Pennsylvania Department of Environmental Protection

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0051781**
Facility Type	**Industrial**	APS ID	**5530**
Major / Minor	**Minor**	Authorization ID	**1485236**

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

Applicant and Facility Information

Applicant Name	**Reading Area Water Authority – Berks County**	Facility Name	**Reading Area Water Authority**
Applicant Address	1801 Kutztown Road Reading, PA 19604-1515	Facility Address	108 Berkley Road Reading, PA 19605-9270
Applicant Contact	Gary Phillips*	Facility Contact	Gary Phillips
Applicant Phone	(610) 406-6300* gary.phillips@readingareawater.com	Facility Phone	(610) 406-6300
Client ID	77883	Site ID	239748
SIC Code	4941	Municipality	Ontelaunee Township
SIC Description	Trans. & Utilities - Water Supply	County	Berks
Date Application Received	May 16, 2024	EPA Waived?	Yes (verified coding in eFacts)
Date Application Accepted	May 21, 2024	If No, Reason	
Purpose of Application	NPDES Renewal for discharge of treated industrial wastewater		

*Jamie Lorah, SSM Group , jamie.lorah@ssmgroup.com

Summary of Review

The existing permit was issued January 23, 2020. The terms and conditions were administratively extended past its expiration date of January 31, 2025. The NPDES renewal application was received via DEP's electronic upload system (Reference # 234391) on May 16, 2024.

This water filtration plant processes water from Maiden Creek, including disinfection via chlorination and fluoridation, for potable water use. The filter backwash water and raw sludge from sedimentation at the water filtration plant is treated, including dechlorination, before discharge to the Maiden Creek via outfall 001. Waters originating from the chlorine analyzer, pump seal water, and diesel generator cooling water are discharged via Outfall 002.

The design flow for outfall 001 according to the renewal application and the existing NPDES permit is 3.0 MGD. The design flow for outfall 002 according to the renewal application and the existing NPDES permit is 0.26 MGD. The facility's DMRs from January 1, 2023 through June 30, 2025 were reviewed. The reported flows did not indicate a need to change the design flow.

Sludge use and disposal description and location(s)

To be hauled off-site for further treatment and disposal

Unresolved Violations

There are no unresolved violations for this client, according to DEP's Client History Summary Report. There are no outstanding annual fees for this permit according to DEP's Chapter 92a Annual Fees Report.

Approve	Deny	Signatures	Date
x		*Bonnie Boylan* Bonnie Boylan / Environmental Engineering Specialist	July 23, 2025
x		*Daniel W. Martin* Daniel W. Martin, P.E. / Environmental Engineer Manager	July 23, 2025

Summary of Review

Delaware River Basin Commission (DRBC)

The discharge is within the Delaware River watershed. A copy of the draft permit and Fact Sheet will therefore be sent to the DRBC for their review in accordance with State regulations and an interagency agreement. Any comments from the DRBC will be considered.

The DRBC issued a docket for the wastewater from this facility: Docket No. D-2010-009 CP-4, approved 3/12/2025, expires 1/31/2030.

A separate DRBC docket exists for this facility for Public Water Supply: Docket No. D-2000-059 CP-3, expires 3/10/2031. This docket approves a withdrawal allocation of 35 MGD of surface water. The docket states:

> "The filter plant has a design capacity of 53.7 mgd and a permitted capacity of 40.0 mgd. The treatment process includes disinfection, particulate removal, corrosion control with fluoride added. Disinfection is provided with chloramines….The system has an active total storage capacity of approximately 50.0 million gallons."

The docket also says that no withdrawals from the Maiden Creek intake (on Maiden Creek downstream of Lake Ontelaunee) can occur if the stream flow is less than 49.66 cfs and that no withdrawals from the Lake Ontelaunee intake (on Maiden Creek just after Lake Ontelaunee) can occur if the stream flow is less than 46.55 cfs. Thus, there would be no withdrawals occurring at the two intakes when the stream is flowing at 39.9 cfs which is PA Stream Stats' estimated $Q_{7\text{-}10}$ (the design stream low-flow for developing NPDES permit limits) at the facility's location.

Public Participation

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

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	3.0
Latitude	40° 25' 29.43" Per appl & map in appl (the equiv. of 40.424842)	Longitude	-75° 56' 37.87 appl.& map (the equiv. of 75.943853)
Quad Name		Quad Code	
Wastewater Description:	Water Treatment Effluent		
Receiving Waters	Maiden Creek (WWF, MF)	Stream Code	01985
NHD Com ID	26000370	RMI	0.34 (eMapPA & lat/long in appl)
Drainage Area	216 sq.mi.	Yield (cfs/mi^2)	0.185
Q_{7-10} Flow (cfs)	39.9	Q_{7-10} Basis	USGS / PA StreamStats*
Elevation (ft)	255' , estimated	Slope (ft/ft)	
Watershed No.	3-B	Chapter 93 Class.	WWF, MF
Existing Use	N/A	Existing Use Qualifier	N/A
Exceptions to Use	N/A	Exceptions to Criteria	N/A
Assessment Status	Impaired for Aquatic Life and for Recreational Use		
Cause(s) of Impairment	Habitat Alterations Due To Dam, Pathogens		
Source(s) of Impairment	Dam Or Impoundment, Source Unknown		
TMDL Status		Name	

Secondary Water:
Maiden Creek empties into Schuylkill River (WWF, MF) at RMI 86.7. Schuylkilll River is impaired for Fish Consumption due to PCBs and is subject to a Total Maximum Daily Load (TMDL) titled Schuylkill River PCB TMDL.

Background/Ambient Data		Data Source – no WQN in vicinity
pH (SU)		
Temperature (°F)		
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake	Pottstown Borough Water Authority		
PWS Waters	Schuylkill River	Flow at Intake (cfs)	
PWS RMI	approx.. 57	Distance from Outfall (mi)	30

*online tool: https://streamstats.usgs.gov/ss/

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	002	Design Flow (MGD)	0.26
Latitude	40° 25' 27.3" per 2nd appl & map (equiv 40.42425)	Longitude	-75° 56' 44.8" 2nd appl & map* (equiv -75.945778)
Quad Name		Quad Code	
Wastewater Description:	Water Treatment Effluent		
Receiving Waters	Maiden Creek (WWF, MF)	Stream Code	01985
NHD Com ID	26000370	RMI	0.3 (eMap, latlong 2nd appl)
Drainage Area	216 sq.mi.	Yield (cfs/mi^2)	0.185
Q_{7-10} Flow (cfs)	39.9	Q_{7-10} Basis	USGS / PA StreamStats *
Elevation (ft)	253', estimated	Slope (ft/ft)	
Watershed No.	3-B	Chapter 93 Class.	WWF, MF
Existing Use	N/A	Existing Use Qualifier	N/A
Exceptions to Use	N/A	Exceptions to Criteria	N/A
Assessment Status	Impaired for Aquatic Life and for Recreational Use		
Cause(s) of Impairment	Habitat Alterations Due To Dam, Pathogens		
Source(s) of Impairment	Dam Or Impoundment, Source Unknown		
TMDL Status	N/A	Name	

Secondary Water:
Maiden Creek empties into Schuylkill River (WWF, MF) at RMI 86.7. Schuylkilll River is impaired for Fish Consumption due to PCBs and is subject to a Total Maximum Daily Load (TMDL):Schuylkill River PCB TMDL.

Background/Ambient Data		Data Source – no WQN in vicinity
pH (SU)		
Temperature (°F)		
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake	Pottstown Borough Water Authority		
PWS Waters	Schuylkill River	Flow at Intake (cfs)	
PWS RMI	approx.. 57	Distance from Outfall (mi)	30

*online tool: https://streamstats.usgs.gov/ss/

Treatment Facility Summary

Treatment Facility Name: Reading Area Water- Maiden Cr

WQM Permit No.	Issuance Date
0610201 A-1	2/12/2014
0610201 (New)	9/22/2010

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Industrial			Chlorine disinfection of drinking water	3.26 (total)

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
		Not Overloaded	De-watered	landfilled

The Water Filtration Plant (WFP) waste treatment process consists of four (4) sludge thickeners, two (2) centrifuges, one (1) clarifier, one (1) final clarifier, and a non-operational storage lagoon. WFP sludge is dried by the centrifuges and hauled to RAWA's Residual Waste Landfill or land applied by a Contractor.

Chemicals used:

-Sodium permanganate for manganese removal
-Sodium bisulfite for dechlorination
-polymer for sludge thickening

EXISTING PERMIT LIMITS, Outfall 001:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
TRC	XXX	XXX	XXX	0.134	XXX	0.439	1/day	Grab
TSS	750	1500	XXX	30	60	75	1/week	24-Hr Composite
Total Aluminum	20.0	40.0	XXX	0.82	1.6	2	1/week	24-Hr Composite
Total Iron	50	100	XXX	2.0	4.0	5	1/week	24-Hr Composite
Total Manganese	25	50	XXX	1.0	2.0	2.5	1/week	24-Hr Composite

EXISTING PERMIT LIMITS, Outfall 002:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
TRC	XXX	XXX	XXX	0.134	XXX	0.439	1/day	Grab
TSS	65	130	XXX	30	60	75	1/week	24-Hr Composite
Total Aluminum	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite
Total Iron	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite
Total Manganese	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite

Compliance History

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

Parameter	MAY-25	APR-25	MAR-25	FEB-25	JAN-25	DEC-24	NOV-24	OCT-24	SEP-24	AUG-24	JUL-24	JUN-24
Flow (MGD) Average Monthly	1.077	1.022	0.959	1.051	1.088	1.108	1.025	1.218	1.223	1.195	1.056	0.943
Flow (MGD) Daily Maximum	1.57	2.11	2.229	1.995	1.325	1.686	1.889	2.019	1.888	4.215	1.823	1.222
pH (S.U.) Instantaneous Minimum	7.0	6.9	6.8	6.62	7.1	7.3	7.1	7.2	7.2	7.1	7.1	7.2
pH (S.U.) Instantaneous Maximum	7.5	7.6	7.4	7.53	7.7	7.8	7.8	7.9	7.7	7.9	7.8	7.7
TRC (mg/L) Average Monthly	< 0.020	< 0.020	< 0.020	< 0.020	< 0.030	< 0.020	< 0.020	< 0.020	< 0.020	< 0.040	< 0.060	< 0.020
TRC (mg/L) Instantaneous Maximum	0.030	0.030	0.020	0.030	0.270	0.040	0.040	0.040	0.030	0.230	0.410	0.040
TSS (lbs/day) Average Monthly	< 11	74	< 11	< 16	32	< 22	20	61	55	26	< 24	36
TSS (lbs/day) Daily Maximum	14	165	15	27	52	70	29	113	74	45	38	51
TSS (mg/L) Average Monthly	< 2	8	< 1	< 2	4	< 2	3	5	5	3	< 3	4
TSS (mg/L) Daily Maximum	2	19	2	4	6	5	4	8	6	4	5	5
Total Aluminum (lbs/day) Average Monthly	3.0	8.0	4.0	5.0	8.0	6.0	4.0	5.0	5.0	4.0	2.0	4.0
Total Aluminum (lbs/day) Daily Maximum	4.0	24.0	5.0	8.0	15.0	8.0	5.0	10.0	6.0	6.0	5.0	6.0
Total Aluminum (mg/L) Average Monthly	0.40	0.90	0.50	0.60	0.89	0.60	0.50	0.40	0.40	0.40	0.30	0.50
Total Aluminum (mg/L) Daily Maximum	0.52	2.77	0.68	1.02	1.48	0.75	0.61	0.59	0.50	0.50	0.52	0.64
Total Iron (lbs/day) Average Monthly	< 0.2	< 0.3	< 0.2	< 0.2	< 0.2	< 0.3	< 0.2	< 0.2	< 0.3	< 0.2	< 0.2	< 0.2
Total Iron (lbs/day) Daily Maximum	0.3	1	< 0.3	< 0.3	0.4	0.6	0.3	< 0.3	0.6	< 0.3	0.2	0.3

Total Iron (mg/L) Average Monthly	< 0.03	< 0.04	< 0.02	< 0.02	< 0.03	< 0.03	< 0.03	< 0.02	< 0.03	< 0.02	< 0.02	< 0.02
Total Iron (mg/L) Daily Maximum	0.05	0.11	0.03	0.03	0.04	0.06	0.03	0.02	0.05	< 0.02	0.02	0.03
Total Manganese (lbs/day) Average Monthly	1	1	1	0.4	0.7	1	2	2	1	8	2	4
Total Manganese (lbs/day) Daily Maximum	2	2	3	0.7	1	4	2	4	2	27	3	11
Total Manganese (mg/L) Average Monthly	0.2	0.2	0.1	0.04	0.1	0.1	0.2	0.2	0.1	0.6	0.2	0.5
Total Manganese (mg/L) Daily Maximum	0.258	0.268	0.256	0.072	0.146	0.275	0.357	0.448	0.152	2.1	0.315	1.13

DMR Data for Outfall 002 (from June 1, 2024 to May 31, 2025)

Parameter	MAY-25	APR-25	MAR-25	FEB-25	JAN-25	DEC-24	NOV-24	OCT-24	SEP-24	AUG-24	JUL-24	JUN-24
Flow (MGD) Average Monthly	0.007	0.004	0.006	0.005	0.006	0.006	0.004	0.003	0.003	0.005	0.004	0.009
Flow (MGD) Daily Maximum	0.025	0.012	0.013	0.014	0.008	0.016	0.009	0.020	0.005	0.012	0.013	0.055
pH (S.U.) Instantaneous Minimum	6.6	6.3	6.5	6.41	6.8	6.9	6.9	6.8	6.7	6.9	6.9	6.9
pH (S.U.) Instantaneous Maximum	7.4	7.3	7.1	7.18	7.4	7.5	7.3	7.1	7.3	7.3	7.5	7.7
TRC (mg/L) Average Monthly	< 0.040	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.030
TRC (mg/L) Instantaneous Maximum	0.320	0.020	0.020	0.030	0.030	0.020	0.030	0.020	0.020	0.050	0.020	0.160
TSS (lbs/day) Average Monthly	< 0.1	< 0.03	< 0.04	< 0.04	< 0.05	< 0.05	< 0.04	< 0.02	< 0.03	< 0.04	< 0.03	< 0.07
TSS (lbs/day) Daily Maximum	0.2	< 0.06	< 0.04	< 0.06	< 0.06	< 0.07	0.07	< 0.03	0.03	< 0.06	< 0.06	0.1
TSS (mg/L) Average Monthly	< 2	< 1	< 1	< 1	< 1	< 1	< 2	< 1	< 1	< 1	< 1	< 1

TSS (mg/L) Daily Maximum	3	1	< 1	1	< 1	1	2	1	1	1	< 1	2
Total Aluminum (lbs/day) Average Monthly	0.002	0.002	0.001	0.001	0.001	0.002	0.001	0.001	0.005	0.002	0.001	0.002
Total Aluminum (lbs/day) Daily Maximum	0.004	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.02	0.002	0.002	0.003
Total Aluminum (mg/L) Average Monthly	0.05	0.1	0.04	0.03	0.03	0.03	0.04	0.1	0.2	0.04	0.04	0.04
Total Aluminum (mg/L) Daily Maximum	0.07	0.07	0.05	0.03	0.03	0.04	0.05	0.06	0.5	0.05	0.06	0.05
Total Iron (lbs/day) Average Monthly	0.002	< 0.0009	< 0.0008	< 0.0009	< 0.001	< 0.001	< 0.0009	0.0007	< 0.0007	0.001	0.001	< 0.001
Total Iron (lbs/day) Daily Maximum	0.002	0.002	0.001	< 0.001	< 0.001	< 0.001	0.002	0.0008	0.001	0.002	0.002	0.001
Total Iron (mg/L) Average Monthly	0.04	< 0.03	< 0.02	< 0.02	< 0.02	< 0.02	< 0.03	0.03	< 0.03	0.03	0.04	< 0.02
Total Iron (mg/L) Daily Maximum	0.06	0.04	0.03	< 0.02	0.02	< 0.02	0.05	0.05	0.06	0.04	0.05	0.02
Total Manganese (lbs/day) Average Monthly	< 0.0004	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0003	< 0.0001	< 0.0001	< 0.0001	< 0.0002	< 0.0002	< 0.0003
Total Manganese (lbs/day) Daily Maximum	0.0007	< 0.0003	< 0.0002	< 0.0003	< 0.0003	< 0.0003	< 0.0002	0.0002	< 0.0002	< 0.0003	< 0.0003	< 0.0003
Total Manganese (mg/L) Average Monthly	< 0.009	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.006	< 0.005	< 0.005	< 0.005	< 0.005
Total Manganese (mg/L) Daily Maximum	0.021	0.006	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.012	0.006	< 0.005	0.007	< 0.005

Compliance History

Effluent Violations for Outfall 001, from July 1, 2024 to June 30, 2025:

Parameter	Date	Statistical Base Code	Discharge Monitoring Report Value	Units	Limit Value	Units
Total Aluminum	01/31/25	Avg Mo	0.89	mg/L	0.82	mg/L
Total Aluminum	04/30/25	Avg Mo	0.90	mg/L	0.82	mg/L
Total Aluminum	04/30/25	Daily Max	2.77	mg/L	1.6	mg/L
Total Manganese	08/31/24	Daily Max	2.1	mg/L	2.0	mg/L

Compliance History

Most Recent DEP Clean Water Inspections:

September 21, 2020 Administrative Review (during Covid-19 pandemic) – No violations.

All treatment units were reported to be online and operable in phone conversation with Operator and no bypasses have occurred since last DEP inspection. DEP was notified on September 15, 2020 that the facility planned to take the backwash tank out of service for cleaning and return the tank to service on October 9, 2020.

March 30, 2018 – Incident. Violation: Discharge of poly-aluminum chloride to Maidencreek through the Industrial Waste Treatment Plant is a violation of PA Clean Streams Law, Section 401 and 402. Failure to notify the department within 4 hours of any incident causing or threatening pollution is a violation of Part A of your NPDES Permit. Faulty valve blamed. The faulty valve was replaced the same day.
24-hr effluent sample results collected show an effluent aluminum result of 32.4 mg/L (daily max 2.5 mg/L is permit limit) and total suspended solids result of 130 mg/L (daily maximum 60 mg/L is permit limit). Effluent pH was analyzed at 001: 5.87 mg/L (instantaneous minimum 6.0 s.u. is permit limit). No apparent downstream impact was observed at the outfall.

February 16, 2017 – No violations. All treatment units are operating normally and records are well maintained.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 3
Latitude 40º 25' 29.43" **Longitude** -75º 56' 37.87"
Wastewater Description: Water Treatment Effluent

Permit limits can be Technology Based Effluent Limitations (TBELs) or Water Quality Based Effluent Limitations (WQBELs). Both are discussed in this Fact Sheet, in separate sections. Typically the limits imposed in the NPDES permit are the more stringent of the TBELs or the WQBELs as needed or the existing limits that are carried forward to avoid backsliding.

Technology-Based Effluent Limitations (TBELs)

There are no federal Effluent Limitation Guidelines (ELGs) for Water Treatment.

TBELs for water treatment plant wastewater discharges are presented in DEP's Guidance document [386-2183-001] entitled, "Technology-Based Control Requirements for Water Treatment Plant Wastes":

Parameter	Monthly Avg mg/l	Daily Max. mg/l
Suspended Solids	30	60
Aluminum	4	8
Iron	2	4
Manganese	1	2
TRC	0.5	1.0
pH	6 - 9 S.U at all times	

According to the Guidance document, the above requirements are based upon use of "**best professional judgment (BPJ)"** in applying the factors specified in Section 304 of the Federal Clean Water Act to determine: Best Practicable Control Technology Currently Available (BPT), Best Conventional Pollutant Control Technology (BCT), and Best Available Technology Economically Achievable (BAT). They apply to filter backwash water, and/or wastes generated from pre-sedimentation, coagulation and settling, water softening (other than regeneration of ion-exchange softening units), and iron/manganese removal processes. "These technology-based effluent control requirements are only applicable where the WTP's wastewater discharge will not result in water quality standards violations in the receiving stream" [386-2183-001].

The limits in the above table match the limits in the existing permit for **Total Suspended Solids (TSS), Total Iron, Total Manganese, and pH.** The existing permit limits for these 4 parameters are carried forward into the draft renewal permit. The permit limits for Total Aluminum and Total Residual Chlorine (TRC) are discussed in the WQBELs section of this Fact Sheet.

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

Parameter	Limit	Statistical Basis Code	Federal Regulation	State Regulation	DRBC
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)	
Total Residual Chlorine (TRC)	0.5 mg/l	Average Monthly	-	92a.48(b)(2)	
Total Dissolved Solids (TDS)	1000 mg/l *	Average Quarterly	-		18 CFR Part 410 3.10.4 and 3.10.3 & docket D-2010-009 CP-4

*or a concentration established by the Commission which is compatible with designated water uses and stream quality objectives and recognizes the need for reserve capacity to serve future dischargers (i.e. a limit based on a TDS Determination submitted to DRBC proving that the discharge will not cause the TDS in the receiving water to exceed the lesser of 500 mg/l or 133% of background. The DRBC docket for this facility does not include such a TDS variance).

Due to DRBC regulations and the facility's DRBC docket, a monitoring requirement and limits have been included in the draft renewal permit for TDS: 1000.0 mg/l as a quarterly average. (DEP permitting software requires one decimal place in the limit.)

Water Quality-Based Effluent Limitations (WQBELs)

Total Maximum Daily Load (TMDL): Not Applicable

The Lake Ontelaunee TMDL does not apply because this facility is downstream of the Lake.

The Schuylkill River PCB TMDL does not apply because this facility is not a direct discharger to the Schuylkill River, nor are Polychlorinated Bi-phenyls (PCBs) expected to be present in the discharge.

WQBELs other than TMDL:

DEP uses a **TRC** model (Excel spreadsheet) to determine WQBELs for TRC: the model utilizes the equations and calculations provided in DEP's 'Implementation Guidance Total Residual Chlorine (TRC) Regulation' for TRC, document #386-2000-011. The model input and results are attached. The model did not indicate that more protective permit limits for TRC are needed than the existing permit limits, which are WQBELs carried forward from the 2004 NPDES permit.

DEP uses a model known as WQM 7.0 to calculate WQBELs for $CBOD_5$, Ammonia (NH_3-N), and Dissolved Oxygen (DO). The permit application reported 'Non-detect' for BOD_5 in the discharge at outfall 001 using a Quantitation Limit (QL) of 2.0 mg/l. The permit application reported the maximum Ammonia concentration in the discharge at outfall 001 as 0.08 mg/l. Therefore, the WQM 7.0 model was not run, consistent with DEP's Standard Operating Procedure (SOP) Establishing Effluent Limitations for Individual Industrial Permits.

DEP uses a model called the Toxics Management Spreadsheet (TMS) for toxic pollutants. It is a macro-enabled Excel version of DEP's former PENTOX model. It evaluates the reasonable potential for discharges to cause in-stream exceedances of water quality criteria and recommends Water Quality-Based Effluent Limitations (WQBELs) be imposed as permit limits or may recommend 'monitoring only' without a limit. The TMS is coded to recommend limits in the draft permit when the discharge concentration input value equals or exceeds 50% of the calculated WQBEL. The TMS is coded to recommend a monitoring requirement (without limits) in the draft permit when the discharge concentration is between 25% and 50% of the WQBEL in the case of non-conservative pollutants or between 10% and 50% of the WQBEL in the case of conservative pollutants. For more explanation of the TMS/PENTOX model, see Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, document #386-2000-015. The model input and results are attached.

When there are less than 10 data points, the maximum effluent concentration of the available data (such as from the permit application and from DMRs) is used by DEP as the discharge concentration input value in the TMS, with the exception of discharge Hardness for which the average effluent concentration is typically used. When there are more than 10 data points, DEP typically uses a statistical spreadsheet called TOXCONC to calculate the average monthly concentration with 99% probability and the coefficient of variation. Discrete data points are needed for TOXCONC. Such information was available for this facility from the Daily Effluent Supplemental DMRs for Total Aluminum, Total Manganese, and Total Iron. In order to save time and effort, discrete monitoring results were not loaded into TOXCONC for Total Iron since the TMS did not recommend a WQBEL or monitoring requirement for Total Iron even when the *maximum* concentration from DMRs and the application was used as the model input value. The TOXCONC results for Total Aluminum and Total Manganese are attached. The results were used in the TMS as the discharge concentration and daily coefficient of variation for outfall 001.

The source of the River Mile Indices (RMI's) and elevations that were used in the TMS model was DEP's eMapPA while the source of the Drainage Areas and stream design low-flows was the USGS PA Stream Stats online tool (see attached). Low Flow Yield (LFY) is calculated as stream low-flow $Q_{7\text{-}10}$ divided by Drainage Area. In this case:
39.9 cfs / 216 sq.mi. = 0.185 cfs/sq.mi.

Some default values were used in the models in the absence of site-specific data including:

Stream pH = 7 s.u.
Stream chlorine demand = 0.3
Background stream concentrations for toxic parameters = 0 ug/l
Discharge chlorine demand = 0
Discharge pH = 7 s.u.
Coefficient of Variability in data = 0.5 (other than the parameters for which TOXCONC was used)

In addition the TMS model estimates the stream width, depth, and velocity.

The TMS calculates Q_{30-10} flow from the Q_{7-10} flow: $Q_{30-10} = 1.36 \times Q_{7-10}$
The TMS calculates Q_{1-10} flow from the Q_{7-10} flow: $Q_{1-10} = 0.64 \times Q_{7-10}$

According to the TRC model and the TMS, the existing permit limits (which are WQBELs) are protective and will be carried forward into the draft renewal permit, consistent with DEP's SOP Establishing WQBELs and Permit Conditions for Toxic Pollutants in NPDES Permits:

-0.134 mg/l as a Monthly Average and 0.439 mg/l as an Instantaneous Maximum (IMAX) for **TRC**
-0.82 mg/l as a Monthly Average, 1.6 mg/l as a Daily Maximum, and 2 mg/l as an IMAX for **Total Aluminum**

The TMS model did not recommend limits or monitoring requirements for any other parameters.

Anti-Backsliding

None of the limits in the draft renewal permit are less stringent than the limits in the existing permit.

Per- and Polyfluoroalkyl Substances (PFAS) Monitoring

Given the concern over PFAS in waterways, DEP initiated a policy to identify PFAS in discharges using 4 indicator parameters: Perfluorooctanoic acid (PFOA), Perfluorooctane sulfonic acid (PFOS), Perfluorobutane sulfonic acid (PFBS), and Hexafluoropropylene oxide dimer acid (HFPO-DA).

The permit application reported detected concentrations in the effluent at outfall 001 for PFOA, PFOS, and PFBS, using QL of 1.8 ng/l:

Pollutant	Units	Maximum Concentration	Average Concentration	# of Detects out of # samples	EPA Method Used*	DEP Target QL
PFOA	ng/l	5.6	5.3	3 / 3	EPA 537 Isotope Dilution	4.0
PFOS	ng/l	2.1	2.0	3 / 3	EPA 537 Isotope Dilution	3.7
PFBS	ng/l	6.3	6.0	3 / 3	EPA 537 Isotope Dilution	3.5
HFPO-DA	ng/l	<1.8	<1.8	0 / 3	EPA 537 Isotope Dilution	6.4

*In 2024, EPA published two analytical methods for measuring PFAS in wastewater: Methods 1633 and 1621. EPA encouraged labs to use these methods.

DEP's Bureau of Clean Water has advised regional office staff that DEP will not require PFAS monitoring for water treatment plant backwash discharges unless there is a treatment process in place specifically designed to remove PFAS from drinking water. DEP expects that wastewater generated from a Water Treatment Plant not specifically treating for PFAS would not exhibit levels greater than the raw water.

Development of Effluent Limitations

Outfall No.	002	**Design Flow (MGD)**	0.26
Latitude	40º 25' 27.3"	**Longitude**	75º 56' 44.8"

Wastewater Description: Water Treatment Effluent

Permit limits can be Technology Based Effluent Limitations (TBELs) or Water Quality Based Effluent Limitations (WQBELs). Both are discussed in this Fact Sheet, in separate sections. Typically the limits imposed in the NPDES permit are the more stringent of the TBELs or the WQBELs as needed (or the existing limits that are carried forward to avoid backsliding).

Technology-Based Effluent Limitations (TBELs)

The TBELs from DEP's Guidance document [386-2183-001] entitled, "Technology-Based Control Requirements for Water Treatment Plant Wastes" do not apply to the discharge at outfall 002. Those TBELs are specific for filter backwash and sludge. Note: the facility's DMRs from January 1, 2023 through May 31, 2025 demonstrate the concentrations in the discharge at outfall 002 are well below the TBELs provided in the Guidance document 386-2183-001.

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

Parameter	Limit	Statistical Basis Code	Federal Regulation	State Regulation	DRBC
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)	
Total Residual Chlorine (TRC)	0.5 mg/l	Average Monthly	-	92a.48(b)(2)	
Total Dissolved Solids (TDS)	1000 mg/l *	Average Quarterly	-		18 CFR Part 410 3.10.4 and 3.10.3 & docket D-2010-009 CP-4

*or a concentration established by the Commission which is compatible with designated water uses and stream quality objectives and recognizes the need for reserve capacity to serve future dischargers (i.e. a limit based on a TDS Determination submitted to DRBC proving that the discharge will not cause the TDS in the receiving water to exceed the lesser of 500 mg/l or 133% of background. The DRBC docket for this facility does not include such a TDS variance).

Due to DRBC regulations and the facility's DRBC docket, a **TDS** limit has been included in the draft renewal permit: 1000.0 mg/l as a quarterly average. (DEP permitting software requires one decimal place in the limit.) The existing permit limits (TBELs) for **pH** and **TSS** have been carried forward into the draft renewal permit. The above TBEL for TRC is less stringent than the WQBEL, as discussed in the section below.

Water Quality-Based Effluent Limitations (WQBELs)

Total Maximum Daily Load (TMDL): Not Applicable. Already discussed in the outfall 001 section of the Fact Sheet.

WQBELs other than TMDL:

The same models and defaults were used for outfall 002 as for outfall 001.

The TRC model did not indicate that more protective permit limits for **TRC** are needed than the existing permit limits, which are WQBELs carried forward from the 2004 NPDES permit: 0.134 mg/l as a Monthly Average and 0.439 mg/l as an Instantaneous Maximum (IMAX).

The effluent concentrations reported in the permit application were 'non-detect' for BOD5 (QL of 2.0 mg/l) and low for Ammonia (0.68 mg/l). As with outfall 001, no WQM 7.0 model was run, consistent with DEP's SOP Establishing Effluent Limitations for Individual Industrial Permits. No monitoring requirements or permit limits are proposed for those parameters, nor were they included in the existing permit.

The extra step of using the TOXCONC statistical spreadsheet was not needed for outfall 002 because the TMS did not recommend any permit limits or monitoring requirements even when the *maximum* concentrations from the application and the DMRs were used. The model pages are attached.

While the TMS indicated that no limits for toxics are needed at this time, the monitoring requirements for Total Aluminum, Total Iron and Total Manganese will be continued from the existing permit.

Per- and Polyfluoroalkyl Substances (PFAS) Monitoring

The permit application reported detected concentrations in the effluent at outfall 001 for PFOA, PFOS, and PFBS, using QL of 1.8 ng/l:

Pollutant	Units	Maximum Concentration	Average Concentration	# of Detects out of # samples	EPA Method Used*	DEP Target QL
PFOA	ng/l	5.7	4.3	3 / 3	EPA 537 Isotope Dilution	4.0
PFOS	ng/l	2.2	<2.0	1 / 3	EPA 537 Isotope Dilution	3.7
PFBS	ng/l	5.2	3.9	3 / 3	EPA 537 Isotope Dilution	3.5
HFPO-DA	ng/l	<1.8	<1.8	0 / 3	EPA 537 Isotope Dilution	6.4

*In 2024, EPA published two analytical methods for measuring PFAS in wastewater: Methods 1633 and 1621. EPA encouraged labs to use these methods.

No monitoring or limits for PFAS have been included in the draft renewal permit.

Additional Considerations, all Outfalls

Chemical Additives

The renewal application included chemical additives that they use in the production of drinking water or for the wastewater treatment. No usage restrictions or Supplemental DMRs for 'Chemical Additives', as defined by DEP, are indicated as necessary. Note: DEP's definition of 'Chemical Additives' for NPDES permits "generally excludes chemicals used for neutralization of waste streams, the production of goods, and treatment of wastewater."

Nutrients Monitoring

Monitoring for Total Nitrogen (TN) and Total Phosphorus (TP) are not required for industrial waste discharges when the concentrations are not expected to be of concern, as in this case. The renewal application showed low concentrations for TN and TP at both outfalls.

Mass Loading Limitations

Effluent mass loading limits have been based on the formula: design flow x concentration limit x conversion factor of 8.34.

Sample Types and Frequencies

Sample Types and Frequencies are consistent with the Technical Guidance for the Development and Specification of Effluent Limitations, document #386-0400-001, or with other NPDES permits for similar facilities.

Flow Monitoring

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

Other Permit Conditions

Conditions that are standard for Minor Industrial facilities are included in Part C of the draft renewal permit, including solids management requirements and minimizing the discharge of chlorine. Because the facility is in the Delaware River watershed and the facility's flow is above DRBC's reviewable threshold, the condition that approval from DRBC must be obtained (or maintained when docket has already been issued) has been included.

Class A Trout Waters

The receiving water (and downstream waters) are not considered Class A Trout Waters.

Trout Natural Reproduction Waters

The receiving water (and downstream waters) are not considered Trout Natural Reproduction Waters.

303d Impaired Waters

Maiden Creek was included on the List of Impaired Waters that is forwarded to EPA in accordance with Section 303d of the Clean Water Act. No TMDL has been developed. The discharges from this facility are not expected to contribute to the impairment due to pathogens and habitat alterations.

Anti-degradation Requirements

All effluent limitations and monitoring requirements have been developed such that the designated stream uses and the level of water quality necessary to protect the designated uses are maintained and protected. No High Quality or Exceptional Value waters are impacted by this discharge.

Stormwater

Stormwater leaving the site from an 18" pipe is not subject to the federal regulations at 40 CFR 122.26(b)(14)(xi) requiring a NPDES permit for the discharge of "stormwater associated with industrial activity". The existing permit also did not include any stormwater outfalls or requirements.

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality as needed and BPJ. Instantaneous Maximum (IMAX) limits are generally determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (386-0400-001), SOPs and/or BPJ.

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Instant. Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
TRC	XXX	XXX	XXX	0.134	XXX	0.439	1/day	Grab
TSS	750	1500	XXX	30	60	75	1/week	24-Hr Composite
Total Dissolved Solids	XXX	XXX	XXX	1000.0 Avg.Qrtrly.	XXX	XXX	1/quarter	24-Hr Composite
Total Aluminum	20.0	40.0	XXX	0.82	1.6	2	1/week	24-Hr Composite
Total Iron	50	100	XXX	2.0	4.0	5	1/week	24-Hr Composite
Total Manganese	25	50	XXX	1.0	2.0	2.5	1/week	24-Hr Composite

