

Application Type Renewal
Facility Type Municipal
Major / Minor Major

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Application No. PA0044113
APS ID 275582
Authorization ID 1374729

Applicant and Facility Information

<p>Applicant Name <u>South Middleton Township Municipal Authority</u></p> <p>Applicant Address <u>PO Box 8 345 Lear Lane</u> <u>Boiling Springs, PA 17007-0008</u></p> <p>Applicant Contact <u>Josephine Hall</u></p> <p>Applicant Phone <u>(717) 258-6476</u></p> <p>Client ID <u>86435</u></p> <p>Ch 94 Load Status <u>Not Overloaded</u></p> <p>Connection Status <u>No Limitations</u></p> <p>Date Application Received <u>November 2, 2021</u></p> <p>Date Application Accepted <u>November 16, 2021</u></p> <p>Purpose of Application <u>NPDES Permit Renewal</u></p>	<p>Facility Name <u>South Middleton Township MA WWTP</u></p> <p>Facility Address <u>345 Lear Lane</u> <u>Boiling Springs, PA 17007</u></p> <p>Facility Contact <u>Josephine Hall</u></p> <p>Facility Phone <u>(717) 258-6476</u></p> <p>Site ID <u>451892</u></p> <p>Municipality <u>South Middleton Township</u></p> <p>County <u>Cumberland</u></p> <p>EPA Waived? <u>No</u></p> <p>If No, Reason <u>Major Facility, Significant CB Discharge</u></p>
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Summary of Review

South Middleton Township Municipal Authority (SMTMA) has applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of its NPDES permit. The permit was last reissued on April 27, 2017 and became effective on May 1, 2017. The permit expired on April 30, 2022 but the terms and conditions have been extended since that time.

Based on the review, it is recommended that the permit be drafted with requirements specified in this fact sheet.

Sludge use and disposal description and location(s): Sludge is processed onsite prior to being land applied under PAG083603.

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		<i>Jinsu Kim</i> Jinsu Kim / Environmental Engineering Specialist	October 13, 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)	1.5
Latitude	40° 08' 56"	Longitude	-77° 05' 38"
Quad Name	Mechanicsburg	Quad Code	
Wastewater Description: Treated Sewage			
Receiving Waters	Yellow Breeches Creek	Stream Code	08309
NHD Com ID	2050305	RMI	26.9
Drainage Area	135 mi ²	Yield (cfs/mi ²)	
Q ₇₋₁₀ Flow (cfs)	42.93	Q ₇₋₁₀ Basis	See comments below
Elevation (ft)	454	Slope (ft/ft)	
Watershed No.	7-E	Chapter 93 Class.	HQ-CWF, MF
Existing Use	None	Existing Use Qualifier	None
Exceptions to Use	None	Exceptions to Criteria	None
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment	N/A		
Source(s) of Impairment	N/A		
TMDL Status	N/A	Name	N/A
Nearest Downstream Public Water Supply Intake	United Water Company		
PWS Waters	Yellow Breeches Creek	Flow at Intake (cfs)	N/A
PWS RMI	7.42	Distance from Outfall (mi)	19.48

Drainage Area

The discharge is to Yellow Breeches Creek at RM 26.9. A drainage area upstream of the point of discharge is determined to be 135 sq.mi, according to the USGS StreamStats available at <https://streamstats.usgs.gov/ss/>.

Stream Flow

USGS gauging station no. 01571500 on Yellow Breeches Creek, located 3.1 miles above mouth also measures the hatchery flow and springs at Huntsdale (PA0037141) which results in a greater yield rate in the basin than actually exists. The monthly hatchery discharge is estimated to be 12.384 MGD during low-flow periods of the year and the gauge flow should be adjusted by subtracting the hatchery discharge as follows:

$$\begin{aligned}
 \text{Gauge flow} &= 86.8 - 12.384(1.547) = 67.64 \text{ cfs} \\
 \text{Q7-10 runoff rate} &= (67.64) / 213 = 0.318 \text{ cfs/sq.mi.} \\
 \text{Q30-10:Q7-10} &= 94.0/86.8 = 1.08:1 \quad / \quad \text{Q1-10:Q7-10} = 81.6/86.8 = 0.94:1 \\
 \text{Q7-10} &= 135(0.318) = 42.93 \text{ cfs}
 \end{aligned}$$

Yellow Breeches Creek

Under 25 Pa Code §93.9o, Yellow Breeches Creek is designated as high quality-cold water & migratory fishes. It is not classified as a Class A Trout stream; therefore no Class A Wild Trout Fishery is impacted by this discharge. DEP's 2020 PA Integrated Water Quality Monitoring and Assessment report indicates that Yellow Breeches Creek including a number of unnamed tributaries are currently impaired at further downstream of the point of discharge. The discharge is currently located in a stream segment listed as attaining uses. Yellow Breeches Creek is a special protection surface waterbody. As a result, permit requirements will be developed to ensure that existing instream water uses and the level of water quality necessary to protect the existing uses for Yellow Breeches Creek are maintained and protected as per 25 Pa Code §§ 93.4a(b) and (c).

Water Supply Intake

The nearest downstream public water supply intake is the United Water Company, located on the Yellow Breeches Creek, approximately 20 miles from the outfall. Considering distance, nature and dilution, the discharge is not expected to significantly impact this intake.

Treatment Facility Summary				
Treatment Facility Name: South Middleton Township Municipal Authority WWTP				
WQM Permit No.	Issuance Date	WQM Permit No.	Issuance Date	
2102403 A-3	04/18/2014	WQG02212102	08/13/2021	
2108404	10/17/2008	WQG02211701	08/08/2017	
WQG02210601	08/18/2006	2172402	04/27/2017	
2104414	01/26/2005	2172402	06/20/1972	
2103404	10/10/2003	2172402 11-1	03/12/2013	
Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Tertiary with phosphorous removal	Activated Sludge	Ultraviolet	1.5
Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
1.5	2,940	Not Overloaded	Aerobic Digestion	Combination of methods

South Middleton Township Municipal Authority WWTP serves South Middleton Township (79%) and Monroe Township (21%) areas. All sewer systems are 100% separated. The facility is located at 345 Lear Lane, Boiling Springs, PA 17007. The treatment process, according to the application, is as follows:

Course/Fine Screening → Pump Station → Grit Removal → 5-stage Integrated Fixed Film Activated Sludge (IFAS) → Clarifiers (2) → Cloth Media Filters (2) → UV Disinfection → Outfall 001 to Yellow Breeches Creek

IFAS system has four treatment trains and each of this train consists of anaerobic zone, anoxic zone no.1, aeration zone no.1 & no.2, recycle sump, anoxic zone no.2, and reaeration zone.

Aluminum Sulfate is added for phosphorous removal. Solids from IFAS and clarifiers are sent to aerobic digesters (6) and then thickened with a rotary drum thickener. Digested solids will be land applied, placed on reed beds (13) at the site or dewatered using a centrifuge. For sludge disposal, SMTMA is currently authorized under DEP's biosolids permit no. PAG083603.

The facility currently has two (2) industrial users connected to the sewer system. One of the users, Land O' Lakes, is however contributing only sanitary wastewater (5,050 GPD) to the sewer system. Industrial wastewater generated from Land O' Lakes is treated and discharges to water(s) of Commonwealth (NPDES Permit no. PA0044911). Another user, Vitro Flat Glass LLC (formerly known as PPG Industries), discharges 17,100 GPD of sanitary wastewater and 7,400 GPD of process wastewater to the sewer system. This is a glass manufacturing facility generating industrial wastewater from the temporary protective overcoat spray process applied to some glass products. Considering the number and percent wastewater contribution of industrial users, SMTMA does not currently have a pretreatment program.

Compliance History

Summary of DMRs:	A summary of past 12-month DMR data is presented on the next page.																		
Summary of Inspections:	01/12/2022: Brandon Bettinger, DEP Water Quality Specialist, conducted a routine inspection. No violations were noted at the time of inspection. 02/25/2021: Mike Benham, former DEP Water Quality Specialist, conducted a routine inspection. A number of recommendations on O&M were made during the inspection but no violations noted. 04/29/2020: Mike Benham conducted an incident inspection in response to the SSO reported on 4/28/2020. A 5-day report submission was recommended. No violations were noted at the time of inspection.																		
Other Comments:	<p>Since the last permit reissuance, the facility had the following permit violations:</p> <table><tr><th>Date</th><th>Description</th><th>NON_COMPL_CATEGORY_DESC</th></tr><tr><td>Jul-19</td><td></td><td>Unauthorized Discharges</td></tr><tr><td>Nov-20</td><td>Late DMR Submission</td><td>Other Violations</td></tr><tr><td>Apr-21</td><td>Late DMR Submission</td><td>Other Violations</td></tr><tr><td>Dec-21</td><td>Late DMR Submission</td><td>Other Violations</td></tr><tr><td>Mar-22</td><td>Late DMR Submission</td><td>Other Violations</td></tr></table> <p>DEP's database revealed that there are two (2) open violations associated with DEP SCRO Safe Drinking Water Program on August 26, 2021 for failure of a public water system to obtain a permit and on 03/11/2022 for failure to address a significant deficiency. A draft permit cover letter will indicate that the permit may not be finalized until all open violations are resolved and closed.</p>	Date	Description	NON_COMPL_CATEGORY_DESC	Jul-19		Unauthorized Discharges	Nov-20	Late DMR Submission	Other Violations	Apr-21	Late DMR Submission	Other Violations	Dec-21	Late DMR Submission	Other Violations	Mar-22	Late DMR Submission	Other Violations
Date	Description	NON_COMPL_CATEGORY_DESC																	
Jul-19		Unauthorized Discharges																	
Nov-20	Late DMR Submission	Other Violations																	
Apr-21	Late DMR Submission	Other Violations																	
Dec-21	Late DMR Submission	Other Violations																	
Mar-22	Late DMR Submission	Other Violations																	

Effluent Data

DMR Data for Outfall 001 (from April 1, 2021 to March 31, 2022)

Parameter	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21	APR-21
Flow (MGD) Average Monthly	0.784	0.825	0.723	0.732	0.778	0.785	0.953	0.725	0.711	0.723	0.755	0.831
Flow (MGD) Daily Maximum	0.866	1.052	0.825	0.792	0.994	1.072	1.584	1.013	0.915	0.855	0.905	1.214
pH (S.U.) Minimum	7.23	6.87	6.80	7.19	7.10	7.12	7.19	7.15	6.99	7.07	7.13	7.0
pH (S.U.) Maximum	7.79	7.69	8.63	7.71	7.65	7.73	8.0	7.62	7.46	7.55	7.97	8.12
DO (mg/L) Minimum	8.73	9.22	9.20	8.83	8.90	8.42	9.18	8.3	8.21	8.76	8.70	9.61
CBOD5 (lbs/day) Average Monthly	13.05	18.37	12.87	13.82	22.13	12.59	16.08	13.84	13.57	12.27	13.15	13.83
CBOD5 (lbs/day) Weekly Average	13.67	30.76	15.37	17.97	27.77	13.65	18.09	16.1	14.60	13.55	15.13	15.03
CBOD5 (mg/L) Average Monthly	2.0	2.65	2.18	2.27	3.52	2.0	2.0	2.27	2.26	2.01	2.16	2.07
CBOD5 (mg/L) Weekly Average	2.0	4.45	2.55	2.85	4.45	2.0	2.0	2.5	2.65	2.05	2.25	2.3
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	1011.8	1358.48	1034.70	993.02	959.84	461.33	691.71	445.94	691.52	537.32	672.49	491.62
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	1222.7	1640.68	1306.34	1189.52	1183.95	749.60	1192.54	945.29	1175.47	1098.80	989.77	918.41
BOD5 (mg/L) Raw Sewage Influent Average Monthly	154.98	195.88	175.50	163.00	152.78	73.48	88.39	73.78	115.46	87.61	111.48	73.73
TSS (lbs/day) Average Monthly	26.08	27.74	23.64	24.30	25.14	25.15	32.313	24.58	24.18	24.83	24.29	26.75
TSS (lbs/day) Raw Sewage Influent Average Monthly	1081.7	1297.96	1180.19	1390.35	1249.89	445.62	882.69	536.35	746.11	594.42	604.91	474.97
TSS (lbs/day) Raw Sewage Influent Daily Maximum	1755.1	1561.72	1671.44	2514.31	1699.33	1238.59	1666.92	1338.14	1574.26	1829.17	1120.01	1545.30
TSS (lbs/day) Weekly Average	27.32	29.65	24.40	25.47	25.44	27.27	36.135	29.10	24.39	26.71	26.86	30.02
TSS (mg/L) Average Monthly	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.1	4.0	4.0

NPDES Permit Fact Sheet
South Middleton Township MA WWTP

NPDES Permit No. PA0044113

Parameter	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21	APR-21
TSS (mg/L) Raw Sewage Influent Average Monthly	165.7	187.13	200.13	231.44	198.56	71.41	115.70	88.98	125.56	97.13	100.00	69.39
TSS (mg/L) Weekly Average	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.35	4.0	4.0
Fecal Coliform (CFU/100 ml) Geometric Mean	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	2.0	2	< 1	6	1	1	1	1	< 1	< 1	< 1	1
UV Intensity (µw/cm²) Minimum	261	248.3	161.0	172.0	183.3	184.0	179.6	216	173.3	183.3	165.0	190.0
Nitrate-Nitrite (mg/L) Average Monthly	2.57	2.10	3.66	3.77	4.85	5.18	5.77	3.54	2.48	2.36	1.30	1.47
Nitrate-Nitrite (lbs) Total Monthly	530.38	416.22	667.47	712.69	919.37	1032.92	1349.9	676.9	472.96	441.60	247.92	295.30
Total Nitrogen (mg/L) Average Monthly	3.21	2.73	4.46	4.54	5.45	5.71	6.34	4.51	3.22	2.92	1.83	2.11
Total Nitrogen (lbs) Effluent Net Total Monthly	659.12	538.65	814.14	859.11	1031.20	1135.61	1485.67	859.04	610.29	545.03	347.01	423.30
Total Nitrogen (lbs) Total Monthly	659.12	538.65	814.14	859.11	1031.20	1135.61	1485.67	859.04	610.29	545.03	347.01	423.30
Total Nitrogen (lbs) Effluent Net Total Annual							9391					
Total Nitrogen (lbs) Total Annual							9391					
Ammonia (lbs/day) Average Monthly	0.65	0.70	0.64	0.61	0.63	0.63	0.8	0.61	0.61	0.61	0.61	0.68
Ammonia (mg/L) Average Monthly	0.1	0.10	0.11	0.10	0.10	0.10	0.1	0.1	0.10	0.10	0.10	0.10
Ammonia (lbs) Total Monthly	20.24	19.53	19.96	18.88	18.90	19.57	24.13	19.05	18.77	18.30	18.79	20.33
Ammonia (lbs) Total Annual							233					
TKN (mg/L) Average Monthly	0.64	0.64	0.80	0.77	0.59	0.53	0.56	0.97	0.74	0.56	0.53	0.64
TKN (lbs) Total Monthly	128.74	122.43	146.67	146.42	111.83	102.69	135.77	182.14	137.33	103.43	99.08	128.00

NPDES Permit Fact Sheet
South Middleton Township MA WWTP

NPDES Permit No. PA0044113

Parameter	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21	APR-21
Total Phosphorus (lbs/day) Average Monthly	6.54	7.10	5.58	6.27	6.48	6.38	8.72	6.03	7.14	6.81	6.55	6.78
Total Phosphorus (mg/L) Average Monthly	1.0	1.02	0.94	1.03	1.03	1.02	1.09	0.98	1.17	1.12	1.07	1.01
Total Phosphorus (lbs) Effluent Net Total Monthly	202.59	198.66	172.98	194.30	194.27	197.70	261.73	186.90	221.27	204.37	203.01	203.37
Total Phosphorus (lbs) Total Monthly	202.59	198.66	172.98	194.30	194.27	197.70	261.73	186.90	221.27	204.37	203.01	203.37
Total Phosphorus (lbs) Effluent Net Total Annual							2201					
Total Phosphorus (lbs) Total Annual							2201					

Existing Effluent Limits 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	9.0 Max	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
UV intensity (µw/cm²)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Recorded
CBOD5 May 1 - Oct 31	187	275	XXX	15.0	22.0	30	2/week	24-Hr Composite
CBOD5 Nov 1 - Apr 30	218	325	XXX	17.5	26.0	35	2/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Suspended Solids	250	375	XXX	20.0	30.0	40	2/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/week	Grab
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/week	Grab
Ammonia-Nitrogen May 1 - Oct 31	100	XXX	XXX	8.0	XXX	16	2/week	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	119	XXX	XXX	9.5	XXX	19	2/week	24-Hr Composite
Total Phosphorus	18.5	XXX	XXX	1.5	XXX	3.0	2/week	24-Hr Composite

Existing Effluent Limits and Monitoring Requirements (continued)

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 ⁽³⁾	Report	27397	XXX	XXX	XXX	XXX	1/month	Calculation
Net Total Phosphorus ⁽³⁾	Report	3653	XXX	XXX	XXX	XXX	1/month	Calculation

(3) The permittee is authorized to use 1925 lbs/year as Total Nitrogen (TN) Offsets toward compliance with the Annual Net TN mass load limitations (Cap Loads), in accordance with Part C of this permit. These Offsets may be applied throughout the Compliance Year or during the Truing Period. The application of offsets must be reported to DEP as described in Part C. The Offsets are authorized for the following pollutant load reduction activities:

- Connection of 77 on-lot sewage disposal systems to the public sewer system after January 1, 2003, in which 25 lbs/year of TN offsets are granted per connection.

Development of Effluent Limitations and Monitoring Requirements

Outfall No. 001
Latitude 40° 8' 51.28"
Wastewater Description: Sewage Effluent

Design Flow (MGD) 1.5
Longitude -77° 5' 43.56"

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: The facility currently utilizes UV system; therefore, TRC effluent limitation is not applicable. See Best Professional Judgment Limitations section for additional consideration for CBOD₅, NH₃-N and Total Suspended Solids effluent limits.

Water Quality-Based Limitations

CBOD₅, NH₃-N and Dissolved Oxygen (DO)

WQM 7.0 is a water quality model designed to assist DEP to determine appropriate permit requirements for CBOD₅, NH₃-N and DO. DEP's guidance no. 391-2000-007 provides the technical methods contained in WQM 7.0 for conducting wasteload allocation and for determining recommended NPDES effluent 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. As shown on the table below, there is a number of point source discharges located on the Yellow Breeches Creek. A multiple discharge analysis was therefore conducted to evaluate the cumulative impact of these discharges:

Facility Name	NPDES Permit no.	RMI	Discharge Flow, MGD
Huntsdale Fish Hatchery	PA0037141	40.75	12.34
SMTMA WWTP	PA0044113	26.9	1.5
Williams Grove MHP	PA0081795	21.65	0.03
Upper Allen WWTP	PA0024902	19.14	1.1

For the multiple discharge analysis, the information currently available to DEP was used. The Water Quality Network station no. 212 is situated at the mouth of Yellow Breeches Creek approximately 27 miles downstream of the outfall. This station routinely collects chemical/biological data of the stream. As recommended by DEP's technical guidance no. 391-2000-006, median pH (8.0 SU) and temperature (20.5 °C) values obtained from this WQN station will be used in modeling. All other discharges such as small flow sewage and water treatment plant wastewater were purposely excluded from the analysis considering the volume and nature of discharge. These stream reaches were properly chosen as the model accommodates the DO sag curve low point and beginning of recovery. The model output indicates that existing limits for all discharges except for Upper Allen STP discharge are still protective of water quality. No changes are therefore recommended for SMTMA.

Toxics

DEP utilizes a Toxics Management Spreadsheet (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 worksheet combines the functionality of DEP's Toxics Screening Analysis worksheet and PENTOXSD. The initial review based on the spreadsheet requires a routine monitoring for Total Copper and WQBELs for Indeno (1,2,3-cd) pyrene. Based on the sample results provided in the application, SMT may not be able to achieve compliance with WQBELs for Indeno (1,2,3-cd) pyrene. In such cases, DEP's SOP no. BCW.PMT-037 recommends a pre-draft permit survey to be developed and sent to the permittee. This survey allows DEP to develop appropriate permit requirements and to understand facility's current capabilities or plans to treat or control the pollutant of concern. The survey was prepared on May 19, 2022 and SMT completed and submitted the survey on June 8, 2022 indicating that SMT will conduct additional sampling for Indeno (1,2,3-cd) pyrene to supplement the application. On October 13, 2022, DEP received additional influent/effluent sample results for both Indeno (1,2,3-cd) pyrene and Total Copper. The results are summarized below.

Sample Date	Total Copper (ug/L)		Indeno (1,2,3-cd) pyrene (ug/)	
	Influent (ug/L)*	Effluent (ug/L)*	Influent (ug/L)*	Effluent (ug/L)*
06/30/2022	88.00	5.0	<1.81	<0.3650
07/07/2022		6.0		<0.3620
07/14/2022	58.00	4.0	<1.79	<0.3580
07/21/2022		6.0		<0.3580
07/28/2022	59.00	5.0	<0.3580	<0.3580
08/04/2022		4.0		<0.3620
08/11/2022	65.00	5.0	<1.79	<0.3580
08/18/2022		6.0		<0.3620

DEP's TOXCON worksheet was utilized to produce an average monthly effluent concentration and daily coefficient of variation for both pollutants. It is noteworthy that given a number of non-detect values for Indeno (1,2,3-cd) pyrene, data cannot be statistically analyzed. Since effluent has been consistently contain non-detect levels of Indeno (1,2,3-cd) pyrene, DEP ruled out the need of WQBELs for Indeno (1,2,3-cd) pyrene. One sample that has a detected value of Indeno (1,2,3-cd) pyrene amongst twelve (12) samples (including samples for the original application) is appeared to be an outlier and Indeno (1,2,3-cd) pyrene is not detected in influent. DEP therefore determined that a reasonable potential has not demonstrated. For Total Copper, the average monthly effluent concentration and daily coefficient of variation values were then entered into Toxics Management Spreadsheet. The spreadsheet still recommends a routine monitoring for Total Copper.

Best Professional Judgment (BPJ) Limitations

CBOD5, NH3-N and Total Suspended Solids

The discharge is in the HQ-CWF segment of Yellow Breeches Creek. Based on the social economic justification (SEJ) approved by memo dated March 27, 1996 for the upgrade project, DEP adjusted existing effluent limits for CBOD5, NH3-N and Total Suspended Solids using antidegradation best available combination of technologies (ABACT) requirements found in DEP's technical guidance no. 391-0300-002 (25 Pa Code §93.4c(b)(iii)). Specifically, these limits were developed during the 1996 permit renewal by mass balancing the ABACT limits for the expanded flow (1.5 MGD) with the limits at 0.75 MGD. Presumably, effluent limits were calculated as follows:

- $CBOD5 = \text{existing } (0.75 \text{ MGD} * 20 \text{ mg/L}) + \text{proposed } (0.75 \text{ MGD} * 10 \text{ mg/L}) = \text{combined } (1.5 \text{ MGD} * X); X = 15 \text{ mg/L}$

Effluent limits for Total Suspended Solids were adjusted in a same manner (i.e., existing limit was 30 mg/L and ABACT is 10 mg/L). For NH3-N, DEP assumed 15 mg/L as an existing limit to calculate the limit since no effluent limit was given for NH3-N prior to the upgrade and ABACT for NH3-N is 1.5 mg/L. These effluent limits were properly determined to ensure that existing and therefore no changes are recommended.

Total Phosphorus

For Total Phosphorus (TP), the current NPDES permit requires the permittee to comply with average monthly and instantaneous maximum (IMAX) limits of 1.5 mg/L and 3.0 mg/L, respectively. Historically a TP effluent limit of 2.0 mg/L was established in the permit when DEP generally determines that the facility is expected to contribute 0.25% or more of the total point source phosphorus loading at the point of impact (page 17 of DEP's technical guidance no. 391-2000-018). DEP previously documented that the discharge contributes more than 0.25% and phosphorus controls were therefore

needed. Since the discharge is in the HQ-CWF segment of Yellow Breeches Creek, DEP adjusted TP effluent limits during the 1996 permit renewal using ABACT (i.e., 1.0 mg/L). These effluent limits were properly determined and therefore no changes are recommended.

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)¹ and it is also determined to be appropriate according to water quality modeling.

Additional Considerations

E. Coli Monitoring Requirement

As recommended by DEP's SOP no. BPNPSM-PMT-033, 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/month will be included permit to be consistent with the recommendation from this SOP.

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.

Flow Monitoring

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

Ultraviolet (UV) Monitoring

DEP's Standard Operating Procedure (SOP no. BPNPSM-PMT-033) recommends a routine monitoring of Ultraviolet (UV) transmittance or intensity when the facility is utilizing an UV disinfection system in lieu of chlorination. Presumably, this recommendation was implemented as a part of the proper operation and maintenance requirement specified in Part B of the NPDES permit, requesting permittees to demonstrate the effectiveness of UV disinfection system. This is a reasonable approach and has been assigned to other facilities equipped with similar technology. Accordingly, UV monitoring is recommended for this permit renewal.

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 491 mg/L and Bromide was non-detected at 0.1 mg/L. Accordingly, the requirement to monitor these pollutants is not necessary.

¹ Although DO criteria for HQ waters is not specified, 25 Pa Code § 93.7(a) requires a minimum of 5.0 mg/L for DO in CWF waters and Yellow Breeches Creek has a protected water use designation of HQ-CWF.

Stormwater Requirements

Stormwater discharges from any POTWs (SIC Code 4952) described in 40 CFR § 122.26(b)(14)(ix) require coverage under an NPDES permit. There are currently five (5) stormwater outfalls collecting stormwater drained from the property. These outfalls are as follows:

Outfall no.	Coordinates	Drainage Area (ft ²)	Receiving Water
002	Lat: 40°08'53" Long: -77°05'49"	2,357	UNT to Yellow Breeches Creek
003	Lat: 40°08'52" Long: -77°05'47"	4,429	UNT to Yellow Breeches Creek
004	Lat: 40°08'50" Long: -77°05'47"	24,619	UNT to Yellow Breeches Creek
005	Lat: 40°08'49" Long: -77°05'43"	5,091	UNT to Yellow Breeches Creek
006	Lat: 40°08'44" Long: -77°05'39"	15,262	UNT to Yellow Breeches Creek

In general, DEP's standard Part C stormwater requirements and site-specific best management practices (BMPs) are included in the permit for those POTWs. The following standard BMPs for POTWs will be included in Part C of the draft 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.

Chesapeake Bay TMDL

On March 30, 2012, DEP finalized Pennsylvania's Chesapeake Watershed Implementation Plan Phase 2 (i.e., Phase 2 WIP) to address U.S EPA's expectations for the Chesapeake Bay TMDL. The Chesapeake Bay TMDL identifies the necessary pollution reductions from major sources of nitrogen, phosphorus and sediment across the Bay jurisdictions and sets pollution limits necessary to meet water quality standards. The Phase 2 WIP is an update to the Pennsylvania's Chesapeake Bay TMDL Strategy (2004) and the Chesapeake WIP Phase I (2011). In August 2019, DEP finalized Phase 3 Chesapeake Bay Watershed Implementation Plan to provide the plans in place by 2025 to further achieve the nutrient and sediment reduction targets. The more details on the TMDL are available at www.dep.pa.gov.

As part of the Phase 3 WIP process, a Supplement to the Phase 3 WIP was developed, providing an update on TMDL implementation for point sources and a discussion of adjustments to the permitting strategy as a result of implementation experience. According to this document, Mechanicsburg Borough WWTP is a Phase 3 significant discharger located within the Chesapeake Bay watershed. The following Cap Loads specified in the current Supplement to the Phase 3 WIP 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
PA0044113	2	South Middleton Township Municipal Authority	4/27/2017	4/30/2022	10/1/2014	27,397	-	3,653	0.961	0.436

The permittee is authorized to use 1925 lbs/year as Total Nitrogen (TN) Offsets toward compliance with the Annual Net TN mass load limitations (Cap Loads) based on the connection of 77 on-lot sewage disposal systems to the public sewer system after January 1, 2003, in which 25 lbs/year of TN offsets are granted per connection. No additional offsets have been requested since the last permit reissuance.

Monitoring Frequency and Sample Type

Unless otherwise specified throughout this fact sheet, monitoring frequencies and sample types are derived from the "NPDES Permit Writer's Manual" (362-0400-001) and/or BPJ.

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.

Whole Effluent Toxicity (WET)

For Outfall 001, ☐ **Acute** ☒ **Chronic** WET Testing was completed:

- ☒ For the permit renewal application (4 tests).
☐ Quarterly throughout the permit term.
☐ Quarterly throughout the permit term and a TIE/TRE was conducted.
☐ Other:

The dilution series used for the tests was: 100%, 60%, 30%, 5%, and 2%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 5%.

Summary of Four Most Recent Test Results

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

NOEC/LC50 Data Analysis

Test Date	Ceriodaphnia Results (% Effluent)			Pimephales Results (% Effluent)			Pass? *
	NOEC Survival	NOEC Reproduction	LC50	NOEC Survival	NOEC Growth	LC50	
August 2018	100	100		100	100		Yes
August 2019	100	100		100	100		Yes
July 2020	100	30		100	100		Yes
July 2021	100	100		100	100		Yes

* A "passing" result is that which is greater than or equal to the TIWC value.

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

☐ YES ☒ NO

Comments: DEP's Whole Effluent Toxicity Testing Analysis Spreadsheet is attached to this fact sheet for further verification.

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

Acute Partial Mix Factor (PMFa): **0.218**

Chronic Partial Mix Factor (PMFc): **1.0**

1. Determine IWC – Acute (IWCa):

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

$$[(1.5 \text{ MGD} \times 1.547) / ((42.93 \text{ cfs} \times 0.218) + (1.5 \text{ MGD} \times 1.547))] \times 100 = \mathbf{19.87\%}$$

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

Type of Test for Permit Renewal: Chronic

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

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

$$[(1.5 \text{ MGD} \times 1.547) / ((42.93 \text{ cfs} \times 1.0) + (1.5 \text{ MGD} \times 1.547))] \times 100 = \mathbf{5.12\% = 5\%}$$

3. Determine Dilution Series

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

Dilution Series = 100%, 60%, 30%, 5%, and 2%.

WET Limits

Has reasonable potential been determined? ☐ YES ☒ NO

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

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

NA

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

NA

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	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 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
CBOD5 Nov 1 - Apr 30	218	325	XXX	17.5	26.0	35	2/week	24-Hr Composite
CBOD5 May 1 - Oct 31	187	275	XXX	15.0	22.0	30	2/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/week	24-Hr Composite
TSS	250	375	XXX	20.0	30.0	40	2/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/week	Grab
UV Intensity (µw/cm²)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Recorded
Nitrate-Nitrite	XXX	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Nitrate-Nitrite (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/month	Calculation

Outfall 001 , Continued (from Permit Effective Date through Permit Expiration Date)

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) ⁽¹⁾		Concentrations (mg/L)				Minimum ⁽²⁾ Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Daily Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Total Nitrogen (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Ammonia Nov 1 - Apr 30	119	XXX	XXX	9.5	XXX	19	2/week	24-Hr Composite
Ammonia May 1 - Oct 31	100	XXX	XXX	8.0	XXX	16	2/week	24-Hr Composite
Ammonia (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
TKN	XXX	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
TKN (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Phosphorus	18.5	XXX	XXX	1.5	XXX	3	2/week	24-Hr Composite
Total Phosphorus (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Copper	Report	Report Daily Max	XXX	Report	Report Daily Max	XXX	1/month	24-Hr Composite

Proposed 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		
Total Nitrogen (lbs) Effluent Net	XXX	27397 Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Nitrogen (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Ammonia (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Phosphorus (lbs)	XXX	Report Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation
Total Phosphorus (lbs) Effluent Net	XXX	3653 Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation

Tools and References Used to Develop Permit	
<input type="checkbox"/>	WQM for Windows Model (see Attachment)
<input type="checkbox"/>	Toxics Management Spreadsheet (see Attachment)
<input type="checkbox"/>	TRC Model Spreadsheet (see Attachment)
<input type="checkbox"/>	Temperature Model Spreadsheet (see Attachment)
<input type="checkbox"/>	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
<input type="checkbox"/>	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
<input type="checkbox"/>	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
<input type="checkbox"/>	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
<input type="checkbox"/>	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
<input type="checkbox"/>	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
<input type="checkbox"/>	Pennsylvania CSO Policy, 385-2000-011, 9/08.
<input type="checkbox"/>	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
<input type="checkbox"/>	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
<input type="checkbox"/>	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
<input type="checkbox"/>	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
<input type="checkbox"/>	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004.
<input 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 type="checkbox"/>	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
<input type="checkbox"/>	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
<input type="checkbox"/>	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
<input type="checkbox"/>	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
<input type="checkbox"/>	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 10/97.
<input type="checkbox"/>	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 391-2000-019, 10/97.
<input type="checkbox"/>	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 3/99.
<input type="checkbox"/>	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 391-2000-022, 3/1999.
<input type="checkbox"/>	Design Stream Flows, 391-2000-023, 9/98.
<input type="checkbox"/>	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98.
<input type="checkbox"/>	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
<input type="checkbox"/>	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
<input type="checkbox"/>	SOP:
<input type="checkbox"/>	Other:

Attachments

1. StreamStats

5/19/22, 7:49 AM

StreamStats

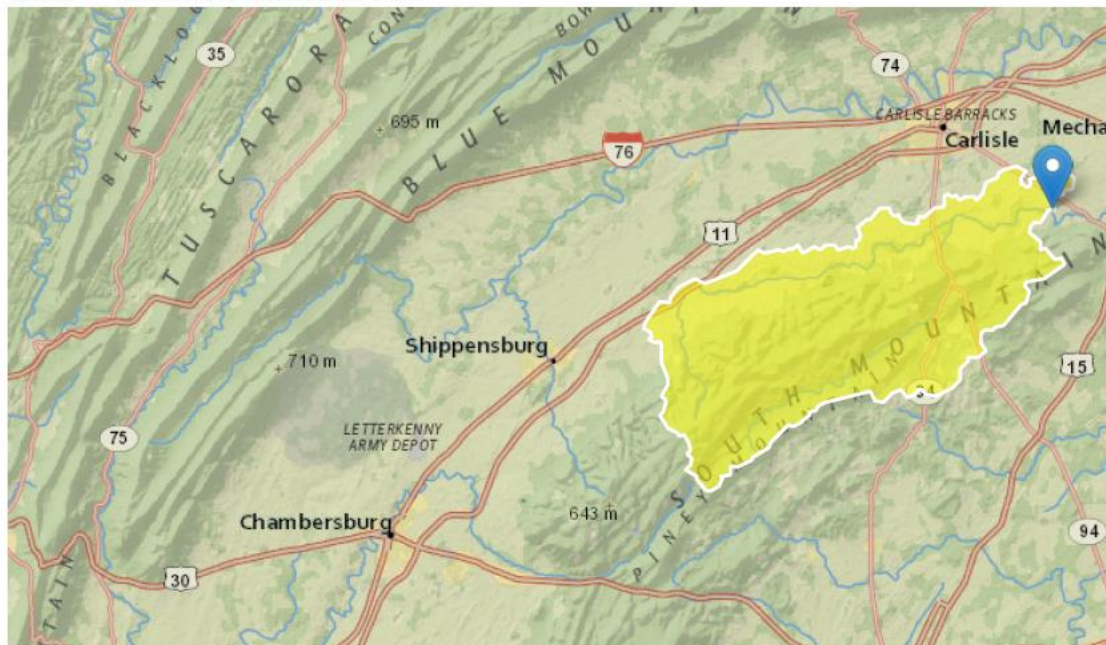
StreamStats Report

Region ID: PA

Workspace ID: PA20220519114827622000

Clicked Point (Latitude, Longitude): 40.14893, -77.09334

Time: 2022-05-19 07:48:48 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	34.4	percent
DRNAREA	Area that drains to a point on a stream	135	square miles
PRECIP	Mean Annual Precipitation	40	inches
ROCKDEP	Depth to rock	5.3	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	1.11	miles per square mile

5/19/22, 7:49 AM

StreamStats

Low-Flow Statistics Parameters [100.0 Percent (135 square miles) Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	135	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	40	inches	35	50.4
STRDEN	Stream Density	1.11	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	5.3	feet	3.32	5.65
CARBON	Percent Carbonate	34.4	percent	0	99

Low-Flow Statistics Flow Report [100.0 Percent (135 square miles) Low Flow Region 2]

PIl: Prediction Interval-Lower, Plu: 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	52.2	ft ³ /s	38	38
30 Day 2 Year Low Flow	58.1	ft ³ /s	33	33
7 Day 10 Year Low Flow	39.3	ft ³ /s	51	51
30 Day 10 Year Low Flow	42.8	ft ³ /s	46	46
90 Day 10 Year Low Flow	49.9	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/>)

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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
07E	10121	YELLOW BREECHES CREEK	40.750	598.00	40.50	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary		Stream	
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	Temp (°C)	pH	Temp (°C)	pH
Q7-10	0.318	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.50	8.00	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
PFBC 001	PA0037141	12.3400	12.3400	12.3400	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	5.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	1.00	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
07E	10121	YELLOW BREECHES CREEK	32.630	501.00	111.00	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	pH	Stream Temp	pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.318	8.26	0.00	0.000	0.000	0.0	0.00	0.00	20.50	8.00	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	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	3.00	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
07E	10121	YELLOW BREECHES CREEK	26.900	454.00	135.00	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	pH	Stream Temp	pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.318	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.50	8.00	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
South Middleton	PA0044113	1.5000	1.5000	1.5000	0.000	20.00	7.70

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	15.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	8.00	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
07E	10121	YELLOW BREECHES CREEK	21.650	415.00	155.00	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	pH	Stream Temp	pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.318	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.50	8.00	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
Williams Grove	PA0081795	0.0300	0.0300	0.0300	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
07E	10121	YELLOW BREECHES CREEK	19.140	410.00	162.00	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary		Stream	
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	Temp	pH	Temp	pH
Q7-10	0.318	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.50	8.00	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
Upper Allen	PA0024902	1.1000	1.1000	1.1000	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	20.00	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
07E	10121	YELLOW BREECHES CREEK	18.940	398.00	175.00	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	pH	Stream Temp	pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.318	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.50	8.00	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

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>		
07E	10121	YELLOW BREECHES CREEK		
<u>RMI</u>	<u>Total Discharge Flow (mgd)</u>	<u>Analysis Temperature (°C)</u>	<u>Analysis pH</u>	
40.750	12.340	20.201	7.196	
<u>Reach Width (ft)</u>	<u>Reach Depth (ft)</u>	<u>Reach WDRatio</u>	<u>Reach Velocity (fps)</u>	
63.668	0.829	76.771	0.605	
<u>Reach CBOD5 (mg/L)</u>	<u>Reach Kc (1/days)</u>	<u>Reach NH3-N (mg/L)</u>	<u>Reach Kn (1/days)</u>	
3.79	0.773	0.60	0.711	
<u>Reach DO (mg/L)</u>	<u>Reach Kr (1/days)</u>	<u>Kr Equation</u>	<u>Reach DO Goal (mg/L)</u>	
6.306	6.288	Tsivoglou	5	
<u>Reach Travel Time (days)</u>	Subreach Results			
0.820	TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
	0.082	3.56	0.56	7.05
	0.164	3.34	0.53	7.51
	0.246	3.13	0.50	7.81
	0.328	2.94	0.47	8.01
	0.410	2.75	0.45	8.15
	0.492	2.58	0.42	8.21
	0.574	2.42	0.40	8.21
	0.656	2.27	0.37	8.21
	0.738	2.13	0.35	8.21
	0.820	2.00	0.33	8.21

<u>RMI</u>	<u>Total Discharge Flow (mgd)</u>	<u>Analysis Temperature (°C)</u>	<u>Analysis pH</u>	
32.630	12.340	20.263	7.278	
<u>Reach Width (ft)</u>	<u>Reach Depth (ft)</u>	<u>Reach WDRatio</u>	<u>Reach Velocity (fps)</u>	
84.292	0.891	94.599	0.536	
<u>Reach CBOD5 (mg/L)</u>	<u>Reach Kc (1/days)</u>	<u>Reach NH3-N (mg/L)</u>	<u>Reach Kn (1/days)</u>	
2.00	0.000	0.26	0.714	
<u>Reach DO (mg/L)</u>	<u>Reach Kr (1/days)</u>	<u>Kr Equation</u>	<u>Reach DO Goal (mg/L)</u>	
8.218	3.906	Tsivoglou	5	
<u>Reach Travel Time (days)</u>	Subreach Results			
0.654	TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
	0.065	2.00	0.25	8.20
	0.131	2.00	0.24	8.20
	0.196	2.00	0.23	8.20
	0.262	2.00	0.22	8.20
	0.327	2.00	0.21	8.20
	0.392	2.00	0.20	8.20
	0.458	2.00	0.19	8.20
	0.523	2.00	0.18	8.20
	0.588	2.00	0.17	8.20
	0.654	2.00	0.17	8.20

WQM 7.0 Hydrodynamic Outputs

<u>SWP Basin</u>		<u>Stream Code</u>		<u>Stream Name</u>								
07E		10121		YELLOW BREECHES CREEK								
RMI	Stream Flow	PWS With	Net Stream Flow	Disc Analysis Flow	Reach Slope	Depth	Width	W/D Ratio	Velocity	Reach Trav Time	Analysis Temp	Analysis pH
	(cfs)	(cfs)	(cfs)	(cfs)	(ft/ft)	(ft)	(ft)		(fps)	(days)	(°C)	
Q7-10 Flow												
40.750	12.88	0.00	12.88	19.09	0.00222	.829	63.67	76.77	0.61	0.820	20.20	7.20
32.630	21.14	0.00	21.14	19.09	0.00155	.891	84.29	94.6	0.54	0.654	20.26	7.28
26.900	28.77	0.00	28.77	21.4105	0.00141	.918	94.93	103.41	0.58	0.557	20.29	7.35
21.650	35.13	0.00	35.13	21.4569	0.00038	.973	108.57	111.58	0.54	0.286	20.31	7.39
19.140	37.36	0.00	37.36	23.1586	0.01136	.98	84.51	86.24	0.73	0.017	20.31	7.38
Q1-10 Flow												
40.750	12.11	0.00	12.11	19.09	0.00222	NA	NA	NA	0.60	0.831	20.19	7.19
32.630	19.87	0.00	19.87	19.09	0.00155	NA	NA	NA	0.53	0.666	20.26	7.27
26.900	27.04	0.00	27.04	21.4105	0.00141	NA	NA	NA	0.56	0.568	20.28	7.34
21.650	33.02	0.00	33.02	21.4569	0.00038	NA	NA	NA	0.52	0.292	20.30	7.38
19.140	35.12	0.00	35.12	23.1586	0.01136	NA	NA	NA	0.72	0.017	20.30	7.37
Q30-10 Flow												
40.750	13.91	0.00	13.91	19.09	0.00222	NA	NA	NA	0.62	0.805	20.21	7.21
32.630	22.83	0.00	22.83	19.09	0.00155	NA	NA	NA	0.55	0.639	20.27	7.29
26.900	31.07	0.00	31.07	21.4105	0.00141	NA	NA	NA	0.59	0.543	20.30	7.36
21.650	37.94	0.00	37.94	21.4569	0.00038	NA	NA	NA	0.55	0.279	20.32	7.40
19.140	40.35	0.00	40.35	23.1586	0.01136	NA	NA	NA	0.75	0.016	20.32	7.40

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	<input checked="" type="checkbox"/>
WLA Method	EMPR	Use Inputted W/D Ratio	<input type="checkbox"/>
Q1-10/Q7-10 Ratio	0.94	Use Inputted Reach Travel Times	<input type="checkbox"/>
Q30-10/Q7-10 Ratio	1.08	Temperature Adjust Kr	<input checked="" type="checkbox"/>
D.O. Saturation	90.00%	Use Balanced Technology	<input checked="" type="checkbox"/>
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>
07E	10121	YELLOW BREECHES 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
40.750	PFBC 001	13.7	2	13.7	2	0	0
32.630		NA	NA	12.42	NA	NA	NA
26.900	South Middleton	4	16	11.33	16	0	0
21.650	Williams Grove	3.78	50	10.74	50	0	0
19.140	Upper Allen	4.96	50	10.83	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
40.750	PFBC 001	1.69	1	1.69	1	0	0
32.630		NA	NA	1.6	NA	NA	NA
26.900	South Middleton	.79	8	1.52	8	0	0
21.650	Williams Grove	.76	25	1.48	25	0	0
19.140	Upper Allen	.91	22.41	1.48	22.41	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	<u>CBOD5</u>		<u>NH3-N</u>		<u>Dissolved Oxygen</u>		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
40.75	PFBC 001	5	5	1	1	5	5	0	0
32.63		NA	NA	NA	NA	NA	NA	NA	NA
26.90	South Middleton	15	15	8	8	5	5	0	0
21.65	Williams Grove	25	25	25	25	5	5	0	0
19.14	Upper Allen	20	20	22.41	22.41	5	5	0	0

WQM 7.0 Effluent Limits

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>					
07E	10121	YELLOW BREECHES 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)
40.750	PFBC 001	PA0037141	12.340	CBOD5	5		
				NH3-N	1	2	
				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)
26.900	South Middleton	PA0044113	1.500	CBOD5	15		
				NH3-N	8	16	
				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)
21.650	Williams Grove	PA0081795	0.030	CBOD5	25		
				NH3-N	25	50	
				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)
19.140	Upper Allen	PA0024902	1.100	CBOD5	20		
				NH3-N	22.41	44.82	
				Dissolved Oxygen			5

3. Toxic Management Spreadsheet



Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions Discharge Stream

Facility: South Middleton Township MA WWTP NPDES Permit No.: PA0044113 Outfall No.: 001

Evaluation Type: Major Sewage / Industrial Waste Wastewater Description: 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
1.5	206	7						

	Discharge Pollutant	Units	Max Discharge Conc	0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
				Trib Conc	Stream Conc	Daily CV	Hourly CV	Strea m CV	Fate Coeff	FOS	Criteri a Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L	434									
	Chloride (PWS)	mg/L	99.1									
	Bromide	mg/L	< 0.2									
	Sulfate (PWS)	mg/L	52.1									
	Fluoride (PWS)	mg/L										
Group 2	Total Aluminum	µg/L	39									
	Total Antimony	µg/L	< 0.4									
	Total Arsenic	µg/L	< 1									
	Total Barium	µg/L	21									
	Total Beryllium	µg/L	< 0.4									
	Total Boron	µg/L	192									
	Total Cadmium	µg/L	< 0.08									
	Total Chromium (III)	µg/L	< 1									
	Hexavalent Chromium	µg/L	0.43									
	Total Cobalt	µg/L	< 1									
	Total Copper	µg/L	8.5892036			0.263						
	Free Cyanide	µg/L	2									
	Total Cyanide	µg/L	6									
	Dissolved Iron	µg/L	< 10									
	Total Iron	µg/L	10									
	Total Lead	µg/L	< 1									
	Total Manganese	µg/L	1									
	Total Mercury	µg/L	< 0.2									
	Total Nickel	µg/L	1									
	Total Phenols (Phenolics) (PWS)	µg/L	5									
	Total Selenium	µg/L	< 2									
	Total Silver	µg/L	< 0.05									
	Total Thallium	µg/L	< 0.4									
	Total Zinc	µg/L	28									
	Total Molybdenum	µg/L	< 1									
	Acrolein	µg/L	< 1									
	Acrylamide	µg/L	< 0.5									
	Acrylonitrile	µg/L	< 0.5									
	Benzene	µg/L	< 0.5									
	Bromoform	µg/L	< 0.5									
	Carbon Tetrachloride	µg/L	< 0.5									

Group 3	Chlorobenzene	µg/L	<	0.5																
	Chlorodibromomethane	µg/L	<	0.5																
	Chloroethane	µg/L	<	0.5																
	2-Chloroethyl Vinyl Ether	µg/L	<	0.5																
	Chloroform	µg/L	<	0.5																
	Dichlorobromomethane	µg/L	<	0.5																
	1,1-Dichloroethane	µg/L	<	0.5																
	1,2-Dichloroethane	µg/L	<	0.5																
	1,1-Dichloroethylene	µg/L	<	0.5																
	1,2-Dichloropropane	µg/L	<	0.5																
	1,3-Dichloropropylene	µg/L	<	0.5																
	1,4-Dioxane	µg/L	<	0.1																
	Ethylbenzene	µg/L	<	0.5																
	Methyl Bromide	µg/L	<	0.5																
	Methyl Chloride	µg/L	<	0.5																
	Methylene Chloride	µg/L	<	0.5																
	1,1,2,2-Tetrachloroethane	µg/L	<	0.5																
	Tetrachloroethylene	µg/L	<	0.5																
	Toluene	µg/L	<	0.5																
	1,2-trans-Dichloroethylene	µg/L	<	0.5																
	1,1,1-Trichloroethane	µg/L	<	0.5																
	1,1,2-Trichloroethane	µg/L	<	0.5																
	Trichloroethylene	µg/L	<	0.5																
	Vinyl Chloride	µg/L	<	0.5																
Group 4	2-Chlorophenol	µg/L	<	0.0867																
	2,4-Dichlorophenol	µg/L	<	0.0781																
	2,4-Dimethylphenol	µg/L	<	0.416																
	4,6-Dinitro-o-Cresol	µg/L	<	0.112																
	2,4-Dinitrophenol	µg/L	<	2.86																
	2-Nitrophenol	µg/L	<	0.0486																
	4-Nitrophenol	µg/L	<	0.039																
	p-Chloro-m-Cresol	µg/L	<	0.0943																
	Pentachlorophenol	µg/L	<	0.099																
	Phenol	µg/L	<	0.0429																
	2,4,6-Trichlorophenol	µg/L	<	0.0943																
	Acenaphthene	µg/L	<	0.0881																
	Acenaphthylene	µg/L	<	0.0886																
Group 5	Anthracene	µg/L	<	0.105																
	Benzidine	µg/L	<	4.76																
	Benzo(a)Anthracene	µg/L	<	0.059																
	Benzo(a)Pyrene	µg/L	<	0.0586																
	3,4-Benzofluoranthene	µg/L	<	0.0429																
	Benzo(ghi)Perylene	µg/L	<	0.162																
	Benzo(k)Fluoranthene	µg/L	<	0.079																
	Bis(2-Chloroethoxy)Methane	µg/L	<	0.081																
	Bis(2-Chloroethyl)Ether	µg/L	<	0.0743																
	Bis(2-Chloroisopropyl)Ether	µg/L	<	0.0848																
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	5.86																
	4-Bromophenyl Phenyl Ether	µg/L	<	0.103																
	Butyl Benzyl Phthalate	µg/L	<	0.0629																
	2-Chloronaphthalene	µg/L	<	0.0867																
	4-Chlorophenyl Phenyl Ether	µg/L	<	0.0905																
	Chrysene	µg/L	<	0.0895																
	Dibenzo(a,h)Anthracene	µg/L	<	0.0505																
	1,2-Dichlorobenzene	µg/L	<	0.5																
	1,3-Dichlorobenzene	µg/L	<	0.5																
	1,4-Dichlorobenzene	µg/L	<	0.5																
	3,3-Dichlorobenzidine	µg/L	<	0.132																
	Diethyl Phthalate	µg/L	<	0.486																
	Dimethyl Phthalate	µg/L	<	0.267																
	Di-n-Butyl Phthalate	µg/L	<	3.26																
	2,4-Dinitrotoluene	µg/L	<	0.08																
	2,6-Dinitrotoluene	µg/L	<	0.105																
	Di-n-Octyl Phthalate	µg/L	<	0.0724																

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Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

South Middleton Township MA WWTP, NPDES Permit No. PA0044113, Outfall 001

Instructions Discharge Stream

Receiving Surface Water Name: Yellow Breeches Creek

No. Reaches to Model: 1

- ☒ Statewide Criteria
☐ Great Lakes Criteria
☐ ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi ²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	010121	26.9	454	135			Yes
End of Reach 1	001021	21.65	415	155			Yes

Q₇₋₁₀

Location	RMI	LFY (cfs/mi ²)*	Flow (cfs)		W/D Ratio	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary					Hardness	pH	Hardness	pH*	Hardness	pH
Point of Discharge	26.9	0.318									100	7		
End of Reach 1	21.65	0.318												

Q_h

Location	RMI	LFY (cfs/mi ²)*	Flow (cfs)		W/D Ratio	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary					Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	26.9													
End of Reach 1	21.65													



Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

South Middleton Township MA WWTP, NPDES Permit No. PA0044113, Outfall 001

Instructions

Results

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Inputs

Results

Limits

Hydrodynamics

Q₇₋₁₀

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)
26.9	42.93		42.93	2.321	0.001	0.911	91.395	100.325	0.543	0.59	315.966
21.65	49.29		49.29								

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)
26.9	198.62		198.62	2.321	0.001	1.755	91.395	52.063	1.252	0.256	128.223
21.65	224.109		224.11								

Wasteload Allocations

AFC

CCT (min): 15

PMF: 0.218

Analysis Hardness (mg/l): 121.07

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 Aluminum	0	0		0	750	750	3.773	
Total Antimony	0	0		0	1,100	1,100	5.534	
Total Arsenic	0	0		0	340	340	1.711	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	105,649	
Total Boron	0	0		0	8,100	8,100	40,750	
Total Cadmium	0	0		0	2,425	2,59	13.0	Chem Translator of 0.936 applied
Total Chromium (III)	0	0		0	666,347	2,109	10,609	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	82.0	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	478	
Total Copper	0	0		0	16,092	16.8	84.3	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	22	22.0	111	
Dissolved Iron	0	0		0	N/A	N/A	N/A	

Model Results

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CFC	CCT (min): #####	PMF: 1	Analysis Hardness (mg/l): 105.44	Analysis pH: 7.00
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Total Aluminum	0	0		0	N/A	N/A	N/A
Model Results							

Total Antimony	0	0	0	0	0	220	220	4,290	Chem Translator of 1 applied
Total Arsenic	0	0	0	0	0	150	150	2,925	
Total Barium	0	0	0	0	0	4,100	4,100	79,951	
Total Boron	0	0	0	0	0	1,600	1,600	31,201	
Total Cadmium	0	0	0	0	0	0.285	0.28	5.49	Chem Translator of 0.907 applied
Total Chromium (III)	0	0	0	0	0	77.398	80.0	1,755	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0	0	0	0	10	10.4	203	Chem Translator of 0.952 applied
Total Cobalt	0	0	0	0	0	19	19.0	371	
Total Copper	0	0	0	0	0	9.370	9.76	190	Chem Translator of 0.96 applied
Free Cyanide	0	0	0	0	0	5.2	5.2	101	
Dissolved Iron	0	0	0	0	0	N/A	N/A	N/A	
Total Iron	0	0	0	0	0	1,500	1,500	29,250	WQC = 30 day average; PMF = 1
Total Lead	0	0	0	0	0	2.666	3.4	68.4	Chem Translator of 0.783 applied
Total Manganese	0	0	0	0	0	N/A	N/A	N/A	
Total Mercury	0	0	0	0	0	0.770	0.91	17.7	Chem Translator of 0.85 applied
Total Nickel	0	0	0	0	0	54.388	54.6	1,064	Chem Translator of 0.997 applied
Total Phenols (Phenolics) (PWS)	0	0	0	0	0	N/A	N/A	N/A	
Total Selenium	0	0	0	0	0	4.600	4.99	97.3	Chem Translator of 0.922 applied
Total Silver	0	0	0	0	0	N/A	N/A	N/A	Chem Translator of 1 applied
Total Thallium	0	0	0	0	0	13	13.0	254	
Total Zinc	0	0	0	0	0	123.558	125	2,444	Chem Translator of 0.986 applied
Acrolein	0	0	0	0	0	3	3.0	58.5	
Acrylamide	0	0	0	0	0	N/A	N/A	N/A	
Acrylonitrile	0	0	0	0	0	130	130	2,535	
Benzene	0	0	0	0	0	130	130	2,535	
Bromoform	0	0	0	0	0	370	370	7,215	
Carbon Tetrachloride	0	0	0	0	0	560	560	10,920	
Chlorobenzene	0	0	0	0	0	240	240	4,680	
Chlorodibromomethane	0	0	0	0	0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0	0	0	0	3,500	3,500	68,251	
Chloroform	0	0	0	0	0	390	390	7,805	
Dichlorobromomethane	0	0	0	0	0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0	0	0	0	3,100	3,100	60,451	
1,1-Dichloroethylene	0	0	0	0	0	1,500	1,500	29,250	
1,2-Dichloropropane	0	0	0	0	0	2,200	2,200	42,901	
1,3-Dichloropropylene	0	0	0	0	0	61	61.0	1,190	
Ethylbenzene	0	0	0	0	0	580	580	11,310	
Methyl Bromide	0	0	0	0	0	110	110	2,145	
Methyl Chloride	0	0	0	0	0	5,500	5,500	107,252	
Methylene Chloride	0	0	0	0	0	2,400	2,400	46,801	
1,1,2,2-Tetrachloroethane	0	0	0	0	0	210	210	4,085	
Tetrachloroethylene	0	0	0	0	0	140	140	2,730	
Toluene	0	0	0	0	0	330	330	6,435	
1,2-trans-Dichloroethylene	0	0	0	0	0	1,400	1,400	27,300	
1,1,1-Trichloroethane	0	0	0	0	0	610	610	11,895	
1,1,2-Trichloroethane	0	0	0	0	0	680	680	13,260	
Trichloroethylene	0	0	0	0	0	459,131/20,750	459,131/20,750	8,775	

