pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0081001**
Facility Type	**Municipal**	APS ID	**275072**
Major / Minor	**Minor**	Authorization ID	**1389153**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Saint Thomas Township Municipal Authority**	Facility Name	**St Thomas Township STP**
Applicant Address	175 Saint Thomas Edenville Road	Facility Address	4500 Gary Way
	St Thomas, PA 17252		Chambersburg, PA 17202
Applicant Contact	Larry Truett	Facility Contact	Barry Rouzer
Applicant Phone	(717) 360-5611	Facility Phone	(717) 369-5495
Client ID	62428	Site ID	451934
Ch 94 Load Status	Not Overloaded	Municipality	Saint Thomas Township
Connection Status	No Limitations	County	Franklin
Date Application Received	February 16, 2022	EPA Waived?	No
Date Application Accepted	March 23, 2022	If No, Reason	Significant CB Discharge
Purpose of Application	NPDES Renewal.		

Summary of Review

Saint Thomas Township Municipal Authority (STTMA) has applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of its NPDES permit. The permit was last reissued on August 8, 2017 and became effective on September 1, 2017. The permit expired on August 31, 2022 but the terms and conditions have been extended since that time.

Based on the review, it is recommended that the permit be drafted.

Sludge use and disposal description and location(s): Sludge is processed onsite prior to being land applied under PAG083560.

Public Participation

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

Approve	Deny	Signatures	Date
X		*Jinsu Kim* Jinsu Kim / Environmental Engineering Specialist	October 20, 2022
X		Daniel W. Martin Daniel W. Martin, P.E. / Environmental Engineer Manager	November 15, 2022

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.40
Latitude	39º 54' 13.45"	Longitude	-77º 44' 45.00"
Quad Name	Chambersburg	Quad Code	1924
Wastewater Description:	Treated Sewage		
Receiving Waters	Back Creek	Stream Code	59902
NHD Com ID	49469690	RMI	8.14
Drainage Area	61.2 mi^2	Yield (cfs/mi^2)	0.1117
Q_{7-10} Flow (cfs)	6.82	Q_{7-10} Basis	USGS Gage no. 01614500
Elevation (ft)	513	Slope (ft/ft)	
Watershed No.	13-C	Chapter 93 Class.	WWF
Existing Use	None	Existing Use Qualifier	N/A
Exceptions to Use	None	Exceptions to Criteria	N/A
Assessment Status	Attaining Use(s)		
TMDL Status	N/A	Name	N/A
Nearest Downstream Public Water Supply Intake	PA-MD Border		
PWS Waters	Conococheague Creek	Flow at Intake (cfs)	unknown
PWS RMI	N/A	Distance from Outfall (mi)	20

Drainage Area
The discharge is to Back Creek at RM 8.14. A drainage area upstream of the point of discharge is estimated to be 61.1 sq.mi., according to USGS StreamStats available at https://streamstats.usgs.gov/ss/.

Streamflow
There were two (2) USGS gauging stations in the vicinity of the point of discharge. Both are currently inactive. One of these stations was located about 0.8 mile downstream but the data would be obsolete as they were collected from 1976 through 1978. Another station was located about 3.8 miles upstream but have very limited datasets collected from June 2001 through September 2001. As a result, the data from these USGS gauging stations will not be used to estimate the streamflow. Previously, the station located on the Conococheague Creek at Fairview, MD (station no. 01614500), about 25 miles downstream from the point of discharge, was used to estimate the streamflow. Historically, low-flow statistic data from this gauging station were used to estimate streamflow at the point of discharge using the Low-Flow Yield approach. DEP has determined to once again use low-flow statistic data from this gauging station to estimate the streamflow. Accordingly,

$$\text{Low-Flow Yield} = Q7\text{-}10_{gauge} / \text{Drainage Area}_{gauge} = 55.2 \text{ cfs} / 494 \text{ sq.mi.} = 0.1117 \text{ cfs/sq.mi.}$$
$$Q7\text{-}10_{site} = \text{Low-Flow Yield} * \text{Drainage Area}_{site} = 0.1117 \text{ cfs/sq.mi.} * 61.1 \text{ sq.mi.} = 6.82 \text{ cfs}$$
$$Q1\text{-}10/Q7\text{-}10 = 45.079 \text{ cfs} / 55.2 \text{ cfs} = 0.816$$
$$Q30\text{-}10/Q7\text{-}10 = 1.188$$

Stream Characteristics
Under 25 Pa Code §93.9z, Back Creek (main stem, US 30 to Mouth) is designated as warm water and migratory fishes. Back Creek is a tributary of Conococheague Creek, which is also designated warm water and migratory fishes. Back Creek is not a Class A Wild Trout stream; therefore no Class A Wild Trout Fishery is impacted by this discharge. No special protection waters such as high-quality and exception value waters are impacted by this discharge.

The discharge is located in a stream segment listed as attaining uses according to PA's 2020 integrated water quality monitoring and assessment report.

Water Supply Intake
The nearest downstream public water supply intake is PA-MD border which is about 20 miles downstream from the point of discharge. Considering the distance and nature of discharge, the discharge is not expected to impact the water supply intake.

Treatment Facility Summary				
Treatment Facility Name: St Thomas Township WWTP				
WQM Permit No.	**Issuance Date**			
2882419	05/18/2012, 07/05/2016 & 05/24/2021			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary With Ammonia And Phosphorus	Sequencing Batch Reactor	Sodium Hypochlorite	0.40
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.40	634	Not Overloaded	Aerobic Digestion	Land Applied

St. Thomas Township WWTP serves St. Thomas Township (99%) and Hamilton Township (1%). All sewer systems are 100% separated. The facility is located at 4500 Gary Way, Chambersburg, PA 17202. The existing Water Quality Management permit no. 2882419 was amended on May 18, 2012 for the addition of a chemical feed system for phosphorus removal, on July 5, 2016 for replacement of gas chlorination system with sodium hypochlorite (liquid) disinfection system and on May 24, 2021 for installation of a new control panel, decanter actuators, mixers DO sensors in SBR basins. The treatment process, according to the application, is as follows:

Influent Pump Station → Sequencing Batch Reactors (2) → Chlorine Contact Tank → Outfall 001 to Back Creek

Aluminum Chloride is added for phosphorous removal. Lime is added for pH control. Solids from SBRs are sent to aerobic sludge digesters (3) prior to land application.

The facility currently serves wastewater generated from a number of commercial users but none of these users are contributing industrial wastewater to the sewer system; therefore, the facility is not required to have an EPA-approved pretreatment program.

Compliance History	
Summary of DMRs:	A summary of past 12-month DMR data is presented on the next page.
Summary of Inspections:	07/01/2021: Brandon Bettinger, DEP Water Quality Specialist, conducted a routine inspection. No violation was noted at the time of inspection. 03/01/2021: Brandon Bettinger conducted an administrative inspection to follow up on Sanitary Sewer Overflows (SSOs) as a result of rain event and snow melt on 2/28/2021 and 3/1/2021 (violations). A 5-day report summarizing the event was requested.
Other Comments:	A notice of violation (NOV) letter was sent out on March 2, 2021 for SSOs occurred on 2/28 an 3/1. DEP's database revealed that there is no open violation associated with this facility or permittee.

Effluent Data

DMR Data for Outfall 001 (from May 1, 2021 to April 30, 2022)

Parameter	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21
Flow (MGD) Average Monthly	0.182	0.161	0.204	0.160	0.131	0.159	0.141	0.202	0.142	0.155	0.175	0.185
Flow (MGD) Daily Maximum	0.396	0.203	0.531	0.280	0.271	0.406	0.277	0.814	0.218	0.196	0.336	0.322
pH (S.U.) Minimum	6.28	6.85	6.78	6.75	6.5	6.15	6.44	6.54	6.59	6.09	6.54	6.24
pH (S.U.) Instantaneous Maximum	7.02	7.21	7.30	7.07	7.03	7.07	6.86	6.85	6.99	6.9	6.90	7.53
DO (mg/L) Minimum	5.0	5.2	5.9	5.0	5.3	5.1	5.3	5.2	5.1	5.1	5.2	5.5
TRC (mg/L) Average Monthly	0.38	0.29	0.29	0.37	0.26	0.16	0.26	0.18	0.21	0.26	0.28	0.3
TRC (mg/L) Instantaneous Maximum	0.57	0.46	0.61	0.58	0.65	0.39	0.73	0.56	0.49	0.51	0.66	0.65
CBOD5 (lbs/day) Average Monthly	< 6.0	< 3.0	< 4.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 2.0	< 4.0	< 3.0	< 3.0
CBOD5 (lbs/day) Weekly Average	14.0	< 3.0	7.0	3.0	3.0	5.0	4.0	3.0	< 3.0	7.0	< 4.0	< 3.0
CBOD5 (mg/L) Average Monthly	< 3.4	< 2.1	< 3.3	< 2.1	< 2.48	< 2.67	< 2.2	2.02	< 2.0	< 3.01	< 2.0	< 2.1
CBOD5 (mg/L) Weekly Average	7.53	2.36	7.08	2.29	2.72	4.63	2.6	2.09	< 2.0	5.83	< 2.0	2.2
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	236	186	195	125	148	165	258	196	236	189	189	218
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	394	241	229	143	169	274	392	373	469	277	225	316
BOD5 (mg/L) Raw Sewage Influent Average Monthly	166	149	155	104	150	142	215	164	197	154	138	151
TSS (lbs/day) Average Monthly	2.0	2.0	4.0	< 3.0	2.0	< 3.0	< 2.0	< 3.0	3.0	< 3.0	< 7.0	5.0
TSS (lbs/day) Raw Sewage Influent Average Monthly	152	147	155	104	136	115	152	119	124	107	165	190

Parameter	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21
TSS (lbs/day) Raw Sewage Influent Daily Maximum	201	161	198	124	257	224	250	208	276	167	202	234
TSS (lbs/day) Weekly Average	2.0	4.0	4.0	5.0	4.0	4.0	4.0	6.0	4.0	7.0	12.0	7.0
TSS (mg/L) Average Monthly	1.3	1.9	2.9	< 2.4	2.32	< 2.5	< 2.0	< 2.4	2.3	< 2.8	< 5.0	3.5
TSS (mg/L) Raw Sewage Influent Average Monthly	104	118	125	83	138	105	127	97	102	87	120	132
TSS (mg/L) Weekly Average	1.5	3.0	3.5	4.0	3.5	3.5	4.0	4.5	4.0	6.0	10.5	5.0
Fecal Coliform (CFU/100 ml) Geometric Mean	< 2.0	< 2.0	3.0	< 1.0	< 14	21	< 2.0	19.0	< 4.0	< 2.0	< 2.0	< 2.0
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	6.0	6.0	50	< 1.0	118	69	6.0	192	28.0	3.0	5	6.0
Nitrate-Nitrite (mg/L) Average Monthly	13.344	16.565	12.593	20.125	27.789	23.961	26.9	24.733	24.3	17.99	21.39	16.43
Nitrate-Nitrite (lbs) Total Monthly	527.7	653.4	427.3	806.7	866.7	828	965.2	921.8	871.6	719.9	902.7	760.3
Total Nitrogen (mg/L) Average Monthly	< 16.623	< 19.332	16.106	< 22.764	< 28.899	< 26.201	< 28.39	< 25.733	< 25.872	< 20.38	< 23.43	< 19.35
Total Nitrogen (lbs) Effluent Net Total Monthly	< 721.3	< 764.2	< 555.2	< 904.9	< 901.6	< 908.7	< 1016	< 959.7	< 926.6	< 819.6	< 991.9	< 888.6
Total Nitrogen (lbs) Total Monthly	< 721.3	< 764.2	< 555.2	< 904.9	< 901.6	< 908.7	< 1016	< 959.7	< 926.6	< 819.6	< 991.9	< 888.6
Total Nitrogen (lbs) Effluent Net Total Annual								7306				
Total Nitrogen (lbs) Total Annual								12080				
Ammonia (lbs/day) Average Monthly	< 3.0	< 1.9	< 3.4	< 1.8	< 0.06	< 2.0	< 0.9	< 0.60	< 0.8	< 2.0	< 0.80	< 2.0
Ammonia (mg/L) Average Monthly	1.983	< 1.466	< 2.702	< 1.495	0.541	< 1.25	< 0.79	< 0.8	< 0.753	< 1.283	< 0.56	1.417
Ammonia (lbs) Total Monthly	< 130.5	< 58.6	< 101.7	< 55.6	< 17	< 45.6	< 27.7	< 19.0	< 26.1	< 51.1	< 24.2	< 63.5
Ammonia (lbs) Total Annual								96.55				

Parameter	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21
TKN (mg/L) Average Monthly	< 3.0	< 2.77	< 3.5	< 2.64	< 34.9	< 2.24	< 1.46	< 1.0	< 1.57	< 1.85	< 2.04	< 2.92
TKN (lbs) Total Monthly	< 132.9	< 110.8	< 127.1	< 98.1	< 1.11	< 80.7	< 50.8	< 37.9	< 55.0	< 77.8	< 89.2	< 128.3
Total Phosphorus (lbs/day) Average Monthly	2.0	1.0	1.0	1.0	2.0	2.0	2.0	3.0	3.0	2.0	2.0	2.0
Total Phosphorus (mg/L) Average Monthly	1.67	0.755	0.818	0.953	2.24	1.72	1.69	2.254	2.18	1.65	1.64	1.658
Total Phosphorus (lbs) Effluent Net Total Monthly	71.0	29.8	34.0	37.4	71.0	59.5	60.7	80.8	79.5	65.9	71.8	75.7
Total Phosphorus (lbs) Total Monthly	71	29.8	34.0	37.4	71	59.5	60.7	80.8	79.5	65.9	71.8	75.7
Total Phosphorus (lbs) Effluent Net Total Annual								779				
Total Phosphorus (lbs) Total Annual								779				

Existing Effluent Limitations and Monitoring Requirements

The table below summarizes effluent limitations and monitoring requirements specified in the current NPDES permit renewal.

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
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	83	133	XXX	25.0	40.0	50	1/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Total Suspended Solids	100	150	XXX	30.0	45.0	60	1/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Ammonia-Nitrogen May 1 - Oct 31	20.0	XXX	XXX	6.0	XXX	12	2/week	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	60	XXX	XXX	18.0	XXX	XXX	2/week	24-Hr Composite

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) [1]		Concentrations (mg/L)				Minimum [2] Measurement Frequency	Required Sample Type
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Net Total Nitrogen	Report	7306	XXX	XXX	XXX	XXX	1/month	Calculation
Net Total Phosphorus	Report	974	XXX	XXX	XXX	XXX	1/month	Calculation

Development of Effluent Limitations and Monitoring Requirements

Outfall No. 001 **Design Flow (MGD)** 0.4
Latitude 39º 54' 14.00" **Longitude** -77º 44' 45.18"
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 Effluent Limitations (WQBELs)

CBOD5, NH3-N and Dissolved Oxygen (DO)
WQM 7.0 version 1.0b is a water quality model designed to assist DEP to determine appropriate permit requirements for CBOD5, NH3-N and DO. DEP's technical guidance no. 391-2000-007 describes the technical methods contained in the model for conducting wasteload allocation analyses and for determining recommended limits for point source discharges. DEP recently updated this model (ver. 1.1) to include new ammonia criteria that has been approved by US EPA as part of the 2017 Triennial Review.

A multiple discharge analysis is needed to consider the loadings from Camp Joy El (NPDES permit no. PA0082627) which is located approximately 5 miles downstream from the point of discharge. The model was properly utilized as the DO replenishment begins within the selected stream reach. The model output indicates that existing limits are still protective of water quality. Therefore, no changes will be made to the existing limits.

Toxics
An application for a minor sewage facility greater than 0.05 MGD but less than 1.0 MGD requires sampling of a limited number of toxic pollutants including Total Copper, Total Lead, Total Zinc, TDS, Chloride, Bromide, and Sulfate. Sample results from these pollutants were entered into DEP's Toxics Management Spreadsheet. The spreadsheet shows no effluent limits or monitoring requirements for these pollutants.

Total Residual Chlorine
Since chlorine is used for disinfection, TRC effluent levels must be regulated. A TBEL of 0.5 mg/L is the existing permit requirement and is directly derived from the state BAT standard found in 25 Pa Code §92a.48(b)(2). DEP's TRC_CALC worksheet is utilized to determine if this existing TBEL is still appropriate. The worksheet indicates that the existing TBEL as well as BPJ instantaneous maximum limit of 1.6 mg/L is still appropriate to protect water quality standards in the receiving water. No change is therefore recommended.

Best Professional Judgment (BPJ) Limitations

Dissolved Oxygen
A minimum of 5.0 mg/L for DO is an existing effluent limit and will remain unchanged in the draft permit as recommended by DEP's SOP. This requirement has also been assigned to other major sewage facilities in the region. 5.0 mg/L is taken directly from 25 Pa. Code § 93.7(a) and it is also determined to be appropriate according to water quality modeling.

Total Phosphorus
DEP's SOP no. BPNPSM-PMT-033 recommends a monitoring requirement for Total Phosphorus and effluent limit of 2.0 mg/L if the discharge of Total Phosphorus contributes or threatens to impair existing or designated uses in a free flowing water in which the determination can be made through a stream enrichment risk analysis. Since the receiving stream, Back Creek, is not impaired for nutrients, no effluent limit is needed. Because the facility is already required to monitor for Total Phosphorus as part of DEP's Chesapeake Bay Tributary Strategy, no additional requirement is needed.

Additional Considerations

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

Influent BOD & TSS Monitoring
As a result of negotiation with EPA, the existing influent monitoring reporting requirement for TSS and BOD5 will be maintained in the draft permit. This requirement has been consistently assigned to all municipal wastewater treatment facilities.

Chesapeake Bay Strategy
Chesapeake Bay TMDL identifies the necessary pollution reductions of nitrogen, phosphorus and sediment across Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia and the District of Columbia and sets pollution limits necessary to meet applicable water quality standards in the Chesapeake Bay and its tidal tributaries. In order to meet these reduction goals, DEP has developed multiple plans for years including Chesapeake Bay Tributary Strategy (12/2004), Phase 1 Watershed Implementation Plan (January 2011), Phase 2 Watershed Implementation Plan (March 2012), and Phase 3 Watershed Implementation Plan (August 2019). More details on these plans are available at www.dep.pa.gov.

As part of Phase 3 Watershed Implementation Plan, Phase 3 Watershed Implementation Plan Wastewater Supplement was developed to provide an update on Chesapeake Bay TMDL implementation activities for point sources and current implementation strategy for wastewater. The following Cap Loads, annual effluent net mass load limits, specified in this document will be included in the draft permit:

NPDES Permit No.	Phase	Facility	Latest Permit Issuance Date	Permit Expiration Date	Cap Load Compliance Start Date	TN Cap Load (lbs/yr)	TN Offsets Included in Cap Load (lbs/yr)	TP Cap Load (lbs/yr)	TN Delivery Ratio	TP Delivery Ratio
PA0081001	3	St. Thomas Township Municipal Authority	8/8/2017	8/31/2022	10/01/2013	7,306	-	974	0.683	0.67

Total Dissolved Solids (TDS)
TDS and its associated solids including Bromide, Chloride, and Sulfate have become statewide pollutants of concern. The requirement to monitor these pollutants must be considered under the criteria specified in 25 Pa. Code § 95.10 and the following January 23, 2014 DEP Central Office Directive:

> *For point source discharges and upon issuance or reissuance of an individual NPDES permit:*
>
> *-Where the concentration of TDS in the discharge exceeds 1,000 mg/L, or the net TDS load from a discharge exceeds 20,000 lbs/day, and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for TDS, sulfate, chloride, and bromide. Discharges of 0.1 MGD or less should monitor and report for TDS, sulfate, chloride, and bromide if the concentration of TDS in the discharge exceeds 5,000 mg/L.*

- *Where the concentration of bromide in a discharge exceeds 1 mg/L and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for bromide. Discharges of 0.1 MGD or less should monitor and report for bromide if the concentration of bromide in the discharge exceeds 10 mg/L.*

The sample result shows that effluent contains a TDS concentration level of 530 mg/L and Bromide was non-detected at 2.0 mg/L. Accordingly, the requirement to monitor these pollutants is not necessary.

E. Coli Monitoring
DEP's SOP No. BCW-PMT-033 recommends under 25 Pa Code §92a.61 a routine monitoring for E. Coli in all new and reissued permits. Since the facility has now the annual average design flow of 0.4 MGD, a quarterly monitoring will be included in the permit.

Monitoring Frequency and Sample Type
Unless otherwise specified throughout this fact sheet, existing monitoring frequencies and sample types will remain unchanged in the permit.

Mass Loading Limitations
All effluent mass loading limits will be based on the formula: design flow x concentration limit x conversion factor of 8.34.

Antidegradation Requirements
All effluent limitations and monitoring requirements have been developed to ensure that existing instream water uses and the level of water quality necessary to protect the existing uses are maintained and protected.

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	Instant. 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
Dissolved Oxygen	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	83	133	XXX	25.0	40.0	50	1/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Total Suspended Solids	100	150	XXX	30.0	45.0	60	1/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Ammonia-Nitrogen May 1 - Oct 31	20.0	XXX	XXX	6.0	XXX	12	2/week	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	60	XXX	XXX	18.0	XXX	XXX	2/week	24-Hr Composite
E. Coli (No./100 mL)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab

roposed 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.

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
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Ammonia--N	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Kjeldahl--N	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Net Total Nitrogen	XXX	7306	XXX	XXX	XXX	XXX	1/month	Calculation
Net Total Phosphorus	XXX	974	XXX	XXX	XXX	XXX	1/month	Calculation

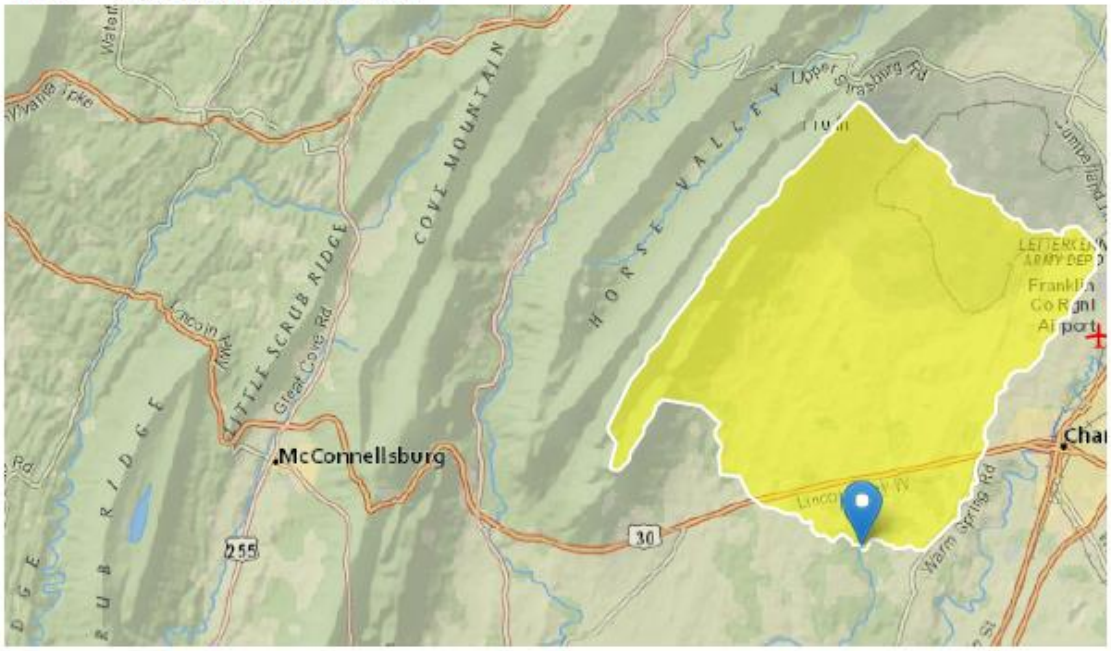
Tools and References Used to Develop Permit	
☐	WQM for Windows Model (see Attachment)
☐	Toxics Management Spreadsheet (see Attachment)
☐	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical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

Attachments

1. StreamStats

StreamStats Report

Region ID: PA
Workspace ID: PA20220616122810448000
Clicked Point (Latitude, Longitude): 39.90371, -77.74585
Time: 2022-06-16 08:28:30 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	16.96	percent
DRNAREA	Area that drains to a point on a stream	61.1	square miles
PRECIP	Mean Annual Precipitation	40	inches
ROCKDEP	Depth to rock	4.1	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	2.79	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	61.1	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	40	inches	35	50.4
STRDEN	Stream Density	2.79	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	4.1	feet	3.32	5.65
CARBON	Percent Carbonate	16.96	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	4.76	ft^3/s	38	38
30 Day 2 Year Low Flow	6.51	ft^3/s	33	33
7 Day 10 Year Low Flow	2.16	ft^3/s	51	51
30 Day 10 Year Low Flow	3.01	ft^3/s	46	46
90 Day 10 Year Low Flow	4.59	ft^3/s	36	36

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/)

2. WQM 7.0 ver. 1.1

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
13C	59902	BACK CREEK	**8.140**	513.00	61.10	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.112	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
St. Thomas	PA0081001	0.4000	0.4000	0.4000	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	6.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
13C	59902	BACK CREEK	**3.570**	488.00	80.10	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.112	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
Camp Joy EL	PA0082627	0.0100	0.0100	0.0100	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

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
13C	59902	BACK CREEK	**0.100**	472.00	91.20	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	0.112	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
		0.0000	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
13C	59902	BACK CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
8.140	0.400	24.585	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
43.554	0.745	58.445	0.230
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
3.91	0.429	0.50	0.996
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.974	2.523	Tsivoglou	5
Reach Travel Time (days)			
1.215			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.121	3.66	0.44	7.56
0.243	3.44	0.39	7.30
0.364	3.22	0.35	7.15
0.486	3.02	0.31	7.07
0.607	2.83	0.27	7.05
0.729	2.66	0.24	7.07
0.850	2.49	0.21	7.11
0.972	2.33	0.19	7.16
1.093	2.19	0.17	7.23
1.215	2.05	0.15	7.30

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
3.570	0.410	24.670	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
49.957	0.782	63.916	0.246
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.08	0.034	0.16	1.003
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.502	2.280	Tsivoglou	5
Reach Travel Time (days)			
0.862			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.086	2.07	0.14	7.58
0.172	2.06	0.13	7.58
0.259	2.06	0.12	7.58
0.345	2.05	0.11	7.58
0.431	2.04	0.10	7.58
0.517	2.03	0.09	7.58
0.603	2.03	0.08	7.58
0.690	2.02	0.08	7.58
0.776	2.01	0.07	7.58
0.862	2.00	0.07	7.58

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
13C	59902	BACK CREEK

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
8.140	6.84	0.00	6.84	.6188	0.00104	.745	43.55	58.44	0.23	1.215	24.59	7.00
3.570	8.97	0.00	8.97	.6343	0.00087	.782	49.96	63.92	0.25	0.862	24.67	7.00
Q1-10 Flow												
8.140	5.58	0.00	5.58	.6188	0.00104	NA	NA	NA	0.21	1.347	24.50	7.00
3.570	7.32	0.00	7.32	.6343	0.00087	NA	NA	NA	0.22	0.958	24.60	7.00
Q30-10 Flow												
8.140	8.13	0.00	8.13	.6188	0.00104	NA	NA	NA	0.25	1.111	24.65	7.00
3.570	10.66	0.00	10.66	.6343	0.00087	NA	NA	NA	0.27	0.787	24.72	7.00

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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	0.816	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.188	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
13C	59902	BACK 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
8.140	St. Thomas	11.54	12	11.54	12	0	0
3.570	Camp Joy EL	11.08	50	11.45	50	0	0

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
8.140	St. Thomas	1.4	6	1.4	6	0	0
3.570	Camp Joy EL	1.37	25	1.39	25	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
8.14	St. Thomas	25	25	6	6	5	5	0	0
3.57	Camp Joy EL	25	25	25	25	5	5	0	0

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
13C	59902	BACK CREEK

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
8.140	St. Thomas	PA0081001	0.400	CBOD5	25		
				NH3-N	6	12	
				Dissolved Oxygen			5

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
3.570	Camp Joy EL	PA0082627	0.010	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			5

3. TRC_CALC Spreadsheet

TRC EVALUATION

Input appropriate values in B4:B8 and E4:E7

6.82	= Q stream (cfs)	0.5	= CV Daily
0.4	= 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 Dischar	15	= AFC_Criteria Compliance Time (min)
0.5	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)
0	= % Factor of Safety (FOS)		=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 3.535	1.3.2.iii	WLA cfc = 3.439
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 1.317	5.1d	LTA_cfc = 1.999

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500	BAT/BPJ
		INST MAX LIMIT (mg/l) = 1.635	

WLA afc	**(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...** **...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)**
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	**(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...** **...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)**
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	**1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)**

4. Toxics Management Spreadsheet

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: St. Thoams Township MA WWTP NPDES Permit No.: PA0081001 Outfall No.: 001

Evaluation Type: Custom / Additives Wastewater Description: Minor Sewage

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.4	100	7						

				0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Strea m CV	Fate Coeff	FOS	Criteri a Mod	Chem Transl
Total Dissolved Solids (PWS)	mg/L		530									
Bromide	mg/L	<	2									
Chloride (PWS)	mg/L		110									
Sulfate (PWS)	mg/L		38.9									
Total Copper	mg/L	<	0.01									
Total Zinc	mg/L	<	0.008									
Total Lead	mg/L		0.0444									

Discharge Information 6/16/2022 Page 1

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

St. Thoams Township MA WWTP, NPDES Permit No. PA0081001, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Back Creek**

No. Reaches to Model: **1**

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

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	059902	8.14	513	61.1			Yes
End of Reach 1	059902	3.57	488	80.1			Yes

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

Location	RMI	LFY (cfs/mi²)*	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	8.14	0.112										100	7		
End of Reach 1	3.57	0.112													

Q_h

Location	RMI	LFY (cfs/mi²)	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	8.14														
End of Reach 1	3.57														

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

St. Thoams Township MA WWTP, NPDES Permit No. PA0081001, Outfall 001

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

☑ ***Hydrodynamics***

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

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
8.14	6.84		6.84	0.619	0.001	0.745	43.554	58.445	0.23	1.215	105.602
3.57	8.97		8.9712								

Q_h

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
8.14	39.90		39.90	0.619	0.001	1.569	43.554	27.76	0.593	0.471	39.857
3.57	50.557		50.56								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.377 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	13.439	14.0	72.3	Chem Translator of 0.96 applied
Total Zinc	0	0		0	117.180	120	619	Chem Translator of 0.978 applied
Total Lead	0	0		0	64.581	81.6	422	Chem Translator of 0.791 applied

☑ ***CFC*** CCT (min): ###### PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	8.956	9.33	112	Chem Translator of 0.96 applied

Total Zinc	0	0		0	118.139	120	1,445	Chem Translator of 0.986 applied
Total Lead	0	0		0	2.517	3.18	38.4	Chem Translator of 0.791 applied

☑ ***THH*** CCT (min): ###### 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	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 39.857 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

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

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

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments

☑ ***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
Bromide	N/A	N/A	No WQS
Chloride (PWS)	N/A	N/A	PWS Not Applicable
Sulfate (PWS)	N/A	N/A	PWS Not Applicable
Total Copper	46.4	µg/L	Discharge Conc ≤ 10% WQBEL
Total Zinc	397	µg/L	Discharge Conc ≤ 10% WQBEL

Total Lead	38.4	µg/L	Discharge Conc ≤ 10% WQBEL