pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0043575**
Facility Type	**Municipal**	APS ID	**10178**
Major / Minor	**Minor**	Authorization ID	**1405963**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Lykens Borough Authority**	Facility Name	**Lykens STP**
Applicant Address	200 Main Street Suite C	Facility Address	Arlington Street
	Lykens, PA 17048-1132		Lykens, PA 17048
Applicant Contact	Kerry Teter	Facility Contact	Nathan Pendal
Applicant Phone	(717) 453-7597	Facility Phone	717-503-5152
Client ID	63975	Site ID	451955
Ch 94 Load Status	Not Overloaded	Municipality	Lykens Borough
Connection Status	No Limitations	County	Dauphin
Date Application Received	August 9, 2022	EPA Waived?	No
Date Application Accepted	August 23, 2022	If No, Reason	Significant CB Discharge

Purpose of Application: Permit renewal for discharge of treated sewage

Summary of Review

1.0 General Discussion:

This fact sheet supports the re-issuance of an existing NPDES permit for discharge of treated domestic wastewater from Lykens Borough Wastewater Treatment Plant located in Lykens Borough, Dauphin County. Lykens Borough Authority (Authority) owns, operates, and maintains the wastewater treatment plant. The standard industrial classification (SIC) Code is 4952. The treatment plant serves Lykens Borough (100% of the flow). The sewer collection system is not combined and there are no bypasses or overflows authorized in the collection system. The treatment plant is sequential batch reactor (SBR) with an annual average design capacity of 0.4100 MGD and an organic design capacity of the facility is 684 lbs/day- BOD5. The discharge goes to Wiconisco Creek, which is classified for Warm Water Fishes (WWF). The existing NPDES permit was issued on February 5, 2018 with effective date March 1, 2018 and an expiration date of February 28, 2023. The applicant submitted an administratively completed application to the Department and has been operating under the terms and conditions in the existing permit pending Department action on the renewal application. A topographic map showing the discharge location is presented in attachment A.

1.1 Sludge use and disposal description and location(s):

Digested sludge is dewatered by belt press and hauled out to landfill for ultimate disposal.

1.2 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-

Approve	Deny	Signatures	Date
X		*J. Pascal Kwedza* J. Pascal Kwedza, P.E. / Environmental Engineer	January 24, 2023
X		*Maria D. Bebenek for* Daniel W. Martin, P.E. / Environmental Engineer Manager	February 1, 2024
X		*Maria D. Bebenek* Maria D. Bebenek, P.E. / Program Manager	February 1, 2024

Summary of Review

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.

.3 Changes to the existing Permit

- Quarterly monitoring of E. Coli has been added

1.4 Existing Permit limitation and Monitoring Requirements

Discharge Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Monthly Average	Weekly Average	Minimum	Monthly Average	Weekly Average	Instantaneous Maximum		
Flow (mgd)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/Day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/Day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/Day	Grab
TSS	102	153	XXX	30	45	60	1/Week	24-hr comp
$CBOD_5$	85	136	XXX	25	40	50	1/Week	24-hr comp
Fecal Coliform (5/1 to 9/30)[(5)]	XXX	XXX	XXX	200	XXX	1000	1/Week	Grab
Fecal Coliform (10/1 to 4/30)	XXX	XXX	XXX	2,000	XXX	10000	1/Week	Grab
Ammonia-Nitrogen Nov 1 - Apr 30	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	36	XXX	XXX	11.5	XXX	23	2/week	24-Hr Composite

1.4.1 Chesapeake Bay Limits

Discharge Parameter	Effluent Limitations					Monitoring Requirements	
	Mass Load(lbs)		Concentrations (mg/l)			Minimum Measurement Frequency	Required Sample Type
	Monthly	Annual	Minimum	Monthly Average	Maximum		
Ammonia---N	Report	Report	XXX	Report	XXX	2/week	24-hr Comp
Kjeldahl---N	Report	XXX	XXX	Report	XXX	2/Week	24-hr Comp
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	2/Week	24-hr Comp
Total Nitrogen	Report	Report	XXX	Report	XXX	1/Month	Calculate
Total Phosphorus	Report	Report	XXX	Report	XXX	2/week	24-hr Comp
Net Total Nitrogen	Report	7,563	XXX	XXX	XXX	1/Month	Calculate
Net Total Phos.	Report	998	XXX	XXX	XXX	1/Month	Calculate

1.5 Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.41
Latitude	40º 34' 8.73"	Longitude	-76º 42' 48.74"
Quad Name		Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Wiconisco Creek	Stream Code	16895
NHD Com ID	54972815	RMI	27.60
Drainage Area	60	Yield (cfs/mi^2)	0.04
Q_{7-10} Flow (cfs)	2.4	Q_{7-10} Basis	USGS Gage Station
Elevation (ft)		Slope (ft/ft)	
Watershed No.	6-C	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Metals, Siltation, pH		
Source(s) of Impairment	Abandoned Mine Drainage,		
TMDL Status	Final	Name	Wiconisco Creek, AMD

Background/Ambient Data		Data Source
pH (SU)		
Temperature (°F)		
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake	Veolia Water PA		
PWS Waters	Susquehanna River	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	<50

Changes Since Last Permit Issuance:

Other Comments:

1.5.1 Public Water Supply Intake

The closest water supply intake located downstream from the discharge is Viola Water PA in Susquehanna Twp., Dauphin County. The distance downstream from the discharge to the intake is approximately 50 miles. No impact is expected on the intake as a result of this discharge.