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n-Nitrosodimethylamine	0	0	0	0	0	3,400	3,400	66,301	
n-Nitrosodi-n-Propylamine	0	0	0	0	0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0	0	0	0	59	59.0	1,151	
Phenanthrene	0	0	0	0	0	1	1.0	19.5	
Pyrene	0	0	0	0	0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0	0	0	0	26	26.0	507	

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	0	500,000	500,000	N/A	
Chloride (PWS)	0	0	0	0	250,000	250,000	N/A	
Sulfate (PWS)	0	0	0	0	250,000	250,000	N/A	
Total Aluminum	0	0	0	0	N/A	N/A	N/A	
Total Antimony	0	0	0	0	5.6	5.6	109	
Total Arsenic	0	0	0	0	10	10.0	195	
Total Barium	0	0	0	0	2,400	2,400	46,801	
Total Boron	0	0	0	0	3,100	3,100	60,451	
Total Cadmium	0	0	0	0	N/A	N/A	N/A	
Total Chromium (III)	0	0	0	0	N/A	N/A	N/A	
Hexavalent Chromium	0	0	0	0	N/A	N/A	N/A	
Total Cobalt	0	0	0	0	N/A	N/A	N/A	
Total Copper	0	0	0	0	N/A	N/A	N/A	
Free Cyanide	0	0	0	0	4	4.0	78.0	
Dissolved Iron	0	0	0	0	300	300	5,850	
Total Iron	0	0	0	0	N/A	N/A	N/A	
Total Lead	0	0	0	0	N/A	N/A	N/A	
Total Manganese	0	0	0	0	1,000	1,000	19,500	
Total Mercury	0	0	0	0	0.050	0.05	0.98	
Total Nickel	0	0	0	0	610	610	11,895	
Total Phenols (Phenolics) (PWS)	0	0	0	0	5	5.0	N/A	
Total Selenium	0	0	0	0	N/A	N/A	N/A	
Total Silver	0	0	0	0	N/A	N/A	N/A	
Total Thallium	0	0	0	0	0.24	0.24	4.68	
Total Zinc	0	0	0	0	N/A	N/A	N/A	
Acrolein	0	0	0	0	3	3.0	58.5	
Acrylamide	0	0	0	0	N/A	N/A	N/A	
Acrylonitrile	0	0	0	0	N/A	N/A	N/A	
Benzene	0	0	0	0	N/A	N/A	N/A	
Bromoform	0	0	0	0	N/A	N/A	N/A	
Carbon Tetrachloride	0	0	0	0	N/A	N/A	N/A	
Chlorobenzene	0	0	0	0	100	100.0	1,950	
Chlorodibromomethane	0	0	0	0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0	0	0	N/A	N/A	N/A	
Chloroform	0	0	0	0	5.7	5.7	111	
Dichlorobromomethane	0	0	0	0	N/A/13/2022	N/A	N/A	

1,2-Dichloroethane	0	0	0	0	0	N/A	N/A	N/A	N/A
1,1-Dichloroethylene	0	0	0	0	0	33	33.0	644	
1,2-Dichloropropane	0	0	0	0	0	N/A	N/A	N/A	
1,3-Dichloropropylene	0	0	0	0	0	N/A	N/A	N/A	
Ethylbenzene	0	0	0	0	0	68	68.0	1,326	
Methyl Bromide	0	0	0	0	0	100	100.0	1,950	
Methyl Chloride	0	0	0	0	0	N/A	N/A	N/A	
Methylene Chloride	0	0	0	0	0	N/A	N/A	N/A	
1,1,2,2-Tetrachloroethane	0	0	0	0	0	N/A	N/A	N/A	
Tetrachloroethylene	0	0	0	0	0	N/A	N/A	N/A	
Toluene	0	0	0	0	0	57	57.0	1,112	
1,2-trans-Dichloroethylene	0	0	0	0	0	100	100.0	1,950	
1,1,1-Trichloroethane	0	0	0	0	0	10,000	10,000	195,003	
1,1,2-Trichloroethane	0	0	0	0	0	N/A	N/A	N/A	
Trichloroethylene	0	0	0	0	0	N/A	N/A	N/A	
Vinyl Chloride	0	0	0	0	0	N/A	N/A	N/A	
2-Chlorophenol	0	0	0	0	0	30	30.0	585	
2,4-Dichlorophenol	0	0	0	0	0	10	10.0	195	
2,4-Dimethylphenol	0	0	0	0	0	100	100.0	1,950	
4,6-Dinitro-o-Cresol	0	0	0	0	0	2	2.0	39.0	
2,4-Dinitrophenol	0	0	0	0	0	10	10.0	195	
2-Nitrophenol	0	0	0	0	0	N/A	N/A	N/A	
4-Nitrophenol	0	0	0	0	0	N/A	N/A	N/A	
p-Chloro-m-Cresol	0	0	0	0	0	N/A	N/A	N/A	
Pentachlorophenol	0	0	0	0	0	N/A	N/A	N/A	
Phenol	0	0	0	0	0	4,000	4,000	78,001	
2,4,6-Trichlorophenol	0	0	0	0	0	N/A	N/A	N/A	
Acenaphthene	0	0	0	0	0	70	70.0	1,365	
Anthracene	0	0	0	0	0	300	300	5,850	
Benzidine	0	0	0	0	0	N/A	N/A	N/A	
Benzo(a)Anthracene	0	0	0	0	0	N/A	N/A	N/A	
Benzo(a)Pyrene	0	0	0	0	0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0	0	0	0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0	0	0	0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0	0	0	0	N/A	N/A	N/A	
Bis(2-Chloroisopropyl)Ether	0	0	0	0	0	200	200	3,900	
Bis(2-Ethylhexyl)Phthalate	0	0	0	0	0	N/A	N/A	N/A	
4-Bromophenyl Phenyl Ether	0	0	0	0	0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0	0	0	0	0.1	0.1	1.95	
2-Chloronaphthalene	0	0	0	0	0	800	800	15,600	
Chrysene	0	0	0	0	0	N/A	N/A	N/A	
Dibenzo(a,h)Anthracene	0	0	0	0	0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0	0	0	0	1,000	1,000	19,500	
1,3-Dichlorobenzene	0	0	0	0	0	7	7.0	137	
1,4-Dichlorobenzene	0	0	0	0	0	300	300	5,850	
3,3-Dichlorobenzidine	0	0	0	0	0	N/A	N/A	N/A	
Diethyl Phthalate	0	0	0	0	0	609	609.0	11,700	

Dimethyl Phthalate	0	0	0	0	2,000	2,000	39,001	
Di-n-Butyl Phthalate	0	0	0	0	20.0	20.0	390	
2,4-Dinitrotoluene	0	0	0	0	N/A	N/A	N/A	
2,6-Dinitrotoluene	0	0	0	0	N/A	N/A	N/A	
1,2-Diphenylhydrazine	0	0	0	0	N/A	N/A	N/A	
Fluoranthene	0	0	0	0	20	20.0	390	
Fluorene	0	0	0	0	50	50.0	975	
Hexachlorobenzene	0	0	0	0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0	0	0	N/A	N/A	N/A	
Hexachlorocyclopentadiene	0	0	0	0	4	4.0	78.0	
Hexachloroethane	0	0	0	0	N/A	N/A	N/A	
Indeno(1,2,3-cd)Pyrene	0	0	0	0	N/A	N/A	N/A	
Isophorone	0	0	0	0	34	34.0	663	
Naphthalene	0	0	0	0	N/A	N/A	N/A	
Nitrobenzene	0	0	0	0	10	10.0	195	
n-Nitrosodimethylamine	0	0	0	0	N/A	N/A	N/A	
n-Nitrosodi-n-Propylamine	0	0	0	0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0	0	0	N/A	N/A	N/A	
Phenanthrene	0	0	0	0	N/A	N/A	N/A	
Pyrene	0	0	0	0	20	20.0	390	
1,2,4-Trichlorobenzene	0	0	0	0	0.07	0.07	1.37	


CRL 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	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 Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	N/A	N/A	N/A	
Total Arsenic	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	N/A	N/A	N/A	
Total Boron	0	0		0	N/A	N/A	N/A	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Free Cyanide	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	

Model Results	Benzo(a)Pyrene	0	0	0	0.000113/268001	0.009
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3,4-Benzofluoranthene	0	0	0	0	0.001	0.001	0.087	
Benzo(k)Fluoranthene	0	0	0	0	0.01	0.01	0.87	
Bis(2-Chloroethyl)Ether	0	0	0	0	0.03	0.03	2.6	
Bis(2-Chloroisopropyl)Ether	0	0	0	0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0	0	0	0.32	0.32	27.7	
4-Bromophenyl Phenyl Ether	0	0	0	0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0	0	0	N/A	N/A	N/A	
2-Chloronaphthalene	0	0	0	0	N/A	N/A	N/A	
Chrysene	0	0	0	0	0.12	0.12	10.4	
Dibenzo(a,h)Anthracene	0	0	0	0	0.0001	0.0001	0.009	
1,2-Dichlorobenzene	0	0	0	0	N/A	N/A	N/A	
1,3-Dichlorobenzene	0	0	0	0	N/A	N/A	N/A	
1,4-Dichlorobenzene	0	0	0	0	N/A	N/A	N/A	
3,3-Dichlorobenzidine	0	0	0	0	0.05	0.05	4.33	
Diethyl Phthalate	0	0	0	0	N/A	N/A	N/A	
Dimethyl Phthalate	0	0	0	0	N/A	N/A	N/A	
Di-n-Butyl Phthalate	0	0	0	0	N/A	N/A	N/A	
2,4-Dinitrotoluene	0	0	0	0	0.05	0.05	4.33	
2,6-Dinitrotoluene	0	0	0	0	0.05	0.05	4.33	
1,2-Diphenylhydrazine	0	0	0	0	0.03	0.03	2.6	
Fluoranthene	0	0	0	0	N/A	N/A	N/A	
Fluorene	0	0	0	0	N/A	N/A	N/A	
Hexachlorobenzene	0	0	0	0	0.00008	0.00008	0.007	
Hexachlorobutadiene	0	0	0	0	0.01	0.01	0.87	
Hexachlorocyclopentadiene	0	0	0	0	N/A	N/A	N/A	
Hexachloroethane	0	0	0	0	0.1	0.1	8.66	
Indeno(1,2,3-cd)Pyrene	0	0	0	0	0.001	0.001	0.087	
Isophorone	0	0	0	0	N/A	N/A	N/A	
Naphthalene	0	0	0	0	N/A	N/A	N/A	
Nitrobenzene	0	0	0	0	N/A	N/A	N/A	
n-Nitrosodimethylamine	0	0	0	0	0.0007	0.0007	0.061	
n-Nitrosodi-n-Propylamine	0	0	0	0	0.005	0.005	0.43	
n-Nitrosodiphenylamine	0	0	0	0	3.3	3.3	286	
Phenanthrene	0	0	0	0	N/A	N/A	N/A	
Pyrene	0	0	0	0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0	0	0	N/A	N/A	N/A	

