Pennsylvania Department of Environmental Protection

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0081752**
Facility Type	**Non-Municipal**	APS ID	**925938**
Major / Minor	**Minor**	Authorization ID	**1478479**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Philhaven Hospital**	Facility Name	**Philhaven Hospital**
Applicant Address	283 S Butler Road PO Box 550	Facility Address	283 Butler Road
	Mt Gretna, PA 17064		Mount Gretna, PA 17064-6085
Applicant Contact	Tammy Petrasic	Facility Contact	Brian Norris
Applicant Phone	(717) 273-8871	Facility Phone	(610) 633-8009
Client ID	178701	Site ID	444117
Ch 94 Load Status	Not Overloaded	Municipality	West Cornwall Township
Connection Status		County	Lebanon
Date Application Received	March 26, 2024	EPA Waived?	Yes
Date Application Accepted	April 9, 2024	If No, Reason	

Purpose of Application: Renewal of NPDES permit for discharge of treated sewage

Summary of Review

1.0 General Discussion

This fact sheet supports the renewal of an existing NPDES permit for discharge of treated domestic wastewater from Philhaven Hospital wastewater treatment plant located in West Cornwall Township, Lebanon County. Wellspan/Philhaven owns and operates the wastewater treatment plant, which provides sanitary services to the Hospital. The extended aeration facility at the site has a design hydraulic capacity of 0.02MGD and discharge to Bachman Run which is classified for Trout Stocking (TSF) and Migratory Fishes (MF). The existing NPDES permit was issued on September 29, 2019 with an effective date of October 1, 2019 and expiration date of September 30, 2024. The applicant submitted a timely permit renewal application to the Department is currently operating under the terms and conditions in the existing permit under administrative extension provisions 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):

Sludge is hold up in a sludge holding tank and hauled out by a licensed hauler periodically.

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*,

Approve	Deny	Signatures	Date
X		*J. Pascal Kwedza* J. Pascal Kwedza, P.E. / Environmental Engineer	February 19, 2025
x		*Maria D. Bebenek* for Daniel W. Martin, P.E. / Environmental Engineer Manager	March 7, 2025
x		*Maria D. Bebenek* Maria D. Bebenek, P.E / Program Manager	March 7, 2025

Summary of Review
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.

1.3.0 Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.02
Latitude	40º 16' 8.12"	Longitude	-76º 28' 1.24"
Quad Name		Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Bachman Run	Stream Code	09724
NHD Com ID	56400833	RMI	5.40
Drainage Area	0.05	Yield (cfs/mi^2)	0.14
Q_{7-10} Flow (cfs)	0.007	Q_{7-10} Basis	USGS Gage Station
Elevation (ft)		Slope (ft/ft)	
Watershed No.	7-G	Chapter 93 Class.	TSF, MF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Pathogens, Nutrients		
Source(s) of Impairment	Unknown, Agriculture		
TMDL Status	Final	Name	Quittapahilla Creek Watershed

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

Nearest Downstream Public Water Supply Intake	PA American Water		
PWS Waters	Swatara Creek	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	20

Changes Since Last Permit Issuance: None**.**

1.3.1 Water Supply Intake

The nearest downstream water supply intake is approximately 20 miles downstream for PA American Water on Swatara Creek in South Hanover Township, Dauphin County. No impact is expected from this discharge on the intake.

2.0 Treatment Facility Summary				
Treatment Facility Name: Philhaven Hospital				
WQM Permit No.	**Issuance Date**			
3885402	May 20, 1985			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Extended Aeration	Hypochlorite	0.02
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.02		Not Overloaded	Aerobic Digestion	Combination of methods

Changes Since Last Permit Issuance: None

2.1 Treatment Facility

Treatment units are:

- 3 Bar screens
- 2 Aerated EQ tanks with lift pumps.
- 3 Aeration tanks
- 1 Clarifier
- 2 Sand filters
- 1 Chlorine Tank
- 1 Dechlorination tank
- 1 Post Aeration/Clear well
- 1 Aerated sludge holding tank