Compliance Sampling Location: outfall 001

Proposed Effluent Limitations and Monitoring Requirements

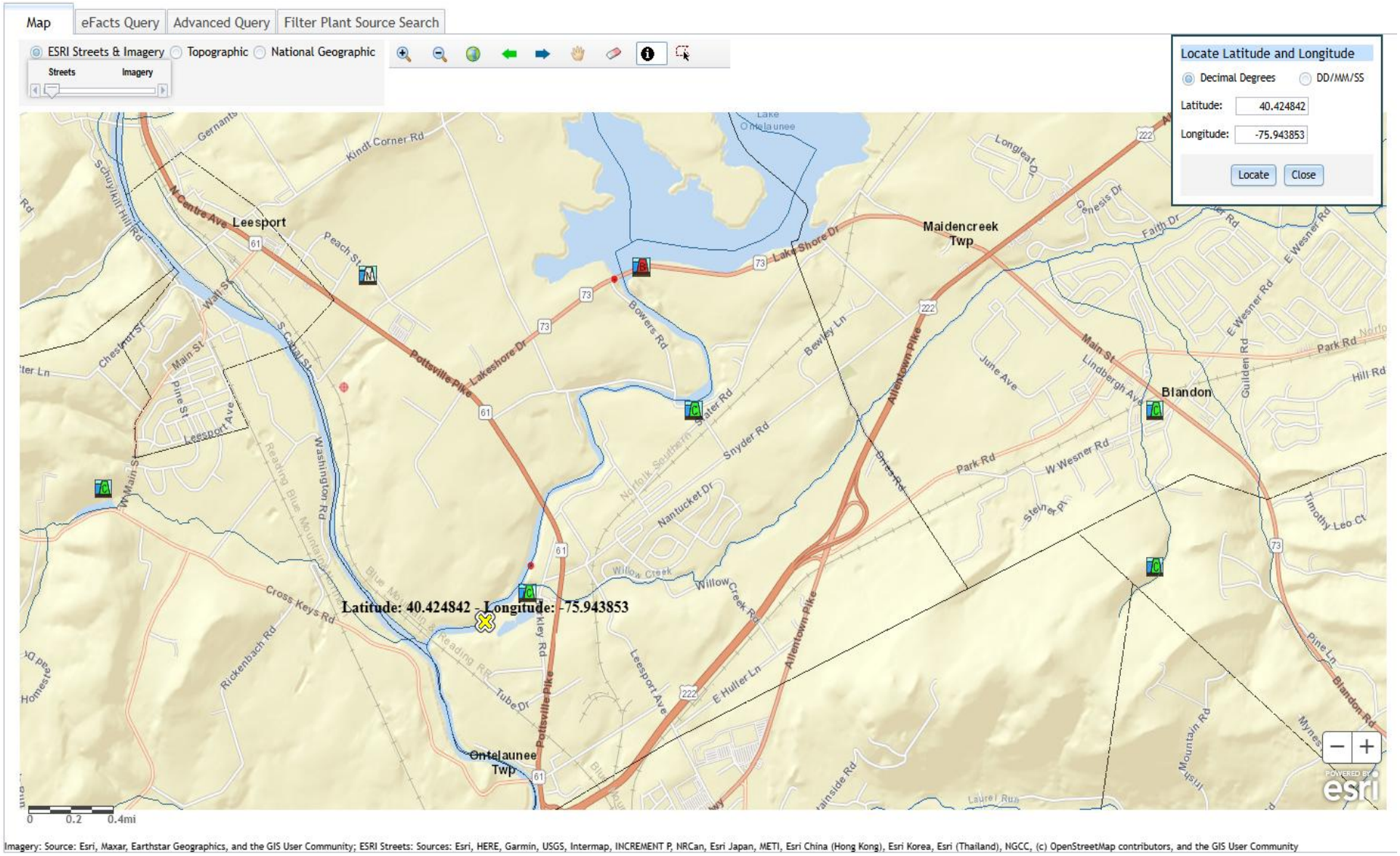
The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality as needed and BPJ. Instantaneous Maximum (IMAX) limits are generally determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (386-0400-001), SOPs and/or BPJ.

Outfall 002, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Instant. Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
TRC	XXX	XXX	XXX	0.134	XXX	0.439	1/day	Grab
TSS	65	130	XXX	30	60	75	1/week	24-Hr Composite
Total Dissolved Solids	XXX	XXX	XXX	1000.0 Avg. Qrtrly .	XXX	XXX	1/quarter	24-Hr Composite
Total Aluminum	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite
Total Iron	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite
Total Manganese	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite

Compliance Sampling Location: at outfall 002

Tools and References Used to Develop Permit	
☐	WQM for Windows Model (see Attachment)
☒	Toxics Management Spreadsheet (see Attachment)
☒	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☒	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☒	Technical Guidance for the Development and Specification of Effluent Limitations, 386-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 386-2000-019, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 386-2000-018, 11/96.
☒	Technology-Based Control Requirements for Water Treatment Plant Wastes, 386-2183-001, 10/97, Rev. 6/28/2023.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 386-2183-002, 12/97.
☐	Pennsylvania CSO Policy, 386-2000-002, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 386-2000-008, 4/97.
☒	Determining Water Quality-Based Effluent Limits, 386-2000-004, 12/97.
☒	Implementation Guidance Design Conditions, 386-2000-007, 9/97.
☐	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 386-2000-016, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 386-2000-012, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 386-2000-009, 3/99.
☒	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 386-2000-015, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 386-2000-022, 11/97.)
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 386-2000-013, 4/2008.
☒	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 386-2000-011, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 386-2000-001, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 386-2000-021, 10/97.
☒	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 386-2000-020, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 386-2000-005, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 386-2000-010, 3/1999.
☒	Design Stream Flows, 386-2000-003, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 386-2000-006, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 386-3200-001, 6/97.
☐	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☒	SOP: Chemical Additives, Version 1.4, Revised January 13, 2015.
☒	SOP: New and Reissuance Industrial Waste and Industrial Stormwater Individual NPDES Permit Applications, Version 1.7, Revised May 14, 2025.
☒	SOP: Establishing Effluent Limitations for Individual Industrial Permits, version 1.7, Revised February 5, 2024.
☒	SOP: Establishing Water-Quality Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers, Version 1.6, May 5, 2025.
☐	

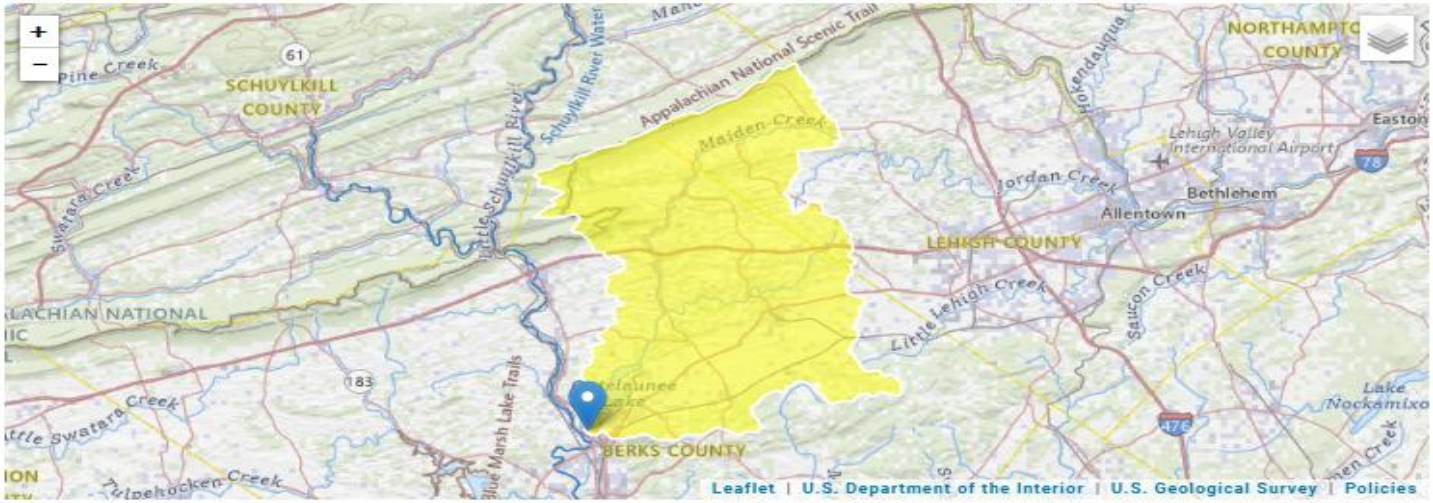


Note: the stream gage shown in above map (small orange dot, west of Rt 61) is not on the Schuylkill River.

Outfall 001

StreamStats Report - Maiden Creek at RAWA

Region ID:	PA
Workspace ID:	PA20250613022255531000
Clicked Point (Latitude, Longitude):	40.42488, -75.94434
Time:	2025-06-12 22:23:18 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	24.17	percent
DRNAREA	Area that drains to a point on a stream	216	square miles
PRECIP	Mean Annual Precipitation	46	inches
ROCKDEP	Depth to rock	4.2	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	1.37	miles per square mile

Low-Flow Statistics Flow Report [Low Flow Region 2]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	71	ft^3/s	38	38
30 Day 2 Year Low Flow	86.7	ft^3/s	33	33
7 Day 10 Year Low Flow	39.9	ft^3/s	51	51
30 Day 10 Year Low Flow	49.6	ft^3/s	46	46
90 Day 10 Year Low Flow	64.6	ft^3/s	36	36

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p.

Application Version: 4.29.1
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

Outfall 002:

StreamStats Report

Region ID: PA
Workspace ID: PA20250716182610509000
Clicked Point (Latitude, Longitude): 40.42442, -75.94606
Time: 2025-07-16 14:26:35 -0400

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
CARBON	Percent Carbonate	24.17	percent	0	99
DRNAREA	Drainage Area	216	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	46	inches	35	50.4
ROCKDEP	Depth to Rock	4.2	feet	3.32	5.65
STRDEN	Stream Density	1.37	miles per square mile	0.51	3.1

Low-Flow Statistics Flow Report [Low Flow Region 2]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	71	ft^3/s	38	38
30 Day 2 Year Low Flow	86.7	ft^3/s	33	33
7 Day 10 Year Low Flow	39.9	ft^3/s	51	51
30 Day 10 Year Low Flow	49.6	ft^3/s	46	46
90 Day 10 Year Low Flow	64.6	ft^3/s	36	36

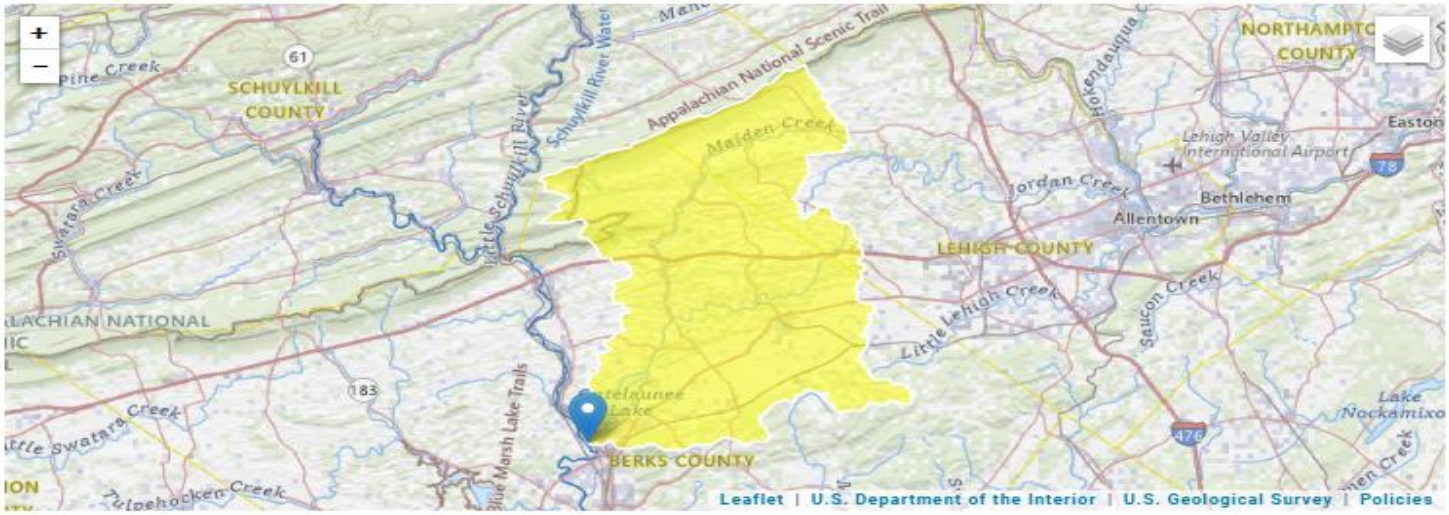
Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p.

(Immediately before confluence)

StreamStats Report - confluence of Maiden Crk & Schuylkill River

Region ID:	PA
Workspace ID:	PA20250613023156441000
Clicked Point (Latitude, Longitude):	40.42323, -75.94930
Time:	2025-06-12 22:32:18 -0400



Low-Flow Statistics Flow Report [Low Flow Region 2]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	71	ft^3/s	38	38
30 Day 2 Year Low Flow	86.8	ft^3/s	33	33
7 Day 10 Year Low Flow	39.9	ft^3/s	51	51
30 Day 10 Year Low Flow	49.7	ft^3/s	46	46
90 Day 10 Year Low Flow	64.6	ft^3/s	36	36

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p.

> Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	24.24	percent
DRNAREA	Area that drains to a point on a stream	216	square miles
PRECIP	Mean Annual Precipitation	46	inches
ROCKDEP	Depth to rock	4.2	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	1.37	miles per square mile

Outfall 001:

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

39.9	= Q stream (cfs)	0.5	= CV Daily
3	= Q discharge (MGD)	0.5	= CV Hourly
30	= no. samples	0.271	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	1	= CFC_Partial Mix Factor
0	= Chlorine Demand of Discharge	15	= AFC_Criteria Compliance Time (min)
0.5	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)
0	= % Factor of Safety (FOS)		=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 0.762	1.3.2.iii	WLA cfc = 2.685
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.284	5.1d	LTA_cfc = 1.561

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.350	AFC
		INST MAX LIMIT (mg/l) = 1.143	

WLA afc	**(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...** **...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)**
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	**(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...** **...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)**
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	**1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)**

The Partial Mix Factors in above model are taken from the TMS output pages.

TOXCONC…..

	Facility:	RAWA					
	NPDES #:	PA0051781					
	Outfall No:	001					
	n (Samples/Month):	4					
	Reviewer/Permit Engineer:	B.Boylan					
Parameter Name	T.Aluminum	T. Manganese					
Units	mg/L	mg/l					
Detection Limit	0.02	0.005					
Sample Date	*When entering values below the detection limit, enter "ND" or use the < notation (eg. <0.02)*						
3/1/2025	0.36	0.036					
	0.25	0.112					
	0.54	0.256					
	0.68	0.188					
Feb-25	0.7	0.072					
	0.59	0.025					
	1.02	0.035					
	0.18	0.041					
Jan-25	0.29	0.018					
	0.64	0.146					
	1.48	0.058					
	1.15	0.073					
Dec-24	0.75	0.081					
	0.59	0.275					
	0.37	0.14					
	0.59	0.048					
	0.62	0.039					
Nov-24	0.32	0.3					
	0.53	0.191					
	0.55	0.1					
	0.61	0.357					
Oct-24	0.5	0.448					
	0.38	0.074					
	0.4	0.211					
	0.35	0.144					
	0.59	0.142					
Sep-24	0.5	0.092					
	0.44	0.102					
	0.32	0.086					
	0.5	0.152					
Aug-24	0.35	2.06					
	0.4	0.185					
	0.19	0.141					
	0.5	0.097					

Continued….

Jul-24	0.29	0.295			
	0.52	0.177			
	0.21	0.315			
	0.26	0.227			
	0.15	0.172			
Jun-24	0.41	0.186			
	0.64	0.24			
	0.46	1.13			
	0.29	0.253			
May-24	0.42	0.208			
	0.42	0.071			
	0.45	0.23			
	0.39	0.107			
Apr-24	0.38	0.032			
	0.47	0.041			
	0.33	0.039			
	0.34	0.041			
	0.44	0.027			
Apr-25	2.77	0.268			
	0.49	0.147			
	0.54	0.162			
	0.3	0.112			
	0.23	0.106			
May-25	0.28	0.124			
	0.33	0.184			
	0.52	0.258			
	0.43	0.056			
Jun-25	0.25	0.058			
	0.57	0.273			
	0.48	0.084			
	0.31	0.066			

Results:

		Reviewer/Permit Engineer:	B.Boylan
Facility:	RAWA		
NPDES #:	PA0051781		
Outfall No:	001		
n (Samples/Month):	4		
Parameter	**Distribution Applied**	**Coefficient of Variation (daily)**	**Avg. Monthly**
T.Aluminum (mg/L)	Lognormal	0.5070388	0.8512123
T. Manganese (mg/l)	Lognormal	1.0774066	0.5061025

TOXCONC….

	Facility:		RAWA		
	NPDES #:		PA0051781		
	Outfall No:		001		
	n (Samples/Month):		4		
Parameter Name	T.Aluminum	T. Manganese			
Number of Samples	65	65			
Samples Nondetected	0	0			
LOGNORMAL					
Log MEAN	-0.8248746	-2.1129650			
Log VAR.	0.2287982	0.7704808			
(LTA) [E(x)]	0.4914105	0.1776883			
Variance [V(x)]	0.0620828	0.0366502			
CV (raw)	0.5070388	1.0774066			
CV (n)	0.2535194	0.5387033			
Monthly Avg. (99%, n-day)	0.8512123	0.5061025			
DELTA-LOGNORMAL					
Delta-Log MEAN	NA	NA			
Delta-Log VAR.					
(LTA) [E(x)]					
Variance [V(x)]					
CV (raw)					
Delta-Log VAR. (n)					
A, Table E-2, TSD					
B, Table E-2, TSD					
C, Table E-2, TSD					
Delta-Log MEAN (n)					
phi (Φ)					
Z*					
Monthly Avg. (99%, n-day)					
NORMAL					
MEAN	NA	NA			
VAR.					
(LTA) [E(x)]					
Variance [V(x)]					
CV (raw)					
CV (n)					
Monthly Avg. (99%, n-day)					

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Toxics Management Spreadsheet
Version 1.4, May 2025

Discharge Information

Instructions | Discharge | Stream

Facility: **RAWA** NPDES Permit No.: **PA0051781** Outfall No.: **001**

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

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
3	92.8	7						

	Discharge Pollutant	Units	Max Discharge Conc		0 if left blank: Trib Conc	Stream Conc	0.5 if left blank: Daily CV	Hourly CV	0 if left blank: Stream CV	Fate Coeff	FOS	1 if left blank: Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		168									
	Chloride (PWS)	mg/L		23.7									
	Bromide	mg/L	<	0.12									
	Sulfate (PWS)	mg/L		43.9									
	Fluoride (PWS)	mg/L	<	0.14									
Group 2	Total Aluminum	µg/L		851.2			0.507						
	Total Antimony	µg/L	<	0.3									
	Total Arsenic	µg/L	<	1									
	Total Barium	µg/L		19									
	Total Beryllium	µg/L	<	1									
	Total Boron	µg/L	<	200									
	Total Cadmium	µg/L	<	0.2									
	Total Chromium (III)	µg/L	<	0.5									
	Hexavalent Chromium	µg/L	<	0.25									
	Total Cobalt	µg/L	<	0.3									
	Total Copper	mg/L	<	0.001									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L		33									
	Dissolved Iron	µg/L	<	20									
	Total Iron	µg/L		110									
	Total Lead	µg/L	<	1									
	Total Manganese	µg/L		506.1			1.077						
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L	<	1									
	Total Phenols (Phenolics) (PWS)	µg/L		3									
	Total Selenium	µg/L	<	1									
	Total Silver	µg/L	<	0.4									
	Total Thallium	µg/L	<	0.3									
	Total Zinc	mg/L	<	0.005									
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

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Toxics Management Spreadsheet
Version 1.4, May 2025

Stream / Surface Water Information

RAWA, NPDES Permit No. PA0051781, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Maiden Creek**

No. Reaches to Model: **1**

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

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	001985	0.34	255	216			Yes
End of Reach 1	001985	0	250	216.1			Yes

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

Location	RMI	LFY (cfs/mi²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	0.34	0.185	39.9									100	7		
End of Reach 1	0	0.185	39.9												

Q_h

Location	RMI	LFY (cfs/mi²)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	0.34														
End of Reach 1	0														

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Toxics Management Spreadsheet
Version 1.4, May 2025

Model Results

RAWA, NPDES Permit No. PA0051781, Outfall 001

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | (●) All ( ) Inputs ( ) Results ( ) Limits

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.271 Analysis Hardness (mg/l): 97.835 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	2,494	
Total Antimony	0	0		0	1,100	1,100	3,658	
Total Arsenic	0	0		0	340	340	1,131	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	69,843	
Total Boron	0	0		0	8,100	8,100	26,940	
Total Cadmium	0	0		0	1.971	2.09	6.94	Chem Translator of 0.945 applied
Total Chromium (III)	0	0		0	559.642	1,771	5,890	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	54.2	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	316	
Total Copper	0	0		0	13.165	13.7	45.6	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	63.060	79.4	264	Chem Translator of 0.794 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	5.48	Chem Translator of 0.85 applied
Total Nickel	0	0		0	459.646	461	1,532	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	3.098	3.64	12.1	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	216	
Total Zinc	0	0		0	115.027	118	391	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): ###### PMF: 1 Analysis Hardness (mg/l): 99.25 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
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	2,111	
Total Arsenic	0	0		0	150	150	1,440	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	39,349	
Total Boron	0	0		0	1,600	1,600	15,356	
Total Cadmium	0	0		0	0.245	0.27	2.58	Chem Translator of 0.909 applied
Total Chromium (III)	0	0		0	73.659	85.6	822	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	99.8	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	182	
Total Copper	0	0		0	8.898	9.27	89.0	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	14,396	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.496	3.15	30.2	Chem Translator of 0.792 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	8.69	Chem Translator of 0.85 applied
Total Nickel	0	0		0	51.676	51.8	497	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	47.9	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	125	
Total Zinc	0	0		0	117.388	119	1,143	Chem Translator of 0.986 applied

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

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	
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	53.7	
Total Arsenic	0	0		0	10	10.0	96.0	
Total Barium	0	0		0	2,400	2,400	23,033	
Total Boron	0	0		0	3,100	3,100	29,752	
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	2,879	
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	9,597	
Total Mercury	0	0		0	0.050	0.05	0.48	
Total Nickel	0	0		0	610	610	5,854	
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	2.3	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 93.029 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
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	

☑ ***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 Aluminum	40.3	63.1	1,610	2,522	4,025	µg/L	1,610	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 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	Discharge Conc < TQL
Total Antimony	N/A	N/A	Discharge Conc < TQL
Total Arsenic	N/A	N/A	Discharge Conc < TQL
Total Barium	23,033	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	15,356	µg/L	Discharge Conc < TQL
Total Cadmium	2.58	µg/L	Discharge Conc < TQL
Total Chromium (III)	822	µg/L	Discharge Conc < TQL
Hexavalent Chromium	34.7	µg/L	Discharge Conc < TQL
Total Cobalt	182	µg/L	Discharge Conc < TQL
Total Copper	0.029	mg/L	Discharge Conc < TQL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	2,879	µg/L	Discharge Conc < TQL
Total Iron	14,396	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	30.2	µg/L	Discharge Conc < TQL
Total Manganese	9,597	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	0.48	µg/L	Discharge Conc < TQL
Total Nickel	497	µg/L	Discharge Conc < TQL
Total Phenols (Phenolics) (PWS)		µg/L	PWS Not Applicable
Total Selenium	47.9	µg/L	Discharge Conc < TQL
Total Silver	7.77	µg/L	Discharge Conc < TQL
Total Thallium	2.3	µg/L	Discharge Conc < TQL
Total Zinc	0.25	mg/L	Discharge Conc < TQL

Combined Flow, 001 and 002, both to Maiden Creek, TMS:

Facility: **RAWA** NPDES Permit No.: **PA0051781** Outfall No.: **001**

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

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
3.26	92.8	7						

					0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L											
	Chloride (PWS)	mg/L											
	Bromide	mg/L											
	Sulfate (PWS)	mg/L											
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L		851.2			0.507						
	Total Antimony	µg/L											
	Total Arsenic	µg/L											
	Total Barium	µg/L											
	Total Beryllium	µg/L											
	Total Boron	µg/L											
	Total Cadmium	µg/L											
	Total Chromium (III)	µg/L											
	Hexavalent Chromium	µg/L											
	Total Cobalt	µg/L											
	Total Copper	mg/L											
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L		110									
	Total Lead	µg/L											
	Total Manganese	µg/L		506.1			1.077						
	Total Mercury	µg/L											

Instructions | Discharge | *Stream*

CLEAR FORM | CALCULATE

○ 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	001985	0.34	255	216			Yes
End of Reach 1	001985	0	250	216.1			Yes

***Q*$_{7-10}$**

Location	RMI	LFY (cfs/mi²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	0.34	0.185	39.9									100	7		
End of Reach 1	0	0.185													

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.272 Analysis Hardness (mg/l): 97.717 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Aluminum	0	0		0	750	750	2,365	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	

☑ ***CFC*** CCT (min): 202.426 PMF: 1 Analysis Hardness (mg/l): 99.192 Analysis pH: 7.00

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

No. Samples/Month: 4

Pollutants	*Mass Limits*		*Concentration Limits*				Governing WQBEL	WQBEL Basis	Comments
	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units			
Total Aluminum	41.5	65.0	1,527	2,391	3,816	µg/L	1,527	AFC	Discharge Conc ≥ 50% WQBEL (RP)

Combined Flow, 001 and 002, both to Maiden Creek, TRC:

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

39.9	= Q stream (cfs)	0.5	= CV Daily
3.26	= Q discharge (MGD)	0.5	= CV Hourly
30	= no. samples	0.272	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	1	= CFC_Partial Mix Factor
0	= Chlorine Demand of Discharge	15	= AFC_Criteria Compliance Time (min)
0.5	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)
0	= % Factor of Safety (FOS)		=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 0.705	1.3.2.iii	WLA cfc = 2.472
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.263	5.1d	LTA_cfc = 1.437

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.324	AFC
		INST MAX LIMIT (mg/l) = 1.058	

WLA afc	**(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...** **...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)**
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	**(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...** **...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)**
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	**1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)**

Outfall 002)

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

39.9	= Q stream (cfs)	0.5	= CV Daily
0.26	= Q discharge (MGD)	0.5	= CV Hourly
30	= no. samples	0.224	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	1	= CFC_Partial Mix Factor
0	= Chlorine Demand of Discharge	15	= AFC_Criteria Compliance Time (min)
0.5	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)
0	= % Factor of Safety (FOS)		=Decay Coefficient (K)

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 7.107	1.3.2.iii	WLA cfc = 30.862
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 2.648	5.1d	LTA_cfc = 17.942

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500	BAT/BPJ
		INST MAX LIMIT (mg/l) = 1.635	

WLA afc	**(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...** **...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)**
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	**(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...** **...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)**
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	**1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)**

The Partial Mix Factors in above model are taken from the TMS output pages.

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Toxics Management Spreadsheet
Version 1.4, May 2025

Discharge Information

Instructions | Discharge | Stream

Facility: **RAWA** NPDES Permit No.: **PA0051781** Outfall No.: **002**

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

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
0.26	79	7						

					0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		175									
	Chloride (PWS)	mg/L		25.5									
	Bromide	mg/L	<	0.12									
	Sulfate (PWS)	mg/L		46.7									
	Fluoride (PWS)	mg/L		0.6									
Group 2	Total Aluminum	µg/L		560									
	Total Antimony	µg/L	<	0.3									
	Total Arsenic	µg/L	<	1									
	Total Barium	µg/L		18									
	Total Beryllium	µg/L	<	1									
	Total Boron	µg/L	<	200									
	Total Cadmium	µg/L	<	0.2									
	Total Chromium (III)	µg/L		0.6									
	Hexavalent Chromium	µg/L	<	0.25									
	Total Cobalt	µg/L	<	0.3									
	Total Copper	mg/L		0.01									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L		21									
	Dissolved Iron	µg/L		20									
	Total Iron	µg/L		250									
	Total Lead	µg/L		17									
	Total Manganese	µg/L		50									
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L	<	1									
	Total Phenols (Phenolics) (PWS)	µg/L	<	2									
	Total Selenium	µg/L	<	1									
	Total Silver	µg/L	<	0.4									
	Total Thallium	µg/L	<	0.3									
	Total Zinc	mg/L		0.03									
	Total Molybdenum	µg/L	<	3									
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

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Toxics Management Spreadsheet
Version 1.4, May 2025

Stream / Surface Water Information

RAWA, NPDES Permit No. PA0051781, Outfall 002

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Maiden Creek**

No. Reaches to Model: **1**

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

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	001985	0.3	253	216			Yes
End of Reach 1	001985	0	250	216.1			Yes

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

Location	RMI	LFY (cfs/mi²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	0.3	0.185	39.9									100	7		
End of Reach 1	0	0.185	39.9												

Q_h

Location	RMI	LFY (cfs/mi²)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	0.3														
End of Reach 1	0														

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Toxics Management Spreadsheet
Version 1.4, May 2025

Model Results

RAWA, NPDES Permit No. PA0051781, Outfall 002

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | (•) All | ( ) Inputs | ( ) Results | ( ) Limits

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.224 Analysis Hardness (mg/l): 99.096 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Fluoride (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	17,420	
Total Antimony	0	0		0	1,100	1,100	25,549	
Total Arsenic	0	0		0	340	340	7,897	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	487,747	
Total Boron	0	0		0	8,100	8,100	188,131	
Total Cadmium	0	0		0	1.996	2.11	49.1	Chem Translator of 0.944 applied
Total Chromium (III)	0	0		0	565.541	1,790	41,567	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	378	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	2,206	
Total Copper	0	0		0	13.325	13.9	322	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	63.946	80.7	1,874	Chem Translator of 0.792 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	38.3	Chem Translator of 0.85 applied
Total Nickel	0	0		0	464.652	466	10,814	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	3.167	3.73	86.5	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	1,510	
Total Zinc	0	0		0	116.282	119	2,762	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): ###### PMF: 1 Analysis Hardness (mg/l): 99.79 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
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	22,044	
Total Arsenic	0	0		0	150	150	15,030	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	410,818	
Total Boron	0	0		0	1,600	1,600	160,319	
Total Cadmium	0	0		0	0.246	0.27	27.1	Chem Translator of 0.909 applied
Total Chromium (III)	0	0		0	73.987	86.0	8,620	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	1,042	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	1,904	
Total Copper	0	0		0	8.940	9.31	933	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	150,299	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.511	3.17	318	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	90.8	Chem Translator of 0.85 applied
Total Nickel	0	0		0	51.914	52.1	5,217	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	500	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	1,303	
Total Zinc	0	0		0	117.929	120	11,984	Chem Translator of 0.986 applied

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

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	
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	561	
Total Arsenic	0	0		0	10	10.0	1,002	
Total Barium	0	0		0	2,400	2,400	240,479	
Total Boron	0	0		0	3,100	3,100	310,618	
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	30,060	
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	100,199	
Total Mercury	0	0		0	0.050	0.05	5.01	
Total Nickel	0	0		0	610	610	61,122	
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	24.0	
Total Zinc	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 (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
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	

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

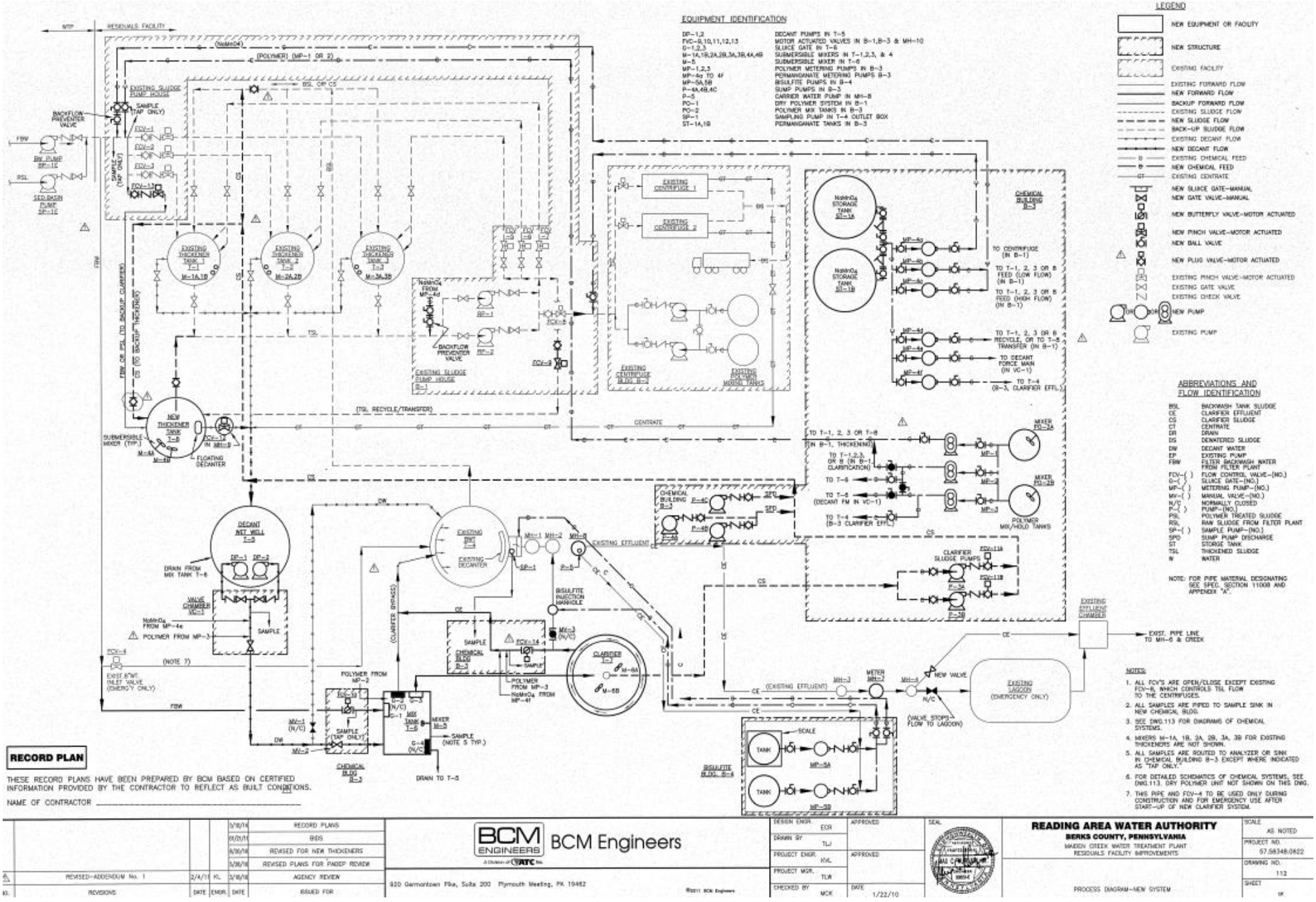
No. Samples/Month: 4

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

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

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

Pollutants	Governing WQBEL	Units	Comments
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	11,165	µg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	N/A	N/A	Discharge Conc < TQL
Total Arsenic	N/A	N/A	Discharge Conc < TQL
Total Barium	240,479	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	120,584	µg/L	Discharge Conc < TQL
Total Cadmium	27.1	µg/L	Discharge Conc < TQL
Total Chromium (III)	8,620	µg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	243	µg/L	Discharge Conc < TQL
Total Cobalt	1,414	µg/L	Discharge Conc < TQL
Total Copper	0.21	mg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	30,060	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	150,299	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	318	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	100,199	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	5.01	µg/L	Discharge Conc < TQL
Total Nickel	5,217	µg/L	Discharge Conc < TQL
Total Phenols (Phenolics) (PWS)		µg/L	Discharge Conc < TQL
Total Selenium	500	µg/L	Discharge Conc < TQL
Total Silver	55.5	µg/L	Discharge Conc < TQL
Total Thallium	24.0	µg/L	Discharge Conc < TQL
Total Zinc	1.77	mg/L	Discharge Conc ≤ 10% WQBEL
Total Molybdenum	N/A	N/A	No WQS


EQUIPMENT IDENTIFICATION
LEGEND
ABBREVIATIONS AND FLOW IDENTIFICATION
NOTES:
1. ALL FCV'S ARE OPEN/CLOSE EXCEPT EXISTING FCV-6, WHICH CONTROLS TSL FLOW TO THE CENTRIFUGES.
2. ALL SAMPLES ARE PIPED TO SAMPLE SINK IN NEW CHEMICAL BLDG.
3. SEE DWG.113 FOR DIAGRAMS OF CHEMICAL SYSTEMS.
4. MIXERS M-1A, 1B, 2A, 2B, 3A, 3B FOR EXISTING THICKENERS ARE NOT SHOWN.
5. ALL SAMPLES ARE ROUTED TO ANALYZER OR SINK IN CHEMICAL BUILDING B-3 EXCEPT WHERE INDICATED AS "TAP ONLY."
6. FOR DETAILED SCHEMATICS OF CHEMICAL SYSTEMS, SEE DWG.113. DRY POLYMER UNIT NOT SHOWN ON THIS DWG.
7. THIS PIPE AND FCV-4 TO BE USED ONLY DURING CONSTRUCTION AND FOR EMERGENCY USE AFTER START-UP OF NEW CLARIFIER SYSTEM.
RECORD PLAN
THESE RECORD PLANS HAVE BEEN PREPARED BY BCM BASED ON CERTIFIED INFORMATION PROVIDED BY THE CONTRACTOR TO REFLECT AS BUILT CONDITIONS.
NAME OF CONTRACTOR
BCM Engineers
READING AREA WATER AUTHORITY
BERKS COUNTY, PENNSYLVANIA
MAIDEN CREEK WATER TREATMENT PLANT
RESIDUALS FACILITY IMPROVEMENTS
PROCESS DIAGRAM-NEW SYSTEM