Pennsylvania Department of Environmental Protection

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0013129**
Facility Type	**Industrial**	APS ID	**276529**
Major / Minor	**Major**	Authorization ID	**1387039**

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

Applicant and Facility Information

Applicant Name	**Carpenter Tech Corp**	Facility Name	**Carpenter Technology Corporation**
Applicant Address	PO Box 14662	Facility Address	101 Bern Street
	Reading, PA 19612-4662		Reading, PA 19601-1203
Applicant Contact	Michael Hart	Facility Contact	Michael Hart
Applicant Phone	(610) 208-2470	Facility Phone	(610) 208-2470
Client ID	77325	Site ID	445262
SIC Code	3315	Municipality	Reading City
SIC Description	Manufacturing - Steel Wire and Related Products	County	Berks
Date Application Received	March 1, 2022	EPA Waived?	No
Date Application Accepted	March 11, 2022	If No, Reason	Major Facility

Purpose of Application: This is an application request for NPDES renewal.

Summary of Review

Due to the lengthy Fact Sheet (dated December 2024), this Fact Sheet has been abbreviated to address (a) updates to water quality modeling and effluent limits and (b) includes responses to the comments to the draft Fact Sheet (dated for December 2024)

Refer to the original Fact Sheet as needed.

Public Participation

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

Approve	Deny	Signatures	Date
X		Nicholas Hong, P.E. / Environmental Engineer Nick Hong (via electronic signature)	May 20, 2025
		Daniel W. Martin, P.E. / Environmental Engineer Manager	
		Maria D. Bebenek, P.E. / Environmental Program Manager	

1.0 Updates to Water Quality Modeling

Carpenter's primary contention with the Fact Sheet (dated December 2024) was the Q710 flow rate and the model estimation for effluent limits from WQM and TMS.

Carpenter's comments on the Draft Fact Sheet from December 2024 requested complete mixing based upon

(1) an aerial photograph suggesting mixing through rapids; and
(2) a photograph showing mixing through a green dye at the point of discharge.

The Comment and Response from 2016 discusses the partial mixing factor (PMF). In 2016, discussions with Carpenter occurred. DEP's initial modeling used a PMF factor of 0.3 to account for the size of the Schuylkill River receiving waters. At Carpenter's request, the PMF was adjusted to 0.5. Dye studies may have been conducted in previous years. The dye studies were not available in DEP files.

Carpenter's comments on the Draft Fact Sheet from 2025 did not include sufficient supporting information to change the PMF of 0.5 to complete mixing. DEP proposes to continue using the PMF of 0.5.

A Part C condition will be included to re-open the permit should Carpenter submit a complete mixing study or provide sufficient additional information for DEP to consider.

StreamStats was used to estimate drainage area and Q710.

The modeling nodes utilized in the modeling are summarized below.

General Data 1	*(Modeling Point #A)*	*(Modeling Point #1)*	*(Modeling Point #2)*	*(Modeling Point #3)*	*(Modeling Point #4)*	*(Modeling Point #5)*	*Units*
	Reading Airport	*Carpenter*	*Wyomissing*	*Reading WWTP*	*Point Downstream*	*Point Downstream*	
Stream Code	833	833	833	833	833	833	
River Mile Index	79.1	76.76	74.13	71.84	70.35	60.2	miles
Elevation	230.57	202.11	187.07	182.61	169.58	136.81	feet
Latitude	40.382218	40.361359	40.329599	40.305091	40.3064	40.25955	
Longitude	-75.952884	-75.938207	-75.938284	-75.920483	-75.906406	-75.765085	
Drainage Area	648	665	903	919	923	1010	sq miles
Q710	153	162	242	268	266	276	
Low Flow Yield	0.2361	0.2436	0.2680	0.2916	0.2882	0.2733	cfs/sq mile
Notes:							
Low Flow Yield = Q710 / Drainage Area							

The PMF factor of 0.5 was applied to the Q710 at Modeling Point #A in the WQM model. This modeling point is further upstream than Carpenter. Thus the stream flow utilized was 76.5 ft^3/s (153 ft^3/s x 0.5 = 76.5 ft^3/s).

The WQM Hydrodynamic Output shows that at the Carpenter node (i.e. RMI 76.76), the Q7 estimates is 80 ft^3/s. This agrees with Streamstats Q710 of 81 ft^3/s (0.5 x 162 ft^3/s = 81 ft^3/s).

WQM Modeling

The WQM Model is a computer model that is used to determine NPDES discharge effluent limitations for Carbonaceous BOD (CBOD5), Ammonia Nitrogen (NH3-N), and Dissolved Oxygen (DO) for single and multiple point source discharges scenarios. WQM Model is a complete-mix model which means that the discharge flow and the stream flow are assumed to instantly and completely mixed at the discharge node.

WQM recommends effluent limits for DO, CBOD5, and NH_3-N in mg/l for the discharge(s) in the simulation.

The current permit limit is 42.3 mg/l based upon a flow rate of 1.45 mg/l.

DRBC regulations requires an ammonia limit of 20 mg/l (Administrative Manual Part III- Water Quality Regulations, amended through December 7, 2022). See page 110, Section 4.30.5.D of the Administrative Manual)

Carpenter contends that a variance was granted for ammonia-nitrogen in 1997. The correspondence is attached to the Fact Sheet.

Water quality modeling was completed using a discharge of 45 mg/l. The modeling recommended a limit of 45 mg/l based upon a flow rate of 0.92 MGD. The proposed limit is less stringent than the current permit of 42.3 mg/l. The prior Fact Sheet based the flow rate on 1.45 MGD.

TMS Modeling

The Toxics Management Spreadsheet model is a computer model that is used to determine effluent limitations for toxics (and other substances) for single discharge wasteload allocations. This computer model uses a mass-balance water quality analysis that includes consideration for mixing, first-order decay, and other factors used to determine recommended water quality-based effluent limits. Toxics Management Spreadsheet does not assume that all discharges completely mix with the stream. The point of compliance with water quality criteria are established using criteria compliance times (CCTs). The available CCTs are either acute fish criterion (AFC), chronic fish criterion (CFC), or human health criteria (THH & CRL).

Acute Fish Criterion (AFC) measures the criteria compliance time as either the maximum criteria compliance time (i.e.15 minutes travel time downstream of the current discharge) or the complete mix time whichever comes first. AFC is evaluated at Q710 conditions.

Chronic Fish Criterion (CFC) measures the criteria compliance time as either the maximum criteria compliance time (i.e. 12 hours travel time downstream of the current discharge) or the complete mix time whichever comes first. CFC is evaluated at Q710 conditions.

Threshold Human Health (THH) measures the criteria compliance time as either the maximum criteria compliance time (i.e. 12 hours travel time downstream of the current discharge) or the estimated travel time downstream to the nearest potable water supply intake whichever comes first. THH is evaluated at Q710 conditions.

Cancer Risk Level (CRL) measures the criteria compliance time as either the maximum criteria compliance time (i.e. 12 hours travel time downstream of the current discharge) or the complete mix time whichever comes first. CRL is evaluated at Qh (harmonic mean or normal flow) conditions.

Determining if NPDES Permit Will Require Monitoring/Limits in the Proposed Permit for Toxic Pollutants

To determine if Toxics modeling is necessary, DEP has developed a Toxics Management Spreadsheet to identify toxics of concern. Toxic pollutants whose maximum concentrations as reported in the permit application or on DMRs are greater than the most stringent applicable water quality criterion are pollutants of concern. A Reasonable Potential Analysis was utilized to determine (a) if the toxic parameters modeled would require monitoring or (b) if permit limitations would be required for the parameters. The toxics reviewed for reasonable potential were the pollutants in Groups 1 through 5.

The NPDES application collected at least three (3) samples.

Based upon the SOP- Establishing Water Quality-Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants (Revised January 10, 2019), monitoring and/or limits will be established as follows.

(a) When reasonable potential is demonstrated, establish limits where the maximum reported concentration equals or exceeds 50% of the WQBEL.
(b) For non-conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 25% - 50% of the WQBEL.
(c) For conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 10% - 50% of the WQBEL.

Two modeling runs were completed.

- Modeling Run # 5 was completed using monitoring data submitted with the NPDES application. Hexavalent chromium appeared with no reasonable potential. Since the parameter is an ELG, monitoring shall continue.
- Modeling Run #6 was completed using a large number to determine WQBEL limits for the following pollutants that are in the ELG. Namely, the pollutants are Cadmium, Chromium, Hexavalent Chromium, Copper, Total Cyanide, Lead, Nickel, Silver, Zinc, Tetrachloroethylene, Naphthalene
    -

Modeling Run #6 with model PMF allows the model to estimate the PMF for acute and chronic compliance times. Modeling shows the acute PMF at 0.099.

Modeling Run #6 with 0.5 PMF coerces the model to estimate the PMF with a PMF of 0.5 at the acute compliance time. The PMF originated from discussions with Carpenter in 2016 (Refer to the 2016 Comment and Response document).

A comparison of the effluent limits with model PMF (PMF = 0.099 @ Acute Compliance Time) and with 0.5 PMF (PMF = 0.50 @ Acute Compliance Time) showed that the effluent limits with 0.5 PMF was less stringent. The comparison was completed for information purposes. Consistent with the 2016 Fact Sheet, the proposed NPDES permit will retain use of the 0.5 PMF and accompanying effluent limits.

Pollutant	Model PMF	0.5 PMF
	MDL	MDL
	ug/l	ug/l
Total Cadmium	45	45
Total Chromium (III)	14,801	14,801
Hexavalent Chromium	200	945
Total Copper	393	1,233
Total Lead	656	656
Total Nickel	9,057	9,057
Total Silver	211	471
Total Zinc	3,097	10,120
Tetrachloroethylene	6,976	6,976
Naphthalene	1,718	5,306
Notes:		
MDL - Maximum Daily Limit		

The WQM and TMS modeling runs have been attached to the Fact Sheet.

WQM Output

TMS Output

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
03F	833	SCHUYLKILL RIVER

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)
79.100	Reading Airport	PA0028720-24	0.420	CBOD5	25		
				NH3-N	20	40	
				Dissolved Oxygen			5

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
76.760	Carpenter	PA0013129-24	0.920	CBOD5	25		
				NH3-N	45	90	
				Dissolved Oxygen			5

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
74.130	Wyomissing	PA0026638-24	4.000	CBOD5	20		
				NH3-N	3	6	
				Dissolved Oxygen			5

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
71.840	Reading WWTP	PA0026549	20.500	CBOD5	17.3		
				NH3-N	5.1	10.2	
				Dissolved Oxygen			5

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
03F	833	SCHUYLKILL RIVER

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
79.100	Reading Airport	2.99	40	2.99	40	0	0
76.760	Carpenter	2.77	90	3.04	90	0	0
74.130	Wyomissing	3.99	6	4.12	6	0	0
71.840	Reading WWTP	7.52	10.2	7.92	10.2	0	0
70.350		NA	NA	7.9	NA	NA	NA

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
79.100	Reading Airport	.6	20	.6	20	0	0
76.760	Carpenter	.59	45	.61	45	0	0
74.130	Wyomissing	.67	3	.69	3	0	0
71.840	Reading WWTP	.94	5.1	.98	5.1	0	0
70.350		NA	NA	.98	NA	NA	NA

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
79.10	Reading Airport	25	25	20	20	5	5	0	0
76.76	Carpenter	25	25	45	45	5	5	0	0
74.13	Wyomissing	20	20	3	3	5	5	0	0
71.84	Reading WWTP	17.3	17.3	5.1	5.1	5	5	0	0
70.35		NA	NA	NA	NA	NA	NA	NA	NA

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
03F	833	SCHUYLKILL RIVER	79.100	230.00	648.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.236	0.00	76.50	0.000	0.000	0.0	0.00	0.00	23.30	8.05	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Reading Airport	PA0028720-24	0.4200	0.4200	0.4200	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	20.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
03F	833	SCHUYLKILL RIVER	76.760	202.00	665.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.244	0.00	0.00	0.000	0.000	0.0	0.00	0.00	23.30	8.05	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Carpenter	PA0013129-24	0.9200	0.9200	0.9200	0.000	25.00	7.67

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	0.70
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	45.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
03F	833	SCHUYLKILL RIVER	**74.130**	187.00	903.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.268	0.00	0.00	0.000	0.000	0.0	0.00	0.00	23.30	8.05	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Wyomissing	PA0026638-24	4.0000	4.0000	4.0000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	20.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	3.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
03F	833	SCHUYLKILL RIVER	71.840	182.00	919.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.292	0.00	0.00	0.000	0.000	0.0	0.00	0.00	23.30	8.05	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Reading WWTP	PA0026549	20.5000	20.5000	20.5000	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	17.30	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	5.10	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
03F	833	SCHUYLKILL RIVER	70.350	169.00	923.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.288	0.00	0.00	0.000	0.000	0.0	0.00	0.00	23.30	8.05	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	0.00	7.00

Parameter Data

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

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
03F	833	SCHUYLKILL RIVER	60.200	136.00	1010.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.273	0.00	0.00	0.000	0.000	0.0	0.00	0.00	23.30	8.05	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	0.00	7.00

Parameter Data

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

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
03F	833	SCHUYLKILL RIVER

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
79.100	0.420	23.314	8.014
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
143.629	1.083	132.609	0.496
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.19	0.115	0.17	0.903
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.216	5.671	Tsivoglou	5
Reach Travel Time (days)			
0.288			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.029	2.19	0.16	7.76
0.058	2.18	0.16	7.76
0.087	2.17	0.16	7.76
0.115	2.16	0.15	7.76
0.144	2.15	0.15	7.76
0.173	2.14	0.14	7.76
0.202	2.14	0.14	7.76
0.231	2.13	0.14	7.76
0.260	2.12	0.13	7.76
0.288	2.11	0.13	7.76

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
76.760	1.340	23.343	8.007
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
153.767	1.091	140.969	0.493
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.50	0.165	0.90	0.905
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.739	2.690	Tsivoglou	5
Reach Travel Time (days)			
0.326			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.033	2.48	0.87	7.68
0.065	2.47	0.84	7.62
0.098	2.45	0.82	7.58
0.130	2.44	0.80	7.54
0.163	2.42	0.77	7.51
0.196	2.41	0.75	7.48
0.228	2.39	0.73	7.46
0.261	2.38	0.71	7.44
0.293	2.36	0.69	7.43
0.326	2.35	0.67	7.42

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
03F	833	SCHUYLKILL RIVER

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
74.130	5.340	23.392	7.882
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
212.020	1.143	185.415	0.630
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.92	0.422	0.48	0.909
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.666	1.317	Tsivoglou	5
Reach Travel Time (days)			
0.222			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.022	2.89	0.47	7.60
0.044	2.85	0.46	7.54
0.067	2.82	0.45	7.49
0.089	2.79	0.45	7.43
0.111	2.76	0.44	7.38
0.133	2.73	0.43	7.33
0.156	2.70	0.42	7.29
0.178	2.67	0.41	7.24
0.200	2.64	0.40	7.20
0.222	2.61	0.39	7.17

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
71.840	25.840	22.821	7.559
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
219.002	1.130	193.819	0.764
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
5.06	0.980	1.17	0.870
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.829	6.297	Tsivoglou	5
Reach Travel Time (days)			
0.119			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.012	5.00	1.16	6.81
0.024	4.93	1.15	6.80
0.036	4.86	1.14	6.79
0.048	4.80	1.13	6.79
0.060	4.74	1.11	6.78
0.072	4.67	1.10	6.78
0.083	4.61	1.09	6.78
0.095	4.55	1.08	6.78
0.107	4.49	1.07	6.78
0.119	4.43	1.06	6.79

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
03F	833	SCHUYLKILL RIVER

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
70.350	25.840	22.824	7.561
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
230.149	1.139	202.067	0.726
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
4.42	0.683	1.05	0.870
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.796	2.229	Tsivoglou	5
Reach Travel Time (days)			
0.855			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.085	4.13	0.98	6.43
0.171	3.87	0.91	6.17
0.256	3.62	0.84	6.00
0.342	3.39	0.78	5.90
0.427	3.17	0.73	5.85
0.513	2.96	0.67	5.85
0.598	2.77	0.63	5.89
0.684	2.59	0.58	5.94
0.769	2.43	0.54	6.02
0.855	2.27	0.50	6.11

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
03F	833	SCHUYLKILL RIVER

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
79.100	76.50	0.00	76.50	.6497	0.00227	1.083	143.63	132.61	0.50	0.288	23.31	8.01
76.760	80.64	0.00	80.64	2.073	0.00108	1.091	153.77	140.97	0.49	0.326	23.34	8.01
74.130	144.43	0.00	144.43	8.261	0.00041	1.143	212.02	185.41	0.63	0.222	23.39	7.88
71.840	149.09	0.00	149.09	39.9745	0.00165	1.13	219	193.82	0.76	0.119	22.82	7.56
70.350	150.24	0.00	150.24	39.9745	0.00062	1.139	230.15	202.07	0.73	0.855	22.82	7.56
Q1-10 Flow												
79.100	48.96	0.00	48.96	.6497	0.00227	NA	NA	NA	0.39	0.369	23.32	8.00
76.760	51.61	0.00	51.61	2.073	0.00108	NA	NA	NA	0.39	0.415	23.37	7.99
74.130	92.43	0.00	92.43	8.261	0.00041	NA	NA	NA	0.50	0.281	23.44	7.82
71.840	95.42	0.00	95.42	39.9745	0.00165	NA	NA	NA	0.63	0.144	22.63	7.46
70.350	96.16	0.00	96.16	39.9745	0.00062	NA	NA	NA	0.60	1.031	22.63	7.46
Q30-10 Flow												
79.100	122.40	0.00	122.40	.6497	0.00227	NA	NA	NA	0.64	0.222	23.31	8.03
76.760	129.03	0.00	129.03	2.073	0.00108	NA	NA	NA	0.64	0.252	23.33	8.02
74.130	231.08	0.00	231.08	8.261	0.00041	NA	NA	NA	0.81	0.173	23.36	7.94
71.840	238.55	0.00	238.55	39.9745	0.00165	NA	NA	NA	0.95	0.096	22.97	7.67
70.350	240.39	0.00	240.39	39.9745	0.00062	NA	NA	NA	0.90	0.688	22.98	7.67

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☐
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.6	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

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Toxics Management Spreadsheet
Version 1.4, May 2023

RUN #5

Discharge Information

Instructions | Discharge | Stream

Facility: Carpenter Technology Corp. NPDES Permit No.: PA0013129 Outfall No.: 901

Evaluation Type: Major Sewage / Industrial Waste Wastewater Description: 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
0.92	1457	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	Strea m CV	Fate Coeff	FOS	Criteri a Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		3916									
	Chloride (PWS)	mg/L		1610									
	Bromide	mg/L	<	2.5									
	Sulfate (PWS)	mg/L		136									
	Fluoride (PWS)	mg/L		10.9									
Group 2	Total Aluminum	µg/L		23									
	Total Antimony	µg/L	<	1									
	Total Arsenic	µg/L	<	22									
	Total Barium	µg/L		44									
	Total Beryllium	µg/L	<	6									
	Total Boron	µg/L		480									
	Total Cadmium	µg/L	<	0.2									
	Total Chromium (III)	µg/L		51									
	Hexavalent Chromium	µg/L		18									
	Total Cobalt	µg/L	<	6									
	Total Copper	µg/L		18									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L	<	14									
	Dissolved Iron	µg/L	<	22									
	Total Iron	µg/L		163									
	Total Lead	µg/L	<	0.5									
	Total Manganese	µg/L	<	6									
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L		118									
	Total Phenols (Phenolics) (PWS)	µg/L	<	20									
	Total Selenium	µg/L		6.3									
	Total Silver	µg/L	<	0.4									
	Total Thallium	µg/L	<	0.5									
	Total Zinc	µg/L	<	6									
	Total Molybdenum	µg/L		1180									
	Acrolein	µg/L	<	2									
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<	1									
	Benzene	µg/L	<	1									
	Bromoform	µg/L	<	1									
	Carbon Tetrachloride	µg/L	<	1									
	Chlorobenzene	µg/L	<	1									
	Chlorodibromomethane	µg/L	<	1									
	Chloroethane	µg/L	<	1									
	2-Chloroethyl Vinyl Ether	µg/L	<	1									

Group 3	Chloroform	µg/L		1.7									
	Dichlorobromomethane	µg/L	<	1									
	1,1-Dichloroethane	µg/L	<	1									
	1,2-Dichloroethane	µg/L	<	1									
	1,1-Dichloroethylene	µg/L	<	1									
	1,2-Dichloropropane	µg/L	<	1									
	1,3-Dichloropropylene	µg/L	<	1									
	1,4-Dioxane	µg/L	<	250									
	Ethylbenzene	µg/L	<	1									
	Methyl Bromide	µg/L	<	1									
	Methyl Chloride	µg/L	<	1									
	Methylene Chloride	µg/L	<	1									
	1,1,2,2-Tetrachloroethane	µg/L	<	1									
	Tetrachloroethylene	µg/L	<	1									
	Toluene	µg/L	<	1									
	1,2-trans-Dichloroethylene	µg/L	<	1									
	1,1,1-Trichloroethane	µg/L	<	1									
	1,1,2-Trichloroethane	µg/L	<	1									
	Trichloroethylene	µg/L	<	1									
	Vinyl Chloride	µg/L	<	0.5									
Group 4	2-Chlorophenol	µg/L	<	5									
	2,4-Dichlorophenol	µg/L	<	5									
	2,4-Dimethylphenol	µg/L	<	10									
	4,6-Dinitro-o-Cresol	µg/L	<	10									
	2,4-Dinitrophenol	µg/L	<	5									
	2-Nitrophenol	µg/L	<	5									
	4-Nitrophenol	µg/L	<	5									
	p-Chloro-m-Cresol	µg/L	<	5									
	Pentachlorophenol	µg/L	<	5									
	Phenol	µg/L	<	1.1									
	2,4,6-Trichlorophenol	µg/L	<	5									
Group 5	Acenaphthene	µg/L	<	5									
	Acenaphthylene	µg/L	<	5									
	Anthracene	µg/L	<	5									
	Benzidine	µg/L	<	50									
	Benzo(a)Anthracene	µg/L	<	2									
	Benzo(a)Pyrene	µg/L	<	2									
	3,4-Benzofluoranthene	µg/L	<	2									
	Benzo(ghi)Perylene	µg/L	<	2									
	Benzo(k)Fluoranthene	µg/L	<	2									
	Bis(2-Chloroethoxy)Methane	µg/L	<	5									
	Bis(2-Chloroethyl)Ether	µg/L	<	5									
	Bis(2-Chloroisopropyl)Ether	µg/L	<	5									
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	5									
	4-Bromophenyl Phenyl Ether	µg/L	<	5									
	Butyl Benzyl Phthalate	µg/L	<	5									
	2-Chloronaphthalene	µg/L	<	5									
	4-Chlorophenyl Phenyl Ether	µg/L	<	5									
	Chrysene	µg/L	<	2									
	Dibenzo(a,h)Anthrancene	µg/L	<	2									
	1,2-Dichlorobenzene	µg/L	<	5									
	1,3-Dichlorobenzene	µg/L	<	5									
	1,4-Dichlorobenzene	µg/L	<	5									
	3,3-Dichlorobenzidine	µg/L	<	5									
	Diethyl Phthalate	µg/L	<	5									
	Dimethyl Phthalate	µg/L	<	5									
	Di-n-Butyl Phthalate	µg/L	<	5									
	2,4-Dinitrotoluene	µg/L	<	5									
	2,6-Dinitrotoluene	µg/L	<	5									
	Di-n-Octyl Phthalate	µg/L	<	5									
	1,2-Diphenylhydrazine	µg/L	<	5									
	Fluoranthene	µg/L	<	5									
	Fluorene	µg/L	<	5									
	Hexachlorobenzene	µg/L	<	5									
	Hexachlorobutadiene	µg/L	<	0.5									
	Hexachlorocyclopentadiene	µg/L	<	5									
	Hexachloroethane	µg/L	<	2.1									
	Indeno(1,2,3-cd)Pyrene	µg/L	<	2									

	Isophorone	µg/L	<	5									
	Naphthalene	µg/L	<	2.1									
	Nitrobenzene	µg/L	<	5									
	n-Nitrosodimethylamine	µg/L	<	5									
	n-Nitrosodi-n-Propylamine	µg/L	<	5									
	n-Nitrosodiphenylamine	µg/L	<	5									
	Phenanthrene	µg/L	<	2									
	Pyrene	µg/L	<	5									
	1,2,4-Trichlorobenzene	µg/L	<	0.5									
Group 6	Aldrin	µg/L	<										
	alpha-BHC	µg/L	<										
	beta-BHC	µg/L	<										
	gamma-BHC	µg/L	<										
	delta BHC	µg/L	<										
	Chlordane	µg/L	<										
	4,4-DDT	µg/L	<										
	4,4-DDE	µg/L	<										
	4,4-DDD	µg/L	<										
	Dieldrin	µg/L	<										
	alpha-Endosulfan	µg/L	<										
	beta-Endosulfan	µg/L	<										
	Endosulfan Sulfate	µg/L	<										
	Endrin	µg/L	<										
	Endrin Aldehyde	µg/L	<										
	Heptachlor	µg/L	<										
	Heptachlor Epoxide	µg/L	<										
	PCB-1016	µg/L	<										
	PCB-1221	µg/L	<										
	PCB-1232	µg/L	<										
	PCB-1242	µg/L	<										
	PCB-1248	µg/L	<										
	PCB-1254	µg/L	<										
	PCB-1260	µg/L	<										
	PCBs, Total	µg/L	<										
	Toxaphene	µg/L	<										
	2,3,7,8-TCDD	ng/L	<										
Group 7	Gross Alpha	pCi/L											
	Total Beta	pCi/L	<										
	Radium 226/228	pCi/L	<										
	Total Strontium	µg/L	<										
	Total Uranium	µg/L	<										
	Osmotic Pressure	mOs/kg											

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Toxics Management Spreadsheet
Version 1.4, May 2023

Stream / Surface Water Information

Carpenter Technology Corp., NPDES Permit No. PA0013129, Outfall 901

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Schuylkill River**

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	000833	76.76	202.11	665			Yes
End of Reach 1	000833	70.35	169.58	923			Yes

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

Location	RMI	LFY (cfs/mi^2)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	76.76	0.244										133	8.05		
End of Reach 1	70.35	0.288										133	8.05		

Q_h

Location	RMI	LFY (cfs/mi^2)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	76.76														
End of Reach 1	70.35														

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Toxics Management Spreadsheet
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Model Results

Carpenter Technology Corp., NPDES Permit No. PA0013129, Outfall 901

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

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.099 Analysis Hardness (mg/l): 240.9 Analysis pH: 7.79

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	9,203	
Total Antimony	0	0		0	1,100	1,100	13,498	
Total Arsenic	0	0		0	340	340	4,172	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	257,687	
Total Boron	0	0		0	8,100	8,100	99,393	
Total Cadmium	0	0		0	4.731	5.21	64.0	Chem Translator of 0.907 applied
Total Chromium (III)	0	0		0	1170.622	3,705	45,457	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	200	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	1,166	
Total Copper	0	0		0	30.771	32.1	393	Chem Translator of 0.96 applied
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	165.747	250	3,068	Chem Translator of 0.663 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	20.2	Chem Translator of 0.85 applied
Total Nickel	0	0		0	985.136	987	12,113	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	14.594	17.2	211	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	798	
Total Zinc	0	0		0	246.822	252	3,097	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	36.8	
Acrylonitrile	0	0		0	650	650	7,976	
Benzene	0	0		0	640	640	7,853	

Bromoform	0	0		0	1,800	1,800	22,087	
Carbon Tetrachloride	0	0		0	2,800	2,800	34,358	
Chlorobenzene	0	0		0	1,200	1,200	14,725	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	220,874	
Chloroform	0	0		0	1,900	1,900	23,314	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	184,062	
1,1-Dichloroethylene	0	0		0	7,500	7,500	92,031	
1,2-Dichloropropane	0	0		0	11,000	11,000	134,979	
1,3-Dichloropropylene	0	0		0	310	310	3,804	
Ethylbenzene	0	0		0	2,900	2,900	35,585	
Methyl Bromide	0	0		0	550	550	6,749	
Methyl Chloride	0	0		0	28,000	28,000	343,582	
Methylene Chloride	0	0		0	12,000	12,000	147,249	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	12,271	
Tetrachloroethylene	0	0		0	700	700	8,590	
Toluene	0	0		0	1,700	1,700	20,860	
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	83,441	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	36,812	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	41,721	
Trichloroethylene	0	0		0	2,300	2,300	28,223	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	6,872	
2,4-Dichlorophenol	0	0		0	1,700	1,700	20,860	
2,4-Dimethylphenol	0	0		0	660	660	8,099	
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	982	
2,4-Dinitrophenol	0	0		0	660	660	8,099	
2-Nitrophenol	0	0		0	8,000	8,000	98,166	
4-Nitrophenol	0	0		0	2,300	2,300	28,223	
p-Chloro-m-Cresol	0	0		0	160	160	1,963	
Pentachlorophenol	0	0		0	19.236	19.2	236	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	5,645	
Acenaphthene	0	0		0	83	83.0	1,018	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	3,681	
Benzo(a)Anthracene	0	0		0	0.5	0.5	6.14	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	30,000	30,000	368,124	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	55,219	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	3,313	
Butyl Benzyl Phthalate	0	0		0	140	140	1,718	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	

Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	820	820	10,062	
1,3-Dichlorobenzene	0	0		0	350	350	4,295	
1,4-Dichlorobenzene	0	0		0	730	730	8,958	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	49,083	
Dimethyl Phthalate	0	0		0	2,500	2,500	30,677	
Di-n-Butyl Phthalate	0	0		0	110	110	1,350	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	19,633	
2,6-Dinitrotoluene	0	0		0	990	990	12,148	
1,2-Diphenylhydrazine	0	0		0	15	15.0	184	
Fluoranthene	0	0		0	200	200	2,454	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	10	10.0	123	
Hexachlorocyclopentadiene	0	0		0	5	5.0	61.4	
Hexachloroethane	0	0		0	60	60.0	736	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	122,708	
Naphthalene	0	0		0	140	140	1,718	
Nitrobenzene	0	0		0	4,000	4,000	49,083	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	208,603	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	3,681	
Phenanthrene	0	0		0	5	5.0	61.4	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	1,595	

☑ ***CFC*** CCT (min): 720 PMF: 0.685 Analysis Hardness (mg/l): 149.74 Analysis pH: 8.00

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	17,399	
Total Arsenic	0	0		0	150	150	11,863	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	324,254	
Total Boron	0	0		0	1,600	1,600	126,538	
Total Cadmium	0	0		0	0.326	0.36	28.9	Chem Translator of 0.892 applied
Total Chromium (III)	0	0		0	103.159	120	9,487	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	822	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	1,503	
Total Copper	0	0		0	12.645	13.2	1,042	Chem Translator of 0.96 applied
Dissolved Iron	0	0		0	N/A	N/A	N/A	

Total Iron	0	0		0	1,500	1,500	172,511	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	3.895	5.32	421	Chem Translator of 0.732 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	71.6	Chem Translator of 0.85 applied
Total Nickel	0	0		0	73.181	73.4	5,805	Chem Translator of 0.997 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	4.600	4.99	395	Chem Translator of 0.922 applied
Total Silver	0	0		0	N/A	N/A	N/A	Chem Translator of 1 applied
Total Thallium	0	0		0	13	13.0	1,028	
Total Zinc	0	0		0	166.326	169	13,341	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	237	
Acrylonitrile	0	0		0	130	130	10,281	
Benzene	0	0		0	130	130	10,281	
Bromoform	0	0		0	370	370	29,262	
Carbon Tetrachloride	0	0		0	560	560	44,288	
Chlorobenzene	0	0		0	240	240	18,981	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	276,802	
Chloroform	0	0		0	390	390	30,844	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	245,168	
1,1-Dichloroethylene	0	0		0	1,500	1,500	118,629	
1,2-Dichloropropane	0	0		0	2,200	2,200	173,990	
1,3-Dichloropropylene	0	0		0	61	61.0	4,824	
Ethylbenzene	0	0		0	580	580	45,870	
Methyl Bromide	0	0		0	110	110	8,699	
Methyl Chloride	0	0		0	5,500	5,500	434,975	
Methylene Chloride	0	0		0	2,400	2,400	189,807	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	16,608	
Tetrachloroethylene	0	0		0	140	140	11,072	
Toluene	0	0		0	330	330	26,098	
1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	110,721	
1,1,1-Trichloroethane	0	0		0	610	610	48,243	
1,1,2-Trichloroethane	0	0		0	680	680	53,779	
Trichloroethylene	0	0		0	450	450	35,589	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	8,699	
2,4-Dichlorophenol	0	0		0	340	340	26,889	
2,4-Dimethylphenol	0	0		0	130	130	10,281	
4,6-Dinitro-o-Cresol	0	0		0	16	16.0	1,265	
2,4-Dinitrophenol	0	0		0	130	130	10,281	
2-Nitrophenol	0	0		0	1,600	1,600	126,538	
4-Nitrophenol	0	0		0	470	470	37,171	
p-Chloro-m-Cresol	0	0		0	500	500	39,543	
Pentachlorophenol	0	0		0	14.758	14.8	1,167	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	7,197	
Acenaphthene	0	0		0	17	17.0	1,344	
Anthracene	0	0		0	N/A	N/A	N/A	

Benzidine	0	0		0	59	59.0	4,666	
Benzo(a)Anthracene	0	0		0	0.1	0.1	7.91	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	6,000	6,000	474,518	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	71,969	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	4,271	
Butyl Benzyl Phthalate	0	0		0	35	35.0	2,768	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	160	160	12,654	
1,3-Dichlorobenzene	0	0		0	69	69.0	5,457	
1,4-Dichlorobenzene	0	0		0	150	150	11,863	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	63,269	
Dimethyl Phthalate	0	0		0	500	500	39,543	
Di-n-Butyl Phthalate	0	0		0	21	21.0	1,661	
2,4-Dinitrotoluene	0	0		0	320	320	25,308	
2,6-Dinitrotoluene	0	0		0	200	200	15,817	
1,2-Diphenylhydrazine	0	0		0	3	3.0	237	
Fluoranthene	0	0		0	40	40.0	3,163	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	2	2.0	158	
Hexachlorocyclopentadiene	0	0		0	1	1.0	79.1	
Hexachloroethane	0	0		0	12	12.0	949	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	166,081	
Naphthalene	0	0		0	43	43.0	3,401	
Nitrobenzene	0	0		0	810	810	64,060	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	268,893	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	4,666	
Phenanthrene	0	0		0	1	1.0	79.1	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	2,056	

☑ ***THH*** CCT (min): 720 PMF: 0.685 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	
Fluoride (PWS)	0	0		0	2,000	2,000	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	

Total Antimony	0	0		0	5.6	5.6	443	
Total Arsenic	0	0		0	10	10.0	791	
Total Barium	0	0		0	2,400	2,400	189,807	
Total Boron	0	0		0	3,100	3,100	245,168	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	300	300	23,726	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	1,000	1,000	79,086	
Total Mercury	0	0		0	0.050	0.05	3.95	
Total Nickel	0	0		0	610	610	48,243	
Total Phenols (Phenolics) (PWS)	0	0		0	5	5.0	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	0.24	0.24	19.0	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	237	
Acrylonitrile	0	0		0	N/A	N/A	N/A	
Benzene	0	0		0	N/A	N/A	N/A	
Bromoform	0	0		0	N/A	N/A	N/A	
Carbon Tetrachloride	0	0		0	N/A	N/A	N/A	
Chlorobenzene	0	0		0	100	100.0	7,909	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	451	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	N/A	N/A	N/A	
1,1-Dichloroethylene	0	0		0	33	33.0	2,610	
1,2-Dichloropropane	0	0		0	N/A	N/A	N/A	
1,3-Dichloropropylene	0	0		0	N/A	N/A	N/A	
Ethylbenzene	0	0		0	68	68.0	5,378	
Methyl Bromide	0	0		0	100	100.0	7,909	
Methyl Chloride	0	0		0	N/A	N/A	N/A	
Methylene Chloride	0	0		0	N/A	N/A	N/A	
1,1,2,2-Tetrachloroethane	0	0		0	N/A	N/A	N/A	
Tetrachloroethylene	0	0		0	N/A	N/A	N/A	
Toluene	0	0		0	57	57.0	4,508	
1,2-trans-Dichloroethylene	0	0		0	100	100.0	7,909	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	790,863	
1,1,2-Trichloroethane	0	0		0	N/A	N/A	N/A	
Trichloroethylene	0	0		0	N/A	N/A	N/A	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	30	30.0	2,373	
2,4-Dichlorophenol	0	0		0	10	10.0	791	
2,4-Dimethylphenol	0	0		0	100	100.0	7,909	

4,6-Dinitro-o-Cresol	0	0		0	2	2.0	158	
2,4-Dinitrophenol	0	0		0	10	10.0	791	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	N/A	N/A	N/A	
Phenol	0	0		0	4,000	4,000	316,345	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	5,536	
Anthracene	0	0		0	300	300	23,726	
Benzidine	0	0		0	N/A	N/A	N/A	
Benzo(a)Anthracene	0	0		0	N/A	N/A	N/A	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroisopropyl)Ether	0	0		0	200	200	15,817	
Bis(2-Ethylhexyl)Phthalate	0	0		0	N/A	N/A	N/A	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	0.1	0.1	7.91	
2-Chloronaphthalene	0	0		0	800	800	63,269	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	1,000	1,000	79,086	
1,3-Dichlorobenzene	0	0		0	7	7.0	554	
1,4-Dichlorobenzene	0	0		0	300	300	23,726	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	47,452	
Dimethyl Phthalate	0	0		0	2,000	2,000	158,173	
Di-n-Butyl Phthalate	0	0		0	20	20.0	1,582	
2,4-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
2,6-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
1,2-Diphenylhydrazine	0	0		0	N/A	N/A	N/A	
Fluoranthene	0	0		0	20	20.0	1,582	
Fluorene	0	0		0	50	50.0	3,954	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	N/A	N/A	N/A	
Hexachlorocyclopentadiene	0	0		0	4	4.0	316	
Hexachloroethane	0	0		0	N/A	N/A	N/A	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	34	34.0	2,689	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	791	
n-Nitrosodimethylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	N/A	N/A	N/A	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	20	20.0	1,582	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	5.54	

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

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	N/A	N/A	N/A	
Total Arsenic	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	N/A	N/A	N/A	
Total Boron	0	0		0	N/A	N/A	N/A	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	0.06	0.06	26.8	
Benzene	0	0		0	0.58	0.58	259	
Bromoform	0	0		0	7	7.0	3,130	
Carbon Tetrachloride	0	0		0	0.4	0.4	179	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	0.8	0.8	358	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	N/A	N/A	N/A	
Dichlorobromomethane	0	0		0	0.95	0.95	425	
1,2-Dichloroethane	0	0		0	9.9	9.9	4,426	
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	0.9	0.9	402	
1,3-Dichloropropylene	0	0		0	0.27	0.27	121	
Ethylbenzene	0	0		0	N/A	N/A	N/A	
Methyl Bromide	0	0		0	N/A	N/A	N/A	
Methyl Chloride	0	0		0	N/A	N/A	N/A	
Methylene Chloride	0	0		0	20	20.0	8,942	
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	89.4	

Tetrachloroethylene	0	0		0	10	10.0	4,471	
Toluene	0	0		0	N/A	N/A	N/A	
1,2-trans-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,1,1-Trichloroethane	0	0		0	N/A	N/A	N/A	
1,1,2-Trichloroethane	0	0		0	0.55	0.55	246	
Trichloroethylene	0	0		0	0.6	0.6	268	
Vinyl Chloride	0	0		0	0.02	0.02	8.94	
2-Chlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dichlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dimethylphenol	0	0		0	N/A	N/A	N/A	
4,6-Dinitro-o-Cresol	0	0		0	N/A	N/A	N/A	
2,4-Dinitrophenol	0	0		0	N/A	N/A	N/A	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	0.030	0.03	13.4	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	671	
Acenaphthene	0	0		0	N/A	N/A	N/A	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	0.0001	0.0001	0.045	
Benzo(a)Anthracene	0	0		0	0.001	0.001	0.45	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.045	
3,4-Benzofluoranthene	0	0		0	0.001	0.001	0.45	
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	4.47	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	13.4	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	143	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	N/A	N/A	N/A	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	0.12	0.12	53.7	
Dibenzo(a,h)Anthrancene	0	0		0	0.0001	0.0001	0.045	
1,2-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,3-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,4-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
3,3-Dichlorobenzidine	0	0		0	0.05	0.05	22.4	
Diethyl Phthalate	0	0		0	N/A	N/A	N/A	
Dimethyl Phthalate	0	0		0	N/A	N/A	N/A	
Di-n-Butyl Phthalate	0	0		0	N/A	N/A	N/A	
2,4-Dinitrotoluene	0	0		0	0.05	0.05	22.4	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	22.4	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	13.4	
Fluoranthene	0	0		0	N/A	N/A	N/A	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	0.00008	0.00008	0.036	
Hexachlorobutadiene	0	0		0	0.01	0.01	4.47	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	44.7	

Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	0.45	
Isophorone	0	0		0	N/A	N/A	N/A	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	N/A	N/A	N/A	
n-Nitrosodimethylamine	0	0		0	0.0007	0.0007	0.31	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	2.24	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	1,475	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	N/A	N/A	N/A	

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

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Hexavalent Chromium	Report	Report	Report	Report	Report	µg/L	128	AFC	Discharge Conc > 10% WQBEL (no RP)

☑ ***Other Pollutants without Limits or Monitoring***

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	N/A	N/A	PWS Not Applicable
Chloride (PWS)	N/A	N/A	PWS Not Applicable
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	N/A	N/A	PWS Not Applicable
Fluoride (PWS)	N/A	N/A	PWS Not Applicable
Total Aluminum	5,899	µg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	N/A	N/A	Discharge Conc < TQL
Total Arsenic	791	µg/L	Discharge Conc ≤ 10% WQBEL

Total Barium	165,167	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	63,707	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cadmium	28.9	µg/L	Discharge Conc < TQL
Total Chromium (III)	9,487	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cobalt	747	µg/L	Discharge Conc ≤ 10% WQBEL
Total Copper	252	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	23,726	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	172,511	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	421	µg/L	Discharge Conc < TQL
Total Manganese	79,086	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	3.95	µg/L	Discharge Conc < TQL
Total Nickel	5,805	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	PWS Not Applicable
Total Selenium	395	µg/L	Discharge Conc ≤ 10% WQBEL
Total Silver	135	µg/L	Discharge Conc < TQL
Total Thallium	19.0	µg/L	Discharge Conc < TQL
Total Zinc	1,985	µg/L	Discharge Conc ≤ 10% WQBEL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	23.6	µg/L	Discharge Conc < TQL
Acrylonitrile	26.8	µg/L	Discharge Conc < TQL
Benzene	259	µg/L	Discharge Conc ≤ 25% WQBEL
Bromoform	3,130	µg/L	Discharge Conc ≤ 25% WQBEL
Carbon Tetrachloride	179	µg/L	Discharge Conc ≤ 25% WQBEL
Chlorobenzene	7,909	µg/L	Discharge Conc ≤ 25% WQBEL
Chlorodibromomethane	358	µg/L	Discharge Conc ≤ 25% WQBEL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	141,571	µg/L	Discharge Conc < TQL
Chloroform	451	µg/L	Discharge Conc ≤ 25% WQBEL
Dichlorobromomethane	425	µg/L	Discharge Conc ≤ 25% WQBEL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	4,426	µg/L	Discharge Conc ≤ 25% WQBEL
1,1-Dichloroethylene	2,610	µg/L	Discharge Conc ≤ 25% WQBEL
1,2-Dichloropropane	402	µg/L	Discharge Conc ≤ 25% WQBEL
1,3-Dichloropropylene	121	µg/L	Discharge Conc ≤ 25% WQBEL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	5,378	µg/L	Discharge Conc ≤ 25% WQBEL
Methyl Bromide	4,326	µg/L	Discharge Conc ≤ 25% WQBEL
Methyl Chloride	220,222	µg/L	Discharge Conc ≤ 25% WQBEL
Methylene Chloride	8,942	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,2,2-Tetrachloroethane	89.4	µg/L	Discharge Conc ≤ 25% WQBEL
Tetrachloroethylene	4,471	µg/L	Discharge Conc ≤ 25% WQBEL
Toluene	4,508	µg/L	Discharge Conc ≤ 25% WQBEL
1,2-trans-Dichloroethylene	7,909	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,1-Trichloroethane	23,595	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,2-Trichloroethane	246	µg/L	Discharge Conc ≤ 25% WQBEL
Trichloroethylene	268	µg/L	Discharge Conc ≤ 25% WQBEL
Vinyl Chloride	8.94	µg/L	Discharge Conc < TQL

2-Chlorophenol	2,373	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	791	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	5,191	µg/L	Discharge Conc < TQL
4,6-Dinitro-o-Cresol	158	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	791	µg/L	Discharge Conc < TQL
2-Nitrophenol	62,921	µg/L	Discharge Conc < TQL
4-Nitrophenol	18,090	µg/L	Discharge Conc < TQL
p-Chloro-m-Cresol	1,258	µg/L	Discharge Conc < TQL
Pentachlorophenol	13.4	µg/L	Discharge Conc < TQL
Phenol	316,345	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	671	µg/L	Discharge Conc < TQL
Acenaphthene	653	µg/L	Discharge Conc ≤ 25% WQBEL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	23,726	µg/L	Discharge Conc ≤ 25% WQBEL
Benzidine	0.045	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	0.45	µg/L	Discharge Conc < TQL
Benzo(a)Pyrene	0.045	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	0.45	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Benzo(k)Fluoranthene	4.47	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	13.4	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	15,817	µg/L	Discharge Conc < TQL
Bis(2-Ethylhexyl)Phthalate	143	µg/L	Discharge Conc < TQL
4-Bromophenyl Phenyl Ether	2,124	µg/L	Discharge Conc < TQL
Butyl Benzyl Phthalate	7.91	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	63,269	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	53.7	µg/L	Discharge Conc < TQL
Dibenzo(a,h)Anthrancene	0.045	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	6,449	µg/L	Discharge Conc ≤ 25% WQBEL
1,3-Dichlorobenzene	554	µg/L	Discharge Conc ≤ 25% WQBEL
1,4-Dichlorobenzene	5,742	µg/L	Discharge Conc ≤ 25% WQBEL
3,3-Dichlorobenzidine	22.4	µg/L	Discharge Conc < TQL
Diethyl Phthalate	31,460	µg/L	Discharge Conc < TQL
Dimethyl Phthalate	19,663	µg/L	Discharge Conc < TQL
Di-n-Butyl Phthalate	865	µg/L	Discharge Conc < TQL
2,4-Dinitrotoluene	22.4	µg/L	Discharge Conc < TQL
2,6-Dinitrotoluene	22.4	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	13.4	µg/L	Discharge Conc < TQL
Fluoranthene	1,573	µg/L	Discharge Conc ≤ 25% WQBEL
Fluorene	3,954	µg/L	Discharge Conc ≤ 25% WQBEL
Hexachlorobenzene	0.036	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	4.47	µg/L	Discharge Conc < TQL
Hexachlorocyclopentadiene	39.3	µg/L	Discharge Conc < TQL
Hexachloroethane	44.7	µg/L	Discharge Conc < TQL
Indeno(1,2,3-cd)Pyrene	0.45	µg/L	Discharge Conc < TQL
Isophorone	2,689	µg/L	Discharge Conc < TQL

Naphthalene	1,101	µg/L	Discharge Conc ≤ 25% WQBEL
Nitrobenzene	791	µg/L	Discharge Conc < TQL
n-Nitrosodimethylamine	0.31	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	2.24	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	1,475	µg/L	Discharge Conc < TQL
Phenanthrene	39.3	µg/L	Discharge Conc < TQL
Pyrene	1,582	µg/L	Discharge Conc ≤ 25% WQBEL
1,2,4-Trichlorobenzene	5.54	µg/L	Discharge Conc < TQL

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Toxics Management Spreadsheet
Version 1.4, May 2023

RUN #6
PMF 0.5

Discharge Information

Instructions | Discharge | Stream

Facility: Carpenter Technology Corp. NPDES Permit No.: PA0013129 Outfall No.: 901

Evaluation Type: Major Sewage / Industrial Waste Wastewater Description: 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
0.92	1457	7	0.5					

					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		1E+11									
	Total Chromium (III)	µg/L		1E+11									
	Hexavalent Chromium	µg/L		1E+11									
	Total Cobalt	µg/L											
	Total Copper	µg/L		1E+11									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L		1E+11									
	Dissolved Iron	µg/L											
	Total Iron	µg/L											
	Total Lead	µg/L		1E+11									
	Total Manganese	µg/L											
	Total Mercury	µg/L											
	Total Nickel	µg/L		1E+11									
	Total Phenols (Phenolics) (PWS)	µg/L											
	Total Selenium	µg/L											
	Total Silver	µg/L		1E+11									
	Total Thallium	µg/L											
	Total Zinc	µg/L		1E+11									
	Total Molybdenum	µg/L											
	Acrolein	µg/L											
	Acrylamide	µg/L											
	Acrylonitrile	µg/L											
	Benzene	µg/L											
	Bromoform	µg/L											
	Carbon Tetrachloride	µg/L											
	Chlorobenzene	µg/L											
	Chlorodibromomethane	µg/L											
	Chloroethane	µg/L											
	2-Chloroethyl Vinyl Ether	µg/L											

Group 3	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		1E+11									
	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		1E+11									
	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

Carpenter Technology Corp., NPDES Permit No. PA0013129, Outfall 901

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Schuylkill River**

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	000833	76.76	202.11	665			Yes
End of Reach 1	000833	70.35	169.58	923			Yes

Q_{7-10}

Location	RMI	LFY (cfs/mi^2)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	76.76	0.244										133	8.05		
End of Reach 1	70.35	0.288										133	8.05		

Q_h

Location	RMI	LFY (cfs/mi^2)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	76.76														
End of Reach 1	70.35														

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Model Results

Carpenter Technology Corp., NPDES Permit No. PA0013129, Outfall 901

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

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.500 Analysis Hardness (mg/l): 155.83 Analysis pH: 7.98

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Cadmium	0	0		0	3.099	3.35	194	Chem Translator of 0.925 applied
Total Chromium (III)	0	0		0	819.345	2,593	150,396	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	945	Chem Translator of 0.982 applied
Total Copper	0	0		0	20.412	21.3	1,233	Chem Translator of 0.96 applied
Total Lead	0	0		0	104.308	144	8,329	Chem Translator of 0.726 applied
Total Nickel	0	0		0	681.457	683	39,606	Chem Translator of 0.998 applied
Total Silver	0	0		0	6.899	8.12	471	Chem Translator of 0.85 applied
Total Zinc	0	0		0	170.639	174	10,120	Chem Translator of 0.978 applied
Tetrachloroethylene	0	0		0	700	700	40,603	
Naphthalene	0	0		0	140	140	8,121	

☑ ***CFC*** CCT (min): 720 PMF: 0.685 Analysis Hardness (mg/l): 149.74 Analysis pH: 8.00

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Cadmium	0	0		0	0.326	0.36	28.9	Chem Translator of 0.892 applied
Total Chromium (III)	0	0		0	103.159	120	9,487	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	822	Chem Translator of 0.962 applied
Total Copper	0	0		0	12.645	13.2	1,042	Chem Translator of 0.96 applied
Total Lead	0	0		0	3.895	5.32	421	Chem Translator of 0.732 applied
Total Nickel	0	0		0	73.181	73.4	5,805	Chem Translator of 0.997 applied
Total Silver	0	0		0	N/A	N/A	N/A	Chem Translator of 1 applied
Total Zinc	0	0		0	166.326	169	13,341	Chem Translator of 0.986 applied
Tetrachloroethylene	0	0		0	140	140	11,072	
Naphthalene	0	0		0	43	43.0	3,401	

☑ ***THH*** CCT (min): 720 PMF: 0.685 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	

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Total Nickel	0	0		0	610	610	48,243	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	
Tetrachloroethylene	0	0		0	N/A	N/A	N/A	
Naphthalene	0	0		0	N/A	N/A	N/A	

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

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	
Tetrachloroethylene	0	0		0	10	10.0	4,471	
Naphthalene	0	0		0	N/A	N/A	N/A	

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☑ ***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 Cadmium	0.22	0.35	28.9	45.0	72.2	µg/L	28.9	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Chromium (III)	72.8	114	9,487	14,801	23,717	µg/L	9,487	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Hexavalent Chromium	4.65	7.25	606	945	1,514	µg/L	606	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Copper	6.07	9.46	790	1,233	1,976	µg/L	790	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Lead	3.23	5.04	421	656	1,052	µg/L	421	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Nickel	44.5	69.5	5,805	9,057	14,513	µg/L	5,805	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Silver	2.32	3.61	302	471	754	µg/L	302	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Zinc	49.8	77.7	6,487	10,120	16,217	µg/L	6,487	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Tetrachloroethylene	34.3	53.5	4,471	6,976	11,178	µg/L	4,471	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Naphthalene	26.1	40.7	3,401	5,306	8,502	µg/L	3,401	CFC	Discharge Conc ≥ 50% WQBEL (RP)

☑ ***Other Pollutants without Limits or Monitoring***

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Total Cyanide	N/A	N/A	No WQS

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Toxics Management Spreadsheet
Version 1.4, May 2023

RUN #6
MODEL TMS

Discharge Information

Instructions | Discharge | Stream

Facility: Carpenter Technology Corp. NPDES Permit No.: PA0013129 Outfall No.: 901

Evaluation Type: Major Sewage / Industrial Waste Wastewater Description: 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
0.92	1457	7						

	Discharge Pollutant	Units	Max Discharge Conc		0 if left blank: Trib Conc	0 if left blank: Stream Conc	0.5 if left blank: Daily CV	0.5 if left blank: Hourly CV	0 if left blank: Strea m CV	0 if left blank: Fate Coeff	0 if left blank: FOS	1 if left blank: Criteri a Mod	1 if left blank: 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		1E+11									
	Total Chromium (III)	µg/L		1E+11									
	Hexavalent Chromium	µg/L		1E+11									
	Total Cobalt	µg/L											
	Total Copper	µg/L		1E+11									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L		1E+11									
	Dissolved Iron	µg/L											
	Total Iron	µg/L											
	Total Lead	µg/L		1E+11									
	Total Manganese	µg/L											
	Total Mercury	µg/L											
	Total Nickel	µg/L		1E+11									
	Total Phenols (Phenolics) (PWS)	µg/L											
	Total Selenium	µg/L											
	Total Silver	µg/L		1E+11									
	Total Thallium	µg/L											
	Total Zinc	µg/L		1E+11									
	Total Molybdenum	µg/L											
	Acrolein	µg/L											
	Acrylamide	µg/L											
	Acrylonitrile	µg/L											
	Benzene	µg/L											
	Bromoform	µg/L											
	Carbon Tetrachloride	µg/L											
	Chlorobenzene	µg/L											
	Chlorodibromomethane	µg/L											
	Chloroethane	µg/L											
	2-Chloroethyl Vinyl Ether	µg/L											

Group 3	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		1E+11									
	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		1E+11										
	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

Carpenter Technology Corp., NPDES Permit No. PA0013129, Outfall 901

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Schuylkill River**

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	000833	76.76	202.11	665			Yes
End of Reach 1	000833	70.35	169.58	923			Yes

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

Location	RMI	LFY (cfs/mi^2)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	76.76	0.244										133	8.05		
End of Reach 1	70.35	0.288										133	8.05		

Q_h

Location	RMI	LFY (cfs/mi^2)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	76.76														
End of Reach 1	70.35														

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Toxics Management Spreadsheet
Version 1.4, May 2023

Model Results

Carpenter Technology Corp., NPDES Permit No. PA0013129, Outfall 901

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

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.099 Analysis Hardness (mg/l): 240.9 Analysis pH: 7.79

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Cadmium	0	0		0	4.731	5.21	64.0	Chem Translator of 0.907 applied
Total Chromium (III)	0	0		0	1170.622	3,705	45,457	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	200	Chem Translator of 0.982 applied
Total Copper	0	0		0	30.771	32.1	393	Chem Translator of 0.96 applied
Total Lead	0	0		0	165.747	250	3,068	Chem Translator of 0.663 applied
Total Nickel	0	0		0	985.136	987	12,113	Chem Translator of 0.998 applied
Total Silver	0	0		0	14.594	17.2	211	Chem Translator of 0.85 applied
Total Zinc	0	0		0	246.822	252	3,097	Chem Translator of 0.978 applied
Tetrachloroethylene	0	0		0	700	700	8,590	
Naphthalene	0	0		0	140	140	1,718	

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☑ ***CFC*** CCT (min): 720 PMF: 0.685 Analysis Hardness (mg/l): 149.74 Analysis pH: 8.00

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Cadmium	0	0		0	0.326	0.36	28.9	Chem Translator of 0.892 applied
Total Chromium (III)	0	0		0	103.159	120	9,487	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	822	Chem Translator of 0.962 applied
Total Copper	0	0		0	12.645	13.2	1,042	Chem Translator of 0.96 applied
Total Lead	0	0		0	3.895	5.32	421	Chem Translator of 0.732 applied
Total Nickel	0	0		0	73.181	73.4	5,805	Chem Translator of 0.997 applied
Total Silver	0	0		0	N/A	N/A	N/A	Chem Translator of 1 applied
Total Zinc	0	0		0	166.326	169	13,341	Chem Translator of 0.986 applied
Tetrachloroethylene	0	0		0	140	140	11,072	
Naphthalene	0	0		0	43	43.0	3,401	

☑ ***THH*** CCT (min): 720 PMF: 0.685 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	

Total Nickel	0	0		0	610	610	48,243	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	
Tetrachloroethylene	0	0		0	N/A	N/A	N/A	
Naphthalene	0	0		0	N/A	N/A	N/A	

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

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	
Tetrachloroethylene	0	0		0	10	10.0	4,471	
Naphthalene	0	0		0	N/A	N/A	N/A	

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

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Cadmium	0.22	0.35	28.9	45.0	72.2	µg/L	28.9	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Chromium (III)	72.8	114	9,487	14,801	23,717	µg/L	9,487	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Hexavalent Chromium	0.98	1.53	128	200	320	µg/L	128	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Copper	1.93	3.02	252	393	630	µg/L	252	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Lead	3.23	5.04	421	656	1,052	µg/L	421	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Nickel	44.5	69.5	5,805	9,057	14,513	µg/L	5,805	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Silver	1.04	1.62	135	211	338	µg/L	135	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Zinc	15.2	23.8	1,985	3,097	4,962	µg/L	1,985	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Tetrachloroethylene	34.3	53.5	4,471	6,976	11,178	µg/L	4,471	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Naphthalene	8.45	13.2	1,101	1,718	2,753	µg/L	1,101	AFC	Discharge Conc ≥ 50% WQBEL (RP)

☑ ***Other Pollutants without Limits or Monitoring***

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Total Cyanide	N/A	N/A	No WQS

Effluent Limit Calculation Tables

A series of tables was utilized to calculate the ELG. A separate table was constructed as a decision tree to select the proposed effluent limit. The proposed effluent limits is the more stringent of the ELG, TBEL, WQBEL, or the current limit through anti-backsliding. The summary table identifies the purpose of the table.

Table	Purpose of Table
ELG1.0	Table of emission factors abstracted from ELG federal regulations for Process lines A to J
ELG1.1	Mass limits for Process Line A thru J. Mass limits obtained by Production x emission factor
ELG2.0	Table of emission factors abstracted from ELG federal regulations for process line K
ELG2.1	Mass limits for Process Line K. Mass limits obtained by Production x emission factor
ELG3.0	Total Mass Loading for Process lines A to K
CONC4.0	Summary of Concentration limits. This table evaluates which policy enforces permit limit
MASS5.0	Summary of Mass limits. This table evaluates which policy enforces permit limit

(1) Table ELG1.0 summarizes the emission factor for Process Lines A to J. Table ELG1.1 multiples the production rate by the emission factor to give the mass loadings for the pollutants.

(2) Table ELG2.0 summarizes the emission factors for Process Line K. Table ELG2.1 multiples the production rate by the emission factor to give the mass loadings for the pollutants.

The pollutants were calculated using the following equation

Mass Loading, lbs/day = (155 gal/min)(60 min/hr)(24 hr/day)*EF*8.34*(1/1e6)

Example: Mass loading for TSS = (155 gal/min)(60 min/hr)(24 hr/day)*(60 mg/l)*8.34*(1/1e6) = 111 lbs/day

(3) Table ELG3.0 provides a grand total of the mass loadings from Tables ELG1.1 and ELG2.1. The total mass loadings for Process Lines A to K appear in the table.

(4) Table CONC4.0 expresses values as concentration in mg/l. This table compares the ELG MassLimitConc (MLC), the TBEL, the WQBEL, and the current limit to select which limit presides for the proposed permit. The MLC was calculated by taking the total mass loadings from Table ELG3.0 and dividing by the average design flow rate and divided by the 8.34 factor

Example: MLC for TSS = (650 lbs/day) / [0.92 MGD / 8.34] = 85 mg/l.

(5) Table Mass5.0 expresses values as mass in lbs/day. This table compares the Total ELG1 + ELG2, the TBEL, the WQBEL, and the current limit to select which limit presides for the proposed permit.

Refer to the Fact Sheet dated December 2024 for a complete set of tables and effluent limit determination.

The decision tree worksheet which selects the effluent limit is attached to the Fact Sheet.

Entries in Table 4.0 Permit Limitation Tree for Concentration for the row labelled WQBEL were updated with revised TMS modeling. This was a result of revised Q710 and PMF. Other rows in the table remained the same from the original Fact Sheet

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Section 2.0: Response to Comments on Draft Fact Sheet (dated December 2024)

CARPENTER
Specialty Alloys

Carpenter Technology Corporation
P.O. Box 14662
Reading, PA 19612-4662

Tel.: 610.208.2000

March 4, 2025

PA Department of Environmental Protection
Southcentral Regional Office
909 Elmerton Avenue
Harrisburg, PA 17110-8200
Attn: Mr. Nicholas Hong, P.E.
nhong@pa.gov

Draft NPDES Permit No. PA0013129
Carpenter Technology Corporation

Dear Mr. Hong:

Carpenter Technology Corporation (Carpenter) is pleased to submit the attached comments on the draft NPDES Permit PA0013129 published in the Pennsylvania Bulletin on January 18, 2025. and the associated Public Notice and Fact Sheet.

Carpenter appreciates the Department's efforts to review our permit renewal application and prepare this draft NPDES permit. The attached comments were prepared to address mostly minor issues and a few significant issues which we trust will be resolved satisfactorily as part of the public notice and comment process.

Please contact us at mhart@cartech.com if you need any additional information as you review the attached comments. Additionally, we would be available to meet with you to resolve any outstanding issues during the comment process.

Sincerely,

Michael Hart

Michael A. Hart, P.E.
Environmental Engineer

Attachment – Comments on Carpenter Technology Corporation 2025 Draft NPDES PA0013129 Permit

Comments on Carpenter Technology Corporation
2025 Draft NPDES PA0013129 Permit
[55 Pa.B. 494]
[Saturday, January 18, 2025]

1. Water Quality Modeling Using WQM 7.0

The draft NPDES permit limits for dissolved oxygen, $CBOD_5$, and ammonia (Outfall 901) were calculated as a multiple discharge wasteload allocation using the Department's WQM 7.0 model. As noted in the Fact Sheet (at 48, 53) this model is a complete-mix model which means that the discharge flow and the stream flow are assumed to instantly and completely mix at the discharge node. Consistent with the Comment (Attachment 1) and DEP Response to Comments from 2016 (Fact Sheet at 251 – 253), a partial mixing factor of 0.5 is achieved for Outfall 901 at the point of discharge (Fact Sheet at 52), when the stream flow is approximately 186 cfs, and nearly 100% mixing is achieved after 12 hours (2017 Draft Permit Fact Sheet at 41 – PENTOXSD CFC analysis). Thus, within a half day of travel time, the effluent from Outfall 901 is dispersed across the entire river and is fully mixed with the full $Q_{7\text{-}10}$ flow in the river. This level of mixing occurs near the end of the reach at the point where the Wyomissing effluent enters the stream. However, the actual flow yield (0.24 cfs/mi^2) was reduced by 50% in the WQM model analysis. (Fact Sheet at 53) This modification of the actual river flow causes the modeling results to be extremely conservative and not representative of actual conditions.

The multiple discharge wasteload allocation is presented in the Fact Sheet at 85 – 98. It appears that a stream flow of 40.31 cfs (at river mile 76.76) was used in this evaluation (Fact Sheet at 97). The $Q_{7\text{-}10}$ at the facility was previously identified in the Fact Sheet (at 38) as 162 cfs. Thus, the wasteload allocation was prepared using a stream flow that was approximately 25% of the actual river flow at the point of the Carpenter Technology Corporation (Carpenter) discharge. If the actual flow was used in the evaluation, the impact of this discharge would be reduced by a factor of 4 and the wasteload allocation for Carpenter would increase significantly.

Moreover, the river is very shallow and full of rapids, which further enhance mixing. A Google Earth review of the river shows that nearly all of the flow in the river is diverted toward the east bank immediately after the Wyomissing WWTP outfall. (Figure 1). It is reasonable to assume that all three upstream effluents, in addition to the significant flow contributed by Tulpehocken Creek (47.6 cfs at the $Q_{7\text{-}10}$ flow (Fact Sheet at 67) are well mixed with the upstream river flow immediately downstream of this point. Based on this information, the WQM Model should be rerun using the actual $Q_{7\text{-}10}$ river flow and assuming complete mixing of the effluents from the Reading Airport, Carpenter, and Wyomissing WWTP.

Figure 1 – Location of Wyomissing WWTP Outfall showing river flow diverted toward east bank where turbulent mixing occurs. (Google Earth Image from 5/6/2024)

2. Toxics Modeling

Water quality-based effluent limits are calculated using the Department's Toxics Management Spreadsheet (TMS) model. The calculated effluent limits are derived primarily through a consideration of dilution with the receiving water. As noted above, it was previously determined through dye testing that the process wastewater effluent flow (Outfall 901) mixes with 50% of the river flow at the point of discharge (see Attachment 1) and is completely mixed with the Q_{7-10} river flow after a travel time of 12 hours. However, as with the WQM model, the TMS model utilized a flow yield equal to only 50% of the Q_{7-10} flow. (Fact Sheet at 53). As a result, all of the water quality-based effluent limits derived using the TMS model significantly underestimate the allowable wasteload allocations for Outfall 901. The TMS model needs to be rerun using the actual Q_{7-10} flow at the point of discharge.

In evaluating water quality-based effluent limits for toxics using the TSM model, the Department used a receiving water hardness concentration of 133 mg/L (based on three samples collected by the facility – Fact Sheet at 38). As we have noted in previous comments, the river hardness expected during low flow conditions should serve as the basis for establishing water quality-based effluent limits. Hardness typically varies inversely with stream flow, since stream hardness

associated primarily with groundwater inflow (as occurs at drought flow conditions) is higher than the stream hardness associated with surface runoff (as occurs during higher flow conditions). When the hardness data for the USGS gage at Berne, PA are regressed against the measured flow, this relationship is readily apparent. (Figure 2)

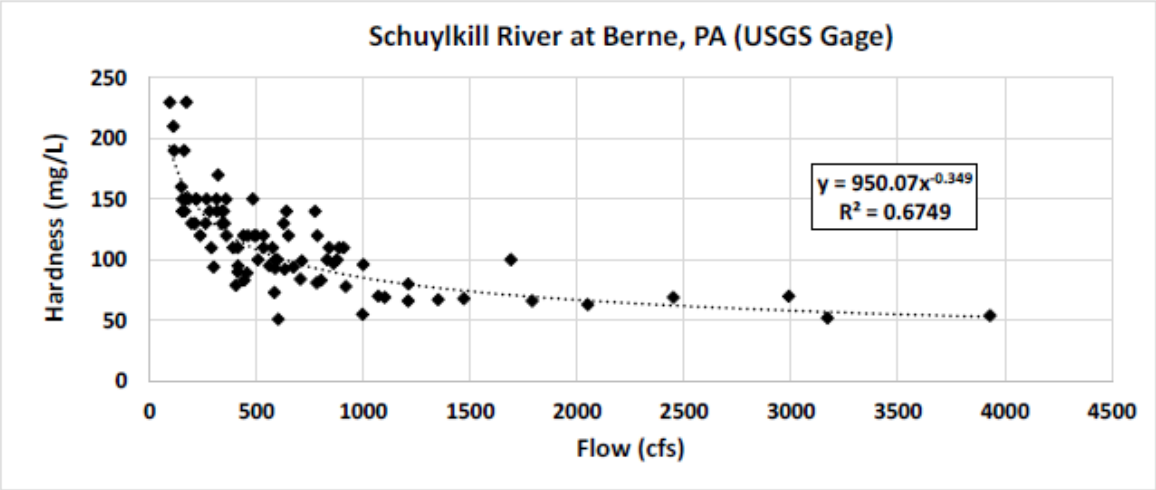


Figure 2 – Hardness versus Flow.
(USGS Water Quality Data for Schuylkill River at Berne, PA)

When the Schuylkill River at Berne, PA is at its $Q_{7\text{-}10}$ flow (84.4 cfs), the river hardness is approximately 202 mg/L based on the regression line shown on the chart. We also expect the river hardness to be approximately 202 mg/L when downstream flow conditions are at low flow. The Department reviewed this comment in the prior draft permit (See Fact Sheet at 254) and responded that the instream hardness is less than 150 mg/L when the $Q_{7\text{-}10}$ is 186 cfs. We note that the data presented in the chart above is for the Schuylkill River at Berne, PA. For this station, the drainage area is 355 square miles (Fact Sheet at 66). The drainage area at Outfall 901 is 665 square miles and the $Q_{7\text{-}10}$ at this location is approximately 162 cfs (Fact Sheet at 43). Although the flow is higher (due to the larger drainage area), the hardness expected at the $Q_{7\text{-}10}$ flow is the same as the hardness in the river at Berne, PA when that station is at a similar low flow. Therefore, we request that a hardness of 202 mg/L be used for evaluating hardness-based water quality effluent limits.

Table 1 presents a comparison of the wasteload allocations (WLAs) for seven metals that have criteria that are affected by hardness. This comparison illustrates the WLAs calculated using the assumptions in the Fact Sheet for upstream flow, partial mixing factor, and hardness; an alternative analysis where the upstream flow and partial mixing factor are corrected to reflect the actual $Q_{7\text{-}10}$ flow and mixing factor; and, an alternative analysis where flow, mixing and hardness are corrected. As shown in the table, the wasteload allocations increase significantly when the upstream flow and partial mixing factor are corrected. When the hardness is also adjusted to reflect conditions expected to occur under drought flow conditions, the WLAs increase even further. All of these WLAs exceed the limits for the corresponding Effluent Limitation Guidelines (ELGs), consequently final permit limits should not be based on these WLAs.

Table 1 – Wasteload Allocations (µg/L) for Metals Based on Alternative Flow, Mixing, and Hardness

Parameter	Fact Sheet		Corrected Flow and Mixing		Corrected Flow, Mixing, and Hardness	
	AFC	CFC	AFC	CFC	AFC	CFS
Yield (cfs/mi^2)	0.122	0.122	0.2436	0.2436	0.2436	0.2436
PMF (decimal)	0.130	0.899	0.5	1.0	0.5	1.0
River Hardness (mg/L)	133	133	133	133	202	202
Analysis Hardness (mg/L)	290.75	158.35	155.86	144.53	223.67	212.93
Cadmium	53.0	19.9	194	40.8	280	54.4
Chromium	36,269	6,557	150,183	13,379	201,880	18,376
Copper	321	722	1,232	1,470	1,731	2,047
Lead	2,666	298	8,319	583.8	13,175	956
Nickel	9,714	4,019	39,550	8,179	53,686	11,352
Silver	199	NA	470	NA	875	NA
Zinc	2,484	9,236	10,106	18,796	13,725	26,101

3. Chemical Additives Limitations

As discussed in the Fact Sheet for the draft NPDES permit, chemical additives are used as corrosion inhibitors and biocides in closed-loop cooling water systems for multiple manufacturing processes. The Department included an analysis, using the Toxics Management Spreadsheet, to evaluate potential limitations on the requested usage rate of the chemical additives. Notwithstanding the issues raised above concerning how dilution flows were miscalculated in the TMS evaluations, we have additional concerns regarding the basis upon which the proposed chemical additives usage rates were evaluated.

The allowable chemical additives usage rates were determined in the Fact Sheet based on the calculation of water quality-based effluent limits for a discharge flow of 0.008 MGD, a low flow yield factor of 0.122 cfs/mi^2, and additive-specific water quality criteria (Fact Sheet at 260) to determine wasteload allocations. These wasteload allocations were then converted into usage rates by multiplying the WLAs by the assumed discharge flow. (Fact Sheet at 161) This approach

is not appropriate and exaggerates the potential impact of an emergency discharge of cooling water containing these chemical additives.

During normal closed-loop cooling water recirculation system operation (non-emergency), chemical additives are added to the closed-loop cooling water systems as necessary to keep the systems working properly. (See Fact Sheet at 9 for Schematic of Cooling Water System) These additives dissolve in the cooling water loop and are replaced when the compounds break down or decay. In an emergency, such as a loss of power, some of the cooling water in this system may be discharged to the Schuylkill River. (Fact Sheet at 53) If this were to occur, a small quantity of the overall water in the closed loop system would be discharged. But this water only contains a fraction of the total chemical, not the daily usage rate. Thus, while the calculations in the Toxics Management Spreadsheet may be valid for the assigned discharge flow (i.e., 0.008 MGD), the WLA only applies to a small fraction of the chemical discharged from the closed loop system, not the total amount of chemical in the system. Moreover, the concentration of the chemical additive in the closed loop system is much lower than the calculated WLA. (Table 2) For example, the wasteload allocation for Spectrus NX1106 is 176,797 µg/L (176.8 mg/L) at 0.008 MGD (Fact Sheet at 154) for a discharge load of 11.8 lbs/day. However, during an emergency discharge event, no chemicals are being added and the expected residual Spectrus NX1106 discharge concentration would be approximately 0.5 mg/L, which is 0.28% of the allowable discharge concentration. Consequently, there is no reasonable potential for an emergency discharge to have an adverse effect on the receiving water for Spectrus NX1106 or any of the other chemical additives.

Table 2 – Comparison of Allowable Discharge Concentration of Chemical Additives to Maximum Expected Concentration Discharged from Closed-Loop Cooling Water System

Chemical Additive	AML (mg/L)	MDL (mg/L)	Max Expected Concentration (mg/L)
Continuum AT3203	1,128	1,760	5.1
Corrshield MD4103	1,224	1,909	8.7
Gengard GN8113	5,930	9,252	5.5
Gengard GN8203	9,206	14,363	3.9
Spectrus NX1103	10.3	16.0	0.06
Spectrus NX1106	113.3	176.8	0.5

Note: AML and MDL from Fact Sheet at 161. Maximum expected concentration in closed-loop cooling water system from information submitted with permit application.

The wasteload allocations were developed using additive-specific water quality criteria (Fact Sheet at 260). These criteria values appear to be highly conservative and are not consistent with the most recent Material Safety Data Sheets (MSDS) for the chemical additives that were submitted with the permit application. These criteria are also inconsistent with information on the Department's Approved Chemical Additives website at:

http://cedatareporting.pa.gov/Reportserver/Pages/ReportViewer.aspx?/Public/DEP/CW/SSRS/WMS_Chem_Add_Approv_ext

For example, the MSDS for Spectrus NX1106 (dated 1/25/2019) provides toxicity data that show the additive to be much less toxic than the values used to calculate the wasteload allocation for this chemical. (Table 3)

Table 3 – Toxicity of Spectrus NX1106

Toxicity Measurement	MSDS (2019)	Fact Sheet Criterion
Fathead Minnow NOEL (96 hr flow-thru bioassay)	2.5 mg/L	-
Fathead Minnow NOEL (36 day early life stage)	1.3 mg/L	0.21
Daphnia magna LC50 (48 hr flow-thru bioassay)	2.9 mg/L	-
Daphnia magna 10% mortality (48 hr flow-thru bioassay)	0.6 mg/L	0.023

In addition to the above concern, we also note that these chemical additives are only discharged during emergency conditions and the vast majority of the time there is no discharge of these chemicals. It is overly conservative to assume that such an emergency condition would coincide with drought conditions in the river, and/or that each of the seven outfalls would experience an emergency at the same time, and/or that maximum chemical additive usage rates would be in effect during an emergency, because no chemicals are added during an emergency event.

We also note that the analysis provided in the Fact Sheet includes chemical additive usage that may discharge through Outfall 902. The river discharge from this outfall also receives treated process flow from internal Outfall 901, which dilutes the discharge and achieves mixing with 50% of the river flow at the point of discharge. Any chemical additives that discharge through Outfall 902 should be evaluated separately from the stormwater and emergency non-contact cooling water outfalls.

Based on these considerations, the proposed limits on the use of chemical additives in Part C.II.E of the draft NPDES permit (37) at should be removed from the NPDES permit. As a side note, the table in Part C.II.E should remove the reference to 0.008 MGD flow rate as this is confusing and unnecessary if limits on the usage of chemical additives was actually required.

4. Effluent Limitation for Oil and Grease at Outfall 901

The draft NPDES permit includes daily maximum (30.0 mg/L) and instantaneous maximum (30 mg/L) limits for Oil and Grease with a sampling frequency of 2/month and a sample type of "grab". (Draft NPDES Permit at 16) These effluent limits are essentially identical and the

sampling frequency/type ensures that the daily grab sample (a measure of instantaneous concentration) will also represent the daily maximum concentration. It is inappropriate to set these two averaging periods at the same concentration limit. We request that either the daily maximum concentration limit be removed from the permit or that the instantaneous maximum concentration be increased to a more appropriate concentration to reflect the difference in averaging periods. Elsewhere in the permit, the Department uses a factor of 1.5 as the difference between the daily maximum and instantaneous maximum concentration limit. Using this factor, the instantaneous maximum effluent limit for Oil and Grease would be 45 mg/L.

5. Stormwater Monitoring Requirements

The Fact Sheet (at 14) discusses stormwater sampling results reported with the NPDES renewal application and notes that several parameters (e.g., cyanide and silver) were not detected and these parameters will not require monitoring in the proposed permit. However, cadmium (Cd (T)) was not detected in any stormwater samples but monitoring is required because this metal is used at the facility (Fact Sheet at 15). This statement regarding the use of cadmium is not correct. (See paragraph 7 for further discussion.)

The Department added Cd (T) as a required monitoring parameter for Outfalls 015 (E6N), 016 (W-11), and 017 (HT-1), with a measurement frequency of 1/6 months and a "Composite" sampling type. (Draft NPDES Permit at 9 – 13) The required measurement frequency for this parameter is the same as all the other parameters which are detected in the stormwater effluent. We request that the sampling frequency for Cd (T) be reduced to 1/year since the available measurements show that it is not present in measurable quantities in the stormwater effluent.

We also note that the required "Composite" sample type is inconsistent with all other parameters which are listed as "Grab" samples. The sample type for this parameter should change this to "Grab" to be consistent with all the other stormwater monitoring parameters.

Finally , Outfall 015 (EGN) on page 9 of the draft permit is incorrect and should be changed to 015 (E6N).

6. Outfall 901 Monitoring Requirements for Organics

The Fact Sheet (at 56) discusses limits and monitoring requirements for Naphthalene and Tetrachloroethylene. It notes that, as allowed in the current NPDES Permit, effluent limits for these parameters are not necessary and monitoring, as allowed in the current permit, will continue. The current permit sets annual monitoring requirements for all organic parameters (including TTO, Naphthalene, Tetrachloroethylene, 1,1,1-Trichloroethane, 1,1-Dichloroethylene, Trichloroethylene, and 1,2-Dichlorothene). The monitoring sample type for all volatile organic parameters (Tetrachloroethylene, 1,1,1-Trichloroethane, 1,1-Dichloroethylene, Trichloroethylene, and 1,2-Dichlorothene) should be "Grab" as required by the current permit and indicated in the draft NPDES permit in Part C.IV.B. Effluent monitoring data for organics (Fact Sheet at 35) shows all volatile organics and Naphthalene are undetected in the effluent and

no information is presented to show that the monitoring frequency should be changed from annual to quarterly.

The draft NPDES permit (Outfall 901at pages 16 & 17) lists Tetrachloroethylene twice, first as an annual "Grab" parameter then as a quarterly "24-Hr Composite" parameter. Tetrachloro-ethylene is a volatile organic chemical (VOC) and the appropriate sample type is "Grab". Carpenter requests that the quarterly sampling requirement for Tetrachloroethylene be removed from the permit as the Fact Sheet notes its intention of retaining the current requirements and the available monitoring data show this parameter is not detected in the effluent.

The Department has changed the monitoring frequency for Naphthalene from annual to quarterly "24-Hr Composite". Carpenter requests that the quarterly sampling requirement for Naphthalene be changed back to 1/year as the Fact Sheet notes its intention of retaining the current requirements and the available monitoring data show this parameter is not detected in the effluent.

7. Outfall 901 Monitoring Requirements for Metals

The Fact Sheet (at 55) identifies total lead, total silver, and total zinc as impurities that are not utilized in the raw material. "Thus, monitoring shall continue 1x/yr." This assessment is supported by effluent monitoring (Fact Sheet at 34) showing that these parameters are not detected in the process wastewater effluent. However, the toxics analysis (Fact Sheet at 59) indicates that these parameters should be monitored on a quarterly basis based on the Effluent Limitation Guidelines (ELGs) for this categorical industry. This same situation applies to cadmium as well. Cadmium is not detected in the process wastewater effluent (Fact Sheet at 32) and is characterized as an impurity in the manufacturing process (Fact Sheet at 59), but monitoring for this metal was increased to quarterly based on the Effluent Limitation Guidelines for this categorical industry.

These metals (cadmium, lead, silver, and zinc) are NOT used in raw materials for the production of Carpenter's alloys. These elements are actually considered contaminants that can adversely affect Carpenter's alloy properties. Carpenter screens raw materials for 15 trace elements including cadmium, lead, silver, and zinc, to prevent alloy contamination. These parameters only appear in Carpenter's permit because they are ELG – listed parameters. Increasing monitoring for these parameters from annual in the current permit to quarterly in the draft permit is not supported by historical monitoring data which shows that these metals are not detected. Consequently, we request that the monitoring requirements for these metals be set to annual.

8. Outfall 002 Process Water

The draft NPDES permit identifies Outfall 002 as consisting of "Emergency overflow of recirculating Noncontact Cooling Water (NCCW)". (Draft NPDES permit at 2) Outfall 002 (E6L) was identified in the 2017 permit and in the 3/02/2022 permit application as consisting of non-contact cooling water (NCCW), process water, and stormwater. Subsequently, Carpenter

informed the Department of a change to the type of effluent discharged from this outfall. Carpenter submitted revised permit pages on 11/14/24 indicating that all process water was eliminated from Outfall 002, so it discharges only stormwater. However, the draft permit removed the stormwater component and kept the process water in Part A (1 A) page 2 under type of effluent. Outfall 002 is subsequently shown correctly in the stormwater outfall table in Part C.III (on page 37 of the draft permit).

We request that the effluent type designation specified for Outfall 002 on page 2 of the draft NPDES permit be revised to reflect that only stormwater is discharged from this outfall.

9. Non-Polluting Stormwater

The draft permit contains the following statement for stormwater discharges (draft NPDES Permit at 37): "the permittee is authorized to discharge non-polluting stormwater from its site".

As identified in the Fact Sheet (at 12 – 13), the outfalls referenced in the draft NPDES permit, Part C.111 (at 37 – 38) are classified as stormwater outfalls associated with industrial activity. As such, they are likely to contain parameters that are regulated as pollutants. The term "non-polluting stormwater" is not defined, confusing, and inconsistent with the designation of these outfalls. The term "non-polluting" should be deleted as was done for the current permit.

10. Sampling and Analytical Methods for Total Toxic Organics (TTO)

Part C.IV.B of the draft NPDES permit (at page 44) provides a table showing sample type and analytical method for TTO samples. The table indicates that 8-hour composite samples are required for Acids and Base/Neutral organic priority pollutants and Pesticides/PCBs. Carpenter requests that the sample type be changed to either a minimum of 8-hour composite or to 24-hour composite to be consistent with all other composite sampling requirements for Outfall 901.

Carpenter also requests that the analytical method for monitoring Pesticides & PCBs be changed to allow for use of Method 608 in addition to or in place of Method 625.

11. Part A – Additional Requirement (at 20)

The draft NPDES permit includes Additional Requirements regarding, among other things, 1. observed deposits in the receiving water and 4. Substances that produce observed changes in color, taste odor or turbidity of the receiving water.

The fourth general prohibition concerning foam or substances that produce an observed change in color, taste, order, or turbidity, specifies that (unless those conditions are otherwise controlled through effluent limitations or other requirements in this permit) for the purpose of determining compliance with this condition, DEP will compare conditions in the receiving water upstream of the discharge to conditions in the receiving water approximately 100 feet downstream of the discharge to determine if there is an observable change in the receiving water. The first general prohibition concerning observed deposits in the receiving stream, however, does not specify a

method for compliance determination or provide an exception for conditions controlled in the permit.

Effluent limitations for Outfall 901 include both concentration and mass limitations for Total Suspended Solids (TSS) (at 16) which include a Monthly Average limitation 30 mg/l, a Daily Maximum limitation of 60 mg/l, and an Instantaneous Maximum limitation of 75 mg/l . At certain steam conditions, even at TSS concentrations well below these limitations, it is not unreasonable to expect some observable deposition immediately downstream from this outfall. Carpenter requests that the Department also specify, for the purpose of determining compliance with this condition, that DEP will compare conditions in the receiving water upstream of the discharge to conditions in the receiving water approximately 100 feet downstream of the discharge to determine if there is an observable deposition in the receiving water. In addition, or alternatively, the Department should include an exception for conditions controlled in the permit.

12. Part A – Supplemental Information (at 20)

The draft NPDES permit includes Supplemental Information regarding the calculation of effluent limits. Specifically, it notes:

> "effluent limitations for Outfalls 002, 004, 005, 011, 012, 013, and 014 were determined using effluent discharge rates of 2.16 MGD, 0.13 MGD, 0.15 MGD, 1 MGD, 1.44 MGD, 0.72 MGD and 3.09 MGD, respectfully."

As noted above in Comment #8, Outfall 002 consists solely of stormwater runoff and should not be identified in this grouping.

Outfall 011 is identified in the Fact Sheet (at 10) with a design flow rate of 2 MGD. The Fact Sheet (at 40) shows the design flow rate of 1 MGD. These need to be consistent internally in the Fact Sheet and with the Supplemental Information.

Outfall 012 shows a design flow of 0.72 MGD (Fact Sheet at 40). This is inconsistent with the Fact Sheet at 10 (1.44 MGD) and with the Supplemental Information.

Outfall 013 shows a design flow of 0.4 MGD (Fact Sheet at 41). This is inconsistent with the Fact Sheet at 10 (0.72 MGD) and with the Supplemental Information.

The list should also include Outfall 901 (design flow of 1.45 MGD and average flow rate of 0.92 MGD used in development of permit limits) and Outfall 902 (design flow of 0.72 MGD). Please note, the table on page 10 of the Fact Sheet identifies the process wastewater outfall as 902. This should be corrected to 901.

Carpenter believes that this section containing appropriate corrections should be made to the Fact Sheet (at 10 and 40) and that this supplemental information should be removed from the final permit because the Department used average daily flows not the design daily flows to develop effluent limitations.

13. PCB Monitoring

The draft NPDES permit includes requirements for PCB Monitoring (Part C.V) and for preparing a PCB Pollution Minimization Plan (PMP) and Monitoring (Part C.VI). Part C.V requires Carpenter to collect one wet weather and one dry weather PCB sample from Outfall 018 during the first 12 months of the permit. Part C.VI requires Carpenter to develop and implement a PMP and to conduct annual PCB monitoring at Outfall 018. The PMP is to be implemented within 60 days of receipt of a PMP completeness determination issued by DEP.

The discussion in the Fact Sheet (at 51) notes that the facility has conducted PCB monitoring at Outfall 018 on an annual basis since 2017. The Department commented that, since the sampling data exceed the PCB TMDL water quality criterion of 0.044 ng/L, the facility is required to implement Phase II of the TMDL, which involves annual sampling and the development and implementation of a PMP.

As discussed above, the permit requires the collection of one wet weather and one dry weather sample from Outfall 018 for PCB analysis within 12 months of permit issuance (Part C.V) and the permit requires the subsequent collection of one wet weather and one dry weather sample from Outfall 018 for PCB analysis annually. Outfall 018 is a stormwater outfall, with discharge only expected in response to precipitation. The requirement to provide a dry weather sample for PCB analysis should be removed from the permit because no discharge occurs during dry weather conditions.

We note that Carpenter has already submitted a PMP to DEP on 3/18/2024 (See, Fact Sheet at 235 – 239). This PMP provides additional information on the sampling efforts conducted by the permittee as well as information on testing results, using analytical method 1668A, on trip blanks, method blanks, Bernhart's Creek, and precipitation within the watershed. These results are summarized in the Fact Sheet (at 238) and show that even trip blank and method blank samples cannot show compliance with the TMDL. This is likely because reporting requires the summation of all PCB congeners with lab-estimated concentrations (J, JB, JEMPC, and JEMPCB) above the method detection level but below the quantifiable level. Thus, while no PCB congener is quantifiable, all samples (when the congeners are summed) exceed the TMDL target. These results indicates that PMP efforts to meet the TMDL requirements cannot succeed.

As indicated in the PCB elimination plan submitted to the Department, Carpenter does not manufacture, process, or otherwise use PCBs in its Reading, PA facility, and our manufacturing process do not have the necessary chemistry or conditions to generate PCBs. The facility had some electrical equipment that contained PCB fluids and these potential sources have been eliminated through an aggressive PCB equipment removal plan. The last PCB electrical capacitors, switches, etc. were removed in 2008 and the last PCB transformer was removed in 2011. As a result of this PCB equipment removal plan, all known potential PCB sources have been eliminated from the facility, and the stormwater sampling data indicates that there are no other sources of PCB contributing to runoff in this service area.

The intent of the sampling required by the Schuylkill River PCB TMDL is to assess whether there are hot spot sources of PCB contamination that might be amenable to remediation through

a PMP. As indicated in the PCB elimination plan already submitted to the Department, Method 1668 A PCB data generated through Carpenter's extended water sampling efforts has not generated any conclusive information indicating an onsite source of PCBs. Carpenter therefore requests that PCB monitoring requirements be removed from the final permit.

14. PFAS Monitoring and Reduction Plan

The draft NPDES permit includes requirements for quarterly monitoring of PFOA, PFOS, PFSB, and HFPO-DA for Outfall 901 (Part A at 17 – 18). In addition, Part C includes requirements for a PFAS Reduction Plan (Part C.VII at 46) which includes a source evaluation to determine the source of PFAS in the effluent and to determine whether the facility uses or has historically used any materials or products containing Per- and Polyfluoroalkyl Substances (PFAS)and BMPs to address Aqueous Film Forming Foam (Part C.VIII at 47),

The monitoring requirement includes a footnote stating:

> 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 (QLs) 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.

Carpenter does not engage in any of the numerous industrial processes identified as potential sources in EPA's Pollution Prevention Strategies for Industrial PFAS Discharges, nor do we use any PFSA containing materials in our manufacturing processes. However, based upon a sample taken from our water supplied by the Reading Area Water Authority (RAWA), we expect that PFSA concentrations in our industrial wastewater will exceed the QLs in the draft NPDES permit.

Parameter	QL (ng/l)	RAWA * (ng/l)
PFOA	4.0	6.02
PFOS	3.7	2.39
HFPO-DA	3.5	5.22
PFBS	6.4	< 1.7

* Sample collected 2/15/2025

As mentioned above, Carpenter does not have any processes identified by EPA's Pollution Prevention Strategies for Industrial PFAS Discharges, Carpenter does use any PFSA containing materials in our manufacturing processes and the water supplied to us for our industrial processes apparently contain PFAS compounds which exceed the specified PFSA QLs. Any potential PFAS compounds in Outfall 901 are expected to be from a combination of supply water and possible historically used materials like AFFF. Because there does not appear to be any potential process

changes available to Carpenter that would have an immediate effect on the Outfall 901 discharge, Carpenter requests that the PFSA monitoring frequency for Outfall 901 be changed from quarterly to annual. Annual sampling is sufficient to characterize PFAS concentrations in the discharge and to support development of a PFAS Reduction Plan and Best Management Practices (BMPs).

Attachment 1
Comments Submitted by Carpenter Technology Corporation on 2016 Draft NPDES Permit on Proposed Ammonia Limits

3. Ammonia Limits

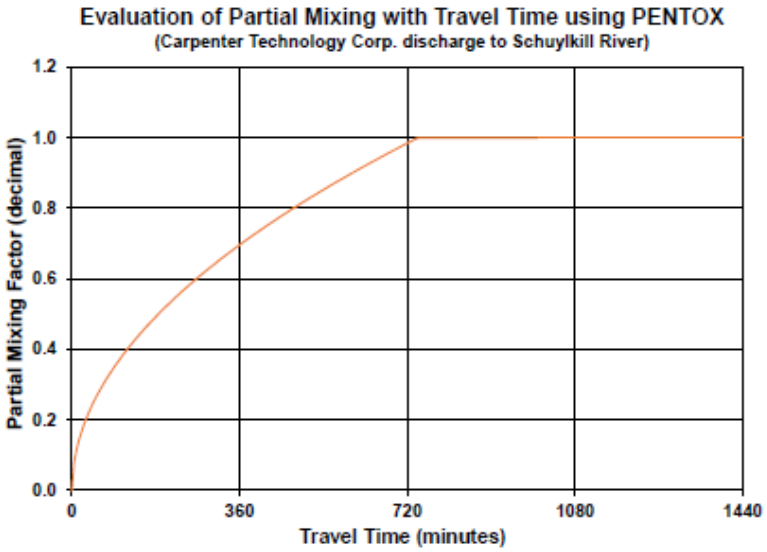
The draft NPDES permit limits for ammonia (IMP 901) were calculated as a multiple discharge wasteload allocation using the Department's WQM 7.0 model. Although the low flow yield (LFY) for the Schuylkill River at Berne was calculated at 0.23 cfs/mi^2, the wasteload allocation was based on a LFY of 0.08 cfs/mi^2 (one third of the actual LFY). The rationale for this change is presented in the Fact Sheet with the draft permit as follows:

> "Due to the width of the Schuylkill River, however, it is not expected that full mixing across the width of the river would occur. The model itself does not make adjustments for mixing (unlike the Department's PENTOX model discussed below). One approach used in NPDES permits for other dischargers to the Schuylkill River has been reducing the calculated Low Flow Yield (LFY) by a third as the input value in the model, thereby estimating that mixing would occur in 1/3 of the river's width: LFY/3 = 0.23/3 = 0.08 cfs/sq.mi. That approach has been used in this permit."
>
> (Fact Sheet at 17)

The assumption that the discharge is not expected to mix across the Schuylkill River is inconsistent with the PENTOX model evaluations. As noted in the Fact Sheet, the PENTOX model estimates dilution with travel time. The dilution estimates are based on the conservative assumption that the effluent is confined to the shoreline at the point of discharge and must passively diffuse across the entire width of the river. (See, Technical Reference Guide 391-2000-011 at 20 et seq.) This assumes a bank discharge with zero velocity and no near-field mixing, which is not representative of Carpenter's outfall. Carpenter's discharge accelerates as it passes through an eight inch Parshall flume located at the outfall and travels down a steep concrete spillway reaching a velocity > 8 feet per second before entering the River. This results in near-field mixing across approximately half of the River as evidenced by the picture below which is looking across the Schuylkill River from the wastewater treatment plant outfall (Outfall 009) during a recent mixing zone dye test. The green dye shows the effluent spreading out to the middle of the river channel at the point of discharge. Due to the design of the discharge point, the effluent enters the river at a velocity sufficient to achieve significant near-field mixing at the point of discharge. Consequently, the PENTOX dilution estimates should be considered highly conservative.

Moreover, there are numerous areas downstream from the outfall, and within the river reach starting at river mile 78.2, that contain rapids. These areas, visible in a Google Earth view of the river below, promote more rapid mixing than that assumed by the model.

Even using conservative assumptions that do not account for initial turbulent mixing or the presence of rapids in the stream, the PENTOX model estimates that, at the Q_{7-10} river flow (0.23 LFY x 665 square miles = 152.95 cfs), the partial mixing factor is 0.142 after 15 minutes and 0.984 after 720 minutes. Using the methodology in the Technical Reference Guide, complete mixing occurs in 743 minutes (approximately half a day's travel time from the outfall) as illustrated in figure below.



Consequently, the dilution model used by the Department in the PENTOX model shows that the effluent will completely mix across the entire width of the river in a short period of time relative to potential oxygen depletion caused by oxidation of carbonaceous BOD and ammonia-nitrogen. Therefore, it is inappropriate to assume that the discharge will not mix across the entire width of the river as the dilution model used in PENTOX confirms that mixing occurs across the entire width of the river in half a day.

Moreover, we have the following comments on the wasteload allocation calculations:

$Q_{7\text{-}10}$ Flow: The WQM 7.0 model and PENTOX use a drainage area of 665 square miles at the point of discharge and a LFY = 0.23 to yield a drought flow of 151.8 cfs for evaluating water quality-based effluent limits. Prior to this permit, the $Q_{7\text{-}10}$ flow was 191 cfs and the drainage area at the outfall was 683.5 square miles, resulting in a LFY = 0.28. Please revise the analysis to use the 683.5 square mile drainage area and flow of 191 cfs or provide the data used to calculate the revised drainage area and flow. Please allow 30 days for review and comment on the new data.

DRBC Minimum Effluent Limit: The Fact Sheet notes that DRBC technology-based effluent limit for ammonia is 20 mg/L as a monthly average. This ammonia limit was addressed in a variance request, supported by the Department (See, Letter from Roger Musselman to Ronald Rulon, June 17, 1997 - Attachment 1), which justified the current monthly average ammonia-nitrogen effluent limit of 45 mg/L. This letter also identifies the $Q_{7\text{-}10}$ flow as 191 cfs. The DRBC approved this variance as indicated in the Letter from Carol Collier to Michael Hart, February 28, 2000 (Attachment 2). Consequently, the technology-based ammonia limit of 20 mg/L as a monthly average should not be used in the WQM 7.0 model to alter the ammonia-nitrogen permit limits.

Chronic Ammonia Limits: The ammonia limits in the current permit were calculated without consideration for downstream dischargers. If the current permit limits are revised based on a

wasteload allocation for the nearby facilities, the Department needs to account for the significant additional dilution flow that enters the Schuylkill River from Tulpehocken Creek. This additional flow enters the river prior to the edge of the chronic mixing zone and further dilutes the effluent before it reaches the next, downstream point source (Wyomissing STP).

Wyomissing STP Ammonia-nitrogen Limits: The current NPDES permit for the Wyomissing STP identifies the monthly average ammonia limit for the summer season (May 1 – October 31) as 3.0 mg/L. DMR data for the Wyomissing STP confirm that the facility easily meets its permit limits. The wasteload allocation for Carpenter Technology Corporation used a default value of 20 mg/l for the Wyomissing STP and should have been calculated using the current permit limit for the Wyomissing STP in the multiple discharge allocation.

Responses to Carpenter Comments on Fact Sheet/NPDES

Comment #1

The Comment and Response from 2016 discusses the partial mixing factor (PMF). In 2016, discussions with Carpenter occurred. DEP's initial modeling used a PMF factor of 0.3 to account for the large receiving waters. At Carpenter's request, the PMF was adjusted to 0.5. Dye studies may have been conducted in previous years. The dye studies were not available in DEP files.

Carpenter's comments on the Draft Fact Sheet from 2025 requested complete mixing based upon (1) an aerial photograph suggesting mixing through rapids (2) a photograph showing mixing through a green dye at the point of discharge. Carpenter's comments on the Draft Fact Sheet from 2025 did not include sufficient supporting information to change the PMF of 0.5 to complete mixing. DEP proposes to continue using the PMF of 0.5. A Part C condition will be included to re-open the permit should Carpenter submit a complete mixing study or provide sufficient additional information for DEP to consider.

Comment #2

Carpenter contends that hardness can be abstracted from a flow vs. hardness relationship. We are not familiar with a flow and hardness relationship. We are unsure if the data can be extrapolated to provide a finding.

Common practices for permit writers is to use monitoring data from a local water quality network (WQN) station. A nearby WQN station is the WQN 111 located on the Schuylkill River located approximately 24 miles downstream from the subject facility. Utilizing WQN 111, the median hardness data point from the December 1998 to April 2016 data set was 136 mg/l. The data set was comprised of 124 data points. The *Implementation Guidance Design Conditions* (391-2000-006) (Page 8) guidance document recommends using the historical median value or representative instream measurements.

In comparison, the facility collected three upstream water samples for hardness. The average hardness value was 133 mg/l. Since the historical median and the upstream water sample are nearly the same, using the hardness value of 133 mg/l for TMS modeling is reasonable.

The previous fact used a hardness of 149 mg/l. Conceptually the value of 133 mg/l and 149 mg/l are in the same ballpark. This fact sheet utilized a different WQN station.

Comment #3

An applicant wishing to use an additive was instructed to complete the Chemical Additives Notification Form and New Chemical Additives Request Form. With the forms and MSDS, DEP Central Office calculates the toxicity of the chemical additives by estimating reference values for the acute aquatic life effect level, chronic aquatic life effect level, and human health safe usage concentration. The reference values to be placed in the TMS sheet where the reasonable potential will be calculated by the TMS Sheet. The reference values of the toxicity from DEP's Central Office additive database are shown below. (See procedure outlined in the Standard Operating Procedure for Chemical Additives)

CHEMICAL ADDITIVE NAME	MANUFACTURER	PURPOSE	AQUATIC LIFE EFFECT LEVEL ACUTE (mg/L)	AQUATIC LIFE EFFECT LEVEL CHRONIC (mg/L)	HUMAN HEALTH SAFE USAGE CONCENTRATION (mg/L)	CRL	APPROVED DATE	MSDS DATE
Continuum AT3203	Veolia WTS USA, Inc. (formerly SUEZ WTS USA, Inc., formerly GE Betz Inc.)		2.09	0.23	2.1	No	09/18/2013	01/19/2010
Corrshield MD4103	Veolia WTS USA, Inc. (formerly SUEZ WTS USA, Inc., formerly GE Betz Inc.)		106.88	11.88	.21	No	09/18/2013	06/28/2011
Gengard GN8113	Veolia WTS USA, Inc. (formerly SUEZ WTS USA, Inc., formerly GE Betz Inc.)	Corrosion Inhibitor	10.99	1.22	64.2	No	05/22/2024	02/19/2023
Gengard GN8203	Veolia WTS USA, Inc. (formerly SUEZ WTS USA, Inc., formerly GE Betz Inc.)	Corrosion Inhibitor	17.06	1.9	112.9	No	05/20/2016	01/19/2016
Spectrus NX1103	Veolia WTS USA, Inc. (formerly SUEZ WTS USA, Inc., formerly GE Betz Inc.)	Microbial Control Agent	0.019	0.002	.035	No	09/18/2013	09/15/2011
Spectrus NX1106	Veolia WTS USA, Inc. (formerly SUEZ WTS USA, Inc., formerly GE Betz Inc.)	Microbial Control Agent	0.21	0.023	NT	No	10/16/2023	01/25/2019

The chemical usage amounts of the additives are recommended by Toxics Management Spreadsheet. The concentrations from the TMS are multiplied by the flow rate to arrive at the maximum usage rates.

Discussion on Proposed Chemical Usage Limits

We acknowledge that the likelihood of events such as an emergency during drought conditions, each of the seven outfalls receiving an emergency, and the maximum chemical additive used occurring simultaneously is not likely. Our position is to model worst case scenario.

Outfalls 004, 005, 011, 012, 013, 014, and 902 are discharge outfalls used for emergency situations only.

Two modeling runs were conducted to determine maximum chemical usage rates.

Modeling Run #1 utilized a flow rate of 0.001 MGD.

Modeling Run #2 utilized a flow rate of 1.54 MGD. This is the maximum flow during production/operation for one of the seven aforementioned non-contact cooling water outfalls (i.e. Outfall 014).

A comparison of the average monthly (AML) usage rates yielded very similar results for both the 0.001 MGD flow rate and the 1.54 MGD flow rate.

See the summary table.

Chemical Usage Limits

Flow Rate	0.001 MGD	1.54 MGD
Pollutants	lbs/day	lbs/day
Continuum AT3203	137	141
Corrshield MD4103	125	129
Gengard GN8113	727	749
Gengard GN8203	1132	1167
Spectrus NX1103	1.19	1.23
Spectrus NX1106	13.7	14.1
Notes:		
Chemical Usage limits as Average Monthly Limit (AML)		

A review of DMR data from 2023 to 2024 for all the non-contact cooling water outfalls showed a daily maximum flow rate of 1.38 MGD for Outfall 012 in May 2024.

The draft permit shall apply the chemical usage rates listed under the 1.54 MGD. This would allow for small discharge or discharges up to 1.54 MGD. Again, the average monthly discharge limits are similar for 0.001 MGD and 1.54 MGD.

Additive usage rates will remain in Part C of the permit.

TMS Outputs for Chemical Usage

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Toxics Management Spreadsheet
Version 1.4, May 2023

Discharge Information

CHEMICAL
0.001 MGD

Instructions | Discharge | Stream

Facility: Carpenter Technology Corp. NPDES Permit No.: PA0013129 Outfall No.: See WW De

Evaluation Type: Major Sewage / Industrial Waste Wastewater Description: NCCW (4,5,11,12,13,14,902)

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
0.001	107	7	0.5					

					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		257									
	Chloride (PWS)	mg/L		118									
	Bromide	mg/L	<	2.5									
	Sulfate (PWS)	mg/L		19									
	Fluoride (PWS)	mg/L		0.52									
Group 2	Total Aluminum	µg/L		89									
	Total Antimony	µg/L	<	22									
	Total Arsenic	µg/L	<	22									
	Total Barium	µg/L		102									
	Total Beryllium	µg/L	<	6									
	Total Boron	µg/L	<	22									
	Total Cadmium	µg/L	<	0.2									
	Total Chromium (III)	µg/L	<	6									
	Hexavalent Chromium	µg/L	<	1									
	Total Cobalt	µg/L	<	6									
	Total Copper	µg/L		68									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L	<	10									
	Dissolved Iron	µg/L		449									
	Total Iron	µg/L		456									
	Total Lead	µg/L	<	4.7									
	Total Manganese	µg/L		16									
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L		6									
	Total Phenols (Phenolics) (PWS)	µg/L	<	20									
	Total Selenium	µg/L	<	1									
	Total Silver	µg/L	<	0.5									
	Total Thallium	µg/L	<	0.5									
	Total Zinc	µg/L		88									
	Total Molybdenum	µg/L		22									
	Acrolein	µg/L	<	2									
	Acrylamide	µg/L											
	Acrylonitrile	µg/L	<	1									
	Benzene	µg/L	<	1									
	Bromoform	µg/L	<	1									
	Carbon Tetrachloride	µg/L	<	1									
	Chlorobenzene	µg/L		1									
	Chlorodibromomethane	µg/L	<	1									
	Chloroethane	µg/L	<	1									
	2-Chloroethyl Vinyl Ether	µg/L	<	1									

Group 3	Chloroform	µg/L		3.86									
	Dichlorobromomethane	µg/L	<	1									
	1,1-Dichloroethane	µg/L	<	1									
	1,2-Dichloroethane	µg/L	<	1									
	1,1-Dichloroethylene	µg/L	<	1									
	1,2-Dichloropropane	µg/L	<	1									
	1,3-Dichloropropylene	µg/L	<	1									
	1,4-Dioxane	µg/L	<	250									
	Ethylbenzene	µg/L	<	1									
	Methyl Bromide	µg/L	<	1									
	Methyl Chloride	µg/L	<	1									
	Methylene Chloride	µg/L	<	1									
	1,1,2,2-Tetrachloroethane	µg/L	<	1									
	Tetrachloroethylene	µg/L	<	1									
	Toluene	µg/L	<	1									
	1,2-trans-Dichloroethylene	µg/L	<	1									
	1,1,1-Trichloroethane	µg/L	<	1									
	1,1,2-Trichloroethane	µg/L	<	1									
	Trichloroethylene	µg/L	<	1									
	Vinyl Chloride	µg/L	<	0.5									
Group 4	2-Chlorophenol	µg/L	<	5									
	2,4-Dichlorophenol	µg/L	<	5									
	2,4-Dimethylphenol	µg/L	<	10									
	4,6-Dinitro-o-Cresol	µg/L	<	10									
	2,4-Dinitrophenol	µg/L	<	5									
	2-Nitrophenol	µg/L	<	5									
	4-Nitrophenol	µg/L	<	5									
	p-Chloro-m-Cresol	µg/L	<	5									
	Pentachlorophenol	µg/L	<	5									
	Phenol	µg/L	<	1.1									
	2,4,6-Trichlorophenol	µg/L	<	5									
Group 5	Acenaphthene	µg/L	<	5									
	Acenaphthylene	µg/L	<	5									
	Anthracene	µg/L	<	5									
	Benzidine	µg/L	<	50									
	Benzo(a)Anthracene	µg/L	<	2									
	Benzo(a)Pyrene	µg/L	<	2									
	3,4-Benzofluoranthene	µg/L	<	2									
	Benzo(ghi)Perylene	µg/L	<	5									
	Benzo(k)Fluoranthene	µg/L	<	2									
	Bis(2-Chloroethoxy)Methane	µg/L	<	5									
	Bis(2-Chloroethyl)Ether	µg/L	<	5									
	Bis(2-Chloroisopropyl)Ether	µg/L	<	5									
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	5									
	4-Bromophenyl Phenyl Ether	µg/L	<	5									
	Butyl Benzyl Phthalate	µg/L	<	5									
	2-Chloronaphthalene	µg/L	<	5									
	4-Chlorophenyl Phenyl Ether	µg/L	<	5									
	Chrysene	µg/L	<	2									
	Dibenzo(a,h)Anthrancene	µg/L	<	2									
	1,2-Dichlorobenzene	µg/L	<	5									
	1,3-Dichlorobenzene	µg/L	<	5									
	1,4-Dichlorobenzene	µg/L	<	5									
	3,3-Dichlorobenzidine	µg/L	<	5									
	Diethyl Phthalate	µg/L	<	5									
	Dimethyl Phthalate	µg/L	<	5									
	Di-n-Butyl Phthalate	µg/L	<	5									
	2,4-Dinitrotoluene	µg/L	<	5									
	2,6-Dinitrotoluene	µg/L	<	5									
	Di-n-Octyl Phthalate	µg/L	<	5									
	1,2-Diphenylhydrazine	µg/L	<	5									
	Fluoranthene	µg/L	<	5									
	Fluorene	µg/L	<	5									
	Hexachlorobenzene	µg/L	<	5									
	Hexachlorobutadiene	µg/L	<	2.1									
	Hexachlorocyclopentadiene	µg/L	<	5									
	Hexachloroethane	µg/L	<	5									
	Indeno(1,2,3-cd)Pyrene	µg/L	<	2									

	Isophorone	µg/L	<	5									
	Naphthalene	µg/L	<	2.1									
	Nitrobenzene	µg/L	<	5									
	n-Nitrosodimethylamine	µg/L	<	5									
	n-Nitrosodi-n-Propylamine	µg/L	<	5									
	n-Nitrosodiphenylamine	µg/L	<	5									
	Phenanthrene	µg/L	<	5									
	Pyrene	µg/L	<	5									
	1,2,4-Trichlorobenzene	µg/L	<	0.5									
Group 6	Aldrin	µg/L	<										
	alpha-BHC	µg/L	<										
	beta-BHC	µg/L	<										
	gamma-BHC	µg/L	<										
	delta BHC	µg/L	<										
	Chlordane	µg/L	<										
	4,4-DDT	µg/L	<										
	4,4-DDE	µg/L	<										
	4,4-DDD	µg/L	<										
	Dieldrin	µg/L	<										
	alpha-Endosulfan	µg/L	<										
	beta-Endosulfan	µg/L	<										
	Endosulfan Sulfate	µg/L	<										
	Endrin	µg/L	<										
	Endrin Aldehyde	µg/L	<										
	Heptachlor	µg/L	<										
	Heptachlor Epoxide	µg/L	<										
	PCB-1016	µg/L	<										
	PCB-1221	µg/L	<										
	PCB-1232	µg/L	<										
	PCB-1242	µg/L	<										
	PCB-1248	µg/L	<										
	PCB-1254	µg/L	<										
	PCB-1260	µg/L	<										
	PCBs, Total	µg/L	<										
	Toxaphene	µg/L	<										
	2,3,7,8-TCDD	ng/L	<										
Group 7	Gross Alpha	pCi/L											
	Total Beta	pCi/L	<										
	Radium 226/228	pCi/L	<										
	Total Strontium	µg/L	<										
	Total Uranium	µg/L	<										
	Osmotic Pressure	mOs/kg											
	Continuum AT3203	mg/L		1.00E+09									
	Corrshield MD4103	mg/L		1.00E+09									
	Gengard GN8113	mg/L		1.00E+09									
	Gengard GN8203	mg/L		1.00E+09									
	Spectrus NX1103	mg/L		1.00E+09									
	Spectrus NX1106	mg/L		1.00E+09									

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Toxics Management Spreadsheet
Version 1.4, May 2023

Stream / Surface Water Information

Carpenter Technology Corp., NPDES Permit No. PA0013129, Outfall See WW Desc

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Schuylkill River**

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	000833	76.76	202.11	665			Yes
End of Reach 1	000833	70.35	169.58	923			Yes

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

Location	RMI	LFY (cfs/mi²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	76.76	0.244										133	8.05		
End of Reach 1	70.35	0.288										133	8.05		

Q_h

Location	RMI	LFY (cfs/mi²)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	76.76														
End of Reach 1	70.35														

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Toxics Management Spreadsheet
Version 1.4, May 2023

Model Results

Carpenter Technology Corp., NPDES Permit No. PA0013129, Outfall See WW Desc

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

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.500 Analysis Hardness (mg/l): 133 Analysis pH: 8.05

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	39,333,329	
Total Antimony	0	0		0	1,100	1,100	57,688,883	
Total Arsenic	0	0		0	340	340	17,831,109	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	##########	
Total Boron	0	0		0	8,100	8,100	##########	
Total Cadmium	0	0		0	2.657	2.85	149,497	Chem Translator of 0.932 applied
Total Chromium (III)	0	0		0	719.661	2,277	##########	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	854,492	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	4,982,222	
Total Copper	0	0		0	17.582	18.3	960,484	Chem Translator of 0.96 applied
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	87.970	117	6,155,886	Chem Translator of 0.749 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	86,379	Chem Translator of 0.85 applied
Total Nickel	0	0		0	595.994	597	31,319,197	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	5.253	6.18	324,131	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	3,408,889	
Total Zinc	0	0		0	149.208	153	8,001,177	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	157,333	
Acrylonitrile	0	0		0	650	650	34,088,885	
Benzene	0	0		0	640	640	33,564,441	

Bromoform	0	0		0	1,800	1,800	94,399,990	
Carbon Tetrachloride	0	0		0	2,800	2,800	#########	
Chlorobenzene	0	0		0	1,200	1,200	62,933,327	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	#########	
Chloroform	0	0		0	1,900	1,900	99,644,434	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	#########	
1,1-Dichloroethylene	0	0		0	7,500	7,500	#########	
1,2-Dichloropropane	0	0		0	11,000	11,000	#########	
1,3-Dichloropropylene	0	0		0	310	310	16,257,776	
Ethylbenzene	0	0		0	2,900	2,900	#########	
Methyl Bromide	0	0		0	550	550	28,844,441	
Methyl Chloride	0	0		0	28,000	28,000	#########	
Methylene Chloride	0	0		0	12,000	12,000	#########	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	52,444,439	
Tetrachloroethylene	0	0		0	700	700	36,711,107	
Toluene	0	0		0	1,700	1,700	89,155,546	
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	#########	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	#########	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	#########	
Trichloroethylene	0	0		0	2,300	2,300	#########	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	29,368,886	
2,4-Dichlorophenol	0	0		0	1,700	1,700	89,155,546	
2,4-Dimethylphenol	0	0		0	660	660	34,613,330	
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	4,195,555	
2,4-Dinitrophenol	0	0		0	660	660	34,613,330	
2-Nitrophenol	0	0		0	8,000	8,000	#########	
4-Nitrophenol	0	0		0	2,300	2,300	#########	
p-Chloro-m-Cresol	0	0		0	160	160	8,391,110	
Pentachlorophenol	0	0		0	25.057	25.1	1,314,116	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	24,124,442	
Acenaphthene	0	0		0	83	83.0	4,352,888	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	15,733,332	
Benzo(a)Anthracene	0	0		0	0.5	0.5	26,222	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	30,000	30,000	#########	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	#########	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	14,159,999	
Butyl Benzyl Phthalate	0	0		0	140	140	7,342,221	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	

Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	820	820	43,004,440	
1,3-Dichlorobenzene	0	0		0	350	350	18,355,554	
1,4-Dichlorobenzene	0	0		0	730	730	38,284,440	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	#########	
Dimethyl Phthalate	0	0		0	2,500	2,500	#########	
Di-n-Butyl Phthalate	0	0		0	110	110	5,768,888	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	83,911,102	
2,6-Dinitrotoluene	0	0		0	990	990	51,919,995	
1,2-Diphenylhydrazine	0	0		0	15	15.0	786,667	
Fluoranthene	0	0		0	200	200	10,488,888	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	10	10.0	524,444	
Hexachlorocyclopentadiene	0	0		0	5	5.0	262,222	
Hexachloroethane	0	0		0	60	60.0	3,146,666	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	#########	
Naphthalene	0	0		0	140	140	7,342,221	
Nitrobenzene	0	0		0	4,000	4,000	#########	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	#########	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	15,733,332	
Phenanthrene	0	0		0	5	5.0	262,222	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	6,817,777	
Continuum AT3203	0	0		0	2,090	2,090	#########	
Corrshield MD4103	0	0		0	106,880	106,880	#########	
Gengard GN8113	0	0		0	10,990	10,990	#########	
Gengard GN8203	0	0		0	17,060	17,060	#########	
Spectrus NX1103	0	0		0	19	19.0	996,444	
Spectrus NX1106	0	0		0	210	210	11,013,332	

☑ ***CFC*** CCT (min): 720 PMF: 0.681 Analysis Hardness (mg/l): 133 Analysis pH: 8.05

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	15,723,157	
Total Arsenic	0	0		0	150	150	10,720,335	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	#########	
Total Boron	0	0		0	1,600	1,600	#########	

Total Cadmium	0	0		0	0.300	0.33	23,891	Chem Translator of 0.897 applied
Total Chromium (III)	0	0		0	93.613	109	7,779,568	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	742,920	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	1,357,909	
Total Copper	0	0		0	11.427	11.9	850,703	Chem Translator of 0.96 applied
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	#########	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	3.428	4.57	326,906	Chem Translator of 0.749 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	64,742	Chem Translator of 0.85 applied
Total Nickel	0	0		0	66.197	66.4	4,745,231	Chem Translator of 0.997 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	4.600	4.99	356,569	Chem Translator of 0.922 applied
Total Silver	0	0		0	N/A	N/A	N/A	Chem Translator of 1 applied
Total Thallium	0	0		0	13	13.0	929,096	
Total Zinc	0	0		0	150.429	153	10,903,650	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	214,407	
Acrylonitrile	0	0		0	130	130	9,290,957	
Benzene	0	0		0	130	130	9,290,957	
Bromoform	0	0		0	370	370	26,443,492	
Carbon Tetrachloride	0	0		0	560	560	40,022,582	
Chlorobenzene	0	0		0	240	240	17,152,535	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	#########	
Chloroform	0	0		0	390	390	27,872,870	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	#########	
1,1-Dichloroethylene	0	0		0	1,500	1,500	#########	
1,2-Dichloropropane	0	0		0	2,200	2,200	#########	
1,3-Dichloropropylene	0	0		0	61	61.0	4,359,603	
Ethylbenzene	0	0		0	580	580	41,451,960	
Methyl Bromide	0	0		0	110	110	7,861,579	
Methyl Chloride	0	0		0	5,500	5,500	#########	
Methylene Chloride	0	0		0	2,400	2,400	#########	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	15,008,468	
Tetrachloroethylene	0	0		0	140	140	10,005,646	
Toluene	0	0		0	330	330	23,584,736	
1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	#########	
1,1,1-Trichloroethane	0	0		0	610	610	43,596,027	
1,1,2-Trichloroethane	0	0		0	680	680	48,598,850	
Trichloroethylene	0	0		0	450	450	32,161,004	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	7,861,579	
2,4-Dichlorophenol	0	0		0	340	340	24,299,425	
2,4-Dimethylphenol	0	0		0	130	130	9,290,957	
4,6-Dinitro-o-Cresol	0	0		0	16	16.0	1,143,502	
2,4-Dinitrophenol	0	0		0	130	130	9,290,957	
2-Nitrophenol	0	0		0	1,600	1,600	#########	
4-Nitrophenol	0	0		0	470	470	33,590,382	

p-Chloro-m-Cresol	0	0		0	500	500	35,734,449	
Pentachlorophenol	0	0		0	19.224	19.2	1,373,926	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	6,503,670	
Acenaphthene	0	0		0	17	17.0	1,214,971	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	4,216,665	
Benzo(a)Anthracene	0	0		0	0.1	0.1	7,147	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	6,000	6,000	##########	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	65,036,696	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	3,859,320	
Butyl Benzyl Phthalate	0	0		0	35	35.0	2,501,411	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	160	160	11,435,024	
1,3-Dichlorobenzene	0	0		0	69	69.0	4,931,354	
1,4-Dichlorobenzene	0	0		0	150	150	10,720,335	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	57,175,118	
Dimethyl Phthalate	0	0		0	500	500	35,734,449	
Di-n-Butyl Phthalate	0	0		0	21	21.0	1,500,847	
2,4-Dinitrotoluene	0	0		0	320	320	22,870,047	
2,6-Dinitrotoluene	0	0		0	200	200	14,293,779	
1,2-Diphenylhydrazine	0	0		0	3	3.0	214,407	
Fluoranthene	0	0		0	40	40.0	2,858,756	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	2	2.0	142,938	
Hexachlorocyclopentadiene	0	0		0	1	1.0	71,469	
Hexachloroethane	0	0		0	12	12.0	857,627	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	##########	
Naphthalene	0	0		0	43	43.0	3,073,163	
Nitrobenzene	0	0		0	810	810	57,889,807	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	##########	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	4,216,665	
Phenanthrene	0	0		0	1	1.0	71,469	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	1,858,191	
Continuum AT3203	0	0		0	230	230	16,437,846	
Corrshield MD4103	0	0		0	11,980	11,980	##########	
Gengard GN8113	0	0		0	1,220	1,220	87,192,055	
Gengard GN8203	0	0		0	1,900	1,900	##########	

Spectrus NX1103	0	0		0	2	2.0	142,938	
Spectrus NX1106	0	0		0	23	23.0	1,643,785	

☑ ***THH*** CCT (min): 720 PMF: 0.681 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	
Fluoride (PWS)	0	0		0	2,000	2,000	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	400,226	
Total Arsenic	0	0		0	10	10.0	714,689	
Total Barium	0	0		0	2,400	2,400	##########	
Total Boron	0	0		0	3,100	3,100	##########	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	300	300	21,440,669	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	1,000	1,000	71,468,897	
Total Mercury	0	0		0	0.050	0.05	3,573	
Total Nickel	0	0		0	610	610	43,596,027	
Total Phenols (Phenolics) (PWS)	0	0		0	5	5.0	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	0.24	0.24	17,153	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	214,407	
Acrylonitrile	0	0		0	N/A	N/A	N/A	
Benzene	0	0		0	N/A	N/A	N/A	
Bromoform	0	0		0	N/A	N/A	N/A	
Carbon Tetrachloride	0	0		0	N/A	N/A	N/A	
Chlorobenzene	0	0		0	100	100.0	7,146,890	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	407,373	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	N/A	N/A	N/A	
1,1-Dichloroethylene	0	0		0	33	33.0	2,358,474	
1,2-Dichloropropane	0	0		0	N/A	N/A	N/A	
1,3-Dichloropropylene	0	0		0	N/A	N/A	N/A	
Ethylbenzene	0	0		0	68	68.0	4,859,885	
Methyl Bromide	0	0		0	100	100.0	7,146,890	
Methyl Chloride	0	0		0	N/A	N/A	N/A	

Methylene Chloride	0	0		0	N/A	N/A	N/A	
1,1,2,2-Tetrachloroethane	0	0		0	N/A	N/A	N/A	
Tetrachloroethylene	0	0		0	N/A	N/A	N/A	
Toluene	0	0		0	57	57.0	4,073,727	
1,2-trans-Dichloroethylene	0	0		0	100	100.0	7,146,890	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	##########	
1,1,2-Trichloroethane	0	0		0	N/A	N/A	N/A	
Trichloroethylene	0	0		0	N/A	N/A	N/A	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	30	30.0	2,144,067	
2,4-Dichlorophenol	0	0		0	10	10.0	714,689	
2,4-Dimethylphenol	0	0		0	100	100.0	7,146,890	
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	142,938	
2,4-Dinitrophenol	0	0		0	10	10.0	714,689	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	N/A	N/A	N/A	
Phenol	0	0		0	4,000	4,000	##########	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	5,002,823	
Anthracene	0	0		0	300	300	21,440,669	
Benzidine	0	0		0	N/A	N/A	N/A	
Benzo(a)Anthracene	0	0		0	N/A	N/A	N/A	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroisopropyl)Ether	0	0		0	200	200	14,293,779	
Bis(2-Ethylhexyl)Phthalate	0	0		0	N/A	N/A	N/A	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	0.1	0.1	7,147	
2-Chloronaphthalene	0	0		0	800	800	57,175,118	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	1,000	1,000	71,468,897	
1,3-Dichlorobenzene	0	0		0	7	7.0	500,282	
1,4-Dichlorobenzene	0	0		0	300	300	21,440,669	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	42,881,338	
Dimethyl Phthalate	0	0		0	2,000	2,000	##########	
Di-n-Butyl Phthalate	0	0		0	20	20.0	1,429,378	
2,4-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
2,6-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
1,2-Diphenylhydrazine	0	0		0	N/A	N/A	N/A	
Fluoranthene	0	0		0	20	20.0	1,429,378	
Fluorene	0	0		0	50	50.0	3,573,445	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	N/A	N/A	N/A	

Hexachlorocyclopentadiene	0	0		0	4	4.0	285,876	
Hexachloroethane	0	0		0	N/A	N/A	N/A	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	34	34.0	2,429,943	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	714,689	
n-Nitrosodimethylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	N/A	N/A	N/A	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	20	20.0	1,429,378	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	5,003	
Continuum AT3203	0	0		0	2,100	2,100	##########	
Corrshield MD4103	0	0		0	210	210	15,008,468	
Gengard GN8113	0	0		0	64,200	64,200	##########	
Gengard GN8203	0	0		0	112,900	112,900	##########	
Spectrus NX1103	0	0		0	35	35.0	2,501,411	
Spectrus NX1106	0	0		0	N/A	N/A	N/A	

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

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	N/A	N/A	N/A	
Total Arsenic	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	N/A	N/A	N/A	
Total Boron	0	0		0	N/A	N/A	N/A	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	N/A	N/A	N/A	

Acrylonitrile	0	0		0	0.06	0.06	24,625	
Benzene	0	0		0	0.58	0.58	238,041	
Bromoform	0	0		0	7	7.0	2,872,913	
Carbon Tetrachloride	0	0		0	0.4	0.4	164,166	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	0.8	0.8	328,333	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	N/A	N/A	N/A	
Dichlorobromomethane	0	0		0	0.95	0.95	389,895	
1,2-Dichloroethane	0	0		0	9.9	9.9	4,063,119	
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	0.9	0.9	369,374	
1,3-Dichloropropylene	0	0		0	0.27	0.27	110,812	
Ethylbenzene	0	0		0	N/A	N/A	N/A	
Methyl Bromide	0	0		0	N/A	N/A	N/A	
Methyl Chloride	0	0		0	N/A	N/A	N/A	
Methylene Chloride	0	0		0	20	20.0	8,208,322	
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	82,083	
Tetrachloroethylene	0	0		0	10	10.0	4,104,161	
Toluene	0	0		0	N/A	N/A	N/A	
1,2-trans-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,1,1-Trichloroethane	0	0		0	N/A	N/A	N/A	
1,1,2-Trichloroethane	0	0		0	0.55	0.55	225,729	
Trichloroethylene	0	0		0	0.6	0.6	246,250	
Vinyl Chloride	0	0		0	0.02	0.02	8,208	
2-Chlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dichlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dimethylphenol	0	0		0	N/A	N/A	N/A	
4,6-Dinitro-o-Cresol	0	0		0	N/A	N/A	N/A	
2,4-Dinitrophenol	0	0		0	N/A	N/A	N/A	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	0.030	0.03	12,312	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	615,624	
Acenaphthene	0	0		0	N/A	N/A	N/A	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	0.0001	0.0001	41.0	
Benzo(a)Anthracene	0	0		0	0.001	0.001	410	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	41.0	
3,4-Benzofluoranthene	0	0		0	0.001	0.001	410	
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	4,104	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	12,312	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	131,333	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	N/A	N/A	N/A	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	

Chrysene	0	0		0	0.12	0.12	49,250	
Dibenzo(a,h)Anthrancene	0	0		0	0.0001	0.0001	41.0	
1,2-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,3-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,4-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
3,3-Dichlorobenzidine	0	0		0	0.05	0.05	20,521	
Diethyl Phthalate	0	0		0	N/A	N/A	N/A	
Dimethyl Phthalate	0	0		0	N/A	N/A	N/A	
Di-n-Butyl Phthalate	0	0		0	N/A	N/A	N/A	
2,4-Dinitrotoluene	0	0		0	0.05	0.05	20,521	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	20,521	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	12,312	
Fluoranthene	0	0		0	N/A	N/A	N/A	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	0.00008	0.00008	32.8	
Hexachlorobutadiene	0	0		0	0.01	0.01	4,104	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	41,042	
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	410	
Isophorone	0	0		0	N/A	N/A	N/A	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	N/A	N/A	N/A	
n-Nitrosodimethylamine	0	0		0	0.0007	0.0007	287	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	2,052	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	1,354,373	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	N/A	N/A	N/A	
Continuum AT3203	0	0		0	N/A	N/A	N/A	
Corrshield MD4103	0	0		0	N/A	N/A	N/A	
Gengard GN8113	0	0		0	N/A	N/A	N/A	
Gengard GN8203	0	0		0	N/A	N/A	N/A	
Spectrus NX1103	0	0		0	N/A	N/A	N/A	
Spectrus NX1106	0	0		0	N/A	N/A	N/A	

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

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Continuum AT3203	137	214	16,438	25,646	41,095	mg/L	16,438	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Corrshield MD4103	125	195	15,008	23,416	37,521	mg/L	15,008	THH	Discharge Conc ≥ 50% WQBEL (RP)
Gengard GN8113	727	1,135	87,192	136,034	217,980	mg/L	87,192	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Gengard GN8203	1,132	1,767	135,791	211,856	339,477	mg/L	135,791	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Spectrus NX1103	1.19	1.86	143	223	357	mg/L	143	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Spectrus NX1106	13.7	21.4	1,644	2,565	4,109	mg/L	1,644	CFC	Discharge Conc ≥ 50% WQBEL (RP)

☑ ***Other Pollutants without Limits or Monitoring***

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	N/A	N/A	PWS Not Applicable
Chloride (PWS)	N/A	N/A	PWS Not Applicable
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	N/A	N/A	PWS Not Applicable
Fluoride (PWS)	N/A	N/A	PWS Not Applicable
Total Aluminum	25,211,076	µg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	400,226	µg/L	Discharge Conc ≤ 10% WQBEL
Total Arsenic	714,689	µg/L	Discharge Conc ≤ 10% WQBEL
Total Barium	##########	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	##########	µg/L	Discharge Conc < TQL
Total Cadmium	23,891	µg/L	Discharge Conc < TQL
Total Chromium (III)	7,779,568	µg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	547,695	µg/L	Discharge Conc < TQL
Total Cobalt	1,357,909	µg/L	Discharge Conc ≤ 10% WQBEL

Total Copper	615,632	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	21,440,669	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	#########	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	326,906	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	71,468,897	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	3,573	µg/L	Discharge Conc < TQL
Total Nickel	4,745,231	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	PWS Not Applicable
Total Selenium	356,569	µg/L	Discharge Conc < TQL
Total Silver	207,755	µg/L	Discharge Conc ≤ 10% WQBEL
Total Thallium	17,153	µg/L	Discharge Conc < TQL
Total Zinc	5,128,432	µg/L	Discharge Conc ≤ 10% WQBEL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	100,844	µg/L	Discharge Conc < TQL
Acrylonitrile	24,625	µg/L	Discharge Conc < TQL
Benzene	238,041	µg/L	Discharge Conc ≤ 25% WQBEL
Bromoform	2,872,913	µg/L	Discharge Conc ≤ 25% WQBEL
Carbon Tetrachloride	164,166	µg/L	Discharge Conc ≤ 25% WQBEL
Chlorobenzene	7,146,890	µg/L	Discharge Conc ≤ 25% WQBEL
Chlorodibromomethane	328,333	µg/L	Discharge Conc ≤ 25% WQBEL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	#########	µg/L	Discharge Conc < TQL
Chloroform	407,373	µg/L	Discharge Conc ≤ 25% WQBEL
Dichlorobromomethane	389,895	µg/L	Discharge Conc ≤ 25% WQBEL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	4,063,119	µg/L	Discharge Conc ≤ 25% WQBEL
1,1-Dichloroethylene	2,358,474	µg/L	Discharge Conc ≤ 25% WQBEL
1,2-Dichloropropane	369,374	µg/L	Discharge Conc ≤ 25% WQBEL
1,3-Dichloropropylene	110,812	µg/L	Discharge Conc ≤ 25% WQBEL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	4,859,885	µg/L	Discharge Conc ≤ 25% WQBEL
Methyl Bromide	7,146,890	µg/L	Discharge Conc ≤ 25% WQBEL
Methyl Chloride	#########	µg/L	Discharge Conc ≤ 25% WQBEL
Methylene Chloride	8,208,322	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,2,2-Tetrachloroethane	82,083	µg/L	Discharge Conc ≤ 25% WQBEL
Tetrachloroethylene	4,104,161	µg/L	Discharge Conc ≤ 25% WQBEL
Toluene	4,073,727	µg/L	Discharge Conc ≤ 25% WQBEL
1,2-trans-Dichloroethylene	7,146,890	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,1-Trichloroethane	43,596,027	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,2-Trichloroethane	225,729	µg/L	Discharge Conc ≤ 25% WQBEL
Trichloroethylene	246,250	µg/L	Discharge Conc ≤ 25% WQBEL
Vinyl Chloride	8,208	µg/L	Discharge Conc < TQL
2-Chlorophenol	2,144,067	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	714,689	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	7,146,890	µg/L	Discharge Conc < TQL
4,6-Dinitro-o-Cresol	142,938	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	714,689	µg/L	Discharge Conc < TQL
2-Nitrophenol	#########	µg/L	Discharge Conc < TQL

4-Nitrophenol	33,590,382	µg/L	Discharge Conc < TQL
p-Chloro-m-Cresol	5,378,363	µg/L	Discharge Conc < TQL
Pentachlorophenol	12,312	µg/L	Discharge Conc < TQL
Phenol	##########	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	615,624	µg/L	Discharge Conc < TQL
Acenaphthene	1,214,971	µg/L	Discharge Conc ≤ 25% WQBEL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	21,440,669	µg/L	Discharge Conc ≤ 25% WQBEL
Benzidine	41.0	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	410	µg/L	Discharge Conc < TQL
Benzo(a)Pyrene	41.0	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	410	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Benzo(k)Fluoranthene	4,104	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	12,312	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	14,293,779	µg/L	Discharge Conc < TQL
Bis(2-Ethylhexyl)Phthalate	131,333	µg/L	Discharge Conc < TQL
4-Bromophenyl Phenyl Ether	3,859,320	µg/L	Discharge Conc < TQL
Butyl Benzyl Phthalate	7,147	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	57,175,118	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	49,250	µg/L	Discharge Conc < TQL
Dibenzo(a,h)Anthrancene	41.0	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	11,435,024	µg/L	Discharge Conc ≤ 25% WQBEL
1,3-Dichlorobenzene	500,282	µg/L	Discharge Conc ≤ 25% WQBEL
1,4-Dichlorobenzene	10,720,335	µg/L	Discharge Conc ≤ 25% WQBEL
3,3-Dichlorobenzidine	20,521	µg/L	Discharge Conc < TQL
Diethyl Phthalate	42,881,338	µg/L	Discharge Conc < TQL
Dimethyl Phthalate	35,734,449	µg/L	Discharge Conc < TQL
Di-n-Butyl Phthalate	1,429,378	µg/L	Discharge Conc < TQL
2,4-Dinitrotoluene	20,521	µg/L	Discharge Conc < TQL
2,6-Dinitrotoluene	20,521	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	12,312	µg/L	Discharge Conc < TQL
Fluoranthene	1,429,378	µg/L	Discharge Conc ≤ 25% WQBEL
Fluorene	3,573,445	µg/L	Discharge Conc ≤ 25% WQBEL
Hexachlorobenzene	32.8	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	4,104	µg/L	Discharge Conc ≤ 25% WQBEL
Hexachlorocyclopentadiene	71,469	µg/L	Discharge Conc < TQL
Hexachloroethane	41,042	µg/L	Discharge Conc < TQL
Indeno(1,2,3-cd)Pyrene	410	µg/L	Discharge Conc < TQL
Isophorone	2,429,943	µg/L	Discharge Conc < TQL
Naphthalene	3,073,163	µg/L	Discharge Conc ≤ 25% WQBEL
Nitrobenzene	714,689	µg/L	Discharge Conc < TQL
n-Nitrosodimethylamine	287	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	2,052	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	1,354,373	µg/L	Discharge Conc < TQL
Phenanthrene	71,469	µg/L	Discharge Conc ≤ 25% WQBEL

Pyrene	1,429,378	µg/L	Discharge Conc ≤ 25% WQBEL
1,2,4-Trichlorobenzene	5,003	µg/L	Discharge Conc < TQL

CHEMICAL

1.54MGD

Pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Discharge Information

Instructions | Discharge | Stream

Facility: Carpenter Technology Corp. NPDES Permit No.: PA0013129 Outfall No.: See WW De

Evaluation Type: Major Sewage / Industrial Waste Wastewater Description: NCCW (4,5,11,12,13,14,902)

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
1.54	107	7	0.5					

					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		257									
	Chloride (PWS)	mg/L		118									
	Bromide	mg/L	<	2.5									
	Sulfate (PWS)	mg/L		19									
	Fluoride (PWS)	mg/L		0.52									
Group 2	Total Aluminum	µg/L		89									
	Total Antimony	µg/L	<	22									
	Total Arsenic	µg/L	<	22									
	Total Barium	µg/L		102									
	Total Beryllium	µg/L	<	6									
	Total Boron	µg/L	<	22									
	Total Cadmium	µg/L	<	0.2									
	Total Chromium (III)	µg/L	<	6									
	Hexavalent Chromium	µg/L	<	1									
	Total Cobalt	µg/L	<	6									
	Total Copper	µg/L		68									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L	<	10									
	Dissolved Iron	µg/L		449									
	Total Iron	µg/L		456									
	Total Lead	µg/L	<	4.7									
	Total Manganese	µg/L		16									
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L		6									
	Total Phenols (Phenolics) (PWS)	µg/L	<	20									
	Total Selenium	µg/L	<	1									
	Total Silver	µg/L	<	0.5									
	Total Thallium	µg/L	<	0.5									
	Total Zinc	µg/L		88									
	Total Molybdenum	µg/L		22									
	Acrolein	µg/L	<	2									
	Acrylamide	µg/L											
	Acrylonitrile	µg/L	<	1									
	Benzene	µg/L	<	1									
	Bromoform	µg/L	<	1									
	Carbon Tetrachloride	µg/L	<	1									
	Chlorobenzene	µg/L		1									
	Chlorodibromomethane	µg/L	<	1									
	Chloroethane	µg/L	<	1									
	2-Chloroethyl Vinyl Ether	µg/L	<	1									

Group 3	Chloroform	µg/L		3.86									
	Dichlorobromomethane	µg/L	<	1									
	1,1-Dichloroethane	µg/L	<	1									
	1,2-Dichloroethane	µg/L	<	1									
	1,1-Dichloroethylene	µg/L	<	1									
	1,2-Dichloropropane	µg/L	<	1									
	1,3-Dichloropropylene	µg/L	<	1									
	1,4-Dioxane	µg/L	<	250									
	Ethylbenzene	µg/L	<	1									
	Methyl Bromide	µg/L	<	1									
	Methyl Chloride	µg/L	<	1									
	Methylene Chloride	µg/L	<	1									
	1,1,2,2-Tetrachloroethane	µg/L	<	1									
	Tetrachloroethylene	µg/L	<	1									
	Toluene	µg/L	<	1									
	1,2-trans-Dichloroethylene	µg/L	<	1									
	1,1,1-Trichloroethane	µg/L	<	1									
	1,1,2-Trichloroethane	µg/L	<	1									
	Trichloroethylene	µg/L	<	1									
	Vinyl Chloride	µg/L	<	0.5									
Group 4	2-Chlorophenol	µg/L	<	5									
	2,4-Dichlorophenol	µg/L	<	5									
	2,4-Dimethylphenol	µg/L	<	10									
	4,6-Dinitro-o-Cresol	µg/L	<	10									
	2,4-Dinitrophenol	µg/L	<	5									
	2-Nitrophenol	µg/L	<	5									
	4-Nitrophenol	µg/L	<	5									
	p-Chloro-m-Cresol	µg/L	<	5									
	Pentachlorophenol	µg/L	<	5									
	Phenol	µg/L	<	1.1									
	2,4,6-Trichlorophenol	µg/L	<	5									
Group 5	Acenaphthene	µg/L	<	5									
	Acenaphthylene	µg/L	<	5									
	Anthracene	µg/L	<	5									
	Benzidine	µg/L	<	50									
	Benzo(a)Anthracene	µg/L	<	2									
	Benzo(a)Pyrene	µg/L	<	2									
	3,4-Benzofluoranthene	µg/L	<	2									
	Benzo(ghi)Perylene	µg/L	<	5									
	Benzo(k)Fluoranthene	µg/L	<	2									
	Bis(2-Chloroethoxy)Methane	µg/L	<	5									
	Bis(2-Chloroethyl)Ether	µg/L	<	5									
	Bis(2-Chloroisopropyl)Ether	µg/L	<	5									
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	5									
	4-Bromophenyl Phenyl Ether	µg/L	<	5									
	Butyl Benzyl Phthalate	µg/L	<	5									
	2-Chloronaphthalene	µg/L	<	5									
	4-Chlorophenyl Phenyl Ether	µg/L	<	5									
	Chrysene	µg/L	<	2									
	Dibenzo(a,h)Anthrancene	µg/L	<	2									
	1,2-Dichlorobenzene	µg/L	<	5									
	1,3-Dichlorobenzene	µg/L	<	5									
	1,4-Dichlorobenzene	µg/L	<	5									
	3,3-Dichlorobenzidine	µg/L	<	5									
	Diethyl Phthalate	µg/L	<	5									
	Dimethyl Phthalate	µg/L	<	5									
	Di-n-Butyl Phthalate	µg/L	<	5									
	2,4-Dinitrotoluene	µg/L	<	5									
	2,6-Dinitrotoluene	µg/L	<	5									
	Di-n-Octyl Phthalate	µg/L	<	5									
	1,2-Diphenylhydrazine	µg/L	<	5									
	Fluoranthene	µg/L	<	5									
	Fluorene	µg/L	<	5									
	Hexachlorobenzene	µg/L	<	5									
	Hexachlorobutadiene	µg/L	<	2.1									
	Hexachlorocyclopentadiene	µg/L	<	5									
	Hexachloroethane	µg/L	<	5									
	Indeno(1,2,3-cd)Pyrene	µg/L	<	2									

	Isophorone	µg/L	<	5										
	Naphthalene	µg/L	<	2.1										
	Nitrobenzene	µg/L	<	5										
	n-Nitrosodimethylamine	µg/L	<	5										
	n-Nitrosodi-n-Propylamine	µg/L	<	5										
	n-Nitrosodiphenylamine	µg/L	<	5										
	Phenanthrene	µg/L	<	5										
	Pyrene	µg/L	<	5										
	1,2,4-Trichlorobenzene	µg/L	<	0.5										
Group 6	Aldrin	µg/L	<											
	alpha-BHC	µg/L	<											
	beta-BHC	µg/L	<											
	gamma-BHC	µg/L	<											
	delta BHC	µg/L	<											
	Chlordane	µg/L	<											
	4,4-DDT	µg/L	<											
	4,4-DDE	µg/L	<											
	4,4-DDD	µg/L	<											
	Dieldrin	µg/L	<											
	alpha-Endosulfan	µg/L	<											
	beta-Endosulfan	µg/L	<											
	Endosulfan Sulfate	µg/L	<											
	Endrin	µg/L	<											
	Endrin Aldehyde	µg/L	<											
	Heptachlor	µg/L	<											
	Heptachlor Epoxide	µg/L	<											
	PCB-1016	µg/L	<											
	PCB-1221	µg/L	<											
	PCB-1232	µg/L	<											
	PCB-1242	µg/L	<											
	PCB-1248	µg/L	<											
	PCB-1254	µg/L	<											
	PCB-1260	µg/L	<											
	PCBs, Total	µg/L	<											
	Toxaphene	µg/L	<											
	2,3,7,8-TCDD	ng/L	<											
Group 7	Gross Alpha	pCi/L												
	Total Beta	pCi/L	<											
	Radium 226/228	pCi/L	<											
	Total Strontium	µg/L	<											
	Total Uranium	µg/L	<											
	Osmotic Pressure	mOs/kg												
	Continuum AT3203	mg/L		1.00E+09										
	Corrshield MD4103	mg/L		1.00E+09										
	Gengard GN8113	mg/L		1.00E+09										
	Gengard GN8203	mg/L		1.00E+09										
	Spectrus NX1103	mg/L		1.00E+09										
	Spectrus NX1106	mg/L		1.00E+09										

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Stream / Surface Water Information

Carpenter Technology Corp., NPDES Permit No. PA0013129, Outfall See WW Desc

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Schuylkill River**

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	000833	76.76	202.11	665			Yes
End of Reach 1	000833	70.35	169.58	923			Yes

Q_{7-10}

Location	RMI	LFY (cfs/mi^2)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	76.76	0.244										133	8.05		
End of Reach 1	70.35	0.288										133	8.05		

Q_h

Location	RMI	LFY (cfs/mi^2)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	76.76														
End of Reach 1	70.35														

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Model Results

Carpenter Technology Corp., NPDES Permit No. PA0013129, Outfall See WW Desc

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

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.500 Analysis Hardness (mg/l): 132.26 Analysis pH: 7.94

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	26,291	
Total Antimony	0	0		0	1,100	1,100	38,560	
Total Arsenic	0	0		0	340	340	11,918	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	736,138	
Total Boron	0	0		0	8,100	8,100	283,939	
Total Cadmium	0	0		0	2.643	2.83	99.4	Chem Translator of 0.932 applied
Total Chromium (III)	0	0		0	716.374	2,267	79,468	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	571	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	3,330	
Total Copper	0	0		0	17.489	18.2	639	Chem Translator of 0.96 applied
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	87.441	117	4,085	Chem Translator of 0.75 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	57.7	Chem Translator of 0.85 applied
Total Nickel	0	0		0	593.183	594	20,835	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	5.203	6.12	215	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	2,279	
Total Zinc	0	0		0	148.504	152	5,323	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	105	
Acrylonitrile	0	0		0	650	650	22,785	
Benzene	0	0		0	640	640	22,435	

Bromoform	0	0		0	1,800	1,800	63,098	
Carbon Tetrachloride	0	0		0	2,800	2,800	98,152	
Chlorobenzene	0	0		0	1,200	1,200	42,065	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	630,975	
Chloroform	0	0		0	1,900	1,900	66,603	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	525,813	
1,1-Dichloroethylene	0	0		0	7,500	7,500	262,906	
1,2-Dichloropropane	0	0		0	11,000	11,000	385,596	
1,3-Dichloropropylene	0	0		0	310	310	10,867	
Ethylbenzene	0	0		0	2,900	2,900	101,657	
Methyl Bromide	0	0		0	550	550	19,280	
Methyl Chloride	0	0		0	28,000	28,000	981,517	
Methylene Chloride	0	0		0	12,000	12,000	420,650	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	35,054	
Tetrachloroethylene	0	0		0	700	700	24,538	
Toluene	0	0		0	1,700	1,700	59,592	
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	238,368	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	105,163	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	119,184	
Trichloroethylene	0	0		0	2,300	2,300	80,625	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	19,630	
2,4-Dichlorophenol	0	0		0	1,700	1,700	59,592	
2,4-Dimethylphenol	0	0		0	660	660	23,136	
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	2,804	
2,4-Dinitrophenol	0	0		0	660	660	23,136	
2-Nitrophenol	0	0		0	8,000	8,000	280,433	
4-Nitrophenol	0	0		0	2,300	2,300	80,625	
p-Chloro-m-Cresol	0	0		0	160	160	5,609	
Pentachlorophenol	0	0		0	22.412	22.4	786	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	16,125	
Acenaphthene	0	0		0	83	83.0	2,909	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	10,516	
Benzo(a)Anthracene	0	0		0	0.5	0.5	17.5	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	30,000	30,000	1,051,625	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	157,744	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	9,465	
Butyl Benzyl Phthalate	0	0		0	140	140	4,908	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	

Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	820	820	28,744	
1,3-Dichlorobenzene	0	0		0	350	350	12,269	
1,4-Dichlorobenzene	0	0		0	730	730	25,590	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	140,217	
Dimethyl Phthalate	0	0		0	2,500	2,500	87,635	
Di-n-Butyl Phthalate	0	0		0	110	110	3,856	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	56,087	
2,6-Dinitrotoluene	0	0		0	990	990	34,704	
1,2-Diphenylhydrazine	0	0		0	15	15.0	526	
Fluoranthene	0	0		0	200	200	7,011	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	10	10.0	351	
Hexachlorocyclopentadiene	0	0		0	5	5.0	175	
Hexachloroethane	0	0		0	60	60.0	2,103	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	350,542	
Naphthalene	0	0		0	140	140	4,908	
Nitrobenzene	0	0		0	4,000	4,000	140,217	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	595,921	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	10,516	
Phenanthrene	0	0		0	5	5.0	175	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	4,557	
Continuum AT3203	0	0		0	2,090	2,090	73,263	
Corrshield MD4103	0	0		0	106,880	106,880	3,746,591	
Gengard GN8113	0	0		0	10,990	10,990	385,245	
Gengard GN8203	0	0		0	17,060	17,060	598,024	
Spectrus NX1103	0	0		0	19	19.0	666	
Spectrus NX1106	0	0		0	210	210	7,361	

☑ ***CFC*** CCT (min): 720 PMF: 0.687 Analysis Hardness (mg/l): 132.46 Analysis pH: 7.97

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	10,518	
Total Arsenic	0	0		0	150	150	7,172	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	196,026	
Total Boron	0	0		0	1,600	1,600	76,498	

Total Cadmium	0	0		0	0.299	0.33	15.9	Chem Translator of 0.897 applied
Total Chromium (III)	0	0		0	93.300	108	5,187	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	497	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	908	
Total Copper	0	0		0	11.387	11.9	567	Chem Translator of 0.96 applied
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	103,663	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	3.413	4.55	218	Chem Translator of 0.75 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	43.3	Chem Translator of 0.85 applied
Total Nickel	0	0		0	65.968	66.2	3,163	Chem Translator of 0.997 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	4.600	4.99	239	Chem Translator of 0.922 applied
Total Silver	0	0		0	N/A	N/A	N/A	Chem Translator of 1 applied
Total Thallium	0	0		0	13	13.0	622	
Total Zinc	0	0		0	149.908	152	7,269	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	143	
Acrylonitrile	0	0		0	130	130	6,215	
Benzene	0	0		0	130	130	6,215	
Bromoform	0	0		0	370	370	17,690	
Carbon Tetrachloride	0	0		0	560	560	26,774	
Chlorobenzene	0	0		0	240	240	11,475	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	167,339	
Chloroform	0	0		0	390	390	18,646	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	148,214	
1,1-Dichloroethylene	0	0		0	1,500	1,500	71,717	
1,2-Dichloropropane	0	0		0	2,200	2,200	105,184	
1,3-Dichloropropylene	0	0		0	61	61.0	2,916	
Ethylbenzene	0	0		0	580	580	27,730	
Methyl Bromide	0	0		0	110	110	5,259	
Methyl Chloride	0	0		0	5,500	5,500	262,961	
Methylene Chloride	0	0		0	2,400	2,400	114,747	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	10,040	
Tetrachloroethylene	0	0		0	140	140	6,694	
Toluene	0	0		0	330	330	15,778	
1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	66,936	
1,1,1-Trichloroethane	0	0		0	610	610	29,165	
1,1,2-Trichloroethane	0	0		0	680	680	32,512	
Trichloroethylene	0	0		0	450	450	21,515	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	5,259	
2,4-Dichlorophenol	0	0		0	340	340	16,256	
2,4-Dimethylphenol	0	0		0	130	130	6,215	
4,6-Dinitro-o-Cresol	0	0		0	16	16.0	765	
2,4-Dinitrophenol	0	0		0	130	130	6,215	
2-Nitrophenol	0	0		0	1,600	1,600	76,498	
4-Nitrophenol	0	0		0	470	470	22,471	

p-Chloro-m-Cresol	0	0		0	500	500	23,906	
Pentachlorophenol	0	0		0	17.194	17.2	822	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	4,351	
Acenaphthene	0	0		0	17	17.0	813	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	2,821	
Benzo(a)Anthracene	0	0		0	0.1	0.1	4.78	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	6,000	6,000	286,867	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	43,508	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	2,582	
Butyl Benzyl Phthalate	0	0		0	35	35.0	1,673	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	160	160	7,650	
1,3-Dichlorobenzene	0	0		0	69	69.0	3,299	
1,4-Dichlorobenzene	0	0		0	150	150	7,172	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	38,249	
Dimethyl Phthalate	0	0		0	500	500	23,906	
Di-n-Butyl Phthalate	0	0		0	21	21.0	1,004	
2,4-Dinitrotoluene	0	0		0	320	320	15,300	
2,6-Dinitrotoluene	0	0		0	200	200	9,562	
1,2-Diphenylhydrazine	0	0		0	3	3.0	143	
Fluoranthene	0	0		0	40	40.0	1,912	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	2	2.0	95.6	
Hexachlorocyclopentadiene	0	0		0	1	1.0	47.8	
Hexachloroethane	0	0		0	12	12.0	574	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	100,403	
Naphthalene	0	0		0	43	43.0	2,056	
Nitrobenzene	0	0		0	810	810	38,727	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	162,558	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	2,821	
Phenanthrene	0	0		0	1	1.0	47.8	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	1,243	
Continuum AT3203	0	0		0	230	230	10,997	
Corrshield MD4103	0	0		0	11,980	11,980	572,777	
Gengard GN8113	0	0		0	1,220	1,220	58,330	
Gengard GN8203	0	0		0	1,900	1,900	90,841	

Spectrus NX1103	0	0		0	2	2.0	95.6	
Spectrus NX1106	0	0		0	23	23.0	1,100	

☑ ***THH*** CCT (min): 720 PMF: 0.687 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	
Fluoride (PWS)	0	0		0	2,000	2,000	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	268	
Total Arsenic	0	0		0	10	10.0	478	
Total Barium	0	0		0	2,400	2,400	114,747	
Total Boron	0	0		0	3,100	3,100	148,214	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	300	300	14,343	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	1,000	1,000	47,811	
Total Mercury	0	0		0	0.050	0.05	2.39	
Total Nickel	0	0		0	610	610	29,165	
Total Phenols (Phenolics) (PWS)	0	0		0	5	5.0	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	0.24	0.24	11.5	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	143	
Acrylonitrile	0	0		0	N/A	N/A	N/A	
Benzene	0	0		0	N/A	N/A	N/A	
Bromoform	0	0		0	N/A	N/A	N/A	
Carbon Tetrachloride	0	0		0	N/A	N/A	N/A	
Chlorobenzene	0	0		0	100	100.0	4,781	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	273	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	N/A	N/A	N/A	
1,1-Dichloroethylene	0	0		0	33	33.0	1,578	
1,2-Dichloropropane	0	0		0	N/A	N/A	N/A	
1,3-Dichloropropylene	0	0		0	N/A	N/A	N/A	
Ethylbenzene	0	0		0	68	68.0	3,251	
Methyl Bromide	0	0		0	100	100.0	4,781	
Methyl Chloride	0	0		0	N/A	N/A	N/A	

Methylene Chloride	0	0		0	N/A	N/A	N/A	
1,1,2,2-Tetrachloroethane	0	0		0	N/A	N/A	N/A	
Tetrachloroethylene	0	0		0	N/A	N/A	N/A	
Toluene	0	0		0	57	57.0	2,725	
1,2-trans-Dichloroethylene	0	0		0	100	100.0	4,781	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	478,111	
1,1,2-Trichloroethane	0	0		0	N/A	N/A	N/A	
Trichloroethylene	0	0		0	N/A	N/A	N/A	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	30	30.0	1,434	
2,4-Dichlorophenol	0	0		0	10	10.0	478	
2,4-Dimethylphenol	0	0		0	100	100.0	4,781	
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	95.6	
2,4-Dinitrophenol	0	0		0	10	10.0	478	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	N/A	N/A	N/A	
Phenol	0	0		0	4,000	4,000	191,244	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	3,347	
Anthracene	0	0		0	300	300	14,343	
Benzidine	0	0		0	N/A	N/A	N/A	
Benzo(a)Anthracene	0	0		0	N/A	N/A	N/A	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroisopropyl)Ether	0	0		0	200	200	9,562	
Bis(2-Ethylhexyl)Phthalate	0	0		0	N/A	N/A	N/A	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	0.1	0.1	4.78	
2-Chloronaphthalene	0	0		0	800	800	38,249	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	1,000	1,000	47,811	
1,3-Dichlorobenzene	0	0		0	7	7.0	335	
1,4-Dichlorobenzene	0	0		0	300	300	14,343	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	28,687	
Dimethyl Phthalate	0	0		0	2,000	2,000	95,622	
Di-n-Butyl Phthalate	0	0		0	20	20.0	956	
2,4-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
2,6-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
1,2-Diphenylhydrazine	0	0		0	N/A	N/A	N/A	
Fluoranthene	0	0		0	20	20.0	956	
Fluorene	0	0		0	50	50.0	2,391	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	N/A	N/A	N/A	

Hexachlorocyclopentadiene	0	0		0	4	4.0	191	
Hexachloroethane	0	0		0	N/A	N/A	N/A	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	34	34.0	1,626	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	478	
n-Nitrosodimethylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	N/A	N/A	N/A	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	20	20.0	956	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	3.35	
Continuum AT3203	0	0		0	2,100	2,100	100,403	
Corrshield MD4103	0	0		0	210	210	10,040	
Gengard GN8113	0	0		0	64,200	64,200	3,069,473	
Gengard GN8203	0	0		0	112,900	112,900	5,397,873	
Spectrus NX1103	0	0		0	35	35.0	1,673	
Spectrus NX1106	0	0		0	N/A	N/A	N/A	

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

Pollutants	Stream Conc	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	N/A	N/A	N/A	
Total Arsenic	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	N/A	N/A	N/A	
Total Boron	0	0		0	N/A	N/A	N/A	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	N/A	N/A	N/A	

Acrylonitrile	0	0		0	0.06	0.06	16.1	
Benzene	0	0		0	0.58	0.58	155	
Bromoform	0	0		0	7	7.0	1,873	
Carbon Tetrachloride	0	0		0	0.4	0.4	107	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	0.8	0.8	214	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	N/A	N/A	N/A	
Dichlorobromomethane	0	0		0	0.95	0.95	254	
1,2-Dichloroethane	0	0		0	9.9	9.9	2,648	
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	0.9	0.9	241	
1,3-Dichloropropylene	0	0		0	0.27	0.27	72.2	
Ethylbenzene	0	0		0	N/A	N/A	N/A	
Methyl Bromide	0	0		0	N/A	N/A	N/A	
Methyl Chloride	0	0		0	N/A	N/A	N/A	
Methylene Chloride	0	0		0	20	20.0	5,350	
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	53.5	
Tetrachloroethylene	0	0		0	10	10.0	2,675	
Toluene	0	0		0	N/A	N/A	N/A	
1,2-trans-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,1,1-Trichloroethane	0	0		0	N/A	N/A	N/A	
1,1,2-Trichloroethane	0	0		0	0.55	0.55	147	
Trichloroethylene	0	0		0	0.6	0.6	161	
Vinyl Chloride	0	0		0	0.02	0.02	5.35	
2-Chlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dichlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dimethylphenol	0	0		0	N/A	N/A	N/A	
4,6-Dinitro-o-Cresol	0	0		0	N/A	N/A	N/A	
2,4-Dinitrophenol	0	0		0	N/A	N/A	N/A	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	0.030	0.03	8.03	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	401	
Acenaphthene	0	0		0	N/A	N/A	N/A	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	0.0001	0.0001	0.027	
Benzo(a)Anthracene	0	0		0	0.001	0.001	0.27	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.027	
3,4-Benzofluoranthene	0	0		0	0.001	0.001	0.27	
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	2.68	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	8.03	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	85.6	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	N/A	N/A	N/A	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	

Chrysene	0	0		0	0.12	0.12	32.1	
Dibenzo(a,h)Anthrancene	0	0		0	0.0001	0.0001	0.027	
1,2-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,3-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,4-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
3,3-Dichlorobenzidine	0	0		0	0.05	0.05	13.4	
Diethyl Phthalate	0	0		0	N/A	N/A	N/A	
Dimethyl Phthalate	0	0		0	N/A	N/A	N/A	
Di-n-Butyl Phthalate	0	0		0	N/A	N/A	N/A	
2,4-Dinitrotoluene	0	0		0	0.05	0.05	13.4	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	13.4	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	8.03	
Fluoranthene	0	0		0	N/A	N/A	N/A	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	0.00008	0.00008	0.021	
Hexachlorobutadiene	0	0		0	0.01	0.01	2.68	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	26.8	
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	0.27	
Isophorone	0	0		0	N/A	N/A	N/A	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	N/A	N/A	N/A	
n-Nitrosodimethylamine	0	0		0	0.0007	0.0007	0.19	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	1.34	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	883	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	N/A	N/A	N/A	
Continuum AT3203	0	0		0	N/A	N/A	N/A	
Corrshield MD4103	0	0		0	N/A	N/A	N/A	
Gengard GN8113	0	0		0	N/A	N/A	N/A	
Gengard GN8203	0	0		0	N/A	N/A	N/A	
Spectrus NX1103	0	0		0	N/A	N/A	N/A	
Spectrus NX1106	0	0		0	N/A	N/A	N/A	

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

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Copper	Report	Report	Report	Report	Report	µg/L	409	AFC	Discharge Conc > 10% WQBEL (no RP)
Hexachlorobutadiene	0.034	0.054	2.68	4.17	6.69	µg/L	2.68	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Continuum AT3203	141	220	11.0	17.2	27.5	mg/L	11.0	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Corrshield MD4103	129	201	10.0	15.7	25.1	mg/L	10.0	THH	Discharge Conc ≥ 50% WQBEL (RP)
Gengard GN8113	749	1,169	58.3	91.0	146	mg/L	58.3	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Gengard GN8203	1,167	1,820	90.8	142	227	mg/L	90.8	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Spectrus NX1103	1.23	1.92	0.096	0.15	0.24	mg/L	0.096	CFC	Discharge Conc ≥ 50% WQBEL (RP)

Spectrus NX1106	14.1	22.0	1.1	1.72	2.75	mg/L	1.1	CFC	Discharge Conc ≥ 50% WQBEL (RP)

☑ ***Other Pollutants without Limits or Monitoring***

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	N/A	N/A	PWS Not Applicable
Chloride (PWS)	N/A	N/A	PWS Not Applicable
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	N/A	N/A	PWS Not Applicable
Fluoride (PWS)	N/A	N/A	PWS Not Applicable
Total Aluminum	16,851	µg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	268	µg/L	Discharge Conc ≤ 10% WQBEL
Total Arsenic	478	µg/L	Discharge Conc ≤ 10% WQBEL
Total Barium	114,747	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	76,498	µg/L	Discharge Conc < TQL
Total Cadmium	15.9	µg/L	Discharge Conc < TQL
Total Chromium (III)	5,187	µg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	366	µg/L	Discharge Conc < TQL
Total Cobalt	908	µg/L	Discharge Conc ≤ 10% WQBEL

Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	14,343	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	103,663	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	218	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	47,811	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	2.39	µg/L	Discharge Conc < TQL
Total Nickel	3,163	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	PWS Not Applicable
Total Selenium	239	µg/L	Discharge Conc < TQL
Total Silver	138	µg/L	Discharge Conc ≤ 10% WQBEL
Total Thallium	11.5	µg/L	Discharge Conc < TQL
Total Zinc	3,412	µg/L	Discharge Conc ≤ 10% WQBEL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	67.4	µg/L	Discharge Conc < TQL
Acrylonitrile	16.1	µg/L	Discharge Conc < TQL
Benzene	155	µg/L	Discharge Conc ≤ 25% WQBEL
Bromoform	1,873	µg/L	Discharge Conc ≤ 25% WQBEL
Carbon Tetrachloride	107	µg/L	Discharge Conc ≤ 25% WQBEL
Chlorobenzene	4,781	µg/L	Discharge Conc ≤ 25% WQBEL
Chlorodibromomethane	214	µg/L	Discharge Conc ≤ 25% WQBEL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	167,339	µg/L	Discharge Conc < TQL
Chloroform	273	µg/L	Discharge Conc ≤ 25% WQBEL
Dichlorobromomethane	254	µg/L	Discharge Conc ≤ 25% WQBEL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	2,648	µg/L	Discharge Conc ≤ 25% WQBEL
1,1-Dichloroethylene	1,578	µg/L	Discharge Conc ≤ 25% WQBEL
1,2-Dichloropropane	241	µg/L	Discharge Conc ≤ 25% WQBEL
1,3-Dichloropropylene	72.2	µg/L	Discharge Conc ≤ 25% WQBEL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	3,251	µg/L	Discharge Conc ≤ 25% WQBEL
Methyl Bromide	4,781	µg/L	Discharge Conc ≤ 25% WQBEL
Methyl Chloride	262,961	µg/L	Discharge Conc ≤ 25% WQBEL
Methylene Chloride	5,350	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,2,2-Tetrachloroethane	53.5	µg/L	Discharge Conc ≤ 25% WQBEL
Tetrachloroethylene	2,675	µg/L	Discharge Conc ≤ 25% WQBEL
Toluene	2,725	µg/L	Discharge Conc ≤ 25% WQBEL
1,2-trans-Dichloroethylene	4,781	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,1-Trichloroethane	29,165	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,2-Trichloroethane	147	µg/L	Discharge Conc ≤ 25% WQBEL
Trichloroethylene	161	µg/L	Discharge Conc ≤ 25% WQBEL
Vinyl Chloride	5.35	µg/L	Discharge Conc < TQL
2-Chlorophenol	1,434	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	478	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	4,781	µg/L	Discharge Conc < TQL
4,6-Dinitro-o-Cresol	95.6	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	478	µg/L	Discharge Conc < TQL
2-Nitrophenol	76,498	µg/L	Discharge Conc < TQL
4-Nitrophenol	22,471	µg/L	Discharge Conc < TQL

p-Chloro-m-Cresol	3,595	µg/L	Discharge Conc < TQL
Pentachlorophenol	8.03	µg/L	Discharge Conc < TQL
Phenol	191,244	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	401	µg/L	Discharge Conc < TQL
Acenaphthene	813	µg/L	Discharge Conc ≤ 25% WQBEL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	14,343	µg/L	Discharge Conc ≤ 25% WQBEL
Benzidine	0.027	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	0.27	µg/L	Discharge Conc < TQL
Benzo(a)Pyrene	0.027	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	0.27	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Benzo(k)Fluoranthene	2.68	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	8.03	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	9,562	µg/L	Discharge Conc < TQL
Bis(2-Ethylhexyl)Phthalate	85.6	µg/L	Discharge Conc < TQL
4-Bromophenyl Phenyl Ether	2,582	µg/L	Discharge Conc < TQL
Butyl Benzyl Phthalate	4.78	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	38,249	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	32.1	µg/L	Discharge Conc < TQL
Dibenzo(a,h)Anthrancene	0.027	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	7,650	µg/L	Discharge Conc ≤ 25% WQBEL
1,3-Dichlorobenzene	335	µg/L	Discharge Conc ≤ 25% WQBEL
1,4-Dichlorobenzene	7,172	µg/L	Discharge Conc ≤ 25% WQBEL
3,3-Dichlorobenzidine	13.4	µg/L	Discharge Conc < TQL
Diethyl Phthalate	28,687	µg/L	Discharge Conc < TQL
Dimethyl Phthalate	23,906	µg/L	Discharge Conc < TQL
Di-n-Butyl Phthalate	956	µg/L	Discharge Conc < TQL
2,4-Dinitrotoluene	13.4	µg/L	Discharge Conc < TQL
2,6-Dinitrotoluene	13.4	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	8.03	µg/L	Discharge Conc < TQL
Fluoranthene	956	µg/L	Discharge Conc ≤ 25% WQBEL
Fluorene	2,391	µg/L	Discharge Conc ≤ 25% WQBEL
Hexachlorobenzene	0.021	µg/L	Discharge Conc < TQL
Hexachlorocyclopentadiene	47.8	µg/L	Discharge Conc < TQL
Hexachloroethane	26.8	µg/L	Discharge Conc < TQL
Indeno(1,2,3-cd)Pyrene	0.27	µg/L	Discharge Conc < TQL
Isophorone	1,626	µg/L	Discharge Conc < TQL
Naphthalene	2,056	µg/L	Discharge Conc ≤ 25% WQBEL
Nitrobenzene	478	µg/L	Discharge Conc < TQL
n-Nitrosodimethylamine	0.19	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	1.34	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	883	µg/L	Discharge Conc < TQL
Phenanthrene	47.8	µg/L	Discharge Conc ≤ 25% WQBEL
Pyrene	956	µg/L	Discharge Conc ≤ 25% WQBEL
1,2,4-Trichlorobenzene	3.35	µg/L	Discharge Conc < TQL

Comment #4

Regulations enforce oil and grease at 15 mg/l as an average monthly and 30 mg/l as an instantaneous maximum. The instantaneous and daily maximum concentrations are set for both at 30 mg/l.

Refer to Section 95.2 of the regulations. An excerpt of the regulations appears is shown below.

§ 95.2. Effluent standards for industrial wastes.

Industrial wastes must meet the following effluent standards:

(1) Wastes must have a pH of not less than 6 and not greater than 9, except where:

(i) The wastes are discharged to an acid stream, in which case the pH may be greater than 9.

(ii) The discharger affirmatively demonstrates, in writing, to the Department that biological respiration in the wastewater treatment system will cause the discharge to exceed the limits in this paragraph and that exceeding these limits will not result in a violation of applicable water quality standards or of the applicable treatment requirements and effluent limitations to which a discharge is subject under the Federal Act, in which case the Department may grant a variance, in writing, from the limitation set forth in this paragraph.

(2) Oil-bearing wastewaters, except those subject to paragraph (3), must comply with the following:

(i) At no time cause a film or sheen upon or discoloration of the waters of this Commonwealth or adjoining shoreline.

(ii) At no time contain more than 15 milligrams of oil per liter as a daily average value nor more than 30 milligrams of oil per liter at any time, or whatever lesser amount the Department may specify for a given discharge or type of discharge as being necessary for the proper protection of the public interest or to meet any requirements based upon the State Act or the Federal Act, as defined in § 92.1 (relating to definitions).

(3) Petroleum marketing terminals must:

(i) Be provided with facilities to remove oil from waters, including stormwater runoff, before discharge into waters of this Commonwealth. Compliance with this paragraph constitutes compliance with paragraph (2)(i) except to the extent that the State Act or Federal Act or regulations promulgated thereunder impose a more stringent requirement.

(ii) Develop, implement and keep up to date pollution incident prevention plans as described in § 91.34 (relating to activities utilizing pollutants).

(iii) Design, maintain and utilize oil removal facilities that consist of an American Petroleum Institute (A.P.I.) listed oil separator, unless the person operating the facility can demonstrate to the Department that an alternate design is equivalent or better in removing oil from water to maintain and protect the waters of this Commonwealth, including all existing and designated uses established under Chapter 93 (relating to water quality standards).

(4) Waste may not contain more than 7 milligrams per liter of dissolved iron.

(5) When surface waters are used in the industrial plant, the quality of the effluent need not exceed the quality of the raw water supply if the source or supply would normally drain to the point of effluent discharge, unless otherwise required under the act or Federal Act or regulations promulgated thereunder.

Comment #5

Carpenter contends that cadmium is an impurity and not a raw material.

Consistent with monitoring frequency for the stormwater parameters, the monitoring for cadmium shall be 2x/yr as a grab sample.

The outfall 015 has been corrected to E6N.

Comment #6

The duplicate entry for tetrachlorethylene has been removed.

Tetrachlorethylene and Naphthalene are parameters listed in the federal ELG. No reasonable potential was observed by TMS. The parameters shall be monitored on a 1x/yr basis.

Comment #7

Carpenter contends that cadmium, lead, silver, zinc, and cadmium are impurities. The parameters are listed in the federal ELG. Due to the flow rate for the facility, monitoring for these parameters shall be 2x/yr.

Comment #8

Corrected

Comment #9

DEP utilizes the template language in all permits. DEP will retain the same language without modification.

Comment #10

To maintain consistency with monitoring for other parameters at the facility as a 24-hour composite, TTO shall be monitored as a 24-hour composite through EPA Method 608.

Comment #11

Carpenter requests that the provision be included with an exception if conditions are controlled by the permit.

The language in Section Part A, Additional Requirements references the regulations at 25 PA Code 92a.41(c). An excerpt of the regulations is below. It contains the exception as controlled by the permit.

25 PA Code 92a.41(c): *The discharger may not discharge floating materials, scum, sheen, or substances that result in deposits in the receiving water. Except as provided for in the permit, the discharger may not discharge foam, oil, grease, or substances that produce an observable change in the color, taste, odor or turbidity of the receiving water.*

DEP utilizes the template language in all permits. DEP will retain the same language without modification.

Comment #12

The supplemental information is standard template language used in all of permits. The information generated uses design flow rates. Modeling is based upon annual average design flow rate. The language will remain.

The effluent limitations for Internal Monitoring Point 901 were determined using an effluent discharge rate of 1.45 MGD.
The effluent limitations for Internal Monitoring Point 902 were determined using an effluent discharge rate of 0.72 MGD.
The combined design flow for outfall 009 is 1.45 + 0.72 = 2.17 MGD.
The effluent limitations for outfall 004 were determined using an effluent discharge rate of 0.13 MGD.
The effluent limitations for outfall 005 were determined using an effluent discharge rate of 0.15 MGD.
The effluent limitations for outfall 011 were determined using an effluent discharge rate of 2.0 MGD.
The effluent limitations for outfall 012 were determined using an effluent discharge rate of 1.44 MGD.
The effluent limitations for outfall 013 were determined using an effluent discharge rate of 0.72 MGD.
The effluent limitations for outfall 014 were determined using an effluent discharge rate of 3.09 MGD.

Outfalls 004, 005, 011, 012, 013, and 014 are intermittent, only occurring during emergencies.

Outfalls 002, 015, 016, 017, and 018 are stormwater-only outfalls, with 0 design flow.

Comment #13

Carpenter historically had some electrical equipment that contained PCB fluids but the potential sources have been eliminated through an aggressive PCB equipment removal plan. The last PCB was removed in 2011. Carpenter contends that all known sources of PCB have been eliminated.

Lab data shows that even trip blanks and method blanks exhibit positive test results.

To collect additional samples to make a determination in future renewals, DEP proposes to continue monitoring for PCBs on an annual basis for wet weather.

Comment #14

The facility intakes approximately 0.9 MGD from city water and 1.0 MGD from groundwater.

DEP recognizes Carpenter's comment that several of the PFOS parameters from the source water exceeds quantitation limits.
DEP standard of practice is to as follows:

The permittee may discontinue monitoring for PFOA, PFOS, HFPO-DA, and PFBS if the results in 4 consecutive monitoring periods indicate non-detects 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 should enter a No Discharge Indicator (NODI) Code of “GG” on DMRs

DEP proposes to require the facility to (1) monitor the influent annually and (2) monitor the effluent quarterly for the first and second year. Should the facility find the influent exceeding quantitation limits, the monitoring frequency for the effluent beginning in the third year may be reduced to annual.

A Part C condition will be included to itemize this condition.

The facility possibly used AFFF historically. The facility contends they do not use AFFF currently. The Part C condition for AFFF shall be removed.

Comment # Attachment 1

The Comment and Response from 2016 (page 3) details that DRBC granted a variance for ammonia in years past. The DRBC limit for ammonia was 45 mg/l and 90 as a daily maximum.

The TBEL limit of 20 mg/l is found at 18 CFR Part 410. EPA considered ammonia when they develop the ELGs and concluded TBELS for ammonia were not warranted.

Water quality modeling was completed using a discharge of 45 mg/l. The modeling recommended a limit of 45 mg/l. This proposed limit is less stringent than the current permit. The previous Fact Sheet used a flow rate of 1.45 MGD. This Fact Sheet used a flow rate of 0.92 MGD.

Responses to EPA Comments on Fact Sheet/NPDES

This document contains claimed confidential business information.

According to our Memorandum of Agreement, the Environmental Protection Agency (EPA) Region III has received the draft National Pollutant Discharge Elimination System (NPDES) permit for:

Carpenter Technology Corporation
NPDES Number: PA0013129
EPA Received: 01/06/2025
30-day due date: 02/05/2025, PADEP 2-Week Extension Granted to: 02/19/2025

This is a major permit that discharges to the Schuylkill River, and is affected by the Schuylkill River PCB TMDL. EPA has chosen to perform a limited review of the draft permit based on the wasteload allocation requirements of the approved TMDL, and the requirements of the Effluent Limitation Guidelines (ELGs) 40 CFR Part 420 for Iron and Steel Manufacturing and 40 CFR Part 433 for Metal Finishing.

Based on our limited review, we offer the following comments:

1. EPA would appreciate a discussion with PADEP to gain more clarity on the permit's effluent limitations and conditions. We would like to better understand the decision process for selection of TBELs and WQBELs for the final permit limits. In general, the fact sheet does not provide a clear explanation of the derivation of specific effluent limitations and conditions, and it should be updated to provide this necessary explanation (40 CFR 124.56(a)).

Points that EPA would like clarified include:

2. Permit Limitation Tree
    a. In some instances, the more stringent limit has not been selected as the proposed limit. The fact sheet states that the decision tree was used to select the proposed effluent limit, and the proposed limit is "the more stringent of the ELG, TBEL, WQBEL, or the current limit..." However, in some instances it appears as though the most stringent limit was not selected. For example, the cadmium WQBEL is the most stringent value, but it was not selected as the proposed limit. Please clarify the decision process used for selection of proposed limits.
    b. While the basis of the ELG row is understood, the basis of the TBEL row is not clear. What is the basis for the TBELs and how were they derived?
3. There are three different TMS runs for outfall 901, the difference between the runs is not clear and does not appear to be addressed in the fact sheet. Please provide an explanation for the three separate runs.
4. "TMS Run #3 - Estimated concentration/mass for ELG pollutants" for outfall 901 determined RP for Naphthalene and Benzo(a)Pyrene; however, the draft permit does not contain limits for these parameters. Please clarify how TMS Run 3 was considered in developing the permit limits.

PFAS Reduction Plan and BMPs to Address Aqueous Film Forming Foam (AFFF):

5. The Draft Permit contains special conditions for a PFAS Reduction Plan and BMPs to address AFFF. The fact sheet does not provide a discussion of PFAS on the site, and only discusses the permit monitoring requirements. The inclusion of the PFAS Reduction Plan and BMPs to address AFFF indicate that activities involving PFAS occur on site. If this assumption is accurate, further discussion should be included in the fact sheet to discuss the basis of the PFAS special conditions in the permit.

    a. In addition, if the inclusion of the PFAS Reduction Plan is intentional, we recommend the following edits are incorporated. These edits have previously been incorporated into PFAS Reduction Plans required by PADEP [*suggested modifications made in blue and italicized*].

PFAS REDUCTION PLAN

Within 6 months of the effective date of the permit, the permittee shall complete a source evaluation to determine the source of PFAS in the effluent and to determine whether the facility uses or has historically used any materials or products containing Per- and Polyfluoroalkyl Substances (PFAS).

Where the permittee determines the facility uses or has historically used any materials or products containing PFAS, the permittee shall evaluate whether use of those products or legacy contamination reasonably can be reduced or eliminated and submit a PFAS Reduction Plan to DEP to identify the measures that will be taken to achieve reduction or elimination within one (1) year following the effective date of the permit. *The PFAS Reduction Plan shall include a schedule for implementation of all elements of the PFAS Reduction Plan within the term of this permit*. The PFAS Reduction Plan may include:

1. Elimination of the use of materials or products containing PFAS or substitute when a reasonable alternative to using materials or products containing PFAS is available in the industrial process.
2. Minimization of the potential for the accidental discharge of materials or products containing PFAS through planning, proper operation and maintenance (O&M) practices, and good housekeeping practices.
3. Decontamination or replacement of equipment where PFAS materials or products have historically been used to reduce the potential for discharges of legacy PFAS following the implementation of product substitution, as applicable.

Upon submission to the Department, the PFAS Reduction Plan will be incorporated by reference into this NPDES permit. The permittee *shall* ~~*will begin*~~ implement*ing* the ~~*steps in the*~~ PFAS Reduction Plan *and any updates consistent with the schedule set forth in the Plan, and in any case shall complete all actions describe in the PFAS Reduction Plan within the five year term of this permit* ~~*upon submittal to DEP*~~. An

annual status report shall be prepared and submitted to DEP which includes a list of potential PFAS sources, a summary of actions taken to implement the PFAS Reduction Plan, *a summary of all data collected and evaluated under the Plan including the efficacy of the Plan's reduction measures to reduce PFAS,* and any modifications to the Plan, based on the findings. The annual report is due by the anniversary of the permit effective date each year following commencement of plan implementation until the plan is complete.

To an extent that a reply by PADEP is necessary that may contain CBI, please ensure the information is sent encrypted and password protected.

If there are any questions or concerns, please coordinate with Kelly Yachera on my staff via telephone at 215-814-5743 or via electronic mail at yachera.kelly@epa.gov.

EPA submitted comments on February 13, 2025. Attached are DEP's responses to the comments.

Hong, Nicholas

From: Hong, Nicholas
Sent: Tuesday, February 18, 2025 9:45 AM
To: Yachera, Kelly
Cc: Martin, Daniel; Bebenek, Maria
Subject: DEP response to Carpenter Technology comments
Attachments: TMS PA0013129 Modeling Run #4.pdf

EPA / Kelly Yachera:

Below are DEP's responses to comments on the draft Fact Sheet for Carpenter Technology which were dated for February 13, 2025.

1. The decision tree has four pollutants which may appear to not have selected the most stringent effluent limit. Consultation with the facility indicated that pollutants cadmium, lead, silver, and zinc are not used in the raw material but appear in the effluent as impurities. Thus, the permit application review selected to use ELG. This approach is consistent with the previous fact sheet decision.
2. The basis of the TBELS are PA State regulations. Effluent Limits for pH, Oil and Grease, and TSS governed by state regulations. See Section 95.2(1), 95.2(2), and 92a.47(1) of the PA Regulations.

Mass limits were derived as shown below:

Oil and Grease: 8.34* 15 mg/l * 0.92 MGD = 115 Lbs/day
TSS: 8.34 * 30 mg/l * 0.92 MGD = 230 lbs/day

3. There are several TMS runs for outfall 902.

TMS Run #1: Data utilized for input originated from NPDES application (Page 99 of Fact Sheet)
TMS Run #2: Resampled data for NPDES renewal application (Page 115 of Fact Sheet)
TMS Run #3: Estimated concentration/mass for ELG pollutants (Page132 of Fact Sheet)

4. Using additional revised/re-sampled data for benzo(a) pyrene and naphthalene, an additional TMS run was ocnducted. This is TMS Run #4. The results show no reasonable potential for these pollutants
5. Consistent with the SOP, appropriate langugae will be included in the permit for PFAS. The language that appears in EPA's comment letter will be adhered subject to DEP Central Office template.

Let us know if we need to discuss.

Nick Hong, PE | Environmental Engineer
PA Department of Environmental Protection
Clean Water Programs
Southcentral Regional Office
909 Elmerton Avenue | Harrisburg, PA 17110
Phone: 717.705.4824 | Fax: 717.705.4760
www.dep.pa.gov

THE SOUTHCENTRAL REGIONAL OFFICE AFTER HOURS REPORTING & 24 HOUR EMERGENCY RESPONSE NUMBER IS 1-800-541-2050

EPA submitted comments on March 7, 2025.

EPA 3/7/25

This document contains claimed confidential business information.

Hello Nick,

Thank you for your responses and for providing the additional TMS run. We have some additional questions/points to be clarified:

1. Permit Limitation Decision Tree
   In the instances where the more stringent WQBEL was not selected as the proposed permit limit, the fact sheet will need to document that the imposed limit (the ELG/TBEL) is still protective of water quality (40 CFR 122.44(d)(1)). There are several ways that this could be demonstrated, please see EPA's Permit Writers' Manual, section 6.2.1.1 "Pollutants with Applicable TBELs." It explains that the permit writer must determine whether more stringent limitations than the applicable TBELs are needed to prevent an excursion above water quality standards in the receiving water. A permit writer can determine whether the TBELs are sufficiently protective by either 1.) proceeding to calculate WQBELs and comparing them to the TBELs or 2.) by assuming that the maximum daily TBEL calculated is the maximum discharge concentration in the water quality assessments (the TMS analysis). In order to show that the imposed TBELs in the permit are protective of water quality, one of the two described options will need to be addressed in the fact sheet.

2. Revised/re-sampled data for benzo(a) pyrene and naphthalene used for TMS Run #4
   Please clarify if the re-sampled/revised data was used to address the state's target quantitation limits. Please also include an explanation in the fact sheet of the rational for TMS Run#4 (40 CFR 124.56(a)).

3. PFAS Reduction Plan language
   For your awareness, EPA has discussed these recommended revisions to the PFAS Reduction Plan with PADEP Central Office (Sean Furjanic). Central Office was agreeable to the revisions; however, please discuss and confirm with Central Office as needed.

4. The draft permit contains a special condition for BMPs to address AFFF. The fact sheet would benefit from a discussion of PFAS on the site (it currently only discusses that the permit will include monitoring requirements). The inclusion of the PFAS Reduction Plan and BMPs to address AFFF indicate that activities involving PFAS occur on site. If this assumption is accurate, further discussion should be included in the fact sheet to discuss the basis of the PFAS special conditions in the permit. Please note that EPA does not have any comments on the BMPs to address AFFF, but requests that an explanation is included in the fact sheet to explain why this condition has been added.

5. In general, we recommend that the fact sheet is updated to include the explanations and clarifications provided in this correspondence. As written the fact sheet does not include a clear explanation of the derivation of specific effluent limitations and conditions (40 CFR 124.56(a)).

Thank you for your coordination on this permit review. Please let us know if you have any questions or would like to discuss further.

DEP's responses to the comments are below.

Response to Comment #1:

The most stringent limit for cadmium shall be proposed in the permit. The current permit limit is 0.05 mg/l. The proposed permit shall be 0.045 mg/l. The proposed limit is slightly lower than the current limit due to the differences in average annual flow rate.

The previous permit used a flow rate of 1.45 MGD.

This Fact Sheet utilized a flow rate of 0.92 MGD.

Response to Comment #2:

To avoid confusion, Modeling Run #4 shall be deleted.

TMS Modeling Run #5 was completed due to additional monitoring data for benzo(a) pyrene and naphthalene.

On November 18, 2024, Michael Hart of Carpenter submitted email correspondence for updated monitoring data for Outfall 902. The sampling data for benzo(a) pyrene and naphthalene were included in TMS Modeling Run #5. There was no reasonable potential observed with the updated monitoring data for the parameters.

On December 18, 2024, Michael Hart of Carpenter again submitted email correspondence monitoring data for benzo(a) pyrene at < 2.0 ug/l.

Comment #3:

The PFOS template language from Central Office will be used to prepare the proposed permit.

Comment #4:

Carpenter claims that the facility does not utilize PFOS containing materials in their manufacturing process.

The facility intakes water approximately 0.9 MGD from city water and 1.0 MGD from groundwater.

DEP recognizes Carpenter's comment that several of the PFOS parameters from the source water exceeds quantitation limits.

DEP standard of practice is to as follows:

The permittee may discontinue monitoring for PFOA, PFOS, HFPO-DA, and PFBS if the results in 4 consecutive monitoring periods indicate non-detects 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 should enter a No Discharge Indicator (NODI) Code of "GG" on DMRs.

DEP proposes to require the facility to (1) monitor the influent annually and (2) monitor the effluent quarterly for the first and second years. Should the facility find the influent exceeding quantitation limits, the monitoring frequency for the effluent beginning in the third year may be reduced to annual. A Part C condition will itemize this condition.

The requirement for AFFF in the NPDES permit will be removed.

Comment #5:

A series of tables was utilized to calculate the ELG. A separate table was constructed as a decision tree to select the proposed effluent limit. The proposed effluent limits is the more stringent of the ELG, TBEL, WQBEL, or the current limit through anti-backsliding. The summary table identifies the purpose of the table.

Table	Purpose of Table
ELG1.0	Table of emission factors abstracted from ELG federal regulations for Process lines A to J
ELG1.1	Mass limits for Process Line A thru J. Mass limits obtained by Production x emission factor
ELG2.0	Table of emission factors abstracted from ELG federal regulations for process line K
ELG2.1	Mass limits for Process Line K. Mass limits obtained by Production x emission factor
ELG3.0	Total Mass Loading for Process lines A to K
CONC4.0	Summary of Concentration limits. This table evaluates which policy enforces permit limit
MASS5.0	Summary of Mass limits. This table evaluates which policy enforces permit limit

(1) Table ELG1.0 summarizes the emission factor for Process Lines A to J. Table ELG1.1 multiples the production rate by the emission factor to give the mass loadings for the pollutants.

(2) Table ELG2.0 summarizes the emission factors for Process Line K. Table ELG2.1 multiples the production rate by the emission factor to give the mass loadings for the pollutants.

The pollutants were calculated using the following equation

Mass Loading, lbs/day = (155 gal/min)(60 min/hr)(24 hr/day)*EF*8.34*(1/1e6)

Example: Mass loading for TSS = (155 gal/min)(60 min/hr)(24 hr/day)*(60 mg/l)*8.34*(1/1e6) = 111 lbs/day

(3) Table ELG3.0 provides a grand total of the mass loadings from Tables ELG1.1 and ELG2.1. The total mass loadings for Process Lines A to K appear in the table.

(4) Table CONC4.0 expresses values as concentration in mg/l. This table compares the ELG MassLimitConc (MLC), the TBEL, the WQBEL, and the current limit to select which limit presides for the proposed permit. The MLC was calculated by taking the total mass loadings from Table ELG3.0 and dividing by the average design flow rate and divided by the 8.34 factor

Example: MLC for TSS = (650 lbs/day) / [0.92 MGD / 8.34] = 85 mg/l.

(5) Table Mass5.0 expresses values as mass in lbs/day. This table compares the Total ELG1 + ELG2, the TBEL, the WQBEL, and the current limit to select which limit presides for the proposed permit.

Responses to DRBC Comments on Fact Sheet/NPDES

On January 6, 2025, David Kovach submitted comments.

DEP will correct the Outfall number to 901.

Hong, Nicholas

From: Kovach, David [DRBC] <David.Kovach@drbc.gov>
Sent: Monday, January 6, 2025 2:00 PM
To: Hong, Nicholas
Subject: [External] RE: Draft NPDES Carpenter Technology / PA0013129 / Email 1 of 3
Attachments: 1975-069 Carpenter Tech corp.pdf

ATTENTION: *This email message is from an external sender. Do not open links or attachments from unknown senders. To report suspicious email, use the Report Phishing button in Outlook.*

Hi Nick,
I got all three emails. Thanks.
Additionally,

1. The "Design Flow Outfalls" table on p. 10 of the fact sheet repeats 902 when I believe the top 902 should be 901.
2. DRBC has a basin wide Ammonia (N) in effluent average monthly limit of 20 mg/l. It appears from the included DMR's that the facility regularly meets the limit at Outfall 901 where an Ammonia limit is imposed.

DRBC Project review has no other comments.

David Kovach P.G.
Project Review Manager
Delaware River Basin Commission
25 Cosey Road
West Trenton, NJ 08628-0360
609-477-7264
David.kovach@drbc.gov

Correspondence

Pennsylvania Department of Environmental Protection
One Ararat Boulevard
Harrisburg, PA 17110-9333
June 17, 1997

Southcentral Regional Office

717-657-4590
FAX - 717-657-4446

Mr. Ronald B. Rulon
Delaware River Basin Commission
Project Review Branch
P.O. Box 7360
West Trenton, NJ 08628

Re: Industrial Waste
Carpenter Technology Corporation
NPDES Permit No. PA 0013129
Reading City, Berks County

Dear Mr. Rulon:

Enclosed you will find a copy of our analysis on the Ammonia Nitrogen discharge from Carpenter Technology Corporation.

Your aid in helping us and the company resolve this issue in a timely manner would be greatly appreciated. If our office can be of any assistance, feel free to give us a call at the above telephone number.

Sincerely,

G. Roger Musselman, P.E.
Chief, Permits Section
Water Management Program

Enclosure

cc: Michael Hart, Carpenter Technology Corporation

Re: Carpenter Tech/NH3-N Reevaluation
By: Roger Musselman
Date: June 6, 1997

Issue:

The existing NPDES Permit contains a DRBC Technology Monthly Average Limit of 20 mg/l which does not become effective until Carpenter Technology's site specific determination request to DRBC has been resolved. This reevaluation was designed to determine if the WQ Limit is higher than the DRBC Tech Limit and how high the limitation can be increased and be protective of water quality.

Information/assumptions used to complete this analysis:

- Q7-10 flow of 191 cfs for the Schuylkill River.
- Pentox model calculated 15 min Acute Mixing is 23.4 cfs (12.24% of 191 cfs).
- Pentox model calculated 4 day Chronic Mixing is 162 cfs (84.8% of 191 cfs).
- Chapter 93 Acute Criteria for NH3-N is a 24 hour average.
- Chapter 93 Chronic Criteria for NH3-N is a 30 day average.
- Analysis performed during the NPDES renewal process using current Dissolved Oxygen and Ammonia Nitrogen Modeling Techniques (WQM 6.3) did not indicate a problem for either until 157 mg/l of ammonia nitrogen.

Method used to arrive at the Recommended Conclusion:

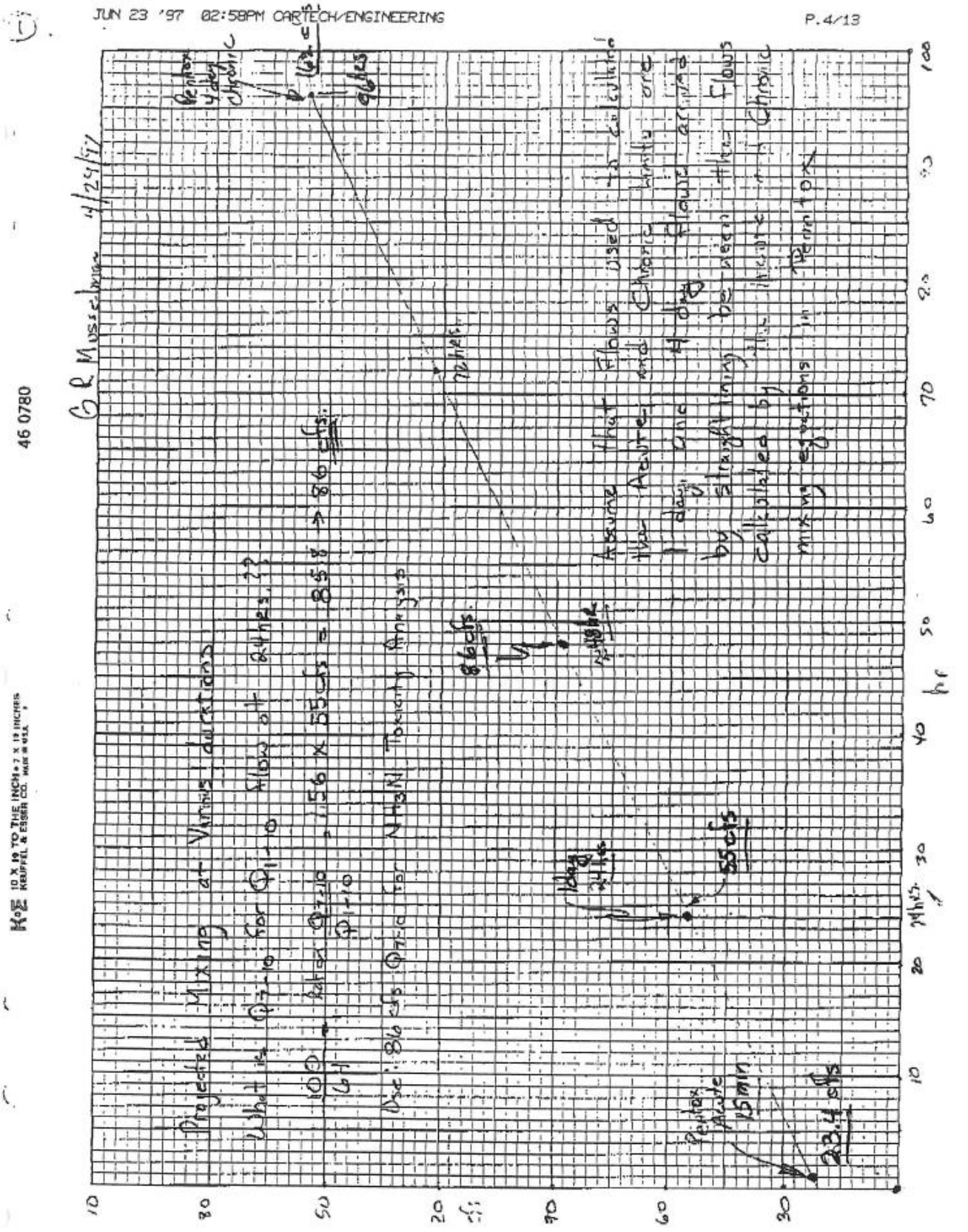
- Plotted Pentox Acute and Chronic flows on a graph of time VS flow.
- Straight lined between Acute and Chronic flows on the above graph to determine what flows to use for 24 hour Acute NH3-N toxicity analysis.
- Determined that 24 hour flow to be used for Acute analysis is 55 cfs.
- Adjusted the 55 cfs by the ratio of the Q1-10 to Q7-10 flows to determine what flow to input into the WQM 6.3 (1.56 * 55 = 86 cfs). Note: The model uses a default multiplier to convert the acute flow back to 55 cfs.
- Ran the WQM 6.3 Model to determine the Chronic and Acute Limitation.
- To be conservative, no NH3-N decay was used in the Model.
- As a check and comparison, WQM 6.3 was also ran using Chronic Q7-10 flow (162 cfs) with complete mix to be consistent with existing procedures of calculation of the NH3-N limitations.

Results of the Analysis:

- The first approach resulted in a calculated Chronic Toxicity Limitation of 45 mg/l and Acute Limitation of 160 mg/l.
- The second approach resulted in a calculated Chronic Toxicity Limitation of 103 mg/l and Acute Limitation of 300 mg/l.
- Dissolved oxygen did not appear to be a problem in either analysis.

Recommendations:

- The existing procedure of considering complete mix for calculating NH3-N Toxicity is inconsistent with the procedure used by the Department for all other Toxic Parameters (WQM 6.3 Vs Pentox). It is possible the procedure may be made more consistent in the future. A procedure more consistent with current toxicity analysis and resulting in a more conservative approach and effluent limitations was used to make the final recommendation.
- Revised Limitations of 45 mg/l Monthly Average and 90 mg/l Daily Maximum of ammonia nitrogen are fully protective of the environment and the Schuylkill River.
- The Department will forward a copy of the analysis to the DRBC for their information and consideration for the site specific determination required by the NPDES Permit.


JUN 23 '97 02:58PM CARTECH/ENGINEERING
P.4/13
G & M Mussetter
4/24/97
Projected Mixing at Various durations
What if Q=10 for Q=10 Allow at others??
Use: 86 cfs @ Q=10 for NH3N Toxicity Analysis
Assume that Flows used in the Acute and Chronic limits are 1 day Flows by straight log probability
Calculated by mixing equations
Penlan Acute 15 min 23.4 cfs
46 0780

(2) JUN 23 '97 03:00PM CARTECH/ENGINEERING P.5/13

FILE: c:\carl.wqm

GRM 4/29/97

REACH # 1
Headwaters and Tributary data

No. of Reaches : 1

Rh	Q7-10 (cfs)	T (c)	pH (su)	DO (mg/l)	CBOD5 (mg/l)	NH3-N (mg/l)
HW	86.0000	25	7	7.54	2	.5
1	0.0000					

1) 86 cfs Q_{7-10} ⇒ 55 cfs Q_{1-10} (1 day Mixing flows)

2) Model 86 cfs (Q_{7-10}) to determine Acute NH_3N Limits at a Q_{1-10} of 55 cfs...

3) Use no NH_3N decay for additional safety factor.

(WQAM63.EXE) Release 1.2 04-29-1997 11:34:56

06/23/97 14:01 TX/RX NO.4342 P.005

(3) JUN 23 '97 03:00PM CARTECH/ENGINEERING P.6/13

FILE: c:\car1.wqm GRM 4/29/97

DISCHARGE # 1
Discharger Data
Q7-10 Design Conditions

Rh	FLOW (MGD)	T (c)	pH (su)	DO (mg/l)	CBOD5 (mg/l)	NH3-N (mg/l)	KC (1/days)
1	1.4500	25	7	3	25	150 / 4	1.5

starting point

FILE: c:\car1.wqm

REACH # 1
Reach Characteristics

Rh	D.O. GOAL	KN (/D)	RCH. SL. (FT/FT)	RCH. LEN. (FT.)	DRAIN AREA (MI^2)	W/D
1	5	0 / 4	0.00060	3000	683.5	10

No NH_3N decay assumed.

(WQAM63.EXE) Release 1.2 04-29-1997 11:35:36

06/23/97 14:01 TX/RX NO.4342 P.006

(4). JUN 23 '97 03:00PM CARTECH/ENGINEERING GRM 4/27/97

FILE: c:\carl.wqm

NH3-N Discharge Allocations at Q30-10 (EMPR)

DIS	Q (mgd)	BASE. CONC. (mg/l)	MULT. CONC. (mg/l)	CRIT. RCH.	PCT. RED. (%)
1	1.450	45.18	45.18	0	0

At flow of 86 cfs.

FILE: c:\carl.wqm

NH3-N Discharge Allocations at Q1-10 (EMPR)

DIS	Q (mgd)	BASE. CONC. (mg/l)	MULT. CONC. (mg/l)	CRIT. RCH.	PCT. RED. (%)
1	1.450	160.46	160.46	0	0

(WQAM63.EXE) Release 1.2 04-29-1997 11:36:22

06/23/97 14:01 TX/RX NO.4342 P.007

(5) JUN 23 '97 03:01PM CARTECH/ENGINEERING P.8/13

GRM. 4/29/97

FILE: c:\car1.wqm

Effluent Limitations Display

DIS #	Q MGD	NH3-N 1 DAY	TOX. 30 DAY	DISS. OXYGEN C-BOD5 30-DAY	NH3-N 30-DAY	EFF. D.O.
1	1.45	90.4	45.2	25	45.2	3

These values appear to be conservative since they do not include any decay and Q_{7-10} flow used was a 24 hr flow rather than monthly flows.

The standard NH_3N using WQM 6.3 and considering complete mix with Chronic Q_{7-10} flow of 162 cfs (4 days) shows an allowable NH_3N limit of 133 mg/l month average.

The method used provides for the following:

1) Monthly ave. — 45. mg/l
2) Daily max — 90. mg/l.

Recommendation:

As discussed with Mike Hart on 4/29/97, the current discharge is 25–30 mg/l on a monthly average basis. The 45 mg/l monthly ave limit should be protective of the environment and within the range expected to be able to be met by the discharger.

06/23/97 14:01 TX/RX NO.4342 P.008

JUN 23 '97 03:01PM CARTECH/ENGINEERING P.9/13

FILE: c:\car1.wqm

Method 2 -
Using 162 cfs
Pg 1

REACH # 1
Headwaters and Tributary data

No. of Reaches : 1

Rh	Q7-10 (cfs)	T (c)	pH (su)	DO (mg/l)	CBOD5 (mg/l)	NH3-N (mg/l)
HW	162.0000	25	7	7.54	2	.5
1	0.0000					

Chronic mixing from Penfax
0.85 x 191 = 162 cfs

(WQAM63.EXE) Release 1.2 04-29-1997 11:01:53

06/23/97 14:01 TX/RX NO.4342 P.009

JUN 23 '97 03:01PM CARTECH/ENGINEERING P.10/13

Method 2
Pg 2

FILE: c:\car1.wqm

Stream Characteristics

Rh	Q7-10 (cfs)	T (c)	pH (su)	DO (mg/l)	CBOD5 (mg/l)	NH3-N (mg/l)
1	162	25	7	7.54	2	.5

Q 1-10/Q 7-10 = .64
Q 30-10/Q 7-10 = 1.36

06/23/97 14:01 TX/RX NO.4342 P.010

JUN 23 '97 03:01PM CARTECH/ENGINEERING P.11/13

Method 2
pg 3

FILE: c:\car1.wqm

REACH # 1
Reach Characteristics

Rh	D.O. GOAL	KN (/D)	RCH. SL. (FT/FT)	RCH. LEN. (FT.)	DRAIN AREA (MI^2)	W/D
1	5	0	0.00060	3000	683.5	10

(WQAM63.EXE) Release 1.2 04-29-1997 11:03:49

06/23/97 14:01 TX/RX NO.4342 P.011

JUN 23 '97 03:02PM CARTECH/ENGINEERING P.12/13

Method 2
Pg 4

FILE: c:\car1.wqm

DISCHARGE # 1
Discharger Data
Q7-10 Design Conditions

Rh	FLOW (MGD)	T (c)	pH (su)	DO (mg/l)	CBOD5 (mg/l)	NH3-N (mg/l)	KC (1/days)
1	1.4500	25	7	3	25	150	1.5

FILE: c:\untitled.wqm

Calculating Stream Characteristics

(WQAM63.EXE) Release 1.2 04-29-1997 11:05:38

06/23/97 14:01 TX/RX NO.4342 P.012

JUN 23 '97 03:02PM CARTECH/ENGINEERING P.13/13

Method 2
Pg 5

FILE: c:\carl.wqm

NH3-N Discharge Allocations at Q30-10 (EMPR)

DIS	Q (mgd)	BASE. CONC. (mg/l)	MULT. CONC. (mg/l)	CRIT. RCH.	PCT. RED. (%)
1	1.450	103.48	103.48	0	0

Mo Ave.

FILE: c:\carl.wqm

NH3-N Discharge Allocations at Q1-10 (EMPR)

DIS	Q (mgd)	BASE. CONC. (mg/l)	MULT. CONC. (mg/l)	CRIT. RCH.	PCT. RED. (%)
1	1.450	300.00	300.00	0	0

Maximum.

(WQAM63.EXE) Release 1.2 04-29-1997 11:06:29

06/23/97 14:01 TX/RX NO.4342 P.013