Pennsylvania Department of Environmental Protection

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0088251**
Facility Type	**Municipal**	APS ID	**47355**
Major / Minor	**Minor**	Authorization ID	**1471487**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Upper Bern Township Berks County**	Facility Name	**Upper Bern Township STP**
Applicant Address	25 N 5th Street	Facility Address	Wolf Creek Road
	Shartlesville, PA 19554-7005		Shartlesville, PA 19554
Applicant Contact*	Arthur Lambert, Twp Supervisor	Facility Contact	Justin Latourette, Operator
Applicant Phone	(610) 488-1191 UpperBernTownship@Comcast.net	Facility Phone	(610) 589-4023 selectenvironmental@gmail.com
Client ID	65375	Site ID	524787 (PF 564211)
Ch 94 Load Status		Municipality	Upper Bern Township
Connection Status		County	Berks
Date Application Received	January 29, 2024 & February 20, 2024	EPA Waived?	Yes
Date Application Accepted	February 22, 2024	If No, Reason	
Purpose of Application	Renewal of NPDES permit		

*copy John Roche, Twp Engineer, Vision Engineering, John@VisionEngineeringInc.net 717-625-1930

Summary of Review

The existing permit was issued July 25, 2019. The renewal application was received on January 29, 2024 using DEP's electronic Public Upload system, Reference ID #206090. The existing permit was administratively extended past its expiration date of July 31, 2024.

This Sewage Treatment Plant (STP) serves Upper Bern Township. According to the application, they are not proposing a modification or addition of the existing facility.

Design Flow

The existing permit's limits were based on a design flow of 0.155 MGD. The draft renewal permit includes the same design flow of 0.155 MGD.

DMRs from the last 3 years (1/1/2022-12/31/2024) indicate an average flow of 0.078 MGD and a Maximum Monthly Average flow of 0.13 MGD. (See attached.)

Combined Sewers

Not Applicable.

Industrial/Commercial Users

While the permit application did not provide a list of industrial or commercial establishments connected to the sewer system,

Approve	Deny	Signatures	Date
x		*Bonnie Boylan* Bonnie Boylan / Environmental Engineering Specialist	March 5, 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. / Environmental Program Manager	March 7, 2025

While the permit application did not provide a list of industrial or commercial establishments connected to the sewer system, the permit application did include effluent sample results for Total Copper, Total Lead, and Total Zinc in accordance with the application instructions for minor sewage STPs with industrial or commercial users.

The 2023 Chapter 94 Municipal Wasteload Report, Attachment 9, provided:

> *There have been no Industrial Wastewater Users connected to the system since the system was operational. There are NO existing or proposed Industrial waste Pre-Treatment Users on the system. Therefore, this section of the report is very brief.*
>
> *There are various commercial users and connections to the system, however all those users and connections discharge wastewater which is consistent with the strength and composition of a typical residential strength wastewater discharge. The residential strength wastewater discharged for treatment is able to be adequately treated at the existing Wastewater Treatment Plant Facility.*

EPA Pretreatment Program

Not applicable.

Hauled-in Wastes

Their application stated that no hauled-in wastes were received in the past three years and that none were anticipated in the next 5 years.

Variances

There were no variances requested.

Sludge use and disposal

Sludge is hauled off-site and disposed at other WWTPs.

Delaware River Basin Commission (DRBC)

The discharge is within the Delaware River watershed. A copy of the draft permit and Fact Sheet will therefore be sent to the DRBC for their review in accordance with State regulations and an interagency agreement. Any comments from the DRBC will be considered.

The most recent DRBC docket #D-2001-002 CP-5 was approved for this facility on December 8, 2021 and expires July 31, 2029. The docket notes that Wolf Creek is classified by DRBC as an intermittent stream because it has an estimated seven-day low flow with a recurrence interval of 10 years ($Q_{7\text{-}10}$) of less than 0.1 cubic feet per second (cfs).

Outstanding Violations

There are no outstanding violations according to DEP's Compliance History Summary report by client.

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)	0.155 (0.24 cfs)
Latitude	40º 30' 36" (40.51)	Longitude	-76º 6' 37" (-76.110278)
Quad Name		Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Wolf Creek (CWF) – upstream of Blue Marsh Reservoir per docket	Stream Code	1924
NHD Com ID	25960934	RMI	2.3
Drainage Area	0.9 sq.mi.	Yield (cfs/mi^2)	0.027
Q_{7-10} Flow (cfs)	0.024, estimated (Qs:Qd = 1:10)	Q_{7-10} Basis	USGS Stream Stats
Elevation (ft)	540	Slope (ft/ft)	
Watershed No.	3-C	Chapter 93 Class.	CWF
Existing Use	-	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Impaired for Recreational Use (assessment ID # 12833)		
Cause(s) of Impairment	Pathogens		
Source(s) of Impairment	Suspected Agriculture		
TMDL Status	None	Name	None for Wolf Creek or downstream Northkill Creek,Tulpehocken Creek, or Blue Marsh Lake

Secondary Receiving Water: Wolf Creek empties into **Northkill Creek** (Stream Code 1902) at RMI 5 (CWF, Trout Natural Reproduction, Impaired for Recreational Uses due to pathogens) which empties into **Tulpehocken Creek** (Stream Code 1846) at RMI 15 (WWF, Impaired for Recreational Uses due to pathogens) and the **Blue Marsh Lake/Reservoir**.

Background/Ambient Data -	none	
pH (SU)		
Temperature (°F)		
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake	Western Berks Water Authority (2 MGD safe yield)		
PWS Waters	Tulpehocken Creek	Flow at Intake (cfs)	
PWS RMI	6.5 approx (planned intake) 6 approx (old intake)	Distance from Outfall	Approx. 16 miles

Other Comments:

-Wolf Creek is NOT a 'Class A Wild Trout' water, nor a 'Trout Natural Reproduction' water.

-No stream gages or WQN stations on Wolf Creek or Northkill Crk..

-No other sewage discharges in proximity according to DEP's eMapPA (to include in modeling).

Treatment Facility Summary

Treatment Facility Name: Upper Bern Township STP

WQM Permit No.	Issuance Date
0600408 A-3 (Amendment)	10/6/2022
0600408 (Amendment)	3/24/2021
0600408 (Amendment)	8/27/2020
0600408 (Amendment)	5/30/2007
0600408 (New)	4/19/2001

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary With Ammonia And Phosphorus Reduction	Activated Sludge	Ultraviolet	0.155

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.206	437		Concentration	Other WWTP

Treatment Plant Process Information provided in 2024 NPDES permit renewal application:

Two BESST treatment trains (94,550 GPD & 60,450 GPD) for a total of 155,000 GPD

(BESST = Biologically Engineered Single Sludge Treatment)

2023 Chapter 94 Report:

The two original SBR tanks are not typically used but remain fully functional. A pinch valve with an automatic operator prevents flow from entering the SBR tanks. The SBR treatment system is used to treat flow in excess of 0.100 MGD or as a backup system to perform maintenance on the BESST system. According to the plant operator, the SBR system has not been used since the BESST system was brought online. The chlorine contact tank can be used for disinfection as a backup to the UV disinfection system. The existing de-chlorination tank can be used to ensure NPDES residual chlorine discharge limits are met.

DEP 2018 inspection report:

Treatment Process Units
(NPDES Permit Part B / WQM Permit)

Treatment Units	Total	On-Line	Inoperable	Date Inoperable / Expected Date Return to Service / Comments
Manual Bar Screen	1			
Lakeside Fine Screen	1			Float level controlled with timer backup
Wet Well	1			Influent sampling from wet well, alum feed enters here.
Anoxic Tank	1			2 mechanical mixers alternate. Recieves RAS, medium brown color
Aeration Tanks (BESST)	2			24/7 Aeration, good mixing
Clarifiers (BESST)	2			see comment page
Post Aeration Chamber	1			
UV Disinfection	1			3 banks of 5 bulbs, all indicator lights on
Sludge Holding Tank	1			Timed aeration
SBR Tanks	1			Available for surge flows.

Existing Permit Limits, outfall 001:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Instantaneous 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	6.0	XXX	XXX	XXX	1/day	Grab
CBOD5	32.0	51.0	XXX	25.0	40.0	50	1/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TSS	38.0	58.0	XXX	30.0	45.0	60	1/week	24-Hr Composite
TSS Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
UV Intensity (mW/cm²)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Metered
Nitrate-Nitrite	XXX	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Nitrate-Nitrite (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/month	Calculation
Total Nitrogen (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Ammonia Nov 1 - Apr 30	6.0	XXX	XXX	4.5	XXX	9.0	1/week	24-Hr Composite
Ammonia May 1 - Oct 31	2.0	XXX	XXX	1.5	XXX	3.0	1/week	24-Hr Composite
Ammonia (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Instantaneous Minimum	Average Monthly	Weekly Average	Instant. Maximum		
TKN	XXX	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TKN (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation
Total Phosphorus	1.3	XXX	XXX	1.0	XXX	2.0	1/week	24-Hr Composite
Total Phosphorus (lbs)	Report Total Mo	XXX	XXX	XXX	XXX	XXX	1/month	Calculation

Compliance History

DMR Data for Outfall 001 (from February 1, 2023 to January 31, 2024)

Parameter	JAN-24	DEC-23	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23	MAR-23	FEB-23
Flow (MGD) Average Monthly	0.131	0.1348	0.0824	0.0787	0.0902	0.113	0.0606	0.0469	0.0606	0.0606	0.0739	0.0657
Flow (MGD) Daily Maximum	0.353	0.3641	0.1442	0.1171	0.1317	0.2885	0.0606	0.08	0.1221	0.0975	0.1461	0.0916
pH (S.U.) Instantaneous Minimum	6.42	6.38	6.15	6.65	6.7	6.48	6.59	6.75	6.71	6.73	6.72	6.72
pH (S.U.) Instantaneous Maximum	7.95	7.24	7.49	7.63	7.45	7.27	7.41	7.7	7.58	7.58	7.46	7.49
DO (mg/L) Instantaneous Minimum	6.16	6.29	7.04	7.14	6.1	6.05	6.07	6.44	6.11	6.32	7.35	7.67
CBOD5 (lbs/day) Average Monthly	10.0	13.0	< 2.0	< 2.0	1.0	< 3.0	1.0	2.0	< 2.0	1.0	< 3.0	3.0
CBOD5 (lbs/day) Weekly Average	30.0	20.0	4.0	3.0	2.0	6.0	1.0	1.0	3.0	2.0	4.0	4.0
CBOD5 (mg/L) Average Monthly	7.8	8.7	< 3.5	< 3.6	< 3.0	< 2.5	2.4	2.5	< 3.6	3.1	< 4.3	5.4
CBOD5 (mg/L) Weekly Average	19.3	12.8	6.0	6.0	4.0	3.6	2.7	3.4	7.0	3.5	6.5	6.5
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	324	408	302	296	182	272	173	282	176	176	271	206
BOD5 (mg/L) Raw Sewage Influent Average Monthly	353	389	455	481	313	306	343	405	391	377	442	414
TSS (lbs/day) Average Monthly	< 7.0	15.0	< 5.0	< 2.0	< 2.0	< 4.0	< 2.0	< 2.0	< 2.0	3.0	4.0	4.0
TSS (lbs/day) Raw Sewage Influent Average Monthly	432	621	447	434	249	308	213	277	163	234	388	211
TSS (lbs/day) Weekly Average	19.0	23.0	8.0	< 3.0	< 3.0	< 7.0	< 2.0	< 2.0	< 3.0	4.0	6.0	5.0

TSS (mg/L) Average Monthly	< 6.5	10.6	< 6.1	< 4.0	< 4.0	< 4.0	< 4.0	< 4.2	< 4.0	6.1	6.2	7.4
TSS (mg/L) Raw Sewage Influent Average Monthly	484	576	649	689	422	312	422	506	361	483	629	430
TSS (mg/L) Weekly Average	12.0	13.6	10.8	< 4.0	< 4.0	< 4.0	< 4.0	4.8	< 4.0	7.6	8.4	8.0
Fecal Coliform (No./100 ml) Geometric Mean	25	19	< 5	< 5	< 1	< 2	< 14	< 1	< 1	< 1	< 1	< 1
Fecal Coliform (No./100 ml) Instantaneous Maximum	136	44	11	120	3	12	20000	< 1	1	< 1	1	< 1
UV Intensity (mW/cm²) Instantaneous Minimum	100.9	88.4	89.7	112.9	101.8	67.9	179.2	235.6	115.4	227.1	290.3	265.1
Nitrate-Nitrite (mg/L) Average Monthly	20.8	22	29	25.9	18.8	18.1	12.9	13.2	12.03	15.3	22.6	22.2
Nitrate-Nitrite (lbs) Total Monthly	595	815	633	501	< 337	476	202	79	184	208	431	313
Total Nitrogen (mg/L) Average Monthly	23.8	< 24.8	30.6	< 26.9	< 19.83	< 19.18	14.3	< 14.5	< 13	16.7	< 23.9	23.7
Total Nitrogen (lbs) Total Monthly	679	< 949	668	< 522	< 355	< 511	224	< 89	< 197	228	< 456	333
Ammonia (lbs/day) Average Monthly	< 1.0	< 2.0	< 0.2	< 0.06	< 0.06	< 0.09	< 0.05	< 0.06	< 0.05	< 0.05	< 0.06	< 0.05
Ammonia (mg/L) Average Monthly	< 1.64	< 1.14	< 0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ammonia (mg/L) Instantaneous Maximum	5.12	4.13	0.7	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ammonia (lbs) Total Monthly	< 45	< 57	< 5	< 2	< 2.0	< 3.0	< 2.0	< 0.7	< 1	< 1	< 2	< 1
TKN (mg/L) Average Monthly	2.91	< 2.86	1.64	< 1.04	< 1.06	1.03	1.33	< 1.31	< 0.98	1.48	< 1.22	1.51
TKN (lbs) Total Monthly	83	< 134	35	< 20	< 18	< 34	21	< 10	< 13	21	< 24	21
Total Phosphorus (lbs/day) Average Monthly	0.4	0.7	0.4	0.3	0.3	0.5	0.3	0.3	0.2	0.3	0.3	0.2

Total Phosphorus (mg/L) Average Monthly	0.38	0.5	0.5	0.4	0.53	0.54	0.55	0.5	0.35	0.61	0.49	0.49
Total Phosphorus (mg/L) Instantaneous Maximum	0.53	0.81	0.87	0.57	1.1	0.67	0.68	0.61	0.38	0.68	0.69	0.83
Total Phosphorus (lbs) Total Monthly	12	21	11	8	9	0.54	9	4	5	9	9	7

Compliance History

Recent Effluent Violations for Outfall 001, through January 2025 (as posted in DEP's WMS database)**:**

NC ID	Event Start Date	Event End Date	Parameter	Limit Type	Reported Value		Permit Limit	Unit	Sampling Point	Sampling Frequency	Sampling Type	Cause of NC	Corrective Action	External Comments
227752	10/01/2024	10/31/2024	Fecal Coliform	Instantaneous Maximum	16100	>	10000	No./100 ml	Final Effluent (001)	1/week	Grab			
195719	07/01/2023	07/31/2023	Fecal Coliform	Instantaneous Maximum	20000	>	1000	No./100 ml	Final Effluent (001)	1/week	Grab	See attached comments	None taken	Lab collected from wrong location at plant
183666	01/01/2023	01/31/2023	Ammonia-Nitrogen	Instantaneous Maximum	13.5	>	9	mg/L	Final Effluent (001)	1/week	24-Hr Composite	Equipment malfunction/failure	Equipment repaired	Belt on main aeration blower broke
161671	02/01/2022	02/28/2022	Ammonia-Nitrogen	Instantaneous Maximum	11.2	>	9	mg/L	Final Effluent (001)	1/week	24-Hr Composite	Unknown	Other	Corrective Action: Pushed more air to aeration tanks

Summary of Most Recent Inspections:

7/16/2018 – No Violations cited. Treatment units are online and appear to be operating normally, records are up to date. One of two anoxic tank mixers is offline for repair since April 2018. Scum layer on clarifier is mostly contained behind effluent baffles. Effluent appears mostly clear with some suspended solids. No apparent solids accumulation at outfall. Light algae growth in effluent channel. Ultrasonic flow meter. Have an emergency generator. No hauled-in wastes being accepted.

12/1/2016 – No violations cited.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.155
Latitude 40º 30' 36" **Longitude** -76º 6' 37"
Wastewater Description: Sewage Effluent

Permit limits can be Technology Based Effluent Limitations (TBELs) or Water Quality Based Effluent Limitations (WQBELs). Both are discussed in this Fact Sheet, in separate sections. Existing permit limits can also be carried forward in accordance with anti-backsliding provisions [40 CFR §122.44(l)(1)]. Typically the limits imposed in the new permit are the more stringent of the Technology Based Effluent Limitations, Water Quality Based Effluent Limitations as needed, or the existing permit limits.

Technology-Based Effluent Limitations (TBELs)

Federal Effluent Limitation Guidelines (ELGs): not applicable, no industrial users subject to ELGs.

The following technology-based limitations apply to sewage dischargers, where applicable:

	Limit (mg/l)	Statistical Base Code	Federal Regulation	State Regulation	DRBC*
$CBOD_5$	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 (TSS)	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 (TRC)	0.5	Average Monthly	-	92a.48(b)(2)	
Total Phosphorus (TP)**	2.0	Avg. Monthly		96.5(c)	
Total Dissolved Solids (TDS)	2000 mg/l if increase TDS load by more than 5000 lbs/day from Aug 2010 baseline load, unless granted a waiver	Average Monthly		95.1	
Total Dissolved Solids (TDS)	1000 ***	Not specified but other effluent quality requirements in these regs are expressed as monthly averages	-	-	based on 18 CFR Part 410
Total Dissolved Solids (TDS)	1000	Not specified			Docket D-2001-002 CP-4
Ammonia as N	20	Average Monthly	-	-	18 CFR Part 410

*DEP has an interagency agreement with the Delaware River Basin Commission (DRBC) and incorporates their requirements (18 CFR Part 410 Water Quality Regulations and approved dockets) into our permits where appropriate.

**applicable to discharges to a receiving water that is known to be impaired for nutrients.

***or a concentration established by the Commission which is compatible with designated water uses and stream quality objectives and recognizes the need for reserve capacity to serve future dischargers (i.e. a limit based on a TDS Determination submitted to DRBC proving that the discharge will not cause the TDS in the receiving water to exceed the lesser of 500 mg/l or 133% of background. The DRBC docket for this facility does not include such a TDS variance).

The above limits for **$CBOD_5$**, **TSS, pH, and Fecal Coliform** have been included in the draft permit. These are the same limits as in the existing permit.

The **TRC** TBELs in the above table are less stringent than the WQBELs for TRC. See the TRC discussion in the WQBEL section of this Fact Sheet.

The **TP** limits in the existing permit are more stringent than the limits shown above and have been carried forward into the draft renewal permit to prevent backsliding.

The **TDS** limit and minimum monitoring frequency in the DRBC docket has been incorporated into the draft renewal permit.

The **Ammonia** limits in the existing permit are more stringent than the TBELs in the above table and have been carried forward into the draft renewal permit.

Best Professional Judgment (BPJ) Limitations

None.

Water Quality-Based Effluent Limitations (WQBELs)

Total Maximum Daily Load (TMDL) for receiving water: Not Applicable

WQBELs other than TMDLs:

DEP uses a model known as **WQM 7.0** to determine appropriate limits for CBOD5, Ammonia (NH3-N), and Dissolved Oxygen (DO). DEP's 'Implementation Guidance for Section 93.7 Ammonia Criteria', document #386-2000-022, provides the methods and calculations contained in the WQM 7.0 model for conducting wasteload allocation and for determining recommended NPDES effluent limits for point source discharges. For more explanation of the WQM 7.0 model, see 'Technical Reference Guide WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen', document #386-2000-016. Because there are no other nearby sewage treatment plants on Wolf Creek, no other discharges were included in the model simulation.

The source of the River Mile Indices (RMI's) and elevations that were used in the WM 7.0 model (and TMS model discussed below) was DEP's eMapPA while the source of the Drainage Areas and stream design low-flows was the USGS PA Stream Stats online tool (see attached). Low Flow Yield (LFY) is calculated as stream low-flow Q7-10 divided by Drainage Area.

DEP's uses a **TRC model** (Excel spreadsheet) to determine WQBELs for TRC: the model utilizes the equations and calculations provided in DEP's 'Implementation Guidance Total Residual Chlorine (TRC) Regulation' for TRC, document #386-2000-011.

DEP uses a model called the **Toxics Management Spreadsheet** (TMS) for toxic pollutants. It is a macro-enabled Excel version of DEP's former PENTOX model. It evaluates the reasonable potential for discharges to cause in-stream

exceedances of water quality criteria and recommends Water Quality-Based Effluent Limitations (WQBELs) be imposed as permit limits as needed and may recommend monitoring be required (without limits) for some parameters to better evaluate the 'reasonable potential' to cause an in-stream exceedance of a water quality criteria. The TMS is coded to recommend limits in the draft permit when the discharge concentration input value equals or exceeds 50% of the calculated WQBEL. The TMS is coded to recommend a monitoring requirement (without limits) in the draft permit when the discharge concentration is between 25% and 50% of the WQBEL in the case of non-conservative pollutants or between 10% and 50% of the WQBEL in the case of conservative pollutants. For more explanation of the TMS / PENTOX model, see Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, document #386-2000-015.

When there are less than 10 data points, the maximum effluent concentrations of the available data (such as from the permit application and from DMRs) is used by DEP as the discharge concentration input values in the TMS. For this facility the available sampling data for toxic pollutants was that which was provided in the application and consisted of less than 10 samples.

Some default values were used in the models in the absence of site-specific data including:

Stream Temperature = 20°C
Stream pH = 7 s.u.
Background $CBOD_5$ in stream = 2 mg/l
Background Ammonia in stream = 0 mg/l
Background DO in stream = 8.24 mg/l
Background stream concentrations for toxic parameters = 0 ug/l
Stream chlorine demand = 0.3
Discharge chlorine demand = 0
Discharge Temperature = 25°C
Discharge pH = 7 s.u.
Coefficient of Variability in data = 0.5

In addition the WQM 7.0 and TMS models estimated the stream width, depth, and velocity.

The following limitations and monitoring requirements were determined through water quality modeling (input values used and output files **attached**). Also see the discussion below the tables:

Parameter	Limit (mg/l)	Statistical Base Code	Model
Total Residual Chlorine (TRC)	0.023 / 0.076	Avg.Monthly / IMAX	TRC Excel Spreadsheet
CBOD5	25 *	Average Monthly	WQM 7.0
Dissolved Oxygen (DO)	6.0 *	Minimum	WQM 7.0
Ammonia	1.5 / 3 *	Avg.Monthly / Max.	WQM 7.0

*For these parameters, the model defaulted to the existing permit limits meaning no more stringent limits are necessary to protect the receiving water.

Parameter*	***units***	***Average Monthly***	***Daily Maximum***	***Instant. Maximum***	***Model***
Total Copper	mg/l	0.01	0.016	0.016	Toxics Management Spreadsheet (TMS)
Total Lead	mg/l	Report	Report	XXX	Toxics Management Spreadsheet (TMS)
Total Zinc	mg/l	Report	Report	XXX	Toxics Management Spreadsheet (TMS)

DEP's model calculated WQBELs for **TRC** of 0.023 mg/l as a monthly average and 0.076 mg/l as am Instantaneous Maximum. It is appropriate that UV is used for disinfection instead of chlorine because of the stringent WQBELs. DEP recommends that chlorine not be used at this facility at all. The 2023 Chapter 94 Report, however, stated: "The chlorine contact tank can be used for disinfection as a backup to the UV disinfection system. The existing de-chlorination tank can be used to ensure NPDES residual chlorine discharge limits are met." For this reason, a Part C Condition has been added to the permit that restricts the usage of chlorine and requires meeting the above TRC limits if chlorine is used for short-term situations such as emergencies.

The WQM 7.0 model indicated that the existing permit limits for **CBOD5, DO, and Ammonia** are still protective of water quality and these existing permit limits have been carried forward. Because Ammonia is less toxic in cold water, the existing permit and the draft renewal permit include Ammonia limits during cold months that are three times the limits for warm months.

The draft renewal permit includes the new WQBELs recommended by DEP's TMS model for **Total Copper** and a monitoring requirement for **Total Lead** and **Total Zinc.**

The permittee's responses to the Pre-Draft Survey, sent to them ahead of issuing the draft permit, were received by DEP on February 27, 2025, as an email attachment. Their Survey response indicated they could not immediately meet the new Total Copper limits nor did they know the source of the Copper. A compliance schedule of three years, with interim due dates, has therefore been proposed in the draft permit in order to:

a) gather data, possibly eliminate sources or add treatment, and meet the new WQBELs, or
b) to obtain a permit amendment if site-specific data that is gathered and submitted and a re-run of DEP's model finds that a permit amendment is warranted, whether to make the permit limits more stringent or less stringent than those included in the draft renewal permit based on available data.

DEP's Standard Operating Procedure (SOP) Establishing Water-Quality Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers recommends that permittees be given the opportunity to forward site-specific data to replace any default values used in DEP's model simulations if they choose to do so, in order to refine the WQBELs. This option is included in Part C. III. of the draft renewal permit. The same SOP recommends that the permit include a requirement to conduct a Toxics Reduction Evaluation (TRE) to investigate and control the source(s) of the pollutant(s) subject to final WQBELs. This requirement is included in Part C. III. of the draft renewal permit. If the permittee has control of the operation of their water supply, reducing copper concentrations in the water supply could be considered. A Lead and Copper Corrosion Control Feasibility Study would be needed and coordination with DEP's Safe Drinking Water Program to make changes to the public water supply. This possibility for source reduction is also included in Part C.III. of the draft renewal permit.

Anti-Backsliding

All permit limits proposed in this fact sheet are at least as stringent as permit limits specified in the existing permit renewal in accordance with 40 CFR §122.44(l)(1).

Mass Load vs. Concentration Limits

Consistent with the Technical Guidance for the Development and Specification of Effluent Limitations, document #386-0400-001, and the SOP for Establishing Effluent Limitations for Individual Sewage Permits, average monthly mass loading limits have been established for $CBOD_5$, TSS, and NH3, and average weekly mass loading limits have additionally been established for $CBOD_5$ and TSS.

Mass Loading Limitations

All effluent mass loading limits have been based on the formula: design flow x concentration limit x conversion factor of 8.34.

Sample Types and Frequencies

Sample Types and Frequencies are consistent with the Technical Guidance for the Development and Specification of Effluent Limitations, document #386-0400-001, and/or carried forward from the previous permit when deemed appropriate.

Flow Monitoring

The requirement to monitor the volume of effluent will remain in the draft permit per 40 CFR § 122.44(i)(1)(ii).

Influent BOD5 & TSS Monitoring

Influent monitoring for BOD5 and TSS are required by DEP in NPDES permits for most sewage wastewater treatment facilities. The information is used for evaluating treatment performance and by DEP Sewage Planning (Act 537 Plans and Chapter 94 Municipal Loading Reports).

E. Coli Monitoring

Consistent with the SOP Establishing Effluent Limitations for Individual Sewage Permits and due to the regulatory change in the State Water Quality Standards, PA Code Chapter 93, E. Coli monitoring has been included in the draft renewal permit. The statutory basis for this requirement is provided at PA Code § 92a.61. The monitoring frequency of once per quarter is consistent with DEP's SOP Establishing Effluent Limitations for Individual Sewage Permits for a facility of this size.

Total Nitrogen (TN) and Total Phosphorus (TP) Monitoring

In an effort to understand nutrient loading on PA streams, sewage dischargers with design flows greater than 2000 gpd are being required in NPDES permits to monitor for TN and TP. The statutory basis for this requirement is provided at PA Code § 92a.61.

TN and TP monitoring was included in the existing permit (as well as limits for TP). The facility's DMRs from January 1, 2022 through December 31, 2024 indicated an average effluent TN concentration of 19.9 mg/l and an average TN load of 12.9 lbs/day. The facility's DMRs from January 1, 2022 through December 31, 2024 indicated an average effluent TP concentration of 0.5 mg/l and an average TP load of 0.3 lbs/day.

Per- and Polyfluoroalkyl Substances (PFAS) Monitoring

The NPDES application for Minor Sewage facilities does not require sampling results for any PFAS parameters and DEP is not imposing limits or monitoring requirements on Minor Sewage facilities at this time. There is a new reporting requirement added, however, in the General Pretreatment permit language in Part B.I.D.4. of the draft renewal permit:

> *Each POTW without an [EPA] approved Pretreatment Program shall, within six (6) months of the permit effective date, develop a list of Industrial Users (IUs) in industry categories expected or suspected of per- and polyfluoroalkyl substance (PFAS) discharges to the POTW and submit the list to EPA at EPA_R3_Pretreatment@epa.gov and to DEP at RA-EPNPDES_PERMITS@pa.gov. These industry categories shall include airports; centralized waste treatment; electroplating; electric and electronic components; fire training; landfills; leather tanning & finishing; metal finishing; organic chemicals, plastics & synthetic fibers (OCPSF); paint formulating; plastics molding & forming; pulp, paper & paperboard; textile mills; sites known or suspected of PFAS contamination; and any other sources expected or suspected of PFAS discharges. The list must contain the names, addresses, NAICS codes, and industry categories (as listed above) of any IUs identified.*

Other Permit Conditions

Conditions standard for Minor Sewage facilities are included in Part C of the draft renewal permit, including restrictions of hauled in wastes during periods of high flow, Solids Management requirements, and coordination with DRBC. The new Part C Conditions, not in the existing permit, are relevant to the new WQBELs and the restriction on chlorine use which was previously discussed in the Fact Sheet.

Anti-degradation Requirements

All effluent limitations and monitoring requirements have been developed such that the designated stream uses and the level of water quality necessary to protect the designated uses are maintained and protected. No High Quality or Exceptional Value waters are impacted by this discharge.

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 as needed and BPJ. Instantaneous Maximum (IMAX) limits are provided by regulations, models, or 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 Effective Date + 3 Years.

Parameter (units if other than lbs/day or mg/L)	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day except as otherwise noted))		Concentrations (mg/L except as otherwise noted))				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Instantaneous 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	6.0	XXX	XXX	XXX	1/day	Grab
CBOD5	32.0	51.0	XXX	25.0	40.0	50	1/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TSS	38.0	58.0	XXX	30.0	45.0	60	1/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Total Dissolved Solids	XXX	XXX	XXX	1000.0 Avg.Qrtrly.	XXX	XXX	1/quarter	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
E. Coli	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
UV Intensity (mW/cm²)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Metered
Ammonia Nov 1 - Apr 30	6.0	XXX	XXX	4.5	XXX	9.0	1/week	24-Hr Composite

Parameter (units if other than lbs/day or mg/L)	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day except as otherwise noted))		Concentrations (mg/L except as otherwise noted))				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Instantaneous Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Ammonia May 1 - Oct 31	2.0	XXX	XXX	1.5	XXX	3.0	1/week	24-Hr Composite
Nitrate-Nitrite	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TKN	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Total Nitrogen	Report	XXX	XXX	Report	XXX	XXX	1/month	Calculation
Total Phosphorus	1.3	XXX	XXX	1.0	XXX	2.0	1/week	24-Hr Composite
Total Copper	Report	Report Daily Max.	XXX	Report	Report Daily Max.	XXX	1/week	24-Hr Composite
Total Lead	Report	Report Daily Max	XXX	Report	Report Daily Max	XXX	1/month	24-Hr Composite
Total Zinc	Report	Report Daily Max	XXX	Report	Report Daily Max	XXX	1/month	24-Hr Composite

Compliance Sampling Location: at outfall 001

Continued on next page

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 as needed and BPJ. Instantaneous Maximum (IMAX) limits are provided by regulations, models, or 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.

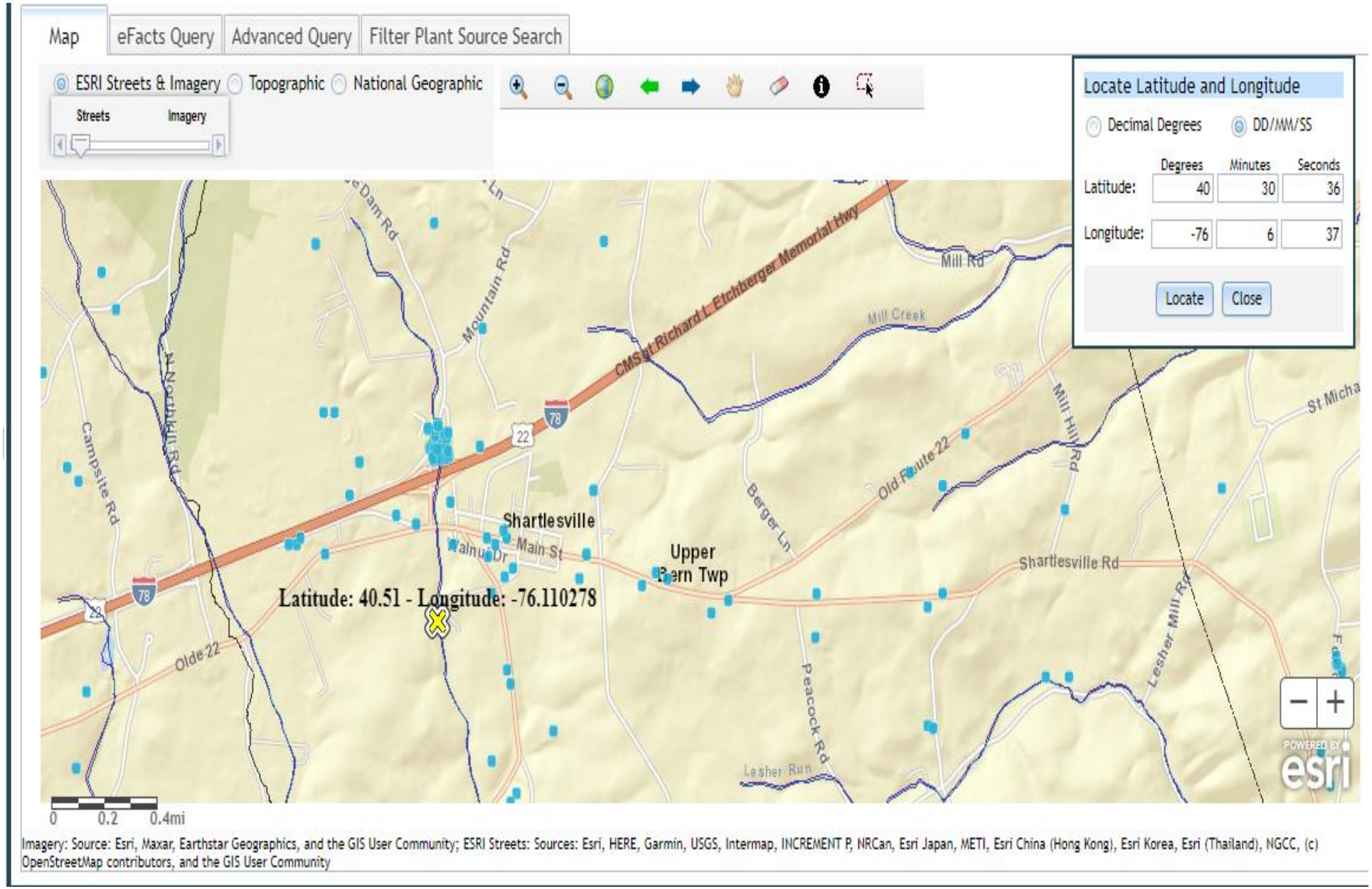
Outfall 001, Effective Period: Permit Effective Date + 3 Years through Permit Expiration Date.

Parameter (units if other than lbs/day or mg/L)	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day except as otherwise noted))		Concentrations (mg/L except as otherwise noted))				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Instantaneous 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	6.0	XXX	XXX	XXX	1/day	Grab
CBOD5	32.0	51.0	XXX	25.0	40.0	50	1/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TSS	38.0	58.0	XXX	30.0	45.0	60	1/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Total Dissolved Solids	XXX	XXX	XXX	1000.0 Avg.Qrtrly.	XXX	XXX	1/quarter	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
E. Coli	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
UV Intensity (mW/cm²)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Metered
Ammonia Nov 1 - Apr 30	6.0	XXX	XXX	4.5	XXX	9.0	1/week	24-Hr Composite

Parameter (units if other than lbs/day or mg/L)	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day except as otherwise noted))		Concentrations (mg/L except as otherwise noted))				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Instantaneous Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Ammonia May 1 - Oct 31	2.0	XXX	XXX	1.5	XXX	3.0	1/week	24-Hr Composite
Nitrate-Nitrite	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TKN	Report	XXX	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Total Nitrogen	Report	XXX	XXX	Report	XXX	XXX	1/month	Calculation
Total Phosphorus	1.3	XXX	XXX	1.0	XXX	2.0	1/week	24-Hr Composite
Total Copper	0.013	0.02 Daily Max.	XXX	0.01	0.016 Daily Max.	0.016	1/week	24-Hr Composite
Total Lead	Report	Report Daily Max	XXX	Report	Report Daily Max	XXX	1/month	24-Hr Composite
Total Zinc	Report	Report Daily Max	XXX	Report	Report Daily Max	XXX	1/month	24-Hr Composite

Compliance Sampling Location: at outfall 001

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☒	Toxics Management Spreadsheet (see Attachment)
☒	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☒	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☒	Technical Guidance for the Development and Specification of Effluent Limitations, 386-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 386-2000-019, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 386-2000-018, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 386-2183-001, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 386-2183-002, 12/97.
☐	Pennsylvania CSO Policy, 386-2000-002, 9/08.
☒	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 386-2000-008, 4/97.
☒	Determining Water Quality-Based Effluent Limits, 386-2000-004, 12/97.
☒	Implementation Guidance Design Conditions, 386-2000-007, 9/97.
☒	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 386-2000-016, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 386-2000-012, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 386-2000-009, 3/99.
☒	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 386-2000-015, 5/2004.
☒	Implementation Guidance for Section 93.7 Ammonia Criteria, 386-2000-022, 11/97.
☒	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 386-2000-013, 4/2008.
☒	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 386-2000-011, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 386-2000-001, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 386-2000-021, 10/97.
☒	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 386-2000-020, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 386-2000-005, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 386-2000-010, 3/1999.
☒	Design Stream Flows, 386-2000-003, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 386-2000-006, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 386-3200-001, 6/97.
☐	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☒	EPA Technical Support Document for Water Quality-based Toxics Control (TSD), EPA/505/2-90-001, PB91-127415, March 1991.
☒	SOP: New and Reissuance Sewage Individual NPDES Permit Applications, Version 2.0, February 3, 2022
☒	SOP: Establishing Effluent Limitations in Individual Sewage NPDES Permits, Version 2.0, February 5, 2024
☒	SOP: Establishing Water-Quality Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers. Version 1.5, May 20, 2021.
☒	Other: DRBC docket #D-2001-002 CP-5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PA0088251	UPPER BERN TOWNSHIP STP	1/1/2022	1/31/2022	1	001	Final Effluent	Flow	MGD	0.0618	Monitor a	Average M	0.0758	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	2/1/2022	2/28/2022	1	001	Final Effluent	Flow	MGD	0.0798	Monitor a	Average M	0.1458	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	3/1/2022	3/31/2022	1	001	Final Effluent	Flow	MGD	0.0684	Monitor a	Average M	0.0848	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	4/1/2022	4/30/2022	1	001	Final Effluent	Flow	MGD	0.0897	Monitor a	Average M	0.1848	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	5/1/2022	5/31/2022	1	001	Final Effluent	Flow	MGD	0.0811	Monitor a	Average M	0.1683	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	6/1/2022	6/30/2022	1	001	Final Effluent	Flow	MGD	0.0665	Monitor a	Average M	0.0952	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	7/1/2022	7/31/2022	1	001	Final Effluent	Flow	MGD	0.0581	Monitor a	Average M	0.0735	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	8/1/2022	8/31/2022	1	001	Final Effluent	Flow	MGD	0.0568	Monitor a	Average M	0.0709	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	9/1/2022	9/30/2022	1	001	Final Effluent	Flow	MGD	0.0627	Monitor a	Average M	0.1039	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	10/1/2022	10/31/2022	1	001	Final Effluent	Flow	MGD	0.0719	Monitor a	Average M	0.1161	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	11/1/2022	11/30/2022	1	001	Final Effluent	Flow	MGD	0.0732	Monitor a	Average M	0.1045	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	12/1/2022	12/31/2022	1	001	Final Effluent	Flow	MGD	0.1004	Monitor a	Average M	0.2334	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	1/1/2023	1/31/2023	1	001	Final Effluent	Flow	MGD	0.0931	Monitor a	Average M	0.1411	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	2/1/2023	2/28/2023	1	001	Final Effluent	Flow	MGD	0.0657	Monitor a	Average M	0.0916	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	3/1/2023	3/31/2023	1	001	Final Effluent	Flow	MGD	0.0739	Monitor a	Average M	0.1461	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	4/1/2023	4/30/2023	1	001	Final Effluent	Flow	MGD	0.0606	Monitor a	Average M	0.0975	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	5/1/2023	5/31/2023	1	001	Final Effluent	Flow	MGD	0.0606	Monitor a	Average M	0.1221	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	6/1/2023	6/30/2023	1	001	Final Effluent	Flow	MGD	0.0469	Monitor a	Average M	0.08	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	7/1/2023	7/31/2023	2	001	Final Effluent	Flow	MGD	0.0606	Monitor a	Average M	0.0606	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	8/1/2023	8/31/2023	1	001	Final Effluent	Flow	MGD	0.113	Monitor a	Average M	0.2885	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	9/1/2023	9/30/2023	1	001	Final Effluent	Flow	MGD	0.0902	Monitor a	Average M	0.1317	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	10/1/2023	10/31/2023	1	001	Final Effluent	Flow	MGD	0.0787	Monitor a	Average M	0.1171	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	11/1/2023	11/30/2023	1	001	Final Effluent	Flow	MGD	0.0824	Monitor a	Average M	0.1442	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	12/1/2023	12/31/2023	1	001	Final Effluent	Flow	MGD	0.1348	Monitor a	Average M	0.3641	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	1/1/2024	1/31/2024	1	001	Final Effluent	Flow	MGD	0.131	Monitor a	Average M	0.353	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	2/1/2024	2/29/2024	1	001	Final Effluent	Flow	MGD	0.083	Monitor a	Average M	0.1746	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	3/1/2024	3/31/2024	1	001	Final Effluent	Flow	MGD	0.1017	Monitor a	Average M	0.1798	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	4/1/2024	4/30/2024	1	001	Final Effluent	Flow	MGD	0.1035	Monitor a	Average M	0.2739	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	5/1/2024	5/31/2024	1	001	Final Effluent	Flow	MGD	0.0762	Monitor a	Average M	0.0463	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	6/1/2024	6/30/2024	1	001	Final Effluent	Flow	MGD	0.0637	Monitor a	Average M	0.1007	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	7/1/2024	7/31/2024	1	001	Final Effluent	Flow	MGD	0.0646	Monitor a	Average M	0.0983	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	8/1/2024	8/31/2024	1	001	Final Effluent	Flow	MGD	0.0708	Monitor a	Average M	0.1441	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	9/1/2024	9/30/2024	1	001	Final Effluent	Flow	MGD	0.0682	Monitor a	Average M	0.1084	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	10/1/2024	10/31/2024	1	001	Final Effluent	Flow	MGD	0.0659	Monitor a	Average M	0.099	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	11/1/2024	11/30/2024	1	001	Final Effluent	Flow	MGD	0.0705	Monitor a	Average M	0.1195	Monitor a	Daily Maximum	
PA0088251	UPPER BERN TOWNSHIP STP	12/1/2024	12/31/2024	1	001	Final Effluent	Flow	MGD	0.0705	Monitor a	Average M	0.1195	Monitor a	Daily Maximum	
									0.0778	Avg		0.14052	Avg		
									0.1348	MMA		0.3641	Max		
													flows over design flow of 0.155 MGD		

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

PADEP Chapter 94 Spreadsheet
Sewage Treatment Plants

Reporting Year: 2023

Facility Name: Upper Bern Township WWTP

Permit No.: PA0088251

Persons/EDU: 2.5

Existing Hydraulic Design Capacity:	0.155	MGD	**Existing Organic Design Capacity:**	437	lbs BOD5/day
Upgrade Planned in Next 5 Years?	NO	**Year:**	**Upgrade Planned in Next 5 Years?**	NO	**Year:**
Future Hydraulic Design Capacity:		MGD	**Future Organic Design Capacity:**		lbs BOD5/day

Monthly Average Flows for Past Five Years (MGD)

Month	2019	2020	2021	2022	2023
January	0.069	0.053	0.0558	0.0618	0.0931
February	0.0665	0.0525	0.0549	0.0798	0.0657
March	0.0728	0.0561	0.0788	0.0684	0.0739
April	0.0591	0.0523	0.0605	0.0897	0.0606
May	0.0701	0.0501	0.0565	0.0811	0.0606
June	0.0531	0.049	0.0598	0.0665	0.0469
July	0.0473	0.0494	0.0598	0.0581	0.0606
August	0.0449	0.0634	0.0539	0.0568	0.113
September	0.0462	0.0463	0.3288	0.0627	0.0902
October	0.053	0.0449	0.0596	0.0719	0.0787
November	0.0659	0.0494	0.0687	0.0732	0.0824
December	0.0584	0.0724	0.0634	0.0634	0.1348

Monthly Average BOD5 Loads for Past Five Years (lbs/day)

Month	2019	2020	2021	2022	2023
January	178	103	264	188	242
February	142	127	161	210	206
March	152	110	222	256	271
April	141	89	219	294	176
May	126	146	190	323	176
June	97	137	235	217	282
July	92	225	205	206	173
August	103	162	276	178	272
September	105	128	211	233	182
October	133	117	196	233	296
November	162	191	201	275	302
December	272	241	229	229	408

Annual Avg	0.0589	0.0532	0.0834	0.0695	0.08
Max 3-Mo Avg	0.0694	0.0591	0.1524	0.0797	0.0986
Max : Avg Ratio	1.18	1.11	1.83	1.15	1.23
Existing EDUs	385.0	389.0	461.0	551.0	551.0
Flow/EDU (GPD)	153.0	136.8	180.9	126.1	145.2
Flow/Capita (GPD)	61.2	54.7	72.4	50.5	58.1
Exist. Overload?	**NO**	**NO**	**NO**	**NO**	**NO**

Annual Avg	142	148	217	237	249
Max Mo Avg	272	241	276	323	408
Max : Avg Ratio	1.92	1.63	1.27	1.36	1.64
Existing EDUs	385	389	461	551	551
Load/EDU	0.369	0.380	0.472	0.430	0.452
Load/Capita	0.147	0.152	0.189	0.172	0.181
Exist. Overload?	**NO**	**NO**	**NO**	**NO**	**NO**

Projected Flows for Next Five Years (MGD)

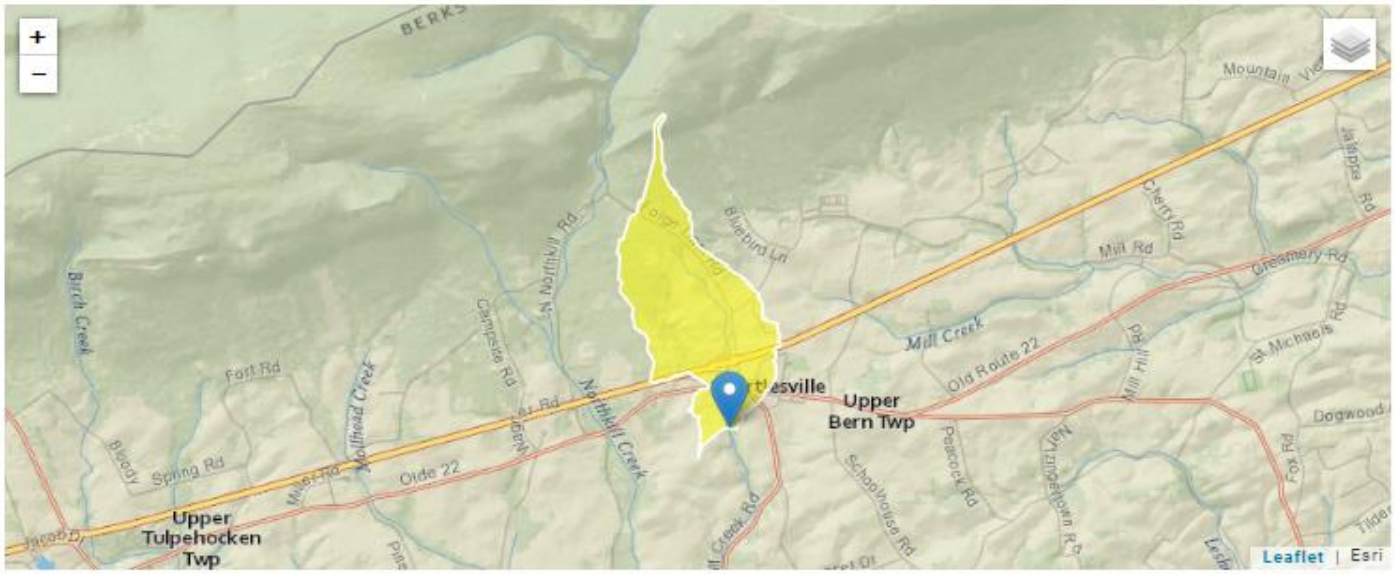
	2024	2025	2026	2027	2028
New EDUs	15.0	15.0	20.0	10.0	10.0
New EDU Flow	0.0022581	0.0022581	0.0030108	0.0015054	0.0015054
Proj. Annual Avg	0.0713	0.07356	0.07657	0.07807	0.07958
Proj. Max 3-Mo Avg	0.0926	0.0956	0.0995	0.1014	0.1034
Proj. Overload?	**NO**	**NO**	**NO**	**NO**	**NO**

Projected BOD5 Loads for Next Five Years (lbs/day)

	2024	2025	2026	2027	2028
New EDUs	15	15	20	10	10
New EDU Load	6.306	6.306	8.409	4.204	4.204
Proj. Annual Avg	255	261	270	274	278
Proj. Max Avg	399	409	422	429	435
Proj. Overload?	**NO**	**NO**	**NO**	**NO**	**NO**

StreamStats Report

Region ID:	PA
Workspace ID:	PA20250116214143568000
Clicked Point (Latitude, Longitude):	40.50969, -76.11015
Time:	2025-01-16 16:42:08 -0500



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	0.9	square miles
PRECIP	Mean Annual Precipitation	47	inches
ROCKDEP	Depth to rock	3.4	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	1.48	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
CARBON	Percent Carbonate	0	percent	0	99
DRNAREA	Drainage Area	0.9	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	47	inches	35	50.4
ROCKDEP	Depth to Rock	3.4	feet	3.32	5.65
STRDEN	Stream Density	1.48	miles per square mile	0.51	3.1

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	0.0846	ft^3/s
30 Day 2 Year Low Flow	0.131	ft^3/s
7 Day 10 Year Low Flow	0.0243	ft^3/s
30 Day 10 Year Low Flow	0.0397	ft^3/s
90 Day 10 Year Low Flow	0.0775	ft^3/s

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p.

Application Version: 4.25.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

StreamStats Report

Region ID:	PA
Workspace ID:	PA20250116215051404000
Clicked Point (Latitude, Longitude):	40.48626, -76.11229
Time:	2025-01-16 16:51:15 -0500

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	2.17	square miles
PRECIP	Mean Annual Precipitation	47	inches
ROCKDEP	Depth to rock	3.3	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	1.47	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
CARBON	Percent Carbonate	0	percent	0	99
DRNAREA	Drainage Area	2.17	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	47	inches	35	50.4
ROCKDEP	Depth to Rock	3.3	feet	3.32	5.65
STRDEN	Stream Density	1.47	miles per square mile	0.51	3.1

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	0.213	ft^3/s
30 Day 2 Year Low Flow	0.327	ft^3/s
7 Day 10 Year Low Flow	0.062	ft^3/s
30 Day 10 Year Low Flow	0.102	ft^3/s
90 Day 10 Year Low Flow	0.197	ft^3/s

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p.

Further downstream, at confluence of Wolf Creek and Northkill Creek…..

StreamStats Report

Region ID:	PA
Workspace ID:	PA20250116215549962000
Clicked Point (Latitude, Longitude):	40.48214, -76.11075
Time:	2025-01-16 16:56:12 -0500

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	3.07	square miles
PRECIP	Mean Annual Precipitation	47	inches
ROCKDEP	Depth to rock	3.3	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	1.54	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
CARBON	Percent Carbonate	0	percent	0	99
DRNAREA	Drainage Area	3.07	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	47	inches	35	50.4
ROCKDEP	Depth to Rock	3.3	feet	3.32	5.65
STRDEN	Stream Density	1.54	miles per square mile	0.51	3.1

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	0.298	ft^3/s
30 Day 2 Year Low Flow	0.458	ft^3/s
7 Day 10 Year Low Flow	0.0885	ft^3/s
30 Day 10 Year Low Flow	0.145	ft^3/s
90 Day 10 Year Low Flow	0.277	ft^3/s

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p.

TRC EVALUATION			
Input appropriate values in A3:A9 and D3:D9			
0.024	= Q stream (cfs)	0.5	= CV Daily
0.155	= 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 = 0.051	1.3.2.iii	WLA cfc = 0.042
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.019	5.1d	LTA_cfc = 0.024

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.023	AFC
		INST MAX LIMIT (mg/l) = 0.076	

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)**

(0.011/EXP(-K*CFC_tc/1440))+(((CFC_Yc*Qs*0.011)/(1.547*Qd)....
....*EXP(-K*CFC_tc/1440)))+Xd+(CFC_Yc*Qs*Xs/1.547*Qd))*(1-FOS/100)

WQM 7.0 model inputs:

Input Data WQM 7.0

General Data

General | Stream | Discharge and Parameters

Stream Code	RMI	Elevation (ft)	Drainage Area (sq mi)	LFY (cfsm)	Slope (ft/ft)	PWS With (mgd)	Apply FC
1924	2.300	540	0.9	0.03	0	0	☑
1924	0.380	435	2.17	0.03	0	0	☑

Add Record

Delete Record

Stream Data

General | Stream | Discharge and Parameters

Design Condition ◉ Q7-10 ○ Q1-10 ○ Q30-10

RMI	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
2.300	0.00	0.00	0.000	0.00	0	0.00	0.00	20.00	7.00	0.000	0.00
0.380	0.00	0.00	0.000	0.00	0	0.00	0.00	20.00	7.00	0.000	0.00

Discharge and Parameter Data

General | Stream | Discharge and Parameters

Discharge Data

RMI	Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
2.300	Upper Bern Twp	PA0088251	0.0000	0.1550	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/day)
CBOD5	25.00	2.00	0.00	1.50
NH3-N	1.50	0.00	0.00	0.70
Dissolved Oxygen	6.00	8.24	0.00	0.00

Record: 1 of 2 | No Filter | Search

Discharge and Parameter Data

General | Stream | Discharge and Parameters

Discharge Data

RMI	Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (ºC)	Disc pH
0.380	downstream		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/day)
CBOD5	25.00	2.00	0.00	1.50
NH3-N	20.00	0.00	0.00	0.70
Dissolved Oxygen	6.00	8.24	0.00	0.00

Record: 2 of 2 | No Filter | Search

Results:

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)
2.30	Upper Bern Twp	PA0088251	0.0000

Parameter	Effluent Limit 30 Day Average (mg/L)	Effluent Limit Maximum (mg/L)	Effluent Limit Minimum (mg/L)
CBOD5	25		
NH3-N	1.5	3	
Dissolved Oxygen			6

Record: 1 of 1 | No Filter | Search

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Discharge Information

Instructions | Discharge | Stream

Facility: **Upper Bern Twp** NPDES Permit No.: **PA0088251** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **sewage**

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.155	100	7						

					0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		541									
	Chloride (PWS)	mg/L		169									
	Bromide	mg/L		0.2									
	Sulfate (PWS)	mg/L		21.2									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L											
	Total Antimony	µg/L											
	Total Arsenic	µg/L											
	Total Barium	µg/L											
	Total Beryllium	µg/L											
	Total Boron	µg/L											
	Total Cadmium	µg/L											
	Total Chromium (III)	µg/L											
	Hexavalent Chromium	µg/L											
	Total Cobalt	µg/L											
	Total Copper	mg/L		0.006									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L											
	Total Lead	µg/L		0.4									
	Total Manganese	µg/L											
	Total Mercury	µg/L											
	Total Nickel	µg/L											
	Total Phenols (Phenolics) (PWS)	µg/L											
	Total Selenium	µg/L											
	Total Silver	µg/L											
	Total Thallium	µg/L											
	Total Zinc	mg/L		0.058									
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

Group 3	Carbon Tetrachloride	µg/L	<										
	Chlorobenzene	µg/L											
	Chlorodibromomethane	µg/L	<										
	Chloroethane	µg/L	<										
	2-Chloroethyl Vinyl Ether	µg/L	<										
	Chloroform	µg/L	<										
	Dichlorobromomethane	µg/L	<										
	1,1-Dichloroethane	µg/L	<										
	1,2-Dichloroethane	µg/L	<										
	1,1-Dichloroethylene	µg/L	<										
	1,2-Dichloropropane	µg/L	<										
	1,3-Dichloropropylene	µg/L	<										
	1,4-Dioxane	µg/L	<										
	Ethylbenzene	µg/L	<										
	Methyl Bromide	µg/L	<										
	Methyl Chloride	µg/L	<										
	Methylene Chloride	µg/L	<										
	1,1,2,2-Tetrachloroethane	µg/L	<										
	Tetrachloroethylene	µg/L	<										
	Toluene	µg/L	<										
	1,2-trans-Dichloroethylene	µg/L	<										
	1,1,1-Trichloroethane	µg/L	<										
	1,1,2-Trichloroethane	µg/L	<										
	Trichloroethylene	µg/L	<										
	Vinyl Chloride	µg/L	<										
Group 4	2-Chlorophenol	µg/L	<										
	2,4-Dichlorophenol	µg/L	<										
	2,4-Dimethylphenol	µg/L	<										
	4,6-Dinitro-o-Cresol	µg/L	<										
	2,4-Dinitrophenol	µg/L	<										
	2-Nitrophenol	µg/L	<										
	4-Nitrophenol	µg/L	<										
	p-Chloro-m-Cresol	µg/L	<										
	Pentachlorophenol	µg/L	<										
	Phenol	µg/L	<										
	2,4,6-Trichlorophenol	µg/L	<										
Group 5	Acenaphthene	µg/L	<										
	Acenaphthylene	µg/L	<										
	Anthracene	µg/L	<										
	Benzidine	µg/L	<										
	Benzo(a)Anthracene	µg/L	<										
	Benzo(a)Pyrene	µg/L	<										
	3,4-Benzofluoranthene	µg/L	<										
	Benzo(ghi)Perylene	µg/L	<										
	Benzo(k)Fluoranthene	µg/L	<										
	Bis(2-Chloroethoxy)Methane	µg/L	<										
	Bis(2-Chloroethyl)Ether	µg/L	<										
	Bis(2-Chloroisopropyl)Ether	µg/L	<										
	Bis(2-Ethylhexyl)Phthalate	µg/L	<										
	4-Bromophenyl Phenyl Ether	µg/L	<										
	Butyl Benzyl Phthalate	µg/L	<										
	2-Chloronaphthalene	µg/L	<										
	4-Chlorophenyl Phenyl Ether	µg/L	<										
	Chrysene	µg/L	<										
	Dibenzo(a,h)Anthrancene	µg/L	<										
	1,2-Dichlorobenzene	µg/L	<										
	1,3-Dichlorobenzene	µg/L	<										
	1,4-Dichlorobenzene	µg/L	<										
	3,3-Dichlorobenzidine	µg/L	<										
	Diethyl Phthalate	µg/L	<										
	Dimethyl Phthalate	µg/L	<										
	Di-n-Butyl Phthalate	µg/L	<										
	2,4-Dinitrotoluene	µg/L	<										

	2,6-Dinitrotoluene	µg/L	<										
	Di-n-Octyl Phthalate	µg/L	<										
	1,2-Diphenylhydrazine	µg/L	<										
	Fluoranthene	µg/L	<										
	Fluorene	µg/L	<										
	Hexachlorobenzene	µg/L	<										
	Hexachlorobutadiene	µg/L	<										
	Hexachlorocyclopentadiene	µg/L	<										
	Hexachloroethane	µg/L	<										
	Indeno(1,2,3-cd)Pyrene	µg/L	<										
	Isophorone	µg/L	<										
	Naphthalene	µg/L	<										
	Nitrobenzene	µg/L	<										
	n-Nitrosodimethylamine	µg/L	<										
	n-Nitrosodi-n-Propylamine	µg/L	<										
	n-Nitrosodiphenylamine	µg/L	<										
	Phenanthrene	µg/L	<										
	Pyrene	µg/L	<										
	1,2,4-Trichlorobenzene	µg/L	<										
Group 6	Aldrin	µg/L	<										
	alpha-BHC	µg/L	<										
	beta-BHC	µg/L	<										
	gamma-BHC	µg/L	<										
	delta BHC	µg/L	<										
	Chlordane	µg/L	<										
	4,4-DDT	µg/L	<										
	4,4-DDE	µg/L	<										
	4,4-DDD	µg/L	<										
	Dieldrin	µg/L	<										
	alpha-Endosulfan	µg/L	<										
	beta-Endosulfan	µg/L	<										
	Endosulfan Sulfate	µg/L	<										
	Endrin	µg/L	<										
	Endrin Aldehyde	µg/L	<										
	Heptachlor	µg/L	<										
	Heptachlor Epoxide	µg/L	<										
	PCB-1016	µg/L	<										
	PCB-1221	µg/L	<										
	PCB-1232	µg/L	<										
	PCB-1242	µg/L	<										
	PCB-1248	µg/L	<										
	PCB-1254	µg/L	<										
	PCB-1260	µg/L	<										
	PCBs, Total	µg/L	<										
	Toxaphene	µg/L	<										
	2,3,7,8-TCDD	ng/L	<										
Group 7	Gross Alpha	pCi/L											
	Total Beta	pCi/L	<										
	Radium 226/228	pCi/L	<										
	Total Strontium	µg/L	<										
	Total Uranium	µg/L	<										
	Osmotic Pressure	mOs/kg											

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Toxics Management Spreadsheet
Version 1.4, May 2023

Stream / Surface Water Information

Upper Bern Twp, NPDES Permit No. PA0088251, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Wolf Creek**

No. Reaches to Model: **1**

- (●) Statewide Criteria
- ( ) Great Lakes Criteria
- ( ) ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	001924	2.3	540	0.9			Yes
End of Reach 1	001924	0.38	435	2.17			Yes

$Q_{7\text{-}10}$

Location	RMI	LFY (cfs/mi²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	2.3	0.03										100	7		
End of Reach 1	0.38	0.03													

Q_h

Location	RMI	LFY (cfs/mi²)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	2.3														
End of Reach 1	0.38														

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Toxics Management Spreadsheet
Version 1.4, May 2023

Model Results

Upper Bern Twp, NPDES Permit No. PA0088251, Outfall 001

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | (●) All | ( ) Inputs | ( ) Results | ( ) Limits

☑ ***Hydrodynamics***

$Q_{7\text{-}10}$

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
2.3	0.03		0.03	0.24	0.01	0.41	5.973	14.575	0.109	1.077	0.019
0.38	0.07		0.065								

Q_h

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
2.3	0.32		0.32	0.24	0.01	0.566	5.973	10.551	0.164	0.714	0.365
0.38	0.682		0.68								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 0.019 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	13.439	14.0	15.6	Chem Translator of 0.96 applied
Total Lead	0	0		0	64.581	81.6	90.8	Chem Translator of 0.791 applied
Total Zinc	0	0		0	117.180	120	133	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 0.019 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	

Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	8.956	9.33	10.4	Chem Translator of 0.96 applied
Total Lead	0	0		0	2.517	3.18	3.54	Chem Translator of 0.791 applied
Total Zinc	0	0		0	118.139	120	133	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): 0.019 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 0.365 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Copper	0.013	0.02	0.01	0.016	0.016	mg/L	0.01	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Lead	Report	Report	Report	Report	Report	µg/L	3.54	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	mg/L	0.12	AFC	Discharge Conc > 10% WQBEL (no RP)

☑ ***Other Pollutants without Limits or Monitoring***

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	N/A	N/A	PWS Not Applicable

Chloride (PWS)	N/A	N/A	PWS Not Applicable
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	N/A	N/A	PWS Not Applicable