2.0 Treatment Facility Summary				
Treatment Facility Name: Lykens Borough Authority - STP				
WQM Permit No.	**Issuance Date**			
2292407	11/23/2011			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Sequencing Batch Reactor	Gas Chlorine	0.41
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
1.575	684	Not Overloaded	Aerobic Digestion	Landfill

Changes Since Last Permit Issuance: None

2.1 Treatment Facility Details

The treatment plant consists of an influent pump station to pump influent to the headworks (rotary drum fine screen), screened flow goes to the 2 SBR units capable of treating annual average flow of 0.41MGD and Chlorine for disinfection. Alum is added for phosphorus removal, Sludge is wasted to two aerobic digesters. Digested sludge is belt pressed prior to hauling out for ultimate disposal at a landfill.

3.0 Compliance History

3.1 DMR Data for Outfall 001 (from December 1, 2022 to November 30, 2023)

Parameter	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22
Flow (MGD) Average Monthly	0.177	0.184	0.147	0.132	0.130	0.325	0.153	0.134	0.017	0.017	0.2378	0.2673
Flow (MGD) Daily Maximum	0.366	0.352	0.396	0.262	0.209	1.579	0.641	0.873	0.031	0.021	0.513	0.7117
pH (S.U.) Minimum	6.1	6.0	6.4	6.4	6.4	6.3	5.1	6.6	6.5	6.2	6.3	6.35
pH (S.U.) Maximum	7.3	7.2	7.3	7.4	7.3	7.5	7.9	7.6	7.4	7.3	10.05	7.38
DO (mg/L) Minimum	5.3	5.1	5.0	6.1	5.2	5.3	5.4	5.2	7.0	6.9	6.21	6.34
TRC (mg/L) Average Monthly	0.27	0.49	0.47	0.5	0.3	0.4	0.23	0.1	0.2	0.3	0.3	0.3
TRC (mg/L) Instantaneous Maximum	1.0	1.99	1.0	1.6	0.90	1.10	2.20	0.38	0.70	0.60	0.91	0.64
CBOD5 (lbs/day) Average Monthly	< 5.7	7.9	4.8	5.4	3	19	7.9	6.2	1	1	12	16
CBOD5 (lbs/day) Weekly Average	8.9	13.7	5.4	13.2	4	60	13.6	8.7	2	1	18	32
CBOD5 (mg/L) Average Monthly	< 3.3	5.2	4.9	5.4	3.3	10.4	5.7	8.9	7.6	7.5	5.9	5.5
CBOD5 (mg/L) Weekly Average	5.2	6.7	5.7	10.6	5.0	11.4	10.4	13.5	12.1	9.1	8.0	7.8
BOD5 (lbs/day) Raw Sewage Influent Ave. Monthly	356	195	113	108	292	576	563	239	21	30	344	474
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	812	370	131	157	494	1947	1009	406	29	43	420	775
BOD5 (mg/L) Raw Sewage Influent Average Monthly	196	143	116	109	283	273	549	334	172	231	169	192
TSS (lbs/day) Average Monthly	26	41	27	16	11	47	25	11	2	2	37	38

TSS (lbs/day) Raw Sewage Influent Average Monthly	345	147	71	41	466	233	1186	158	7	18	288	220
TSS (lbs/day) Raw Sewage Influent Daily Maximum	1068	391	178	57	1076	439	3052	319	12	32	349	447
TSS (lbs/day) Weekly Average	65	99	42	22	13	167	66	16	3	2	52	86
TSS (mg/L) Average Monthly	13.4	29.8	27.1	16.2	12.0	21.5	20.9	16.1	13.8	15.0	18.0	13.2
TSS (mg/L) Raw Sewage Influent Ave. Monthly	197	111	70	45	432	192	1262	206	54	140	142	103
TSS (mg/L) Weekly Average	21.2	68.0	40.0	20.5	13.6	20.5	57.0	24.7	20	18.0	23.0	24.8
Fecal Coliform (No./100 ml) Geometric Mean	< 63	< 252	31	27	687	7925	> 9438	16471	1716	24	71	11
Fecal Coliform (No./100 ml) Instant. Maximum	2800	6200	188	45	8800	20000	> 20000	20000	20000	98	9800	63
Nitrate-Nitrite (mg/L) Average Monthly	12.85	10.72	8.43	9.55	8.44	10.03	6.86	9.2	9.01	9.53	6.75	4.03
Nitrate-Nitrite (lbs) Total Monthly	631	401	272	313	236	714	258	201	33	37	394.0	235
Total Nitrogen (mg/L) Average Monthly	14.85	13.05	10.71	10.92	10.41	12.12	8.79	12.03	11.41	11.84	8.52	8.08
Total Nitrogen (lbs) Effluent Net Total Monthly	733	489	343	356	292	864	313	262	42	46	495	550
Total Nitrogen (lbs) Total Monthly	733	489	343	356	292	864	313	262	42	46	16.0	550
Total Nitrogen (lbs) Effluent Net Total Annual			< 4452									
Total Nitrogen (lbs) Total Annual			< 4452									
Ammonia (lbs/day) Average Monthly		< 0.2	< 0.4	< 0.2	< 0.2	< 0.3	< 0.18					
Ammonia (mg/L) Average Monthly	< 0.1	< 0.2	< 0.4	< 0.2	< 0.2	< 0.1	< 0.1	0.5	< 0.7	< 0.4	< 0.1	< 2.23
Ammonia (lbs) Total Monthly	< 7	< 6	< 11	< 6	< 6	< 8	< 6	10	< 2	< 2	< 6.0	< 189

Ammonia (lbs) Total Annual			< 274									
TKN (mg/L) Average Monthly	2.00	2.31	2.28	1.36	1.98	2.09	< 2.16	2.82	2.41	2.32	1.77	4.26
TKN (lbs) Total Monthly	101	88	72	43	57	148	< 66	60	9	9	101	325
Total Phosphorus (mg/L) Average Monthly	1.2	1.3	1.4	1.2	1.1	0.8	0.9	1.2	0.6	1.9	1.12	2.8
Total Phosphorus (lbs) Effluent Net Total Monthly	61	49	45	38	33	74	34	26	2	7	67.0	209
Total Phosphorus (lbs) Total Monthly	61	49	45	38	33	74	34	26	2	7	67.0	209
Total Phosphorus (lbs) Effluent Net Total Annual			944									
Total Phosphorus (lbs) Total Annual			944									
Total Aluminum (mg/L) Average Quarterly			E			0.543			0.375			0.166
Total Iron (mg/L) Average Quarterly			E			< 0.100			< 0.200			< 0.1
Total Manganese (mg/L) Average Quarterly			E			0.034			< 0.020			0.022

3.2 Effluent Violations for Outfall 001, from: January 1, 2023 To: November 30, 2023

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
pH	05/31/23	Min	5.1	S.U.	6.0	S.U.
pH	01/31/23	Max	10.05	S.U.	9.0	S.U.
TRC	05/31/23	IMAX	2.20	mg/L	1.63	mg/L
TRC	10/31/23	IMAX	1.99	mg/L	1.63	mg/L
TSS	06/30/23	Wkly Avg	167	lbs/day	153	lbs/day
TSS	05/31/23	Wkly Avg	57.0	mg/L	45.0	mg/L

TSS	10/31/23	Wkly Avg	68.0	mg/L	45.0	mg/L
Fecal Coliform	05/31/23	Geo Mean	> 9438	No./100 ml	200	No./100 ml
Fecal Coliform	04/30/23	Geo Mean	16471	No./100 ml	2000	No./100 ml
Fecal Coliform	06/30/23	Geo Mean	7925	No./100 ml	200	No./100 ml
Fecal Coliform	07/31/23	Geo Mean	687	No./100 ml	200	No./100 ml
Fecal Coliform	06/30/23	IMAX	20000	No./100 ml	1000	No./100 ml
Fecal Coliform	03/31/23	IMAX	20000	No./100 ml	10000	No./100 ml
Fecal Coliform	07/31/23	IMAX	8800	No./100 ml	1000	No./100 ml
Fecal Coliform	05/31/23	IMAX	> 20000	No./100 ml	1000	No./100 ml
Fecal Coliform	04/30/23	IMAX	20000	No./100 ml	10000	No./100 ml

3.3 Summary of Discharge Monitoring Reports (DMRs)**:**

DMRs review for the facility for the last 12 months of operation, presented on the table above in section 3.1 indicates is not meeting permit limit consistently. Fecal Coliform, PH, TRC and TSS effluent violations were noted on DMRs for several months in 2023 and presented in section 3.2 above. The Department is working on enforcement action. The permit will be drafted, and the cover letter of the draft permit will have the following condition “According to DEP’s records, there are unresolved violation(s) at one or more facilities you own or operate. In accordance with DEP’s Clean Water Program standard operating procedures, an applicant’s compliance history is considered prior to making a final decision on any permit application. Please take the opportunity to address these violations during this draft comment period. DEP may not be able to issue a final permit until the violation(s) are resolved”

3.4 Summary of Inspections:

The facility has been inspected a couple times during last permit cycle. No effluent violations were found during plant inspections.

4.0 Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .41
Latitude 40º 34' 8.65" **Longitude** -76º 42' 48.66"
Wastewater Description: Sewage Effluent

4.1 Basis for Effluent Limitations

In general, the Clean Water Act (CWA) requires that the effluent limits for a particular pollutant be the more stringent of either technology-based limits or water quality-based limits. Technology-based limits are set according to the level of treatment that is achievable using available technology. A water quality-based effluent limit is designed to ensure that the water quality standards applicable to a waterbody are being met and may be more stringent than technology-based effluent limits.

4.2 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: None

4.3 Mass-Based Limits

The federal regulation at 40 CFR 122.45(f) requires that effluent limits be expressed in terms of mass, if possible. The regulation at 40 CFR 122.45(b) requires that effluent limitations for POTWs be calculated based on the design flow of the facility. The mass-based limits are expressed in pounds per day and are calculated as follows:

Mass based limit (lb/day) = concentration limit (mg/L) × design flow (mgd) × 8.34

4.3.1 WQM 7.0 Stream Model

WQM 7.0 is a water quality model DEP utilizes to establish appropriate effluent limits for $CBOD_5$, NH_3-N and DO in permits. The model simulates mixing and degradation of NH_3-N in the stream and compares calculated instream NH_3-N concentrations to NH_3-N water quality criteria and also simulates mixing and consumption of D.O. in the stream due to the degradation of $CBOD_5$ and NH_3N and compares calculated instream D.O. concentrations to D.O. water quality criteria and recommends effluent limits

4.4 Water Quality-Based Limitations

4.4.1 Receiving Stream

The receiving stream is the Wiconisco Creek. According to 25 PA § 93.9o, Wiconisco Creek is protected for Warm Water Fishes (WWF). It is located in Drainage List m and State Watershed 6-C. It has been assigned stream code 16895. According to the Department's Pennsylvania Integrated Water Quality Monitoring and Assessment Report, this stream is impaired for pH, siltation and metals due to abandoned mine drainage. A TMDL for the effects of Acid Mine Drainage was completed and approved on November 24, 2008 and is discussed further in this report.

4.4.2 Streamflow:

Streamflows for the water quality analysis were determined by correlating with the yield of USGS gauging station No. 0155500 on Mahantango. The Q_{7-10} and drainage area at the gage are 6.38ft^3/s and 164 mi^2 respectively. The resulting yields are as follows:

Q_{7-10} = 6.38 cfs /164 sq. mi = 0.04cfs/sq.mi
Q_{30-10} /Q_{7-10} = 1.47
Q_{1-10} /Q_{7-10} = 0.74

The drainage area at the point of discharge taken from previous protection report = 60.0 sq. mi.
The design flow is calculated as: Q_{7-10} = 0.04cfs x 60 sq. mi = 2.4cfs

NH_3N calculations will be based on the Department's Implementation Guidance of Section 93.7 Ammonia Criteria, dated 11/4/97 (ID No. 391-2000-013). The following data is necessary to determine the instream NH_3N criteria used in the attached computer model of the stream:

- STP pH = 7.0 (DMR Median July – Sept.)
- STP Temperature = 25 ^{o} C (default)
- Stream pH = 7.0 (Default)
- Stream Temperature = 20 ^{o}C (Default)
- Background NH_3-N = 0.0 (Default)

4.4.3 $CBOD_5$:

Water quality modeling for this discharge was done in conjunction with the Williamstown Borough Authority STP discharge, Washington Township STP's discharge and Elizabethville Borough's discharge due to the proximity of these discharges to each other. The attached results of the WQM 7.0 stream model (attachment B) indicates that for Lykens Borough's discharge with an annual average flow of 0.41 MGD, a monthly average limit of 25 mg/l is needed to protect the water quality of the stream. This limit is consistent with the existing permit limits. DMRs and inspection reports show that the STP has been achieving less than 25 mg/l $CBOD_5$. Therefore, a limit of 25mg/l monthly average with 40mg/l weekly average and 50 mg/l instantaneous maximum will again be applied for this current permit cycle.

Mass Limits are calculated as follows:

Mass based AML (lb/day) = 25 (mg/L) × 0.41(mgd) × 8.34 = 85

Mass based AWL (lb/day) = 40(mg/L) × 0.41(mgd) × 8.34 = 136

4.4.4 NH_3-N

The attached computer printout of the WQM 7.0 stream model (Attachment B) indicates that a summer average monthly limit of 11.5mg/l NH_3 (rounded) is necessary to protect the aquatic life from toxicity effects. This is consistent with the existing summer limit of 11.5 mg/l for ammonia nitrogen will remain with monitor and report during winter months. The facility's DMR and inspection report indicate the facility is meeting the limits.

Mass based AML (lb/day) for the summer months = 11.5 (mg/L) × 0.41(mgd) × 8.34 = 39

4.4.5 Dissolved Oxygen

The existing permit contains a limit of 5 mg/l for Dissolved Oxygen (DO). DEP's Technical Guidance for the Development and Specification of Effluent Limitations (362-0400-001, 10/97) suggests that either the adopted minimum stream D.O. criteria for the receiving stream or the effluent level determined through water quality modeling be used for the limit. Since the WQM 7.0 model was run using a minimum D.O. of 5.0 mg/l, this limit will be continued in the renewed permit with a daily monitoring requirement.

4.4.6 Total Suspended Solids (TSS)

There is no water quality criteria for TSS. A limit of 30 mg/l AML will be required based on the minimum level of effluent quality attainable by secondary treatment as defined in 40 CFR 133.102b(1) and 25 PA § 92a.47(a)(1) and an AWL of 45mg/l per 40CFR 133.102(b)(2) and 25 PA § 92a.47(a)(2)

Mass based AML (lb/day) = 30 (mg/L) × 0.41(mgd) × 8.34 = 102

Mass based AWL (lb/day) = 45(mg/L) × 0.41(mgd) × 8.34 = 153

4.4.7 Phosphorus

Currently there is no watershed-wide requirement for phosphorus limitation in the Wiconisco Basin, therefore no phosphorus limitation is required for this discharge other than Chesapeake Bay Annual Total Phosphorus Cap load.

4.4.8 Total Residual Chlorine

The attached TRC model results presented in attachments C utilize the equations and calculations as presented in the Department's May 1, 2003 Implementation Guidance for Total Residual Chlorine (TRC) (ID No. 391-2000-015) for developing chlorine limitations. The Guidance references Chapter 92a, Section 92a.48 (b) which establishes a standard BAT limit of 0.5 mg/l unless a facility-specific BAT has been developed. The attached results indicate that a technology limit of 0.5 mg/l and 1.63mg/l IMAX would be needed to prevent toxicity concerns. This is consistent with the existing permit. DMR and inspection report indicate the facility has been complying with this limitation.

4.4.9 Toxics

A reasonable potential (RP) analysis was done for pollutants in the discharge. The discharge consists entirely of domestic wastewater with no pollutants of concern that needs further analysis.

4.4.10 Fecal Coliform and E. Coli

The existing Fecal Coliform limit is consistent with the technology limits recommended in 92a.47(a)(4) and (a)(5) and will remain in the permit. In March of 2021, EPA approved DEP's Triennial Review of Water Quality Standards, which included a new swimming season criterion for E. coli. As a result, DEP is including monitoring requirements for E. Coli in new and renewed sewage permits above 2000gpd. Monitoring frequency is based on annual average flow as follows: 1/month for design flows >= 1 MGD, 1/quarter for design flows >= 0.05 and < 1 MGD and 1/year for design flows of 0.002 and < 0.05 MGD. Your discharge of 0.41MGD requires 1/quarter monitoring as included in the permit.

4.4.11 Chesapeake Bay Strategy

The Department formulated a strategy in April 2007, to comply with the EPA and Chesapeake Bay requirements to reduce point source loadings of Total Nitrogen (TN) and Total Phosphorus (TP) to the Bay. In the Strategy, sewage dischargers have been prioritized by DEP based on their delivered TN loadings to the Bay. The highest priority (Phases 1, 2, and 3) dischargers received annual loading caps based on their design flow on August 29, 2005 and concentrations of 6 mg/l TN and 0.8 mg/l TP. Phase 4 (0.2 -0.4mgd) and Phase 5(below 0.2mdg) are required to monitor and report TN and TP during permit renewal and any facility in Phases 4 and 5 that undergoes expansion is subjected to cap load right away. EPA published Chesapeake Bay TMDL in December of 2010. In order to address the TMDL, Pennsylvania developed

Chesapeake Watershed Implementation Plan (WIP) Phase 1, Phase 2 and currently Phase 3 WIP and a supplement to the WIPs to be implemented with the original Chesapeake Bay Strategy.

Phase 3 WIP and the supplement to the WIP, indicates renewing permits for significant dischargers would follow the same phased approach formulated in the original Bay strategy whilst Phase 4 and Phase 5 will be required to monitor and report TN and TP during permit renewals. This facility falls in phase 3 of the strategy and is required to meet a total maximum annual Total Nitrogen Cap load of 7,488 lbs/year based on a design annual wasteflow of 0.41 MGD and 6 mg/l total nitrogen and a TP cap load of 998 lbs/year based on annual wasteflow of 0.41 MGD and 0.8 mg/l total phosphorus. The facility is complying with the Chesapeake Bay Cap load requirements.

The Department approved a total nitrogen offset of 75lbs of nitrogen based on 3 EDUs at 25lbs/EDU for the Authority. The offsets are for 3 EDUs on-lot disposal systems that have been connected to the sewer conveyance system. These on-lot systems were put into use prior to January 1, 2003 and retired after January 1, 2003. The approved offsets are only for compliance purposes and are not available for trading or selling. The permit will show the base cap load on the effluent page and show the offsets as a foot note with a language indicating the offsets may be applied throughout the compliance year or during the truing period. A complete list of addresses of the dwellings that were served by the retired on-lot systems that are now connected to the sewage conveyance system is on file.

4.4.12 Influent BOD and TSS Monitoring

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

4.4.13 Stormwater

There is no stormwater outfall associated with this facility.

4.4.14 Industrial Users

This Wastewater Treatment Plant does not receive wastewater from any significant industrial users.

4.4.15 Pretreatment Requirements

The design annual average flow of the treatment plant is 0.41 MGD and the facility receives no flow from significant Industrial users. EPA does not require development of pretreatment program for facilities with design flow less than 5MGD. However, the permit contains standard conditions requiring the permittee to monitor and control industrial users if applicable.

5.0 Other Requirements

5.1 Anti-backsliding

Not applicable to this permit

5.2 Anti-Degradation (93.4)

The effluent limits for this discharge 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. No High-Quality Waters are impacted by this discharge. No Exceptional Value Waters are impacted by this discharge.

5.3 Class A Wild Trout Fisheries

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

5.4 303d Listed Streams

The discharge is located on a 303d listed stream segment as impaired due to Acid Mine Drainage. A TMDL was approved for Wiconisco Creek Watershed which set allowable loadings for iron, manganese, aluminum and acidity in Wiconsico Creek. In addition, allowable loads for sediment and nutrients were set for Little Wiconisco Creek and several unnamed

tributaries. The TMDL does not set allowable loads for nutrients in Wiconsico Creek. The discharge from Lykens predates the TMDL development. Lykens discharge is the only one on the segment, is located close to monitoring point WICO 2.0. The TMDL did not call for load reduction at the monitoring point (WICO 2.0) which is below Lykens discharge. Further downstream at monitoring point WICO 1.0, the creek recovered except for acidity. The existing permit has quarterly monitoring for Total Aluminum, Total Iron and Total Manganese which be continued for the permit cycle to ensure discharge levels are not increasing.

5.5 Special Permit Conditions

The permit contains the following special conditions:

- Stormwater Prohibition, Approval Contingencies, Solids Management and Restriction on receipt of hauled in waste under certain conditions and chlorine minimization requirement.

5.6 Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality. The permittee is responsible for conducting the monitoring and for reporting results on Discharge Monitoring Reports (DMRs).

5.7 Effluent Monitoring Frequency

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Permittees have the option of taking more frequent samples than are required under the permit. These samples can be used for averaging if they are conducted using EPA-approved test methods (generally found in 40 CFR 136) and if the Method Detection Limits are less than the effluent limits. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

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" (386-0400-001), SOPs and/or BPJ.

Outfall 001, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.63	1/day	Grab
CBOD5	85	136	XXX	25.0	40.0	50	1/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TSS	102	153	XXX	30.0	45.0	60	1/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
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

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	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/month	Calculation
Total Nitrogen (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Ammonia May 1 - Oct 31	39	XXX	XXX	11.5	XXX	23	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	XXX	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Phosphorus (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Aluminum	XXX	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Total Iron	XXX	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Total Manganese	XXX	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite

Compliance Sampling Location: At Outfall 001

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.

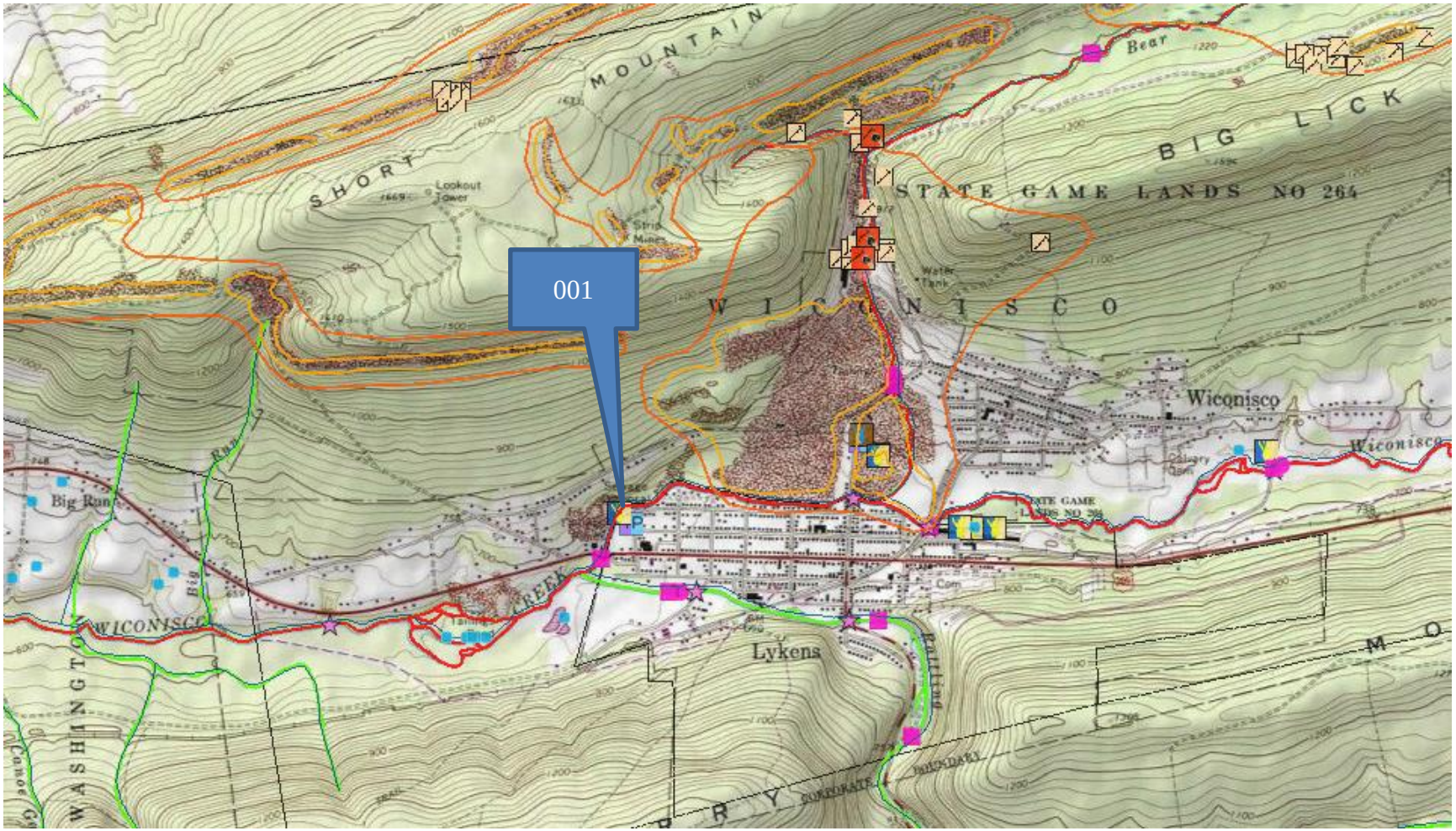
Parameter [1]	Effluent Limitations					Monitoring Requirements	
	Mass Units (lbs)		Concentrations (mg/L)			Minimum [2] Measurement Frequency	Required Sample Type
	Monthly	Annual	Minimum	Monthly Average	Maximum		
Ammonia---N	Report	Report	XXX	Report	XXX	2/week	24-Hr Composite
Kjeldahl---N	Report	XXX	XXX	Report	XXX	2/week	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	2/week	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	2/week	24-Hr Composite
Net Total Nitrogen*	Report	7,488	XXX	XXX	XXX	1/year	Calculation
Net Total Phosphorus	Report	998	XXX	XXX	XXX	1/year	Calculation

Compliance Sampling Location: At Outfall 001

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

8.0 Attachment

A. Topographical MAP



B. WQM Model Results

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
06C	16895	WICONISCO 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)
32.400	Williamstwn STP	PA0021491	0.450	CBOD5	15.01		
				NH3-N	4.49	8.98	
				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)
27.600	Lykens Boro STP	PA0043575	0.410	CBOD5	25		
				NH3-N	11.82	23.64	
				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)
23.500	Washingtom Twp	PA0086185	0.050	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)
15.950	Elizabethville	PA0037737	0.400	CBOD5	25		
				NH3-N	15.76	31.52	
				Dissolved Oxygen			5

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
06C	16895	WICONISCO CREEK	**32.400**	695.00	21.80	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.040	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Williamstwn STP	PA0021491	0.4500	0.4500	0.4500	0.000	22.00	6.80

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
06C	16895	WICONISCO CREEK	**27.600**	645.00	60.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.040	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Lykens Boro STP	PA0043575	0.4100	0.4100	0.4100	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	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
06C	16895	WICONISCO CREEK	**23.500**	580.00	66.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.040	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Washingtom Twp	PA0086185	0.0500	0.0500	0.0500	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	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
06C	16895	WICONISCO CREEK	**15.950**	518.00	80.49	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.040	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Elizabethville	PA0037737	0.4000	0.4000	0.4000	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	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
06C	16895	WICONISCO CREEK	**7.420**	450.00	89.60	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.040	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Dauphin Meadows	PA0080187	0.0500	0.0500	0.0500	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	50.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	50.00	0.00	0.00	0.70

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
06C	16895	WICONISCO CREEK

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
32.400	0.87	0.00	0.87	.6962	0.00197	.577	21.43	37.17	0.13	2.308	20.89	6.90
27.600	2.41	0.00	2.41	1.3304	0.00300	.67	32.56	48.58	0.17	1.464	21.22	6.96
23.500	2.65	0.00	2.65	1.4078	0.00156	.692	35.27	50.98	0.17	2.777	21.22	6.96
15.950	3.23	0.00	3.23	2.0266	0.00151	.722	39.7	55.02	0.18	2.842	21.53	6.97
Q1-10 Flow												
32.400	0.65	0.00	0.65	.6962	0.00197	NA	NA	NA	0.12	2.519	21.04	6.88
27.600	1.78	0.00	1.78	1.3304	0.00300	NA	NA	NA	0.15	1.622	21.47	6.95
23.500	1.96	0.00	1.96	1.4078	0.00156	NA	NA	NA	0.15	3.082	21.47	6.95
15.950	2.39	0.00	2.39	2.0266	0.00151	NA	NA	NA	0.17	3.133	21.82	6.96
Q30-10 Flow												
32.400	1.29	0.00	1.29	.6962	0.00197	NA	NA	NA	0.14	2.026	20.70	6.92
27.600	3.54	0.00	3.54	1.3304	0.00300	NA	NA	NA	0.20	1.262	20.94	6.97
23.500	3.89	0.00	3.89	1.4078	0.00156	NA	NA	NA	0.19	2.391	20.93	6.97
15.950	4.74	0.00	4.74	2.0266	0.00151	NA	NA	NA	0.21	2.466	21.19	6.97

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.74	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.47	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
06C	16895	WICONISCO 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
32.400	Williamstwn STP	16.87	32.56	16.87	32.56	0	0
27.600	Lykens Boro STP	15.03	50	15.52	50	0	0
23.500	Washingtom Twp	16.5	50	15.47	50	0	0
15.950	Elizabethville	15.39	50	14.89	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
32.400	Williamstwn STP	1.86	5.28	1.86	5.28	0	0
27.600	Lykens Boro STP	1.8	11.82	1.8	11.82	0	0
23.500	Washingtom Twp	1.88	25	1.8	25	0	0
15.950	Elizabethville	1.82	15.76	1.76	15.76	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
32.40	Williamstwn STP	15.01	15.01	4.49	4.49	5	5	0	0
27.60	Lykens Boro STP	25	25	11.82	11.82	5	5	0	0
23.50	Washingtom Twp	25	25	25	25	5	5	0	0
15.95	Elizabethville	25	25	15.76	15.76	5	5	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
06C	16895	WICONISCO CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
32.400	0.450	20.887	6.900
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
21.429	0.577	37.171	0.127
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
7.77	0.565	1.99	0.749
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.805	2.433	Tsivoglou	5
Reach Travel Time (days)			
2.308			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.231	6.78	1.67	5.53
0.462	5.92	1.41	5.12
0.692	5.17	1.18	5.16
0.923	4.51	1.00	5.41
1.154	3.94	0.84	5.76
1.385	3.44	0.71	6.12
1.615	3.00	0.59	6.48
1.846	2.62	0.50	6.80
2.077	2.29	0.42	7.10
2.308	2.00	0.35	7.36

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
27.600	0.860	21.221	6.955
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
32.565	0.670	48.580	0.171
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
5.90	0.675	2.15	0.769
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.320	5.027	Tsivoglou	5
Reach Travel Time (days)			
1.464			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.146	5.32	1.92	6.82
0.293	4.79	1.72	6.71
0.439	4.32	1.54	6.79
0.586	3.89	1.37	6.94
0.732	3.50	1.23	7.11
0.878	3.15	1.10	7.29
1.025	2.84	0.98	7.45
1.171	2.56	0.88	7.60
1.317	2.31	0.78	7.74
1.464	2.08	0.70	7.86

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
06C	16895	WICONISCO CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
23.500	0.910	21.221	6.958
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
35.272	0.692	50.979	0.166
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.51	0.077	1.12	0.769
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.831	2.527	Tsivoglou	5
Reach Travel Time (days)			
2.777			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.278	2.45	0.91	7.64
0.555	2.40	0.73	7.68
0.833	2.34	0.59	7.81
1.111	2.29	0.48	7.96
1.389	2.24	0.39	8.06
1.666	2.19	0.31	8.06
1.944	2.14	0.25	8.06
2.222	2.09	0.20	8.06
2.499	2.05	0.16	8.06
2.777	2.00	0.13	8.06

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
15.950	1.310	21.531	6.968
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
39.698	0.722	55.018	0.183
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
4.71	0.281	1.96	0.788
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.719	2.729	Tsivoglou	5
Reach Travel Time (days)			
2.842			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.284	4.32	1.57	6.73
0.568	3.97	1.25	6.55
0.853	3.64	1.00	6.70
1.137	3.34	0.80	6.95
1.421	3.07	0.64	7.22
1.705	2.82	0.51	7.46
1.989	2.59	0.41	7.68
2.273	2.37	0.33	7.86
2.558	2.18	0.26	8.01
2.842	2.00	0.21	8.01

C. TRC CALCULATIONS

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

2.4	= Q stream (cfs)	0.5	= CV Daily
0.41	= Q discharge (MGD)	0.5	= CV Hourly
30	= no. samples	1	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	1	= CFC_Partial Mix Factor
0	= Chlorine Demand of Discharge	15	= AFC_Criteria Compliance Time (min)
0.5	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)
0	= % Factor of Safety (FOS)	0	=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 1.226	1.3.2.iii	WLA cfc = 1.188
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.457	5.1d	LTA_cfc = 0.691

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

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