

Application Type Renewal
Facility Type Municipal
Major / Minor Minor

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Application No. PA0052353
APS ID 1140967
Authorization ID 1533194

Applicant and Facility Information

Applicant Name <u>Buckingham Township</u>	Facility Name <u>Buckingham Village STP</u>
Applicant Address <u>PO Box 413</u>	Facility Address <u>2380 Durham Road</u>
<u>Buckingham, PA 18912-0413</u>	<u>Buckingham, PA 18912</u>
Applicant Contact <u>Stephen Clark</u>	Facility Contact <u>Stephen Clark</u>
Applicant Phone <u>(215) 794-8834</u>	Facility Phone <u>(215) 794-8834</u>
Client ID <u>85901</u>	Site ID <u>495985</u>
Ch 94 Load Status <u>Not Overloaded</u>	Municipality <u>Buckingham Township</u>
Connection Status <u>No Limitations</u>	County <u>Bucks</u>
Date Application Received <u>July 8, 2025</u>	EPA Waived? <u>Yes</u>
Date Application Accepted _____	If No, Reason _____
Purpose of Application <u>Permit Renewal.</u>	

Summary of Review

The permittee has submitted application for renewal of NPDES permit to discharge 236,000 gpd of treated sewage from the Buckingham Village STP into Mill Creek through Outfall 001. This is a seasonal stream discharge from November 1 to April 30, the remainder of the year the effluent is spray irrigated. The discharge during the remainder of the months is land applied under WQM permit No. 0911402.

In January 1985, DEP approved 80,000-gpd for a proposed winter only discharge to address failing on-lot systems in Buckingham Township. A winter only stream discharge was deemed consistent with the Sewage Plan. In October 1986, the original NPDES permit was issued for 236,000-gpd to discharge to Lahaska Creek (Mill Creek). The increase in the permitted flow from the initial permit application was to accommodate additional sewage from the Village of Lahaska, and from existing package plants that were required to tie into the proposed plant. Buckingham Village WWTP was built with significant federal grant money.

Buckingham Village WWTP is permitted to discharge to Mill Creek from November 1 through April 30. The remainder of the year, the treated sewage is diverted by force main to Cole's Nursery, or to Furlong Lagoon #2 (formerly the Kaplan spray field lagoon). Buckingham Village WWTP treatment processes include influent screens, two (parallel) sequential batch reactor (SBR) biological treatment units, chlorine contact tank, and dual final sand filters.

Furlong WWTP was constructed at the Kaplan spray field site to handle the sewage from newer developments in Buckingham Township and was later expanded to treat sewage from additional developments. Furlong WWTP upgraded and expanded two existing treatment lagoons, constructed a third treatment lagoon, and expanded the spray irrigation areas. Seasonal flow from Buckingham Village WWTP still discharges to the Furlong WWTP. The Furlong lagoon treatment system provides partial mixed aeration and is hydraulically designed and permitted to treat a flow up to 304,000 gpd.

Approve	Deny	Signatures	Date
X		<i>Ketan Thaker</i> Ketan Thaker / Project Manager	10/2/2025
X		<i>Pravin Patel</i> Pravin C. Patel, P.E. / Environmental Engineer Manager	10/02/2025

Summary of Review

The treated effluent from the STP generally meets effluent limits of the NPDES permit. There is no change of quantity or quality of wastewater from the last permit renewal. Effluent limits for most of the parameters will remain the same for this permit renewal. We have included effluent limit of 1000 mg/l for Total Dissolved Solids (TDS) as recommended in DRBC Docket # D-2004-015 CP-4. It appears from the TDS sample results that STP can meet this limit. We have included effluent limit of 0.034 mg/l for Copper for this permit renewal. The treatment plant can meet this limit as well. We have added monitoring for E. Coli for this permit renewal, which is consistent with SOP.

Sludge use and disposal description and location(s): Sewage sludge disposed at Landfills by Franc Environmental.

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.

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.236
Latitude	40° 19' 7.78"	Longitude	-75° 3' 24.66"
Quad Name	Buckingham	Quad Code	07-23-2
Wastewater Description: Effluent			
Receiving Waters	Lahaska Creek (CWF, MF)	Stream Code	02596
NHD Com ID	25475484	RMI	6.55
Drainage Area	5.45 mi ²	Yield (cfs/mi ²)	0.11
Q ₇₋₁₀ Flow (cfs)	0.62	Q ₇₋₁₀ Basis	Previous Permit
Elevation (ft)	215	Slope (ft/ft)	
Watershed No.	2-F	Chapter 93 Class.	CWF, MF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s) Mill Creek is not impaired		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status	Final	Name	Neshaminy Creek
Background/Ambient Data	Data Source		
pH (SU)			
Temperature (°F)			
Hardness (mg/L)			
Other:			
Nearest Downstream Public Water Supply Intake			
PWS Waters		Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	

Changes Since Last Permit Issuance: No changes to the facility since last renewal.

Design Stream Flow (Basis: Previous Permit)

The design stream flow (e.g. Q₇₋₁₀) is based on the flow at USGS stream gage #01465500 located on Neshaminy Creek. The Q₇₋₁₀ flow at the gage is 11.9-cfs at a drainage area of 210 mi². Therefore, the low-flow yield for the Neshaminy Creek watershed is 0.057-cfs/mi². Since the Buckingham Village WWTP discharges only during the winter season, a winter multiplier of 2X was applied to the low-flow yield, which calculates a low-flow yield of about 0.11-cfs/mi². For a drainage area of 5.45 mi², the winter Q₇₋₁₀ at the point of discharge is 0.62-cfs.

Treatment Facility Summary				
Treatment Facility Name: Buckingham Village WWTP				
WQM Permit No.		Issuance Date		
0911402 A-1		6/13/2013		
Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Sequencing Batch Reactor	Chlorine	0.236
Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.236	1058	Not Overloaded		Landfill

Compliance History

DMR Data for Outfall 001 (from August 1, 2024 to July 31, 2025)

Parameter	JUL-25	JUN-25	MAY-25	APR-25	MAR-25	FEB-25	JAN-25	DEC-24	NOV-24	OCT-24	SEP-24	AUG-24
Flow (MGD) Average Monthly				0.151	0.138	0.135	0.128	0.156	0.135			
Flow (MGD) Daily Maximum				0.242	0.201	0.274	0.197	0.224	0.162			
pH (S.U.) Minimum				7.6	7.5	7.6	7.4	7.5	7.4			
pH (S.U.) Instantaneous Maximum				8.0	8.0	8.0	8.0	8.0	8.0			
DO (mg/L) Daily Minimum				8.0	8.9	10.1	8.7	9.2	8.5			
TRC (mg/L) Average Monthly				0.04	0.04	0.02	0.03	0.03	0.02			
TRC (mg/L) Instantaneous Maximum				0.21	0.49	0.06	0.10	0.05	0.04			
CBOD5 (lbs/day) Average Monthly				3	5	5	5	7	7			
CBOD5 (lbs/day) Raw Sewage Influent Average Monthly				413	344	382	308	508	381			
CBOD5 (lbs/day) Weekly Average				4	7	7	8	8	9			
CBOD5 (mg/L) Average Monthly				2.8	4.0	4.9	5.0	5.3	6.3			
CBOD5 (mg/L) Raw Sewage Influent Average Monthly				361	280	361	282	402	333			
CBOD5 (mg/L) Weekly Average				4.0	6.0	6.7	7.9	6.0	8.0			
BOD5 (lbs/day) Raw Sewage Influent Average Monthly				471	404	437	362	566	436			

**NPDES Permit Fact Sheet
Buckingham Village STP**

NPDES Permit No. PA0052353

BOD5 (mg/L) Raw Sewage Influent Average Monthly				412	328	412	332	447	380			
TSS (lbs/day) Average Monthly				8	6	6	4	3	10			
TSS (lbs/day) Raw Sewage Influent Average Monthly				1000	387	359	357	534	343			
TSS (lbs/day) Weekly Average				15	15	8	10	5	14			
TSS (mg/L) Average Monthly				6.5	5.3	5.3	3.8	2.3	9.0			
TSS (mg/L) Raw Sewage Influent Average Monthly				888	313	333	326	424	300			
TSS (mg/L) Weekly Average				13.0	12.0	8.0	9.0	4.0	12.0			
Fecal Coliform (CFU/100 ml) Geometric Mean				4	1	2	8	15	26			
Fecal Coliform (CFU/100 ml) Instantaneous Maximum				24	4	5	90	30	120			
Nitrate-Nitrite (lbs/day) Average Monthly				12	9	12	12	13	17			
Nitrate-Nitrite (mg/L) Average Monthly				10.47	7.42	10.89	11.04	10.16	14.4			
Total Nitrogen (lbs/day) Average Monthly				13	11	14	14	15	18			
Total Nitrogen (mg/L) Average Monthly				11.59	9.28	13.11	12.82	11.81	16.14			
Ammonia (lbs/day) Average Monthly				0.07	0.3	0.6	0.5	0.3	0.3			
Ammonia (mg/L) Average Monthly				0.01	0.01	1.0	1.0	0.01	0.01			
TKN (lbs/day) Average Monthly				1	2	2	2	2	2			
TKN (mg/L) Average Monthly				1.12	1.86	2.22	1.78	1.65	1.72			

**NPDES Permit Fact Sheet
Buckingham Village STP**

NPDES Permit No. PA0052353

Total Phosphorus (lbs/day) Average Monthly				0.8	0.8	0.7	0.8	0.8	2.0			
Total Phosphorus (mg/L) Average Monthly				0.71	0.64	0.67	0.72	0.65	1.77			
Total Copper (mg/L) Average Monthly				0.016	0.02	0.02	0.014	0.017	0.02			
Total Zinc (mg/L) Average Monthly				0.039	0.047	0.056	0.045	0.045	0.037			
Total Hardness (mg/L) Average Monthly				212	196	216	224	152	180			

A	B	C	D	E	F	G
TRC EVALUATION						
Input appropriate values in A3:A9 and D3:D9			Buckingham Village WWTP			
0.62	= Q stream (cfs)		0.5	= CV Daily		
0.236	= 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		
	= Chlorine Demand of Discharge		15	= AFC_Criteria Compliance Time (min)		
0.5	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)		
	= % Factor of Safety (FOS)			=Decay Coefficient (K)		
Source	Reference	AFC Calculations		Reference	CFC Calculations	
TRC	1.3.2.iii	WLA afc = 0.561		1.3.2.iii	WLA cfc = 0.539	
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373		5.1c	LTAMULT cfc = 0.581	
PENTOXSD TRG	5.1b	LTA_afc= 0.209		5.1d	LTA_cfc = 0.313	
Source	Effluent Limit Calculations					
PENTOXSD TRG	5.1f	AML MULT = 1.231				
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.257		AFC		
		INST MAX LIMIT (mg/l) = 0.841				
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)					

WQM 7.0 Effluent Limits

<u>SWP Basin</u>		<u>Stream Code</u>	<u>Stream Name</u>				
02F		2596	MILL 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)
6.550	Buckingham V W	PA0052353	0.236	CBOD5	20		
				NH3-N	10	20	
				Dissolved Oxygen			3

WQM 7.0 Wasteload Allocations

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>
02F	2596	MILL CREEK

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)		
6.55	Buckingham V W	20	20	10	10	3	3	0	0

WQM 7.0 D.O. Simulation

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>		
02F	2596	MILL CREEK		
<u>RMI</u>	<u>Total Discharge Flow (mgd)</u>	<u>Analysis Temperature (°C)</u>	<u>Analysis pH</u>	
6.550	0.236	22.006	7.000	
<u>Reach Width (ft)</u>	<u>Reach Depth (ft)</u>	<u>Reach WDRatio</u>	<u>Reach Velocity (fps)</u>	
14.999	0.539	27.842	0.113	
<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>	
9.22	1.075	4.01	0.817	
<u>Reach DO (mg/L)</u>	<u>Reach Kr (1/days)</u>	<u>Kr Equation</u>	<u>Reach DO Goal (mg/L)</u>	
6.140	16.546	Owens	6	
<u>Reach Travel Time (days)</u>	Subreach Results			
1.112	TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
	0.111	8.09	3.66	6.92
	0.222	7.09	3.35	7.20
	0.334	6.22	3.05	7.38
	0.445	5.46	2.79	7.54
	0.556	4.79	2.55	7.67
	0.667	4.20	2.33	7.79
	0.779	3.68	2.12	7.90
	0.890	3.23	1.94	7.95
	1.001	2.83	1.77	7.95
	1.112	2.49	1.62	7.95

WQM 7.0 Modeling Specifications

Parameters	D.O.	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	0.64	Use Inputted Reach Travel Times	<input type="checkbox"/>
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	<input checked="" type="checkbox"/>
D.O. Saturation	90.00%	Use Balanced Technology	<input checked="" type="checkbox"/>
D.O. Goal	6		

WQM 7.0 Hydrodynamic Outputs

<u>SWP Basin</u>		<u>Stream Code</u>				<u>Stream Name</u>						
02F		2596				MILL 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												
6.550	0.55	0.00	0.55	.3651	0.00046	.539	15	27.84	0.11	1.112	22.01	7.00
Q1-10 Flow												
6.550	0.35	0.00	0.00	.3651	0.00046	NA	NA	NA	0.00	0.000	0.00	0.00
Q30-10 Flow												
6.550	0.74	0.00	0.00	.3651	0.00046	NA	NA	NA	0.00	0.000	0.00	0.00

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
02F	2596	MILL CREEK	6.550	215.00	5.45	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Stream pH	Stream Temp (°C)	Stream pH
	(cfsm)	(cfs)	(cfs)									
Q7-10	0.100	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
Buckingham V W	PA0052353	0.2360	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	20.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	10.00	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
02F	2596	MILL CREEK	4.500	210.00	12.30	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary		Stream	
	(cfsm)	(cfs)	(cfs)						Temp (°C)	pH	Temp (°C)	pH
Q7-10	0.100	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
		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



Discharge Information

Instructions Discharge Stream

Facility: Buckingham Village WWTP NPDES Permit No.: PA0052353 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 _n
0.236	202	7.5						

				0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
	Discharge Pollutant	Units	Max Discharge Conc	Trib Conc	Stream Conc	Daily CV	Hourly CV	Strea m CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L										
	Chloride (PWS)	mg/L										
	Bromide	mg/L										
	Sulfate (PWS)	mg/L										
	Fluoride (PWS)	mg/L										
Group 2	Total Aluminum	µg/L										
	Total Antimony	µg/L										
	Total Arsenic	µg/L										
	Total Barium	µg/L										
	Total Beryllium	µg/L										
	Total Boron	µg/L										
	Total Cadmium	µg/L										
	Total Chromium (III)	µg/L										
	Hexavalent Chromium	µg/L										
	Total Cobalt	µg/L										
	Total Copper	mg/L	0.024			0.23						
	Free Cyanide	µg/L										
	Total Cyanide	µg/L										
	Dissolved Iron	µg/L										
	Total Iron	µg/L										
	Total Lead	µg/L										
	Total Manganese	µg/L										
	Total Mercury	µg/L										
	Total Nickel	µg/L										
	Total Phenols (Phenolics) (PWS)	µg/L										
	Total Selenium	µg/L										
	Total Silver	µg/L										
	Total Thallium	µg/L										
	Total Zinc	mg/L	0.058									
	Total Molybdenum	µg/L										
	Acrolein	µg/L	<									
	Acrylamide	µg/L	<									
	Acrylonitrile	µg/L	<									
	Benzene	µg/L	<									
	Bromoform	µg/L	<									
	Carbon Tetrachloride	µg/L	<									
	Chlorobenzene	µg/L										
	Chlorodibromomethane	µg/L	<									
	Chloroethane	µg/L	<									
	2-Chloroethyl Vinyl Ether	µg/L	<									

[illegible]

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Stream / Surface Water Information

Buckingham Village WWTP, NPDES Permit No. PA0052353, Outfall 001

Instructions Discharge **Stream**

Receiving Surface Water Name: **Mill 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	002596	6.55	215	5.45			Yes
End of Reach 1	002596	4.5	210	12.3			Yes

Q₇₋₁₀

Location	RMI	LFY (cfs/mi ²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	6.55	0.3										100	7		
End of Reach 1	4.5	0.3													

Q_h

Location	RMI	LFY (cfs/mi ²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	6.55														
End of Reach 1	4.5														



Model Results

Buckingham Village WWTP, NPDES Permit No. PA0052353, Outfall 001

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

☐ Hydrodynamics

☒ Wasteload Allocations

☒ AFC

CCT (min): 15

PMF: 0.673

Analysis Hardness (mg/l): 125.4

Analysis pH: 7.08

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Copper	0	0		0	16.634	17.3	69.6	Chem Translator of 0.96 applied
Total Zinc	0	0		0	141.954	145	583	Chem Translator of 0.978 applied

☒ CFC

CCT (min): 33.082

PMF: 1

Analysis Hardness (mg/l): 118.62

Analysis pH: 7.06

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Copper	0	0		0	10.363	10.8	59.1	Chem Translator of 0.96 applied
Total Zinc	0	0		0	136.529	138	759	Chem Translator of 0.986 applied

☒ THH

CCT (min): 33.082

PMF: 1

Analysis Hardness (mg/l): N/A

Analysis pH: N/A

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Copper	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☒ CRL

CCT (min): 14.420

PMF: 1

Analysis Hardness (mg/l): N/A

Analysis pH: N/A

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Copper	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☒ Recommended WQBELs & Monitoring Requirements

No. Samples/Month: 4

NPDES Permit Fact Sheet
Buckingham Village STP

NPDES Permit No. PA0052353

Pollutants	Mass Limits		Concentration Limits				Governing WQBEL	WQBEL Basis	Comments
	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units			
Total Copper	0.066	0.084	0.034	0.043	0.084	mg/L	0.034	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Zinc	Report	Report	Report	Report	Report	mg/L	0.37	AFC	Discharge Conc > 10% WQBEL (no RP)

☒ **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

Development of Effluent Limitations

Outfall No. 001
Latitude 40° 19' 7.71"
Wastewater Description: Effluent

Design Flow (MGD) 0.236
Longitude -75° 3' 25.19"

Technology-Based Limitations

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

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

Water Quality-Based Limitations

CBOD₅

The Department's WQM 7.0 model was run with the existing effluent limits and a design Q7-10 stream flow of 0.62-cfs. The model confirms that the existing seasonal CBOD₅ discharge limit of 20 mg/l limit is appropriate. For the period from May 1 to October 31, and at any other period the flow is diverted to spray irrigation, the effluent should receive a minimum of secondary treatment prior to spraying at an irrigation field.

Total Suspended Solids (TSS)

The existing TSS limit of 30 mg/l is consistent with secondary treatment standards. For the period from May 1 to October 31, and at any other period the flow is diverted to spray irrigation, require that the effluent receive a minimum of secondary treatment prior to spraying at spray irrigation field.

NH₃-N

The Department's WQM 7.0 model was run with the existing effluent limits and a design Q7-10 stream flow of 0.62-cfs. The model confirms that the existing seasonal NH₃-N limit of 10 mg/l limit is appropriate. For the period from May 1 to October 31, and at any other period the flow is diverted to spray irrigation, the effluent should receive a limit consistent with the Part II permit for the spray irrigation field.

Nitrite + Nitrate as N, TKN

To be consistent with other permits recently issued in the watershed, a monitoring only condition for these parameters is included. For the period from May 1 to October 31, and at any other period the flow is diverted to spray irrigation, the effluent should receive a limit consistent with the Part II permit for the spray irrigation field.

Dissolved Oxygen

The Department's WQM 7.0 computer model was run with the existing effluent limits and a design Q7-10 stream flow of 0.62-cfs. The model recommends a minimum DO discharge limit of 3 mg/l in order to meet the CWF stream criteria. To keep Dissolved Oxygen (D.O.) consistent with DEP's SOP No. BCW-PMT-033, D.O. has been changed to 4.0 mg/l.

Disinfection/ Total Residual Chlorine (TRC)

The existing permit includes the DRBC required fecal coliform limit of 200#/100ml. This fecal coliform limit is also recommended for the effluent at the spray field prior to spray irrigation. Based on the Department's TRC spreadsheet calculation, the TRC limit should be 0.26 mg/l as a monthly average (0.84 mg/l instantaneous maximum).

Phosphorous

Department's regulation (25 Pa Code 96.5) related to the phosphorous limits requires a phosphorus of 2.0 mg/l as a monthly average, if not more stringent.

The following are effluent limitations:

Parameter	Effluent Limit (mg/l)	Basis
CBOD5	20	WQM Model
Total Suspended Solids	30	25 Pa Code 92a.47
pH (S.U.)	6.0 – 9.0 S.U.	25 Pa Code 92a.47, 95.2
Fecal Coliform (No./100 ml)	200 Geo. Mean	25 Pa Code 92a.47
Total Residual Chlorine	0.26	TRC Spreadsheet
Nitrate-Nitrite as N	Report	25 Pa Code 92a.61
Dissolved Oxygen	4.0	SOP - BPJ
E. Coli	Report	25 Pa Code 92a.47
Total Nitrogen	Report	25 Pa Code 92a.61
Ammonia-Nitrogen	10	WQM Model
Total Kjeldahl Nitrogen	Report	25 Pa Code 92a.61
Total Phosphorus	2.0	25 Pa Code 96.5
Copper, Total	0.034	TM Spreadsheet
Zinc, Total	Report	TM Spreadsheet
Total Dissolved Solids	1000	DRBC Docket # D-2004-015 CP-4

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) Nov 1 - Apr 30	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.) Nov 1 - Apr 30	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO Nov 1 - Apr 30	XXX	XXX	4.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC Nov 1 - Apr 30	XXX	XXX	XXX	0.26	XXX	0.84	1/day	Grab
CBOD5 Raw Sewage Influent Nov 1 - Apr 30	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
CBOD5 Nov 1 - Apr 30	39	59	XXX	20.0	30.0	40	1/week	24-Hr Composite
BOD5 Raw Sewage Influent Nov 1 - Apr 30	Report	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
TSS Nov 1 - Apr 30	59	88	XXX	30.0	45.0	60	1/week	24-Hr Composite
TSS Raw Sewage Influent Nov 1 - Apr 30	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Fecal Coliform (No./100 ml) Nov 1 - Apr 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
E. Coli (No./100 ml) Nov 1 - Apr 30	XXX	XXX	XXX	XXX	XXX	Report	1/month	Grab

Outfall001 , 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		
Nitrate-Nitrite Nov 1 - Apr 30	Report	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Total Nitrogen Nov 1 - Apr 30	Report	XXX	XXX	Report	XXX	XXX	1/month	Calculation
Ammonia Nov 1 - Apr 30	20	XXX	XXX	10	XXX	20	1/week	24-Hr Composite
TKN Nov 1 - Apr 30	Report	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Total Phosphorus Nov 1 - Apr 30	3.9	XXX	XXX	2.0	XXX	4	1/week	24-Hr Composite
Total Copper Nov 1 - Apr 30	0.066	0.084 Daily Max	XXX	0.034	0.043 Daily Max	0.084	1/month	24-Hr Composite
Total Zinc Nov 1 - Apr 30	XXX	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Total Dissolved Solids Feb 1 - 28, Dec 1 - 31	Report Avg Qtrly	Report Daily Max	XXX	1000 Avg Qtrly	2000 Daily Max	2500	1/quarter	24-Hr Composite