pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southeast Regional Office
CLEAN WATER PROGRAM

Application Type	**New**	Application No.	**PA0245208**
Facility Type	**Industrial**	APS ID	**1021493**
Major / Minor	**Minor**	Authorization ID	**1323465**

NPDES PERMIT FACT SHEET INDIVIDUAL INDUSTRIAL WASTE (IW) AND IW STORMWATER

Applicant and Facility Information

Applicant Name	**Penn Engineering & Manufacturing Corp**	Facility Name	**Penn Engineering Manufacturing Plant**
Applicant Address	5190 Old Easton Road	Facility Address	5190 Old Easton Road
	Danboro, PA 18916		Danboro, PA 18916
Applicant Contact	Matthew Miller	Facility Contact	Matthew Miller
Applicant Phone	(215) 766-8853	Facility Phone	(215) 766-8853
Client ID	83281	Site ID	249797
SIC Code	3452	Municipality	Plumstead Township
SIC Description	Manufacturing - Bolts, Nuts, Rivets, And Washers	County	Bucks
Date Application Received	August 5, 2020	EPA Waived?	Yes
Date Application Accepted	N/A	If No, Reason	

Purpose of Application: Groundwater Extraction and Treatment system.

Summary of Review

This application was submitted for a National Pollutant Discharge Elimination System (NPDES) permit to discharge groundwater remediation effluent to the North Branch Neshaminy Creek via an on-site, existing outfall (Outfall 003). The site is contaminated with chlorinated solvents and related compounds. Groundwater contamination is suspected to have occurred from previous vapor degreasers at the facility, spent solvents released from a septic system and leaking underground storage tanks. The facility is part of the DEP Act 2 program. The remediation system consists of two groundwater extraction wells, groundwater treatment system and a discharge. The groundwater treatment system is HiPox unit that utilizes ozone and hydrogen peroxide to destroy organic groundwater contaminants. Influent water from the extraction wells flow into a holding tank then into the HiPOX reactor to be treated with ozone and hydrogen peroxide. Ozone is produced by an ozone generator supplied with oxygen and the hydrogen peroxide is stored at the treatment facility in a 120-gallon tank. After treatment the water passes through a separator before being discharged to the outfall. The separator directs ozone to an ozone destruct reactor where it is destroyed. The flow rate is 7,200 gallons per day (GPD) run in continuous mode.

Based on effluent results reported in the application, it is anticipated that the facility will be able to meet the proposed permit limitations.

Act 14 Notifications:
Plumstead Township: received April 27, 2020
Bucks County: received April 14, 2020

Published in the newspaper on March 10, March 17, March 24, and March 31, 2020.

Approve	Deny	Signatures	Date
X		Harmonie Hawley, PhD, PE / Environmental Engineering Specialist /s/	December 14, 2020
X		Pravin C. Patel, P.E. / Environmental Engineer Manager /s/	12/14/2020

Summary of Review

Permit Conditions:

A. Acquire Necessary Property Rights
B. Proper Sludge Disposal
C. BAT/BCT Reopener
D. Groundwater Monitoring
E. Annual Groundwater Report
F. No Stripper Tower Wastewater
G. Continuous Operation

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.	003	Design Flow (MGD)	0.0072
Latitude	40º 21' 51.26"	Longitude	-75º 8' 24.47"
Quad Name	Doylestown	Quad Code	1644
Wastewater Description:	Groundwater Cleanup Discharge		

Receiving Waters	North Branch Neshaminy Creek (WWF, MF)	Stream Code	002789
NHD Com ID	25478638	RMI	2.31
Drainage Area	5.05 square miles	Yield (cfs/mi^2)	0.012
Q_{7-10} Flow (cfs)	0.06	Q_{7-10} Basis	PA StreamStats
Elevation (ft)	354.41	Slope (ft/ft)	0.002
Watershed No.	2-F	Chapter 93 Class.	WWF, MF
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment	None		
Source(s) of Impairment	None		
TMDL Status	Final	Name	Neshaminy Creek

Background/Ambient Data		Data Source
pH (SU)	7	Toxics Analysis Spreadsheet default
Temperature (°F)	68 (20 °C)	Toxics Analysis Spreadsheet default
Hardness (mg/L)	100	Toxics Analysis Spreadsheet default

Changes Since Last Permit Issuance: Not Applicable as new permit.

Other Comments: The RMI is upstream of the end of Lake Galena. The nearest water intake is 2.09 miles downstream of the beginning of Lake Galena and about 6.9 miles from the outfall (including Lake Galena).

Treatment Facility Summary

Treatment Facility Name: Penn Engineering GW Remediation

WQM Permit No.	Issuance Date
N/A	N/A

This is a groundwater remediation system and is not constructed under a WQM permit.

Changes Since Last Permit Issuance: Not Applicable as new permit.

Other Comments: None.

Compliance History	
Summary of DMRs:	None
Summary of Inspections:	None

Other Comments: This is a new facility so there are no DMRs. No violations by client number or permit number were found in WMS.

