass limits are calculated as follows:

Average monthly mass limit: 2.0 mg/L x 0.0315 MGD x 8.34 = 0.53 (0.5) lbs/day

Toxics:
DEP utilizes a Toxics Management Spreadsheet (TMS) (last modified on March 2021, ver. 1.3) to facilitate calculations necessary for completing a reasonable potential analysis and determining WQBELs for toxic pollutants. The effluent testing information renewal application (page 7) indicates that there are no toxic pollutants of concern.

Chesapeake Bay Strategy:
According to DEP's Chesapeake Bay Phase II Watershed Implementation Plan (WIP) Wastewater Supplement, this facility is considered a phase 5 non-significant sewage discharger with design flow less than 0.2 MGD but greater than 0.002 MGD. In general, DEP will issue permits for all phase 5 facilities with monitoring and reporting for Total Nitrogen (TN) and Total Phosphorus (TP) throughout the permit term at a frequency no less than annually. Furthermore, DEP's SOP No. BPNPSM-PMT-033 states that in general, at a minimum, monitoring for TN and TP should be included in new and reissued permits for sewage discharges with design flows > 2,000 gpd. This plant is classified as a phase 5, which will be required to monitor and report Ammonia—N, Nitrate-Nitrite as N, Total Kjeldahl Nitrogen and Total Nitrogen once per quarter as per Table 6-3 of DEP's Technical Guidance for the Development and Specification of Effluent Limitations (362-0400-001). The yearly calculation "report" for Ammonia—N, TN & TP will remain in the proposed permit

Stormwater:
There is no known stormwater outfall associated with this facility.

Total Dissolved Solids (TDS):
Minor facilities with design flow <0.1 MGD are not required to report effluent TDS and constituents.

WETT:
Minor facilities and facilities without a formal EPA approved pretreatment program are exempted from WETT.

Anti-Backsliding
The proposed limits are at least as stringent as are in existing permit; therefore, anti-backsliding rule is not applicable

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 basin is classified as a TSF. No High-Quality Waters are impacted by this discharge. No Exceptional Value Waters are impacted by this discharge.

Class A Wild Trout Fisheries:
No Class A Wild Trout Fisheries are impacted by this discharge.

303(d) Listed Streams:
The stream is listed as attaining its designated use(s).

WQM 7.0:

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

• Discharge pH	7.0	(Default)
• Discharge Temperature	20°C	(Default per 391-2000-013)
• Stream pH	7.0	(Default per 391-2000-013)
• Stream Temperature	25°C	(Default per 391-2000-013)

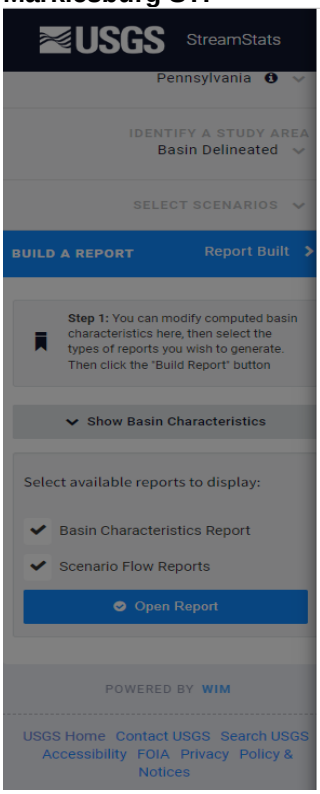
The following two nodes were used in modeling:

Node 1: At Outfall 001 on UNT 13424 to James Creek

Elevation:	804.34 ft (USGS National Map)
Drainage Area:	1.57 mi^2 (USGS StreamStats)
River Mile Index:	1.73 (PA DEP eMapPA)
Low Flow Yield:	0.03 cfs/mi^2 (default)
Discharge Flow:	0.0315 MGD

Node 2: At the confluence with UNT 13429 to James Creek

Elevation:	786.5 ft (USGS National Map)
Drainage Area:	7.26 mi^2 (USGS StreamStats)
River Mile Index:	1.23 (PA DEP eMapPA)
Low Flow Yield:	0.03 cfs/mi^2
Discharge Flow:	0.00 MGD



ROCKDEP	Depth to rock	3.9	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	1.4	miles per square mile

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 2]

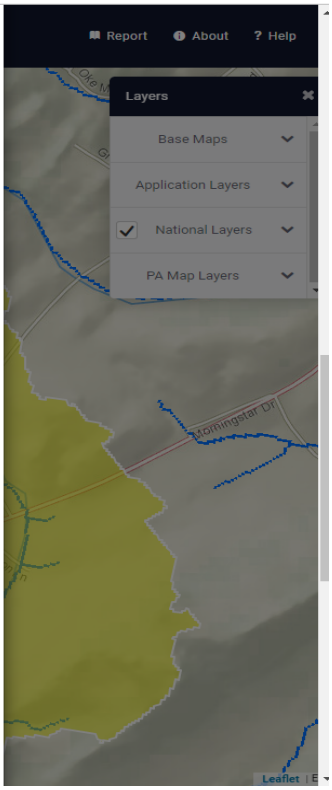
Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.57	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	38	inches	35	50.4
STRDEN	Stream Density	1.4	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	3.9	feet	3.32	5.65
CARBON	Percent Carbonate	24.3	percent	0	99

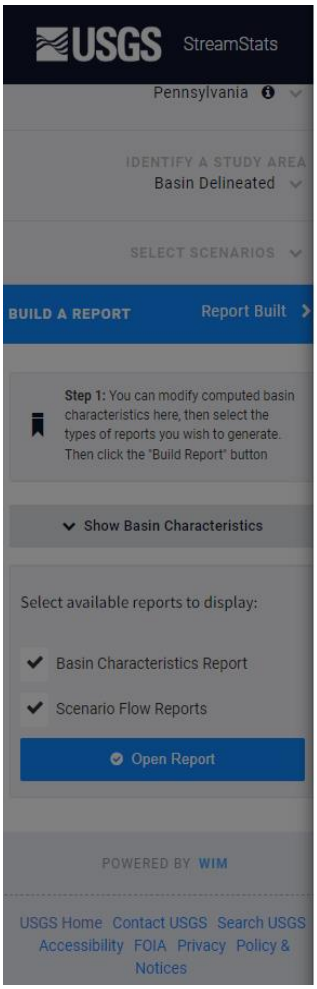
Low-Flow Statistics Disclaimers [Low Flow Region 2]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Low-Flow Statistics Flow Report [Low Flow Region 2]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.13	ft^3/s
30 Day 2 Year Low Flow	0.185	ft^3/s
7 Day 10 Year Low Flow	0.0479	ft^3/s
30 Day 10 Year Low Flow	0.0713	ft^3/s
90 Day 10 Year Low Flow	0.125	ft^3/s





DRNAREA	Area that drains to a point on a stream	7.26	square miles
PRECIP	Mean Annual Precipitation	38	inches
ROCKDEP	Depth to rock	3.9	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	2.16	miles per square mile

Low-Flow Statistics

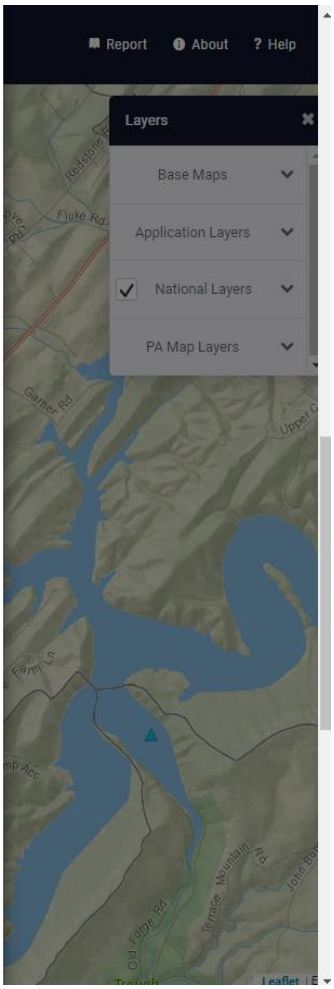
Low-Flow Statistics Parameters [Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	7.26	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	38	inches	35	50.4
STRDEN	Stream Density	2.16	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	3.9	feet	3.32	5.65
CARBON	Percent Carbonate	20.42	percent	0	99

Low-Flow Statistics Flow Report [Low Flow Region 2]

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

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	0.451	ft^3/s	38	38
30 Day 2 Year Low Flow	0.646	ft^3/s	33	33
7 Day 10 Year Low Flow	0.173	ft^3/s	51	51
30 Day 10 Year Low Flow	0.257	ft^3/s	46	46
90 Day 10 Year Low Flow	0.439	ft^3/s	36	36



Analysis Results WQM 7.0

Hydrodynamics | NH3-N Allocations | D.O. Allocations | D.O. Simulation | Effluent Limitations

RMI	Discharge Name	Permit Number	Disc Flow (mgd)
1.73	Marklesburg Bor	PA0086673	0.0315

Parameter	Effluent Limit 30 Day Average (mg/L)	Effluent Limit Maximum (mg/L)	Effluent Limit Minimum (mg/L)
CBOD5	25		
NH3-N	3.64	7.28	
Dissolved Oxygen			5

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rptEffLimits

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
11D	13424	Trib 13424 to James Creek

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Eff. Limit 30-day Avg. (mg/L)	Eff. Limit Maximum (mg/L)	Eff. Limit Minimum (mg/L)
1.730	Marklesburg Bor	PA0086673	0.032	CBOD5	25		
				NH3-N	3.64	7.28	
				Dissolved Oxygen			5

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rpt_WLA

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
11D	13424	Trib 13424 to James Creek

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
1.730	Marklesburg Bor	14.31	23.15	14.31	23.15	0	0

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
1.730	Marklesburg Bor	1.57	3.64	1.57	3.64	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5 Baseline (mg/L)	CBOD5 Multiple (mg/L)	NH3-N Baseline (mg/L)	NH3-N Multiple (mg/L)	Dissolved Oxygen Baseline (mg/L)	Dissolved Oxygen Multiple (mg/L)	Critical Reach	Percent Reduction
1.730	Marklesburg Bor	25	25	3.64	3.64	5	5	0	0

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rptDOSim

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
11D	13424	Trib 13424 to James Creek

RM	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.730	0.032	22.457	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach W/D Ratio**	**Reach Velocity (fps)**
4.239	0.348	13.909	0.057
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
13.70	13.34	1.25	0.846
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.564	23.782	Owens	6
Reach Travel Time (days)			
0.537			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.054	12.64	1.77	7.06
0.107	11.67	1.69	7.26
0.161	10.77	1.61	7.39
0.215	9.94	1.54	7.50
0.269	9.17	1.47	7.59
0.322	8.47	1.41	7.67
0.376	7.82	1.35	7.74
0.429	7.21	1.29	7.81
0.483	6.66	1.23	7.88
0.537	6.15	1.17	7.88

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rptModelSpecs

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	6		

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rptHydro

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
11D	13424	Trib 13424 to James Creek

RM	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
1.730	0.05	0.00	0.05	.0487	0.01812	.348	4.84	13.91	0.06	0.537	22.46	7.00
Q1-10 Flow												
1.730	0.03	0.00	0.03	.0487	0.01812	NA	NA	NA	0.05	0.569	21.91	7.00
Q30-10 Flow												
1.730	0.06	0.00	0.06	.0487	0.01812	NA	NA	NA	0.06	0.490	22.84	7.00

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rptGeneral

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RM	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
11D	13424	Trib 13424 to James Creek	1.730	894.34	1.57	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	W/D Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.030	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Marklesburg Stp	PA0086673	0.0315	0.0315	0.0315	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

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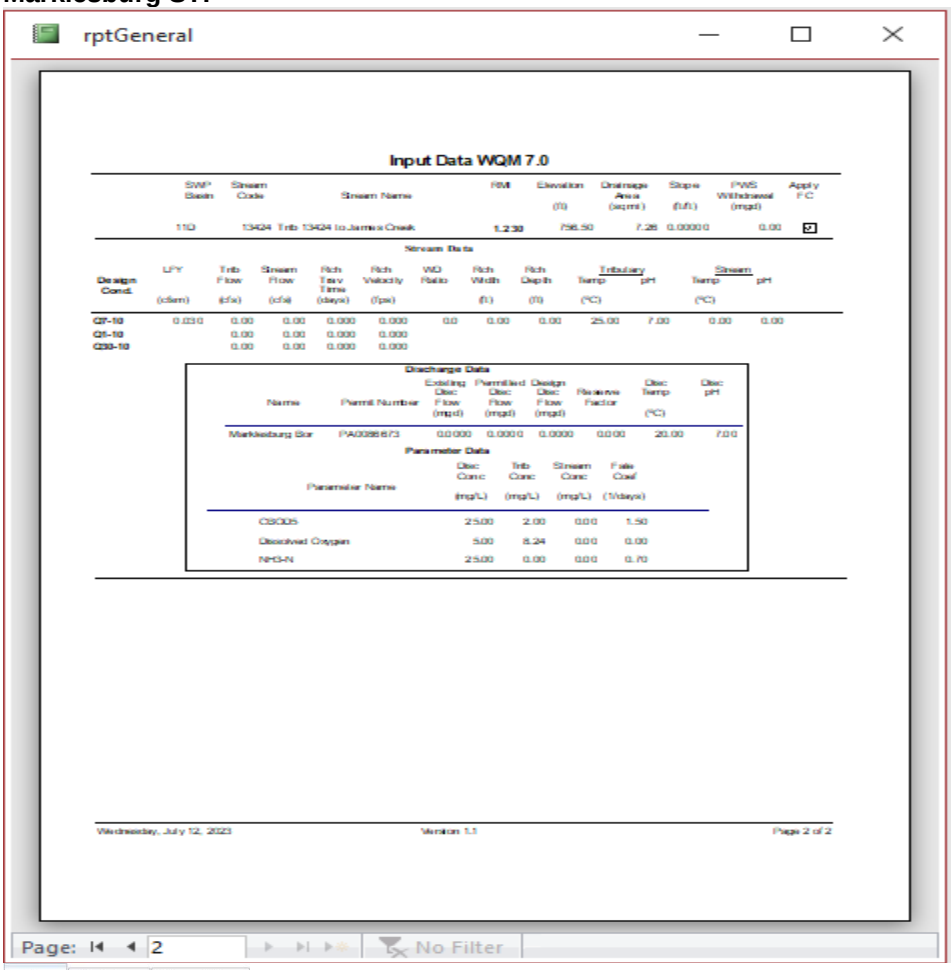
rptGeneral

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RM	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
11D	13424	Trib 13424 to James Creek	1.230	756.50	7.28	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.0310	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Marklesburg Stor	PA0086673	0.0000	0.0000	0.0000	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

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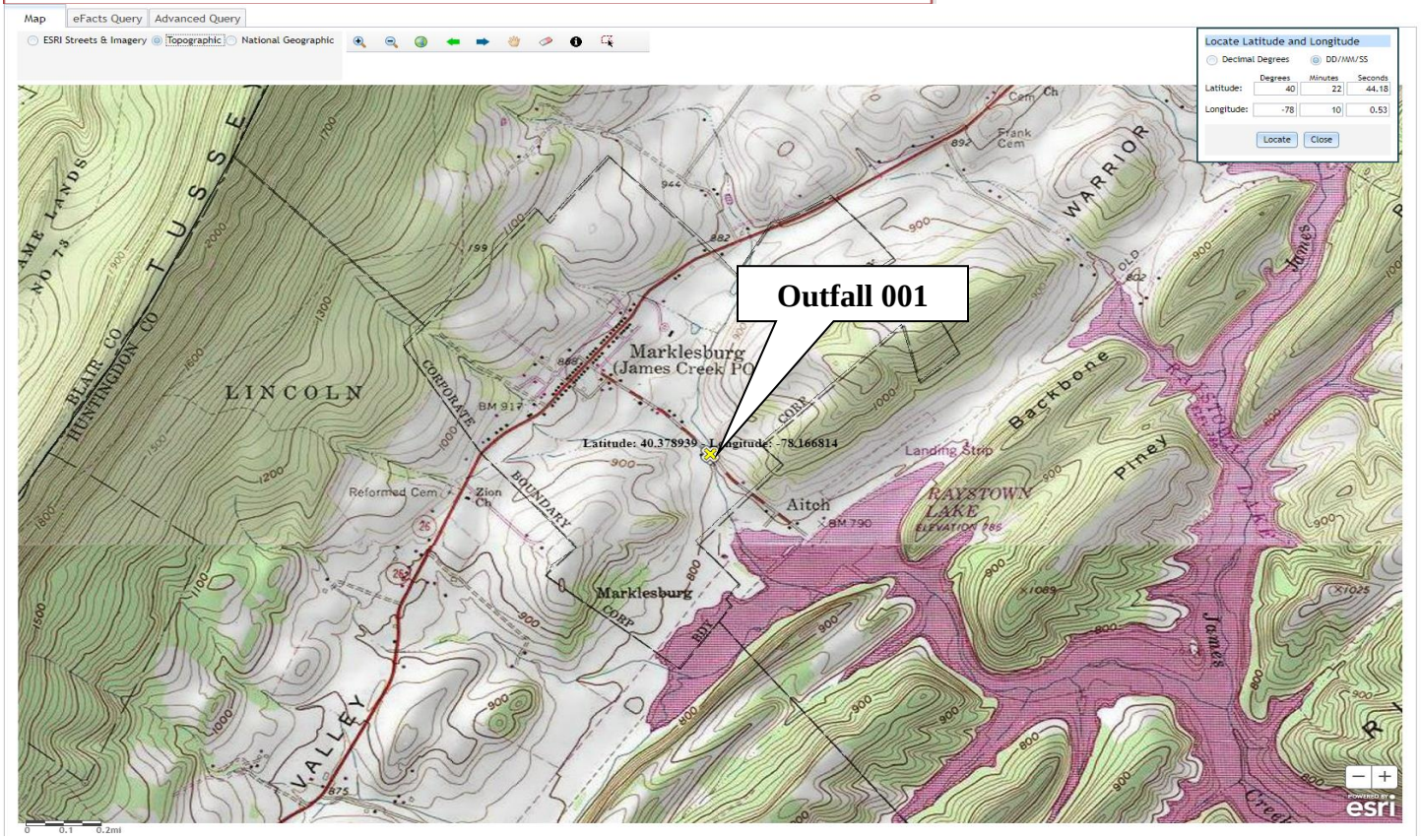

Existing Effluent Limitations and Monitoring Requirements

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Daily Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	9.0 Daily Max	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	6.5	10.0	XXX	25.0	40.0	50	2/month	24-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	24-Hr Composite
Total Suspended Solids	7.5	11.0	XXX	30.0	45.0	60	2/month	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Ammonia-Nitrogen Nov 1 - Apr 30	4.5	XXX	XXX	18.0	XXX	36	2/month	24-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	1.5	XXX	XXX	6.0	XXX	12	2/month	24-Hr Composite
Total Phosphorus	0.5	XXX	XXX	2.0	XXX	4	2/month	24-Hr Composite
UV Intensity (mW/cm^2)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Recorded

Existing Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, to comply with Pennsylvania's Chesapeake Bay Tributary Strategy.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs) [1]		Concentrations (mg/L)				Minimum [2] Measurement Frequency	Required Sample Type
	Quarterly	Annual	Monthly	Average Quarterly	Maximum	Instant. Maximum		
Ammonia--N	Report	Report	XXX	Report	XXX	XXX	1/quarter	24-Hr Composite
Kjeldahl--N	Report	XXX	XXX	Report	XXX	XXX	1/quarter	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	1/quarter	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/quarter	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	1/quarter	24-Hr Composite

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, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
D.O.	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
UV Intensity (mW/cm²)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Recorded
CBOD5	6.5	10.0	XXX	25.0	40.0	50.0	2/month	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	24-Hr Composite
TSS	7.5	11.0	XXX	30.0	45.0	60.0	2/month	24-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	24-Hr Composite
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
Ammonia May 1 - Oct 31	0.9	XXX	XXX	3.5	XXX	7.0	2/month	24-Hr Composite
Ammonia Nov 1 - Apr 30	2.5	XXX	XXX	10.0	XXX	21.0	2/month	24-Hr Composite
Total Phosphorus	0.5	XXX	XXX	2.0	XXX	4.0	2/month	24-Hr Composite

Compliance Sampling Location:

Other Comments:

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, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs) [1]		Concentrations (mg/L)				Minimum [2] Measurement Frequency	Required Sample Type
	Quarterly	Annual	Monthly	Average Quarterly	Maximum	Instant. Maximum		
Ammonia--N	Report	Report	XXX	Report	XXX	XXX	1/quarter	24-Hr Composite
Kjeldahl--N	Report	XXX	XXX	Report	XXX	XXX	1/quarter	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	1/quarter	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/quarter	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	1/quarter	24-Hr Composite

Compliance Sampling Location:

Other Comments:

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☐	Toxics Management Spreadsheet (see Attachment)
☐	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical Guidance for the Development and Specification of Effluent Limitations, 386-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 386-2000-019, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 386-2000-018, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 386-2183-001, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 386-2183-002, 12/97.
☐	Pennsylvania CSO Policy, 386-2000-002, 9/08.
☒	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 386-2000-008, 4/97.
☐	Determining Water Quality-Based Effluent Limits, 386-2000-004, 12/97.
☐	Implementation Guidance Design Conditions, 386-2000-007, 9/97.
☒	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 386-2000-016, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 386-2000-012, 10/1997.
☒	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 386-2000-009, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 386-2000-015, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 386-2000-022, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 386-2000-013, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 386-2000-011, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 386-2000-001, 4/09.
☒	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 386-2000-021, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 386-2000-020, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 386-2000-005, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 386-2000-010, 3/1999.
☐	Design Stream Flows, 386-2000-003, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 386-2000-006, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 386-3200-001, 6/97.
☒	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☒	SOP: BCW-PMT-033
☐	Other: