Pennsylvania Department of Environmental Protection

Southwest Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Amendment, Major**	Application No.	**PA0027570 A-1**
Facility Type	**Municipal**	APS ID	**1131880**
Major / Minor	**Major**	Authorization ID	**1517406**

Applicant and Facility Information

Applicant Name	**Western Westmoreland Municipal Authority**	Facility Name	**Brush Creek STP**
Applicant Address	12441 Route 993 North Huntingdon, PA 15642-4264	Facility Address	12441 Route 993 North Huntingdon, PA 15642-4264
Applicant Contact	Stanley A. Gorski Jr.	Facility Contact	***same as applicant***
Applicant Phone	(724) 864-0452	Facility Phone	***same as applicant***
Applicant Email	sgorski@wwmaweb.com	Facility Email	***same as applicant***
Client ID	65426	Site ID	263851
Ch 94 Load Status	Projected Hydraulic Overload	Municipality	North Huntingdon Township
Connection Status	Dept. Imposed Connection Prohibitions	County	Westmoreland
Date Application Received	February 19, 2025	EPA Waived?	No
Date Application Accepted	February 26, 2025	If No, Reason	Major Facility
Purpose of Application	Removal of interim reporting requirements, final effluent limits, and schedule of compliance for Free Cyanide.		

Summary of Review

On December 8, 2023, DEP issued NPDES Permit PA0027570 to the Western Westmoreland Municipal Authority (WWMA) for discharges of treated sewage from WWMA's Brush Creek STP. The permit took effect on January 1, 2024. Among other things, the permit imposed new water quality-based effluent limits (WQBELs) for Free Cyanide subject to a three-year schedule of compliance with interim reporting requirements and final limits of 4.52 µg/L average monthly and 7.05 µg/L maximum daily due to take effect in 2026. The schedule of compliance in the permit required WWMA to perform site-specific data collection studies to collect data to refine the accuracy of the WQBELs, and a Toxics Reduction Evaluation (TRE) to identify the source(s) of Free Cyanide and to evaluate options to eliminate those sources and options to provide treatment for Free Cyanide.

On February 17, 2025, on behalf of WWMA, Herbert, Rowland & Grubic, Inc. (HRG) submitted a TRE Report that includes an influent and effluent quality review, a source inventory evaluation, source reduction evaluation, and effluent limits verification discussion. The TRE Report was accompanied by an NPDES Permit Amendment Application requesting to remove the requirements for Free Cyanide from the permit.

Based on the TRE Report (see excerpt in **Attachment A** to this Fact Sheet) and its supporting documentation, DEP agrees that elevated concentrations of Free Cyanide reported in the effluent upon which the previously calculated WQBELs were based are attributable to laboratory interference and sample preservation methods. DEP re-modeled the discharge using WWMA's unpreserved post-chlorination results and determined that no WQBELs or reporting requirements are necessary for Free Cyanide (see **Attachment B**). Based on the TRE Report and its supporting documentation, the Free Cyanide WQBELs due to take effect in 2026, the interim reporting requirements for Free Cyanide, and the associated schedule of compliance requirements (Part C, Condition III) will be removed from the permit in accordance with the exception to anti-backsliding given in Section 402(o)(2)(B)(i) of the Clean Water Act (33 U.S.C. 1342(o)(2)(B)(i)) regarding new information that justifies the application of less stringent effluent limitations.

Approve	Return	Deny	Signatures	Date
✓			Ryan C. Decker Ryan C. Decker, P.E. / Environmental Engineer	May 20, 2025
✓			Mahbuba Iasmin Mahbuba Iasmin, Ph.D., P.E. / Environmental Engineer Manager	May 21, 2025

Summary of Review

Public Participation

The changes to the permit do not qualify as minor modifications under 40 CFR § 122.63. Therefore, 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.

ATTACHMENT A

Excerpt from
WWMA's Toxics Reduction Evaluation Report

INTRODUCTION

Western Westmoreland Municipal Authority (WWMA) wastewater treatment plant (WWTP) received their National Pollutant Discharge Elimination System (NPDES) Permit Renewal (PA0027570) on December 8, 2023. According to Part C Section III.A of the NPDES permit, the Final Water Quality Based Effluent Limitations (WQBELs) for free cyanide should not exceed a monthly average of 4.52 micrograms per liter (ug/L) and a maximum daily value of 7.05 ug/L starting November 1, 2026. As described in Part C Section III.D, WWMA is required to submit a Phase I Toxics Reduction Evaluation (TRE) Report to the Pennsylvania Department of Environmental Protection (PADEP) to investigate free cyanide.

A TRE work plan was submitted to PADEP on May 14, 2024, in advance of the deadline described in the NPDES permit. The TRE workplan outlined three (3) main hypotheses that WWMA would investigate as part of this TRE. This Report details all activities to identify and address sources of free cyanide in WWMA's effluent.

SERVICE AREA DESCRIPTION

WWMA's service area is located in Westmoreland County, comprised of North Huntingdon, Irwin Borough, Penn Township, Manor Borough, Hempfield Township, and North Irwin Borough. Member municipalities own, operate, and maintain their respective sewer collection systems.

WWMA serves approximately 16,469 equivalent dwelling units, including residential, commercial, and industrial users. WWMA owns and operates approximately 7.5 miles of interceptor sewers, which include the following interceptors: Brush Creek, Bushy Run, Manor, and Paintertown.

TREATMENT PLANT DESCRIPTION

The Brush Creek WWTP is located at 12441 Route 993, North Huntington, Pennsylvania. The WWTP has a permitted hydraulic capacity of 4.4 million gallons per day (MGD) and an organic design capacity of 7,490 pounds (lbs.) of 5-day biological oxygen demand (BOD_5) per day and discharges into Brush Creek at Outfall 001. In 2024, the annual average flow was 3.24 MGD with an annual average organic loading of 3,753 lbs-BOD_5/day.

The WWTP provides preliminary and primary treatment, as well as disinfection and sludge processing. The process flow diagram is included in Exhibit 1. The WWTP utilizes a fine mechanically cleaned bar screen, grit collection, primary clarification, fine bubble aeration, final clarification, and chlorine disinfection. The WWTP also utilizes a 7 MGD equalization tank for wet weather flow events. Anaerobic digestors, a gravity thickener, and a centrifuge are used to process solids.

The WWTP was originally designed for contact stabilization, but since 2021, the WWTP operates in the conventional activated sludge mode. The process change was made to address elevated ammonia-nitrogen concentrations and WET test failures per the TRE completed in 2021.

NPDES PERMIT RENEWAL

As part of the NPDES Permit Renewal Application, Groups 1-5 pollutants were tested per NPDES instructions with one (1) sample of the influent and three (3) samples of the effluent. On May 10, 2023,

PADEP provided a draft NPDES permit in which new pollutants were proposed for weekly effluent monitoring. WWMA requested time to collect seven (7) additional samples to provide a total of ten (10) samples for use in PADEP Toxics Management Spreadsheet. PADEP issued the final NPDES permit to include one (1) WQBEL and weekly reporting of free cyanide which triggered the TRE and WQBEL Compliance Report requirements outlined in Part C Section III of the NPDES permit.

INFLUENT AND EFFLUENT QUALITY REVIEW

Phase I of the TRE requires an evaluation and identification of pollutants entering and leaving the WWTP. As such, a historic data review and sampling plan were performed to identify and confirm pollutants.

HISTORICAL DATA REVIEW

The following section summarizes historical data and findings regarding free cyanide. Historic sampling occurred from 2021 to 2023 as part of the NPDES renewal process and included one (1) influent sample and ten (10) effluent samples. Since January 2024, the Authority has sampled weekly for free cyanide in the effluent per the new NPDES permit. All historic influent and effluent data from Pace Laboratory between August 2021 and August 2024 are summarized in Exhibit 2.

SAMPLING PLAN AND RESULTS

As outlined in the TRE Work Plan submitted on May 14, 2024, three (3) hypotheses were investigated over the course of the TRE sampling period. These hypotheses include:

- Plant Operations: Investigate whether free cyanide is being produced within the WWTP by sampling the plant influent and effluent.
- Chlorination Processes: Given that chlorination processes are possibly associated with free cyanide, the TRE will investigate this by comparing pre-chlorination and post-chlorination samples.
- Lab Interference/Preservation of Samples: Some research suggests that sample preservation methods can contribute to higher cyanide levels ["Factors Affecting Cyanide Generation in Chlorinated Wastewater Effluent Matrix"]. The TRE will investigate this hypothesis further if plant operation and maintenance investigations are inconclusive.

Hypothesis 1: Plant Operations

WWMA collected and analyzed nineteen (19) samples in 2024 from both the influent and effluent. The results are shown in Figure 1.

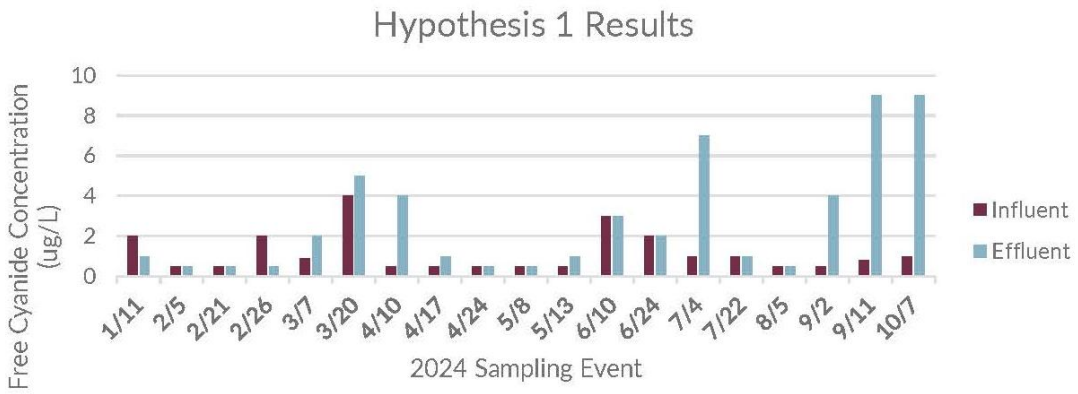

Figure 1: Influent and Effluent Results from January through October 2024.

Figure 1 shows no consistent trend. Two (2) sampling events had influent results greater than effluent results; eight (8) sampling events had influent results equal to those of the effluent; and nine (9) sampling events had influent results less than the effluent results. The results indicate that there could be intermittent free cyanide production within the plant or that the sampling and analysis procedures could affect free cyanide levels in the effluent. The results were considered inconclusive and WWMA proceeded with Hypothesis 2.

Hypothesis 2: Chlorination Processes

In August, WWMA began to investigate whether the chlorination process was the cause of free cyanide production, given numerous studies that show free chlorine reacts with compounds (e.g., thiocyanate) in the effluent to produce free cyanide. Four (4) sampling events were conducted to test this hypothesis by sampling before (pre-chlorination) and after (post-chlorination) within the chlorine contact tank. Pre-chlorination samples were preserved with NaOH and analyzed within fourteen (14) days. Post-chlorination samples were preserved with NaOH, dechlorinated with sodium arsenite, and analyzed with fourteen (14) days. The results are summarized in Table 1. Note that a different lab, Eurofins, was used for these analyses, as they were able to concurrently do the rushed samples in Hypothesis 3.

TABLE 1- HYPOTHESIS 2 RESULTS

Sample	Sample Collection Date	Eurofins Lab OIA-1677 (QL= 0.79 ug/L)	
		Pre-Chlor Preserved	Post-Chlor Preserved
1[1]	8/14/24	2.40	0.93
2	8/19/24	1.00	2.00
3	8/28/24	0.87	2.20
4	9/11/24	1.30	1.80

[1] Experiment 1 had inadvertently left out the sodium arsenite, and the preserved post-chlorination sample was lower than expected.

In three (3) of the four (4) samples analyzed, the preserved post-chlorination free cyanide was higher than the preserved pre-chlorination. The exception was Sample 1, in which sodium arsenite was inadvertently

left out of the post chlorination sample. From this data, it appears free chlorine, and/or free chlorine combined with other factors could influence free cyanide levels in the effluent.

Hypothesis 3: Lab Interference/Preservation of Samples

Hypothesis 3 investigates lab interferences due to the combination of chloramination, dechlorination with sodium arsenite, and pH adjustment with NaOH. This hypothesis followed a WEF Manuscript titled "Factors Affecting Cyanide Generation in Chlorinated Wastewater Effluent Matrix" (See Appendix B) which was conducted in Los Angeles County. WWMA investigated this lab interference in parallel with Hypothesis 2.

To test this hypothesis, WWMA sent samples to two (2) different certified labs. Pace Labs has been utilized for NPDES permit requirements and references using method OIA-1677-09 (Appendix C). Eurofins reports Method OIA 1677 (Appendix C) was utilized to test rushed samples, as it was the only laboratory that could analyze samples within a 24-hour period. After collecting two (2) post-chlorination effluent samples at the same time, one sample was preserved with NaOH and sodium arsenite and another was analyzed within 24-hours with sodium arsenite as a dechlorinating agent but without NaOH as a preservative. All samples from both labs during the testing period are summarized in Table 2, including preserved and rushed influent, preserved pre-chlorination, and preserved and rushed post-chlorination.

TABLE 2 - SAMPLING PLAN RESULTS

Sample	Sample Collection Date	Pace Labs OIA-1677-09 (QL= 0.50 ug/L)		Eurofins Lab OIA-1677 (QL= 0.79 ug/L)				
		Influent Preserved	Post-Chlor Preserved	Influent Preserved	Influent Rushed	Pre-Chlor Preserved	Post-Chlor Preserved	Post-Chlor Rushed
1[1]	8/14/24	-	1.00	-	-	2.40	0.93	1.20
2	8/19/24	-	1.00	-	-	1.00	2.00	<0.79
3	8/28/24	-	<0.50	-	-	0.87	2.20	<0.79
4	9/2/24	<0.50	4.00	-	-		2.60	<0.79
5	9/11/24	0.80	9.00	-	-	1.30	1.80	<0.79
6	10/30/24	-	6.00	-	-	<0.79	1.30	<0.79
7	11/4/24	-	5.00	-	-	<0.79	<0.79	<0.79
8	11/13/24	4.00	5.00	<0.79	<0.79	<0.79	2.00	<0.79
9	11/18/24	<0.50	5.00	0.92	<0.79	<0.79	1.50	<0.79
10	11/25/24	1.00	8.00	<0.79	<0.79	<0.79	1.50	<0.79

[1] Experiment 1 had inadvertently left out the sodium arsenite, and the preserved post-chlorination sample was lower than expected.

The rushed post-chlorination samples (Eurofins, Method 1677) were consistently non-detect, except for Sample 1, while the preserved post-chlorination samples were detected above the 0.79 µg/L quantitation limit (QL) except for Sample 7. In addition, Samples 6-10 of the preserved pre-chlorination were non-detect, while the corresponding preserved post-chlorination Samples 7, 8-10 detected free cyanide. Last, a consistent variance between the two laboratories was observed. The Pace Lab preserved post-chlorination results were significantly higher despite having the same sampling event.

Overall, these results are consistent with research findings that indicate that elevated cyanide levels are the result of test interferences due to the combination of chloramination; dechlorination with sodium arsenite; pH adjustment with NaOH; and the presence of precursors that generate cyanide under strong basic conditions. Cyanide formation from NaOH addition is discussed in Standard Methods (23rd Edition), but EPA OIA methods do not state anything about cyanide formation.

The results also demonstrated an inconsistency between laboratories. Pace Labs subs free cyanide to Suburban Testing Laboratories which had referenced EPA OIA Method 1677-09 and Eurofins had referenced EPA OIA Method 1677. These two testing methods are included in Appendix C. The two methods were compared and differences were found (Table 3). Thus, HRG and WWMA are attributing the result differences between laboratories to lab interferences and different preservation methods between the two OIA 1677 methods.

TABLE 3 - FREE CYANIDE TESTING METHODS

Method	Preserved (>24-Hours)	Unpreserved (Rush, <24-Hours)
EPA OIA Method 1677-09	Add NaOH for pH adjustment with 1 drop of 10 M per vial Add 0.1-g/L sodium arsenite for preservation Add 0.6-g/L ascorbic acid for dechlor Max 14 day holding time	Add NaOH for pH adjustment with 1 drop of 10 M per vial Add 0.6-g/L ascorbic acid for dechlor
Method OIA-1677	Add 0.6g ascorbic acid per liter of sample for dechlor Max 14 day holding time	Nothing added <24 hour holding time
Eurofins*	NaOH for pH adjustment Add 0.25g sodium arsenite for dechlor Max 14 day holding time	0.25g sodium arsenite Max 7-day holding time OR 0.06 g ascorbic acid for <24 hour holding time Samples not preserved to pH >12 have a max 7-day holding time
Standard Methods 23rd Edition, Section 4500-CN-B	Add 0.1-g/L sodium arsenite for dechlor Add NaOH	Add 0.1-g sodium arsenite for dechlor

*Eurofins used sodium arsenite for dechlorination of WWMA samples.

Given method 1677-09 and 1677 have slightly different additives and approaches, HRG requested from both laboratories their additives and their standard operating procedures to include in this report. Pace Laboratories subs their free cyanide testing to Suburban Testing Laboratories which had declined to provide their SOP but stated that they would provide upon DEP's request. Based on the chain of custody, Pace added NaOH to preserved samples, however, it was unable to be confirmed if anything else was added in the laboratory for dechlorination. Eurofins provided their sample collection and pretreatment instructions and their SOP which is included in Appendix C for reference.

SOURCE INVENTORY EVALUATION

The Source Inventory Evaluation was conducted as part of this Report per the PADEP Guidance Document 361-0100-003. The evaluation investigated potential sources of pollutants, including industrial and commercial contributors and other potential sources (e.g., WWTP operations and maintenance, public water suppliers, etc.).

INDUSTRIAL CONTRIBUTORS

WWMA owns and maintains the Brush Creek WWTP and the four (4) interceptors conveying flow to the plant. A list of the largest industrial users within the area served by the WWMA is included in Table 5. The estimated annual usage data is from the WWMA 2024 Chapter 94 Report.

TABLE 5 – LARGEST INDUSTRIAL CUSTOMERS IN WWMA SERVICE AREA

Name of Customer	Estimated Annual Usage (gallons)
Waste Management (Valley Landfill)	28,185,672
8850 Barnes Lake Road, LLC (Health Care Facility)	3,481,000
Golden Heights	2,236,000
Penn-Trafford High School	2,090,000
PA Commercial	1,912,000
Irwin Hotel Associates, LP (Hampton Inn)	1,903,000
Norwin School District (High School)	1,639,000
Giant Eagle	1,635,000
Walmart	1,380,000
Allcity/Holiday Inn	1,333,000
Total	**45,794,672**

Valley Landfill

Valley Landfill is owned by Waste Management and located in Irwin, Pennsylvania. The landfill accepts non-hazardous waste for disposal and operates under PA DEP Solid Waste Permit #100280.

WWMA and Valley Landfill are collaborating to determine a solution to the elevated ammonia levels. As part of ongoing collaboration and operational adjustments by both parties, Valley Landfill has implemented aeration on their site in an effort to further decrease the ammonia levels. Both WWMA and Valley Landfill will continue to monitor the results of joint efforts to address ammonia related issues and WET test requirements. Given the findings of the sampling plan discussed above, Valley Landfill and other industrial contributors are not suspected of contributing to elevated free cyanide levels.

OTHER SOURCES

Other sources of pollutants per the PADEP guidance include WWTP operations and maintenance practices, public water supply, and miscellaneous sources and were evaluated as part of this TRE.

WWTP Operations and Maintenance

WWMA's WWTP operation and maintenance includes chemical addition and dewatering using the centrifuge. Disinfection occurs through the process of chlorine gas being combined with carrier water and then piped into the chlorine contact tank in order to treat the flow before exiting the WWTP via Outfall 001. Additionally, WWMA utilizes magnesium hydroxide in order to reduce ammonia-nitrogen levels in the plant. The magnesium hydroxide is fed into the primary effluent at the head of the aeration basins.

As shown in Exhibit 1, typical effluent sampling occurs after the chlorine contact tank after the water has been treated through chlorine disinfection before Outfall 001. For the purposes of this report, samples were taken before and after the chlorine contact tank to evaluate the hypotheses. The sampling locations used are labeled as "Pre-Chlor" and "Post-Chlor" on Exhibit 1.

The WWTP operates in the conventional activated sludge mode due to issues previously encountered with contact stabilization, such as elevated ammonia-nitrogen concentrations and WET test failures. Due to the historic elevated ammonia-nitrogen concentrations at the WWTP, WWMA performed a historic data review to determine if there was a correlation between cyanide and ammonia-nitrogen levels. In this review, there was no trend found between these two data sets.

Based on the results discussed previously, additional testing for O&M investigations was not performed as it was determined that the elevated free cyanide was a result of laboratory interference and sample preservation methods, and not a result of WWTP operations.

Public Water Supply

Public water supply can provide pollutants through water treatment plant (WTP) sludge discharges and metal corrosion in the distribution system. WWMA customers are served by various public water authorities. WWMA is served by the Municipal Authority of Westmoreland County through the George R. Sweeney Water Plant (PWSID: PA5650032) and the Indian Creek Water Plant (PWSID: PA5260036). WWMA does not receive any WTP waste.

SOURCE REDUCTION EVALUATION

Per the PADEP Guidance Document 361-0100-003, a source reduction evaluation includes evaluating industrial waste pretreatment and sewer use codes/ordinances to determine how to reduce the amount of toxic material entering the WWTP. Based on the results discussed above, a source reduction evaluation was not performed as it was determined that the elevated free cyanide was a result of laboratory interference and sample preservation methods, and not a result of sources within the WWTP service area.

CONCLUSION

As part of WWMA's NPDES Permit Renewal, one (1) WQBEL was imposed for free cyanide. This WQBEL triggered a WQBEL Compliance Report and a Phase I Toxics Reduction Evaluation. A sampling plan was conducted to investigate free cyanide concentrations in the influent vs effluent, before and after the chlorine contact tank, and variations between testing methods. The sampling plan results demonstrate that the elevated free cyanide results are attributed to laboratory interference and sample preservation methods, and the actual concentration of free cyanide in the effluent is non-detect and weekly testing requirements and a WQBEL Compliance Report are not necessary. In conjunction with this TRE report, an NPDES permit modification application has been prepared and included in Appendix D to remove the weekly free cyanide testing, permit limit, and WQBEL Compliance Report requirements.

ATTACHMENT B

Toxics Management Spreadsheet for Outfall 001 (Free Cyanide Only)

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Discharge Information

Instructions | Discharge | Stream

Facility: **WWMA Brush Creek STP** NPDES Permit No.: **PA0027570** Outfall No.: **001**

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

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
4.4	182	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											
	Chloride (PWS)	mg/L											
	Bromide	mg/L											
	Sulfate (PWS)	mg/L											
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L											
	Total Antimony	µg/L											
	Total Arsenic	µg/L											
	Total Barium	µg/L											
	Total Beryllium	µg/L											
	Total Boron	µg/L											
	Total Cadmium	µg/L											
	Total Chromium (III)	µg/L											
	Hexavalent Chromium	µg/L											
	Total Cobalt	µg/L											
	Total Copper	µg/L											
	Free Cyanide	µg/L	<	0.79									
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L											
	Total Lead	µg/L											
	Total Manganese	µg/L											
	Total Mercury	µg/L											
	Total Nickel	µg/L											
	Total Phenols (Phenolics) (PWS)	µg/L											
	Total Selenium	µg/L											
	Total Silver	µg/L											
	Total Thallium	µg/L											
	Total Zinc	µg/L											
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

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

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

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Toxics Management Spreadsheet
Version 1.4, May 2023

Stream / Surface Water Information

WWMA Brush Creek STP, NPDES Permit No. PA0027570, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Brush 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	037246	7.72	851.24	45.5	0.001		Yes
End of Reach 1	037246	6.72	841.66	47.2	0.001		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	7.72	0.0195			10	30						317	7		
End of Reach 1	6.72	0.0195													

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	7.72														
End of Reach 1	6.72														

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Toxics Management Spreadsheet
Version 1.4, May 2023

Model Results

WWMA Brush Creek STP, NPDES Permit No. PA0027570, Outfall 001

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

☑ ***Hydrodynamics***

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

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
7.72	0.89		0.89	6.807	0.001	1.031	30.	10.	0.249	0.246	0.496
6.72	0.92		0.92								

Q_h

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
7.72	6.69		6.69	6.807	0.001	1.32	30.	22.727	0.341	0.179	6.322
6.72	6.91		6.91								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 0.496 PMF: 1 Analysis Hardness (mg/l): 197.57 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
Free Cyanide	0	0		0	22	22.0	24.9	

☑ ***CFC*** CCT (min): 0.496 PMF: 1 Analysis Hardness (mg/l): 197.57 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
Free Cyanide	0	0		0	5.2	5.2	5.88	

☑ ***THH*** CCT (min): 0.496 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
Free Cyanide	0	0		0	4	4.0	4.52	

☑ ***CRL*** CCT (min): 6.322 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
Free Cyanide	0	0		0	N/A	N/A	N/A	

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

No. Samples/Month: 4

Pollutants	*Mass Limits*		*Concentration Limits*				Governing WQBEL	WQBEL Basis	Comments
	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units			

☑ ***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
Free Cyanide	N/A	N/A	Discharge Conc < TQL