Development of Effluent Limitations

Outfall No. 003 **Design Flow (MGD)** .0072
Latitude 40º 21' 51.26" **Longitude** -75º 8' 24.47"
Wastewater Description: Groundwater Cleanup Discharge

Technology-Based Limitations

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

Parameter	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)

Comments: There are no Federal Effluent Limitations Guidelines (ELGs) for groundwater contamination. The proposed monitoring frequency for this permit is 2 times per month, thus average weekly concentrations are not used. CBOD5 and fecal coliform are not expected in this effluent as this is treated groundwater. The facility does not use chlorine so TRC is not included in the permit.

The DEP Media Specific Criteria (MSC) for Groundwater were evaluated as this effluent is treated groundwater. In addition, drinking water standards were evaluated as the neighboring property has drinking water wells; however, for the contaminants of concern the MSC were the same as, or more stringent than, the drinking water standards and were used in this permit. The application noted that solvents are believed to be the cause of volatile organic compounds (VOCs) in the groundwater. The tetrachloroethylene and trichloroethylene limits from the MSC are included in this permit.

The DEP General NPDES Permit (PAG05) for Discharges from Petroleum Product Contaminated Groundwater Remediation Systems was evaluated. The contaminants of concern included Toluene, which was found in measurable levels in untreated groundwater, and samples were analyzed for benzene, ethylbenzene, and xylenes which are common petroleum contaminants. It was noted in the application that contamination may have occurred from leaking underground storage tanks indicating petroleum contamination. The limitations for parameters from the PAG05 (benzene, Total BTEX, MtBE, total suspended solids, pH, oil and grease) and associated parameters (toluene, ethylbenzene and total xylenes) are included in this permit.

Water Quality-Based Limitations

A “Reasonable Potential Analysis” (Attachment A) determined the following parameters were candidates for limitations: Vinyl Chloride.

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

Parameter	Limit (mg/l)	SBC	Model
Vinyl Chloride	0.0015	2/month	Toxics Management Spreadsheet (TMS)

Comments: Vinyl chloride limitations are included in the permit with the limits from the TMS.

Best Professional Judgment (BPJ) Limitations

Comments: Not applicable.

Anti-Backsliding

Not Applicable.

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 003, 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	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	XXX	XXX	XXX	XXX	XXX	2/month	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	2/month	Grab
TSS	XXX	XXX	XXX	30.0	60.0	75	2/month	Grab
Oil and Grease	XXX	XXX	XXX	15	XXX	30	2/month	Grab
Ethylbenzene	Report	XXX	XXX	Report	Report	XXX	2/month	Grab
Benzene	0.00006	0.00012	XXX	0.001	0.002	0.0025	2/month	Grab
Total BTEX	0.006	0.012	XXX	0.1	0.2	0.25	2/month	Grab
Tetrachloro-ethylene	0.0003	0.0006	XXX	0.005	0.01	0.0125	2/month	Grab
Toluene	Report	XXX	XXX	Report	Report	XXX	2/month	Grab
Trichloroethylene	0.0003	0.0006	XXX	0.005	0.01	0.0125	2/month	Grab
Total Xylenes	Report	XXX	XXX	Report	Report	XXX	2/month	Grab
MTBE	0.0012	0.0024	XXX	0.02	0.04	0.05	2/month	Grab
Vinyl Chloride	0.00009	0.00016	XXX	0.0015	0.0026	0.0036	2/month	Grab

Compliance Sampling Location: Outfall 003

Other Comments: None

Tools and References Used to Develop Permit	
☐	WQM for Windows Model (see Attachment)
☐	PENTOXSD for Windows Model (see Attachment)
☐	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☒	Toxics Screening Analysis Spreadsheet (see Attachment **A**)
☐	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 for Establishing Effluent Limitations for Individual Industrial Permits, BCW-PMT-032, Final October 1, 2020, Version 1.6. SOP for New and Reissuance Industrial Waste and Industrial Stormwater Individual NPDES Permits, BPNPSM-PMT-001, Final November 9, 2012, Revised October 11, 2013, Version 1.5.

Attachment A

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.0, July 2020

Discharge Information

Instructions | Discharge | Stream

Facility: Penn Eng & Manuf | NPDES Permit No.: PA0245208 | Outfall No.: 003

Evaluation Type: Major Sewage / Industrial Waste | Wastewater Description: GW remediation

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.0072	100	8.3						

					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 Available Cyanide	µg/L											
	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	<	0.5									
	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		5.9									
	1,2-Dichloroethane	µg/L	<										
	1,1-Dichloroethylene	µg/L	<	1									
	1,2-Dichloropropane	µg/L	<										
	1,3-Dichloropropylene	µg/L	<										
	1,4-Dioxane	µg/L		0.84									
	Ethylbenzene	µg/L	<	1									
	Methyl Bromide	µg/L	<										
	Methyl Chloride	µg/L	<										
	Methylene Chloride	µg/L	<										
	1,1,2,2-Tetrachloroethane	µg/L	<										
	Tetrachloroethylene	µg/L	<	0.9									
	Toluene	µg/L	<	1									
	1,2-trans-Dichloroethylene	µg/L	<										
	1,1,1-Trichloroethane	µg/L		26.1									
	1,1,2-Trichloroethane	µg/L	<										
	Trichloroethylene	µg/L	<	0.53									
	Vinyl Chloride	µg/L	<	0.79									
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												
	Total Xylenes	µg/L	<	1										
	Acetone	µg/L	<	10										
	MTBE	µg/L	<	0.51										
	Freon 113	µg/L	<	5										

Stream / Surface Water Information

Penn Eng & Manuf, NPDES Permit No. PA0245208, Outfall 003

Instructions | Discharge | Stream

Receiving Surface Water Name: North Branch Neshaminy 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	002789	2.31	354.41	5.05			Yes
End of Reach 1	002789	0.73	335.39	7.38			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	2.31	0.1	0.06									100	7		
End of Reach 1	0.73	0.1	0.11									100	7		

Q_h

Location	RMI	LFY (cfs/mi²)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	2.31														
End of Reach 1	0.73														

Model Results

Penn Eng & Manuf, NPDES Permit No. PA0245208, Outfall 003

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

☑ ***Hydrodynamics***

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

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
2.31	0.06		0.06	0.011	0.002	0.351	6.453	18.364	0.031	3.078	4.082
0.73	0.11		0.11								

Q_h

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
2.31	0.64		0.64	0.011	0.002	0.928	6.453	6.954	0.108	0.894	1.291
0.73	1.079		1.08								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 4.082 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.07

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Benzene	0	0		0	640	640	4,088	
1,1-Dichloroethylene	0	0		0	7,500	7,500	47,901	
Ethylbenzene	0	0		0	2,900	2,900	18,522	
Tetrachloroethylene	0	0		0	700	700	4,471	
Toluene	0	0		0	1,700	1,700	10,858	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	19,160	
Trichloroethylene	0	0		0	2,300	2,300	14,690	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
Total Xylenes	0	0		0	1,100	1,100	7,025	
Acetone	0	0		0	450,000	450,000	2,874,047	
Freon 113	0	0		0	71,000	71,000	453,461	

☑ ***CFC*** CCT (min): 4.082 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.07

Pollutants	Upstream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Benzene	0	0		0	130	130	830	
1,1-Dichloroethylene	0	0		0	1,500	1,500	9,580	
Ethylbenzene	0	0		0	580	580	3,704	
Tetrachloroethylene	0	0		0	140	140	894	
Toluene	0	0		0	330	330	2,108	
1,1,1-Trichloroethane	0	0		0	610	610	3,896	
Trichloroethylene	0	0		0	450	450	2,874	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
Total Xylenes	0	0		0	210	210	1,341	
Acetone	0	0		0	86,000	86,000	549,262	
Freon 113	0	0		0	1,250,000	1,250,000	7,983,463	

☑ *THH* CCT (min): 4.082 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Upstream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Benzene	0	0		0	N/A	N/A	N/A	
1,1-Dichloroethylene	0	0		0	33	33.0	211	
Ethylbenzene	0	0		0	530	530	3,385	
Tetrachloroethylene	0	0		0	N/A	N/A	N/A	
Toluene	0	0		0	1,300	1,300	8,303	
1,1,1-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	
Total Xylenes	0	0		0	70,000	70,000	447,074	
Acetone	0	0		0	3,500	3,500	22,354	
Freon 113	0	0		0	N/A	N/A	N/A	

☑ *CRL* CCT (min): 1.291 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Upstream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Benzene	0	0		0	1.2	1.2	69.7	
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A	
Ethylbenzene	0	0		0	N/A	N/A	N/A	
Tetrachloroethylene	0	0		0	0.69	0.69	40.1	
Toluene	0	0		0	N/A	N/A	N/A	
1,1,1-Trichloroethane	0	0		0	N/A	N/A	N/A	
Trichloroethylene	0	0		0	2.5	2.5	145	
Vinyl Chloride	0	0		0	0.025	0.025	1.45	
Total Xylenes	0	0		0	N/A	N/A	N/A	
Acetone	0	0		0	N/A	N/A	N/A	
Freon 113	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			
Vinyl Chloride	0.00009	0.0001	1.45	2.26	3.63	µg/L	1.45	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
1,1-Dichloroethylene	211	µg/L	Discharge Conc ≤ 25% WQBEL
Ethylbenzene	3,385	µg/L	Discharge Conc ≤ 25% WQBEL
Tetrachloroethylene	40.1	µg/L	Discharge Conc ≤ 25% WQBEL
Toluene	2,108	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,1-Trichloroethane	3,896	µg/L	Discharge Conc ≤ 25% WQBEL
Trichloroethylene	145	µg/L	Discharge Conc ≤ 25% WQBEL
Acetone	22,354	µg/L	Discharge Conc ≤ 25% WQBEL
Freon 113	290,650	µg/L	Discharge Conc ≤ 25% WQBEL
Benzene	69.7	µg/L	Discharge Conc < TQL
1,1-Dichloroethane	N/A	N/A	No WQS
1,4-Dioxane	N/A	N/A	No WQS
Total Xylenes	1,341	µg/L	Discharge Conc < TQL
MTBE	N/A	N/A	No WQS