pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

000Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0096571**
Facility Type	**Non-Municipal**	APS ID	**729178**
Major / Minor	**Minor**	Authorization ID	**1214366**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Bethlehem Center School District**	Facility Name	**Beth Center Elementary Jr Sr High School**
Applicant Address	194 Crawford Road	Facility Address	194 Crawford Road
	Fredericktown, PA 15333-2012		Fredericktown, PA 15333-2012
Applicant Contact	Matthew Waugh	Facility Contact	Same as Applicant
Applicant Phone	(724) 267-4914	Facility Phone	Same as Applicant
Client ID	191323	Site ID	256435
Ch 94 Load Status	Not Overloaded	Municipality	Deemston Borough
Connection Status	No Limitations	County	Washington
Date Application Received	June 21, 2017	EPA Waived?	Yes
Date Application Accepted	January 23, 2018	If No, Reason	

Purpose of Application: Application for renewal of an NPDES permit for treated sewage

Summary of Review

The permittee has applied for a renewal of NPDES Permit No. PA0096571. PA0096571 was previously issued by the PA Department of Environmental Protection (DEP) on November 22, 2011 and expired on November 30, 2016. The renewal application was submitted in a timely manner, and therefore was granted an administrative extension.

There are two sewage treatment plants on site. The first one is an extended aeration plant and the second a septic tank. Sewage from both facilities combines and is further treated by sand filter, and chlorine addition before discharging to a dry swale through Outfall 001. The Point of First use occurs at a RMI of 2.0 on Black Dog Hollow (ID 40286) which is classified as a Warm Water Fishery (WWF) per Chapter 93 Designated Use.

The permittee is currently enrolled in and will continue to use eDMR.

The applicant complied with Act-14 Notifications with letters dated May 15, 2017 and sent to Deemston Borough and Washington County.

Sewage sludge removal and disposal in contracted out to Hapchuck Sanitation and R&D Watters.

Since the last permit, the TRC and ammonia-nitrogen limits have changed to become more restrictive and annual *E. coli* monitoring has been added.

Anti-Backsliding

Approve	Deny	Signatures	Date
X		Stephanie Conrad / Environmental Engineering Specialist	January 11, 2022
x		Mahbuba Iasmin, Ph.D., P.E. / Environmental Program Manager	May 19, 2023

Summary of Review

Section 402(o) of the Clean Water Act (CWA), enacted in the Water Quality Act of 1987, establishes anti-backsliding rules governing two situations. The first situation occurs when a permittee seeks to revise a Technology-Based effluent limitation based on BPJ to reflect a subsequently promulgated effluent guideline which is less stringent. The second situation addressed by Section 402(o) arises when a permittee seeks relaxation of an effluent limitation which is based upon a State treatment standard of water quality standard.

Previous limits can be used pursuant to EPA's anti-backsliding regulation 40 CFR 122.44 **(l) Reissued permits. (1) Except as provided in paragraph (l)(2) of this section when a permit is renewed or reissued. Interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit (unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification or revocation and reissuance under §122.62). (2) In the case of effluent limitations established on the basis of Section 402(a)(1)(B) of the CWA, a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under section 304(b) subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.**

The facility is not seeking to revise the previously permitted effluent limits.

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)	0.025
Latitude	40º 1' 2"	Longitude	-80º 1' 35"
Quad Name	Ellsworth	Quad Code	1805
Wastewater Description:	Sewage Effluent		

Receiving Waters	Black Dog Hollow	Stream Code	40286
NHD Com ID	99424966	RMI	2.0
Drainage Area	0.49	Yield (cfs/mi^2)	0.006857
Q_{7-10} Flow (cfs)	0.00336	Q_{7-10} Basis	USGS Stream Stats
Elevation (ft)	1066	Slope (ft/ft)	
Watershed No.	19-B	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	

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

Nearest Downstream Public Water Supply Intake	Tri County Joint Municipal Authority		
PWS Waters	Monongahela River	Flow at Intake (MGD)	4.0
PWS RMI		Distance from Outfall (mi)	4.11

Changes Since Last Permit Issuance: None

Other Comments: The facility discharges to a dry swale. The receiving water information above reflects stream information at the Point of First Use.

Treatment Facility Summary				
Treatment Facility Name: Bethlehem Center School District - WWTP				
WQM Permit No.	**Issuance Date**	**Purpose**		
6376408	July 27, 1976			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Tertiary	Septic tank/sand filter	Chlorination	0.025
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.025	60	Not Overloaded		Pumped and Hauled offsite

Changes Since Last Permit Issuance: None

Other Comments:

Compliance History

Operations Compliance Check Summary Report

Facility: Bethlehem Center School District WWTP
NPDES Permit No.: PA0096571
Compliance Review Period: 1/1/2018-1/9/23
Inspection Summary:

INSPECTED DATE	INSP TYPE	AGENCY	INSPECTION RESULT DESC
05/18/2022	Compliance Evaluation	PA Dept of Environmental Protection	Violation(s) Noted
07/30/2021	Administrative/File Review	PA Dept of Environmental Protection	Administratively Closed
07/30/2021	Compliance Evaluation	PA Dept of Environmental Protection	No Violations Noted
01/02/2020	Administrative/File Review	PA Dept of Environmental Protection	Violation(s) Noted
10/08/2019	Administrative/File Review	PA Dept of Environmental Protection	Violation(s) Noted

Violation Summary:

VIOLATION DATE	VIOLATION TYPE	VIOLATION TYPE DESC	VIOLATION COMMENT
05/18/2022	92A.44	NPDES - Violation of effluent limits in Part A of permit	Effluent violations of fecal coliform.
05/18/2022	92A.41(A)5	NPDES - Failure to properly operate and maintain all facilities which are installed or used by the permittee to achieve compliance	The chlorinator is inoperable; The backup generator is inoperable; The diffuser in the EQ tank is inoperable; sewage in the EQ tank was septic; The sand in the tertiary units is unserviceable; The outfall is buried and inaccessible.
05/18/2022	92A.41(A)5	NPDES - Failure to properly operate and maintain all facilities which are installed or used by the permittee to achieve compliance	The unit is inoperable.
05/18/2022	92A.41(A)5	NPDES - Failure to properly operate and maintain all facilities which are installed or used by the permittee to achieve compliance	Outfall is inaccessible.
05/18/2022	92A.41(A)5	NPDES - Failure to properly operate and maintain all facilities which are installed or used by the permittee to achieve compliance	The generator is inoperable.
05/18/2022	92A.41(A)5	NPDES - Failure to properly operate and maintain all facilities which are installed or used by the permittee to achieve compliance	The outfall (discharge pipe) is buried and not accessible.
05/18/2022	92A.41(A)5	NPDES - Failure to properly operate and maintain all facilities which are installed or used by the permittee to achieve compliance	Generator doesn't operate.
01/02/2020	92A.61(G)	NPDES - Failure to use a format or process required by DEP for self-monitoring results	
10/08/2019	302.202	Operator Certification - Failure to submit annual system fee	

Open Violations by Client ID:

There are currently no open violations for Client ID 191323

Enforcement Summary:

ENF TYPE	ENF TYPE DESC	EXECUTED DATE	VIOLATIONS	ENF FINAL STATUS
NOV	Notice of Violation	01/02/2020	92A.61(G)	Comply/Closed
NOV	Notice of Violation	10/08/2019	302.202	Comply/Closed

Effluent Violation Summary:

MON_PD_END	PARAMETER	SAMPLE	PERMIT	UNIT	STAT_BASE_CODE
9/30/22	Ammonia-Nitrogen	3.6	3	mg/L	Average Monthly
5/31/22	Ammonia-Nitrogen	4.1	3	mg/L	Average Monthly
5/31/22	Ammonia-Nitrogen	8.1	6	mg/L	Instantaneous Maximum
10/31/21	Dissolved Oxygen	5.7	6	mg/L	Minimum
9/30/21	Fecal Coliform	2517	200	CFU/100 ml	Geometric Mean
8/31/21	Fecal Coliform	1023	200	CFU/100 ml	Geometric Mean
5/31/21	Fecal Coliform	460.6	200	CFU/100 ml	Geometric Mean
7/31/20	Fecal Coliform	217	200	CFU/100 ml	Geometric Mean
6/30/20	Flow	0.645	0.025	MGD	Average Monthly
5/31/20	Total Residual Chlorine (TRC)	0.14	0.11	mg/L	Instantaneous Maximum

Compliance Status: As of December 2022, the Permittee had received approval from the Township to tie into the public sewer system. The Township is updating the Act 537 plan and actively seeking funding to pursue this project, which will also result in the connection of 30 residences in the area. It is anticipated that this process will take 1-2 years. There are currently no open violations and no major enforcement actions pending, however Operations will continue to monitor non-Compliance until the facility can be closed and the NPDES permit is eligible for termination.

Completed by: Amanda Schmidt

Completed date: 1/9/23

Compliance History

DMR Data for Outfall 001 (from November 1, 2021 to October 31, 2022)

Parameter	OCT-22	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21
Flow (MGD) Average Monthly	0.0026	0.0037	0.00055	0.0017	0.00272	0.00297	0.00307	0.00404	0.00350	0.00261	0.00259	0.00268
pH (S.U.) Minimum	6.1	6.8	7.4	7.2	7.2	7.0	6.8	7.2	7.1	7.0	6.6	7.5
pH (S.U.) Maximum	7.4	7.4	7.0	7.2	7.2	7.1	7.4	7.4	7.3	7.3	8.0	7.5
DO (mg/L) Minimum	7.7	7.9	7.2	8.7	8.2	7.7	7.5	8.7	7.3	8.2	6.4	6.2
TRC (mg/L) Average Monthly	0.01	0.02	0.02	0.01	0.03	0.02	0.02	0.02	0.05	0.04	0.02	0.02
TRC (mg/L) Instantaneous Maximum	0.02	0.04	0.02	0.01	0.04	0.02	0.02	0.03	0.08	0.07	0.04	0.04
CBOD5 (mg/L) Average Monthly	4.7	7.6	2.0	2.7	2.0	5.6	3.9	2.2	3.0	2.0	3.0	2.0
CBOD5 (mg/L) Instantaneous Maximum	2.0	2.0	2.6	2.5	2.0	9.1	5.8	2.4	4.0	2.0	3.9	2.0
TSS (mg/L) Average Monthly	12	5.0	5.0	5.0	5.0	5.0	10.5	5.0	5.0	5.0	5.0	5.0
TSS (mg/L) Instantaneous Maximum	5.0	5.0	5.0	5.0	5.0	5.0	16.0	5.0	5.0	5.0	5.0	5.0
Fecal Coliform (CFU/100 ml) Geometric Mean	206	112	108	150	194	139	346	154	266	210	20	25
Ammonia (mg/L) Average Monthly	2.4	3.6	0.1	0.1	0.1	4.1	3.1	0.1	0.4	0.1	1.0	0.2
Ammonia (mg/L) Instantaneous Maximum	0.1	0.1	0.1	0.1	0.1	8.1	6.0	0.1	0.6	0.1	1.8	0.2

Compliance History

Effluent Violations for Outfall 001, from: December 1, 2021 To: October 31, 2022

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Ammonia	05/31/22	Avg Mo	4.1	mg/L	3.0	mg/L
Ammonia	09/30/22	Avg Mo	3.6	mg/L	3.0	mg/L
Ammonia	05/31/22	IMAX	8.1	mg/L	6.0	mg/L

Summary of Inspections: The facility was last inspected by the Department of Environmental Protection on July 30, 2021 and no violations were noted.

Other Comments:

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .025
Latitude 40º 1' 2.00" **Longitude** -80º 1' 35.00"
Wastewater Description: Sewage Effluent

Technology-Based Effluent Limitations (TBELs)

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

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
Flow (MGD)	Report	Average Monthly	-	92a.27, 92a.61
$CBOD_5$	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)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)
Ammonia-Nitrogen	25	Average Monthly	-	BPJ
Dissolved Oxygen	4.0	Min	-	BPJ
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Total Nitrogen	Report	Average Monthly	-	92a.61
Total Phosphorus	Report	Average Monthly	-	92a.61
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)

Reimposition of Existing Limitations

The Department issued the guidance document, *Implementation Guidance for Evaluating Discharges to Drainage Swales and Ditches,* on May 22, 1987. The guidance document established the following minimum treatment requirements for facilities that discharge to a dry swale:

$CBOD_5$	15 / 30
TSS	25 / 50
DO	3 Instantaneous Min
Ammonia-Nitrogen (Nov 1 – Apr 30)	9.0 / 18.0
Ammonia-Nitrogen (May 1 – Oct 31)	3.0 / 6.0
Fecal Coliform (Nov 1 – Apr 30)	200/100 mL as a geometric mean
Fecal Coliform (May 1 – Oct 31)	2000/100 mL as a geometric mean
Total Residual Chlorine	Monitor and Report
pH	Not less than 6.0 nor greater than 9.0

The Department issued a subsequent dry swales guidance document titled *Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers* [Doc. No. 391-2000-014] on April 12, 2008. The guidance document amended Advanced Treatment Requirements by making $CBOD_5$ and TSS more stringent while removing the remaining contaminants of concern and adding Dissolved Oxygen (DO), Total Nitrogen, and Total Phosphorus. Bethlehem Center Elementary Jr. Sr, High School STP was originally permitted with WQM Permit No. 6376408 on July 27, 1976. The facility predates the 2008 guidance and is therefore considered to be an "existing discharge." In accordance with the Department's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033], when evaluating an existing discharge, if the advanced treatment requirements cannot be achieved, the standards in DEP guidance document number 391-2000-014 do not apply unless the receiving stream is impaired and the point source discharge contributes to the impairment. The receiving

stream, Black Dog Hollow (ID 40286) is not impaired. Therefore, the advanced treatment requirements will not be imposed on this facility.

Point of First Use (POFU)

On April 4, 2022, Biologist Jamie Detwiler conducted a POFU Study that is included in Attachment A. During the study, the outfall could not be located, however a dry swale exists where the outfall is expected to be. The study found that the POFU occurred at Latitude 40.009995, Longitude -80.022786 and at a RMI of 2.0 on Black Dog Hollow (ID 40286). State Surface Water Assessment Program (SSWAP) sampling was conducted by Abbey Owoc in 1998 and long-lived taxa were found.

Water Quality-Based Effluent Limitations (WQBELs)

In accordance with the Department's *Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers* [Doc. No. 391-2000-014], modeling for $CBOD_5$, ammonia-nitrogen, and DO at the Point of First Use (POFU) downstream was also conducted to determine if more stringent WQBELs are necessary to protect water quality.

Pursuant to EPA's approval of Pennsylvania's 2017 Triennial Review of Water Quality Standards and corresponding regulatory changes published in the *Pennsylvania Bulletin* on July 11, 2020, new water quality criteria for ammonia-nitrogen apply to waters off the commonwealth. Therefore, WQBELs for Outfall 001 are re-evaluated even though there have been no changes to the STP.

WQM 7.0 Water Quality Modeling

DEP's WQM 7.0 version 1.1 model is a Microsoft Access® Program used for sewage dischargers to determine whether TBELs are sufficient to meet in-stream water quality criteria for ammonia-nitrogen, carbonaceous biochemical oxygen demand ($CBOD_5$) and dissolved oxygen (DO). To accomplish this, the model simultaneously simulates mixing and degradation of ammonia-nitrogen and mixing and consumption of DO through $CBOD_5$ and ammonia-nitrogen degradation. WQM 7.0 determines the highest pollutant loading that the stream can assimilate while still meeting water quality criteria under design conditions.

The model is a two-step process. The discharge is first modeled for the summer period (May through October) because warm temperatures are more likely to result in critical loading conditions. Reduced DO levels likely also play a role in ammonia toxicity and solubility of DO decreases at increased water temperature. If summer modeling determines that WQBELs are appropriate for the summer period, then modeling is completed for the winter period (November through April). This is in accordance with the Department's *Implementation Guidance of Section 93.7 Ammonia Criteria* [Doc. No. 391-2000-013] (Ammonia Guidance).

River Mile Index (RMI) was measured in eMAP PA as the distance from the facility's outfall to the mouth of the Ohio River. Elevation was read by applying a topomap in eMAP PA. Discharge point and downstream drainage areas as swell as Q_{7-10} flow were generated by USGS Stream Stats. USGS Stream Stats output files are included in Attachment D. In the absence of site-specific data, discharge temperature, stream temperature, and stream pH are assumed to be 20, 25, and 7 in accordance with the Ammonia Guidance. Stream width to depth was assumed to be 10 in accordance with the Department's *Technical Reference Guide (TRG) for WQM 7.0 for Windows Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen Version 1.0* [Doc. No. 391-2000-007].

WQM 7.0 Modeling inputs are documented in the table below:

Discharge Characteristics		Basin/Stream Characteristics	
Parameter	**Value**	**Parameter**	**Value**
River Mile Index (RMI)	2.0	Drainage Area (mile)	0.49
Discharge Flow (MGD)	0.025	$Q_{7-10\ (cfs)}$	0.00343
Discharge Temp (^oC)	20	Low-flow yield (cfs/mi^2)	0.007
Ammonia-Nitrogen (mg/L)	3.00	Elevation (ft)	1066.0
$CBOD_5$ (mg/L)	15.00	Stream Width/Depth	10

DO (mg/L)	6.0	Stream Temp (°C)	25.0
pH (s.u.)	7.0	Stream pH (s.u.)	7.0

The effluent was modeled using WQM 7.0 to evaluate the $CBOD_5$, ammonia-nitrogen, and DO limitations. Modeling confirmed that the minimum treatment requirement from the 1988 Dry Swales Guidance is appropriate for $CBOD_5$. Modeling also determined that water quality-based ammonia-nitrogen and DO limits are necessary to meet in-stream water quality criterion. In accordance with the Department's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. PCW-PMT-033 Version 1.0], winter ammonia-nitrogen limits are assessed by comparing the winter WQM 7.0 output value with one calculated from the summer limit using a seasonal multiplier of three. The more restrictive of the two values is then imposed. For this facility the ammonia-nitrogen winter limit is equal to the value output from the WQM 7.0 model.

Due to the new ammonia-nitrogen criteria previously discussed, the facility is receiving new, more restrictive winter ammonia-nitrogen limits. Based on eDMR data, the facility as currently operating is unlikely to meet the effluent limits 90% of the time. Following the procedure documented in the Department's SOP for *Establishing Water Quality-Based Effluent limitations (WQBELs) and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers* [SOP No. BCW-PMT-037], if eDMR data suggests that a permittee is unable to meet a WQBEL 90% of the time, then a compliance period will be included with the permit. The upgrades to the facility needed to meet the new ammonia-nitrogen limit are likely to cause an economic burden on this facility. Additionally, the facility has received permission to connect to the public sewer and is in the process of acquiring funds for this action. Because of these considerations, a compliance schedule of five years is being included in the permit.

WQM 7.0 model output files are included in Attachment B.

Total Residual Chlorine Modeling

The Department's Total Residual Chlorine (TRC) Spreadsheet is a Microsoft Excel® Program used to evaluate WQBELs for TRC using mass balance. In accordance with the Department's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 Version 1.9], default values of 0.3 mg/L and 0 mg/L for in-stream and discharge chlorine demand were used for model inputs. Part C. IV. B. has been added to the permit, giving the permittee the opportunity to complete site specific sampling to refine the model.

Total Residual Chlorine (TRC) was modeled with the Department's TRC Spreadsheet, and it was determined that a stricter limit is necessary to meet in-stream water quality criteria. Based on eDMR data, the facility as currently operating is not able to meet the new, more restrictive Average Monthly TRC limit. Model output files are included in Attachment C.

Based on the same considerations documented in the ammonia-nitrogen section, a TRC compliance schedule of five years is being included in the permit.

The proposed TRC effluent limit is lower than the Quantification Limit (QL), as defined in 25 Pa. Code§ 252.1, of the most sensitive EPA-approved test method. Part C V. has been added to the permit to address this concern. TRC shall be analyzed using one of the test methods indicated in Part C V. of the permit.

Parameter	Limit (mg/l)	SBC	Model
Total Residual Chlorine	0.02	Average Monthly	TRC Spreadsheet
Dissolved Oxygen	6.0	Instantaneous Minimum	WQM 7.0
Ammonia-Nitrogen (winter)	3.5	Average Monthly	WQM 7.0
Ammonia-Nitrogen (summer)	2.0	Average Monthly	WQM 7.0

Additional Considerations

In accordance with Section 1.A. of the Department's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 Version 1.9], pursuant to EPA's approval of Pennsylvania's 2017 Triennial Review of

Water Quality Standards and corresponding regulatory changes published in the *Pennsylvania Bulletin* on July 11, 2020 and under the authority of 25 Pa. Code § 93.7(a) and § 92.a.61, sewage discharges will include monitoring, at a minimum, for *E. coli* in new and reissued permits, with a monitoring frequency of 1/year for design flows of 0.002 – 0.05 MGD.

In accordance with Section 1.A. of the Department's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 Version 1.9], and under the authority of 25 Pa. Code § 92a.61(b), nutrient monitoring for total nitrogen and total phosphorus will be imposed. The intent of this monitoring is to establish the nutrient load of the wastewater and evaluate the impact that load may have on the quality of the receiving stream. The SOP states that if the receiving stream is not impaired for nutrients, then discretion may be used in setting the monitoring frequency. Black Dog Hollow is not impaired for nutrients; therefore, a monitoring frequency of 1/year will be imposed. This is the first time that these monitoring requirements are being imposed.

Monitoring frequency for proposed effluent limits are based upon Table 6-3, Self-Monitoring Requirements for Sewage Dischargers, from the Department's *Technical Guidance for the Development and Specification of Effluent Limitations* [Doc No. 362-0400-001]. Please note that Monitoring Requirements were changes for flow to 1/week measured and for pH, DO, and TRC to 1/day to be consistent with the guidance.

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

Outfall 001, Effective Period: Beginning of Sixtieth (60th) Month following Permit Issuance 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		
TRC	XXX	XXX	XXX	0.02	XXX	0.06	1/day	Grab
Ammonia-Nitrogen Nov 1 - Apr 30	XXX	XXX	XXX	3.5	XXX	7.0	2/month	Grab
Ammonia-Nitrogen May 1 - Oct 31	XXX	XXX	XXX	2.0	XXX	4.0	2/month	Grab

Compliance Sampling Location: Outfall #001

Other Comments:

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

Outfall 001, Effective Period: Permit Effective Date through End of Fifty-Ninth (59th) Month Following Permit.

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		
TRC	XXX	XXX	XXX	0.05	XXX	0.11	1/day	Grab
Ammonia-Nitrogen Nov 1 - Apr 30	XXX	XXX	XXX	5.0	XXX	10.0	2/month	Grab
Ammonia-Nitrogen May 1 - Oct 31	XXX	XXX	XXX	3.0	XXX	6.0	2/month	Grab

Compliance Sampling Location: Outfall #001

Other Comments:

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	0.025	XXX	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	6.0 Inst Min	XXX	XXX	XXX	1/day	Grab
CBOD5	XXX	XXX	XXX	15	XXX	30	2/month	Grab
TSS	XXX	XXX	XXX	25	XXX	50	2/month	Grab
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
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab

Compliance Sampling Location: Outfall #001
Other Comments:

ATTACHMENT A

POFU Study

Permit No. PA0096571

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

MEMO

TO Stephanie Conrad
Environmental Specialist
Clean Water Program

FROM Jamie Detweiler
Aquatic Biologist 2
Clean Water Program

THROUGH Richard Spear
Aquatic Biologist 3
Clean Water Program

DATE March 28, 2022

RE Point of First Use Survey
Tributary 40288 to "Black Dog Hollow"
State Water Plan: 19B
Hydrologic Unit Code: 05020005
Stream Code: 40288
Aquatic Use Designation: WWF
Bethlehem-Center School District Waste Water Treatment Plant
Deemston Borough, Washington County

INTRODUCTION

On April 4, 2022, at the request of Stephanie Conrad of the Clean Water Program, a Point of First Surface Water Use (POFU) survey was attempted on Tributary 40288 to "Black Dog Hollow", located in Deemston Borough, Washington County (Figures 1 and 2). The objective of the survey was to determine if the tributary was capable of supporting an Aquatic Life Use as defined in 25 Pennsylvania Code §93.9q in the vicinity of the discharge of the Bethlehem-Center School District Wastewater Treatment Plant (WWTP), located at approximately Latitude: 40.017222, Longitude: -80.026389.

According to former permits reviews, the WWTP discharges to a dry channel. It appears that a POFU survey was never completed for the former permit reviews, so it was decided that a POFU survey should be completed for this renewal.

According to USGS StreamStats (Figure 3), the drainage area to the stream at the location of the POFU survey is 0.04 square miles. The drainage area is approximately 35% forest and 65 % developed, with the school taking up most of the drainage area. Tributary 40288 to "Black Dog Hollow" is in the Tenmile Creek State Water Plan (19B), and the Lower Monongahela Hydrologic Unit (Hydrologic Unit Code 05010009). This stream is listed as attaining its designated Aquatic Life Use for Warm Water Fisheries (WWF).

Southwest Regional Office
400 Waterfront Drive | Pittsburgh, PA 16335 | 412.442.4000 | Fax. 412.442.4194 | www.dep.pa.gov

SAMPLING METHODOLOGY

The point of first aquatic life use is the location at which a body of water is capable of supporting aquatic life as defined in 25 Pennsylvania Code §93. Guidance for determining the point of first aquatic life use is in the Department's guidance document #391-2000-014, Policy and Procedures for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers (revised April 12, 2008). Specifically, Appendix B of the guidance document provides additional guidance when making a point of first use determination.

During the site visit, an outfall location could not be found. At the location where the discharge was expected, there was no channel. Therefore, the normal protocol could not be followed. Following a probable drainage route, I found a location with substrate and flow, and examined the underside of rocks to determine which aquatic macroinvertebrates inhabit this channel.

RESULTS

During the site visit, the discharge could not be found. We assumed it was either downslope from the WWTP, found on Crawford Road (Figures 4, 5, 6) or downslope of an area that looked like a filtering system, located near the WWTP. A channel was located next to the area that appeared to be a filtering system and a small amount of water was within the channel (Figures 7, 8). Since there was only a small amount of water and April is a wet month, it was assumed that the channel was dry for a large part of the year. Immediately downslope of the filtering area (and downslope of the channel), were no bed and banks (Figure 9). Continuing downslope, there was another channel that had defined bed and banks and rock substrate (Figure 10, 11). Since flow did not appear to be consistent, I continued downstream, until I was approximately 350 meters from the filter area (downstream of Figures 12, 13). Here, I turned over submerged rocks and leaves to look for aquatic macroinvertebrates. I could not use our typical protocol because the water was not deep enough. At this location, I found Isopods, flatworms, chironomids, and Uenoid caddisflies.

DISCUSSION AND CONCLUSIONS

The objective of this study was to examine aquatic life in Tributary 40288 to "Black Dog Hollow" to determine if the stream has an aquatic life use at the point of discharge.

Findings from this study suggest that the Tributary 40288 to "Black Dog Hollow" does not have an aquatic life use at the probable discharge location. While the WWTP outfall could not be found on the day of the investigation, the water conveyances do not support an Aquatic Life Use. In 1998, Aquatic Biologist Abbey Owoc performed State Surface Water Assessment Program (SSWAP) sampling at a station, located at Latitude: 40.009995, Longitude: -80.022786. She found long-lived taxa, including Sialidae, Hydropsychidae, Psephenidae, and Elmidae. The 1998 SSWAP Station (Figure 1) should be considered the POFU for the WWTP.

cc: Stream File – Tributary 40288 to "Black Dog Hollow"
Mahbuba Iasmin – SWRO, Environmental Group Manager
Christopher Kriley – SWRO, Environmental Program Manager
Michael (Josh) Lookenbill – CO, Environmental Group Manager

Permit No. PA0096571

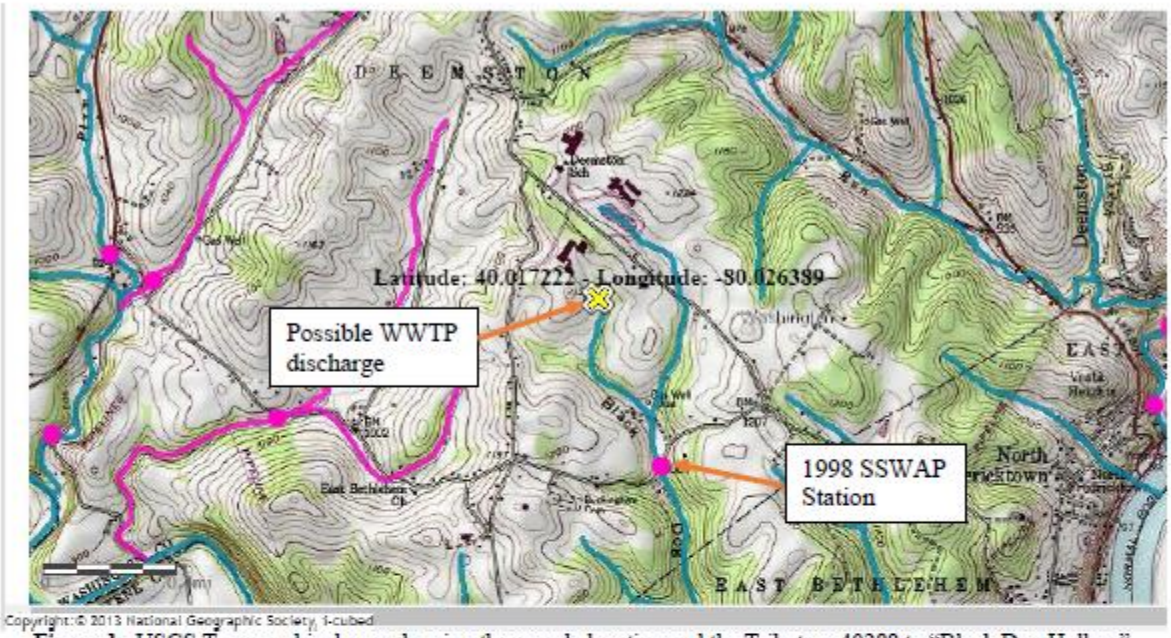


Figure 1. USGS Topographical map showing the sample location and the Tributary 40288 to "Black Dog Hollow".

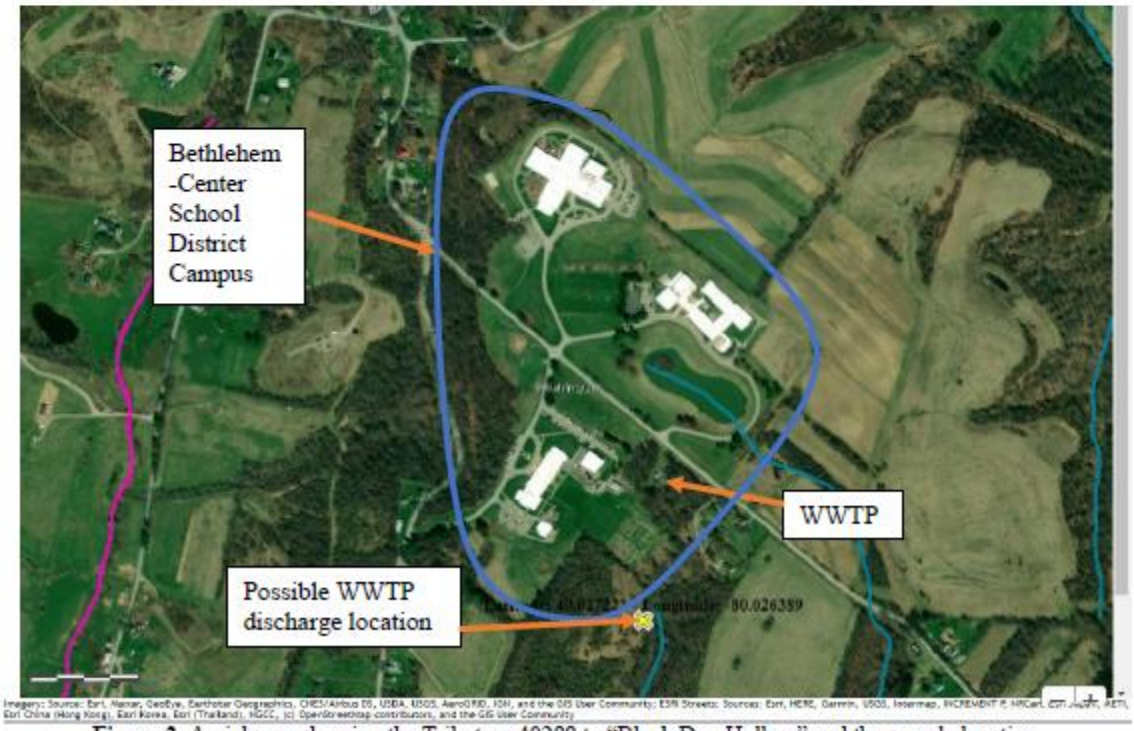


Figure 2. Aerial map showing the Tributary 40288 to "Black Dog Hollow" and the sample location.

StreamStats Report

Region ID:	PA
Workspace ID:	PA20220405182543547000
Clicked Point (Latitude, Longitude):	40.01735, -80.02607
Time:	2022-04-05 14:26:06 -0400

Figure 3. USGS StreamStats Report for the drainage area.

Table 1. Macroinvertebrates observed in the Tributary 40288 to "Black Dog Hollow".

TAXA	Family	Number in sample	Long lived taxa
Chironomidae	Chironomidae (Non-biting Midge)	common	No
Isopoda	Tipulidae (Crane Fly)	abundant	No
Neophylax	Uenoidae (Stonecase Caddis Fly)	present	No
Platyhelminthes	Platyhelminthes (Flatworms)	common	No

Figure 4. WWTP

Figure 5. Looking downslope from WWTP

Figure 6. Looking downslope from WWTP.

Figure 7. Drainage path along filter area, looking downslope.

Figure 8. Ditch alongside filter area, looking upslope

Figure 9. Panorama, looking upslope at the filter area. (Note: no sign of a drainage channel).

Permit No. PA0096571

Figure 10. Looking upslope at the filter area. Note drainage channel forming but no outfall.

Figure 11. Looking downslope, below the possible filter area.

Permit No. PA0096571

Figure 12. Looking upstream near the location where the POFU was attempted.

Figure 13. Looking downstream near the location where the POFU was attempted.

ATTACHMENT B

WQM 7.0 Modeling Results

Summer

Permit No. PA0096571

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
19B	40286	"BLACK DOG HOLLOW"	2.000	1066.00	0.49	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	0.007	0.00	0.00	0.000	0.000	10.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Bethlehem Cente	PA0096571	0.0000	0.0250	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	15.00	2.00	0.00	1.50
Dissolved Oxygen	6.00	8.24	0.00	0.00
NH3-N	3.00	0.00	0.00	0.70

Permit No. PA0096571

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
19B	40286	"BLACK DOG HOLLOW"	0.930	960.00	1.20	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.007	0.00	0.00	0.000	0.000	10.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

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

Permit No. PA0096571

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
19B	40286	"BLACK DOG HOLLOW"

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												
2.000	0.00	0.00	0.00	.0387	0.01876	.305	2.97	9.74	0.05	1.406	20.40	7.00
Q1-10 Flow												
2.000	0.00	0.00	0.00	.0387	0.01876	NA	NA	NA	0.05	1.429	20.26	7.00
Q30-10 Flow												
2.000	0.00	0.00	0.00	.0387	0.01876	NA	NA	NA	0.05	1.384	20.53	7.00

Permit No. PA0096571

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	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

Permit No. PA0096571

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
19B	40286	"BLACK DOG HOLLOW"

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
2.000	Bethlehem Cente	16.4	6	16.4	6	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
2.000	Bethlehem Cente	1.82	2.04	1.82	2.04	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)		
2.00	Bethlehem Cente	15	15	2.04	2.04	6	6	0	0

Permit No. PA0096571

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19B	40286	"BLACK DOG HOLLOW"

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
2.000	0.025	20.400	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
2.967	0.305	9.738	0.047
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
13.96	1.357	1.88	0.722
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.179	25.273	Owens	5
Reach Travel Time (days)			
1.406			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.141	11.50	1.70	7.82
0.281	9.47	1.53	8.06
0.422	7.79	1.38	8.18
0.562	6.42	1.25	8.18
0.703	5.28	1.13	8.18
0.844	4.35	1.02	8.18
0.984	3.58	0.92	8.18
1.125	2.95	0.83	8.18
1.266	2.43	0.75	8.18
1.406	2.00	0.68	8.18

Permit No. PA0096571

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
19B	40286	"BLACK DOG HOLLOW"

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)
2.000	Bethlehem Cente	PA0096571	0.000	CBOD5	15		
				NH3-N	2.04	4.08	
				Dissolved Oxygen			6

Winter

Permit No. PA0096571

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
19B	40286	"BLACK DOG HOLLOW"	2.000	1066.00	0.49	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	0.014	0.00	0.00	0.000	0.000	10.0	0.00	0.00	5.00	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
Bethlehem Cente	PA0096571	0.0000	0.0250	0.0000	0.000	15.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	15.00	2.00	0.00	1.50
Dissolved Oxygen	6.00	12.51	0.00	0.00
NH3-N	5.00	0.00	0.00	0.70

Permit No. PA0096571

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
19B	40286	"BLACK DOG HOLLOW"

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												
2.000	0.01	0.00	0.01	.0387	0.01876	.309	3.03	9.81	0.05	1.347	13.52	7.00
Q1-10 Flow												
2.000	0.00	0.00	0.00	.0387	0.01876	NA	NA	NA	0.05	1.389	14.00	7.00
Q30-10 Flow												
2.000	0.01	0.00	0.01	.0387	0.01876	NA	NA	NA	0.05	1.308	13.09	7.00

Permit No. PA0096571

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	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

Permit No. PA0096571

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
19B	40286	"BLACK DOG HOLLOW"

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
2.000	Bethlehem Cente	24.1	10	24.1	10	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
2.000	Bethlehem Cente	2.95	3.64	2.95	3.64	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)		
2.00	Bethlehem Cente	15	15	3.64	3.64	6	6	0	0

Permit No. PA0096571

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19B	40286	"BLACK DOG HOLLOW"

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
2.000	0.025	13.520	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
3.029	0.309	9.811	0.049
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
13.08	1.424	3.10	0.425
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.964	21.565	Owens	5
Reach Travel Time (days)			
1.347			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.135	11.34	2.93	9.16
0.269	9.83	2.77	9.38
0.404	8.53	2.61	9.38
0.539	7.40	2.47	9.38
0.673	6.41	2.33	9.38
0.808	5.56	2.20	9.38
0.943	4.82	2.08	9.38
1.078	4.18	1.96	9.38
1.212	3.63	1.85	9.38
1.347	3.15	1.75	9.38

Permit No. PA0096571

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
19B	40286	"BLACK DOG HOLLOW"

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)
2.000	Bethlehem Cente	PA0096571	0.000	CBOD5	15		
				NH3-N	3.64	7.28	
				Dissolved Oxygen			6

ATTACHMENT C

TRC Modeling Results

Permit No. PA0096571

TRC_CALC_PA0096571

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.00336	= Q stream (cfs)	0.5	= CV Daily
0.025	= 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)		=Decay Coefficient (K)

Source	Reference	AFC Calculations		Reference	CFC Calculations	
TRC	1.3.2.iii	WLA afc =	0.047	1.3.2.iii	WLA cfc =	0.038
PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc =	0.581
PENTOXSD TRG	5.1b	LTA_afc=	0.017	5.1d	LTA_cfc =	0.022

Source		Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML MULT =	1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) =	0.021	AFC
		INST MAX LIMIT (mg/l) =	0.070	

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)

ATTACHMENT D

USGS Stream Stats Output

Permit No. PA0096571

Discharge Point

StreamStats Report

Region ID: PA
Workspace ID: PA20211025163709421000
Clicked Point (Latitude, Longitude): 40.01430, -80.02677
Time: 2021-10-25 12:37:28 -0400

Basin Characteristics

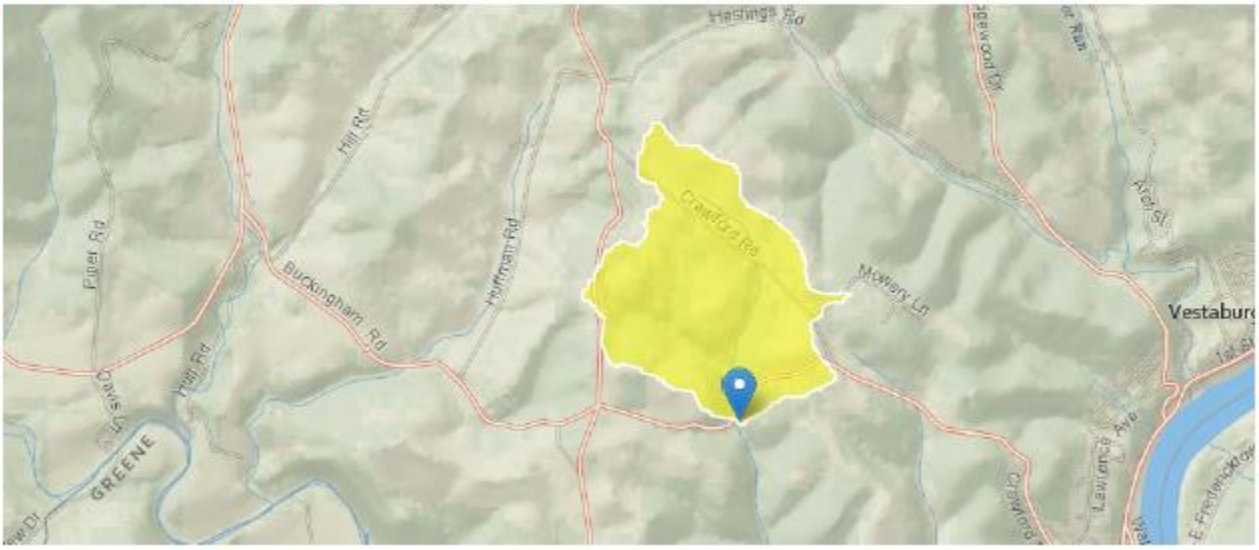
Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.16	square miles
ELEV	Mean Basin Elevation	1174	feet

Permit No. PA0096571

Point of First Use

StreamStats Report

Region ID: PA
Workspace ID: PA20220415133825325000
Clicked Point (Latitude, Longitude): 40.00951, -80.02268
Time: 2022-04-15 09:38:39 -0400



Low-Flow Statistics Parameters [Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.49	square miles	2.26	1400
ELEV	Mean Basin Elevation	1170	feet	1050	2580

Low-Flow Statistics Disclaimers [Low Flow Region 4]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Low-Flow Statistics Flow Report [Low Flow Region 4]

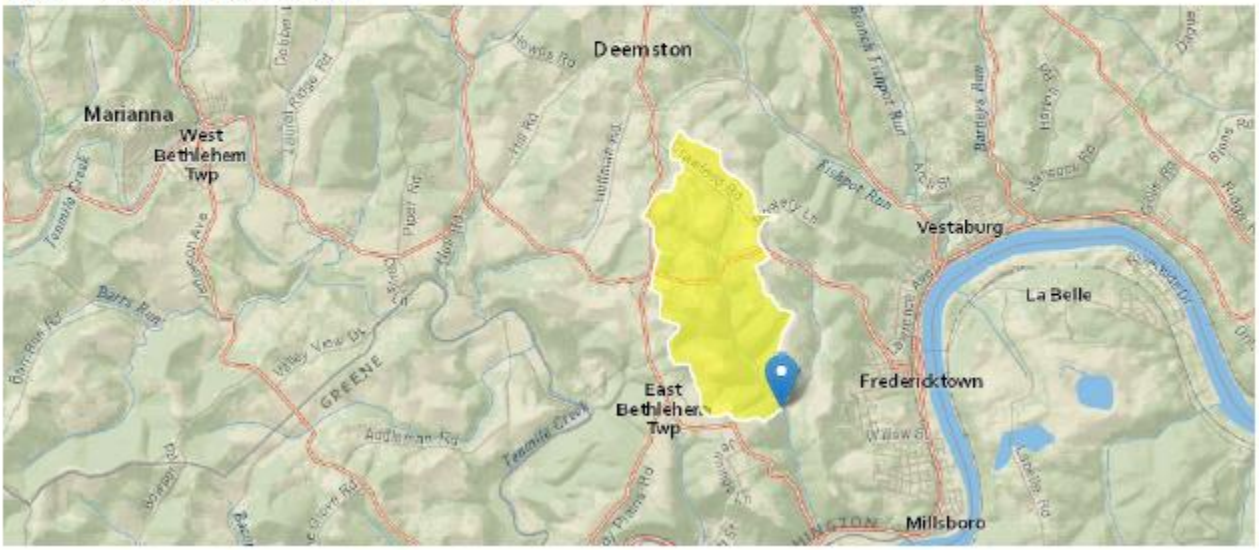
Statistic	Value	Unit
7 Day 2 Year Low Flow	0.0122	ft^3/s
30 Day 2 Year Low Flow	0.0243	ft^3/s
7 Day 10 Year Low Flow	0.00336	ft^3/s
30 Day 10 Year Low Flow	0.00758	ft^3/s
90 Day 10 Year Low Flow	0.0159	ft^3/s

Permit No. PA0096571

Down Stream of Discharge

StreamStats Report

Region ID: PA
Workspace ID: PA20220415134439124000
Clicked Point (Latitude, Longitude): 39.99701, -80.01504
Time: 2022-04-15 09:44:53 -0400



Low-Flow Statistics Parameters [Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.2	square miles	2.26	1400
ELEV	Mean Basin Elevation	1153	feet	1050	2580

Low-Flow Statistics Disclaimers [Low Flow Region 4]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Low-Flow Statistics Flow Report [Low Flow Region 4]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.0334	ft^3/s
30 Day 2 Year Low Flow	0.0638	ft^3/s
7 Day 10 Year Low Flow	0.0101	ft^3/s
30 Day 10 Year Low Flow	0.0212	ft^3/s
90 Day 10 Year Low Flow	0.0425	ft^3/s