pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0084883**
Facility Type	**Municipal**	APS ID	**8672**
Major / Minor	**Minor**	Authorization ID	**1423271**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Broad Top City Borough Huntingdon County**	Facility Name	**Broad Top City Borough STP**
Applicant Address	20432 Hazel Street, PO Box 220	Facility Address	Rt 913 Railroad Avenue
	Broad Top, PA 16621-0220		Broad Top, PA 16621
Applicant Contact	Timothy Maslanik	Facility Contact	Alan Putt
Applicant Phone	(814) 635-2437	Facility Phone	(814) 635-3349
Client ID	67472	Site ID	451727
Ch 94 Load Status	Not Overloaded	Municipality	Broad Top City Borough
Connection Status	No Limitations	County	Huntingdon
Date Application Received	January 3, 2023	EPA Waived?	Yes
Date Application Accepted	January 13, 2023	If No, Reason	
Purpose of Application	NPDES permit renewal		

Summary of Review

Broad Top City Borough (BTCB/Permittee) applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of its National Pollutant Discharge Elimination System (NPDES) permit for Broad Top City STP. This permit renewal application was received on January 3, 2023. The permit was last reissued on June 25, 2018, authorizing discharge of treated sewage from the existing treatment plant located in Broad Top City Borough, Huntingdon County into Shoup Run in watershed 11-D. The permit expires on June 30, 2023.

The average annual design flow and hydraulic design capacity is 0.06 MGD and the organic loading capacity is 160 lbs. BOD_5/day. The renewal application indicated the STP receives its 100% from the Borough, serving a population of 463.

The WQM Part II permit No. 3192403 original was issued on 9/22/1992, 3192403 A-1 amendment was issued on 1/10/2017, and 3192403 A-2 amendment was issued on 6/29/2018.

Sludge use and disposal description and location(s): N/A because sludge hauling is by contractor: Smiths Septic.

Changes from the previous permit: The E. Coli. monitoring and report requirements will add to the proposed permit. Total Residual Chlorine limits changed to 0.04 mg/L AML & 0.13 mg/L IMAX.

Based on the review outlined in this fact sheet, it is recommended that the permit be drafted. A public notice of the draft permit will be published in the *Pennsylvania Bulletin* for public comments for 30 days.

Approve	Deny	Signatures	Date
X		*Hilaryle* Hilary H. Le / Environmental Engineering Specialist	April 7, 2023
X		Maria D. Bebenek for Daniel W. Martin, P.E. / Environmental Engineer Manager	April 13, 2023

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.06
Latitude	40º 12' 17.71"	Longitude	-78º 8' 52.39"
Quad Name	Saxton	Quad Code	1720
Wastewater Description:	Sewage Effluent		
Receiving Waters	Shoup Run (WWF)	Stream Code	13717
NHD Com ID	65842451	RMI	7.51 miles
Drainage Area	0.34 mi.^{2}	Yield (cfs/mi^2)	See comments below
Q_{7-10} Flow (cfs)	See comments below	Q_{7-10} Basis	See comments below
Elevation (ft)	1848.9	Slope (ft/ft)	
Watershed No.	11-D	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Metals, pH		
Source(s) of Impairment	Acid Mine Drainage,		
TMDL Status	Final	Name	Shoup Run Watershed
Nearest Downstream Public Water Supply Intake	Mifflintown Water System Juniata County		
PWS Waters	Juniata River	Flow at Intake (cfs)	
PWS RMI	37.37 miles	Distance from Outfall (mi)	Approximate 100.0 miles

Changes Since Last Permit Issuance: none

Drainage Area

The discharge is to Shoup Run at RMI 7.51 miles. A drainage area upstream of the discharge is estimated to be 0.34 mi.^{2}, according to USGS PA StreamStats available at https://streamstats.usgs.gov/ss/.

Stream Flow

Streamflow data was collected from the nearest downstream USGS stream gauge 01562000 located in Raystown Branch Juniata River at Saxton, PA. Q_{7-10}, and Q_{30-10} values at this gage are 44.8 cfs, and 58.2 cfs, respectively. The drainage area was found to be 754 mi^2 at the gage. These values were obtained from the latest USGS streamflow report. It should be noted that due to drainage area being outside of suggested range, the low flow statistics derived from regression analyses in StreamStats may not be used, as the results were generated with unknown error. Low flow data collected from stream gage will be used in modeling, if needed.

$$\text{Yield} = 44.8 \text{ cfs}/754 \text{ mi}^2 = 0.059 \text{ cfs/mi}^2$$
$$Q_{7-10} = 0.059 \text{ cfs/mi}^2 * 0.34 \text{ mi}^2 = 0.02 \text{ cfs}$$

303d Listed Streams

The discharge from this facility is in Shoup Run at 7.51 RMI which is impaired for Aquatic Life and Potable Water Supply use for Metals and pH from Abandoned Mine Drainage. Shoup Run TMDL was finalized on April 9, 2009. The TMDL will be briefly discussed later in this report. In summary, BTCB pre-dated (plant constructed in late 1993) the TMDL, doesn't discharge metals, and have acceptable compliance for pH, therefore believed not to contribute to the existing impairments.

Public Water Supply

The nearest downstream public water supply intake is for Mifflintown Water Systems in Juniata County on Juniata River, approximately 100.0 miles downstream of this discharge. Considering distance and dilution, the discharge is not expected to impact the water supply.

Treatment Facility Summary

Treatment Facility Name: Broad Top City STP

WQM Permit No.	Issuance Date
3195403	9/22/1992
3192403 A-1	1/10/2017
3192403 A-2	6/29/2018

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Extended Aeration	Hypochlorite	0.06

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.06	160	Not Overloaded	Aerobic Digestion	Combination of methods

Changes Since Last Permit Issuance: none

Other Comments: The receiving stream has a Chapter 93 designation of Warm Water Fishes (WWF), & Migratory Fishes (MF).

The treatment plant is a secondary treatment extended aeration with liquid hypochlorite disinfection. The original WQM permit was issued on September 22, 1992 and the construction was completed in late 1993. The sewer collection system is gravity fed to lift station at head of the plant. Influent is then pumped to one EQ basin. From the basin it goes into one of two aeration basins, both basins are used in case of high Infiltration/Inflow (I/I). From the aeration basin the flow goes to one clarifier which returns solids back to the aeration tank. The effluent from clarifier goes to chlorine contact tank for disinfection. From Chlorine Contact Tank, it goes to effluent tank where the effluent flow is monitored and discharged to Shoup Run via outfall 001.

Per DEP's most recent visit to the treatment plant on June 16, 2022, the treatment plant consists of:

1. One comminutor
2. One equalization tank
3. Two aeration tanks
4. One clarifier
5. One chlorine contact tank
6. One aerated Digester
7. Dechlorination system
8. Three blowers

Chemical used:
Aluminum Sulfate (Alum) is used for Phosphorus removal (precipitation) at 3 gpd. Sodium carbonate is used for pH control at 50 lbs./day. Liquid chlorine is used for disinfection at 2 gpd. Sodium Bisulfite is used for dechlorination at 1 gpd.

Industrial/Commercial Users:
The permit application indicated there are no commercial or industrial contributors to the treatment plant.

Compliance History	
Summary of DMRs:	A summary of past 12-month DMRs is presented on the page 5 & 6.
Summary of Inspections:	**6/16/2022:** Mr. Clark, DEP's WQS, conducted a compliance evaluation inspection. There were no violations identified during inspection. The effluent was clear and field test results were within the permit limits. Recommendation was to investigate the problem with the EQ tank pumps and digester mixer and make repairs as necessary. **3/30/2021:** Mr. Clark, DEP's WQS, conducted a compliance evaluation inspection. There were no violations identified during inspection. The effluent was clear and field test results were within the permit limits. Recommendations were to continue to make repairs to fine screen water line, blower unit, and air lines; and investigate problem with liquid chlorine pump.
Other Comments:	There are no open violations against the permittee or applicant.

Compliance History

DMR Data for Outfall 001 (from March 1, 2022 to February 28, 2023)

Parameter	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22
Flow (MGD) Average Monthly	0.015	0.027	0.019	0.014	0.012	0.012	0.012	0.011	0.014	0.028	0.021	0.018
Flow (MGD) Daily Maximum	0.022	0.104	0.054	0.044	0.019	0.016	0.015	0.015	0.026	0.107	0.032	0.024
pH (S.U.) Daily Minimum	6.4	6.8	7.0	6.5	5.6	6.8	6.9	6.0	6.1	6.2	7.0	4.7
pH (S.U.) Daily Maximum	7.5	7.8	7.6	8.0	8.2	7.7	7.7	8.0	7.4	7.7	7.9	7.8
DO (mg/L) Daily Minimum	9.5	11.3	11.5	10.1	10.3	8.9	8.9	6.6	6.5	9.2	7.5	6.0
TRC (mg/L) Average Monthly	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01
TRC (mg/L) Instantaneous Maximum	0.07	0.06	0.05	0.08	0.08	0.07	0.08	0.08	0.05	0.05	0.06	0.06
CBOD5 (lbs/day) Average Monthly	< 1.0	2.0	1.0	0.7	0.5	< 0.3	0.7	< 0.6	1.0	1.0	1.0	1.0
CBOD5 (lbs/day) Weekly Average	2	3	2	0.8	0.6	< 0.3	1.0	0.9	1	1.0	1.0	1.0
CBOD5 (mg/L) Average Monthly	< 11.0	3.95	11.1	8.4	5.71	< 3.0	7.52	< 5.54	11.0	7.26	7.82	8.02
CBOD5 (mg/L) Weekly Average	19.0	4.02	14.3	9.68	7.57	< 3.0	10.6	8.08	11.4	7.91	8.9	8.86
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	29	50	34	28	40	47	30	42	28	56	39	50
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	32	54	35	39	50	58	35	53	46	57	44	58
BOD5 (mg/L) Raw Sewage Influent Average Monthly	225	226	295	330	394	396	366	421	237	347	293	350
TSS (lbs/day) Average Monthly	< 0.8	< 1.0	0.7	0.5	0.7	0.5	0.4	0.4	0.5	1.0	1	1
TSS (lbs/day) Raw Sewage Influent Average Monthly	16	34	23	16	18	25	16	34	24	29	25	28

TSS (lbs/day) Raw Sewage Influent Daily Maximum	18	36	25	23	20	27	19	41	25	38	30	29
TSS (lbs/day) Weekly Average	1.0	2.0	0.8	0.7	1.0	0.5	0.4	0.6	0.7	2.0	2.0	1.0
TSS (mg/L) Average Monthly	< 7.4	< 6.0	6.4	6.8	8.2	5.0	3.6	4.0	4.8	9.1	7.6	6.8
TSS (mg/L) Raw Sewage Influent Average Monthly	125	155	199	176	170	219	188	335	206	184	188	194
TSS (mg/L) Weekly Average	12.8	10.4	6.8	8.0	12.8	5.6	4.0	5.2	6.8	11.2	13.2	9.2
Fecal Coliform (No./100 ml) Geometric Mean	< 49	18	608	21	29	204	74	210	17	< 2.0	107	1487
Fecal Coliform (No./100 ml) IMAX	2419.6	20.3	1413.6	69.7	866.4	1203.3	866.4	2419.6	39.3	5.2	568.4	2419.6
Nitrate-Nitrite (mg/L) Average Quarterly			< 38.92			< 50.1			< 18.46			< 22.92
Nitrate-Nitrite (lbs) Total Quarterly			4			< 163			< 55			< 89
Total Nitrogen (mg/L) Average Quarterly			< 39.42			< 50.6			< 35.42			< 24.08
Total Nitrogen (lbs) Total Quarterly			< 4			< 165			< 106			< 93
Total Nitrogen (lbs) Total Annual						< 1472						
TKN (mg/L) Average Quarterly			< 0.5			< 0.5			16.96			1.16
TKN (lbs) Total Quarterly			< 0.05			< 2			51			4
Total Phosphorus (lbs/day) Average Monthly	0.07	0.3	0.07	0.01	0.06	0.05	0.2	0.03	0.07	0.03	0.06	0.04
Total Phosphorus (mg/L) Average Monthly	0.657	0.396	0.61	0.1758	0.646	0.524	1.97	0.268	0.65	0.2363	0.428	0.338
Total Phosphorus (mg/L) Average Quarterly			0.61			0.524			0.65			0.338
Total Phosphorus (lbs) Total Quarterly			0.07			2			2			1
Total Phosphorus (lbs) Total Annual						28						

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.06
Latitude 40º 12' 17.46" **Longitude** -78º 8' 52.35"
Wastewater Description: Sewage Effluent

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:

Water Quality-Based Limitations

NH_3-N:
The attached WQM 7.0 modeling (version 1.1) results show that summer-time average monthly limit of 1.9 mg/L and IMAX limit of 3.8 mg/L is necessary to protect the water quality of the stream. The receiving stream is impaired by Abandoned Mine Drainage (AMD). The discharges to waters polluted by AMD are regulated by 25 Pa. Section 95.5.

Section 95.5(a) states *"**§ 95.5. Treatment requirements for discharges to waters affected by abandoned mine drainage.***

> (a) *For wastes discharged to waters polluted by abandoned coal mine drainage, so that the applicable water quality criteria are not being met and designated water uses are not being achieved to the extent that aquatic communities are essentially excluded, and where the pollution cannot be remedied by controlling known, active discharges, the following degrees of treatment shall be provided:*
>
> (1) *Sewage, as defined in The Clean Streams Law (35 P. S. §§ 691.1—691.1001), shall receive secondary treatment, as defined by this chapter*."

Since there is no "secondary" or minimum technology definition for ammonia per chapter 92.a, and *Implementation Guidance of Section 93.7 Ammonia Criteria* (391-2000-013/November 4, 1997/Page 17) states "Since there is no "secondary" or minimum technology definition for ammonia, it eliminates the need for establishing an effluent limit except where (1) the water quality of the receiving water is expected to improve significantly (for purposes of this guidance - that the quality is expected to improve primarily due to an on-going or proposed reclamation project; or other identifiable causes within the next 5 years), and (2) the discharge would cause pollution in downstream waters. The most recent water quality and/or biological information available should be consulted to assure that receiving waters commonly known to be polluted have not improved significantly and to establish the downstream pollution boundary."

Since the whole Shoup Run is still impaired by AMD, not showing significant improvement, and the discharge from this facility is not expected to cause pollution to existing impairment, no ammonia-N limits are necessary at this time.

pH:
The effluent discharge pH should remain above 6.0 and below 9.0 standard units according to 25 Pa. Code § 95.2(1).

Carbonaceous Biochemical Oxygen Demand ($CBOD_5$):
The attached computer printout of the WQM 7.0 stream model (ver. 1.1) indicates that a monthly average limit of 25.0 mg/L, or secondary treatment, is adequate to protect the water quality of the stream. The existing permit 25.0 mg/L as AML, 40.0 mg/L as weekly average limit (AWL), & 50.0 mg/L as IMAX will be in the proposed permit. Recent DMRs and inspection reports show that the facility has typically been achieving concentrations below this limit. Mass limits are calculated as follows:

Average monthly mass limit: 25.0 mg/L x 0.06 MGD x 8.34 = 12.5 lbs/day
Average weekly mass limit: 40.0 mg/L x 0.06 MGD x 8.34 = 20.0 lbs/day

These values are rounded down to 12.0 lbs/day and 20.0 lbs/day, respectively. The minimum monitoring frequency will remain the same as 2/month.

Dissolved Oxygen (D.O.):
The D.O. goal is 6.0 mg/L. However, a minimum D.O. of 5.0 mg/L is required per 25 Pa. Code § 93.7. It is recommended that this limit be maintained in the proposed permit to ensure the protection of water quality standards. This approach is consistent with DEP's current Standard Operating Procedure (SOP) No. BCW-PMT-033, version 1.9 revised March 22, 2021, and has been applied to other point source dischargers throughout the state.

Fecal Coliform:
The recent coliform guidance in 25 Pa. Code § 92a.47.(a)(4) requires a summer technology limit of 200/100 ml as a geometric mean and an instantaneous maximum not greater than 1,000/100ml and § 92a.47.(a)(5) requires a winter limit of 2,000/100ml as a geometric mean and an instantaneous maximum not greater than 10,000/100ml.

E. Coli:
As recommended by DEP's SOP No. BCW-PMT-033, version 1.9 revised March 22, 2021, a routine monitoring for E. Coli will be included in the proposed permit under 25 Pa. Code § 92a.61. This requirement applies to all sewage dischargers greater than 0.002 MGD in their new and reissued permits. A monitoring frequency of 1/quarter will be included in the permit to be consistent with the recommendation from this SOP.

Total Suspended Solids (TSS):
The existing technology-based limits of 30.0 mg/L average monthly, 45.0 mg/L weekly average, and 60.0 mg/L instantaneous maximum will remain in the proposed permit based on the minimum level of effluent quality attainable by secondary treatment based on 25 Pa. Code § 92a.47. Recent DMRs and inspection reports show that the facility has been consistently achieving these limits. Mass limits are calculated as follows:

Average monthly mass limit: 30.0 mg/L x 0.06 MGD x 8.34 = 15.0 lbs/day
Average weekly mass limit: 45.0 mg/L x 0.06 MGD x 8.34 = 22.5 (22.0) lbs/day

The weekly average limit is rounded down to 22.0 lbs./day. The minimum monitoring frequency will remain the same as 2/month.

Total Residual Chlorine (TRC):
Based on the attached TRC Excel Spreadsheet calculator, which uses the equations and calculations from the Department's May 1, 2003 Implementation Guidance for Total Residual Chlorine (ID No. 391-2000-015), and 0.02 cfs of $Q_{7\text{-}10}$ at discharge indicated monthly average limit of 0.04 mg/L and an instantaneous maximum limit of 0.13 mg/L are more stringent and will replace in the proposed permit. Based on the DMRs from the past year, the facility has been consistently achieving these limits.

Raw Sewage Influent Monitoring:
As a result of negotiation with EPA, influent monitoring of TSS and BOD_5 are required for any POTWs; therefore, influent sampling of BOD_5 and TSS will remain in the proposed permit. A 24-hr composite sample type will be required to be consistent with the proposed sampling frequency for TSS and BOD_5 in the effluent.

Toxics:
DEP utilizes a Toxics Management Spreadsheet (last modified on March 2021 ver. 1.3) to facilitate calculations necessary for completing a reasonable potential analysis and determining WQBELs for toxic pollutants. The effluent testing information renewal application (page # 8) indicates that there are no toxic pollutants of concern.

Total Phosphorus:
The existing permit average monthly TP concentration of 2.0 mg/L, and 4.0 mg/L IMAX will remain in the proposed permit. Mass average monthly of 1.0 lbs/day is also in the proposed permit.

Chesapeake Bay Strategy:
According to DEP's Chesapeake Bay Phase II Watershed Implementation Plan (WIP) Wastewater Supplement, this facility is considered a phase 5 non-significant sewage discharger with design flow less than 0.2 MGD but greater than 0.002 MGD. In general, DEP will issue permits for all phase 5 facilities with monitoring and reporting for Total Nitrogen (TN) and Total Phosphorus (TP) throughout the permit term at a frequency no less than annually. Furthermore, DEP's SOP No. BPNPSM-PMT-033 states that in general, at a minimum, monitoring for TN and TP should be included in new and reissued permits for sewage discharges with design flows > 2,000 gpd. At this time, the Department is not requiring a total maximum annual nitrogen or phosphorus loading cap. Nitrate-Nitrite as N, Total Kjeldahl Nitrogen, TN, and TP monitoring is already included in the existing permit and will remain in the proposed renewal.

The quarterly "Monitor & Report" requirements for Nitrate-Nitrite as N, and Total Kjeldahl Nitrogen; and quarterly calculation "Monitor & Report" for TN will remain in the proposed permit. The yearly calculation "report" for TP & TN will remain in the proposed permit.

Stormwater:
There is no known stormwater outfall associated with this facility.

WETT:
Minor facilities and facilities without a formal EPA approved pretreatment program are exempted from WETT.

TMDL:
Shoup Run Watershed TMDL was finalized on April 9, 2001 and approved by EPA on 4/9/2001. High level of metals, and in some areas depressed pH, caused Shoup Run, Miller Run, and Hartman Run to be impaired. The impairments were the result of Acid Mine Drainage (AMD) from abandoned surface and underground coal mines. These TMDLs addressed three primary metals associated with acid mine drainage, iron, manganese, and aluminum, as well as pH. Currently there is no active mining operations in the watershed. The TMDL indicated that all of the discharges in the watershed were from abandoned mines and will be treated as non-point sources. No WLA was assigned so no TMDL based limits are applicable to this facility. The final TMDL can be found here:
http://www.dep.state.pa.us/dep/deputate/watermgt/wqp/wqstandards/tmdl/Shoup_TMDL.pdf

Antidegradation (93.4):
The effluent limits for this discharge have been developed to ensure that existing in-stream 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.

Anti-Backsliding:
The proposed limits will be as stringent as existing limits; therefore, anti-backsliding is not applied in this permit term.

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

303(d) Listed Streams:
The discharge from this facility is to a stream segment that is attaining its designated use(s).

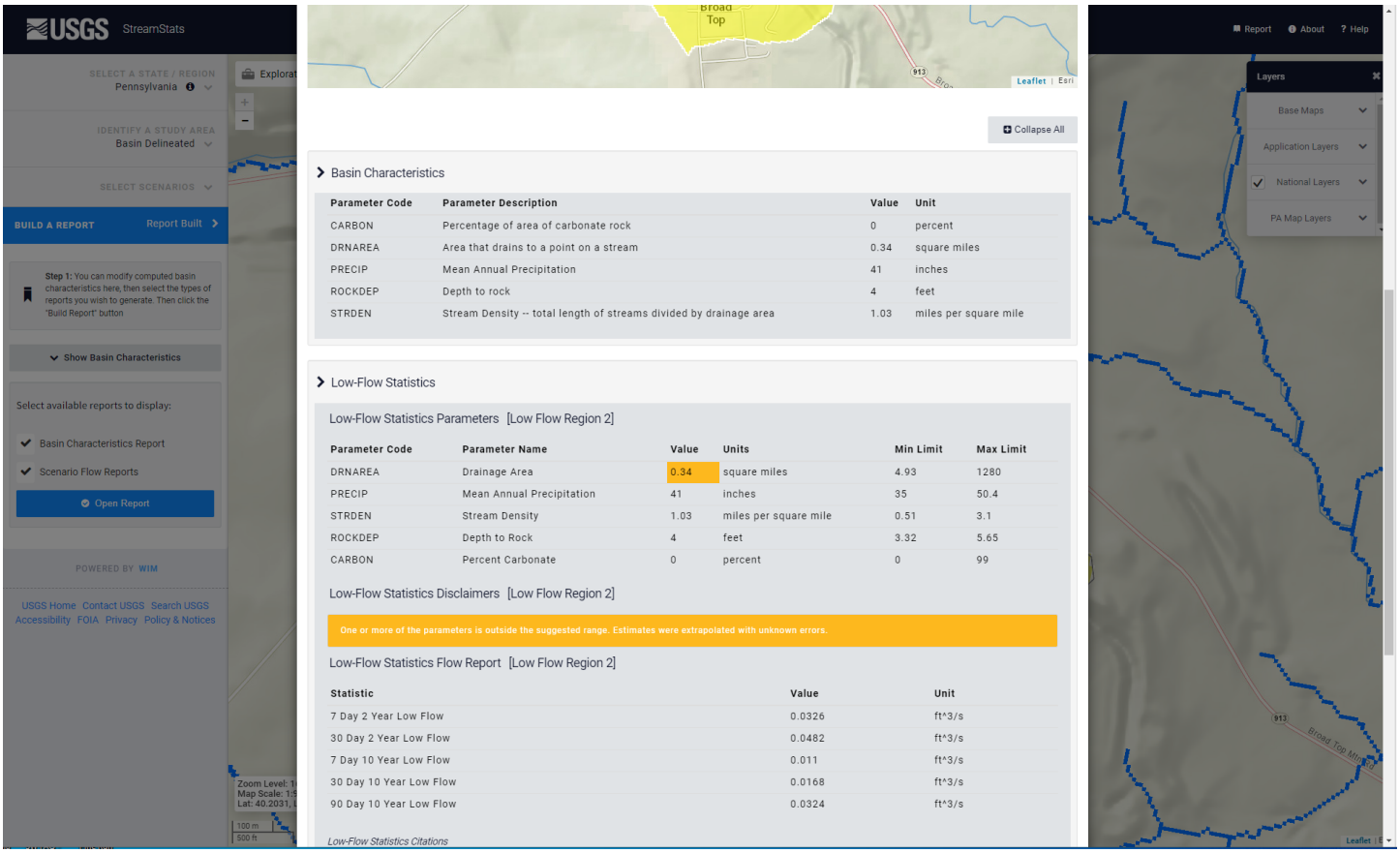
WQM 7.0:
The following data were used in the attached computer model (WQM 7.0) of the stream:

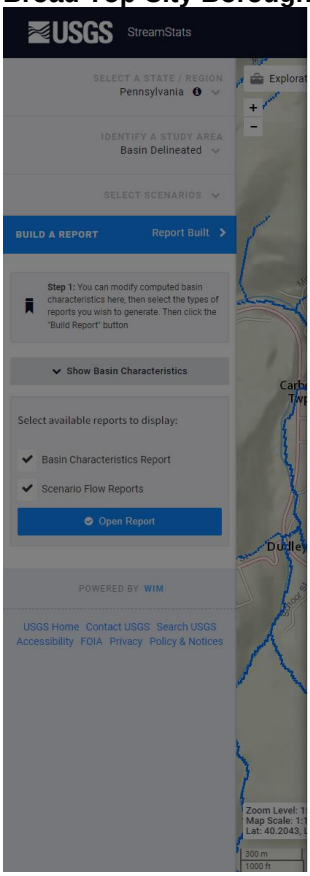
- Discharge pH 7.0 (Default)
- Discharge Temperature 25°C (Default)
- Stream pH 7.0 (Default)
- Stream Temperature 20°C (Default)

The following three nodes were used in modeling:

Node 1: Outfall 001 at Shoup Run (13717)
Elevation: 1848.9 ft (USGS National Map Advanced)
Drainage Area: 0.34 mi^2 (USGS StreamStats)
River Mile Index: 7.51 (PA DEP eMapPA)
Low Flow Yield: 0.059 cfs/mi^2 (calculated)
Discharge Flow: 0.06 MGD

Node 2: At the confluence with Hartman Run (13737)
Elevation: 1657.49 ft (USGS National Map)
Drainage Area: 1.42 mi^2 (USGS StreamStats)
River Mile Index: 6.92 (PA DEP eMapPA)
Low Flow Yield: 0.059 cfs/mi^2
Discharge Flow: 0.00 MGD





Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	0	percent
DRNAREA	Area that drains to a point on a stream	1.42	square miles
PRECIP	Mean Annual Precipitation	41	inches
ROCKDEP	Depth to rock	4	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	1.46	miles per square mile

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 2]

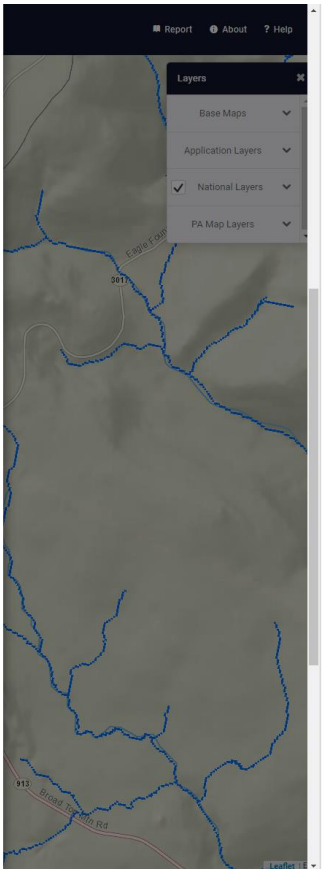
Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.42	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	41	inches	35	50.4
STRDEN	Stream Density	1.46	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	4	feet	3.32	5.65
CARBON	Percent Carbonate	0	percent	0	99

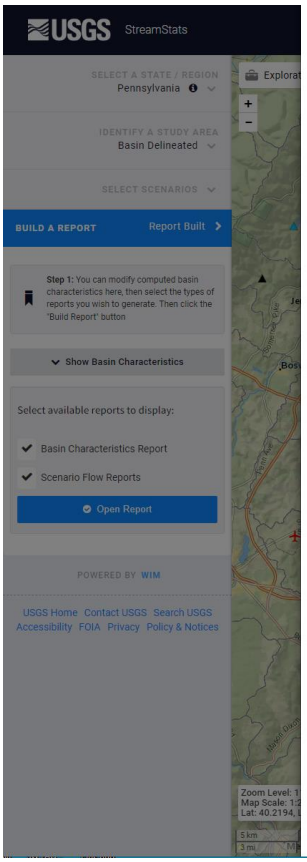
Low-Flow Statistics Disclaimers [Low Flow Region 2]

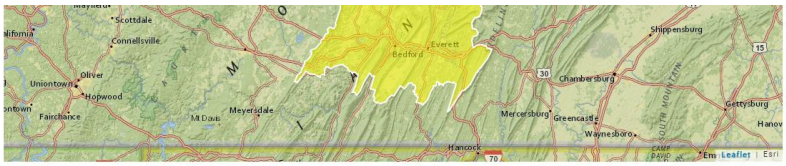
One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Low-Flow Statistics Flow Report [Low Flow Region 2]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.114	ft^3/s
30 Day 2 Year Low Flow	0.168	ft^3/s
7 Day 10 Year Low Flow	0.0408	ft^3/s
30 Day 10 Year Low Flow	0.0614	ft^3/s
90 Day 10 Year Low Flow	0.114	ft^3/s







Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	15.92	percent
DRNAREA	Area that drains to a point on a stream	754	square miles
PRECIP	Mean Annual Precipitation	38	inches
ROCKDEP	Depth to rock	4.3	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	2.34	miles per square mile

Low-Flow Statistics

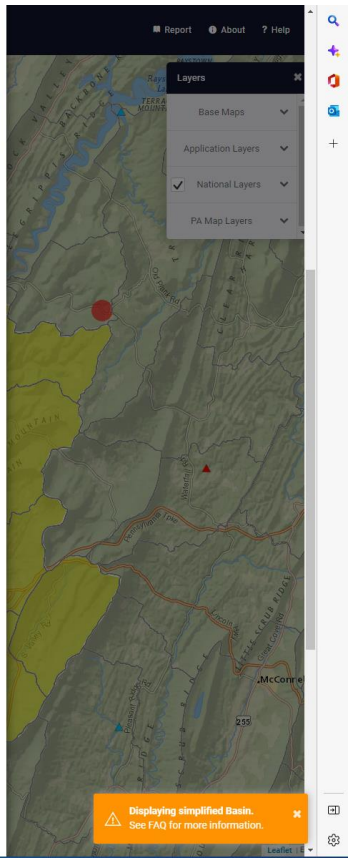
Low-Flow Statistics Parameters [100.0 Percent (754 square miles) Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	754	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	38	inches	35	50.4
STRDEN	Stream Density	2.34	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	4.3	feet	3.32	5.65
CARBON	Percent Carbonate	15.92	percent	0	99

Low-Flow Statistics Flow Report [100.0 Percent (754 square miles) Low Flow Region 2]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	79.3	ft^3/s	38	38
30 Day 2 Year Low Flow	102	ft^3/s	33	33
7 Day 10 Year Low Flow	44.8	ft^3/s	51	51
30 Day 10 Year Low Flow	58.2	ft^3/s	46	46
90 Day 10 Year Low Flow	82.1	ft^3/s	36	36



Analysis Results WQM 7.0

Hydrodynamics | NH3-N Allocations | D.O. Allocations | D.O. Simulation | Effluent Limitations

RMI	Discharge Name	Permit Number	Disc Flow (mgd)
7.51	Broad Top City	PA0084883	0.0600

Parameter	Effluent Limit 30 Day Average (mg/L)	Effluent Limit Maximum (mg/L)	Effluent Limit Minimum (mg/L)
CBOD5	25		
NH3-N	1.9	3.8	
Dissolved Oxygen			6

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rptEffLimits

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
11D	13717	SHOUP RUN

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Eff. Limit 30-day Ave. (mg/L)	Eff. Limit Maximum (mg/L)	Eff. Limit Minimum (mg/L)
7.510	Broad Top City	PA0084883	0.060	CBOD5	25		
				NH3-N	1.9	3.8	
				Dissolved Oxygen			6

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rpt_WLA

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
11D	13717	SHOUP 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
7.510	Broad Top City	11.65	13.26	11.65	13.26	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
7.510	Broad Top City	1.47	1.9	1.47	1.9	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5 Baseline (mg/L)	CBOD5 Multiple (mg/L)	NH3-N Baseline (mg/L)	NH3-N Multiple (mg/L)	Dissolved Oxygen Baseline (mg/L)	Dissolved Oxygen Multiple (mg/L)	Critical Reach	Percent Reduction
7.51	Broad Top City	25	25	1.9	1.9	6	6	0	0

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rptDOSim

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
11D	13717	SHOUP RUN

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
7.510	0.060	24.111	7.000
Reach Width (ft)	Reach Depth (ft)	Reach WDRatio	Reach Velocity (fps)
2.988	0.391	7.648	0.097
Reach CBOD5 (mg/L)	Reach Kr (1/days)	Reach NH3-N (mg/L)	Reach Kn (1/days)
20.91	1.464	1.56	0.961
Reach DO (mg/L)	Reach Kr Equation	Reach DO Goal (mg/L)	
6.399	28.453	Owens	6
Reach Travel Time (days)			
0.373			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.037	19.58	1.51	6.40
0.075	18.33	1.46	6.48
0.112	17.16	1.41	6.58
0.149	16.06	1.36	6.70
0.186	15.04	1.31	6.80
0.224	14.08	1.26	6.90
0.261	13.18	1.22	7.00
0.298	12.34	1.18	7.09
0.336	11.55	1.13	7.18
0.373	10.82	1.09	7.26

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rptModelSpecs

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted WD 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	6		

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rptHydro

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
11D	13717	SHOUP RUN

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	WD Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
7.510	0.02	0.00	0.02	.0928	0.06144	.391	2.99	7.65	0.10	0.373	24.11	7.00
Q1-10 Flow												
7.510	0.01	0.00	0.01	.0928	0.06144	NA	NA	NA	0.09	0.387	24.39	7.00
Q30-10 Flow												
7.510	0.03	0.00	0.03	.0928	0.06144	NA	NA	NA	0.10	0.360	23.86	7.00

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rptGeneral

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
11D	13717	SHOUP RUN	7.510	1848.90	0.34	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	0.059	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
Broad Top City	PA0084883	0.0600	0.0600	0.0600	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

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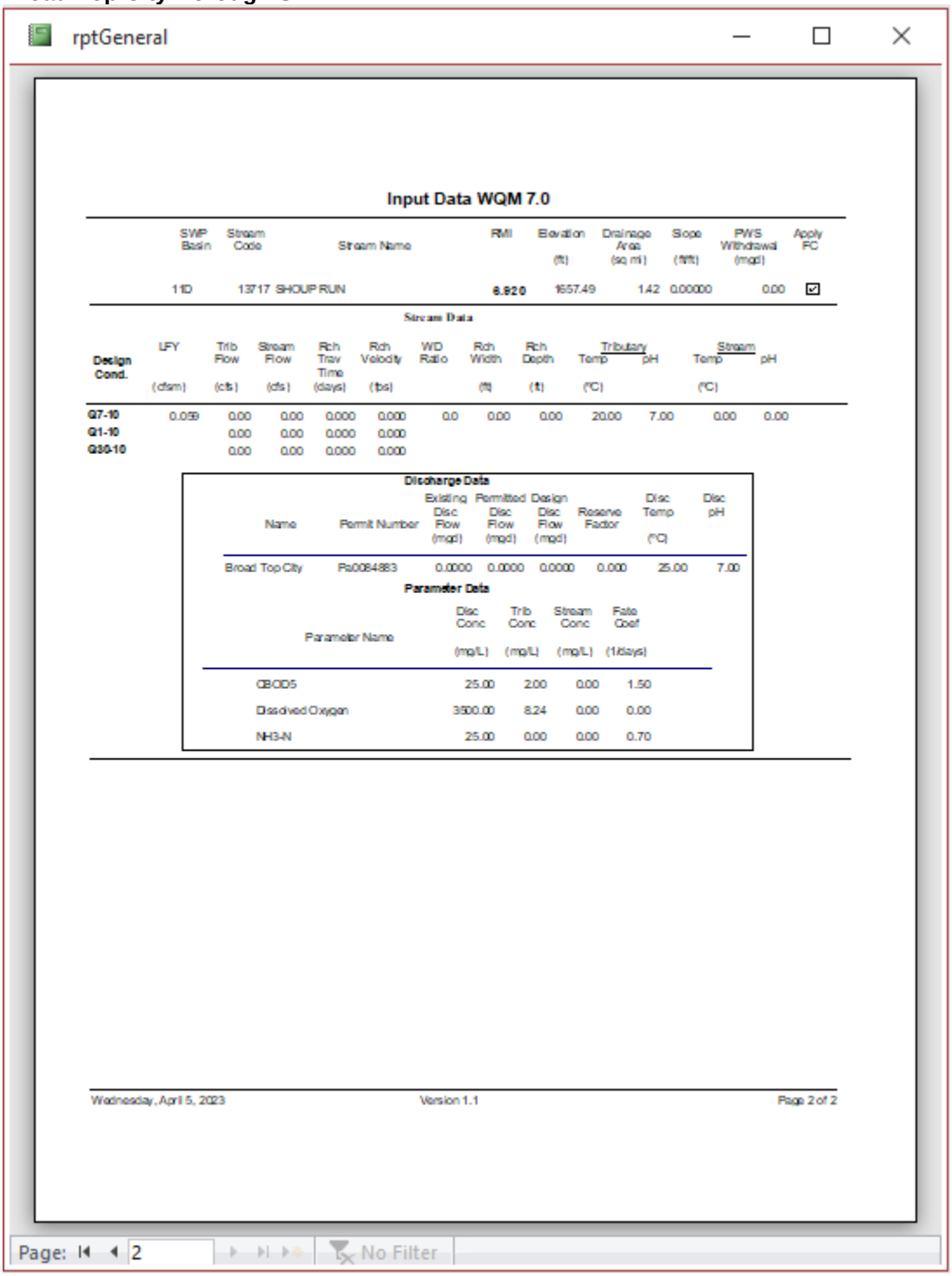

rptGeneral

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
11D	13717	SHOUP RUN	8.820	1657.49	1.42	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	0.059	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
Broad Top City	Pa0084883	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	3500.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

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TRC EVALUATION

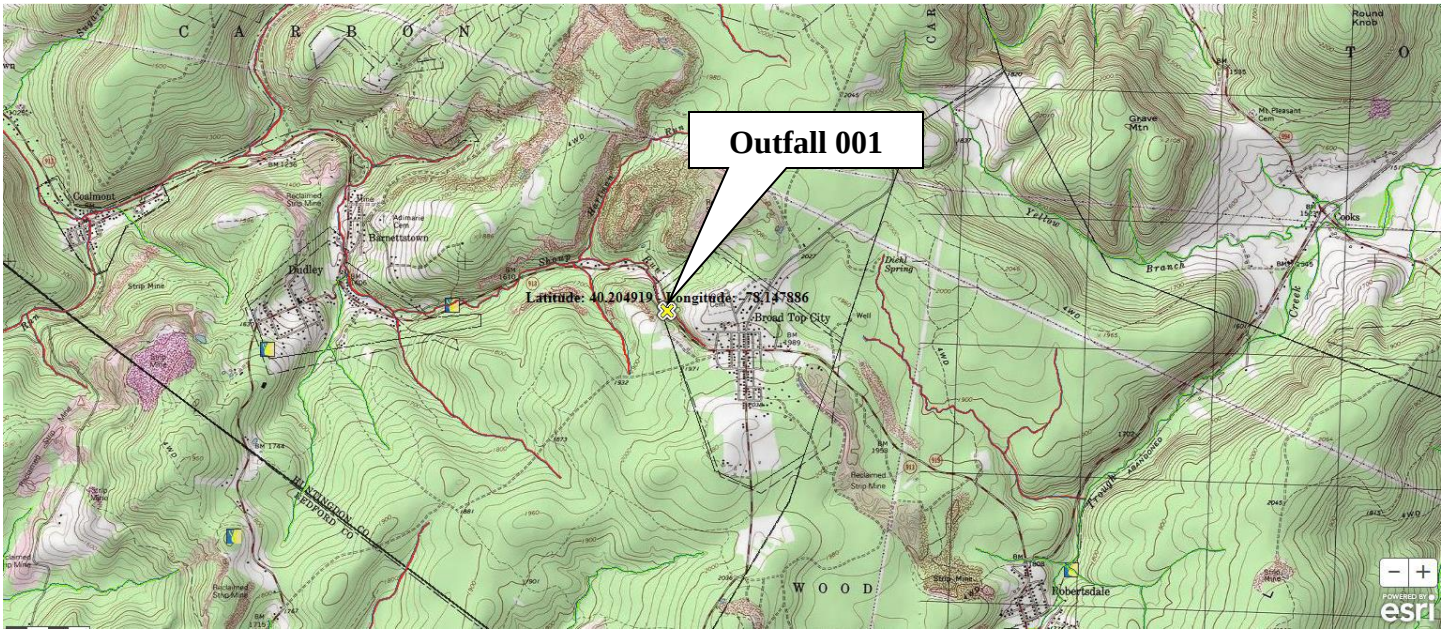
Input appropriate values in A3:A9 and D3:D9

0.02	= Q stream (cfs)	0.5	= CV Daily
0.06	= 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 = 0.088	1.3.2.iii	WLA cfc = 0.078
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.033	5.1d	LTA_cfc = 0.045

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.040	AFC
		INST MAX LIMIT (mg/l) = 0.132	

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)**



Existing Effluent Limitations and Monitoring Requirements

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC (interim)	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
TRC (final)	XXX	XXX	XXX	0.05	XXX	0.18	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	12.0	20	XXX	25.0	40.0	50	2/month	24-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Suspended Solids	15	22.0	XXX	30.0	45.0	60	2/month	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	8-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
Total Phosphorus	1.0	XXX	XXX	2.0	XXX	4	2/month	24-Hr Composite

Existing Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, to comply with Pennsylvania's Chesapeake Bay Tributary Strategy.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Kjeldahl--N	Report	XXX	XXX	Report	XXX	XXX	1/quarter	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	1/quarter	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/quarter	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	1/quarter	24-Hr Composite

Proposed Effluent Limitations and Monitoring Requirements

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

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.04	XXX	0.13	1/day	Grab
$CBOD_5$	12.0	20.0	XXX	25.0	40.0	50.0	2/month	24-Hr Composite
BOD_5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	8-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	8-Hr Composite
TSS	15.0	22.0	XXX	30.0	45.0	60.0	2/month	24-Hr Composite
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
Total Phosphorus	1.0	XXX	XXX	2.0	XXX	4	2/month	24-Hr Composite

Compliance Sampling Location:

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
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Kjeldahl--N	Report	XXX	XXX	Report	XXX	XXX	1/quarter	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	1/quarter	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/quarter	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	1/quarter	24-Hr Composite

Compliance Sampling Location:

Other Comments:

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☐	Toxics Management Spreadsheet (see Attachment)
☒	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
☐	Pennsylvania CSO Policy, 385-2000-011, 9/08.
☒	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
☐	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
☐	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
☒	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004.
☒	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
☒	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
☒	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 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, 391-2000-019, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 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, 391-2000-022, 3/1999.
☐	Design Stream Flows, 391-2000-023, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
☒	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☐	SOP:
☐	Other: