

Application Type Renewal
Facility Type Municipal
Major / Minor Minor

**NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE**

Application No. PA0084964
APS ID 43490
Authorization ID 1279740

Applicant and Facility Information

Applicant Name	<u>Bethel Township Fulton County</u>	Facility Name	<u>Bethel Township STP</u>
Applicant Address	<u>PO Box 239</u> <u>Warfordsburg, PA 17267-0239</u>	Facility Address	<u>283 Pigeon Cove Road</u> <u>Warfordsburg, PA 17267</u>
Applicant Contact	<u>Michael Crunkleton</u>	Facility Contact	<u>Michael Crunkleton</u>
Applicant Phone	<u>(301) 988-7361</u>	Facility Phone	<u>(301) 988-7361</u>
Client ID	<u>74499</u>	Site ID	<u>246347</u>
Ch 94 Load Status	<u>Not Overloaded</u>	Municipality	<u>Bethel Township</u>
Connection Status	<u>No Limitations</u>	County	<u>Fulton</u>
Date Application Received	<u>June 18, 2019</u>	EPA Waived?	<u>Yes</u>
Date Application Accepted	<u>July 18, 2019</u>	If No, Reason	<u></u>
Purpose of Application	<u>NPDES permit Renewal.</u>		

Summary of Review

Bethel Township Sewer Authority has applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of its National Pollutant Discharge Elimination System (NPDES) permit. The permit was issued on February 10, 2015 and became effective on March 1, 2015. The permit authorized discharge of treated sewage from the existing wastewater treatment plant (WWTP) located in Bethel Township, Fulton County to Little Tonoloway Creek. The existing permit expiration date is February 29, 2020.

The discharge design flow is 0.048 MGD. This facility is owned and operated by Bethel Township and serves the Warfordsburg area of Bethel Township.

WQM No. 299340 95-1 amendment was issued on September 27, 1995.

Changes from the previous permit: Unit of Fecal Coliform changed from CFU/100 ml to No./100 ml.

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		Hilary H. Le / Environmental Engineering Specialist	February 19, 2020
		Daniel W. Martin, P.E. / Environmental Engineer Manager	
		Maria D. Bebenek, P.E. / Clean Water Program Manager	

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.048
Latitude	39° 45' 9.63"	Longitude	-78° 10' 48.60"
Quad Name	Needmore	Quad Code	
Wastewater Description: Sewage Effluent			
Receiving Waters	Little Tonoloway Creek (TSF)	Stream Code	60871
NHD Com ID	49477840	RMI	2.90 miles
Drainage Area	50.0 mi. ²	Yield (cfs/mi ²)	See comments below
Q ₇₋₁₀ Flow (cfs)	See comments below	Q ₇₋₁₀ Basis	USGS StreamStats
Elevation (ft)	484.25 ft	Slope (ft/ft)	
Watershed No.	13-B	Chapter 93 Class.	TSF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	
Nearest Downstream Public Water Supply Intake	R.C. Wilson Water Treatment Plant near Williamsport, MD		
PWS Waters	Potomac River	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	Approximate 20 miles

Changes Since Last Permit Issuance: none

Drainage Area

The discharge is to Little Tonoloway Creek at RMI 2.9 miles. A drainage area upstream of the discharge is estimated to be 50.0 mi.², according to USGS StreamStats available at <https://streamstats.usgs.gov/ss/>.

Stream Flow

There are no nearby stream gages with low flow data that have extensive or recent periods of record. Since USGS PA StreamStats estimated the drainage area that is below the minimum value allowed by USGS's regression equations, the USGS StreamStats on Tonoloway Creek at the PA/MD border will be used to calculate the Q₇₋₁₀ at the point of discharge using a low flow yield method. The Q₇₋₁₀ here is 1.69 cfs and the drainage area is 112 mi.² which results in a Q₇₋₁₀ low flow yield of 0.015 cfs/mi.². This information is used to obtain a chronic or 30-day (Q₃₀₋₁₀), and an acute or 1-day (Q₁₋₁₀) exposure stream flow for the discharge point as follows (Guidance No. 391-2000-023):

$$\begin{aligned} \text{Low Flow Yield} &= Q_{7-10\text{gage}} / \text{Drainage Area}_{\text{gage}} = 1.69 \text{ cfs} / 112 \text{ mi.}^2 = 0.015 \text{ cfs/mi.}^2 \\ Q_{7-10\text{discharge}} &= 0.015 \text{ cfs/mi.}^2 * \text{Drainage Area}_{\text{discharge}} = 0.015 \text{ cfs/mi.}^2 * 50.0 \text{ mi.}^2 = 0.75 \text{ cfs} \\ Q_{30-10} &= 1.36 * Q_{7-10\text{discharge}} = 1.36 * 0.75 \text{ cfs} = 1.02 \text{ cfs} \\ Q_{1-10} &= 0.64 * Q_{7-10\text{discharge}} = 0.64 * 0.75 \text{ cfs} = 0.48 \text{ cfs} \end{aligned}$$

Little Tonoloway Creek

25 Pa Code § 93.9z classifies Little Tonoloway Creek as trout stocking fishes (TSF) surface water. Based on the 2018 Integrated Report, Little Tonoloway Creek, (Assessment ID 2714), is not impaired. A TMDL currently does not exist for this stream segment, therefore, no TMDL has been taken into consideration during this review.

Potable Water Supply Intake

The nearest downstream public water supply intake is the R.C. Wilson Water Treatment Plant near Williamsport, MD intake on the Potomac River, approximately 20 miles from the point of discharge. Given the nature and dilution, the discharge is not expected to significantly impact the water supply.

Treatment Facility Summary				
Treatment Facility Name: Bethel Township STP				
WQM Permit No.		Issuance Date		
299340 95-1		9/27/1995		
Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Extended Aeration	Chlorine With Dechlorination	0.048
Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.048	85	Not Overloaded	Aerobic Digestion	Combination of methods

Changes Since Last Permit Issuance: none

The treatment process consists of a pump station/wet well (1), comminutor (1), bar screen (1), equalization tanks (3), aeration tanks (8), clarifiers/settling tanks (2), chlorine contact tank (1), dichlorination tank (1), sludge holding tanks (2), discharge (outfall).

Calcium Hypochlorite is used for disinfection.

Compliance History	
Summary of DMRs:	See DMR reported from January 1, 2019 to December 31, 2019 Table below (Pages # 4 & 5).
Summary of Inspections:	<p>1/14/2020: Mr. Clark, DEP WQS, conducted compliance evaluation inspection. There were some recommendations such as obtain new pH buffers, keep copies of sludge hauling records on site, and fill out biosolids form completely. The field test results were within permitted limits. There were no violations noted during inspection.</p> <p>12/28/2018: Mr. Clark, DEP WQS, conducted compliance evaluation inspection. There were some recommendations such as repair auto dialer, treat for midge flies, and clean up debris around headworks. The field test results were within permitted limits. There were no violations noted during inspection.</p> <p>12/14/2017: Mr. Clark, DEP WQS, conducted compliance evaluation inspection. There were some recommendations such as clean clarifier troughs and note all process control testing in log book. The field test results were within permitted limits. There were no violations noted during inspection.</p> <p>12/16/2016: Mr. Clark, DEP WQS, conducted compliance evaluation inspection. There were some recommendations such as need thermometer for sample storage refrigerator, keep copies of sludge hauling receipts at treatment plant, and increase process control testing. The field test results were within permitted limits. There were no violations noted during inspection.</p>
Other Comments:	There are currently no open violations associated with the permittee or the facility.

Other Comments: DMRs for the past 12 months indicate three instances of non-compliance (two exceedances for average monthly of Fecal Coliform, and one exceedance for IMAX of Fecal Coliform, which are gray color in the Table below). The facility appears to be operating satisfactorily.

Compliance History

DMR Data for Outfall 001 (from January 1, 2019 to December 31, 2019)

Parameter	DEC-19	NOV-19	OCT-19	SEP-19	AUG-19	JUL-19	JUN-19	MAY-19	APR-19	MAR-19	FEB-19	JAN-19
Flow (MGD) Average Monthly	0.0098	0.0043	0.0049	0.0039	0.005848	0.0072	0.0056	0.0105	0.00874	0.011132	0.013261	0.0138
Flow (MGD) Daily Maximum	0.0212	0.0085	0.0170	0.0065	0.011600	0.0119	0.0096	0.0279	0.01870	0.029800	0.027300	0.0396
pH (S.U.) Minimum	7.0	7.0	7.1	7.0	7.1	7.3	6.9	7.1	7.1	7.1	7.1	7.1
pH (S.U.) Instantaneous Maximum	7.6	7.7	7.6	7.4	7.6	7.6	7.7	7.9	7.7	7.7	7.8	7.7
DO (mg/L) Minimum	10.9	9.8	8.2	8.5	8.4	8.3	8.1	8.0	9.8	11.0	10.7	9.9
TRC (mg/L) Average Monthly	0.05	0.06	0.09	0.08	0.07	0.06	0.06	0.08	0.07	0.08	0.05	0.07
TRC (mg/L) Instantaneous Maximum	0.26	0.24	0.35	0.22	0.23	0.26	0.26	0.23	0.21	0.25	0.12	0.19
CBOD ₅ (lbs/day) Average Monthly	0.55	0.14	0.13	0.14	0.32	0.18	0.19	0.32	0.25	0.35	0.44	0.28
CBOD ₅ (lbs/day) Weekly Average	0.86	0.14	0.16	0.15	0.46	0.22	0.19	0.50	0.37	0.38	0.64	0.36
CBOD ₅ (mg/L) Average Monthly	5.9	3.0	3.4	4.1	6.5	3.0	3.9	5.0	5.1	4.3	4.3	3.0
CBOD ₅ (mg/L) Weekly Average	8.7	3.0	3.4	5.2	10.0	3.0	4.8	7.0	5.2	5.7	5.5	3.0
BOD ₅ (lbs/day) Raw Sewage Influent Average Monthly	25	9.6	6.6	6.4	12.8	12.1	9.1	32.8	10.1	37.4	35.2	27.2
BOD ₅ (lbs/day) Raw Sewage Influent Daily Maximum	31.3	9.9	8.3	7.1	15.0	14.3	11.4	52	17.2	55.1	40.7	38.2
BOD ₅ (mg/L) Raw Sewage Influent Average Monthly	292	232.5	168	193.5	258.0	163.0	182	307	177.5	266	267	278.5
TSS (lbs/day) Average Monthly	0.30	0.11	0.12	0.11	0.024	0.13	0.07	0.59	0.24	0.41	0.27	0.27
TSS (lbs/day) Raw Sewage Influent Average Monthly	22	10.1	26.6	7.9	22.7	21	12.7	622.7	13.1	43.3	32.6	24.2
TSS (lbs/day) Raw Sewage Influent Daily Maximum	28.8	10.9	47.9	9.6	33.0	21.3	18.8	1224	22.5	75.1	32.7	36.8
TSS (lbs/day) Weekly Average	0.51	0.15	0.12	0.16	0.12	0.14	0.11	1.13	0.24	0.51	0.37	0.34

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TSS (mg/L) Average Monthly	3.6	2.9	3.2	2.7	1.7	2.1	1.3	4.0	6.6	5.2	2.1	2.9
TSS (mg/L) Raw Sewage Influent Average Monthly	259	234.0	558	243.0	470.0	281	242.5	605	226.0	438	241	238.0
TSS (mg/L) Weekly Average	6.4	4.2	4.0	3.8	2.6	2.4	1.8	6.8	10.0	7.6	3.2	3.0
Fecal Coliform (CFU/100 ml) Geometric Mean	13	7	16	321	245	68	70	25	285	33	299	21
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	43	12	63	384	600	75	146	63	890	140	4480	38
Nitrate-Nitrite (mg/L) Average Monthly	100.4	43.9	56.5	70.1	64.28	68.93	37.90	17.84	4.90	19.2	29.46	23.48
Total Nitrogen (mg/L) Average Monthly	100.9	44.9	57.5	71.1	65.26	69.93	38.90	25.7	15.5	28.1	30.76	24.48
Ammonia (lbs/day) Average Monthly	0.009	0.005	0.04	0.03	0.017	0.006	0.005	0.01	0.123	0.25	0.61	0.0100
Ammonia (mg/L) Average Monthly	0.100	0.10	0.90	0.38	0.30	0.100	0.100	0.100	4.95	3.97	5.22	0.100
TKN (mg/L) Average Monthly	0.50	1.0	1.0	1.00	1.00	1.00	1.00	7.9	11.4	9.0	1.30	1.00
Total Phosphorus (mg/L) Average Monthly	4.14	4.3	5.0	6.04	3.88	9.26	4.52	0.78	3.42	3.97	4.91	2.9

Development of Effluent Limitations

Outfall No. <u>001</u>	Design Flow (MGD) <u>0.048</u>
Latitude <u>39° 45' 9.43"</u>	Longitude <u>-78° 10' 48.93"</u>
Wastewater Description: <u>Sewage Effluent</u>	

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

Carbonaceous Biochemical Oxygen Demand (CBOD₅):

The attached computer printout of the WQM 7.0 stream model indicates that a monthly average limit of 25 mg/L, or secondary treatment, is adequate to protect the water quality of the stream. However, the existing limits of 25 mg/L average monthly (AML), 40 mg/L average weekly limit (AWL), and 50 mg/L instantaneous maximum (IMAX) will remain in the proposed permit as per guidance document 391-2000-014. Recent DMRs and inspection reports show that the facility has been consistently achieving these limits. Mass limits are calculated as follows:

$$\begin{aligned} \text{Mass based AML (lb/day)} &= 25 \text{ (mg/L)} \times 0.048 \text{ (MG/day)} \times 8.34 \text{ (lb/MG)(L/mg)} = 10.00 \text{ lb/day} \\ \text{Mass based AWL (lb/day)} &= 40 \text{ (mg/L)} \times 0.048 \text{ (MG/day)} \times 8.34 \text{ (lb/MG)(L/mg)} = 16.0 \text{ lb/day} \end{aligned}$$

Ammonia (NH₃-N):

NH₃-N calculations were first 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 NH₃-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	=	20°C	(Default)
Background NH ₃ -N	=	0	(Default)

The model input data and results are attached. The printout of the WQM 7.0 output indicates that at a discharge of 0.048 MGD, limits (rounded according to the NPDES Technical Guidance 362-0400-001) of 25.0 mg/L NH₃-N as average monthly (AML) and 50.0 mg/L NH₃-N instantaneous maximum (IMAX) are necessary to protect the aquatic life from toxicity effects. However, the more stringent in existing limits of 14.5 mg/L AML and 40.0 mg/L IMAX will remain in the proposed permit due to anti-backsliding requirements. Additionally, past DMRs and inspection reports show that the facility has been consistently achieving concentrations under these limits. Mass limits are calculated as follows:

$$\text{Mass based AML (lb/day)} = 14.5 \text{ (mg/L)} \times 0.048 \text{ (MG/day)} \times 8.34 \text{ (lb/MG)(L/mg)} = 5.80 \text{ lb/day}$$

Dissolved Oxygen (D.O.):

A minimum D.O. of 5.0 mg/L is required per 25 Pa. Code § 93.7. This is consistent with the previous permit and current Department criteria.

Total Suspended Solids (TSS):

There is no water quality criterion for TSS. A limit of 30 mg/L AML and 60 mg/L IMAX will be required based on the minimum level of effluent quality attainable by secondary treatment as defined in 40 CFR 133.102b(1) and 25 Pa. Code § 92a.47(a)(1), and an AWL of 45 mg/L per 40 CFR 133.102(b)(2) and 25 Pa. Code § 92a.47(a)(2). Mass limits are calculated as follows:

$$\text{Mass based AML (lb/day)} = 30 \text{ (mg/L)} \times 0.048 \text{ (MG/day)} \times 8.34 \text{ (lb/MG)(L/mg)} = 12.0 \text{ lb/day}$$

$$\text{Mass based AWL (lb/day)} = 45 \text{ (mg/L)} \times 0.048 \text{ (MG/day)} \times 8.34 \text{ (lb/MG)(L/mg)} = 18.0 \text{ lb/day}$$

pH:

The effluent discharge pH should remain above 6.0 and below 9.0 standard units according to 25 Pa. Code § 95.2(2).

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 1,000/100 ml and 25 Pa. Code § 92a.47.(a)(5) requires a winter limit of 2,000/100 ml as a geometric mean and an instantaneous maximum not greater than 10,000/100 ml.

Total Residual Chlorine (TRC):

The attached computer printout utilizes the equations and calculations as presented in the Department's 2003 Implementation Guidance for Total Residual Chlorine, dated 11/15/94 (ID No. 391-2000-015) for developing chlorine limitations. The attached printout indicates that an average monthly water quality limit of 0.5 mg/L and 1.6 mg/L max daily would be needed to prevent toxicity concerns. This is consistent with the existing permit. The treatment facility is meeting this limit.

Influent BOD₅ and TSS Monitoring:

The permit will include influent BOD₅ and TSS monitoring at the same frequency as is done for effluent in order to implement Chapter 94.12 and assess percent removal requirements, per DEP policy.

Chesapeake Bay Strategy:

The Department formulated a strategy to comply with the EPA and Chesapeake Bay Foundation requirements by reducing point source loadings of Total Nitrogen (TN) and Total Phosphorus (TP). Sewage discharges have been prioritized by Central Office based on their delivered TN loadings to the Bay. The highest priority (Phases 1, 2, and 3) dischargers will receive annual loading caps based on their design flow on August 29, 2005 and concentrations of 6.0 mg/L TN and 0.8 mg/L TP. These limits may be achieved through a combination of treatment technology, credits, or offsets. Phase 4 (0.2 - 0.4 MGD) will be required to monitor and report TN and TP during permit renewal monthly and Phase 5 (below 0.2 MGD) will monitor during current permit renewal once a year unless two years of monitoring were completed and documented. Any facility in Phases 4 and 5 that undergoes expansion is subjected to cap load right away. This plant is classified as a phase 5 and will be required to monitor and report Nitrate-Nitrite as N, Total Kjeldahl Nitrogen, Total Phosphorus, and Total Nitrogen. The one per month monitoring and report requirements for these parameters will remain in the proposed permit.

Biosolids Management:

According to the permit renewal application submitted on June 28, 2019, the total sewage sludge/biosolids production within the facility for the previous year was approximately 1.2 dry tons. These sewage sludge/biosolids production were hauled by Glenn Smith Septic Hauler to Washington Township, MD WWTP. Since the facility is located in Maryland, there is no PADEP-issued permit associated with this plant.

Toxics:

This is a minor sewage facility receiving domestic wastewater only and the current application does not require sampling of toxic pollutants (or heavy metals) for those facilities with design flows less than 0.1 MGD. Therefore, no reasonable potential analysis for toxic pollutants has been performed for this permit renewal.

Stormwater:

There are no known stormwater outfalls associated with this facility.

Anti-Degradation (93.4)

Since the Chapter 93 classification of this stream is Trout Stocking Fishes (TSF), anti-degradation requirements do not apply. No High-Quality Waters are impacted by this discharge. No Exceptional Value Waters are impacted by this discharge.

303d Listed Streams:

The discharge is not located on a 303d listed stream segment.

Flow Monitoring

The requirement to monitor the volume of effluent will remain in the proposed permit per 40 CFR § 122.44(i)(1)(ii).

Monitoring Frequency and Sample Type

The facility currently is required to collect daily effluent grab samples for D.O., pH, and TRC; two-month effluent 8-hr composite samples of CBOD₅, TSS, and Ammonia-Nitrogen; two-month effluent grab samples of fecal coliform; two-month influent 8-hr composite sample of BOD₅ and TSS; one per month effluent 8-hr composite samples of Nitrate-Nitrite as N, Total Kjeldahl Nitrogen, and TP; and one per month effluent calculation samples of TN. Based on the best professional judgement of the author, the existing monitoring frequencies are sufficient and necessary. Therefore, the existing monitoring frequencies will remain the same as those specified in the proposed permit.

WQM 7.0 model inputs

Node 1: Little Tonoloway Creek (stream code 60871)
Elevation: 484.25 ft (USGS National Map Viewer)
Drainage Area: 50.0 mi.² (USGS PA StreamStats)
River Mile Index: 2.90 miles (PA DEP eMapPA)
Low Flow Yield: 0.015 cfs/mi.²
Discharge Flow: 0.048 MGD (NPDES PA0084964)

Node 2: Just before Trib 60876 to Little Tonoloway Creek
Elevation: 476.64 ft (USGS National Map Viewer)
Drainage Area: 51.00 mi.² (USGS PA StreamStats)
River Mile Index: 2.39 mile (PA DEP eMapPA)
Low Flow Yield: 0.015 cfs/mi.²
Discharge Flow: 0.00 MGD

WQM 7.0 data is attached.



Bethel WQM 7.0
data.pdf

TRC results

TRC EVALUATION				
Input appropriate values in A3:A9 and D3:D9				
0.75	= Q stream (cfs)	0.5	= CV Daily	
0.048	= Q discharge (MGD)	0.5	= CV Hourly	
30	= no. samples	1	= AFC_Partial Mix Factor	
0.3	= Chlorine Demand of Stream	1	= CFC_Partial Mix Factor	
0	= Chlorine Demand of Discharge	15	= AFC_Criteria Compliance Time (min)	
0.5	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)	
0	= % Factor of Safety (FOS)		= Decay Coefficient (K)	
Source	Reference	AFC Calculations		Reference
TRC	1.3.2.iii	WLA_afc = 3.241		1.3.2.iii
PENTOXSD TRG	5.1a	LTAMULT_afc = 0.373		5.1c
PENTOXSD TRG	5.1b	LTA_afc = 1.208		5.1d
				WLA_cfc = 3.152
				LTAMULT_cfc = 0.581
				LTA_cfc = 1.833
Source	Reference	Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML_MULT = 1.231		
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500		BAT/BPJ
		INST MAX LIMIT (mg/l) = 1.635		
WLA_afc	$(.019/e^{-k \cdot AFC_tc}) + [(AFC_Yc \cdot Qs \cdot .019 / Qd \cdot e^{-k \cdot AFC_tc})] \dots$ $\dots + Xd + (AFC_Yc \cdot Qs \cdot Xs / Qd)] \cdot (1 - FOS / 100)$			
LTAMULT_afc	$EXP((0.5 \cdot LN(cvh^2 + 1)) - 2.326 \cdot LN(cvh^2 + 1)^{0.5})$			
LTA_afc	$wla_afc \cdot LTAMULT_afc$			
WLA_cfc	$(.011/e^{-k \cdot CFC_tc}) + [(CFC_Yc \cdot Qs \cdot .011 / Qd \cdot e^{-k \cdot CFC_tc})] \dots$ $\dots + Xd + (CFC_Yc \cdot Qs \cdot Xs / Qd)] \cdot (1 - FOS / 100)$			
LTAMULT_cfc	$EXP((0.5 \cdot LN(cvd^2 / no_samples + 1)) - 2.326 \cdot LN(cvd^2 / no_samples + 1)^{0.5})$			
LTA_cfc	$wla_cfc \cdot LTAMULT_cfc$			
AML_MULT	$EXP(2.326 \cdot LN((cvd^2 / no_samples + 1)^{0.5}) - 0.5 \cdot LN(cvd^2 / no_samples + 1))$			
AVG MON LIMIT	$MIN(BAT_BPJ, MIN(LTA_afc, LTA_cfc) \cdot AML_MULT)$			
INST MAX LIMIT	$1.5 \cdot ((av_mon_limit / AML_MULT) / LTAMULT_afc)$			

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	Daily Maximum	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD ₅	10	16 Wkly Avg	XXX	25	40	50	2/month	8-Hr Composite
Total Suspended Solids	12	18 Wkly Avg	XXX	30	45	60	2/month	8-Hr Composite
BOD ₅ Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	Grab
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/month	Grab
Ammonia-Nitrogen	5.8	XXX	XXX	14.5	XXX	40	2/month	8-Hr Composite
Nitrate-Nitrite as N	XXX	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite
Total Kjeldahl Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/month	Calculation

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	Daily Maximum	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD ₅	10.0	16.0 Wkly Avg	XXX	25.0	40.0	50.0	2/month	8-Hr Composite
TSS	12.0	18.0 Wkly Avg	XXX	30.0	45.0	60.0	2/month	8-Hr Composite
BOD ₅ Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/month	8-Hr Composite
TSS Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/month	8-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
Ammonia	5.8	XXX	XXX	14.5	XXX	40.0	2/month	8-Hr Composite
Nitrate-Nitrite	XXX	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite
TKN	XXX	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/month	Calculation

Compliance Sampling Location: Outfall 001

Tools and References Used to Develop Permit	
<input checked="" type="checkbox"/>	WQM for Windows Model (see Attachment [redacted])
<input type="checkbox"/>	PENTOXSD for Windows Model (see Attachment [redacted])
<input checked="" type="checkbox"/>	TRC Model Spreadsheet (see Attachment [redacted])
<input type="checkbox"/>	Temperature Model Spreadsheet (see Attachment [redacted])
<input type="checkbox"/>	Toxics Screening Analysis Spreadsheet (see Attachment [redacted])
<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 checked="" 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 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 checked="" 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 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 checked="" type="checkbox"/>	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
<input type="checkbox"/>	SOP: [redacted]
<input type="checkbox"/>	Other: [redacted]