2.2 Chemicals

- Soda Ash for pH adjustment as needed
- Ferric chloride for phosphorus removal
- Sodium Hypochlorite for disinfection
- Sodium Bisulfate for dichlorination as needed

3.0 Existing Effluent Limitations and Monitoring Requirements

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.03	XXX	0.09	1/day	Grab
CBOD5 Nov 1 - Apr 30	XXX	XXX	XXX	20	XXX	40	2/month	24-Hr Composite
CBOD5 May 1 - Oct 31	XXX	XXX	XXX	10	XXX	20	2/month	24-Hr Composite
TSS	XXX	XXX	XXX	30	XXX	60	2/month	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Nitrate-Nitrite	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/6 months	24-Hr Composite
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/6 months	Calculation
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	6	XXX	12	2/month	24-Hr Composite
Ammonia May 1 - Oct 31	XXX	XXX	XXX	2	XXX	4	2/month	24-Hr Composite
TKN	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/6 months	24-Hr Composite
Total Phosphorus	XXX	XXX	XXX	2.0	XXX	4	2/month	24-Hr Composite

3.1 Compliance History

3.1.1 DMR Data for Outfall 001 (from January 1, 2024 to December 31, 2024)

Parameter	DEC-24	NOV-24	OCT-24	SEP-24	AUG-24	JUL-24	JUN-24	MAY-24	APR-24	MAR-24	FEB-24	JAN-24
Flow (MGD) Average Monthly	0.01172	0.01196	0.01154	0.01256	0.01526	0.01441	0.01385	0.01376	0.01140	0.01167	0.01226	0.01140
Flow (MGD) Daily Maximum	0.01780	0.01660	0.01890	0.02020	0.02550	0.02130	0.02240	0.01910	0.01580	0.01950	0.02400	0.01870
pH (S.U.) Daily Minimum	7.05	6.88	6.79	6.87	6.88	6.85	6.80	6.85	6.79	6.80	6.87	6.80
pH (S.U.) Daily Maximum	7.31	7.24	7.21	7.21	7.21	7.28	7.22	7.16	7.18	7.16	7.17	7.22
DO (mg/L) Daily Minimum	7.0	6.8	6.8	7.0	7.1	7.1	7.0	7.0	7.0	7.0	7.0	7.0
TRC (mg/L) Average Monthly	0.020	0.021	0.020	0.021	0.021	0.021	0.019	0.019	0.019	0.019	0.019	0.021
TRC (mg/L) Instantaneous Maximum	0.03	0.03	0.03	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03
CBOD5 (mg/L) Average Monthly	< 2.9	3.9	< 2	< 2	< 2	< 2	< 2.55	4	3.85	3.3	4.25	3.4
TSS (mg/L) Average Monthly	5	3.5	5	7	2.5	4	5	7	6	9.5	11.5	14
Fecal Coliform (No./100 ml) Geometric Mean	82	351	22.8	15.2	7.2	9.5	5.7	51.1	13	379.9	11	384.1
Fecal Coliform (No./100 ml) Instantaneous Maximum	240	2800	40	21	18	13	11	145	13	390	40	1250
Nitrate-Nitrite (mg/L) Daily Maximum	41.5						18.4					
Total Nitrogen (mg/L) Daily Maximum	< 42						20.49					
Ammonia (mg/L) Average Monthly	0.62	0.715	1.035	0.075	0.105	0.085	1.12	1.165	0.195	0.145	0.1	0.075
TKN (mg/L) Daily Maximum	< 0.5						2.09					
Total Phosphorus (mg/L) Average Monthly	0.395	0.625	0.14	0.265	0.205	0.31	0.32	0.46	0.63	0.54	0.54	0.605

3.1.2 Summary of DMRs:

DMRs review for the facility for the last 12 months of operation, presented on the table above in section 3.1.1 indicates permit limits have been met consistently. No effluent violations noted during the period reviewed.

3.1.3 Summary of Inspections:

The facility has been inspected a couple of times during the previous permit cycle. No effluent violations were found during plant inspections. The facility is operated and maintained well. The sand filters should be used alternatively and kept in operable condition always, free of overgrown grasses.

4.0 Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .02
Latitude 40º 16' 8.12" **Longitude** -76º 28' 1.24"
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: Weekly averages are not applicable to this discharge.

4.3 Water Quality-Based Limitations

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.

4.3.2 Receiving Stream

The receiving stream is Bachman Run. According to 25 PA § 93.9o, this stream is protected for Trout Stocking (TSF). It is located in Drainage List o and State Watershed 7-D. It has been assigned stream code 09724. According to the Department's Integrated Water Quality Monitoring and Assessment Report, Bachman Run is impaired for pathogens and nutrients. Source is unknown and agriculture, respectively. TMDL is completed and approved by EPA in 2001. See 303d listed streams section of the report for further discussion.

4.3.3 Stream flows

The Technical Support Document for Water Quality-Based Toxics Control (TSD) (EPA, 1991) and the Pennsylvania Water Quality Standards PA WQS) recommend the flow conditions to use in calculating water quality-based effluent limits (WQBELs) using steady-state modeling. The TSD and the PA WQS state that WQBELs intended to protect aquatic life uses should be based on the lowest seven-day average flow rate expected to occur once every ten years ($Q_{7\text{-}10}$) for chronic criteria and the lowest one-day average flow rate expected to occur once every ten years ($Q_{1\text{-}10}$) for acute criteria. The $Q_{30\text{-}10}$ is a biologically-based design flow intended to ensure an excursion frequency of once every three years for a 30-day average flow rate. These flows were determined by correlating with the yield of USGS gage No. 01573560 on Swatara Creek near Hershey. The $Q_{7\text{-}10}$ and drainage area at the gage is 67.7ft3/s and 483mi^2 respectively. The resulting yields are as follows:

- $Q_{7\text{-}10}$ = (67.7ft^3/s)/483 mi^2 = 0.14ft^3/s/ mi^2
- $Q_{30\text{-}10}$ / $Q_{7\text{-}10}$ = 0.89
- $Q_{1\text{-}10}$ / $Q_{7\text{-}10}$ = 1.23

The drainage area at the point of discharge calculated using StreamStats = 0.05 mi^2.

The summer $Q_{7\text{-}10}$ at discharge = 0.05 mi^2 x 0.14 ft^3/s/mi^2 = 0.007 ft^3/s.

4.3.4 NH_3N Calculations

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 modelling of the stream:

- Discharge pH = 6.8 (DMR median)
- Discharge Temperature = 25 ^{o} C (Default)
- Stream pH = 7.8 (WQN Station on Quittapahilla Creek)
- Stream Temperature = 19 ^{o}C (WQN Station on Quittapahilla Creek)
- Background NH_3-N = 0.0 (default)
- Discharge flow = 0.02MGD

4.3.5 $CBOD_5$ & NH_3-N

Existing effluent limits are based on the August 18, 1997, Implementation Guidance for Evaluating Wastewater Discharges to Drainage Ditches and Swales (ID # 391-2000-014). The guidance requires a summer limit of 10 mg/l $CBOD_5$, with a summer limit of 3 mg/l NH3-N and the use of filters for treatment. A water quality analysis conducted during the previous permit cycles indicate that a winter limit of 20 mg/l $CBOD_5$ and summer limit of 2 mg/l of NH3-N and winter limit of 6mg/l of NH3-N is necessary to protect aquatic life from toxicity concerns. The guidance referenced has been revised in 2008, but the revised limits are only applicable to new and expanding facilities. This facility is not expanding and not required to comply with the limits in the revised guidance.

To ensure the existing limits are still adequate to protect aquatic life at the point of first use, a water quality analysis was conducted using WQM stream model 7.0. The results of the WQM 7.0 model presented in attachment B indicates that a monthly average limit of 25 mg/l $CBOD_5$ and 1.50 mg/l NH_3-N (rounded down to the nearest 0.5) as a summer monthly average is necessary to protect the aquatic life from toxicity effects. The existing limits referenced above 10/20 $CBOD_5$, and the current recommended summer limit of 1.5mg/l for NH_3-N and a winter limit of 4.5 mg/l NH_3-N (which is calculated as 3 times the summer limit) are adequate to protect the water quality of the stream. This facility does have filters and past DMRs and inspection reports indicated the facility can meet the recommended slightly more stringent NH_3-N limit.

4.3.6 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 as well, this limit will be continued in the renewed permit with a daily monitoring requirement.

4.3.7 Total Suspended Solids (TSS):

There is no water quality criterion for TSS. The existing limit of 30 mg/l AML 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) will remain in the permit.

4.3.8 Chesapeake Bay Strategy:

The Department formulated a strategy to comply with the EPA and Chesapeake Bay Foundation requirements by reducing point source loadings of Total Nitrogen (TN) and Total Phosphorus (TP). Sewage discharges have been prioritized based on their delivered TN and TP 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. These limits may be achieved through a combination of treatment technology, credits, or offsets if approved by DEP. Phase 4 (0.2 - 0.4mgd) and Phase 5(below 0.2mdg) are required to monitor and report TN series and TP during permit renewal. Any facility in Phases 4 and 5 that undergoes expansion is subjected to cap load right away. This facility is, classified as a phase 5, and has been monitoring and will continue monitoring Nitrate-Nitrite as N, Total Kjeldahl Nitrogen and Total Nitrogen semi-annually throughout the next permit cycle to collect data. There is limitation on Total Phosphorus, monitoring is not required.

4.3.9 Phosphorus

The average monthly limit of 2mg/l phosphorus in the existing permit was required due to nutrient impairment of the stream prior to TMDL development for the Quittapahilla Creek watershed. The TMDL did not allocate any wasteload for Bachman Run, the receiving stream of the discharge. The limit will be continued in the current permit renewal to control nutrient discharges to Bachman Run.

4.3.10 Total Residual Chlorine:

The attached TRC results presented in attachment C utilizes the equations and calculations as presented in the Department's 2003 Implementation Guidance for Residual Chlorine (TRC) (ID # 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 results presented in attachment C indicates that a water quality limit of 0.04 mg/l monthly average and IMAX of 0.13 mg/l would be needed to prevent toxicity concerns. However, the existing limits of 0.03mg/l monthly average and IMAX of 0.09mg/l will remain in the permit due to anti-backsliding restrictions. DMR and inspection reports indicate the facility is meeting the permit requirement.

4.3.11 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.

4.3.12 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 0.02 MGD requires 1/year monitoring as included in the permit.

5.0 Other Requirements

5.1 Anti-backsliding

Not applicable to this permit

5.2 Stormwater:

No storm water outfall is associated with this facility

5.3 Special Permit Conditions

The permit will contain the following special conditions:

1. Stormwater Prohibition. 2. Approval Contingencies, 3. Management of Solids and collected screenings, slurries, sludges and other solids 4. Requirement to connect if a public sewer becomes available in the area. 5. Dry stream discharge condition, 6. Chlorine minimization

5.4 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.

5.5 Class A Wild Trout Fisheries

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

5.6 303d Listed Streams:

The discharge is located on a stream segment that is designated on the 303(d) list as impaired, and the impairment is due to nutrients from agricultural activities in the watershed. TMDL for Quittapahilla Creek Watershed was approved in 2000 but, no waste load was allocated for Bachman Run which is the receiving stream of Philhaven Hospital's discharge. The rationale document stated that, Load Reductions from agricultural activities will be enough to achieve the goals of the TMDL. A monthly average limit of 2.0 mg/l for Total Phosphorus established in the permit to enhance basin nutrient restoration prior to TMDL development will remain in the permit. If further reduction in point source loadings below current permit levels are required in the future, the permit will be re-opened to address it.

5.7 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).

5.8 Effluent Monitoring

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.

6.0 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	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.03	XXX	0.09	1/day	Grab
CBOD5 Nov 1 - Apr 30	XXX	XXX	XXX	20	XXX	40	2/month	24-Hr Composite
CBOD5 May 1 - Oct 31	XXX	XXX	XXX	10	XXX	20	2/month	24-Hr Composite
TSS	XXX	XXX	XXX	30	XXX	60	2/month	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
Nitrate-Nitrite	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/6 months	24-Hr Composite
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/6 months	Calculation
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	4.5	XXX	9	2/month	24-Hr Composite

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

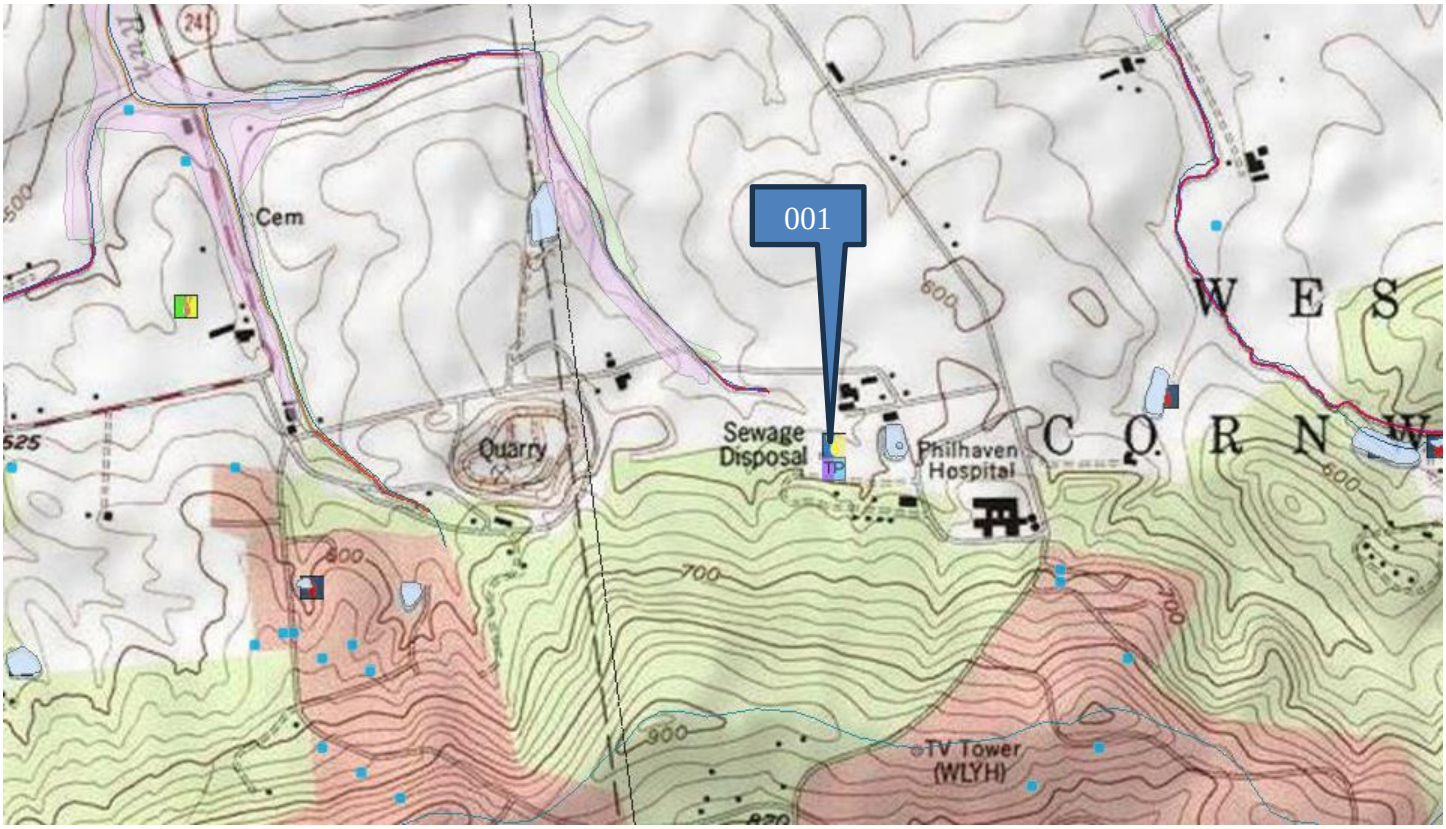
Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Ammonia May 1 - Oct 31	XXX	XXX	XXX	1.5	XXX	3	2/month	24-Hr Composite
TKN	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/6 months	24-Hr Composite
Total Phosphorus	XXX	XXX	XXX	2.0	XXX	4	2/month	24-Hr Composite

Compliance Sampling Location: None

7.0 Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment **B**)
☐	Toxics Management Spreadsheet (see Attachment)
☒	TRC Model Spreadsheet (see Attachment **C**)
☐	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 limitation for individual sewage permit.
☒	Other: WIP 3 and Supplement.

8. Attachments

A. Topographical Map



B. WQM Model Results

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
07D	9724	BACHMAN RUN

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)
5.400	Wellspan Philha	PA0081752	0.020	CBOD5	25		
				NH3-N	1.94	3.88	
				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
07D	9724	BACHMAN RUN	**5.400**	580.00	0.05	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	0.140	0.00	0.00	0.000	0.000	0.0	0.00	0.00	19.00	7.80	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
Wellspan Philha	PA0081752	0.0200	0.0200	0.0200	0.000	25.00	6.85

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
07D	9724	BACHMAN RUN	4.340	500.00	0.50	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	0.140	0.00	0.00	0.000	0.000	0.0	0.00	0.00	19.00	7.80	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	5.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
07D	9724	BACHMAN RUN

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												
5.400	0.01	0.00	0.01	.0309	0.01429	.343	1.56	4.55	0.07	0.913	23.89	6.93
Q1-10 Flow												
5.400	0.01	0.00	0.01	.0309	0.01429	NA	NA	NA	0.07	0.924	23.99	6.92
Q30-10 Flow												
5.400	0.01	0.00	0.01	.0309	0.01429	NA	NA	NA	0.07	0.892	23.69	6.94

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	0.89	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.23	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
07D	9724	BACHMAN RUN

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
5.400	Wellspan Philha	12.86	15.45	12.86	15.45	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
5.400	Wellspan Philha	1.52	1.94	1.52	1.94	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)		
5.40	Wellspan Philha	25	25	1.94	1.94	5	5	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07D	9724	BACHMAN RUN

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
5.400	0.020	23.893	6.928
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
1.560	0.343	4.549	0.071
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
20.76	1.435	1.58	0.945
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.598	29.276	Owens	5
Reach Travel Time (days)			
0.913			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.091	17.75	1.45	6.61
0.183	15.17	1.33	6.91
0.274	12.97	1.22	7.14
0.365	11.09	1.12	7.33
0.457	9.48	1.03	7.50
0.548	8.11	0.94	7.64
0.639	6.93	0.87	7.68
0.731	5.93	0.79	7.68
0.822	5.07	0.73	7.68
0.913	4.33	0.67	7.68

C. TRC Calculations Results

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.007	= Q stream (cfs)	0.5	= CV Daily
0.02	= 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 = 0.091	1.3.2.iii	WLA cfc = 0.081
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.034	5.1d	LTA_cfc = 0.047

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.042	AFC
		INST MAX LIMIT (mg/l) = 0.137	

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)**