Recommended WQBELs & Monitoring Requirements

No. Samples/Month: 4

Pollutants	Mass Limits		Concentration Limits				Governing WQBEL	WQBEL Basis	Comments
	AML (lbs/day) Report	MDL (lbs/day) Report	AML Report	MDL Report	IMAX Report	Units			
Total Copper						µg/L	42.2	AFC	Discharge Conc > 10% WQBEL (no RP)

Model Results

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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
Chloride (PWS)	N/A	N/A	PWS Not Applicable
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	N/A	N/A	PWS Not Applicable
Total Aluminum	2.418	µg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	N/A	N/A	Discharge Conc < TQL
Total Arsenic	N/A	N/A	Discharge Conc < TQL
Total Barium	46,801	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	26,119	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cadmium	5.49	µg/L	Discharge Conc < TQL
Total Chromium (III)	1,755	µg/L	Discharge Conc < TQL
Hexavalent Chromium	52.5	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cobalt	306	µg/L	Discharge Conc < TQL
Free Cyanide	70.9	µg/L	Discharge Conc ≤ 25% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	5,850	µg/L	Discharge Conc < TQL
Total Iron	29,250	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	66.4	µg/L	Discharge Conc < TQL
Total Manganese	19,500	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	0.98	µg/L	Discharge Conc < TQL
Total Nickel	1,064	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	PWS Not Applicable
Total Selenium	97.3	µg/L	Discharge Conc < TQL
Total Silver	17.0	µg/L	Discharge Conc < TQL
Total Thallium	4.68	µg/L	Discharge Conc < TQL
Total Zinc	454	µg/L	Discharge Conc ≤ 10% WQBEL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	9.67	µg/L	Discharge Conc < TQL
Acrylamide	6.06	µg/L	Discharge Conc ≤ 25% WQBEL
Acrylonitrile	5.2	µg/L	Discharge Conc < TQL
Benzene	50.2	µg/L	Discharge Conc < TQL
Bromoform	606	µg/L	Discharge Conc < TQL
Carbon Tetrachloride	34.6	µg/L	Discharge Conc < TQL
Chlorobenzene	1,950	µg/L	Discharge Conc ≤ 25% WQBEL
Chlorodibromomethane	69.3	µg/L	Discharge Conc < TQL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	58,043	µg/L	Discharge Conc < TQL
Chloroform	111	µg/L	Discharge Conc < TQL
Dichlorobromomethane	82.3	µg/L	Discharge Conc < TQL

Model Results 10/13/2022

1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	857	µg/L	Discharge Conc < TQL
1,1-Dichloroethylene	844	µg/L	Discharge Conc < TQL
1,2-Dichloropropane	77.9	µg/L	Discharge Conc < TQL
1,3-Dichloropropylene	23.4	µg/L	Discharge Conc < TQL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	1,326	µg/L	Discharge Conc < TQL
Methyl Bromide	1,774	µg/L	Discharge Conc < TQL
Methyl Chloride	90,289	µg/L	Discharge Conc < TQL
Methylene Chloride	1,732	µg/L	Discharge Conc < TQL
1,1,2,2-Tetrachloroethane	17.3	µg/L	Discharge Conc < TQL
Tetrachloroethylene	866	µg/L	Discharge Conc < TQL
Toluene	1,112	µg/L	Discharge Conc < TQL
1,2-trans-Dichloroethylene	1,950	µg/L	Discharge Conc < TQL
1,1,1-Trichloroethane	9,874	µg/L	Discharge Conc < TQL
1,1,2-Trichloroethane	47.6	µg/L	Discharge Conc < TQL
Trichloroethylene	52.0	µg/L	Discharge Conc < TQL
Vinyl Chloride	1.73	µg/L	Discharge Conc < TQL
2-Chlorophenol	585	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	195	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	1,950	µg/L	Discharge Conc < TQL
4,6-Dinitro-o-Cresol	39.0	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	195	µg/L	Discharge Conc < TQL
2-Nitrophenol	25,797	µg/L	Discharge Conc < TQL
4-Nitrophenol	7,417	µg/L	Discharge Conc < TQL
p-Chloro-m-Cresol	516	µg/L	Discharge Conc < TQL
Pentachlorophenol	2.6	µg/L	Discharge Conc < TQL
Phenol	78,001	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	130	µg/L	Discharge Conc < TQL
Acenaphthene	268	µg/L	Discharge Conc < TQL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	5,950	µg/L	Discharge Conc ≤ 25% WQBEL
Benzidine	0.009	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	0.087	µg/L	Discharge Conc < TQL
Benzo(a)Pyrene	0.009	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	0.087	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Benzo(k)Fluoranthene	0.87	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	2.6	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	3,900	µg/L	Discharge Conc < TQL
Bis(2-Ethylhexyl)Phthalate	27.7	µg/L	Discharge Conc ≤ 25% WQBEL
4-Bromophenyl Phenyl Ether	87.1	µg/L	Discharge Conc < TQL
Butyl Benzyl Phthalate	1.95	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	15,600	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	10.4	µg/L	Discharge Conc ≤ 25% WQBEL

Model Results for 10/14/2022

Dibenz(a,h)Anthracene	0.009	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	2.644	µg/L	Discharge Conc < TQL
1,3-Dichlorobenzene	137	µg/L	Discharge Conc < TQL
1,4-Dichlorobenzene	2,354	µg/L	Discharge Conc < TQL
3,3-Dichlorobenzidine	4.33	µg/L	Discharge Conc < TQL
Diethyl Phthalate	11,700	µg/L	Discharge Conc ≤ 25% WQBEL
Dimethyl Phthalate	8,062	µg/L	Discharge Conc ≤ 25% WQBEL
Di-n-Butyl Phthalate	355	µg/L	Discharge Conc ≤ 25% WQBEL
2,4-Dinitrotoluene	4.33	µg/L	Discharge Conc < TQL
2,6-Dinitrotoluene	4.33	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	2.6	µg/L	Discharge Conc < TQL
Fluoranthene	390	µg/L	Discharge Conc < TQL
Fluorene	975	µg/L	Discharge Conc < TQL
Hexachlorobenzene	0.007	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	0.87	µg/L	Discharge Conc < TQL
Hexachlorocyclopentadiene	16.1	µg/L	Discharge Conc < TQL
Hexachloroethane	8.66	µg/L	Discharge Conc < TQL
Indeno(1,2,3-cd)Pyrene	0.087	µg/L	Discharge Conc < TQL
Isophorone	663	µg/L	Discharge Conc < TQL
Naphthalene	451	µg/L	Discharge Conc < TQL
Nitrobenzene	195	µg/L	Discharge Conc < TQL
n-Nitrosodimethylamine	0.061	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	0.43	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	286	µg/L	Discharge Conc < TQL
Phenanthrene	16.1	µg/L	Discharge Conc < TQL
Pyrene	390	µg/L	Discharge Conc ≤ 25% WQBEL
1,2,4-Trichlorobenzene	1.37	µg/L	Discharge Conc < TQL

Model Results

10/13/2022

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4. Pre-Draft Survey Form / Additional Sample Data / TOXCON

Dear Permittee:

The Department of Environmental Protection (DEP) has reviewed your NPDES permit application and has reached a preliminary finding that new or more stringent water quality-based effluent limitations (WQBELs) for toxic pollutant(s) should be established in the permit. This finding is based on DEP's assessment that reasonable potential exists to exceed water quality criteria under Chapter 93 in the receiving waters during design flow conditions. The following WQBELs are anticipated based on the information available to DEP during its review:

Outfall No.	Pollutant	Average Monthly (µg/L)	Maximum Daily (µg/L)	IMAX (µg/L)
001	Indeno(1,2,3-cd)Pyrene	0.087	0.14	0.22

Attached is a survey that DEP requests that you complete and return to DEP in 30 days. Completion of this survey will help DEP develop the draft NPDES permit and allow DEP to understand your current capabilities or plans to treat or control these pollutant(s). If you decide not to complete and return the survey, DEP will proceed with developing the draft NPDES permit based on all available information and certain assumptions. Your response to this notice does not constitute an official comment for DEP response but will be taken under consideration. When the draft NPDES permit is formally noticed in the *Pennsylvania Bulletin*, you may make official comments for DEP's further consideration and response.

Please contact me if you have any questions about this information or the attached survey.

Sincerely,

Jinsu Kim
Environmental Engineering Specialist
Clean Water Program



**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
PRE-DRAFT PERMIT SURVEY FOR TOXIC POLLUTANTS**

Permittee Name:	<u>South Middleton Township Municipal Authority</u>	Permit No.:	<u>PA0044113</u>
Pollutant(s) identified by DEP that may require WQBELs:	<u>Indeno (1,2,3-cd) pyrene</u>		
Is the permittee aware of the source(s) of the pollutant(s)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Suspected		
If Yes or Suspected, describe the known or suspected source(s) of pollutant(s) in the effluent.			
Has the permittee completed any studies in the past to control or treat the pollutant(s)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
If Yes, describe prior studies and results:			
Does the permittee believe it can achieve the proposed WQBELs now?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Uncertain		
If No, describe the activities, upgrades or process changes that would be necessary to achieve the WQBELs, if known.			
Estimated date by which the permittee could achieve the proposed WQBELs:	Additional sampling for a 10-week period is proposed. <input checked="" type="checkbox"/> Uncertain		
Will the permittee conduct additional sampling for the pollutant(s) to supplement the application? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Check the appropriate box(es) below to indicate site-specific data that have been collected by the permittee in the past. If any of these data have <u>not</u> been submitted to DEP, please attach to this survey.			
<input type="checkbox"/> Discharge pollutant concentration coefficient(s) of variability	Year(s) Studied:		
<input checked="" type="checkbox"/> Discharge and background Total Hardness concentrations (metals)	Year(s) Studied: 2021		
<input type="checkbox"/> Background / ambient pollutant concentrations	Year(s) Studied:		
<input type="checkbox"/> Chemical translator(s) (metals)	Year(s) Studied:		
<input type="checkbox"/> Slope and width of receiving waters	Year(s) Studied:		
<input type="checkbox"/> Velocity of receiving waters at design conditions	Year(s) Studied:		
<input type="checkbox"/> Acute and/or chronic partial mix factors (mixing at design conditions)	Year(s) Studied:		
<input type="checkbox"/> Volatilization rates (highly volatile organics)	Year(s) Studied:		
<input type="checkbox"/> Site-specific criteria (e.g., Water Effect Ratio or related study)	Year(s) Studied:		

Please submit this survey to the DEP regional office that is reviewing the permit application within 30 days of receipt.

Kim, Jin Su

From: Judy Musselman <Judy.Musselman@ghd.com>
Sent: Thursday, October 13, 2022 2:02 PM
To: Kim, Jin Su; Josephine Hall
Cc: Martin, Daniel; Howard Butler
Subject: RE: [External] RE: South Middleton Township MA NPDES Permit Renewal Application
Attachments: 2022-10-13 SMTMA TMS PA0044113.pdf; SMTMA 2022-10-13 TOXCONC.xlsx; SMTMA Cu-Indeno 2021-2022 Data.pdf

Jinsu,

On behalf of South Middleton Township Municipal Authority, I have attached a summary of the 2021-2022 Effluent Copper and Indeno(1,2,3-cd)pyrene data. I have also attached the TOXCONC spreadsheet and the TMS water model populated with the updated values for Copper and Indeno(1,2,3-cd)pyrene. I could not find the errors in the formulas of the TOXCONC spreadsheet as it is password protected so an AMEC could not be displayed for Indeno(1,2,3-cd)pyrene. Bottom line...we believe Copper monitoring is warranted for the renewed NPDES permit but that Indeno(1,2,3-cd)pyrene can be eliminated, as all but one data point were non-detect. Please let us know if this is satisfactory or if you require additional information. Thank you for the additional time to gather the data.

Judy Musselman | A GHD ASSOCIATE

BCES QEP
Project Director/Senior Environmental Scientist

GHD

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225 Grandview Avenue Suite 403 Camp Hill Pennsylvania 17011 USA

D 717 585 8359 M 717 503 7289 E judy.musselman@ghd.com

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Additional Copper & Indeno(1,2,3-cd)pyrene Data

Date	Influent		Effluent	
	Copper µg/L	Indeno(1,2,3- cd)pyrene	Copper µg/L	Indeno(1,2,3- cd)pyrene
08/04/2021			<2.00	<0.0552
08/25/2021			7.00	0.3330
09/22/2021	40.00	<0.0569	4.00	<0.0552
06/16/2022			5.00	<0.0563
06/30/2022	88.00	<1.8100	5.00	<0.3650
07/07/2022			6.00	<0.3620
07/14/2022	58.00	<1.7900	4.00	<0.3580
07/21/2022			6.00	<0.3580
07/28/2022	59.00	<0.3580	5.00	<0.3580
08/04/2022			4.00	<0.3620
08/11/2022	65.00	<1.7900	5.00	<0.3580
08/18/2022			6.00	<0.3620
Average			4.92	0.2819
Max			7.00	<0.3650
TOXCONC			6.59	#DIV/0!

SD	1.2555	0.1309
Avg+2XSD	7.4278	0.5437
Avg-2XSD	2.4056	0.0201
Outliers	None	None

	Facility:	SMTMA	
	NPDES #:	PA0044113	
	Outfall No:	001	
	n (Samples/Month):	4	
	Reviewer/Permit Engineer:		
Parameter Name	Copper	eno(1,2,3--cd)pyrene	
Units	µg/L	µg/L	
Detection Limit	2	0.365	
Sample Date	<i>When entering values below the detection limit, enter</i>		
8/4/2021	<2	<0.0552	
8/25/2021	7	0.333	
9/22/2021	4	<0.0552	
6/16/2022	5	<0.0563	
6/30/2022	5	<0.365	
7/7/2022	6	<0.362	
7/14/2022	4	<0.358	
7/21/2022	6	<0.358	
7/28/2022	5	<0.358	
8/4/2022	4	<0.362	
8/11/2022	5	<0.358	
8/18/2022	6	<0.362	

[illegible]

5. Whole Effluent Toxicity Analysis Spreadsheet

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet						
Type of Test	Chronic		Facility Name	South Middleton Township MA WWTP		
Species Tested	Pimephales		Permit No.	PA0044113		
Endpoint	Survival					
TIWC (decimal)	0.05					
No. Per Replicate	10					
TST b value	0.75					
TST alpha value	0.25					

Test Completion Date			Test Completion Date		
Replicate	8/28/2018		Replicate	8/27/2019	
No.	Control	TIWC	No.	Control	TIWC
1	10	10	1	9	9
2	10	10	2	10	10
3	9	10	3	8	10
4	10	10	4	10	10
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		
11			11		
12			12		
13			13		
14			14		
15			15		

Mean	9.750	10.000	Mean	9.250	9.750
Std Dev.	0.500	0.000	Std Dev.	0.957	0.500
# Replicates	4	4	# Replicates	4	4
T-Test Result	12.5523		T-Test Result	5.8383	
Deg. of Freedom	3		Deg. of Freedom	5	
Critical T Value	0.7649		Critical T Value	0.7287	
Pass or Fail	PASS		Pass or Fail	PASS	

Test Completion Date			Test Completion Date		
Replicate	8/4/2020		Replicate	7/6/2021	
No.	Control	TIWC	No.	Control	TIWC
1	10	10	1	9	10
2	10	10	2	9	9
3	10	10	3	9	9
4	10	10	4	10	10
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		
11			11		
12			12		
13			13		
14			14		
15			15		

Mean	10.000	10.000	Mean	9.250	9.500
Std Dev.	0.000	0.000	Std Dev.	0.500	0.577
# Replicates	4	4	# Replicates	4	4
T-Test Result			T-Test Result	6.4742	
Deg. of Freedom			Deg. of Freedom	5	
Critical T Value			Critical T Value	0.7287	
Pass or Fail	PASS		Pass or Fail	PASS	

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet					
Type of Test	Chronic		Facility Name	South Middleton Township MA WWTP	
Species Tested	Pimephales		Permit No.	PA0044113	
Endpoint	Growth				
TIWC (decimal)	0.05				
No. Per Replicate	10				
TST b value	0.75				
TST alpha value	0.25				

Test Completion Date			Test Completion Date		
Replicate	8/28/2018		Replicate	8/27/2019	
No.	Control	TIWC	No.	Control	TIWC
1	0.412	0.437	1	0.388	0.416
2	0.388	0.427	2	0.39	0.456
3	0.381	0.471	3	0.383	0.476
4	0.419	0.435	4	0.455	0.543
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		
11			11		
12			12		
13			13		
14			14		
15			15		

Mean	0.400	0.443	Mean	0.404	0.473
Std Dev.	0.019	0.019	Std Dev.	0.034	0.053
# Replicates	4	4	# Replicates	4	4
T-Test Result	11.8794		T-Test Result	5.7628	
Deg. of Freedom	5		Deg. of Freedom	4	
Critical T Value	0.7267		Critical T Value	0.7407	
Pass or Fail	PASS		Pass or Fail	PASS	

Test Completion Date			Test Completion Date		
Replicate	5/4/2020		Replicate	7/6/2021	
No.	Control	TIWC	No.	Control	TIWC
1	0.458	0.538	1	0.329	0.357
2	0.543	0.52	2	0.36	0.339
3	0.51	0.547	3	0.378	0.401
4	0.428	0.549	4	0.387	0.344
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		
11			11		
12			12		
13			13		
14			14		
15			15		

Mean	0.484	0.538	Mean	0.359	0.360
Std Dev.	0.052	0.013	Std Dev.	0.021	0.028
# Replicates	4	4	# Replicates	4	4
T-Test Result	8.5020		T-Test Result	5.6559	
Deg. of Freedom	5		Deg. of Freedom	5	
Critical T Value	0.7267		Critical T Value	0.7267	
Pass or Fail	PASS		Pass or Fail	PASS	

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet					
Type of Test	Chronic		Facility Name	South Middleton Township MA WWTP	
Species Tested	Ceriodaphnia				
Endpoint	Survival				
TIWC (decimal)	0.05				
No. Per Replicate	1		Permit No.	PA0044113	
TST b value	0.75				
TST alpha value	0.2				

Test Completion Date			Test Completion Date		
8/27/2018			8/26/2019		
Replicate No.	Control	TIWC	Replicate No.	Control	TIWC
1	1	1	1	1	1
2	1	1	2	1	1
3	1	1	3	1	1
4	1	1	4	1	1
5	1	1	5	1	1
6	1	1	6	1	1
7	1	1	7	1	1
8	1	1	8	1	1
9	1	1	9	1	0
10	1	1	10	1	1
11			11		
12			12		
13			13		
14			14		
15			15		

Mean	1.000	1.000	Mean	1.000	0.900
Std Dev.	0.000	0.000	Std Dev.	0.000	0.316
# Replicates	10	10	# Replicates	10	10

T-Test Result			T-Test Result		
Deg. of Freedom			Deg. of Freedom		
Critical T Value			Critical T Value		
Pass or Fail	PASS		Pass or Fail	PASS	

Test Completion Date			Test Completion Date		
8/3/2020			7/5/2021		
Replicate No.	Control	TIWC	Replicate No.	Control	TIWC
1	1	1	1	1	1
2	1	1	2	1	1
3	1	1	3	1	1
4	1	1	4	1	1
5	1	1	5	1	1
6	1	1	6	1	1
7	1	1	7	1	1
8	1	1	8	1	0
9	1	1	9	1	1
10	1	1	10	1	1
11			11		
12			12		
13			13		
14			14		
15			15		

Mean	1.000	1.000	Mean	1.000	0.900
Std Dev.	0.000	0.000	Std Dev.	0.000	0.316
# Replicates	10	10	# Replicates	10	10

T-Test Result			T-Test Result	1.5000	
Deg. of Freedom			Deg. of Freedom	9	
Critical T Value			Critical T Value	0.8834	
Pass or Fail	PASS		Pass or Fail	PASS	

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet					
Type of Test	Chronic		Facility Name	South Middleton Township MA WWTP	
Species Tested	Ceriodaphnia				
Endpoint	Reproduction				
TIWC (decimal)	0.05				
No. Per Replicate	10		Permit No.	PA0044113	
TST b value	0.75				
TST alpha value	0.2				

Test Completion Date			Test Completion Date		
Replicate	8/27/2018		Replicate	8/25/2019	
No.	Control	TIWC	No.	Control	TIWC
1	31	28	1	37	31
2	32	31	2	30	36
3	30	25	3	31	30
4	31	32	4	31	34
5	32	34	5	35	29
6	17	35	6	35	33
7	34	31	7	36	34
8	37	12	8	38	35
9	30	31	9	34	17
10	31	27	10	33	32
11			11		
12			12		
13			13		
14			14		
15			15		

Mean	30.500	28.600	Mean	34.000	31.100
Std Dev.	5.191	6.586	Std Dev.	2.708	5.425
# Replicates	10	10	# Replicates	10	10
T-Test Result	2.3863		T-Test Result	3.0569	
Deg. of Freedom	15		Deg. of Freedom	13	
Critical T Value	0.8862		Critical T Value	0.8702	
Pass or Fail	PASS		Pass or Fail	PASS	

Test Completion Date			Test Completion Date		
Replicate	8/3/2020		Replicate	7/5/2021	
No.	Control	TIWC	No.	Control	TIWC
1	38	36	1	26	31
2	36	37	2	30	32
3	34	18	3	26	26
4	32	36	4	30	36
5	26	37	5	35	28
6	29	34	6	33	40
7	33	36	7	30	34
8	34	33	8	14	37
9	22	34	9	30	28
10	18	20	10	21	38
11			11		
12			12		
13			13		
14			14		
15			15		

Mean	30.200	32.100	Mean	27.500	33.000
Std Dev.	6.408	7.047	Std Dev.	6.151	4.781
# Replicates	10	10	# Replicates	10	10
T-Test Result	3.5035		T-Test Result	5.9030	
Deg. of Freedom	16		Deg. of Freedom	17	
Critical T Value	0.8847		Critical T Value	0.8633	
Pass or Fail	PASS		Pass or Fail	PASS	

WET Summary and Evaluation

Facility Name	South Middleton Township MA WWTP
Permit No.	PA0044113
Design Flow (MGD)	1.5
Q ₇₋₁₀ Flow (cfs)	42.93
PMF _a	0.218
PMF _c	1

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Pimephales	Survival	8/28/18	8/27/19	8/4/20	7/6/21
		PASS	PASS	PASS	PASS

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Pimephales	Growth	8/28/18	8/27/19	5/4/20	7/6/21
		PASS	PASS	PASS	PASS

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Ceriodaphnia	Survival	8/27/18	8/26/19	8/3/20	7/5/21
		PASS	PASS	PASS	PASS

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Ceriodaphnia	Reproduction	8/27/18	8/25/19	8/3/20	7/5/21
		PASS	PASS	PASS	PASS

Reasonable Potential? NO

Permit Recommendations

Test Type Chronic
TIWC 5 % Effluent
Dilution Series 2, 5, 30, 60, 100 % Effluent
Permit Limit None
Permit Limit Species