pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southeast Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0021857**
Facility Type	**Municipal**	APS ID	**955278**
Major / Minor	**Major**	Authorization ID	**1206923**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Borough of Souderton**	Facility Name	**Borough of Souderton WWTP**
Applicant Address	31 W Summit Street	Facility Address	174 Cowpath Road
	Souderton, PA 18964		Souderton, PA 18964-2007
Applicant Contact	P. Michael Coll	Facility Contact	P Coll
Applicant Phone	(215) 723-3824	Facility Phone	(215) 723-4371
Client ID	3685	Site ID	263090
Ch 94 Load Status	Not Overloaded	Municipality	Franconia Township
Connection Status	No Limitations	County	Montgomery
Date Application Received	November 8, 2017	EPA Waived?	No
Date Application Accepted		If No, Reason	Major Facility
Purpose of Application	Permit Renewal.		

Summary of Review

The PA Department of Environmental Protection (PADEP/Department) received an NPDES permit renewal application from S C Engineers, Inc. (consultant) on behalf of Borough of Souderton (permittee) for permittee's Borough of Souderton WWTP (facility) on November 8, 2017. The draft permit was published in the PA Bulletin on November 24, 2018; however, it was never finalized. The current permit expired on May 31, 2018 and the permit is under administrative extension since then. This is a major sewage facility with design flow of 2.0 MGD and the treated effluent is discharged into an UNT to Skippack Creek (TSF, MF). Renewal NPDES permit applications under Clean Water program are not covered by PADEP's PDG per 021-2100-001.

This fact sheet is developed in accordance with 40 CFR §124.56.

Changes in this permit: Quarterly monitoring for TDS, Total Aluminum, Total Arsenic, Total Boron, Dissolved Iron, and Total Zinc. Limits with schedule for Total Copper, Free Cyanide, Total Iron, Total Thallium, Chlorodibromomethane, Dichlorobromomethane, and Chloroform. Monthly monitoring for E. Coli and Total Nitrogen, TKN, and NO_3-NO_2-N.

Sludge use and disposal description and location(s): Aerobic digestion and dewatering by means of a belt filter press. Digested and dewatered sludge is used under PAG08 in mine sites in Schuylkill county.

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.

Approve	Deny	Signatures	Date
√		Reza H. Chowdhury, E.I.T. / Project Manager	January 10, 2023
X		*Pravin Patel* Pravin C. Patel, P.E. / Environmental Engineer Manager	01/10/2023

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	2.0
Latitude	40º 17' 40.14"	Longitude	-75º 19' 55.92"
Quad Name	Telford	Quad Code	1643
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary to Skippack Creek (TSF, MF)	Stream Code	01119
NHD Com ID	25999040	RMI	0.09
Drainage Area	1.76 mi^2/2.91 mi^2	Yield (cfs/mi^2)	0.05/0.1
Q_{7-10} Flow (cfs)	0.0829/0.291	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	267.3	Slope (ft/ft)	
Watershed No.	3-E	Chapter 93 Class.	TSF, MF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	ALGAE, SILTATION		
Source(s) of Impairment	RURAL (RESIDENTIAL AREAS), RURAL (RESIDENTIAL AREAS)		
TMDL Status	Final 04/09/2005, withdrawn	Name	Skippack Creek Watershed TMDL

Background/Ambient Data		Data Source
pH (SU)	7.0	Previous fact sheet, default
Temperature (°C)	20	Previous fact sheet, default
Hardness (mg/L)	209	Previous fact sheet
Other:		

Nearest Downstream Public Water Supply Intake	Aqua PA Main		
PWS Waters	Skippack Creek	Flow at Intake (cfs)	
PWS RMI	0.9	Distance from Outfall (mi)	15.98

Changes Since Last Permit Issuance: None

Other Comments:

Streamflow:

USGS's web based watershed delineation tool StreamStats (accessible at https://streamstats.usgs.gov/ss/, accessed on October 18, 2022) was utilized to determine the drainage area and low flow statistics of the receiving stream at discharge point. The drainage area was found to be 1.76 mi^2. The previous fact sheet accompanying the 2018 draft stated that "since the point of discharge is located only 0.09 mile from the main stem of the Skippack Creek, the model was utilized as if the discharge was directly to the main stem of Skippack Creek at RMI 14.05 (*corrected to 13.88*) This was done to ensure a sufficient stream length was modeled to observe the effects of DO lag. The Q_{7-10} at river mile 14.05 (*corrected to 13.88*) of Skippack Creek was estimated as 0.0925-cfs (*changed to 0.099 cfs*)." The drainage area at Node 1 (at Skippack Creek RMI 13.88) is found to be 2.91 mi^2, which is outside of suggested range and other flow estimates may produce extrapolated results with unknow error. To avoid this, a default low flow yield of 0.1 cfs/mi^2, Q_{1-10}:Q_{7-10} ratio of 0.64, and Q_{30-10}:Q_{7-10} ratio of 1.36 will be utilized in modeling.

Q_{7-10} runoff rate = 0.1 cfs/mi^2

Q_{7-10} = 0.1 cfs/mi^2 * 2.91 mi^2 = 0.291 cfs

PWS Intake:
The nearest downstream public water supply is Aqua PA Main on Perkiomen Creek, in Lower Merion Township at RMI 0.9. Its approximately 15.98 miles downstream of Outfall 001. Discharge from this facility is expected not to impact the PWS intake. The distance is calculated as follows:

+ Outfall 001 RMI at UNT to Skippack Creek (01119) ---------- 0.09 mi
+ RMI on Skippack Creek (01024) at confluence with 01119 ---------- 13.88 mi
+ RMI on Perkiomen Creek (01017) at confluence with 01024 ---------- 2.91 mi
- PWS RMI at 01017 ---------- 0.9 mi

Total 15.98 miles

Wastewater Characteristics:
A median pH of 7.2 was calculated from daily DMR during dry months July through September for the year 2021-2022. The application data indicated an average Total Hardness of 164 mg/l out of 3 samples. A default temperature of 20^0C will be used for modeling.

Background data:
There is no nearby WQN station to calculate background pH, temperature, or hardness. The permit application indicated an average upstream hardness of 209 mg/l from data collected between 2015-2017. A default stream pH of 7.0 S.U. and temperature of 20°C will be used for modeling.

Skippack Creek Total Maximum Daily Load (TMDL):
Skippack Creek is a 15.2-mile stream located in sub-sub-basin 03E, Montgomery County, PA. it is a tributary to Perkiomen Creek whose drainage basin is composed of urban, suburban, agricultural, and rural components. Skippack Creek begins within Souderton Borough limits and flows generally southwest to its confluence with Perkiomen Creek at RMI 3.0. The Skippack Creek TMDL was finalized in April 9, 2005 for Sediments and Nutrients. There were 11 active NPDES permitted point source discharges in the watershed including 7 STPs, 1 meat packing plant, 1 dairy farm, and 2 manufacturers. No reduction for sediment load from point sources were proposed in the final TMDL. The nutrient portion of the TMDL was withdrawn in summer of 2007. No WLA was assigned to this treatment plant. The effluent limitations in the permit will be applied in a way that the discharge from this facility will not add to the existing impairment of the receiving stream.

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. The receiving streams are designated as Trout Stocking (TSF) and Migratory Fishes (MF.)

Class A Wild Trout Fisheries:
No Class A Wild Trout Fisheries are impacted by this discharge. The secondary receiving stream, Skippack Creek, is a stocked trout water. The existing permit has a minimum DO limit of 6.0 mg/l as minimum to protect the stocked trout. This requirement will be carried over during this renewal.

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	002	Design Flow (MGD)	0
Latitude	40º 17' 44"	Longitude	-75º 19' 55.97"
Quad Name	Telford	Quad Code	1643
Wastewater Description:	Stormwater		
Receiving Waters	UNT to Skippack Creek (TSF, MF)	Stream Code	01119
NHD Com ID	25999040	RMI	0.09

Changes Since Last Permit Issuance: None

Treatment Facility Summary				
Treatment Facility Name: Borough of Souderton WWTP				
WQM Permit No.	**Issuance Date**			
4696406	05/02/1996			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Activated Sludge	Gas Chlorine	2.0
Hydraulic Capacity (MGD)	**Organic Capacity (lbs./day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
2	3,336	Not Overloaded	Aerobic Digestion	Landfill

Changes Since Last Permit Issuance: None

Treatment Plant Description

Borough of Souderton WWTP is a 2.0 MGD Major Sewer Facility (MASF1) located in Souderton Borough, Montgomery County which discharges treated sewage through Outfall 001 into an UNT to Skippack Creek in state watershed 3-E. The WWTP incorporates aerated grit removal, extended aeration for BOD5 removal and nitrification, ferrous sulfate addition for phosphorus removal, final clarification, chlorination, and post aeration. The treated effluent is discharged through Outfall 001. Outfall 002 is a stormwater only outfall.

The facility receives flows mostly from Souderton Borough and small contributions from few other municipalities:

Municipalities served	Flow contribution (%)	Type of Sewer System		Population
		Separate (%)	Combined (%)	
Souderton Borough	88	100	0	11,130
Franconia Township	11	100	0	1,360
Hilltown Township	1	100	0	125

There is one significant and categorical industry that discharges to this WWTP. Leidy's Inc. is in Franconia Township that discharged approximately 59,250 gallons to the WWTP in 2016. The facility is a categorical industry under pretreatment standard as coded in 40 CFR Part 432-Meat and Poultry Products Point Source Category (pork slaughterhouse). The permit application indicated that an industrial user permit been issued to Leidy's Inc.

Per PADEP's most recent site inspection on May 31, 2022, the WWTP consists of the following treatment units:

One influent screen, one grit removal, two aeration basins, two secondary clarifiers, two chlorine contact tanks, two dechlorination tanks, two aerated digesters and one belt filter press

The following chemicals are used as wastewater treatment chemicals:

Chemical name	Purpose	Maximum use rate	Units
Ferrous Sulfate	Phosphorus coagulation	250	GPD
Chlorine	Disinfection	50	Lbs./day
Sulfur Dioxide	Dechlorination	25	Lbs./day

Biosolids Management:
Sludge handling for this WWTP includes aerobic digestion and dewatering by means of a belt filter press. Before dewatering, polymer is measured and mechanically blended with the liquid biosolids. Digested and dewatered sludge is used under PAG08 in mine sites in Schuylkill county.

Compliance History

DMR Data for Outfall 001 (from September 1, 2021 to August 31, 2022)

Parameter	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21
Flow (MGD) Average Monthly	1.015	0.975	1.029	1.911	2.087	1.360	1.701	1.479	1.000	1.072	1.243	1.539
Flow (MGD) Daily Maximum	1.316	1.233	1.128	2.896	3.508	1.569	2.339	2.068	1.487	1.196	2.132	2.508
pH (S.U.) Instantaneous Minimum	7.1	6.6	6.9	6.9	7.0	6.9	6.7	6.6	7.0	6.9	6.8	6.8
pH (S.U.) IMAX	7.5	7.5	7.4	7.4	7.4	7.4	7.3	7.4	7.5	7.4	7.2	7.4
DO (mg/L) Minimum	7.0	7.0	6.8	7.8	8.1	9.0	8.9	8.3	7.7	7.1	6.7	7.7
DO (mg/L) Average Monthly	7.4	7.4	7.8	8.5	9.2	9.6	10.1	9.5	8.3	7.7	8.3	8.4
TRC (mg/L) Average Monthly	0.004	0.002	0.004	0.005	0.003	0.001	0.0019	0.003	0.002	0.002	0.003	0.003
TRC (mg/L) IMAX	0.018	0.008	0.011	0.012	0.012	0.006	0.005	0.010	0.006	0.010	0.007	0.018
CBOD5 (lbs./day) Average Monthly	19.0	19.0	22	42.0	59.8	32.0	34.1	38	20	18	22.0	26
CBOD5 (lbs./day) Weekly Average	22.0	34.0	30	101.0	130.9	44.0	56.7	52	28	20	39.0	44
CBOD5 (mg/L) Average Monthly	2.0	2.0	2.0	3.0	2.6	3.0	2.4	3.0	2.0	2.0	2.0	< 2.0
CBOD5 (mg/L) Weekly Average	3.0	3.0	3.0	5.0	3.1	4.0	2.8	5.0	2.0	2.0	2.0	< 2.0
TSS (lbs./day) Average Monthly	39.3	61.2	43.2	135.2	208.2	60.8	64.2	50.9	39.5	37.7	45.0	50.4
TSS (lbs./day) Weekly Average	54.0	109.0	61.1	389.8	616.3	87.7	113.1	65.7	55.1	42.1	77.3	87.1
TSS (mg/L) Average Monthly	4.8	6.7	4.6	9.6	7.4	5.0	4.3	4.8	4.4	4.3	4.3	< 4.0
TSS (mg/L) Weekly Average	8.2	11.7	6.4	24.2	12.9	6.4	4.7	5.5	5.2	4.8	4.9	< 4.0
Fecal Coliform (CFU/100 ml) Geometric Mean	43	65	69	20	53	11	20	42	70	32	132	123
Fecal Coliform (CFU/100 ml) IMAX	250	273	673	156	3800	44	6400	315	354	82	354	4300
Ammonia (lbs./day) Average Monthly	0.9	1.5	2.20	1.2	2.4	1.2	1.5	2.0	1.4	1.1	1.1	1.2
Ammonia (mg/L) Average Monthly	0.1	0.16	0.21	< 0.10	0.13	< 0.10	< 0.10	0.20	0.16	0.12	0.10	< 0.10

Total Phosphorus (lbs./day) Average Monthly	4.8	7.5	8.7	9.4	10.6	6.1	7.4	5.8	4.6	6.0	7.0	9.0
Total Phosphorus (mg/L) Average Monthly	0.58	0.89	0.93	0.77	0.46	0.51	0.53	0.57	0.52	0.70	0.71	0.70
Total Copper (mg/L) Average Monthly	0.012	0.019	0.017	0.014	0.010	0.012	0.015	0.010	0.011	0.011	0.015	0.018
Total Copper (mg/L) Daily Maximum	0.020	0.021	0.019	0.015	0.012	0.013	0.017	0.015	0.013	0.017	0.019	0.022

DMR Data for Outfall 002 (from September 1, 2021 to August 31, 2022)

Parameter	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21
TSS (mg/L) Daily Maximum									7.0			
Fecal Coliform (CFU/100 ml) Daily Maximum									200			
TKN (mg/L) Daily Maximum									< 0.50			
Total Iron (mg/L) Daily Maximum									0.09			

Compliance History

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

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Fecal Coliform	04/30/22	IMAX	3800	CFU/100 ml	1000	CFU/100 ml
Fecal Coliform	02/28/22	IMAX	6400	CFU/100 ml	1000	CFU/100 ml

Other Comments: The Non-compliance report submitted with April 2022 eDMR stated that the cause of April violation was due to hydraulic flow exceeding plant or unit design. Increased chemical feed showed compliance in follow-up fecal testing. No explanation was provided for February 2022 non-compliance.

Summary of Inspections:
October 4, 2022: CEI conducted. Unpermitted discharge due to overflow from A side of the treatment tank aeration unit on September 6, 2022. The permittee reported this SSO. An NOV was issued on later date.

May 31, 2022: RTPT conducted. No violation noted during the inspection. Increased algal growth was observed at and immediately below outfall 001. Outfall 002 looked normal. The basin was dry and no obvious contamination was evident.

10/19/2021: CEI conducted. No violation noted during the inspection. A greater than normal deposition of plant solids was observed in the first pool downstream of the outfall, which may be due to side B clarifier issue. No issues were evident below this point.

07/20/2021: RTPT conducted. No violation noted.

10/08/2020: CEI conducted. No violation noted. Increased algal growth was present at and immediately below the outfall. Some normal settled solids were present in the first downstream pool.

04/13/2020: ADMIN review conducted. No violation noted. The facility didn't have issues with necessary materials supply due to COVID.

Existing Effluent Limitations and Monitoring Requirements

For Outfall 001:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Inst. Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	Report	XXX	XXX	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.012	XXX	0.038	1/day	Grab
CBOD5 May 1 - Oct 31	250	383	XXX	15	23	30	2/week	24-Hr Composite
CBOD5 Nov 1 - Apr 30	417	667	XXX	25	40	50	2/week	24-Hr Composite
Total Suspended Solids	500	750	XXX	30	45	60	2/week	24-Hr Composite
Fecal Coliform (CFU/100 ml) (October 01 to April 30)	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/week	Grab
Fecal Coliform (CFU/100 ml) (May 01 to September 30)	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/week	Grab
Ammonia-Nitrogen May 1 - Oct 31	30.0	XXX	XXX	1.8	XXX	3.6	2/week	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	60.0	XXX	XXX	3.6	XXX	7.2	2/week	24-Hr Composite
Total Phosphorus Apr 1 - Oct 31	16.5	XXX	XXX	1.0	XXX	2.0	2/week	24-Hr Composite
Total Phosphorus Nov 1 - Mar 31	33.0	XXX	XXX	2.0	XXX	4.0	2/week	24-Hr Composite
Copper, Total	XXX	XXX	XXX	Report	Report Daily Max	Report	1/week	24 Hour Composite

For Outfall 002:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Inst. Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/Year	Upon Request
Fecal Coliform (CFU/100 ml)	XXX	XXX	XXX	XXX	Report	XXX	1/Year	Upon Request
Total Kjeldahl Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/Year	Upon Request
Total Iron	XXX	XXX	XXX	XXX	Report	XXX	1/Year	Upon Request

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 2.0
Latitude 40º 17' 40.14" **Longitude** -75º 19' 55.92"
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)
Fecal Coliform	200 / 100 ml	Geo Mean	DRBC	92a.47(a)(5)
Fecal Coliform	1,000 / 100 ml	IMAX	DRBC	92a.47(a)(5)
Total Dissolved Solids	1,000	Average Monthly		DRBC
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Water Quality-Based Limitations

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

- Discharge pH 7.2 (median July-Sep, 2021-22, eDMR data)
- Discharge Temperature 20°C (Default)
- Discharge Hardness 164 mg/l (Application data)
- Stream pH 7.0 (Default)
- Stream Temperature 20°C (Default)
- Stream Hardness 209 mg/l (Application data)

The following two nodes were used in modeling:

Node 1: At the confluence of UNT 01119 to Skippack Creek with Skippack Creek (01024) at Skippack Creek RMI 13.88

Elevation: 265.75 ft (USGS TNM 2.0 viewer, 10/17/2022)
Drainage Area: 2.91 mi^2 (StreamStat Version 3.0, 10/17/2022)
River Mile Index: 13.88 (PA DEP eMapPA)
Low Flow Yield: 0.1 cfs/mi^2
Discharge Flow: 2.0 MGD

Node 2: At confluence with UNT 01115 with Skippack Creek (01024)

Elevation: 237.18 ft (USGS TNM 2.0 viewer, 10/17/2022)
Drainage Area: 4.57 mi^2 (StreamStat Version 3.0, 10/17/2022)
River Mile Index: 13.18 (PA DEP eMapPA)
Low Flow Yield: 0.1 cfs/mi^2
Discharge Flow: 0.0 MGD

Ammonia (NH_3-N), Carbonaceous Biochemical Oxygen Demand (CBOD5), & Dissolved Oxygen (DO):
WQM 7.0 version 1.0b is a water quality model designed to assist DEP to determine appropriate effluent limits for $CBOD_5$, NH_3-N and DO. The model simulates two basic processes. In the NH_3-N module, the model simulates the mixing and degradation of NH_3-N in the stream and compares calculated instream NH_3-N concentrations to NH_3-N water quality criteria. In the D.O. module, the model simulates the mixing and consumption of D.O. in the stream due to the degradation of $CBOD_5$ and NH_3N and compares calculated instream D.O. concentrations to D.O. water quality criteria. The model was utilized for this permit renewal by using Q_{7-10} and current background water quality levels of the stream.

NH_3-N:
WQM 7.0 suggested NH_3-N limit of 1.8 mg/l as monthly average and 3.6 mg/l as IMAX limit during summer to protect water quality standards. These values are the same as existing permitted limits. The average monthly mass loading is calculated to be 30.0 lbs./day. The existing winter season limits of 3.6 mg/l as average monthly and 7.2 mg/l as IMAX limit will be carried over in this renewal. Winter average monthly mass limit was calculated as 60.0 lbs./day, which is the same as in the existing permit and will remain unchanged.

$CBOD_5$:
The WQM 7.0 model suggests a monthly average $CBOD_5$ limit of 15 mg/l. The average monthly and average weekly mass loadings were calculated as 250 lbs./day and 375 lbs./day respectively. These values are the same as existing permit with the exception of weekly mass limit which is believed to be miscalculated in previous permit. The weekly average limit should be 1.5 times of monthly average values. The current permit has winter season average monthly, weekly average, and IMAX limit of 25 mg/l, 40 mg/l, and 50 mg/l, respectively, which will be carried over in this renewal. Seasonal limit for $CBOD_5$ is allowed in PADEP's guidance [(1)]. The mass limit for winter season is calculated to be 417 lbs./day as monthly average and 667 lbs./day as weekly average which are the same as existing permit and will be carried over. Minimum monitoring frequency will remain the same as 2/week, 24-hr composite sampling.

Dissolved Oxygen (DO):
A minimum of 6.0 mg/L for D.O. is necessary to protect the designated use of the receiving stream and is supported by the output from WQM 7.0 modeling and consistent with Ch. 93.7. This limit will be applied in the draft permit.

Toxics:
Based on the available data, PADEP utilizes Toxics Management Spreadsheet (TMS) to (1) evaluate reasonable potential for toxic pollutants to cause or contribute to an excursion above the water quality standards and (2) develop WQBELs for those such toxic pollutants (i.e., 40 CFR § 122.44(d)(1)(i)). It is noteworthy that some of these pollutants that may be reported as "non-detect", but still exceeded the criteria, were determined to be candidates for modeling because the method detection levels used to analyze those pollutants were higher than target QLs and/or the most stringent Chapter 93 criteria. The model then recommended the appropriate action for the Pollutants of Concerns based on the following logic:

1. In general, establish limits in the draft permit where the effluent concentration determined in B.1 or B.2 equals or exceeds 50% of the WQBEL (i.e., RP is demonstrated). Use the average monthly, maximum daily and instantaneous maximum (IMAX) limits for the permit as recommended by the TMS (or, if appropriate, use a multiplier of 2 times the average monthly limit for the maximum daily limit and 2.5 times the average monthly limit for IMAX).

2. For non-conservative pollutants, in general, establish monitoring requirements where the effluent concentration determined in B.1 or B.2 is between 25% - 50% of the WQBEL.

3. For conservative pollutants, in general, establish monitoring requirements where the effluent concentration determined in B.1 or B.2 is between 10% - 50% of the WQBEL.

NOTE 4 – If the effluent concentration determined in B.1 or B.2 is "non-detect" at or below the target quantitation limit (TQL) for the pollutant as specified in the TMS and permit application, the pollutant may be eliminated as a candidate for WQBELs or monitoring requirements unless 1) a more sensitive analytical method is available for the pollutant under 40 CFR Part 136 where the quantitation limit for the method is less than the applicable water quality criterion and 2) a detection at the more sensitive method may lead to a determination that an effluent limitation is necessary, considering available dilution at design conditions.

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NOTE 5 – If the effluent concentration determined in B.1 or B.2 is a detection below the TQL but above or equal to the applicable water quality criterion, WQBELs or monitoring may be established for the pollutant.

4. Application managers may, on a site- and pollutant-specific basis, deviate from these guidelines where there is specific rationale that is documented in the fact sheet.

☑ ***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 Aluminum	Report	Report	Report	Report	Report	µg/L	750	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Arsenic	Report	Report	Report	Report	Report	µg/L	10.9	THH	Discharge Conc > 10% WQBEL (no RP)
Total Boron	Report	Report	Report	Report	Report	µg/L	1,750	CFC	Discharge Conc > 10% WQBEL (no RP)
Free Cyanide	0.073	0.11	4.38	6.83	10.9	µg/L	4.38	THH	Discharge Conc ≥ 50% WQBEL (RP)
Dissolved Iron	Report	Report	Report	Report	Report	µg/L	328	THH	Discharge Conc > 10% WQBEL (no RP)
Total Iron	27.4	42.7	1,641	2,560	4,103	µg/L	1,641	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Thallium	0.004	0.007	0.26	0.41	0.66	µg/L	0.26	THH	Discharge Conc ≥ 50% WQBEL (RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	186	AFC	Discharge Conc > 10% WQBEL (no RP)
Chlorodibromomethane	0.024	0.038	1.45	2.27	3.63	µg/L	1.45	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Chloroform	0.1	0.16	6.24	9.73	15.6	µg/L	6.24	THH	Discharge Conc ≥ 50% WQBEL (RP)
Dichlorobromomethane	0.029	0.045	1.73	2.69	4.31	µg/L	1.73	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Copper Souderton WWTP	0.57	0.93	33.9	56.0	84.8	µg/L	33.9	CFC	Discharge Conc ≥ 50% WQBEL (RP)

The above table is taken from TMS output and shows TMS recommendation. Each of the parameters are discussed below:

Total Aluminum: TMS suggests monitoring for Total Aluminum based on model input concentration of <100 ug/l. A quarterly monitoring requirement will provide sufficient effluent results for a Reasonable Potential analysis during next permit term.

Total Arsenic: TMS suggests monitoring for Total Arsenic based on model input concentration of 3 ug/l. A quarterly monitoring requirement will provide sufficient effluent results for a Reasonable Potential analysis during next permit term.

Total Boron: TMS suggests monitoring for Total Boron based on model input concentration of 421 ug/l. A quarterly monitoring requirement will provide sufficient effluent results for a Reasonable Potential analysis during next permit term.

Free Cyanide: RP has been demonstrated and TMS suggests numeric limit for Free Cyanide based on model input concentration of <13.5 ug/l. The model suggested AML of 4.38 ug/l, MDL of 6.83 ug/l, IMAX of 10.9 ug/l, and calculated average monthly mass limit of 0.073 lbs./day and MDL of 0.11 lbs./day. Since this is a new pollutant with limits requirements, it'll be added in Pre-draft survey letter for permittee's input.

Dissolved Iron: TMS suggests monitoring for Dissolved Iron based on model input concentration of 61 ug/l. A quarterly monitoring requirement will provide sufficient effluent results for a Reasonable Potential analysis during next permit term.

Total Iron: RP has been demonstrated and TMS suggests numeric limit for Total Iron based on model input concentration of 1,890 ug/l. The model suggested AML of 1.641 mg/l, MDL of 2.56 mg/l, IMAX of 4.103 mg/l, and calculated average monthly mass limit of 27.4 lbs./day and MDL of 42.7 lbs./day. Since this is a new pollutant with limits requirements, it'll be added in Pre-draft survey letter for permittee's input.

Total Thallium: RP has been demonstrated and TMS suggests numeric limit for Total Thallium based on model input concentration of 0.5 ug/l. The model suggested AML of 0.26 ug/l, MDL of 0.41 ug/l, IMAX of 0.66 ug/l, and calculated average monthly mass limit of 0.004 lbs./day and MDL of 0.007 lbs./day. Since this is a new pollutant with limits requirements, it'll be added in Pre-draft survey letter for permittee's input.

Total Zinc: TMS suggests monitoring for Total Zinc based on model input concentration of 53 ug/l. A quarterly monitoring requirement will provide sufficient effluent results for a Reasonable Potential analysis during next permit term.

Chlorodibromomethane: RP has been demonstrated and TMS suggests numeric limit for Chlorodibromomethane based on model input concentration of 0.8 ug/l. The model suggested AML of 1.45 ug/l, MDL of 2.27 ug/l, IMAX of 3.63 ug/l, and

calculated average monthly mass limit of 0.024 lbs./day and MDL of 0.038 lbs./day. Since this is a new pollutant with limits requirements, it'll be added in Pre-draft survey letter for permittee's input.

Chloroform: RP has been demonstrated and TMS suggests numeric limit for Chlorodibromomethane based on model input concentration of 6.6 ug/l. The model suggested AML of 6.24 ug/l, MDL of 9.73 ug/l, IMAX of 15.6 ug/l, and calculated average monthly mass limit of 0.1 lbs./day and MDL of 0.16 lbs./day. Since this is a new pollutant with limits requirements, it'll be added in Pre-draft survey letter for permittee's input.

Dichlorobromomethane: RP has been demonstrated and TMS suggests numeric limit for Chlorodibromomethane based on model input concentration of 2.4 ug/l. The model suggested AML of 1.73 ug/l, MDL of 2.69 ug/l, IMAX of 4.31 ug/l, and calculated average monthly mass limit of 0.029 lbs./day and MDL of 0.045 lbs./day. Since this is a new pollutant with limits requirements, it'll be added in Pre-draft survey letter for permittee's input.

Total Copper: Total Copper had monitoring requirement in current permit. The 2018 draft permit utilized results from 2015 WER study. The 2015 WER study wasn't approved by EPA. Based on the PA Bulletin publication dated August 12, 2006, the approved WER (Total Recoverable) was 2.55 and hardness was 143 mg/l. The bulletin also published the revised CCCrs of 25.9 ug/l and 40.1 ug/l. However, the equations to calculate CCCr and CMCr are changed. The new equations per Ch. 93.8c(b) Table 5 are as follows:

$$CCCr: 0.960 \times Exp^{(0.8545 \times \ln[H] - 1.702)}$$
$$CMCr: 0.960 \times Exp^{(0.9422 \times \ln[H] - 1.700)}$$

Utilizing a published hardness of 143 mg/l, the equations resulted in CCCr of 12.16 ug/l and CMCr of 18.82 ug/l. The revised CCCr is 31 ug/l and CMCr is 48 ug/l. These values were plugged into the TMS as revised criteria for Souderton WWTP. eDMR data for the months July-September for the years 2018-2022 were plugged into TOXCONC to calculate AMEC and Daily CV. Calculated AMEC is 36.075 ug/l and Daily CV is 0.611. These values were the input of TMS and the model suggested AML of 33.9 ug/l, MDL of 56 ug/l, and IMAX of 84.8 ug/l. The calculated mass-based AML is 0.57 lbs./day and MDL is 0.93 lbs./day. Since this is a new pollutant with limits requirements, it'll be added in pre-draft survey letter for permittee's input. Based on the permittee's response, an appropriate compliance schedule and TRE requirement will be applied, if needed. Since Total Copper is hardness-based pollutant, discharge Total Hardness (as $CaCO_3$) will also be added in the permit.

Whole Effluent Toxicity Testing (WETT):

The permittee submitted five (5) WET Test results (annually for years 2012-2016) with the renewal application. The PADEP requested and obtained additional five (5) WETT reports for the years 2017-2022. All these reports were analyzed for QA/QC and the WETT reports for 2019-2022 (four) were evaluated for RP analysis. All four valid WET test results showed "Pass" for all end points. The dilution series is updated. The TIWCc was calculated to be 97% to evaluate the test results for a stream flow of 0.0829 cfs, discharge flow of 2.0 MGD, and PMFa/PMFc of 1. The WET tests are discussed in detail on pages 14-15 of this report.

Additional Considerations

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. Delaware River Basin Commission's (DRBC's) Water Quality Regulations at Section 4.30.4.A requires that during winter season from October through April, the instantaneous maximum concentration of fecal coliform organisms shall not be greater than 1,000 per 100 milliliters in more than 10 percent of the samples tested. Therefore, the summer limit is governed by DEP's regulation while winter limit is governed by DRBC's regulation. These are existing limits and will be carried over.

E. Coli:

Pa Code 25 § 92a. 61 requires monitoring of E. Coli. DEP's SOP titled "Establishing Effluent Limitations for Individual Sewage Permits (BCW-PMT-033, revised March 24, 2021) recommends monthly E. Coli monitoring for major sewage dischargers. This requirement will be applied from this permit term.

pH:

The TBEL for pH is above 6.0 and below 9.0 S.U. (40 CFR §133.102(c) and Pa Code 25 §§ 95.2(1), 92a.47) which are existing limits and will be carried over.

Total Suspended Solids (TSS):
There is no water quality criterion for TSS. The existing limits of 30 mg/L average monthly, 45 mg/l average weekly, and 60 mg/L instantaneous maximum will remain in the permit based on the minimum level of effluent quality attainable by secondary treatment, 25 Pa. Code § 92a.47 and 40CFR 133.102(b). The mass based average monthly and weekly average limits are calculated to be 500 lbs./day and 750 lbs./day respectively, which are the same as were in existing permit.

Total Residual Chlorine (TRC):
The attached computer printout utilizes the equation and calculations as presented in the Department's 2003 Implementation Guidance for Total Residual Chlorine (TRC) (ID#391-2000-015) for developing chlorine limitations. The attached printout indicates that a water quality limit of 0.013 mg/l would be needed to prevent toxicity concerns at the discharge point for Outfall 001. The Instantaneous Maximum (IMAX) limit is 0.041 mg/l. The current permit has average monthly limit of 0.012 mg/l and IMAX limit of 0.038 mg/l which are very close to the recalculated limits and the existing limits will be carried over.

Flow and Influent BOD_5, $CBOD_5$, and TSS Monitoring Requirement:
The requirement to monitor the volume of effluent will remain in the draft permit per 40 CFR § 122.44(i)(1)(ii). Influent BOD_5 and TSS monitoring requirements are established in the permit per the requirements set in Pa Code 25 Chapter 94. To demonstrate 85% removal efficiency, influent $CBOD_5$ will be added in the permit.

Total Dissolved Solids (TDS):
The recent TMS model output indicates no concern for TDS and its constituents. DRBC's basin-wide criteria (DRBC reg 3.10.4.D.2) requires monitoring for TDS. Therefore, a quarterly monitoring for TDS will be added in this renewal.

Best Professional Judgement (BPJ):
Total Phosphorus:
The current permit has a summer average monthly limit of 1.0 mg/l, IMAX of 2.0 mg/l, and mass-based average monthly limit of 16.5 lbs./day. The winter limits are 2.0 mg/l as average monthly, 4.0 mg/l as IMAX, and mass-based average monthly limit of 33.0 lbs./day. These limits will be carried over.

Total Nitrogen: Pa Code 25 § 92a.61 requires monitoring, at a minimum, for all sewage facilities. Monthly monitoring of Total Nitrogen will be applied for this renewal. Since TKN and Nitrate-Nitrite-N are needed to calculate TN, monthly monitoring of TKN and Nitrate-Nitrite-N will be added in this renewal.

Monitoring Frequency and Sample Types:
Otherwise specified above, the monitoring frequency and sample type of compliance monitoring for existing parameters are recommended by DEP's SOP and Permit Writers Manual and/or on a case-by-case basis using best professional judgment (BPJ).

Anti-Backsliding
The proposed limits are at least as stringent as are in existing permit, unless otherwise stated; therefore, anti-backsliding is not applicable.

Development of Effluent Limitations

Outfall No. 002 **Design Flow (MGD)** 0
Latitude 40º 17' 40.13" **Longitude** -75º 19' 55.92"
Wastewater Description: Stormwater

Per Phase II stormwater regulations, major POTWs with point source discharge to surface waters are generally required to have a stormwater permit. The following limits are proposed for stormwater only Outfall 002:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly		Minimum	Annual Average		Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
CBOD5	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
Chemical Oxygen Demand	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
Total Suspended Solids	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
Oil and Grease	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
Fecal Coliform (No./100 ml)	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
Total Kjeldahl Nitrogen	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab
Dissolved Iron	XXX	XXX	XXX	Report	XXX	Report	1/year	Grab

Since the “treatment works treating domestic sewage” is considered as an “Industrial Activity” per 40 CFR §122.26(b)(14)(ix), the stormwater related to industrial activity under individual permit shall contain benchmark values. Therefore, the following benchmark values will be applied at the outfalls:

Parameter	Benchmark Value (mg/L)
Chemical Oxygen Demand	120
Total Suspended Solids	100

Whole Effluent Toxicity (WET)

For Outfall 001, ☐ **Acute** ☒ **Chronic** WET Testing was completed:

☐ For the permit renewal application (4 tests).
☐ Quarterly throughout the permit term.
☐ Quarterly throughout the permit term and a TIE/TRE was conducted.
☒ Other: **Annual**

The dilution series used for the tests was: 100%, 97.8%, 95.6%, 93.5%, and 91.5%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 97.8%.

Summary of Four Most Recent Test Results

TST Data Analysis

(NOTE – In lieu of recording information below, the application manager may attach the DEP WET Analysis Spreadsheet).

Test Date	*Ceriodaphnia* Results (Pass/Fail)		*Pimephales* Results (Pass/Fail)	
	Survival	Reproduction	Survival	Growth
5/23/2022	Pass	Pass	Pass	Pass
5/11/2021	Pass	Pass	Pass	Pass
5/26/2020	Pass	Pass	Pass	Pass
4/30/2019	Pass	Pass	Pass	Pass

***** *A "passing" result is that in which the replicate data for the TIWC is not statistically significant from the control condition. This is exhibited when the calculated t value ("T-Test Result") is greater than the critical t value. A "failing" result is exhibited when the calculated t value ("T-Test Result") is less than the critical t value.*

Is there reasonable potential for an excursion above water quality standards based on the results of these tests? (*NOTE – In general, reasonable potential is determined anytime there is at least one test failure in the previous four tests).*

☐ **YES** ☒ **NO**

Comments: None

Evaluation of Test Type, IWC and Dilution Series for Renewed Permit

Acute Partial Mix Factor (PMFa): **1** Chronic Partial Mix Factor (PMFc): **1**

1. Determine IWC – Acute (IWCa):

$(Q_d \times 1.547) / ((Q_{7\text{-}10} \times PMFa) + (Q_d \times 1.547))$

[(2 MGD x 1.547) / ((0.0829 cfs x 1) + (2 MGD x 1.547))] x 100 = **97.4%**

Is IWCa < 1%? ☐ **YES** ☒ **NO** **(YES - Acute Tests Required OR NO - Chronic Tests Required)**

If the discharge is to the tidal portion of the Delaware River, indicate how the type of test was determined:

Type of Test for Permit Renewal: **Chronic**

2a. Determine Target IWCa (If Acute Tests Required)

TIWCa = IWCa / 0.3 = **%**

2b. Determine Target IWCc (If Chronic Tests Required)

$(Q_d \times 1.547) / (Q_{7\text{-}10} \times PMFc) + (Q_d \times 1.547)$

[(2 MGD x 1.547) / ((0.0829 cfs x 1) + (2 MGD x 1.547))] x 100 = **97.4%**

3. Determine Dilution Series

(NOTE – check Attachment C of WET SOP for dilution series based on TIWCa or TIWCc, whichever applies).

Dilution Series = 100%, 97%, 73%, 49%, and 24%.

WET Limits

Has reasonable potential been determined? ☐ YES ☒ NO

Will WET limits be established in the permit? ☐ YES ☒ NO

If WET limits will be established, identify the species and the limit values for the permit (TU).

N/A

If WET limits will not be established, but reasonable potential was determined, indicate the rationale for not establishing WET limits:

N/A

Proposed Effluent Limitations and Monitoring Requirements

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

Outfall 001, Effective Period: Permit Effective Date through End of Interim Period 1.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Copper, Total (ug/L)	XXX	XXX	XXX	Report	Report	XXX	1/week	24-Hr Composite
Cyanide, Free (ug/L)	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite
Iron, Total (ug/L)	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite
Thallium, Total (ug/L)	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite
Chlorodibromomethane (ug/L)	XXX	XXX	XXX	Report	XXX	Report	1/week	Grab
Dichlorobromomethane (ug/L)	XXX	XXX	XXX	Report	XXX	Report	1/week	Grab
Chloroform (ug/L)	XXX	XXX	XXX	Report	XXX	Report	1/week	Grab

Compliance Sampling Location: At Outfall 001

Other Comments: none

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: End of Interim Period 1 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	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Copper, Total (ug/L)	0.57	0.93	XXX	33.9	56.0	84.8	1/week	24-Hr Composite
Cyanide, Free (ug/L)	0.073	0.11	XXX	4.38	6.83	10.9	1/week	24-Hr Composite
Iron, Total	27.4	42.7	XXX	1.641	2.56	4.103	1/week	24-Hr Composite
Thallium, Total (ug/L)	0.004	0.007	XXX	0.26	0.41	0.66	1/week	24-Hr Composite
Chlorodibromomethane (ug/L)	XXX	XXX	XXX	1.45	XXX	3.63	1/week	Grab
Dichlorobromomethane (ug/L)	XXX	XXX	XXX	1.73	XXX	4.31	1/week	Grab
Chloroform (ug/L)	XXX	XXX	XXX	6.24	XXX	15.6	1/week	Grab

Compliance Sampling Location: At Outfall 001

Other Comments: None

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	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	6.0 Inst Min	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.012	XXX	0.038	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5) Nov 1 - Apr 30	417	667	XXX	25	40 Wkly Avg	50	2/week	24-Hr Composite
Carbonaceous Biochemical Oxygen Demand (CBOD5) May 1 - Oct 31	250	375	XXX	15.0	23.0 Wkly Avg	30	2/week	24-Hr Composite
Carbonaceous Biochemical Oxygen Demand (CBOD5) Raw Sewage Influent	Report	Report	XXX	Report	Report Wkly Avg	XXX	2/week	24-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Total Suspended Solids	500	750	XXX	30	45 Wkly Avg	60	2/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report	XXX	Report	Report Wkly Avg	XXX	2/week	24-Hr Composite
Total Dissolved Solids	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/week	Grab

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/week	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/month	Grab
Nitrate-Nitrite as N	XXX	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Total Nitrogen	Report	XXX	XXX	Report	XXX	XXX	1/month	Calculation
Ammonia-Nitrogen Nov 1 - Apr 30	60.0	XXX	XXX	3.6	XXX	7.2	2/week	24-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	30.0	XXX	XXX	1.8	XXX	3.6	2/week	24-Hr Composite
Total Kjeldahl Nitrogen	Report	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Total Phosphorus Nov 1 - Mar 31	33.0	XXX	XXX	2.0	XXX	4	2/week	24-Hr Composite
Total Phosphorus Apr 1 - Oct 31	16.5	XXX	XXX	1.0	XXX	2	2/week	24-Hr Composite
Aluminum, Total (ug/L)	Report Avg Qrtly	Report Daily Max	XXX	Report Avg Qrtly	Report	XXX	1/quarter	24-Hr Composite
Arsenic, Total (ug/L)	Report Avg Qrtly	Report Daily Max	XXX	Report Avg Qrtly	Report	XXX	1/quarter	24-Hr Composite
Boron, Total (ug/L)	Report Avg Qrtly	Report Daily Max	XXX	Report Daily Max	Report	XXX	1/quarter	24-Hr Composite
Iron, Dissolved (ug/L)	Report Avg Qrtly	Report Daily Max	XXX	Report Avg Qrtly	Report	XXX	1/quarter	24-Hr Composite
Zinc, Total (ug/L)	Report Avg Qrtly	Report Daily Max	XXX	Report Avg Qrtly	Report	XXX	1/quarter	24-Hr Composite
Hardness, Total (as CaCO3)	XXX	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
Toxicity, Chronic - Ceriodaphnia Survival (TUc)	XXX	XXX	XXX	XXX	Report	XXX	See Permit	See Permit
Toxicity, Chronic - Ceriodaphnia Reproduction (TUc)	XXX	XXX	XXX	XXX	Report	XXX	See Permit	See Permit
Toxicity, Chronic - Pimephales Survival (TUc)	XXX	XXX	XXX	XXX	Report	XXX	See Permit	See Permit

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Toxicity, Chronic - Pimephales Growth (TUc)	XXX	XXX	XXX	XXX	Report	XXX	See Permit	See Permit

Compliance Sampling Location: At Outfall 001

Other Comments: None

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.

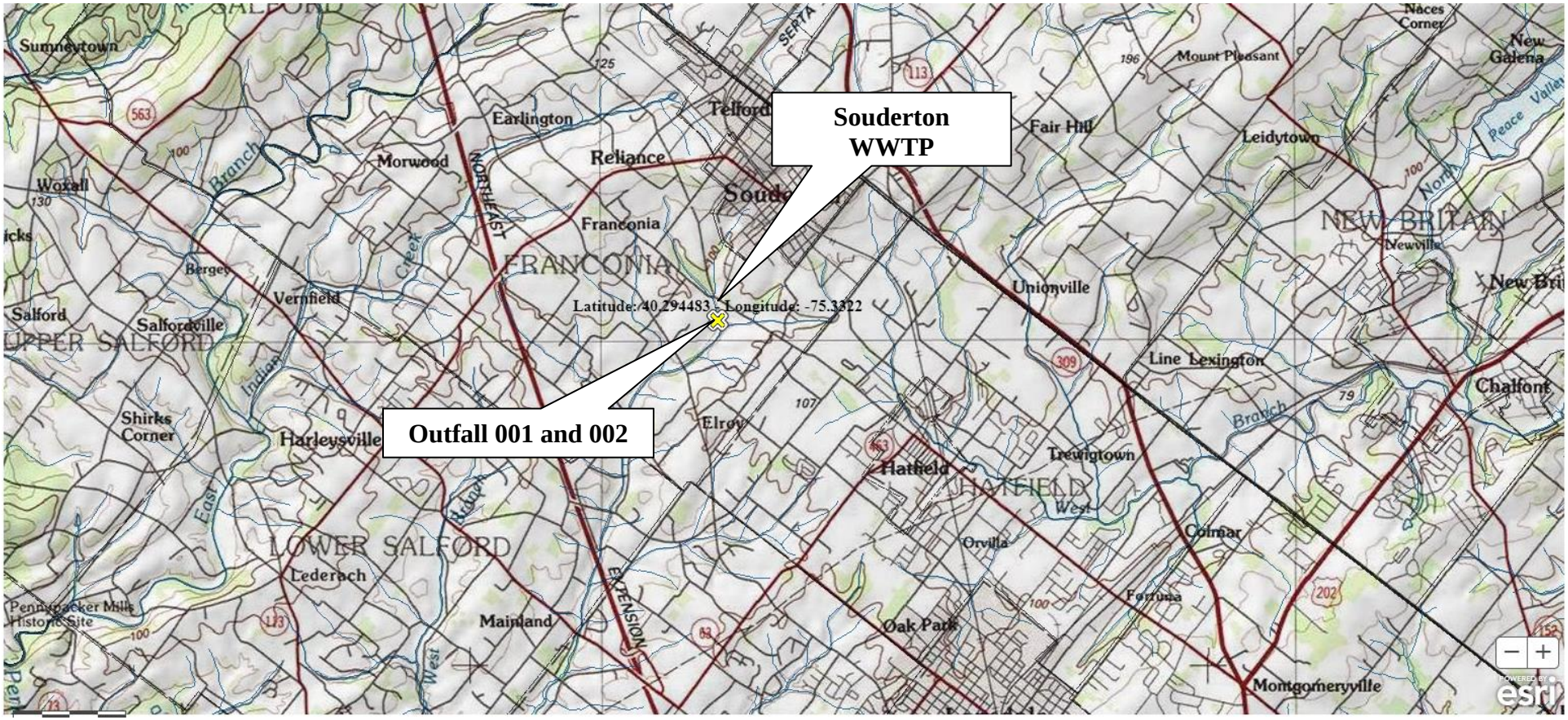
Outfall 002, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Annual Average	Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Chemical Oxygen Demand (COD)	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Total Suspended Solids	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Oil and Grease	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Fecal Coliform (No./100 ml)	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Total Kjeldahl Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab
Iron, Dissolved	XXX	XXX	XXX	Report	XXX	XXX	1/year	Grab

Compliance Sampling Location: At Outfall 002

Other Comments: None

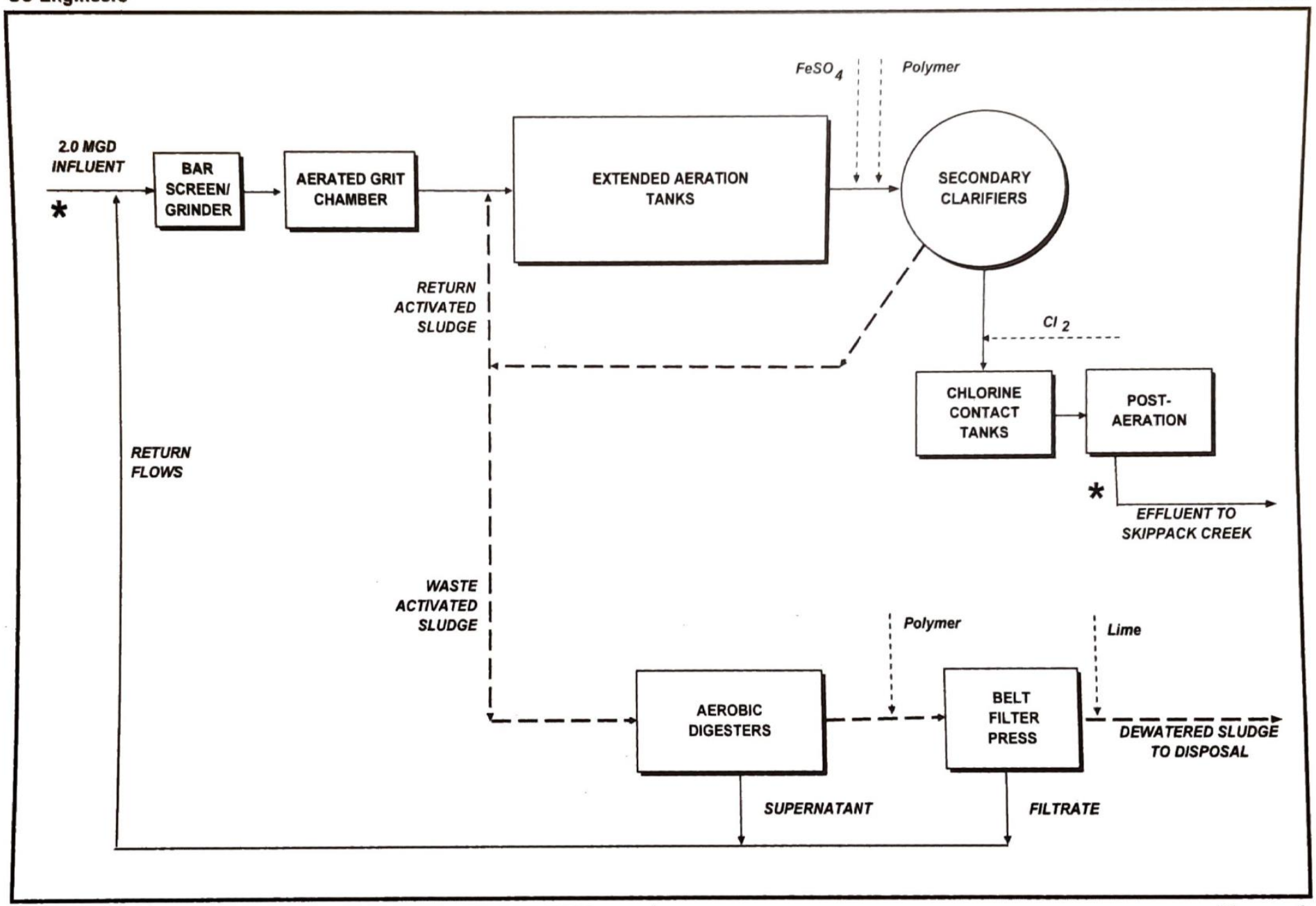
Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☒	Toxics Management Spreadsheet (see Attachment)
☒	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical 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:



Borough of Souderton NPDES Permit #: PA0021857; Borough of Souderton WWTP Franconia Township, Montgomery County		pennsylvania DEPARTMENT OF ENVIRONMENTAL PROTECTION	Reza H Chowdhury Project Manager December 5, 2022

Permit No. PA0021857

SC Engineers SOUDERTON BOROUGH



LEGEND :

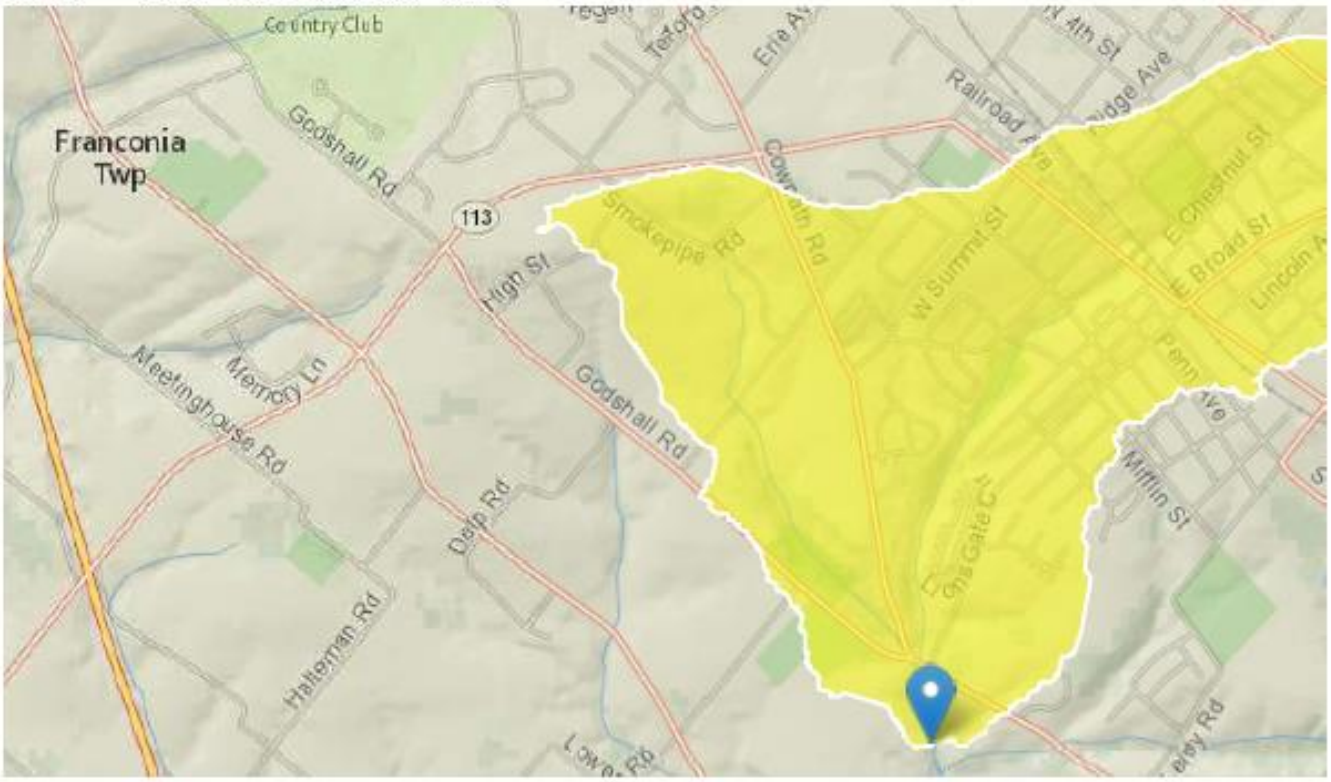
WASTEWATER FLOW LINES — SLUDGE LINES — CHEMICAL FEEDS — * SAMPLE POINTS

Figure 1

SCHEMATIC W.W.T.P. PROCESS DIAGRAM

Streamstats at Outfall 001

Region ID: PA
Workspace ID: PA20221018141312223000
Clicked Point (Latitude, Longitude): 40.29449, -75.33224
Time: 2022-10-18 10:13:33 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLOPD	Mean basin slope measured in degrees	2.7105	degrees
DRNAREA	Area that drains to a point on a stream	1.76	square miles
ROCKDEP	Depth to rock	4	feet
URBAN	Percentage of basin with urban development	60.8295	percent

Low-Flow Statistics

Permit No. PA0021857

Low-Flow Statistics Parameters [Low Flow Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.76	square miles	4.78	1150
BSLOPD	Mean Basin Slope degrees	2.7105	degrees	1.7	6.4
ROCKDEP	Depth to Rock	4	feet	4.13	5.21
URBAN	Percent Urban	60.8295	percent	0	89

Low-Flow Statistics Disclaimers [Low Flow Region 1]

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 1]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.216	ft^3/s
30 Day 2 Year Low Flow	0.351	ft^3/s
7 Day 10 Year Low Flow	0.0829	ft^3/s
30 Day 10 Year Low Flow	0.142	ft^3/s
90 Day 10 Year Low Flow	0.311	ft^3/s

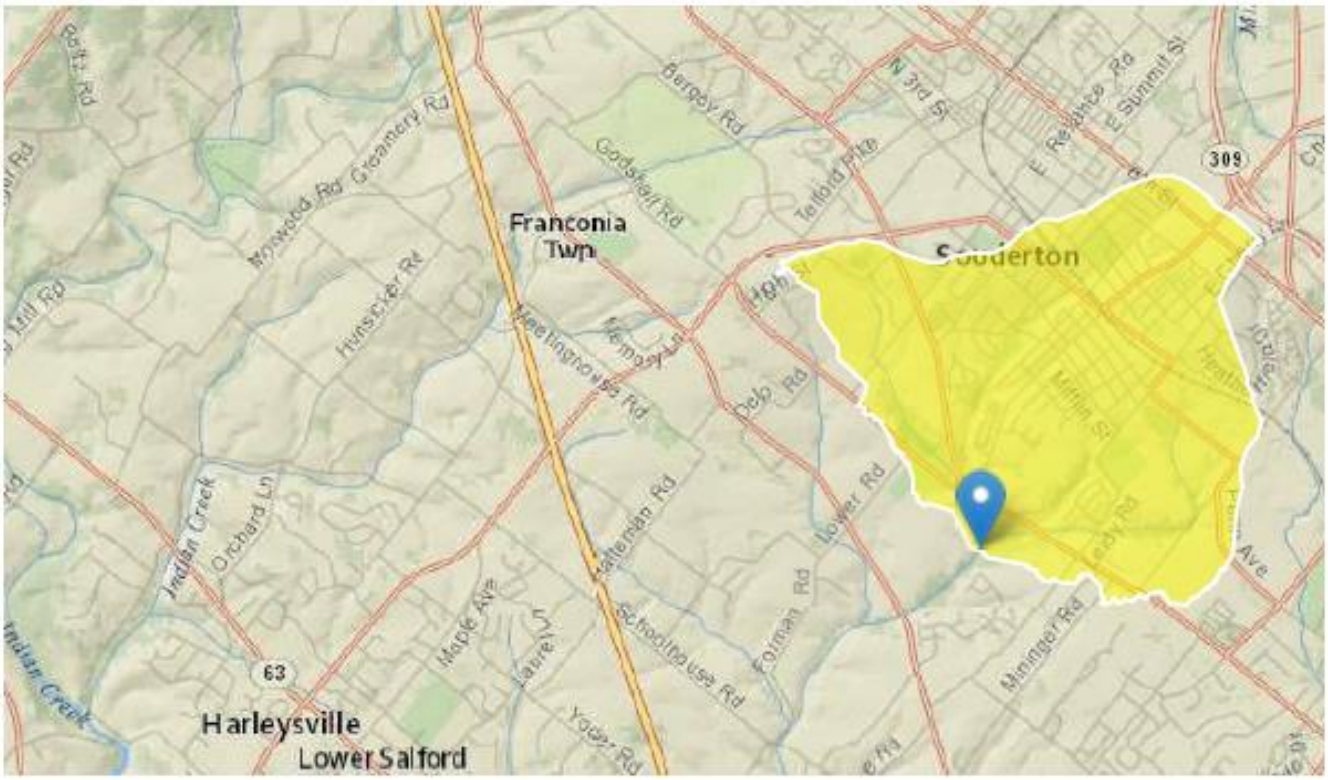
Low-Flow Statistics Citations

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. (http://pubs.usgs.gov/sir/2006/5130/)

Permit No. PA0021857

PA0021857 at Node 1

Region ID: PA
Workspace ID: PA20221017183017077000
Clicked Point (Latitude, Longitude): 40.29310, -75.33169
Time: 2022-10-17 14:30:37 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLOPD	Mean basin slope measured in degrees	2.4405	degrees
CARBON	Percentage of area of carbonate rock	0	percent
DRNAREA	Area that drains to a point on a stream	2.91	square miles
ROCKDEP	Depth to rock	4	feet
URBAN	Percentage of basin with urban development	49.6476	percent

Permit No. PA0021857

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2.91	square miles	4.78	1150
BSLOPD	Mean Basin Slope degrees	2.4405	degrees	1.7	6.4
ROCKDEP	Depth to Rock	4	feet	4.13	5.21
URBAN	Percent Urban	49.6476	percent	0	89

Low-Flow Statistics Disclaimers [Low Flow Region 1]

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 1]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.271	ft^3/s
30 Day 2 Year Low Flow	0.451	ft^3/s
7 Day 10 Year Low Flow	0.099	ft^3/s
30 Day 10 Year Low Flow	0.173	ft^3/s
90 Day 10 Year Low Flow	0.4	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. (http://pubs.usgs.gov/sir/2006/5130/)

Permit No. PA0021857

TRC_CALC

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.0829	= Q stream (cfs)	0.5	= CV Daily
2	= 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 =	0.028	1.3.2.iii	WLA cfc =	0.019
PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc =	0.581
PENTOXSD TRG	5.1b	LTA_afc=	0.010	5.1d	LTA_cfc =	0.011

Source		Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML MULT =	1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) =	0.013	AFC
		INST MAX LIMIT (mg/l) =	0.041	

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)

Permit No. PA0021857

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
03E	1024	SKIPPACK CREEK	13.880	265.75	2.91	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	0.100	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Souderton WWTP	PA0021857	2.0000	2.0000	2.0000	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	15.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	1.80	0.00	0.00	0.70

Permit No. PA0021857

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
03E	1024	SKIPPACK CREEK	13.180	237.18	4.57	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	0.100	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

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

Parameter Data

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

Permit No. PA0021857

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
03E	1024	SKIPPACK CREEK

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
13.880	0.29	0.00	0.29	3.094	0.00773	.6	16.56	27.62	0.34	0.125	20.00	7.00
Q1-10 Flow												
13.880	0.19	0.00	0.19	3.094	0.00773	NA	NA	NA	0.33	0.128	20.00	7.00
Q30-10 Flow												
13.880	0.40	0.00	0.40	3.094	0.00773	NA	NA	NA	0.35	0.123	20.00	7.00

Permit No. PA0021857

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	6		

Permit No. PA0021857

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
03E	1024	SKIPPACK CREEK

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
13.880	Souderton WWT	9.67	3.6	9.67	3.6	0	0

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
13.880	Souderton WWT	1.92	1.8	1.92	1.8	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
13.88	Souderton WWTP	15	15	1.8	1.8	6	6	0	0

Permit No. PA0021857

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
03E	1024	SKIPPACK CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
13.880	2.000	20.000	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
16.560	0.600	27.618	0.341
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
13.88	1.480	1.65	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.193	25.038	Tsivoglou	6
Reach Travel Time (days)			
0.125			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.013	13.63	1.63	6.61
0.025	13.38	1.62	6.92
0.038	13.13	1.60	7.15
0.050	12.89	1.59	7.33
0.063	12.65	1.57	7.46
0.075	12.42	1.56	7.56
0.088	12.19	1.55	7.65
0.100	11.97	1.53	7.71
0.113	11.75	1.52	7.77
0.125	11.53	1.51	7.81

Permit No. PA0021857

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
03E	1024	SKIPPACK CREEK

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
13.880	Souderton WWTP	PA0021857	2.000	CBOD5	15		
				NH3-N	1.8	3.6	
				Dissolved Oxygen			6

Permit No. PA0021857

Reviewer/Permit Engineer: Reza Chowdhury

Facility:	Souderton WWTP
NPDES #:	PA0021857
Outfall No:	001
n (Samples/Month):	4

Parameter	Distribution Applied	Coefficient of Variation (daily)	Avg. Monthly
Total Copper (µg/L)	Lognormal	0.6108612	36.0750178

Permit No. PA0021857

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Borough of Souderton WWTP** NPDES Permit No.: **PA0021857** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Treated 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
2	164	7.2						

					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		619.33									
	Chloride (PWS)	mg/L		225.67									
	Bromide	mg/L	<	1									
	Sulfate (PWS)	mg/L		61.7									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L	<	100									
	Total Antimony	µg/L		0.5									
	Total Arsenic	µg/L		3									
	Total Barium	µg/L		47									
	Total Beryllium	µg/L	<	0.05									
	Total Boron	µg/L		421									
	Total Cadmium	µg/L	<	0.08									
	Total Chromium (III)	µg/L											
	Hexavalent Chromium	µg/L	<	0.1									
	Total Cobalt	µg/L		0.6									
	Total Copper	µg/L											
	Free Cyanide	µg/L	<	13.5									
	Total Cyanide	µg/L		2									
	Dissolved Iron	µg/L		61									
	Total Iron	µg/L		1890									
	Total Lead	µg/L		0.4									
	Total Manganese	µg/L		26									
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L		4									
	Total Phenols (Phenolics) (PWS)	µg/L	<	5									
	Total Selenium	µg/L	<	0.5									
	Total Silver	µg/L	<	0.05									
	Total Thallium	µg/L		0.5									
	Total Zinc	µg/L		53									
	Total Molybdenum	µg/L		4									
	Acrolein	µg/L	<	1									
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<	0.5									
	Benzene	µg/L	<	0.5									
	Bromoform	µg/L	<	0.5									

Permit No. PA0021857

Group 3	Carbon Tetrachloride	µg/L	<	0.5									
	Chlorobenzene	µg/L		0.5									
	Chlorodibromomethane	µg/L		0.8									
	Chloroethane	µg/L	<	0.5									
	2-Chloroethyl Vinyl Ether	µg/L	<	0.5									
	Chloroform	µg/L		6.6									
	Dichlorobromomethane	µg/L		2.4									
	1,1-Dichloroethane	µg/L	<	0.5									
	1,2-Dichloroethane	µg/L	<	0.5									
	1,1-Dichloroethylene	µg/L	<	0.5									
	1,2-Dichloropropane	µg/L	<	0.5									
	1,3-Dichloropropylene	µg/L	<	0.5									
	1,4-Dioxane	µg/L		0.2									
	Ethylbenzene	µg/L		0.5									
	Methyl Bromide	µg/L	<										
	Methyl Chloride	µg/L	<										
	Methylene Chloride	µg/L	<	0.5									
	1,1,2,2-Tetrachloroethane	µg/L	<	0.5									
	Tetrachloroethylene	µg/L	<	0.5									
	Toluene	µg/L		0.7									
	1,2-trans-Dichloroethylene	µg/L	<										
	1,1,1-Trichloroethane	µg/L	<	0.5									
	1,1,2-Trichloroethane	µg/L	<	0.5									
	Trichloroethylene	µg/L	<	0.5									
	Vinyl Chloride	µg/L	<	0.5									
Group 4	2-Chlorophenol	µg/L	<	1									
	2,4-Dichlorophenol	µg/L	<	1									
	2,4-Dimethylphenol	µg/L	<	1									
	4,6-Dinitro-o-Cresol	µg/L	<										
	2,4-Dinitrophenol	µg/L	<	3									
	2-Nitrophenol	µg/L	<	1									
	4-Nitrophenol	µg/L	<	1									
	p-Chloro-m-Cresol	µg/L	<										
	Pentachlorophenol	µg/L	<	1									
	Phenol	µg/L	<	5									
	2,4,6-Trichlorophenol	µg/L	<	1									
Group 5	Acenaphthene	µg/L	<	1									
	Acenaphthylene	µg/L	<	1									
	Anthracene	µg/L	<	1									
	Benzidine	µg/L	<	5									
	Benzo(a)Anthracene	µg/L	<	1									
	Benzo(a)Pyrene	µg/L	<	1									
	3,4-Benzofluoranthene	µg/L	<	1									
	Benzo(ghi)Perylene	µg/L	<	1									
	Benzo(k)Fluoranthene	µg/L	<	1									
	Bis(2-Chloroethoxy)Methane	µg/L	<	1									
	Bis(2-Chloroethyl)Ether	µg/L	<	1									
	Bis(2-Chloroisopropyl)Ether	µg/L	<	1									
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	3									
	4-Bromophenyl Phenyl Ether	µg/L	<	1									
	Butyl Benzyl Phthalate	µg/L	<	1									
	2-Chloronaphthalene	µg/L	<	1									
	4-Chlorophenyl Phenyl Ether	µg/L	<	1									
	Chrysene	µg/L	<	1									
	Dibenzo(a,h)Anthrancene	µg/L	<	1									
	1,2-Dichlorobenzene	µg/L	<	0.5									
	1,3-Dichlorobenzene	µg/L	<	0.5									
	1,4-Dichlorobenzene	µg/L	<	0.5									
	3,3-Dichlorobenzidine	µg/L	<	0.3									
	Diethyl Phthalate	µg/L	<	1									
	Dimethyl Phthalate	µg/L	<	1									
	Di-n-Butyl Phthalate	µg/L	<	3									
	2,4-Dinitrotoluene	µg/L	<	3									

Permit No. PA0021857

	2,6-Dinitrotoluene	µg/L	<	1									
	Di-n-Octyl Phthalate	µg/L	<	3									
	1,2-Diphenylhydrazine	µg/L	<	1									
	Fluoranthene	µg/L	<	1									
	Fluorene	µg/L	<	1									
	Hexachlorobenzene	µg/L	<	1									
	Hexachlorobutadiene	µg/L	<	0.09									
	Hexachlorocyclopentadiene	µg/L	<	1									
	Hexachloroethane	µg/L	<	0.07									
	Indeno(1,2,3-cd)Pyrene	µg/L	<	1									
	Isophorone	µg/L	<	1									
	Naphthalene	µg/L	<	0.07									
	Nitrobenzene	µg/L	<	1									
	n-Nitrosodimethylamine	µg/L	<	1									
	n-Nitrosodi-n-Propylamine	µg/L	<	1									
	n-Nitrosodiphenylamine	µg/L	<	1									
	Phenanthrene	µg/L	<	1									
	Pyrene	µg/L	<	1									
	1,2,4-Trichlorobenzene	µg/L	<	0.1									
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											
	Copper Souderton WWTP	µg/L		36.075			0.611						

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Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Borough of Souderton WWTP, NPDES Permit No. PA0021857, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: _____ No. Reaches to Model: 1

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

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi^2)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	001024	13.88	265.75	2.91			Yes
End of Reach 1	001024	13.18	237.18	4.57			Yes

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

Location	RMI	LFY (cfs/mi^2)*	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	13.88	0.1										209	7		
End of Reach 1	13.18	0.1										209	7		

Q_h

Location	RMI	LFY (cfs/mi^2)	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	13.88														
End of Reach 1	13.18														

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Borough of Souderton WWTP, NPDES Permit No. PA0021857, Outfall 001

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

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 0.068 PMF: 1 Analysis Hardness (mg/l): 167.87 Analysis pH: 7.18

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 Aluminum	0	0		0	750	750	821	
Total Antimony	0	0		0	1,100	1,100	1,203	
Total Arsenic	0	0		0	340	340	372	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	22,975	
Total Boron	0	0		0	8,100	8,100	8,862	
Total Cadmium	0	0		0	3.331	3.61	3.95	Chem Translator of 0.922 applied
Hexavalent Chromium	0	0		0	16	16.3	17.8	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	104	
Free Cyanide	0	0		0	22	22.0	24.1	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	112.984	158	173	Chem Translator of 0.716 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	1.8	Chem Translator of 0.85 applied
Total Nickel	0	0		0	725.753	727	796	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	7.841	9.22	10.1	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	71.1	
Total Zinc	0	0		0	181.749	186	203	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	3.28	
Acrylonitrile	0	0		0	650	650	711	
Benzene	0	0		0	640	640	700	

Bromoform	0	0		0	1,800	1,800	1,969	
Carbon Tetrachloride	0	0		0	2,800	2,800	3,063	
Chlorobenzene	0	0		0	1,200	1,200	1,313	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	19,693	
Chloroform	0	0		0	1,900	1,900	2,079	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	16,411	
1,1-Dichloroethylene	0	0		0	7,500	7,500	8,205	
1,2-Dichloropropane	0	0		0	11,000	11,000	12,035	
1,3-Dichloropropylene	0	0		0	310	310	339	
Ethylbenzene	0	0		0	2,900	2,900	3,173	
Methylene Chloride	0	0		0	12,000	12,000	13,129	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	1,094	
Tetrachloroethylene	0	0		0	700	700	766	
Toluene	0	0		0	1,700	1,700	1,860	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	3,282	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	3,720	
Trichloroethylene	0	0		0	2,300	2,300	2,516	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	613	
2,4-Dichlorophenol	0	0		0	1,700	1,700	1,860	
2,4-Dimethylphenol	0	0		0	660	660	722	
2,4-Dinitrophenol	0	0		0	660	660	722	
2-Nitrophenol	0	0		0	8,000	8,000	8,752	
4-Nitrophenol	0	0		0	2,300	2,300	2,516	
Pentachlorophenol	0	0		0	10.439	10.4	11.4	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	503	
Acenaphthene	0	0		0	83	83.0	90.8	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	328	
Benzo(a)Anthracene	0	0		0	0.5	0.5	0.55	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	30,000	30,000	32,822	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	4,923	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	295	
Butyl Benzyl Phthalate	0	0		0	140	140	153	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	820	820	897	
1,3-Dichlorobenzene	0	0		0	350	350	383	
1,4-Dichlorobenzene	0	0		0	730	730	799	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	

Diethyl Phthalate	0	0		0	4,000	4,000	4,376	
Dimethyl Phthalate	0	0		0	2,500	2,500	2,735	
Di-n-Butyl Phthalate	0	0		0	110	110	120	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	1,750	
2,6-Dinitrotoluene	0	0		0	990	990	1,083	
1,2-Diphenylhydrazine	0	0		0	15	15.0	16.4	
Fluoranthene	0	0		0	200	200	219	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	10	10.0	10.9	
Hexachlorocyclopentadiene	0	0		0	5	5.0	5.47	
Hexachloroethane	0	0		0	60	60.0	65.6	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	10,941	
Naphthalene	0	0		0	140	140	153	
Nitrobenzene	0	0		0	4,000	4,000	4,376	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	18,599	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	328	
Phenanthrene	0	0		0	5	5.0	5.47	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	142	
Copper Souderton WWTP	0	0		0	48	48.0	52.5	

☑ *CFC* CCT (min): 0.068 PMF: 1 Analysis Hardness (mg/l): 167.87 Analysis pH: 7.18

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 Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	241	
Total Arsenic	0	0		0	150	150	164	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	4,486	
Total Boron	0	0		0	1,600	1,600	1,750	
Total Cadmium	0	0		0	0.352	0.4	0.43	Chem Translator of 0.887 applied
Hexavalent Chromium	0	0		0	10	10.4	11.4	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	20.8	
Free Cyanide	0	0		0	5.2	5.2	5.69	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	1,641	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	4.402	6.15	6.73	Chem Translator of 0.716 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	0.99	Chem Translator of 0.85 applied
Total Nickel	0	0		0	80.609	80.9	88.5	Chem Translator of 0.997 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	

Total Selenium	0	0		0	4.600	4.99	5.46	Chem Translator of 0.922 applied
Total Silver	0	0		0	N/A	N/A	N/A	Chem Translator of 1 applied
Total Thallium	0	0		0	13	13.0	14.2	
Total Zinc	0	0		0	183.236	186	203	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	3.28	
Acrylonitrile	0	0		0	130	130	142	
Benzene	0	0		0	130	130	142	
Bromoform	0	0		0	370	370	405	
Carbon Tetrachloride	0	0		0	560	560	613	
Chlorobenzene	0	0		0	240	240	263	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	3,829	
Chloroform	0	0		0	390	390	427	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	3,392	
1,1-Dichloroethylene	0	0		0	1,500	1,500	1,641	
1,2-Dichloropropane	0	0		0	2,200	2,200	2,407	
1,3-Dichloropropylene	0	0		0	61	61.0	66.7	
Ethylbenzene	0	0		0	580	580	635	
Methylene Chloride	0	0		0	2,400	2,400	2,626	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	230	
Tetrachloroethylene	0	0		0	140	140	153	
Toluene	0	0		0	330	330	361	
1,1,1-Trichloroethane	0	0		0	610	610	667	
1,1,2-Trichloroethane	0	0		0	680	680	744	
Trichloroethylene	0	0		0	450	450	492	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	120	
2,4-Dichlorophenol	0	0		0	340	340	372	
2,4-Dimethylphenol	0	0		0	130	130	142	
2,4-Dinitrophenol	0	0		0	130	130	142	
2-Nitrophenol	0	0		0	1,600	1,600	1,750	
4-Nitrophenol	0	0		0	470	470	514	
Pentachlorophenol	0	0		0	8.009	8.01	8.76	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	99.6	
Acenaphthene	0	0		0	17	17.0	18.6	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	64.5	
Benzo(a)Anthracene	0	0		0	0.1	0.1	0.11	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	6,000	6,000	6,564	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	

Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	996	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	59.1	
Butyl Benzyl Phthalate	0	0		0	35	35.0	38.3	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	160	160	175	
1,3-Dichlorobenzene	0	0		0	69	69.0	75.5	
1,4-Dichlorobenzene	0	0		0	150	150	164	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	875	
Dimethyl Phthalate	0	0		0	500	500	547	
Di-n-Butyl Phthalate	0	0		0	21	21.0	23.0	
2,4-Dinitrotoluene	0	0		0	320	320	350	
2,6-Dinitrotoluene	0	0		0	200	200	219	
1,2-Diphenylhydrazine	0	0		0	3	3.0	3.28	
Fluoranthene	0	0		0	40	40.0	43.8	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	2	2.0	2.19	
Hexachlorocyclopentadiene	0	0		0	1	1.0	1.09	
Hexachloroethane	0	0		0	12	12.0	13.1	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	2,298	
Naphthalene	0	0		0	43	43.0	47.0	
Nitrobenzene	0	0		0	810	810	886	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	3,720	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	64.5	
Phenanthrene	0	0		0	1	1.0	1.09	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	28.4	
Copper Souderton WWTP	0	0		0	31	31.0	33.9	

☑ ***THH*** CCT (min): 0.068 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 Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	6.13	
Total Arsenic	0	0		0	10	10.0	10.9	
Total Barium	0	0		0	2,400	2,400	2,626	

Total Boron	0	0		0	3,100	3,100	3,392	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Free Cyanide	0	0		0	4	4.0	4.38	
Dissolved Iron	0	0		0	300	300	328	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	1,000	1,000	1,094	
Total Mercury	0	0		0	0.050	0.05	0.055	
Total Nickel	0	0		0	610	610	667	
Total Phenols (Phenolics) (PWS)	0	0		0	5	5.0	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	0.24	0.24	0.26	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	3.28	
Acrylonitrile	0	0		0	N/A	N/A	N/A	
Benzene	0	0		0	N/A	N/A	N/A	
Bromoform	0	0		0	N/A	N/A	N/A	
Carbon Tetrachloride	0	0		0	N/A	N/A	N/A	
Chlorobenzene	0	0		0	100	100.0	109	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	6.24	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	N/A	N/A	N/A	
1,1-Dichloroethylene	0	0		0	33	33.0	36.1	
1,2-Dichloropropane	0	0		0	N/A	N/A	N/A	
1,3-Dichloropropylene	0	0		0	N/A	N/A	N/A	
Ethylbenzene	0	0		0	68	68.0	74.4	
Methylene Chloride	0	0		0	N/A	N/A	N/A	
1,1,2,2-Tetrachloroethane	0	0		0	N/A	N/A	N/A	
Tetrachloroethylene	0	0		0	N/A	N/A	N/A	
Toluene	0	0		0	57	57.0	62.4	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	10,941	
1,1,2-Trichloroethane	0	0		0	N/A	N/A	N/A	
Trichloroethylene	0	0		0	N/A	N/A	N/A	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	30	30.0	32.8	
2,4-Dichlorophenol	0	0		0	10	10.0	10.9	
2,4-Dimethylphenol	0	0		0	100	100.0	109	
2,4-Dinitrophenol	0	0		0	10	10.0	10.9	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	

Pentachlorophenol	0	0		0	N/A	N/A	N/A	
Phenol	0	0		0	4,000	4,000	4,376	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	76.6	
Anthracene	0	0		0	300	300	328	
Benzidine	0	0		0	N/A	N/A	N/A	
Benzo(a)Anthracene	0	0		0	N/A	N/A	N/A	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroisopropyl)Ether	0	0		0	200	200	219	
Bis(2-Ethylhexyl)Phthalate	0	0		0	N/A	N/A	N/A	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	0.1	0.1	0.11	
2-Chloronaphthalene	0	0		0	800	800	875	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	1,000	1,000	1,094	
1,3-Dichlorobenzene	0	0		0	7	7.0	7.66	
1,4-Dichlorobenzene	0	0		0	300	300	328	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	656	
Dimethyl Phthalate	0	0		0	2,000	2,000	2,188	
Di-n-Butyl Phthalate	0	0		0	20	20.0	21.9	
2,4-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
2,6-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
1,2-Diphenylhydrazine	0	0		0	N/A	N/A	N/A	
Fluoranthene	0	0		0	20	20.0	21.9	
Fluorene	0	0		0	50	50.0	54.7	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	N/A	N/A	N/A	
Hexachlorocyclopentadiene	0	0		0	4	4.0	4.38	
Hexachloroethane	0	0		0	N/A	N/A	N/A	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	34	34.0	37.2	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	10.9	
n-Nitrosodimethylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	N/A	N/A	N/A	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	20	20.0	21.9	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	0.077	
Copper Souderton WWTP	0	0		0	N/A	N/A	N/A	

☑ CRL CCT (min): 1.331 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 Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	N/A	N/A	N/A	
Total Arsenic	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	N/A	N/A	N/A	
Total Boron	0	0		0	N/A	N/A	N/A	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Free Cyanide	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	0.06	0.06	0.11	
Benzene	0	0		0	0.58	0.58	1.05	
Bromoform	0	0		0	7	7.0	12.7	
Carbon Tetrachloride	0	0		0	0.4	0.4	0.73	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	0.8	0.8	1.45	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	N/A	N/A	N/A	
Dichlorobromomethane	0	0		0	0.95	0.95	1.73	
1,2-Dichloroethane	0	0		0	9.9	9.9	18.0	
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	0.9	0.9	1.63	
1,3-Dichloropropylene	0	0		0	0.27	0.27	0.49	
Ethylbenzene	0	0		0	N/A	N/A	N/A	
Methylene Chloride	0	0		0	20	20.0	36.3	
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	0.36	

Tetrachloroethylene	0	0		0	10	10.0	18.2	
Toluene	0	0		0	N/A	N/A	N/A	
1,1,1-Trichloroethane	0	0		0	N/A	N/A	N/A	
1,1,2-Trichloroethane	0	0		0	0.55	0.55	1.	
Trichloroethylene	0	0		0	0.6	0.6	1.09	
Vinyl Chloride	0	0		0	0.02	0.02	0.036	
2-Chlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dichlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dimethylphenol	0	0		0	N/A	N/A	N/A	
2,4-Dinitrophenol	0	0		0	N/A	N/A	N/A	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	0.030	0.03	0.054	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	2.72	
Acenaphthene	0	0		0	N/A	N/A	N/A	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	0.0001	0.0001	0.0002	
Benzo(a)Anthracene	0	0		0	0.001	0.001	0.002	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.0002	
3,4-Benzofluoranthene	0	0		0	0.001	0.001	0.002	
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	0.018	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	0.054	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	0.58	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	N/A	N/A	N/A	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	0.12	0.12	0.22	
Dibenzo(a,h)Anthrancene	0	0		0	0.0001	0.0001	0.0002	
1,2-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,3-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,4-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
3,3-Dichlorobenzidine	0	0		0	0.05	0.05	0.091	
Diethyl Phthalate	0	0		0	N/A	N/A	N/A	
Dimethyl Phthalate	0	0		0	N/A	N/A	N/A	
Di-n-Butyl Phthalate	0	0		0	N/A	N/A	N/A	
2,4-Dinitrotoluene	0	0		0	0.05	0.05	0.091	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	0.091	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	0.054	
Fluoranthene	0	0		0	N/A	N/A	N/A	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	0.00008	0.00008	0.0001	
Hexachlorobutadiene	0	0		0	0.01	0.01	0.018	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	

Hexachloroethane	0	0		0	0.1	0.1	0.18	
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	0.002	
Isophorone	0	0		0	N/A	N/A	N/A	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	N/A	N/A	N/A	
n-Nitrosodimethylamine	0	0		0	0.0007	0.0007	0.001	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	0.009	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	5.99	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	N/A	N/A	N/A	
Copper Souderton WWTP	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 Aluminum	Report	Report	Report	Report	Report	µg/L	750	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Arsenic	Report	Report	Report	Report	Report	µg/L	10.9	THH	Discharge Conc > 10% WQBEL (no RP)
Total Boron	Report	Report	Report	Report	Report	µg/L	1,750	CFC	Discharge Conc > 10% WQBEL (no RP)
Free Cyanide	0.073	0.11	4.38	6.83	10.9	µg/L	4.38	THH	Discharge Conc ≥ 50% WQBEL (RP)
Dissolved Iron	Report	Report	Report	Report	Report	µg/L	328	THH	Discharge Conc > 10% WQBEL (no RP)
Total Iron	27.4	42.7	1,641	2,560	4,103	µg/L	1,641	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Thallium	0.004	0.007	0.26	0.41	0.66	µg/L	0.26	THH	Discharge Conc ≥ 50% WQBEL (RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	186	AFC	Discharge Conc > 10% WQBEL (no RP)
Chlorodibromomethane	0.024	0.038	1.45	2.27	3.63	µg/L	1.45	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Chloroform	0.1	0.16	6.24	9.73	15.6	µg/L	6.24	THH	Discharge Conc ≥ 50% WQBEL (RP)
Dichlorobromomethane	0.029	0.045	1.73	2.69	4.31	µg/L	1.73	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Copper Souderton WWTP	0.57	0.93	33.9	56.0	84.8	µg/L	33.9	CFC	Discharge Conc ≥ 50% WQBEL (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
Total Antimony	6.13	µg/L	Discharge Conc ≤ 10% WQBEL

Total Barium	2,626	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Cadmium	N/A	N/A	Discharge Conc < TQL
Hexavalent Chromium	11.4	µg/L	Discharge Conc < TQL
Total Cobalt	20.8	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS
Total Lead	6.73	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	1,094	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	0.055	µg/L	Discharge Conc < TQL
Total Nickel	88.5	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	Discharge Conc < TQL
Total Selenium	5.46	µg/L	Discharge Conc < TQL
Total Silver	9.22	µg/L	Discharge Conc < TQL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	3.0	µg/L	Discharge Conc < TQL
Acrylonitrile	0.11	µg/L	Discharge Conc < TQL
Benzene	1.05	µg/L	Discharge Conc < TQL
Bromoform	12.7	µg/L	Discharge Conc < TQL
Carbon Tetrachloride	0.73	µg/L	Discharge Conc < TQL
Chlorobenzene	109	µg/L	Discharge Conc ≤ 25% WQBEL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	3,829	µg/L	Discharge Conc < TQL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	18.0	µg/L	Discharge Conc < TQL
1,1-Dichloroethylene	36.1	µg/L	Discharge Conc < TQL
1,2-Dichloropropane	1.63	µg/L	Discharge Conc < TQL
1,3-Dichloropropylene	0.49	µg/L	Discharge Conc < TQL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	74.4	µg/L	Discharge Conc ≤ 25% WQBEL
Methylene Chloride	36.3	µg/L	Discharge Conc < TQL
1,1,2,2-Tetrachloroethane	0.36	µg/L	Discharge Conc < TQL
Tetrachloroethylene	18.2	µg/L	Discharge Conc < TQL
Toluene	62.4	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,1-Trichloroethane	667	µg/L	Discharge Conc < TQL
1,1,2-Trichloroethane	1.	µg/L	Discharge Conc < TQL
Trichloroethylene	1.09	µg/L	Discharge Conc < TQL
Vinyl Chloride	0.036	µg/L	Discharge Conc < TQL
2-Chlorophenol	32.8	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	10.9	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	109	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	10.9	µg/L	Discharge Conc < TQL
2-Nitrophenol	1,750	µg/L	Discharge Conc < TQL
4-Nitrophenol	514	µg/L	Discharge Conc < TQL
Pentachlorophenol	0.054	µg/L	Discharge Conc < TQL
Phenol	4,376	µg/L	Discharge Conc < TQL

2,4,6-Trichlorophenol	2.72	µg/L	Discharge Conc < TQL
Acenaphthene	18.6	µg/L	Discharge Conc < TQL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	328	µg/L	Discharge Conc < TQL
Benzidine	0.0002	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	0.002	µg/L	Discharge Conc < TQL
Benzo(a)Pyrene	0.0002	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	0.002	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Benzo(k)Fluoranthene	0.018	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	0.054	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	219	µg/L	Discharge Conc < TQL
Bis(2-Ethylhexyl)Phthalate	0.58	µg/L	Discharge Conc < TQL
4-Bromophenyl Phenyl Ether	59.1	µg/L	Discharge Conc < TQL
Butyl Benzyl Phthalate	0.11	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	875	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	0.22	µg/L	Discharge Conc < TQL
Dibenzo(a,h)Anthrancene	0.0002	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	175	µg/L	Discharge Conc < TQL
1,3-Dichlorobenzene	7.66	µg/L	Discharge Conc < TQL
1,4-Dichlorobenzene	164	µg/L	Discharge Conc < TQL
3,3-Dichlorobenzidine	0.091	µg/L	Discharge Conc < TQL
Diethyl Phthalate	656	µg/L	Discharge Conc < TQL
Dimethyl Phthalate	547	µg/L	Discharge Conc < TQL
Di-n-Butyl Phthalate	21.9	µg/L	Discharge Conc < TQL
2,4-Dinitrotoluene	0.091	µg/L	Discharge Conc < TQL
2,6-Dinitrotoluene	0.091	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	0.054	µg/L	Discharge Conc < TQL
Fluoranthene	21.9	µg/L	Discharge Conc < TQL
Fluorene	54.7	µg/L	Discharge Conc < TQL
Hexachlorobenzene	0.0001	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	0.018	µg/L	Discharge Conc < TQL
Hexachlorocyclopentadiene	1.09	µg/L	Discharge Conc < TQL
Hexachloroethane	0.18	µg/L	Discharge Conc < TQL
Indeno(1,2,3-cd)Pyrene	0.002	µg/L	Discharge Conc < TQL
Isophorone	37.2	µg/L	Discharge Conc < TQL
Naphthalene	47.0	µg/L	Discharge Conc < TQL
Nitrobenzene	10.9	µg/L	Discharge Conc < TQL
n-Nitrosodimethylamine	0.001	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	0.009	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	5.99	µg/L	Discharge Conc < TQL
Phenanthrene	1.09	µg/L	Discharge Conc < TQL

Pyrene	21.9	µg/L	Discharge Conc < TQL
1,2,4-Trichlorobenzene	0.077	µg/L	Discharge Conc < TQL

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Survival
TIWC (decimal)	0.978
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name: Souderton WWTP

Permit No.: PA0021857

Replicate No.	Test Completion Date 4/30/2019 Control	TIWC
1	10	10
2	10	10
3	10	10
4	10	9
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	10.000	9.750
Std Dev.	0.000	0.500
# Replicates	4	4
T-Test Result	7.6643	
Deg. of Freedom	3	
Critical T Value	0.7649	
Pass or Fail	**PASS**	

Replicate No.	Test Completion Date 5/26/2020 Control	TIWC
1	10	9
2	9	9
3	10	9
4	10	10
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	9.750	9.250
Std Dev.	0.500	0.500
# Replicates	4	4
T-Test Result	5.1314	
Deg. of Freedom	5	
Critical T Value	0.7267	
Pass or Fail	**PASS**	

Replicate No.	Test Completion Date 5/11/2021 Control	TIWC
1	10	9
2	9	10
3	10	10
4	10	10
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	9.750	9.750
Std Dev.	0.500	0.500
# Replicates	4	4
T-Test Result	6.7314	
Deg. of Freedom	5	
Critical T Value	0.7267	
Pass or Fail	**PASS**	

Replicate No.	Test Completion Date 5/24/2022 Control	TIWC
1	9	10
2	10	9
3	10	10
4	10	10
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	9.750	9.750
Std Dev.	0.500	0.500
# Replicates	4	4
T-Test Result	6.7314	
Deg. of Freedom	5	
Critical T Value	0.7267	
Pass or Fail	**PASS**	

Permit No. PA0021857

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Growth
TIWC (decimal)	0.978
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name: Souderton WWTP

Permit No.: PA0021857

Replicate No.	Test Completion Date: 4/30/2019 Control	TIWC
1	0.33	0.389
2	0.338	0.399
3	0.463	0.495
4	0.41	0.428
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.385	0.428
Std Dev.	0.063	0.048
# Replicates	4	4
T-Test Result	4.1281	
Deg. of Freedom	5	
Critical T Value	0.7267	
Pass or Fail	PASS	

Replicate No.	Test Completion Date: 5/26/2020 Control	TIWC
1	0.404	0.437
2	0.403	0.476
3	0.471	0.487
4	0.431	0.54
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.427	0.485
Std Dev.	0.032	0.042
# Replicates	4	4
T-Test Result	6.7495	
Deg. of Freedom	5	
Critical T Value	0.7267	
Pass or Fail	PASS	

Replicate No.	Test Completion Date: 5/11/2021 Control	TIWC
1	0.39	0.368
2	0.39	0.437
3	0.375	0.408
4	0.378	0.369
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.383	0.396
Std Dev.	0.008	0.033
# Replicates	4	4
T-Test Result	6.3805	
Deg. of Freedom	3	
Critical T Value	0.7649	
Pass or Fail	PASS	

Replicate No.	Test Completion Date: 5/24/2022 Control	TIWC
1	0.279	0.339
2	0.356	0.347
3	0.358	0.376
4	0.37	0.378
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.341	0.360
Std Dev.	0.042	0.020
# Replicates	4	4
T-Test Result	5.6403	
Deg. of Freedom	5	
Critical T Value	0.7267	
Pass or Fail	PASS	

Permit No. PA0021857

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Survival
TIWC (decimal)	0.978
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name: Souderton WWTP

Permit No.: PA0021857

Test Completion Date: 4/30/2019

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	10	10

T-Test Result
Deg. of Freedom
Critical T Value
Pass or Fail: **PASS**

Test Completion Date: 5/26/2020

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	10	10

T-Test Result
Deg. of Freedom
Critical T Value
Pass or Fail: **PASS**

Test Completion Date: 5/11/2021

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	10	10

T-Test Result
Deg. of Freedom
Critical T Value
Pass or Fail: **PASS**

Test Completion Date: 5/23/2022

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	0
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	1.000	0.900
Std Dev.	0.000	0.316
# Replicates	10	10

T-Test Result
Deg. of Freedom
Critical T Value
Pass or Fail: **PASS**

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DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Reproduction
TIWC (decimal)	0.978
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name: Souderton WWTP

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Replicate No.	Test Completion Date 4/30/2019 Control	TIWC
1	34	30
2	29	34
3	30	29
4	29	30
5	29	33
6	16	31
7	22	26
8	14	30
9	25	33
10	28	30
11		
12		
13		
14		
15		
Mean	25.600	30.600
Std Dev.	6.415	2.319
# Replicates	10	10
T-Test Result	6.7495	
Deg. of Freedom	17	
Critical T Value	0.8633	
Pass or Fail	PASS	

Replicate No.	Test Completion Date 5/26/2020 Control	TIWC
1	34	12
2	14	22
3	24	22
4	8	24
5	31	18
6	30	26
7	30	32
8	32	22
9	18	28
10	26	24
11		
12		
13		
14		
15		
Mean	24.700	23.000
Std Dev.	8.667	5.437
# Replicates	10	10
T-Test Result	1.6699	
Deg. of Freedom	17	
Critical T Value	0.8633	
Pass or Fail	PASS	

Replicate No.	Test Completion Date 5/11/2021 Control	TIWC
1	23	35
2	28	22
3	29	35
4	27	37
5	24	36
6	22	34
7	32	20
8	25	35
9	22	38
10	27	40
11		
12		
13		
14		
15		
Mean	25.900	33.200
Std Dev.	3.281	6.680
# Replicates	10	10
T-Test Result	6.1190	
Deg. of Freedom	13	
Critical T Value	0.8702	
Pass or Fail	PASS	

Replicate No.	Test Completion Date 5/23/2022 Control	TIWC
1	36	43
2	33	41
3	39	0
4	37	41
5	32	37
6	37	39
7	38	37
8	37	35
9	29	35
10	16	37
11		
12		
13		
14		
15		
Mean	33.400	34.500
Std Dev.	6.851	12.412
# Replicates	10	10
T-Test Result	2.2246	
Deg. of Freedom	14	
Critical T Value	0.8681	
Pass or Fail	PASS	

Permit No. PA0021857

WET Summary and Evaluation

Facility Name	Souderton WWTP
Permit No.	PA0021857
Design Flow (MGD)	2
Q_{7-10} Flow (cfs)	0.0829
PMF_a	1
PMF_c	1

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	4/30/19	5/26/20	5/11/21	5/24/22
Pimephales	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	4/30/19	5/26/20	5/11/21	5/24/22
Pimephales	Growth	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	4/30/19	5/26/20	5/11/21	5/23/22
Ceriodaphnia	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	4/30/19	5/26/20	5/11/21	5/23/22
Ceriodaphnia	Reproduction	PASS	PASS	PASS	PASS

Reasonable Potential? NO

Permit Recommendations

Test Type	**Chronic**
TIWC	**97** % Effluent
Dilution Series	**24, 49, 73, 97, 100** % Effluent
Permit Limit	**None**
Permit Limit Species	