pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0043257**
Facility Type	**Municipal**	APS ID	**5349**
Major / Minor	**Major**	Authorization ID	**1311419**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**New Freedom Borough Authority**	Facility Name	**New Freedom Borough WWTP**
Applicant Address	49 E High Street	Facility Address	12 N Main Street
	New Freedom, PA 17349-9665		Railroad, PA 17355
Applicant Contact	John Smith	Facility Contact	John Smith
Applicant Phone	(717) 235-2337	Facility Phone	(717) 235-2337
Client ID	87475	Site ID	448222
Ch 94 Load Status	Not Overloaded	Municipality	New Freedom Borough
Connection Status	No Limitations	County	York
Date Application Received	April 7, 2020	EPA Waived?	No
Date Application Accepted	June 4, 2020	If No, Reason	Major Facility, Significant CB Discharge
Purpose of Application	NPDES Permit Renewal.		

Summary of Review

New Freedom Borough Authority (NFBA) has applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of its NPDES permit. The permit was last reissued on September 29, 2015 and became effective on October 1, 2015. The permit expired on September 30, 2020 but the terms and conditions of the permit have been administratively extended since that time. The permit was amended on October 22, 2015 to rephrase one of Part C conditions (pertaining to solids management).

Sludge use and disposal description and location(s): Sludges are treated onsite via aerobic diesters (3), gravity thickener and belt filter press (2) prior to being hauled off site for either landfill disposal (Modern Landfill) or land application under PAG083573.

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
X		*Jinsu Kim* Jinsu Kim / Environmental Engineering Specialist	December 11, 2021
x		*Maria D. Bebenek for* Daniel W. Martin, P.E. / Environmental Engineer Manager	December 14, 2021
x		*Maria D. Bebenek* Maria D. Bebenek, P.E. / Program Manager	December 14, 2021

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	2.25
Latitude	39° 45' 50"	Longitude	76° 42' 13"
Quad Name	Glen Rock	Quad Code	2032
Wastewater Description:	Sewage Effluent		
Receiving Waters	South Branch Codorus Creek	Stream Code	08093
NHD Com ID	57475055	RMI	19.94
Drainage Area	3.0 sq. mi.	Yield (cfs/mi^2)	
Q_{7-10} Flow (cfs)	0.498	Q_{7-10} Basis	StreamStats
Elevation (ft)	693	Slope (ft/ft)	
Watershed No.	7-H	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	NUTRIENTS		
Source(s) of Impairment	MUNICIPAL POINT SOURCE DISCHARGES		
TMDL Status	Final	Name	South Branch Codorus Creek
Nearest Downstream Public Water Supply Intake	York Water Company		
PWS Waters	South Branch Codorus Creek	Flow at Intake (cfs)	
PWS RMI	0.35	Distance from Outfall (mi)	19.59

Drainage Area
The discharge is to South Branch Codorus Creek at RM 19.94. A drainage area upstream of the point of discharge is estimated to be 3.0 sq.mi. according to USGS StreamStats available at https://streamstats.usgs.gov/ss/.

Streamflow
USGS StreamStats produced a Q7-10 flow 0.498 cfs at the point of discharge.

South Branch Codorus Creek
Under 25 Pa Code §93.9o, South Branch Codorus Creek from source to UNT from Glen Rock Valley to East Branch Codorus Creek is classified as warm water fishes and supports migratory fishes. No special protection water is impacted by this discharge. DEP's latest integrated water quality report finalized in 2020 indicates that South Branch Codorus Creek near the discharge point is impaired for nutrients as a result of municipal point source discharges. A Total Maximum Daily Load (TMDL) was developed on July 9, 2003 to address siltation and nutrient impairments within the South Branch Codorus Creek watershed. A phosphorus wasteload allocation (WLA) was assigned to this facility. More details of this TMDL WLA will be discussed later in this fact sheet.

Public Water Supply Intake
The fact sheet developed for the last permit renewal indicates that the nearest downstream public water supply intake is York Water Company, located on South Branch Codorus Creek, approximately 20 miles from the discharge. Given the distance, the discharge is not expected to impact the water supply.

Treatment Facility Summary				
Treatment Facility Name: New Freedom STP				
WQM Permit No.	**Issuance Date**			
6791408	Last issued on 10/28/2019			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Sequencing Batch Reactor	Sodium Hypochlorite	2.25
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
7.2	3850	Not Overloaded	Aerobic Digestion	Combination of methods

NFBA owns and operates a sanitary wastewater treatment facility located at 12 North Main Street Railroad PA 17355. The facility is designed for an annual average design flow of 2.25 MGD and hydraulic design capacity of 7.2 MGD with an organic design capacity of 3,850 lbs/day. The facility serves the areas of New Freedom Borough (47.22%), Shrewsbury Borough (51.95%) and Railroad Borough (0.83%). All sewers are 100% separated. The facility utilizes a Sequencing Batch Reactor (SBR) activated sludge treatment process consisting of screening, SBRs (3), Chlorination, and outfall to South Branch Codorus Creek.

Sludges are treated onsite via aerobic diesters (3), gravity thickener and belt filter press (2) prior to being hauled off site for either landfill disposal (Modern Landfill) or land application under PAG083573.

Ferric Chloride is added for phosphorous removal and Sodium Hypochlorite is used for disinfection. The application reported six (6) commercial and industrial users connected to the sewer system. These users are shown below:

Name	Description	Flow (GPD)	Significant Industrial User?	Categorical Industry?
Johnson Controls, Inc	Industrial air conditioning chiller	4,080	No	No
Crescent Industries, Inc	Plastic injection molding	1,227	No	No
J.J. Hartenstein Mortuary, Inc.	Funeral Home and Residence	120	No	No
Seiling and Jones, Inc.	Architectural plywood and laminate of veneer	764	No	No
Truck Specialties Inc	Truck repair shop	48	No	No
Shrewsbury Wash and Stor, Inc.	Car wash and mini storage	3,096	No	No

NFBA is currently not implementing an approved pretreatment program administered by US EPA.

NFBA currently utilizes another outfall (39° 45’ 47, -76° 42’ 0”) discharges stormwater drained from the site (79,337 sq.ft.).

Compliance History	
Summary of DMRs:	A summary of past 12-month DMR data is presented on the next page.
Summary of Inspections:	06/17/2021: Brandon Bettinger, DEP Water Quality Specialist, conducted a routine inspection. No violations were noted at the time of inspection. 12/23/2019: Austen Randecker, former DEP Water Quality Specialist, conducted a Chesapeake Bay administrative inspection. Other than some minor issues, no violations were noted at the time of inspection. 05/16/2019: Austen Randecker conducted a routine inspection. No issues were identified at the time of inspection. 04/26/2018: Sheena Ripple, former DEP Water Quality Specialist, conducted a routine inspection. No issues were identified at the time of inspection.
Other Comments:	There was one effluent violation reported since the last permit reissuance (i.e., fecal coliform 1300 v. 1000 CFU/100 mL August 2020). DEP's database revealed that there is no open violation associated with this facility or permittee.

Effluent Data

DMR Data for Outfall 001 (from August 1, 2020 to July 31, 2021)

Parameter	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20	AUG-20
Flow (MGD) Average Monthly	1.001	1.044	1.09	1.117	1.214	1.063	1.034	1.028	0.921	0.899	0.897	1.002
Flow (MGD) Daily Maximum	1.172	1.177	1.225	1.272	1.712	2.046	1.353	2.228	1.262	1.101	0.967	1.505
pH (S.U.) Minimum	7.1	7.1	6.9	6.8	7.0	6.8	7.0	7.0	6.9	7.0	7.2	7.3
pH (S.U.) Maximum	7.6	7.5	7.5	7.4	7.5	7.4	7.5	7.5	7.5	7.4	7.5	7.5
DO (mg/L) Minimum	7.4	7.8	8.0	8.9	9.2	8.9	8.7	8.8	8.2	8.0	7.2	7.4
TRC (mg/L) Average Monthly	0.10	0.15	0.15	0.12	0.16	0.14	0.17	0.14	0.18	0.15	0.14	0.12
TRC (mg/L) Instantaneous Maximum	0.18	0.21	0.33	0.23	0.23	0.21	0.28	0.26	0.25	0.3	0.26	0.23
CBOD5 (lbs/day) Average Monthly	< 21	< 21	< 22	< 22	< 24	< 24	< 26	< 24	< 22	< 22	< 22	< 26
CBOD5 (lbs/day) Weekly Average	27	< 22	< 26	< 23	< 27	< 28	< 28	< 26	< 23	24	< 23	< 32
CBOD5 (mg/L) Average Monthly	< 3	< 2	< 2	< 2	< 2	< 3	< 3	< 3	< 3	< 3	< 3	< 3
CBOD5 (mg/L) Weekly Average	3	< 2	< 3	< 2	< 2	< 3	4	< 3	< 3	3	< 3	< 3
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	1584	1447	1579	1595	1509	1421	1403	1525	1480	1526	1413	1400
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	2536	2160	1959	1924	2165	1755	1609	2231	1946	2214	1770	2234
BOD5 (mg/L) Raw Sewage Influent Average Monthly	191	166	177	172	153	167	170	193	196	204	190	162
TSS (lbs/day) Average Monthly	36	32	26	24	26	26	25	35	45	34	38	49
TSS (lbs/day) Raw Sewage Influent Average Monthly	1818	1529	1754	1556	1319	1367	1481	1617	1712	1227	1600	1605

Parameter	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20	AUG-20
TSS (lbs/day) Raw Sewage Influent Daily Maximum	2129	2244	3361	1858	1793	1876	1931	2178	2224	1945	1808	2586
TSS (lbs/day) Weekly Average	46	45	38	36	34	41	31	48	55	50	47	95
TSS (mg/L) Average Monthly	4	4	3	3	3	3	3	4	6	5	5	5
TSS (mg/L) Raw Sewage Influent Average Monthly	219	175	196	168	134	162	178	205	227	164	215	185
TSS (mg/L) Weekly Average	6	5	4	4	3.5	5	4	7	8	7	7	9
Fecal Coliform (CFU/100 ml) Geometric Mean	30	19	11	31	9	12	15	> 39	45	47	20	142
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	125	99	23	1203	20	34	34	> 2420	108	225	40	1300
Nitrate-Nitrite (mg/L) Average Monthly	2.5	2.9	2.5	2.9	2.6	2.8	3.2	3.1	3.6	3.6	3.6	3.6
Nitrate-Nitrite (lbs) Total Monthly	634	754	700	813	806	637	813	762	808	829	800	952
Total Nitrogen (mg/L) Average Monthly	< 3.06	< 3.46	< 3.25	< 3.69	< 3.07	< 3.26	< 3.79	< 3.94	< 4.35	< 4.37	< 4.26	4.66
Total Nitrogen (lbs) Effluent Net Total Monthly	< 785	< 899	< 901	< 1021	< 952	< 757	< 983	< 963	< 971	< 1013	< 951	1253
Total Nitrogen (lbs) Total Monthly	< 785	< 899	< 901	< 1021	< 952	< 757	< 983	< 963	< 971	< 1013	< 951	1253
Total Nitrogen (lbs) Effluent Net Total Annual											< 10112	
Total Nitrogen (lbs) Total Annual											< 11812	
Ammonia (lbs/day) Average Monthly	< 0.8	< 0.9	< 0.9	< 0.9	< 1	< 0.8	< 0.8	< 0.8	< 0.7	< 0.7	< 0.7	< 0.9
Ammonia (mg/L) Average Monthly	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ammonia (lbs) Total Monthly	< 26	< 26	< 28	< 28	< 31	< 24	< 26	< 25	< 22	< 23	< 22	27
Ammonia (lbs) Total Annual											< 333	

Parameter	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20	AUG-20
TKN (mg/L) Average Monthly	< 0.59	< 0.56	< 0.72	< 0.76	< 0.51	< 0.51	0.64	< 0.82	< 0.74	< 0.8	< 0.67	1.09
TKN (lbs) Total Monthly	< 151	< 145	< 202	< 208	< 157	< 120	< 170	< 201	< 163	< 184	< 151	302
Total Phosphorus (lbs/day) Average Monthly	1.8	1.8	1.5	1.6	2.5	2.7	2.3	< 2.4	1.2	< 1.1	1.2	1.4
Total Phosphorus (mg/L) Average Monthly	0.2	0.2	0.2	0.2	0.3	0.3	0.3	< 0.3	0.2	< 0.1	0.2	0.2
Total Phosphorus (lbs) Effluent Net Total Monthly	48.2	54.1	47.6	48.6	77.8	76.7	71.8	< 73.8	36.6	< 33.5	36.7	42.7
Total Phosphorus (lbs) Total Monthly	48.2	54.1	47.6	48.6	77.8	76.7	71.8	< 73.8	36.6	< 33.5	36.7	42.7
Total Phosphorus (lbs) Effluent Net Total Annual											< 693	
Total Phosphorus (lbs) Total Annual											< 693	
Total Copper (mg/L) Average Monthly	< 0.005	0.007	0.005	0.011	< 0.005	0.010	0.008	0.006	0.007	< 0.005	< 0.005	0.011
Total Copper (mg/L) Weekly Average	< 0.005	0.007	0.005	0.011	< 0.005	0.013	0.008	0.006	0.007	< 0.005	< 0.005	0.011

Existing Effluent Limits and Monitoring Requirements

These tables below summarize effluent limits and monitoring requirements specified in the current permit:

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	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.20	XXX	0.66	1/day	Grab
BOD5 Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
CBOD5	469	751 Wkly Avg	XXX	25	40	50	2/week	24-Hr Composite
Total Suspended Solids	563	844 Wkly Avg	XXX	30	45	60	2/week	24-Hr Composite
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/week	Grab
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/week	Grab
Ammonia-Nitrogen May 1 - Oct 31	19	XXX	XXX	1.0	XXX	2.0	2/week	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	56	XXX	XXX	3.0	XXX	6.0	2/week	24-Hr Composite
Total Phosphorus	18.8	XXX	XXX	1.0	XXX	2.0	2/week	24-Hr Composite
Total Copper	XXX	XXX	XXX	0.012	0.024	0.030	1/month	24-Hr Composite

Existing Effluent Limits and Monitoring Requirements (continued)

Parameter [1]	Effluent Limitations					Monitoring Requirements	
	Mass Units (lbs)		Concentrations (mg/L)			Minimum [2] Measurement Frequency	Required Sample Type
	Monthly	Annual	Minimum	Monthly Average	Maximum		
Ammonia---N	Report	Report	XXX	Report	XXX	2/week	24-Hr Composite
Kjeldahl---N	Report	XXX	XXX	Report	XXX	2/week	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	2/week	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	2/week	24-Hr Composite
Net Total Nitrogen	Report	41,095	XXX	XXX	XXX	1/month	Calculation
Net Total Phosphorus	Report	5,479	XXX	XXX	XXX	1/month	Calculation

The permittee is authorized to use 1,700 lbs/year as Total Nitrogen (TN) Offsets toward compliance with the Annual Net TN mass load limitations (Cap Loads), in accordance with Part C of this permit. These Offsets may be applied throughout the Compliance Year or during the Truing Period. The application of offsets must be reported to DEP as described in Part C. The Offsets are authorized for the following pollutant load reduction activities:

Connection of 68 on-lot sewage disposal systems to the public sewer system after January 1, 2003, in which 25 lbs/year of TN offsets are granted per connection.

Development of Effluent Limitations and Monitoring Requirements

Outfall No.	001	**Design Flow (MGD)**	2.25
Latitude	39° 45' 50"	**Longitude**	76° 42' 13"
Wastewater Description:	Sewage		

Technology-Based Limitations

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

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	IMAX	-	92a.47(a)(4)
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geo Mean	-	92a.47(a)(5)
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	IMAX	-	92a.47(a)(5)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Water Quality-Based Limitations

CBOD5, NH3-N and Dissolved Oxygen (DO)
WQM 7.0 is a water quality model designed to assist DEP to determine appropriate permit requirements for CBOD5, NH3-N and DO. DEP's guidance no. 391-2000-007 provides the technical methods contained in WQM 7.0 for conducting wasteload allocation and for determining recommended NPDES effluent limits for point source discharges. DEP recently updated this model (ver. 1.1) to include the new ammonia criteria that has been approved by US EPA as part of the 2017 Triennial Review. A multiple discharge analysis is needed as there is another POTW discharge (Glen Rock STP PA0020818) located approximately 3 miles downstream from this discharge. The stream designation at Glen Rock STP discharge is however cold-water fishes; therefore, the model will be utilized to reflect this change in stream designation within the South Branch Codorus Creek watershed. The model output indicates that all existing effluent limits for these pollutants are still appropriate. No changes are therefore recommended.

Total Residual Chlorine (TRC)
Since chlorine gas is used for disinfection, TRC effluent levels must be regulated under 25 Pa Code §92a.48(b)(2). DEP's TRC_CALC worksheet has been utilized to develop appropriate permit requirements for TRC. A site-specific study was conducted in 1998 by NFBA. During the study, stream chlorine demand of 0.32 mg/L and discharge chlorine demand of 0.41 mg/L were obtained. DEP's SOP no. BCW-PMT-033 indicates that if site-specific TRC study data is more than 20 years old, the data is still to be used to develop limits for the renewal but the permit will also include a condition in Part C for the permittee to collect a new site-specific study and provide the results with the subsequent permit renewal application. The worksheet indicate that existing effluent limits are still protective of water quality. No changes are therefore recommended.

Toxic Pollutants
DEP utilizes a Toxics Management Spreadsheet to facilitate calculations necessary for completing a reasonable potential analysis and determining WQBELs for toxic pollutants. The worksheet combines the functionality of DEP's Toxics Screening Analysis worksheet and PENTOXSD. The worksheet output shows the existing WQBELs for Total Copper are still protective of water quality; therefore, no changes are recommended. The worksheet also recommends a routine monitoring requirement for Total Arsenic, Total Iron, Dissolved Iron, and Total Zinc. It is therefore recommended that the monitoring requirements for these pollutants be included in the draft permit.

The worksheet recommended WQBELs for Free Cyanide, Total Selenium and Dichlorobromomethane. Further sampling analysis conducted by NFBA showed that free cyanide and total Selenium are not pollutants of concern as these pollutants were not detected in all additional effluent samples. Therefore, the need of permit requirements for free cyanide, total selenium has been ruled out. For Dichlorobromomethane, ten (10) additional samples have been collected and the results of those samples still show effluent contains a detectable amount of this pollutant. Dichlorobromomethane is a chlorine by-product typically emanated from chlorine used for disinfection. It is recommended that these WQBELs be included in the draft permit in accordance with 40 CFR §122.44(d)(1)(i). Based on the sample results, the facility will be able to meet WQBELs recommended by the worksheet; therefore, these limits will be included in the draft permit without a compliance schedule.

Whole Effluent Toxicity Testing
NFBA is required under 40 CFR §122.21(h)(5)(ii)(A) to conduct WETT and submit the results to DEP. See WETT section of this fact sheet for more details on the results submitted by NFBA.

Best Professional Judgment (BPJ) Limitations

Dissolved Oxygen
The existing minimum DO effluent limit is the current warm water fishery water quality criterion for DO listed in 25 Pa Code §93.7(a). It is recommended that this limit be maintained in the permit to ensure the protection of water quality standards. This approach is consistent with DEP's current Standard Operating Procedure (SOP) no. BPNPSM-PMT-033 and has been applied to other point source dischargers throughout the state.

Total Phosphorus
The current permit includes an annual mass load effluent limit for Total Phosphorus required under the Chesapeake Bay TMDL Watershed Implementation Plan. In addition, the permit also includes average monthly/daily maximum mass load and concentration effluent limits for Total Phosphorus. These limits have been included in the permit consistently for the protection of the local watershed, South Branch Codorus Creek. The following is the rationale for imposing these limits explained in the last fact sheet:

The protection report approved on September 11, 2002 addressed the TMDL for South Branch Codorus Creek that was in the process of being written. Through meetings between DEP's regional office, central office, and Susquehanna River Basin Commission engineers and biologists during the summer of 2002, it was jointly decided that in the interests of TMDL development and implementation for the watershed that New Freedom's effluent limit would be reduced to 1.5 mg/L average monthly in the interim (a level that it could already meet at the time, without any modifications), and 1.0 mg/L average monthly as a final limit, a level that may require chemical addition or process modifications. It was also decided that for waste allocation purposes, New Freedom's mass limits and allocation in the TMDL would be based on 1.5 MGD, a level below the hydraulic design capacity but not expected to be exceeded within the next five years.

The October 29, 2002 permit included interim phosphorus limits of 2.0 mg/L (AML) and final phosphorus limits of 1.5 mg/L (AML). The final limitations were based on the values for New Freedom within a draft TMDL for South Branch Codorus Creek. New Freedom appealed the final phosphorus limits. During a February 5, 2003 meeting, the Department informed New Freedom that it had made an error in basing the final limitations on a basin-wide plan, when the limitations should be based on the localized impact observed downstream from the plant. The Department also indicated during the meeting that the NPDES permit mass loading limit should not exceed the TMDL waste load allocation, but can be more stringent than the allocation.

The Department's March 14, 2003 letter informed New Freedom that the amended permit "will include an interim monthly average total phosphorus concentration limitation of 2.0 mg/L, and a loading limitation based on New Freedom's Chapter 94 2007 flow projection. The interim total phosphorus limitation will be in effect until the Department completes its study (based on prevention of localized impacts). The amended permit will state that upon completion of the study, New Freedom's NPDES permit may be amended to include a new total phosphorus limitation based on the results of the study." The concentration limits in the (revoked) final permit amendment were 2.0 mg/L (AML) and 4.0 mg/L (IMAX), with a mass limit of 20.6 lbs/day based on a 2007 projected flow from the Chapter 94 report.

The Department visited the South Branch Codorus Creek during July 2003, with the intent to determine what effect nutrients may be having on dissolved oxygen levels in the stream. Department biologists felt that stream flows were sufficiently high that an impact would not likely be observed. Based on this evaluation, the biologists felt that imposing limitations on phosphorus less than technology-based standards would be unwarranted at this time. Therefore, the Department agreed

to provide New Freedom with a mass limitation of 37.5 lbs/day (2.0 mg/L x 2.25 MGD x 8.34). New Freedom has concurred with this proposal.

Following a October 28, 2003 meeting, regional office staff learned that the TMDL plan writers and administrators had submitted a final TMDL to EPA, and EPA had approved the TMDL in August 2003. However, the TMDL was not considered final due to the omission of public notification per Chapter 96.7(b). Therefore, the loading cap in the TMDL for phosphorus was not established in the permit at that time.

A letter from EPA Region III, dated February 10, 2004, instructed the Department to promptly publish a revised draft TMDL for South Branch Codorus Creek, following which EPA comments will be considered and the TMDL finalized. The Department was also instructed to issue the final New Freedom permit with a clause authorizing the Department to reopen the permit on the basis of a revised TMDL and with an expiration date of not later than November 1, 2007. However, the average monthly phosphorus limit of 2.0 mg/L is still in place. The TMDL dated July 9, 2003 is currently listed as approved by EPA. It allocates 6853.33 lbs/yr of phosphorus for New Freedom.

The average monthly concentration and average monthly mass limit to be placed in the permit can be calculated:

Average monthly concentration: 6,853.33 lbs/yr / (2.25 MGD x 8.34 x 365) = 1.0 mg/L

Average monthly mass limit: 1.0 mg/L x 2.25 MGD x 8.34 = 18.8 lbs/day

Based on the review, it appears these limits were based on the published wasteload allocation (WLA) developed for this facility as part of the South Branch Codorus Creek TMDL (see below for more detailed information about this TMDL) given that DEP as well as other agencies has previously concluded that effluent phosphorus levels from this facility need to be controlled and regulated to ensure the local water quality protection. The design flow of 2.25 MGD would require NFBA to meet the TMDL-derived concentration and mass limits of 1.0 mg/L and 18.8 lbs/day respectively as shown above. For this renewal, this approach seems appropriate and DEP finds no rationale to relax or remove these limits; therefore, these limits will remain unchanged in the permit in accordance with 40 CFR §122.44(l)(1).

Additional Considerations

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

Influent BOD & TSS Monitoring
As a result of negotiation with EPA, the existing influent monitoring reporting requirement for TSS and BOD5 will be maintained in the draft permit. This requirement has been consistently assigned to all municipal wastewater treatment facilities.

Total Dissolved Solids (TDS)
TDS and its associated solids including Bromide, Chloride, and Sulfate have become statewide pollutants of concern. The requirement to monitor these pollutants must be considered under the criteria specified in 25 Pa. Code § 95.10 and the following January 23, 2014 DEP Central Office Directive:

For point source discharges and upon issuance or reissuance of an individual NPDES permit:

-Where the concentration of TDS in the discharge exceeds 1,000 mg/L, or the net TDS load from a discharge exceeds 20,000 lbs/day, and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for TDS, sulfate, chloride, and bromide. Discharges of 0.1 MGD or less should monitor and report for TDS, sulfate, chloride, and bromide if the concentration of TDS in the discharge exceeds 5,000 mg/L.

- Where the concentration of bromide in a discharge exceeds 1 mg/L and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for bromide. Discharges of 0.1 MGD or less should monitor and report for bromide if the concentration of bromide in the discharge exceeds 10 mg/L.

-Where the concentration of 1,4-dioxane (CAS 123-91-1) in a discharge exceeds 10 µg/L and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for 1,4-dioxane. Discharges of 0.1 MGD or less should monitor and report for 1,4-dioxane if the concentration of 1,4-dioxane in the discharge exceeds 100 µg/L.

NFBA reported maximum concentrations of 368 mg/L for TDS, 0.11 mg/L for bromide, and < 0.05 mg/L for 1,4-dioxane. Accordingly, the requirement to monitor for these pollutants is not necessary.

Chesapeake Bay TMDL
In August 2019, DEP finalized Phase 3 Chesapeake Bay Watershed Implementation Plan to provide the plans in place by 2025 to further achieve the nutrient and sediment reduction targets that would ultimately meet U.S EPA's expectations for the Chesapeake Bay TMDL. The Chesapeake Bay TMDL identifies the necessary pollution reductions from major sources of nitrogen, phosphorus and sediment across the Bay jurisdictions and sets pollution limits necessary to meet water quality standards. The Phase 3 WIP is an update to the Pennsylvania's Chesapeake Bay TMDL Strategy (2004), the Chesapeake WIP Phase I (2011) and Phase 2 WIP (2012). The more details on the TMDL are available at www.dep.pa.gov.

As part of the Phase 3 WIP process, a Supplement to the Phase 3 WIP was developed, providing an update on TMDL implementation for point sources and a discussion of adjustments to the permitting strategy as a result of implementation experience. According to this document, NFBA WWTP is a Phase 3 significant discharger located within the Chesapeake Bay watershed. The following Cap Loads specified in the current Supplement to the Phase 3 WIP will be included in the draft permit:

NPDES Permit No.	Phase	Facility	Latest Permit Issuance Date	Permit Expiration Date	Cap Load Compliance Start Date	TN Cap Load (lbs/yr)	TN Offsets Included in Cap Load (lbs/yr)	TP Cap Load (lbs/yr)	TN Delivery Ratio	TP Delivery Ratio
PA0043257	3	New Freedom Borough	10/22/2015	9/30/2020	10/1/2012	41,095	-	5,479	0.961	0.436

These Cap Loads will continue to be included in the permit. NFBA is currently authorized to use 1,700 lbs/year as Total Nitrogen Offsets toward compliance with the above-referenced Total Nitrogen Cap Loads that were calculated based on the 25 lbs/year per on-lot sewage disposal systems (in EDUs) and the reported 68 on-lot sewage disposal systems that have been connected to the sewer system after January 1, 2003. These offsets will continue to be allowed and will be specified in the permit.

South Branch Codorus Creek TMDL
DEP finalized a TMDL in 2003 to address nutrient and sediment impairments identified within South Branch Codorus Creek watershed. As part of the TMDL implementation, a wasteload allocation (WLA) for Total Phosphorus was developed for two (2) point source discharges within this watershed; Glen Rock STP and New Freedom Borough WWTP. A WLA of 6,855.33 lbs/year was set and was based on the average monthly permitted flow of 1.237 MGD (presumably, that is the design flow at the time when the TMDL was developed).

Both South Branch Codorus Creek TMDL and Chesapeake Bay TMDL established annual mass load effluent limits of Total Phosphorus for this facility. As the Cap Load (5,479 lbs/yr.) from the Chesapeake Bay TMDL is more stringent than the WLA (6,855.33 lbs/yr.) from the South Branch Codorus Creek TMDL, the Cap Load will be included in the permit. The permittee will still be able to purchase credits for any phosphorus loading that is in excess of the Cap Load; but only up to the WLA. This approach has been implemented in the current permit under one of Part C conditions pertaining to Chesapeake Bay Nutrient Requirements as shown below:

New Freedom Borough Authority is included on the South Branch Codorus Creek TMDL, which has a load allocation of 6,853.33 lbs/year for the facility. As indicated in Part A.I.B., the Chesapeake Bay Watershed Implementation Plan is requiring a more stringent Cap Load of 5,479 lbs/year. Therefore, Credits may be purchased for any phosphorus loading that is in excess of the Bay Cap Load – but only up to the TMDL annual load of 6,853.33 lbs/year, which is not to be exceeded (i.e., credits may only be purchased for up to 1,374.33 lbs/year of phosphorus loading).

This condition will continue to be included in the permit under Part C condition for Chesapeake Bay TMDL.

E. Coli Monitoring
DEP's SOP No. BCW-PMT-033 recommends under 25 Pa Code §92a.61 a routine monitoring for E. Coli in all new and reissued permits. Since the facility has the design flow of 2.25 MGD, a monthly monitoring will be included in the permit.

Mass Loading Limitations
All effluent mass loading limits will be based on the formula: design flow x concentration limit x conversion factor of 8.34.

Stormwater Requirements
Stormwater discharges from any POTWs (SIC Code 4952) described in 40 CFR § 122.26(b)(14)(ix) require coverage under an NPDES permit. NFBA currently utilizes one outfall collecting stormwater drained from the property. DEP's standard Part C stormwater requirements and site-specific best management practices (BMPs) will be included in the permit as this is a standard approach for major sewage facilities over 1.0 MGD.

Class A Wild Trout Fishery
A Class A Wild Trout stream is not impacted by this discharge.

Anti-backsliding Requirements
Unless stated otherwise in this fact sheet, all permit requirements proposed in this fact sheet are at least as stringent as those specified in the existing permit.

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:

The dilution series used for the tests was: 100%, 93%, 86%, 43%, and 22%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 86%.

Summary of Four Most Recent Test Results

(NOTE – Enter results into one table, depending on which data analysis method was used).

NOEC/LC50 Data Analysis

Test Date	*Ceriodaphnia* Results (% Effluent)			*Pimephales* Results (% Effluent)			Pass? *
	NOEC Survival	NOEC Reproduction	LC50	NOEC Survival	NOEC Growth	LC50	
May 2021	100	100		100	100		Yes
April 2020	100	100		100	100		Yes
April 2019	100	100		100	100		Yes
April 2018	100	100		100	100		Yes

***** *A "passing" result is that which is greater than or equal to the TIWC 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: DEP's WET Analysis Spreadsheet is attached to this fact sheet.

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

Acute Partial Mix Factor (PMFa): **1.0** Chronic Partial Mix Factor (PMFc): **1.0**

1. Determine IWC – Acute (IWCa):

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

[(2.25 MGD x 1.547) / ((0.498 cfs x 1) + (2.25 MGD x 1.547))] x 100 = **87%**

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

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

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

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

[(2.25 MGD x 1.547) / ((0.498 cfs x 1) + (2.25 MGD x 1.547))] x 100 = **87%**

3. Determine Dilution Series

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

Dilution Series = 100%, 94%, 87%, 44%, and 22%.

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 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	Instant. Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.20	XXX	0.66	1/day	Grab
BOD5 Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
CBOD5	469	751 Wkly Avg	XXX	25	40 Wkly Avg	50	2/week	24-Hr Composite
Total Suspended Solids	563	844 Wkly Avg	XXX	30	45 Wkly Avg	60	2/week	24-Hr Composite
Fecal Coliform (no./100 mL) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/week	Grab
Fecal Coliform (no./100 mL) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/week	Grab
Ammonia-Nitrogen May 1 - Oct 31	19	XXX	XXX	1.0	XXX	2.0	2/week	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	56	XXX	XXX	3.0	XXX	6.0	2/week	24-Hr Composite
Total Phosphorus	18.8	XXX	XXX	1.0	XXX	2.0	2/week	24-Hr Composite
Total Copper	0.22	0.45	XXX	0.012	0.024	0.030	1/month	24-Hr Composite
Total Arsenic	Report	Report	XXX	Report	Report	XXX	1/month	24-Hr Composite

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Instant. Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Total Zinc	Report	Report	XXX	Report	Report	XXX	1/month	24-Hr Composite
Total Iron	Report	Report	XXX	Report	Report	XXX	1/month	24-Hr Composite
Dissolved Iron	Report	Report	XXX	Report	Report	XXX	1/month	24-Hr Composite
Dichlorobromomethane (ug/L)	0.039	0.055	XXX	2.05	2.92	XXX	1/month	Grab
E. Coli (no./100 mL)	XXX	XXX	XXX	XXX	XXX	Report	1/month	Grab

Proposed Effluent Limitations and Monitoring Requirements (continued)

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

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

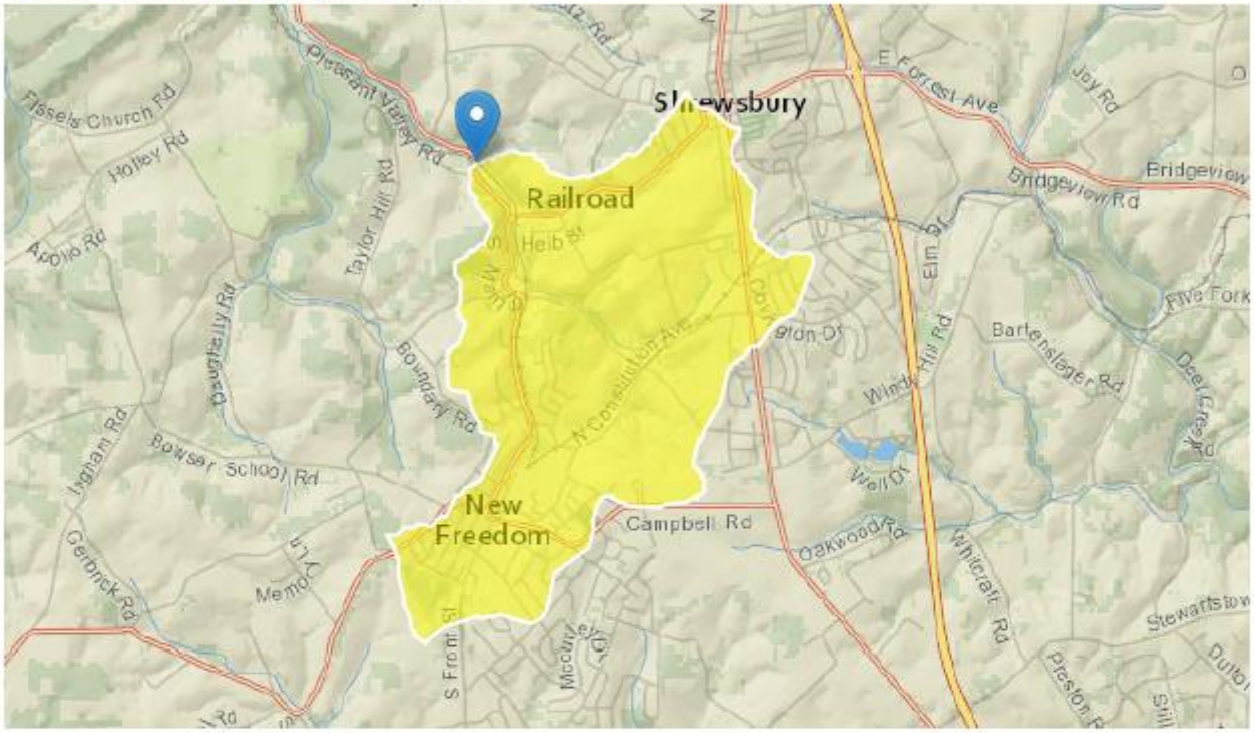
Parameter	Effluent Limitations					Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)			Minimum Measurement Frequency	Required Sample Type
	Monthly	Annual	Minimum	Monthly Average	Maximum		
Ammonia---N	Report	Report	XXX	Report	XXX	2/week	24-Hr Composite
Kjeldahl---N	Report	XXX	XXX	Report	XXX	2/week	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	2/week	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	2/week	24-Hr Composite
Net Total Nitrogen	XXX	41,095	XXX	XXX	XXX	1/month	Calculation
Net Total Phosphorus	XXX	5,479	XXX	XXX	XXX	1/month	Calculation

The permittee is authorized to use 1,700 lbs/year as Total Nitrogen (TN) Offsets toward compliance with the Annual Net TN mass load limitations (Cap Loads), in accordance with Part C of this permit. These Offsets may be applied throughout the Compliance Year or during the Truing Period. The application of offsets must be reported to DEP as described in Part C. The Offsets are authorized for the following pollutant load reduction activities:

- Connection of 68 on-lot sewage disposal systems to the public sewer system after January 1, 2003, in which 25 lbs/year of TN offsets are granted per connection.

StreamStats Report

Region ID: PA
Workspace ID: PA20210916115610579000
Clicked Point (Latitude, Longitude): 39.76438, -76.70373
Time: 2021-09-16 07:56:31 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	3	square miles
BSLOPD	Mean basin slope measured in degrees	4.4312	degrees
ROCKDEP	Depth to rock	5	feet
URBAN	Percentage of basin with urban development	20.3606	percent

Low-Flow Statistics Parameters [Low Flow Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	3	square miles	4.78	1150
BSLOPD	Mean Basin Slope degrees	4.4312	degrees	1.7	6.4
ROCKDEP	Depth to Rock	5	feet	4.13	5.21
URBAN	Percent Urban	20.3606	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]

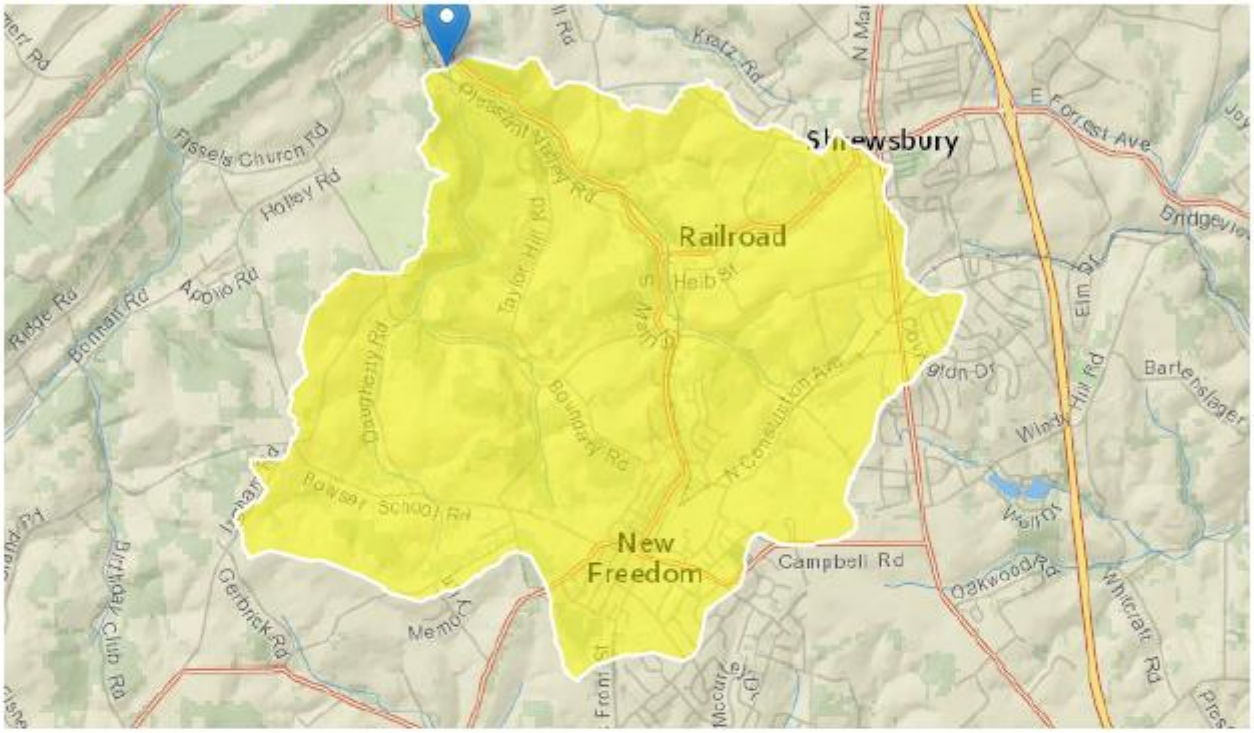
Statistic	Value	Unit
7 Day 2 Year Low Flow	0.999	ft^3/s
30 Day 2 Year Low Flow	1.28	ft^3/s
7 Day 10 Year Low Flow	0.498	ft^3/s
30 Day 10 Year Low Flow	0.651	ft^3/s
90 Day 10 Year Low Flow	0.993	ft^3/s

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/)

StreamStats Report

Region ID: PA
Workspace ID: PA20210916132327956000
Clicked Point (Latitude, Longitude): 39.77424, -76.72092
Time: 2021-09-16 09:23:48 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	6.98	square miles
BSLOPD	Mean basin slope measured in degrees	5.558	degrees
ROCKDEP	Depth to rock	4.9	feet
URBAN	Percentage of basin with urban development	9.4861	percent

Low-Flow Statistics Parameters [Low Flow Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	6.98	square miles	4.78	1150
BSLOPD	Mean Basin Slope degrees	5.558	degrees	1.7	6.4
ROCKDEP	Depth to Rock	4.9	feet	4.13	5.21
URBAN	Percent Urban	9.4861	percent	0	89

Low-Flow Statistics Flow Report [Low Flow Region 1]

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

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	2.37	ft^3/s	46	46
30 Day 2 Year Low Flow	2.89	ft^3/s	38	38
7 Day 10 Year Low Flow	1.24	ft^3/s	51	51
30 Day 10 Year Low Flow	1.55	ft^3/s	46	46
90 Day 10 Year Low Flow	2.14	ft^3/s	41	41

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/)

TRC_CALC

1A	B	C	D	E	F	G
2	**TRC EVALUATION**					
3	Input appropriate values in B4:B8 and E4:E7					
4	3	= Q stream (cfs)		0.5	= CV Daily	
5	2.25	= Q discharge (MGD)		0.5	= CV Hourly	
6	30	= no. samples		1	= AFC_Partial Mix Factor	
7	0.32	= Chlorine Demand of Stream		1	= CFC_Partial Mix Factor	
8	0.41	= Chlorine Demand of Discharge		15	= AFC_Criteria Compliance Time (min)	
9	0.2	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)	
	0	= % Factor of Safety (FOS)			=Decay Coefficient (K)	
10	Source	Reference	AFC Calculations		Reference	CFC Calculations
11	TRC	1.3.2.iii	WLA afc = 0.721		1.3.2.iii	WLA cfc = 0.706
12	PENTOXSD TRG	5.1a	LTAMULT afc = 0.373		5.1c	LTAMULT cfc = 0.581
13	PENTOXSD TRG	5.1b	LTA_afc= 0.269		5.1d	LTA_cfc = 0.411
14						
15	Source		Effluent Limit Calculations			
16	PENTOXSD TRG	5.1f	AML MULT = 1.231			
17	PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.200		BAT/BPJ	
18			INST MAX LIMIT (mg/l) = 0.654			

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)

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
07H	8093	SOUTH BRANCH CODORUS CREEK	19.940	693.00	3.00	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	0.50	0.000	0.000	20.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
New Freedom STP	PA0043257	2.2500	2.2500	2.2500	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	1.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
07H	8093	SOUTH BRANCH CODORUS CREEK	18.750	603.00	6.98	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	1.24	0.000	0.000	0.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	0.00	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

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
07H	8093	SOUTH BRANCH CODORUS CREEK	16.250	532.00	16.29	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	2.52	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
Glen Rock STP	PA0020818	0.6000	0.6000	0.6000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	8.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
07H	8093	SOUTH BRANCH CODORUS CREEK	15.930	523.00	18.20	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.100	0.00	3.45	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	0.00	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

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
07H	8093	SOUTH BRANCH CODORUS 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												
19.940	0.50	0.00	0.50	3.4808	0.01432	.621	16.43	26.46	0.39	0.186	25.00	7.00
18.750	1.24	0.00	1.24	3.4808	0.00538	.629	22.82	36.26	0.33	0.465	25.00	7.00
16.250	2.52	0.00	2.52	4.409	0.00533	.673	30.46	45.24	0.34	0.058	24.08	7.00
Q1-10 Flow												
19.940	0.32	0.00	0.32	3.4808	0.01432	NA	NA	NA	0.38	0.191	25.00	7.00
18.750	0.79	0.00	0.79	3.4808	0.00538	NA	NA	NA	0.31	0.491	25.00	7.00
16.250	1.61	0.00	1.61	4.409	0.00533	NA	NA	NA	0.31	0.063	24.32	7.00
Q30-10 Flow												
19.940	0.68	0.00	0.68	3.4808	0.01432	NA	NA	NA	0.40	0.182	25.00	7.00
18.750	1.69	0.00	1.69	3.4808	0.00538	NA	NA	NA	0.35	0.442	25.00	7.00
16.250	3.43	0.00	3.43	4.409	0.00533	NA	NA	NA	0.36	0.054	23.89	7.00

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07H	8093	SOUTH BRANCH CODORUS CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
19.940	2.250	25.000	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
16.427	0.621	26.461	0.390
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
22.12	1.480	0.87	1.029
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.406	59.788	Tsivoglou	5
Reach Travel Time (days)			
0.186			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.019	21.37	0.86	6.68
0.037	20.64	0.84	7.12
0.056	19.93	0.83	7.28
0.075	19.25	0.81	7.36
0.093	18.60	0.79	7.41
0.112	17.96	0.78	7.45
0.130	17.35	0.76	7.48
0.149	16.76	0.75	7.51
0.168	16.19	0.74	7.54
0.186	15.64	0.72	7.54

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
18.750	2.250	25.000	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
22.820	0.629	36.263	0.329
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
13.49	1.409	0.61	1.029
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.649	18.916	Tsivoglou	5
Reach Travel Time (days)			
0.465			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.046	12.43	0.58	6.93
0.093	11.44	0.55	6.72
0.139	10.54	0.53	6.71
0.186	9.70	0.50	6.78
0.232	8.94	0.48	6.88
0.279	8.23	0.46	6.99
0.325	7.58	0.44	7.09
0.372	6.98	0.42	7.19
0.418	6.43	0.40	7.28
0.465	5.92	0.38	7.36

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07H	8093	SOUTH BRANCH CODORUS CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
16.250	2.850	24.076	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
30.456	0.673	45.240	0.338
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
7.75	1.352	1.23	0.958
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.206	18.841	Tsivoglou	5
Reach Travel Time (days)			
0.058			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.006	7.68	1.23	7.21
0.012	7.61	1.22	7.21
0.017	7.54	1.21	7.21
0.023	7.46	1.21	7.22
0.029	7.39	1.20	7.22
0.035	7.32	1.19	7.23
0.041	7.26	1.19	7.23
0.046	7.19	1.18	7.24
0.052	7.12	1.17	7.25
0.058	7.05	1.17	7.26

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
07H	8093	SOUTH BRANCH CODORUS 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
19.940	New Freedom ST	11.07	2	11.07	2	0	0
18.750		NA	NA	11.07	NA	NA	NA
16.250	Glen Rock STP	12.66	16	11.72	16	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
19.940	New Freedom ST	1.37	1	1.37	1	0	0
18.750		NA	NA	1.37	NA	NA	NA
16.250	Glen Rock STP	1.56	7.3	1.47	7.3	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)		
19.94	New Freedom STP	25	25	1	1	5	5	0	0
18.75		NA	NA	NA	NA	NA	NA	NA	NA
16.25	Glen Rock STP	25	25	7.3	7.3	5	5	0	0

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
07H	8093	SOUTH BRANCH CODORUS 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)
19.940	New Freedom STP	PA0043257	2.250	CBOD5	25		
				NH3-N	1	2	
				Dissolved Oxygen			5

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)
16.250	Glen Rock STP	PA0020818	0.600	CBOD5	25		
				NH3-N	7.3	14.6	
				Dissolved Oxygen			5

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Reproduction
TIWC (decimal)	0.86
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name: New Freedom WWTP

Permit No.: PA0043257

Test Completion Date: 5/1/2018

Replicate No.	Control	TIWC
1	32	32
2	28	36
3	34	27
4	29	30
5	14	34
6	27	34
7	35	33
8	0	39
9	27	35
10	29	30
11		
12		
13		
14		
15		
Mean	25.500	33.000
Std Dev.	10.659	3.432
# Replicates	10	10

T-Test Result	5.0435
Deg. of Freedom	16
Critical T Value	0.8647
Pass or Fail	PASS

Test Completion Date: 4/30/2019

Replicate No.	Control	TIWC
1	8	22
2	29	26
3	18	22
4	28	31
5	31	27
6	20	31
7	28	31
8	30	37
9	31	34
10	31	35
11		
12		
13		
14		
15		
Mean	25.400	29.600
Std Dev.	7.662	5.211
# Replicates	10	10

T-Test Result	4.3006
Deg. of Freedom	17
Critical T Value	0.8633
Pass or Fail	PASS

Test Completion Date: 4/28/2020

Replicate No.	Control	TIWC
1	21	20
2	20	18
3	20	24
4	19	17
5	16	21
6	20	20
7	6	20
8	16	19
9	21	23
10	18	20
11		
12		
13		
14		
15		
Mean	17.700	20.200
Std Dev.	4.498	2.098
# Replicates	10	10

T-Test Result	5.5125
Deg. of Freedom	17
Critical T Value	0.8633
Pass or Fail	PASS

Test Completion Date: 5/4/2021

Replicate No.	Control	TIWC
1	33	33
2	29	19
3	23	36
4	29	33
5	23	25
6	20	35
7	24	38
8	29	28
9	30	29
10	32	28
11		
12		
13		
14		
15		
Mean	27.200	30.400
Std Dev.	4.367	5.739
# Replicates	10	10

T-Test Result	4.7859
Deg. of Freedom	15
Critical T Value	0.8662
Pass or Fail	PASS

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Survival
TIWC (decimal)	0.86
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name: New Freedom WWTP

Permit No.: PA0043257

Test Completion Date: 5/1/2018

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	0	1
6	1	1
7	1	1
8	0	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	0.800	1.000
Std Dev.	0.422	0.000
# Replicates	10	10

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

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: 4/28/2020

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: 5/4/2021

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**

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Survival
TIWC (decimal)	0.86
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name: New Freedom WWTP

Permit No.: PA0043257

Test Completion Date: 5/1/2018

Replicate No.	Control	TIWC
1	1	0.9
2	1	0.9
3	1	0.8
4	1	0.8
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	1.000	0.850
Std Dev.	0.000	0.058
# Replicates	4	4

T-Test Result	10.5088
Deg. of Freedom	3
Critical T Value	0.7649
Pass or Fail	**PASS**

Test Completion Date: 4/30/2019

Replicate No.	Control	TIWC
1	1	0.8
2	0.9	1
3	1	0.4
4	1	0.6
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.975	0.700
Std Dev.	0.050	0.258
# Replicates	4	4

T-Test Result	1.0047
Deg. of Freedom	3
Critical T Value	0.7649
Pass or Fail	**PASS**

Test Completion Date: 4/28/2020

Replicate No.	Control	TIWC
1	0.9	1
2	1	1
3	0.9	1
4	1	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.950	1.000
Std Dev.	0.058	0.000
# Replicates	4	4

T-Test Result	23.5123
Deg. of Freedom	3
Critical T Value	0.7649
Pass or Fail	**PASS**

Test Completion Date: 5/4/2021

Replicate No.	Control	TIWC
1	0.8	0.9
2	0.7	0.8
3	0.7	0.9
4	1	0.8
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.800	0.850
Std Dev.	0.141	0.058
# Replicates	4	4

T-Test Result	7.4791
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	**PASS**

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Growth
TIWC (decimal)	0.86
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name: New Freedom WWTP

Permit No.: PA0043257

Test Completion Date: 5/1/2018

Replicate No.	Control	TIWC
1	0.383	0.362
2	0.363	0.353
3	0.463	0.348
4	0.426	0.41
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.409	0.368
Std Dev.	0.045	0.028
# Replicates	4	4

T-Test Result	2.8064
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	**PASS**

Test Completion Date: 4/30/2019

Replicate No.	Control	TIWC
1	0.275	0.327
2	0.329	0.216
3	0.253	0.178
4	0.308	0.409
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.291	0.283
Std Dev.	0.034	0.105
# Replicates	4	4

T-Test Result	1.1819
Deg. of Freedom	4
Critical T Value	0.7407
Pass or Fail	**PASS**

Test Completion Date: 4/28/2020

Replicate No.	Control	TIWC
1	0.391	0.48
2	0.408	0.501
3	0.382	0.378
4	0.361	0.389
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.386	0.437
Std Dev.	0.020	0.063
# Replicates	4	4

T-Test Result	4.6046
Deg. of Freedom	4
Critical T Value	0.7407
Pass or Fail	**PASS**

Test Completion Date: 5/4/2021

Replicate No.	Control	TIWC
1	0.34	0.348
2	0.295	0.371
3	0.287	0.418
4	0.379	0.335
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.325	0.368
Std Dev.	0.043	0.037
# Replicates	4	4

T-Test Result	5.1064
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	**PASS**

WET Summary and Evaluation

Facility Name	New Freedom WWTP
Permit No.	PA0043257
Design Flow (MGD)	2.25
Q_{7-10} Flow (cfs)	0.498
PMF_a	1
PMF_c	1

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	5/1/18	4/30/19	4/28/20	5/4/21
Ceriodaphnia	Reproduction	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	5/1/18	4/30/19	4/28/20	5/4/21
Ceriodaphnia	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	5/1/18	4/30/19	4/28/20	5/4/21
Pimephales	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	5/1/18	4/30/19	4/28/20	5/4/21
Pimephales	Growth	PASS	PASS	PASS	PASS

Reasonable Potential? NO

Permit Recommendations

Test Type	**Chronic**
TIWC	**87** % Effluent
Dilution Series	**22, 44, 87, 94, 100** % Effluent
Permit Limit	**None**
Permit Limit Species	

Total Maximum Daily Load (TMDL)

South Branch Codorus Creek Watershed

York County

Pennsylvania Department of Environmental Protection
Central Office
Office of Water Management

July 9, 2003

Summary of the South Branch Codorus Creek TMDL

1. The impaired segment of the South Branch Codorus Creek addressed by this TMDL is located in York County. The watershed covers approximately 72 square miles. The creek flows from the Pennsylvania/Maryland border to its confluence with Codorus Creek just southwest of the City of York. The protected use of the watershed is aquatic life. The aquatic life designation for the main stem South Branch Codorus Creek is *warm water fishes*, with the tributaries also designated as *warm water fishes*. For the purposes of developing this TMDL, two subbasins were delineated within the South Branch Codorus Creek subwatershed.

2. The TMDL for the South Branch segment was developed to address use impairments caused by siltation and nutrients. The main stem of South Branch Codorus Creek was placed on Pennsylvania's 303(d) list in 1996. A total of 16 miles were listed as impaired due to agriculture. The cause code indicates excess amounts of nutrients and suspended solids to be a problem. In 1999, as part of Pa. DEP's Unassessed Waters Program, an additional 15 miles were added to the year 2000 305(b) report. In order to ensure attainment and maintenance of water quality standards in the South Branch Codorus Creek for the 1996 listed segment, mean annual loadings of total phosphorus and sediment for subbasin 1 will need to be limited to 16,367.00 lbs/yr and 13,773,460.00 lbs/yr respectively. Mean annual loadings of total phosphorus and sediment for subbasin 2 will need to be limited to 13,493.61 lbs/yr and 11,355,391.80 lbs/yr respectively.

   The major components of the South Branch Codorus Creek TMDL are summarized below:

Subbasin 1 Components	Total Phosphorus (lbs/yr)	Sediment (lbs/yr)
TMDL (Total Maximum Daily Load)	16,367.00	13,773,460.00
WLA (Wasteload Allocation)	3,650.00	0.00
MOS (Margin of Safety)	1,636.70	1,377,346.00
LA (Load Allocation)	11,080.30	12,396,114.00

Subbasin 2 Components	Total Phosphorus (lbs/yr)	Sediment (lbs/yr)
TMDL (Total Maximum Daily Load)	13,493.61	11,355,391.80
WLA (Wasteload Allocation)	6,853.33	0.00
MOS (Margin of Safety)	1,349.36	1,135,539.18
LA (Load Allocation)	5,290.92	10,219,852.62

3. Mean annual total phosphorus and sediment loading for subbasin 1 is estimated to be 33,852.94 lbs/yr and 29,141,794.00 lbs/yr respectively. Mean annual total phosphorus and sediment loading for subbasin 2 is estimated to be 24,269.89 lbs/yr and 17,753,092.40 lbs/yr respectively. To meet the TMDL, the phosphorus and sediment loading for subbasin 1 will require a 52 percent and 53 percent

reduction respectively. To meet the TMDL, the phosphorus and sediment loading for subbasin 2 will require a 44 percent and 36 percent reduction respectively.

4. There are two point sources of total phosphorus to address in this TMDL. Load Allocations (LA) for phosphorus and sediment were made to the following nonpoint sources: hay and pasture lands, croplands, coniferous forest, mixed forest, deciduous forest, developed areas, stream banks, groundwater and septic systems.

5. For subbasin 1, the phosphorus and sediment TMDL includes a nonpoint source LA of 11,080.30 lbs/yr and 12,308,514.00 respectively. For subbasin 2, the phosphorus and sediment TMDL includes a nonpoint source LA of 5,290.92 lbs/yr and 10,219,852.62 respectively. Sources receiving allocations are hay/pasture, cropland, developed lands, and stream banks. Phosphorus and sediment loadings from all other sources were maintained at their existing levels. Allocations of phosphorus and sediment to all nonpoint sources in the TMDL segment are summarized below:

Load Allocations for Sources of Phosphorus and Sediment			
Pollutant	**Current Loading (lbs/yr)**	**Load Allocation (lbs/yr)**	**% Reduction**
Subbasin 1			
Phosphorus	33,852.94	11,080.30	67
Sediment	29,141,794.00	12,396,114.00	58
Subbasin 2			
Phosphorus	24,269.89	5,290.92	78
Sediment	17,753,092.40	10,219,852.62	42

6. Ten percent of the South Branch Codorus Creek phosphorus and sediment TMDL was set-aside as a margin of safety (MOS). The MOS is that portion of the pollutant loading that is reserved to account for any uncertainty in the data and computational methodology used for the analysis. For subbasin 1, the MOS for the phosphorus and sediment TMDL was set at 1,636.70 lbs/yr and 1,377,346.00 lbs/yr respectively. For subbasin 2, the MOS for the phosphorus and sediment TMDL was set at 1,349.36 lbs/yr and 1,135,539.18 lbs/yr respectively.

7. The continuous simulation model used for developing the South Branch Codorus Creek TMDL considers seasonal variation through a number of mechanisms. Daily time steps are used for weather data and water balance calculations. The model requires specification of the growing season and hours of daylight for each month. The model also considers the months of the year when manure is applied to the land. The combination of these actions accounts for seasonal variability.

Targeted TMDL values were then used as the basis for load allocations and reductions in the South Branch Codorus Creek subbasins, using the following two equations:

1. TMDL = WLA + LA + MOS
2. LA = ALA + LNR

where:

TMDL = Total Maximum Daily Load
WLA = Waste Load Allocation (point sources)
LA = Load Allocation (nonpoint sources)
ALA = Adjusted Load Allocation
LNR = Loads not Reduced

C. Waste Load Allocation

There are two point sources in the watershed that discharge nutrients into the South Branch Codorus Creek. Both discharges are wastewater treatment plants associated with the towns of Glen Rock and New Freedom. Glen Rock has an average annual loading for phosphorus of 1,754.00 lbs/yr, with a permit limit (WLA) of 3,650.00 lbs/yr, based on its National Pollutant Discharge Elimination System (NPDES) permit requirements. The Glen Rock permit allows an average monthly mass loading limit of 10 lbs/day. New Freedom has an average annual loading for phosphorus of 5,031.80 lbs/yr. The WLA for New Freedom is set at 6,853.33 lbs/yr, based on the average monthly permitted flow of 1.237 million gallons per day. Table 7 shows the WLA information associated with both wastewater treatment plants.

Table 7. Waste Load Allocations (WLA) for the South Branch Codorus Creek Subbasins

Permitted Discharges	Phosphorus Load (lbs/yr)	
	Existing (Calculated from December 1999 thru June 1999 DMRs) (Used in AVGWLF)	TMDL WLA (Used in EMPR Scenario)
Subbasin 1		
Glen Rock PA0020818	1,754.00	3,650.00
Subbasin 2		
New Freedom PA0043257	5,031.80	6,853.33

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **New Freedom Borough WWTP** NPDES Permit No.: **PA0043257** Outfall No.: **001**

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

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
2.25	145	7						

					0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		368									
	Chloride (PWS)	mg/L		120									
	Bromide	mg/L		0.11									
	Sulfate (PWS)	mg/L		21									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L		12			0.108						
	Total Antimony	µg/L	<	1									
	Total Arsenic	µg/L		2			0.346						
	Total Barium	µg/L		1			0.125						
	Total Beryllium	µg/L	<	1									
	Total Boron	µg/L		120			0.16						
	Total Cadmium	µg/L	<	0.2									
	Total Chromium (III)	µg/L		1									
	Hexavalent Chromium	µg/L	<	0.25									
	Total Cobalt	µg/L	<	1									
	Total Copper	µg/L		12			0.233						
	Free Cyanide	µg/L	<	0.5									
	Total Cyanide	µg/L	<	4									
	Dissolved Iron	µg/L		170			0.035						
	Total Iron	µg/L		400			0.072						
	Total Lead	µg/L	<	1									
	Total Manganese	µg/L		51			0.158						
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L		4									
	Total Phenols (Phenolics) (PWS)	µg/L		22			0.214						
	Total Selenium	µg/L	<	1			0.53						
	Total Silver	µg/L		0.3			0.247						
	Total Thallium	µg/L	<	1									
	Total Zinc	µg/L		26			0.069						
	Total Molybdenum	µg/L		1.3			0.912						
	Acrolein	µg/L	<	2									
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<	2									
	Benzene	µg/L	<	0.5									
	Bromoform	µg/L		1.1			0.495						

Group 3	Carbon Tetrachloride	µg/L	<	0.5										
	Chlorobenzene	µg/L	<	0.5										
	Chlorodibromomethane	µg/L	<	0.5										
	Chloroethane	µg/L	<	0.5										
	2-Chloroethyl Vinyl Ether	µg/L	<	5										
	Chloroform	µg/L		2.2			0.438							
	Dichlorobromomethane	µg/L		1.7			0.361							
	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	<	5										
	Ethylbenzene	µg/L	<	0.5										
	Methyl Bromide	µg/L	<	0.5										
	Methyl Chloride	µg/L	<	0.5										
	Methylene Chloride	µg/L	<	0.5										
	1,1,2,2-Tetrachloroethane	µg/L	<	0.5										
	Tetrachloroethylene	µg/L	<	0.5										
	Toluene	µg/L		2.8			0.696							
	1,2-trans-Dichloroethylene	µg/L	<	0.5										
	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	<	10										
	2,4-Dichlorophenol	µg/L	<	10										
	2,4-Dimethylphenol	µg/L	<	10										
	4,6-Dinitro-o-Cresol	µg/L	<	10										
	2,4-Dinitrophenol	µg/L	<	10										
	2-Nitrophenol	µg/L	<	10										
	4-Nitrophenol	µg/L	<	10										
	p-Chloro-m-Cresol	µg/L	<	10										
	Pentachlorophenol	µg/L	<	10										
	Phenol	µg/L	<	10										
	2,4,6-Trichlorophenol	µg/L	<	10										
Group 5	Acenaphthene	µg/L	<	2.5										
	Acenaphthylene	µg/L	<	2.5										
	Anthracene	µg/L	<	2.5										
	Benzidine	µg/L	<	50										
	Benzo(a)Anthracene	µg/L	<	2.5										
	Benzo(a)Pyrene	µg/L	<	2.5										
	3,4-Benzofluoranthene	µg/L	<	2.5										
	Benzo(ghi)Perylene	µg/L	<	2.5										
	Benzo(k)Fluoranthene	µg/L	<	2.5										
	Bis(2-Chloroethoxy)Methane	µg/L	<	5										
	Bis(2-Chloroethyl)Ether	µg/L	<	5										
	Bis(2-Chloroisopropyl)Ether	µg/L	<	5										
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	5										
	4-Bromophenyl Phenyl Ether	µg/L	<	5										
	Butyl Benzyl Phthalate	µg/L	<	5										
	2-Chloronaphthalene	µg/L	<	5										
	4-Chlorophenyl Phenyl Ether	µg/L	<	5										
	Chrysene	µg/L	<	2.5										
	Dibenzo(a,h)Anthrancene	µg/L	<	2.5										
	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	<	5										
	Diethyl Phthalate	µg/L	<	5										
	Dimethyl Phthalate	µg/L	<	5										
	Di-n-Butyl Phthalate	µg/L	<	5										
	2,4-Dinitrotoluene													

	2,6-Dinitrotoluene	µg/L	<	5										
	Di-n-Octyl Phthalate	µg/L	<	5										
	1,2-Diphenylhydrazine	µg/L	<	5										
	Fluoranthene	µg/L	<	2.5										
	Fluorene	µg/L	<	2.5										
	Hexachlorobenzene	µg/L	<	5										
	Hexachlorobutadiene	µg/L	<	0.5										
	Hexachlorocyclopentadiene	µg/L	<	5										
	Hexachloroethane	µg/L	<	5										
	Indeno(1,2,3-cd)Pyrene	µg/L	<	2.5										
	Isophorone	µg/L	<	5										
	Naphthalene	µg/L	<	0.5										
	Nitrobenzene	µg/L	<	5										
	n-Nitrosodimethylamine	µg/L	<	5										
	n-Nitrosodi-n-Propylamine	µg/L	<	5										
	n-Nitrosodiphenylamine	µg/L	<	5										
	Phenanthrene	µg/L	<	2.5										
	Pyrene	µg/L	<	2.5										
	1,2,4-Trichlorobenzene	µg/L	<	0.5										
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												

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

New Freedom Borough WWTP, NPDES Permit No. PA0043257, Outfall 001

Instructions | Discharge | Stream

Receiving Surface Water Name: **South Branch Codorus Creek**

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	008093	19.94	693	3			Yes
End of Reach 1	008093	18.75	603	6.98			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	19.94	0.1	0.498		20							102.7	7		
End of Reach 1	18.75	0.1	1.24												

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	19.94														
End of Reach 1	18.75														

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

New Freedom Borough WWTP, NPDES Permit No. PA0043257, Outfall 001

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

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 0.057 PMF: 1 Analysis Hardness (mg/l): 139.71 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	857	
Total Antimony	0	0		0	1,100	1,100	1,257	
Total Arsenic	0	0		0	340	340	389	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	24,005	
Total Boron	0	0		0	8,100	8,100	9,259	
Total Cadmium	0	0		0	2.787	3.0	3.43	Chem Translator of 0.93 applied
Total Chromium (III)	0	0		0	749.246	2,371	2,710	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	18.6	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	109	
Total Copper	0	0		0	18.416	19.2	21.9	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	22	22.0	25.1	
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	92.759	125	143	Chem Translator of 0.742 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	1.88	Chem Translator of 0.85 applied
Total Nickel	0	0		0	621.320	623	712	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	5.717	6.73	7.69	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	74.3	
Total Zinc	0	0		0	155.559	159	182	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	3.43	

Acrylonitrile	0	0		0	650	650	743	
Benzene	0	0		0	640	640	732	
Bromoform	0	0		0	1,800	1,800	2,058	
Carbon Tetrachloride	0	0		0	2,800	2,800	3,201	
Chlorobenzene	0	0		0	1,200	1,200	1,372	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	20,575	
Chloroform	0	0		0	1,900	1,900	2,172	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	17,146	
1,1-Dichloroethylene	0	0		0	7,500	7,500	8,573	
1,2-Dichloropropane	0	0		0	11,000	11,000	12,574	
1,3-Dichloropropylene	0	0		0	310	310	354	
Ethylbenzene	0	0		0	2,900	2,900	3,315	
Methyl Bromide	0	0		0	550	550	629	
Methyl Chloride	0	0		0	28,000	28,000	32,006	
Methylene Chloride	0	0		0	12,000	12,000	13,717	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	1,143	
Tetrachloroethylene	0	0		0	700	700	800	
Toluene	0	0		0	1,700	1,700	1,943	
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	7,773	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	3,429	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	3,886	
Trichloroethylene	0	0		0	2,300	2,300	2,629	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	640	
2,4-Dichlorophenol	0	0		0	1,700	1,700	1,943	
2,4-Dimethylphenol	0	0		0	660	660	754	
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	91.4	
2,4-Dinitrophenol	0	0		0	660	660	754	
2-Nitrophenol	0	0		0	8,000	8,000	9,145	
4-Nitrophenol	0	0		0	2,300	2,300	2,629	
p-Chloro-m-Cresol	0	0		0	160	160	183	
Pentachlorophenol	0	0		0	8.723	8.72	9.97	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	526	
Acenaphthene	0	0		0	83	83.0	94.9	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	343	
Benzo(a)Anthracene	0	0		0	0.5	0.5	0.57	
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	34,292	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	5,144	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	309	
Butyl Benzyl Phthalate	0	0		0	140	140	160	

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	937	
1,3-Dichlorobenzene	0	0		0	350	350	400	
1,4-Dichlorobenzene	0	0		0	730	730	834	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	4,572	
Dimethyl Phthalate	0	0		0	2,500	2,500	2,858	
Di-n-Butyl Phthalate	0	0		0	110	110	126	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	1,829	
2,6-Dinitrotoluene	0	0		0	990	990	1,132	
1,2-Diphenylhydrazine	0	0		0	15	15.0	17.1	
Fluoranthene	0	0		0	200	200	229	
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	11.4	
Hexachlorocyclopentadiene	0	0		0	5	5.0	5.72	
Hexachloroethane	0	0		0	60	60.0	68.6	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	11,431	
Naphthalene	0	0		0	140	140	160	
Nitrobenzene	0	0		0	4,000	4,000	4,572	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	19,432	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	343	
Phenanthrene	0	0		0	5	5.0	5.72	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	149	

☑ *CFC* CCT (min): 0.057 PMF: 1 Analysis Hardness (mg/l): 139.71 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	251	
Total Arsenic	0	0		0	150	150	171	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	4,687	
Total Boron	0	0		0	1,600	1,600	1,829	
Total Cadmium	0	0		0	0.310	0.35	0.4	Chem Translator of 0.895 applied
Total Chromium (III)	0	0		0	97.462	113	130	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	11.9	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	21.7	
Total Copper	0	0		0	11.918	12.4	14.2	Chem Translator of 0.96 applied

Free Cyanide	0	0		0	5.2	5.2	5.94	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	1,715	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	3.615	4.87	5.57	Chem Translator of 0.742 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	1.04	Chem Translator of 0.85 applied
Total Nickel	0	0		0	69.009	69.2	79.1	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	5.7	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	14.9	
Total Zinc	0	0		0	156.831	159	182	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	3.43	
Acrylonitrile	0	0		0	130	130	149	
Benzene	0	0		0	130	130	149	
Bromoform	0	0		0	370	370	423	
Carbon Tetrachloride	0	0		0	560	560	640	
Chlorobenzene	0	0		0	240	240	274	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	4,001	
Chloroform	0	0		0	390	390	446	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	3,544	
1,1-Dichloroethylene	0	0		0	1,500	1,500	1,715	
1,2-Dichloropropane	0	0		0	2,200	2,200	2,515	
1,3-Dichloropropylene	0	0		0	61	61.0	69.7	
Ethylbenzene	0	0		0	580	580	663	
Methyl Bromide	0	0		0	110	110	126	
Methyl Chloride	0	0		0	5,500	5,500	6,287	
Methylene Chloride	0	0		0	2,400	2,400	2,743	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	240	
Tetrachloroethylene	0	0		0	140	140	160	
Toluene	0	0		0	330	330	377	
1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	1,600	
1,1,1-Trichloroethane	0	0		0	610	610	697	
1,1,2-Trichloroethane	0	0		0	680	680	777	
Trichloroethylene	0	0		0	450	450	514	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	126	
2,4-Dichlorophenol	0	0		0	340	340	389	
2,4-Dimethylphenol	0	0		0	130	130	149	
4,6-Dinitro-o-Cresol	0	0		0	16	16.0	18.3	
2,4-Dinitrophenol	0	0		0	130	130	149	
2-Nitrophenol	0	0		0	1,600	1,600	1,829	
4-Nitrophenol	0	0		0	470	470	537	

p-Chloro-m-Cresol	0	0		0	500	500	572	
Pentachlorophenol	0	0		0	6.693	6.69	7.65	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	104	
Acenaphthene	0	0		0	17	17.0	19.4	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	67.4	
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	6,858	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	1,040	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	61.7	
Butyl Benzyl Phthalate	0	0		0	35	35.0	40.0	
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	183	
1,3-Dichlorobenzene	0	0		0	69	69.0	78.9	
1,4-Dichlorobenzene	0	0		0	150	150	171	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	914	
Dimethyl Phthalate	0	0		0	500	500	572	
Di-n-Butyl Phthalate	0	0		0	21	21.0	24.0	
2,4-Dinitrotoluene	0	0		0	320	320	366	
2,6-Dinitrotoluene	0	0		0	200	200	229	
1,2-Diphenylhydrazine	0	0		0	3	3.0	3.43	
Fluoranthene	0	0		0	40	40.0	45.7	
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	2.29	
Hexachlorocyclopentadiene	0	0		0	1	1.0	1.14	
Hexachloroethane	0	0		0	12	12.0	13.7	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	2,400	
Naphthalene	0	0		0	43	43.0	49.2	
Nitrobenzene	0	0		0	810	810	926	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	3,886	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	67.4	
Phenanthrene	0	0		0	1	1.0	1.14	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	29.7	

☑ *THH* CCT (min): 0.057 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	6.4	
Total Arsenic	0	0		0	10	10.0	11.4	
Total Barium	0	0		0	2,400	2,400	2,743	
Total Boron	0	0		0	3,100	3,100	3,544	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	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	
Total Copper	0	0		0	N/A	N/A	N/A	
Free Cyanide	0	0		0	4	4.0	4.57	
Dissolved Iron	0	0		0	300	300	343	
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	1,143	
Total Mercury	0	0		0	0.050	0.05	0.057	
Total Nickel	0	0		0	610	610	697	
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	0.27	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	3.43	
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	114	
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	N/A	N/A	N/A	
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	37.7	
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	77.7	

Methyl Bromide	0	0		0	100	100.0	114	
Methyl Chloride	0	0		0	N/A	N/A	N/A	
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	65.2	
1,2-trans-Dichloroethylene	0	0		0	100	100.0	114	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	11,431	
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	34.3	
2,4-Dichlorophenol	0	0		0	10	10.0	11.4	
2,4-Dimethylphenol	0	0		0	100	100.0	114	
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	2.29	
2,4-Dinitrophenol	0	0		0	10	10.0	11.4	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
p-Chloro-m-Cresol	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	4,572	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	80.0	
Anthracene	0	0		0	300	300	343	
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	229	
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	914	
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	1,143	
1,3-Dichlorobenzene	0	0		0	7	7.0	8.0	
1,4-Dichlorobenzene	0	0		0	300	300	343	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	686	
Dimethyl Phthalate	0	0		0	2,000	2,000	2,286	
Di-n-Butyl Phthalate	0	0		0	20	20.0	22.9	
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	22.9	
Fluorene	0	0		0	50	50.0	57.2	
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	4.57	
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	38.9	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	11.4	
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	22.9	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	0.08	

☑ *CRL* CCT (min): 0.684 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	
Total Chromium (III)	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	
Total Copper	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	0.13	
Benzene	0	0		0	0.58	0.58	1.25	
Bromoform	0	0		0	7	7.0	15.1	
Carbon Tetrachloride	0	0		0	0.4	0.4	0.86	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	0.8	0.8	1.73	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	12.3	
Dichlorobromomethane	0	0		0	0.95	0.95	2.05	
1,2-Dichloroethane	0	0		0	9.9	9.9	21.4	
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	0.9	0.9	1.94	
1,3-Dichloropropylene	0	0		0	0.27	0.27	0.58	
Ethylbenzene	0	0		0	N/A	N/A	N/A	
Methyl Bromide	0	0		0	N/A	N/A	N/A	
Methyl Chloride	0	0		0	N/A	N/A	N/A	
Methylene Chloride	0	0		0	20	20.0	43.2	
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	0.43	
Tetrachloroethylene	0	0		0	10	10.0	21.6	
Toluene	0	0		0	N/A	N/A	N/A	
1,2-trans-Dichloroethylene	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	1.19	
Trichloroethylene	0	0		0	0.6	0.6	1.3	
Vinyl Chloride	0	0		0	0.02	0.02	0.043	
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	
4,6-Dinitro-o-Cresol	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	
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	0.030	0.03	0.065	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	3.24	
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	0.022	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	0.065	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	0.69	
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	0.26	
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	0.11	
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	0.11	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	0.11	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	0.065	
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	0.0002	
Hexachlorobutadiene	0	0		0	0.01	0.01	0.022	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	0.22	
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	0.002	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	0.011	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	7.13	
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	

☑ ***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 Arsenic	Report	Report	Report	Report	Report	µg/L	11.4	THH	Discharge Conc > 10% WQBEL (no RP)

Total Copper	0.27	0.36	14.2	19.2	19.2	µg/L	14.2	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Dissolved Iron	Report	Report	Report	Report	Report	µg/L	343	THH	Discharge Conc > 10% WQBEL (no RP)
Total Iron	Report	Report	Report	Report	Report	µg/L	1,715	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	159	AFC	Discharge Conc > 10% WQBEL (no RP)
Dichlorobromomethane	0.039	0.055	2.05	2.92	5.13	µg/L	2.05	CRL	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 Aluminum	750	µg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	N/A	N/A	Discharge Conc < TQL
Total Barium	2,743	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	1,829	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cadmium	0.4	µg/L	Discharge Conc < TQL
Total Chromium (III)	130	µg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	11.9	µg/L	Discharge Conc < TQL
Total Cobalt	21.7	µg/L	Discharge Conc < TQL
Free Cyanide	4.57	µg/L	Discharge Conc < TQL
Total Cyanide	N/A	N/A	No WQS
Total Lead	5.57	µg/L	Discharge Conc < TQL
Total Manganese	1,143	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	0.057	µg/L	Discharge Conc < TQL
Total Nickel	79.1	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	PWS Not Applicable
Total Selenium	5.7	µg/L	Discharge Conc < TQL
Total Silver	6.73	µg/L	Discharge Conc ≤ 10% WQBEL
Total Thallium	0.27	µg/L	Discharge Conc < TQL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	3.0	µg/L	Discharge Conc < TQL
Acrylonitrile	0.13	µg/L	Discharge Conc < TQL
Benzene	1.25	µg/L	Discharge Conc < TQL
Bromoform	15.1	µg/L	Discharge Conc ≤ 25% WQBEL
Carbon Tetrachloride	0.86	µg/L	Discharge Conc < TQL
Chlorobenzene	114	µg/L	Discharge Conc < TQL
Chlorodibromomethane	1.73	µg/L	Discharge Conc < TQL

Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	4,001	µg/L	Discharge Conc < TQL
Chloroform	12.3	µg/L	Discharge Conc ≤ 25% WQBEL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	21.4	µg/L	Discharge Conc < TQL
1,1-Dichloroethylene	37.7	µg/L	Discharge Conc < TQL
1,2-Dichloropropane	1.94	µg/L	Discharge Conc < TQL
1,3-Dichloropropylene	0.58	µg/L	Discharge Conc < TQL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	77.7	µg/L	Discharge Conc < TQL
Methyl Bromide	114	µg/L	Discharge Conc < TQL
Methyl Chloride	6,287	µg/L	Discharge Conc < TQL
Methylene Chloride	43.2	µg/L	Discharge Conc < TQL
1,1,2,2-Tetrachloroethane	0.43	µg/L	Discharge Conc < TQL
Tetrachloroethylene	21.6	µg/L	Discharge Conc < TQL
Toluene	65.2	µg/L	Discharge Conc ≤ 25% WQBEL
1,2-trans-Dichloroethylene	114	µg/L	Discharge Conc < TQL
1,1,1-Trichloroethane	697	µg/L	Discharge Conc < TQL
1,1,2-Trichloroethane	1.19	µg/L	Discharge Conc < TQL
Trichloroethylene	1.3	µg/L	Discharge Conc < TQL
Vinyl Chloride	0.043	µg/L	Discharge Conc < TQL
2-Chlorophenol	34.3	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	11.4	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	114	µg/L	Discharge Conc < TQL
4,6-Dinitro-o-Cresol	2.29	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	11.4	µg/L	Discharge Conc < TQL
2-Nitrophenol	1,829	µg/L	Discharge Conc < TQL
4-Nitrophenol	537	µg/L	Discharge Conc < TQL
p-Chloro-m-Cresol	160	µg/L	Discharge Conc < TQL
Pentachlorophenol	0.065	µg/L	Discharge Conc < TQL
Phenol	4,572	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	3.24	µg/L	Discharge Conc < TQL
Acenaphthene	19.4	µg/L	Discharge Conc < TQL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	343	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	0.022	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	0.065	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	229	µg/L	Discharge Conc < TQL
Bis(2-Ethylhexyl)Phthalate	0.69	µg/L	Discharge Conc < TQL

del Results [redacted] Page 16

4-Bromophenyl Phenyl Ether	61.7	µg/L	Discharge Conc < TQL
Butyl Benzyl Phthalate	0.11	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	914	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	0.26	µg/L	Discharge Conc < TQL
Dibenzo(a,h)Anthrancene	0.0002	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	183	µg/L	Discharge Conc < TQL
1,3-Dichlorobenzene	8.0	µg/L	Discharge Conc < TQL
1,4-Dichlorobenzene	171	µg/L	Discharge Conc < TQL
3,3-Dichlorobenzidine	0.11	µg/L	Discharge Conc < TQL
Diethyl Phthalate	686	µg/L	Discharge Conc < TQL
Dimethyl Phthalate	572	µg/L	Discharge Conc < TQL
Di-n-Butyl Phthalate	22.9	µg/L	Discharge Conc < TQL
2,4-Dinitrotoluene	0.11	µg/L	Discharge Conc < TQL
2,6-Dinitrotoluene	0.11	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	0.065	µg/L	Discharge Conc < TQL
Fluoranthene	22.9	µg/L	Discharge Conc < TQL
Fluorene	57.2	µg/L	Discharge Conc < TQL
Hexachlorobenzene	0.0002	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	0.022	µg/L	Discharge Conc < TQL
Hexachlorocyclopentadiene	1.14	µg/L	Discharge Conc < TQL
Hexachloroethane	0.22	µg/L	Discharge Conc < TQL
Indeno(1,2,3-cd)Pyrene	0.002	µg/L	Discharge Conc < TQL
Isophorone	38.9	µg/L	Discharge Conc < TQL
Naphthalene	49.2	µg/L	Discharge Conc < TQL
Nitrobenzene	11.4	µg/L	Discharge Conc < TQL
n-Nitrosodimethylamine	0.002	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	0.011	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	7.13	µg/L	Discharge Conc < TQL
Phenanthrene	1.14	µg/L	Discharge Conc < TQL
Pyrene	22.9	µg/L	Discharge Conc < TQL
1,2,4-Trichlorobenzene	0.08	µg/L	Discharge Conc < TQL

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: