Pennsylvania Department of Environmental Protection

Northeast Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0024716**
Facility Type	**Municipal**	APS ID	**842656**
Major / Minor	**Major**	Authorization ID	**1349191**

Applicant and Facility Information

Applicant Name	**Borough of Freeland Municipal Authority**	Facility Name	**Borough of Freeland Municipal Authority Wastewater Treatment Plant (WWTP) and CSO**
Applicant Address	711 Birkbeck Street	Facility Address	1300 Birkbeck Street
	Freeland, PA 18224-1501		Foster Twp, PA 18224
Applicant Contact	David Kavitski, Chairman	Facility Contact	Kavitski David, Chairman
Applicant Phone	(570) 636-1733	Facility Phone	(570) 636-1733
Client ID	62666	Site ID	241670
Ch 94 Load Status	Not Overloaded	Municipality	Foster Township
Connection Status	No Limitations	County	Luzerne
Date Application Received	March 31, 2021	EPA Waived?	No
Date Application Accepted	April 15, 2021	If No, Reason	Major Facility

Purpose of Application: Renewal of NPDES permit for discharge of treated sewage.

Summary of Review

The applicant is requesting the renewal of an NPDES permit to discharge up to 1.2 MGD of treated sewage into Pond Creek, a High Quality, Cold-Water Fishery, Migratory Fish (HQ-CWF, MF) receiving stream in State Water Plan Basin 2-A (Middle Lehigh River). As per the Department's current existing use list, the receiving stream does not have an existing use classification that is more protective than its designated use. This stream segment is not designated as a naturally reproducing trout stream as per PA Fish & Boat Commission. This discharge is not expected to affect public water supplies.

The point of first aquatic use (POFU) was previously established to be at the Oley Valley Road bridge about 2.8 miles downstream from the actual discharge point (Outfall 001).

A final Total Maximum Daily Load (TMDL) exists for the Lehigh River Watershed and for the Pond Creek, Sandy Run, and Unnamed Tributary 04226 to Sandy Run Watershed. The TMDLs address metals (iron, manganese, and aluminum) and pH associated with acid mine drainage (AMD). There are no approved Waste Load Allocations (WLA) for this facility. Monitoring for Total Aluminum, Total Iron, and Total Manganese were maintained in this permit.

Limitations for pH, $CBOD_5$, Total Suspended Solids (TSS), Dissolved Oxygen (DO), and Fecal Coliform are technology-based and carried over from the previous permit.

WQM modeling recommended stricter summertime limitations for Ammonia-Nitrogen (2.26 mg/L monthly average, 4.52 mg/L IMAX). These limitations will come into effect four (4) years after the permit effective date. Wintertime monitoring/reporting for Ammonia-Nitrogen has also been added at three times the new summertime limitations (6.78 mg/L monthly average, 13.56 mg/L IMAX). The limitations for Ammonia-Nitrogen from the previously issued permit will be in effect the first four (4) years of

Approve	Deny	Signatures	Date
X		/s/ Allison Seyfried Zukosky / Project Manager	July 8, 2025
X		/s/ Edward Dudick, P.E. / Engineer Manager	July 9, 2025

Summary of Review

the permit. A monitoring frequency of 2/week has been applied to be consistent with standard procedures for wastewater treatment plants of this size.

The facility utilizes UV disinfection. In the event the facility uses chlorine for cleaning purposes or as a back-up disinfection option, Total Residual Chlorine (TRC) should be sampled "daily when discharging" (see requirements under Part C.VII.D). The TRC Calculation Spreadsheet recommends a stricter IMAX limitation than the previous permit. The permittee will be required to meet the new water quality-based limit for TRC starting four (4) years after the effective date of the permit. The TRC IMAX limitation from the previously issued permit will is in effect for the first four years after the permit effective date.

Sewage discharges now require monitoring and reporting for E. Coli. A monitoring frequency of 1/month for design flows >= 1 MGD, 1/quarter for design flows >= 0.05 and < 1 MGD, 1/year for design flows of 0.002 – 0.05 MGD will be utilized.

Pollutant sampling results submitted with the permit application were entered into the Toxic Management Spreadsheet (TMS). The TMS recommended limits and/or monitoring for several pollutants that were tested for as part of the application. Many of the recommendations were for pollutants that had "non-detect" concentrations, which means the Department must use the laboratory quantitation limit (or reporting limit) as the pollutant concentration for modeling. The permittee was given the opportunity to conduct additional sampling for these parameters. The sampling was conducted, and results were submitted to the Department.

The TMS was ran again utilizing the new sample results. Limitations were still recommended for Total Cadmium, Free Cyanide, and Total Zinc. The permittee was given the opportunity to conduct a minimum of 10 additional effluent samples for these parameters. The permittee collected the additional samples and provided the results to the Department via email. These updated results were used to re-run the modeling. The modeling indicated the Free Cyanide and Total Zinc limitations should still be established.

Therefore, Free Cyanide and Total Zinc limitations were added to the permit and will come into effect four years after the permit effective date. Monitoring/reporting requirements are included in the permit until the limitations come into effect.

Monitoring/reporting for Total Copper and Total Manganese was also recommended by the TMS. Quarterly Total Copper monitoring/reporting was already in the previous permit and will be maintained. Annual Total Manganese monitoring/reporting was already in the previous permit. The frequency will be increased to quarterly in the renewal.

The Part C. V. condition regarding Toxics Reduction Evaluations (TREs) is added to the permit and applies to the Total Zinc and Free Cyanide limitations. The permittee will have the option to accept the implementation of the limitations or to perform site-specific studies to verify or refine the WQBELs.

The latest DRBC Docket No. D-1965-052 CP-5 does not require any additional monitoring/reporting or limitations.

The monthly monitoring and reporting for Total Nitrogen, Total Phosphorous, Total Kjeldahl Nitrogen, and Nitrate-Nitrite as N has been maintained in this permit.

Per current Standard Operating Procedures for Publicly Owned Treatment Plants, the Influent monitoring requirements for TSS and BOD_5 has been carried over from the previous permit. The 1/week influent monitoring frequency has been updated to 2/week be consistent with the discharge sampling frequency.

Monitoring frequencies for all parameters with limitations have been updated to the recommended frequencies found in Table 6-3 of DEP's Technical Guidance for the Development and Specification of Effluent Limitations (Document No. 362-0400-001).

This type of facility has been identified by the EPA as being a potential source of PFAS. PFAS monitoring requirements have been added in Part A and described further in Part C.VI. The permittee shall monitor for PFOA, PFOS, HFPO-DA and PFBS quarterly at Outfall 001. The permittee may discontinue monitoring for PFOA, PFOS, HFPO-DA, and PFBS if the results in 4 consecutive monitoring periods indicate non-detect results at or below Quantitation Limits of 4.0 ng/L for PFOA, 3.7 ng/L for PFOS, 3.5 ng/L for PFBS and 6.4 ng/L for HFPO-DA. When monitoring is discontinued, permittees must enter a No Discharge Indicator (NODI) Code of "GG" on DMRs.

There are no representative stream gages in the vicinity of the outfall. USGS StreamStats was used to model the flow. River Mile Index (RMI) values were obtained using the Department's eMapPA, drainage areas were delineated using USGS's

Summary of Review

StreamStats interactive map, and elevations were obtained using the elevation profile tool on StreamStats. Modeling can be seen starting on page 13 of this fact sheet.

The permit application identifies one combined sewer overflow (CSO), Outfall: 002. The location of the CSO is listed in the table in Part A.I.D. in the draft NPDES Permit. The 2023 Chapter 94 Municipal Waste Load Management Annual Report and the 2017 LTCP Update both provide additional information about the CSO. The reports state that the CSO is only utilized during a heavy rain event or large snow melt to prevent overflow or flooding at the Wyoming Street Pump Station and/or hydraulic overloading at the WWTP. The CSO discharges to an abandoned string mine off Wyoming Street in Foster Township.

The CSO diversion structure was originally installed in 1985 and was operated manually. The CSO structure was re-constructed and automated as part of the WWTP upgrades project completed in 2014. The CSO has an automated sluice gate controlling bypass flows, a floatable screening device, upstream and downstream flow meters, and is incorporated into the new WWTP SCADA System. A chlorinator system was added to the CSO in 2017 to disinfect bypass flow. The language from the previous permit regarding the Standard Operating Procedures for operation of the proposed sluice gate have been maintained in Part C of this permit.

The Authority is following the Presumption Approach by capturing for treatment at the WWTP no less than 85% by volume of the combined sewage collected during precipitation events on a system-wide annual average basis. Flow metering data was collected, and capture rates were calculated. The capture rates can be seen below:

ANNUAL CAPTURE RATES OF SUBAREA 3 & 4 FLOW
"PRESUMPTION" APPROACH

YEAR	SA 3 & SA 4 ANNUAL FLOW[1] (MGD)	CSO BY PASS ANNUAL FLOW (MGD)	CAPTURE RATE[5]	ANNUAL PRECIPITATION[4]
2014[2]	33.1	23.9	27.8%	40.2
2015	35.9	4.4	87.7%	35.9
2016[3]	37.3	3.0	92.0%	43.5

These results are discussed further in the 2017 LTCP Update. This is also the latest LTCP Update received from the Authority. This report indicates the authority is meeting the 85% required capture rate.

The previous NPDES Permit Part C.IV.H. – Combined Sewer Overflow Compliance Schedule required a Post-Construction Monitoring Plan to be submitted with the next permit renewal application. A Post Construction Plan was not submitted with the application. This plan will be required to be submitted 3 months after the permit effective date of the final renewed permit.

Permit special conditions regarding CSOs are in accordance with the Department's "Pennsylvania Combined Sewer Overflow Policy" (Document No. 385-2000-011, dated March 9, 2013). Per the guidance, the requirements for "Small CSO Systems" are applicable.

The previous permit included a special condition requiring Whole Effluent Toxicity (WET) testing. Based on the results of the WET testing, there is no reasonable potential for the effluent to cause toxicity. The permit includes the Part C condition for permits without WET limits. (See WET evaluation on pages 11-13 of this Fact Sheet)

The existing permit expired on March 31, 2021 and the application for renewal was received on time.

A Water Management System Inspection query indicated that on February 16, 2024 a Partial/ Routine inspection was performed.

There are currently no open violations for this client that warrant withholding issuance of this permit.

Sludge use and disposal description and location(s): As per the permittee's Sewage Sludge and Biosolids Supplemental Report forms, sludge is hauled to the Greater Hazelton WWTF in Hazelton, PA by Biros Disposal and to Alliance Landfill in Taylor, PA by Prestige Disposal.

Summary of Review

Public Participation

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	1.2
Latitude	41º 1' 44.14"	Longitude	-75º 53' 39.90"
Quad Name	Freeland	Quad Code	1038
Wastewater Description:	Sewage Effluent		
Receiving Waters	Pond Creek (HQ-CWF)	Stream Code	4216
NHD Com ID	26280575	RMI	8.86 (Outfall 001) 5.83 (POFU)
Drainage Area	5.42 mi^2 at POFU	Yield (cfs/mi^2)	0.126
Q_{7-10} Flow (cfs)	0.683	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	1,609	Slope (ft/ft)	-
Watershed No.	2-A	Chapter 93 Class.	HQ-CWF
Existing Use	-	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Impaired		
Cause(s) of Impairment	Metals, pH,		
Source(s) of Impairment	Acid Mine Drainage		
TMDL Status	Final	Name	Lehigh River TMDL and Pond Creek, Sandy Run, and Unnamed Tributary 04226 to Sandy Run TMDL
Nearest Downstream Public Water Supply Intake	Hazleton City Water Authority		
PWS Waters	Lehigh River	Flow at Intake (cfs)	-
PWS RMI	62.9	Distance from Outfall (mi)	~ 16.3

Treatment Facility Summary

Treatment Facility Name: Borough of Freeland Municipal Authority

WQM Permit No.	Issuance Date	
4010401	7/26/2010	Expansion/upgrade of existing WWTP to 1.2 MGD and upgrade/replacement of CSO structure
4010401 A-1	7/7/2022	New dewatering screw press, new polymer preparation system, new dewatered cake solids conveyance system, and other associated equipment
4010401 A-2	6/12/2025	Replacement of pumps and pump discharge pipe, new filtrate drain line, replacement of 15 LF of 2.5-inch force main with 4-inch pipe, and new level sensing equipment and valves

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Activated Sludge	Ultraviolet	1.2

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
1.73	4,083	Not Overloaded	Aerobic digestors and screw press	Hauled

Compliance History

DMR Data for Outfall 001 (from June 1, 2024 to May 31, 2025)

Parameter	MAY-25	APR-25	MAR-25	FEB-25	JAN-25	DEC-24	NOV-24	OCT-24	SEP-24	AUG-24	JUL-24	JUN-24
Flow (MGD) Average Monthly	1.113	0.443	0.567	0.372	0.433	0.563	0.371	0.292	0.316	0.629	0.301	0.374
Flow (MGD) Daily Maximum	2.718	0.66	1.272	0.734	0.813	1.617	0.659	0.38	0.399	2.871	0.487	0.987
pH (S.U.) Minimum	6.24	6.52	6.57	6.74	6.5	6.18	6.35	6.48	6.78	6.44	6.98	6.61
pH (S.U.) Maximum	6.95	6.95	7.11	7.76	6.98	6.78	7.15	7.31	7.43	7.23	7.30	7.47
DO (mg/L) Minimum	5.48	5.63	5.5	6.02	5.88	5.36	5.43	6.52	6.4	5.98	5.55	6.25
TRC (mg/L) Instantaneous Maximum	GG	GG	GG	GG	GG	GG	GG	GG	GG	GG	GG	GG
CBOD5 (lbs/day) Average Monthly	< 17	< 10	< 16	13	14	< 17	12	< 7	< 6	< 11	< 6	< 6
CBOD5 (lbs/day) Weekly Average	< 25	16	19	17	30	19	20	10	< 7	19	10	< 7
CBOD5 (mg/L) Average Monthly	< 2	< 3	< 3	4	4	< 5	4	< 3	< 2	< 3	< 2	< 2
CBOD5 (mg/L) Weekly Average	< 2	5	4	5	5	7	5	4	< 3	4	4	< 2
BOD5 (lbs/day) Influent Average Monthly	906	818	954	1087	902	983	996	943	1002	944	998	959
BOD5 (lbs/day) Influent Weekly Average	1016	933	1069	1479	1079	1130	1104	1007	1061	1045	1430	994
BOD5 (mg/L) Influent Average Monthly	128	233	209	337	264	255	339	371	352	231	388	333
BOD5 (mg/L) Influent Weekly Average	142	296	261	479	392	342	429	417	366	292	415	375
TSS (lbs/day) Average Monthly	< 26	< 11	< 15	< 14	19	< 23	15	< 8	< 9	< 16	< 8	< 9
TSS (lbs/day) Influent Average Monthly	717	430	519	641	551	543	493	458	468	521	433	444

TSS (lbs/day) Influent Weekly Average	911	477	601	947	693	677	608	512	495	721	829	467
TSS (lbs/day) Weekly Average	< 37	< 13	< 19	15	36	45	23	< 9	< 9	31	< 10	< 11
TSS (mg/L) Average Monthly	< 3	< 3	< 3	< 4	5	< 5	< 5	< 3	< 3	< 4	< 3	< 3
TSS (mg/L) Influent Average Monthly	92	123	114	201	158	142	167	180	165	123	164	155
TSS (mg/L) Influent Weekly Average	113	147	148	306	257	186	205	199	170	141	204	177
TSS (mg/L) Weekly Average	< 3	4	< 4	5	6	8	7	4	< 3	6	< 4	< 3
Total Dissolved Solids (lbs/day) Average Monthly			2338			1828			1587			4795
Total Dissolved Solids (mg/L) Average Monthly			530			748			618			446
Fecal Coliform (CFU/100 ml) Geometric Mean	2	< 1	< 2	< 1	< 1	3	< 2	< 1	< 1	< 2	< 3	< 1
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	13	3	8	4	2	15	8	5	3	17	33	2
Nitrate-Nitrite (lbs/day) Average Monthly	87	25	0.9	25	33	57	52	38	61	71	33	25
Nitrate-Nitrite (mg/L) Average Monthly	6.95	6.78	0.24	8.75	7.44	20	22.2	15.5	20.6	16.32	12.86	7.06
Total Nitrogen (lbs/day) Average Monthly	121	77	72	52	64	71	68	43	67	94	36	29
Total Nitrogen (mg/L) Average Monthly	9.65	20.98	19.24	18.25	14.44	24.9	29	17.4	22.7	21.52	14.16	8.16
Ammonia (lbs/day) Average Monthly			23			0.3			0.4			126
Ammonia (mg/L) Average Monthly			5.2			0.13			0.16			12
TKN (lbs/day) Average Monthly	34	52	71	27	31	14	16	5	6	23	3	4
TKN (mg/L) Average Monthly	2.7	14.2	19	9.50	7	4.9	6.8	1.9	2.1	5.2	1.30	1.1

Total Phosphorus (lbs/day) Average Monthly	11	10	5	7	1	9	13	13	13	22	14	2
Total Phosphorus (mg/L) Average Monthly	0.85	2.65	1.3	2.30	0.3	3.05	5.5	5.5	4.55	4.95	5.60	0.5
Total Aluminum (lbs/day) Average Monthly						< 0.5						
Total Aluminum (lbs/day) Daily Maximum						< 0.5						
Total Aluminum (mg/L) Average Monthly						< 0.1						
Total Aluminum (mg/L) Daily Maximum						< 0.1						
Total Copper (lbs/day) Average Monthly			< 0.2			< 0.1			0.03			0.04
Total Copper (lbs/day) Daily Maximum			< 0.2			< 0.1			0.03			0.04
Total Copper (mg/L) Average Monthly			< 0.05			< 0.05			0.011			0.004
Total Copper (mg/L) Daily Maximum			< 0.05			< 0.05			0.011			0.004
Total Iron (lbs/day) Average Monthly						< 0.5						
Total Iron (lbs/day) Daily Maximum						< 0.5						
Total Iron (mg/L) Average Monthly						< 0.1						
Total Iron (mg/L) Daily Maximum						< 0.1						
Total Manganese (lbs/day) Average Monthly						0.3						
Total Manganese (lbs/day) Daily Maximum						0.3						
Total Manganese (mg/L) Average Monthly						0.064						

Total Manganese (mg/L) Daily Maximum						0.064						
Bis(2-Ethyl-hexyl)Phthalate (lbs/day) Average Monthly			< 0.01			< 0.007			< 0.04			< 0.03
Bis(2-Ethyl-hexyl)Phthalate (lbs/day) Daily Maximum			< 0.01			< 0.007			< 0.04			< 0.03
Bis(2-Ethyl-hexyl)Phthalate (mg/L) Average Monthly			< 0.00294			< 0.00306			< 0.0144			< 0.00291
Bis(2-Ethyl-hexyl)Phthalate (mg/L) Daily Maximum			< 0.00294			< 0.00306			< 0.0144			< 0.00291

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 1.2
Latitude 41º 1' 38.10" **Longitude** -75º 53' 38.50"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

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

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25.0	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40.0	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
	50.0	IMAX	-	-
Total Suspended Solids	30.0	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45.0	Average Weekly	133.102(b)(2)	92a.47(a)(2)
	60.0	IMAX	-	-
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)
E. Coli	Report	IMAX	-	92a.61
Dissolved Oxygen	5.0	Minimum	-	BPJ

Water Quality-Based Limitations/BPJ

The following limitations were determined through water quality modeling (output files attached):

Parameter	Limit (mg/l)	SBC	Model
Ammonia-Nitrogen Nov 1 - Apr 30	6.78	Average Monthly	WQM 7.0
	13.56	IMAX	
Ammonia-Nitrogen May 1 - Oct 31	2.26	Average Monthly	
	4.52	IMAX	
Total Residual Chlorine (TRC)	0.046	IMAX	TRC Calculation Spreadsheet
Total Zinc	0.12	Average Monthly	Toxic Modeling Spreadsheet (TMS)
	0.16	Daily Maximum	
	0.16	IMAX	
Free Cyanide (µg/L)	5.47	Average Monthly	
	8.54	Daily Maximum	
	13.7	IMAX	
Biochemical Oxygen Demand (BOD5) - Influent	Report	Average Monthly	POTW Standard Requirement
Total Suspended Solids - Influent	Report	Average Monthly	
Nitrate-Nitrite as N	Report	Average Monthly	Previous Permit
Total Nitrogen	Report	Average Monthly	
Total Kjeldahl Nitrogen	Report	Average Monthly	
Total Phosphorus	Report	Average Monthly	
Total Dissolved Solids	1,000	Average Quarterly	DRBC Docket
	2,000	IMAX	
Copper, Total	Report	Average Quarterly	Previous Permit & TMS

Manganese, Total	Report	Average Quarterly	Previous Permit & TMS
Bis(2-Ethylhexyl)Phthalate	Report	Average Quarterly	Previous Permit/Modeling
PFOA (ng/L)	Report	Average Quarterly	EPA Requirement
PFOS (ng/L)	Report	Average Quarterly	
PFBS (ng/L)	Report	Average Quarterly	
HFPO-DA (ng/L)	Report	Average Quarterly	
Aluminum, Total	Report	Annual Average	Previous Permit and TMDL
Iron, Total	Report	Annual Average	

Anti-Backsliding

No limitations were made less stringent.

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: **Annually (2024, 2023, 2022, 2019 Results)**

The dilution series used for the tests was: 100%, 87%, 73%, 37%, and 18%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 73%.

Summary of Four Most Recent Test Results

TST Data Analysis

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

	***Ceriodaphnia* Results (Pass/Fail)**		***Pimephales* Results (Pass/Fail)**	
Test Date	**Survival**	**Reproduction**	**Survival**	**Growth**
August 2024	Pass	Pass	Pass	Pass
July 2023	Pass	Pass	Pass	Pass
August 2022	Pass	Pass	Pass	Pass
February 2019	Pass	Pass	Pass	Pass

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

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

☐ **YES** ☒ **NO**

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):

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

[(1.2 MGD x 1.547) / ((0.683 cfs x 1.0) + (1.2 MGD x 1.547))] x 100 = **73.10%**

Is IWCa < 1%? ☐ **YES** ☒ **NO**

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

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

2. Determine Target IWCc (If Chronic Tests Required)

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

[(1.2 MGD x 1.547) / ((0.683 cfs x 1.0) + (1.2 MGD x 1.547))] x 100 = **73.10%**

3. Determine Dilution Series

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

Dilution Series = 100%, 87%, 73%, 37%, and 18%.

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

WET Summary and Evaluation

Facility Name	Freeland Borough WWTP
Permit No.	PA0024716
Design Flow (MGD)	1.2
Q_{7-10} Flow (cfs)	0.683
PMF_a	1
PMF_c	1

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date

Reasonable Potential? NO

Permit Recommendations

Test Type	Chronic
TIWC	73 % Effluent
Dilution Series	18, 37, 73, 87, 100 % Effluent
Permit Limit	None
Permit Limit Species	

Modeling Using USGS StreamStats Data:

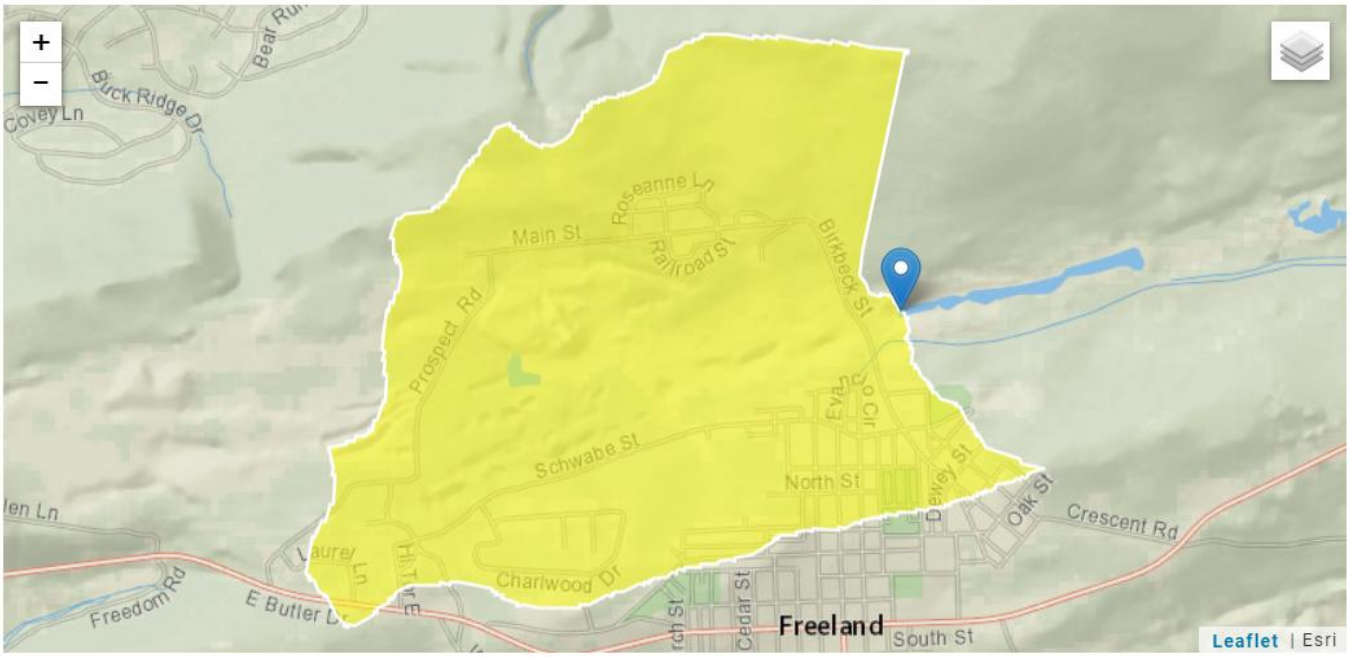
At Outfall 001 on Pond Creek:

RMI	Elevation (ft)	Drainage Area (mi^2)	Q_{7-10} Flow (cfs)
8.859	1,674	1.99	0.513

$$Low\ Flow\ Yield\ using\ StreamStats = \frac{0.513\ ft^3/sec}{1.99\ mi^2} = \mathbf{0.2579}\ \frac{\boldsymbol{ft^3/sec}}{\boldsymbol{mi^2}}$$

StreamStats Report

Region ID:	PA
Workspace ID:	PA20210729172115586000
Clicked Point (Latitude, Longitude):	41.02893, -75.89437
Time:	2021-07-29 13:21:31 -0400



Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	1.99	square miles

Statistic	Value	Unit
7 Day 2 Year Low Flow	1.03	ft^3/s
30 Day 2 Year Low Flow	1.29	ft^3/s
7 Day 10 Year Low Flow	0.513	ft^3/s

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.99	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	45	inches	35	50.4
STRDEN	Stream Density	0.39	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	4.6	feet	3.32	5.65
CARBON	Percent Carbonate	0	percent	0	99

Low-Flow Statistics Disclaimers [Low Flow Region 2]

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

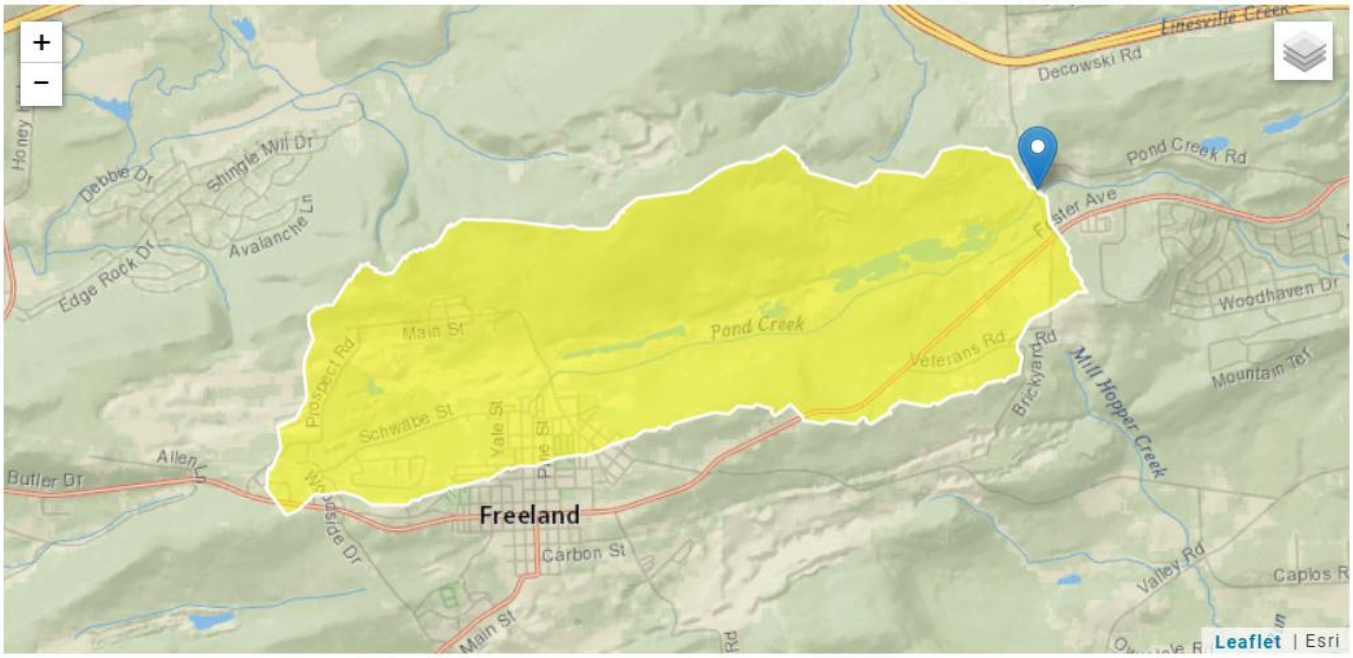
At point of first use on Pond Creek (Oley Bridge Road): 41.042162, -75.844300

RMI	Elevation (ft)	Drainage Area (mi^2)	$Q_{7\text{-}10}$ Flow (cfs)
5.827	1,609	5.42	0.683

$$Low\ Flow\ Yield\ using\ StreamStats = \frac{0.683\ ft^3/sec}{5.42\ mi^2} = \mathbf{0.126}\ \frac{\boldsymbol{ft^3/sec}}{\boldsymbol{mi^2}}$$

StreamStats Report

Region ID: PA
Workspace ID: PA20210729180556797000
Clicked Point (Latitude, Longitude): 41.04216, -75.84432
Time: 2021-07-29 14:06:12 -0400



Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	5.42	square miles

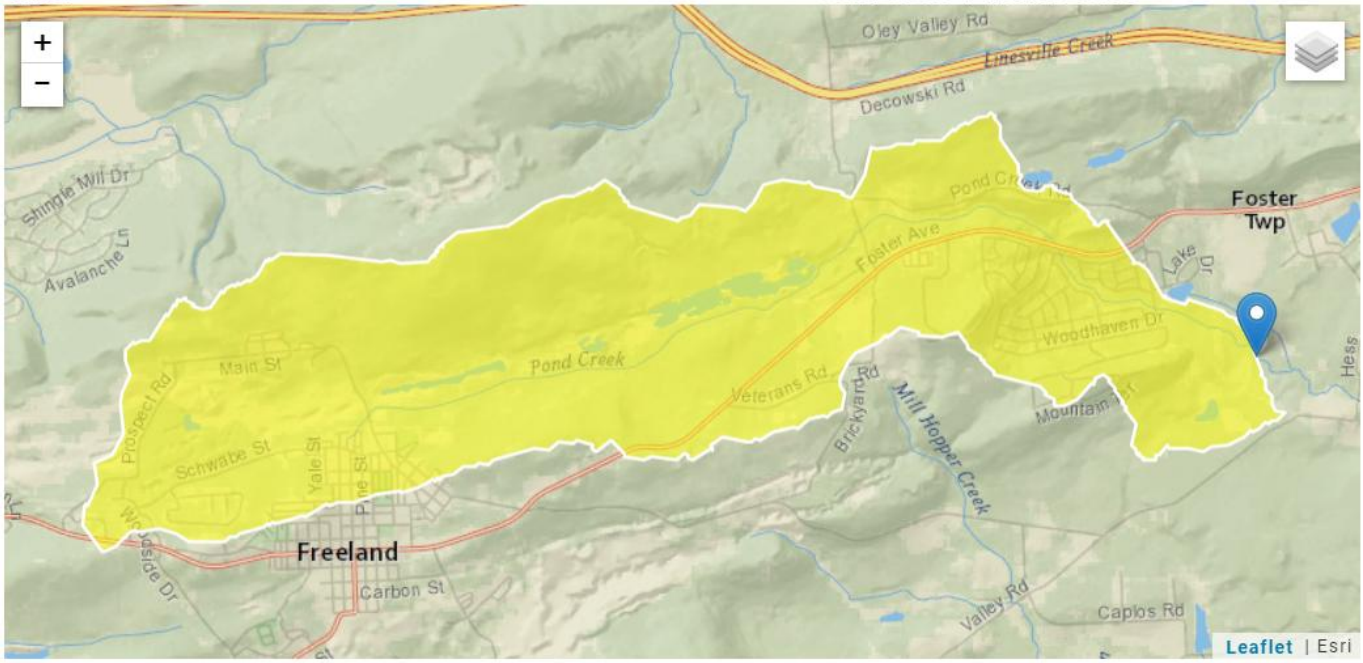
Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	1.4	ft^3/s	38	38
30 Day 2 Year Low Flow	1.82	ft^3/s	33	33
7 Day 10 Year Low Flow	0.683	ft^3/s	51	51

At confluence with Unnamed Tributary 4220 to Pond Creek:

RMI	Elevation (ft)	Drainage Area (mi^2)
3.18	1,317.5	7.51

StreamStats Report

Region ID:	PA
Workspace ID:	PA20210729185542333000
Clicked Point (Latitude, Longitude):	41.03175, -75.80267
Time:	2021-07-29 14:55:59 -0400



Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	7.51	square miles

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
02A	4216	POND 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)
5.827	Freeland Boro	PA0024716	1.200	CBOD5	25		
				NH3-N	2.26	4.52	
				Dissolved Oxygen			4

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.0683	= Q stream (cfs)	0.5	= CV Daily
1.2	= Q discharge (MGD)	0.5	= CV Hourly
30	= no. samples	1	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	1	= CFC_Partial Mix Factor
0	= Chlorine Demand of Discharge	15	= AFC_Criteria Compliance Time (min)
0.5	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)
0	= % Factor of Safety (FOS)		=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 0.031	1.3.2.iii	WLA cfc = 0.022
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.011	5.1d	LTA_cfc = 0.013

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.014	AFC
		INST MAX LIMIT (mg/l) = 0.046	

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)

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Toxics Management Spreadsheet
Version 1.4, May 2025

Discharge Information

Instructions | Discharge | Stream

Facility: Borough of Freeland WWTP NPDES Permit No.: PA0024716 Outfall No.: 001

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

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
1.2	101	6.44						

					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		786									
	Chloride (PWS)	mg/L		266									
	Bromide	mg/L	<	0.2									
	Sulfate (PWS)	mg/L		22.1									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L		23									
	Total Antimony	µg/L		0.4									
	Total Arsenic	µg/L	<	1									
	Total Barium	µg/L		54									
	Total Beryllium	µg/L	<	2									
	Total Boron	µg/L		158									
	Total Cadmium	µg/L	<	0.08									
	Total Chromium (III)	µg/L	<	5									
	Hexavalent Chromium	µg/L	<	0.1									
	Total Cobalt	µg/L		2									
	Total Copper	µg/L		6									
	Free Cyanide	µg/L		3									
	Total Cyanide	µg/L		3.79									
	Dissolved Iron	µg/L		38									
	Total Iron	µg/L		41									
	Total Lead	µg/L	<	1									
	Total Manganese	µg/L		177									
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L	<	4									
	Total Phenols (Phenolics) (PWS)	µg/L	<	4.85									
	Total Selenium	µg/L	<	2									
	Total Silver	µg/L		0.07									
	Total Thallium	µg/L	<	2									
	Total Zinc	mg/L		31.92									
	Total Molybdenum	µg/L	<	5									
	Acrolein	µg/L	<	1									
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<	0.5									
	Benzene	µg/L	<	0.5									
	Bromoform	µg/L	<	0.5									

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	<	0.5										
	Chloroform	µg/L	<	0.5										
	Dichlorobromomethane	µg/L	<	0.5										
	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	<	0.5										
	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	<	0.971										
	2,4-Dichlorophenol	µg/L	<	0.971										
	2,4-Dimethylphenol	µg/L	<	0.971										
	4,6-Dinitro-o-Cresol	µg/L	<	0.971										
	2,4-Dinitrophenol	µg/L	<	2.91										
	2-Nitrophenol	µg/L	<	0.971										
	4-Nitrophenol	µg/L	<	0.971										
	p-Chloro-m-Cresol	µg/L	<	0.971										
	Pentachlorophenol	µg/L	<	0.971										
	Phenol	µg/L	<	4.85										
	2,4,6-Trichlorophenol	µg/L	<	0.971										
Group 5	Acenaphthene	µg/L	<	0.971										
	Acenaphthylene	µg/L	<	0.971										
	Anthracene	µg/L	<	0.971										
	Benzidine	µg/L	<	4.85										
	Benzo(a)Anthracene	µg/L	<	0.971										
	Benzo(a)Pyrene	µg/L	<	0.971										
	3,4-Benzofluoranthene	µg/L	<	0.971										
	Benzo(ghi)Perylene	µg/L	<	0.971										
	Benzo(k)Fluoranthene	µg/L	<	0.971										
	Bis(2-Chloroethoxy)Methane	µg/L	<	0.971										
	Bis(2-Chloroethyl)Ether	µg/L	<	0.971										
	Bis(2-Chloroisopropyl)Ether	µg/L	<	0.971										
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	2.91										
	4-Bromophenyl Phenyl Ether	µg/L	<	0.971										
	Butyl Benzyl Phthalate	µg/L	<	0.971										
	2-Chloronaphthalene	µg/L	<	0.971										
	4-Chlorophenyl Phenyl Ether	µg/L	<	0.971										
	Chrysene	µg/L	<	0.971										
	Dibenzo(a,h)Anthrancene	µg/L	<	0.971										
	1,2-Dichlorobenzene	µg/L	<	0.971										
	1,3-Dichlorobenzene	µg/L	<	0.971										
	1,4-Dichlorobenzene	µg/L	<	0.971										
	3,3-Dichlorobenzidine	µg/L	<	0.138										
	Diethyl Phthalate	µg/L	<	0.971										
	Dimethyl Phthalate	µg/L	<	0.971										
	Di-n-Butyl Phthalate	µg/L	<	2.91										
	2,4-Dinitrotoluene	µg/L	<	0.971										

	2,6-Dinitrotoluene	µg/L	<	0.971										
	Di-n-Octyl Phthalate	µg/L	<	0.971										
	1,2-Diphenylhydrazine	µg/L	<	0.971										
	Fluoranthene	µg/L	<	0.971										
	Fluorene	µg/L	<	0.971										
	Hexachlorobenzene	µg/L	<	0.971										
	Hexachlorobutadiene	µg/L	<	0.081										
	Hexachlorocyclopentadiene	µg/L	<	0.045										
	Hexachloroethane	µg/L	<	0.971										
	Indeno(1,2,3-cd)Pyrene	µg/L	<	0.971										
	Isophorone	µg/L	<	0.971										
	Naphthalene	µg/L	<	0.971										
	Nitrobenzene	µg/L	<	0.971										
	n-Nitrosodimethylamine	µg/L	<	0.971										
	n-Nitrosodi-n-Propylamine	µg/L	<	0.971										
	n-Nitrosodiphenylamine	µg/L	<	0.971										
	Phenanthrene	µg/L	<	0.971										
	Pyrene	µg/L	<	0.971										
	1,2,4-Trichlorobenzene	µg/L	<	0.0924										

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Toxics Management Spreadsheet
Version 1.4, May 2025

Stream / Surface Water Information

Borough of Freeland WWTP, NPDES Permit No. PA0024716, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: Pond Creek

No. Reaches to Model: 1

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

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	004216	5.827	1609	5.42			Yes
End of Reach 1	004216	3.18	1317.5	7.51			Yes

Q_{7-10}

Location	RMI	LFY (cfs/mi²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	5.827	0.126										100	7		
End of Reach 1	3.18	0.126													

Q_h

Location	RMI	LFY (cfs/mi²)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	5.827														
End of Reach 1	3.18														

☑ *AFC*	CCT (min): 0.359	PMF: 1	Analysis Hardness (mg/l): 100.73	Analysis pH: 6.53
☑ *CFC*	CCT (min): 0.359	PMF: 1	Analysis Hardness (mg/l): 100.73	Analysis pH: 6.53
☑ *THH*	CCT (min): 0.359	PMF: 1	Analysis Hardness (mg/l): N/A	Analysis pH: N/A
☑ *CRL*	CCT (min): 1.375	PMF: 1	Analysis Hardness (mg/l): N/A	Analysis pH: N/A

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

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Copper	Report	Report	Report	Report	Report	µg/L	12.8	CFC	Discharge Conc > 10% WQBEL (no RP)
Free Cyanide	0.055	0.085	5.47	8.54	13.7	µg/L	5.47	THH	Discharge Conc ≥ 50% WQBEL (RP)
Total Manganese	Report	Report	Report	Report	Report	µg/L	1,368	THH	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	1.21	1.65	0.12	0.16	0.16	mg/L	0.12	AFC	Discharge Conc ≥ 50% WQBEL (RP)

TMS PA0024716 Updated 7-2-2025.p

WQM 7.0 - Freeland.pdf

DRBC Docket 1965-052 CP-5.pdf