pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0046302**
Facility Type	**Industrial**	APS ID	**274796**
Major / Minor	**Minor**	Authorization ID	**1409638**

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

Applicant and Facility Information

Applicant Name	**PA American Water Company**	Facility Name	**PA American Water Hershey**
Applicant Address	200 East Canal Street	Facility Address	200 Canal Street
	Hummelstown, PA 17036		Hummelstown, PA 17036-9225
Applicant Contact	Cody Cutler	Facility Contact	Cody Cutler
Applicant Phone	(717) 663-9933	Facility Phone	(717) 533-2148
Client ID	87712	Site ID	258391
SIC Code	4941	Municipality	South Hanover Township
SIC Description	Trans. & Utilities - Water Supply	County	Dauphin
Date Application Received	September 8, 2022	EPA Waived?	Yes
Date Application Accepted	September 20, 2022	If No, Reason	

Purpose of Application: Renewal to discharge treated industrial wastewater

Summary of Review

1.0 General Discussion

This factsheet supports the renewal of an existing NPDES permit for the discharge of treated industrial wastewater from Hershey GC Smith water treatment plant. PA American water owns and operates the water treatment plant which is located in Hummelstown, Dauphin County. Water is withdrawn from Swatara and Manada Creeks to produce potable water. Ferric Chloride, Polymer, Sodium Permanganate, Sodium Hydroxide (Caustic Soda), Powdered Carbon and Chlorine are the chemical used for the water purification process. Potable water from the plant is supplied to residential, commercial, and industrial customers in Derry Township, Palmyra Borough, South Hanover Township, North and South Londonderry Townships, North and South Annville Township and Annville. The facility discharges an average of about 0.20 mgd of filter backwash and rinse cycles, sludge blowdowns from sedimentation clarifiers, process analyzer and sample pump wastewater through either outfall 001 to Swatara Creek or outfall 002 to Manada Creek. There are 5 filters at the site and are backwashed every 120hours. Treatment of the wastewater is provided in two settling lagoons. The lagoons have valves which are closed when they received backwash to allow a minimum of 3 hours of settling prior to a discharge. De-Chlorination is provided if needed. Flow is divided between lagoon 1 and lagoon 2 in the ratio of 1 to 3. Lagoon 2 receives most of the flow and discharge to outfall 002. Outfall 001 is used when lagoon 2 is being cleaned. An additional outfall (003) discharges to Manada Creek that serves as an emergency outlet from a clearwell. Lagoons are periodically cleaned to remove sludge for land application by a certified hauler. Both Swatara and Manada Creeks are classified for warm water and migratory fishes. This facility is not covered under ELG but has technology-based treatment requirements developed by the Department. See details at technology limits section of the report. The existing permit was issued on August 30, 2018 with effective date of September 1, 2018 and expiration date of August 31, 2023. The permittee submitted a timely NPDES permit renewal application to the Department and has been operating under the conditions in the existing permit

Approve	Deny	Signatures	Date
X		*J. Pascal Kwedza* J. Pascal Kwedza, P.E. / Environmental Engineer	November 21, 2023
X		*Maria D. Bebenek for* Daniel W. Martin, P.E. / Environmental Engineer Manager	December 7, 2023
X		*Maria D. Bebenek* Maria D. Bebenek, P.E. / Program Manager	December 7, 2023

Summary of Review

pending action on the permit renewal. A topographical map showing the discharge location is presented in attachment A and process flow diagram is presented in attachment F.

1.1 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.

1.2 Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.2
Latitude	40º 18' 15"	Longitude	-76º 40' 7"
Quad Name		Quad Code	
Wastewater Description:	IW Process Effluent without ELG, Water Treatment Effluent		
Receiving Waters	Swatara Creek (WWF, MF)	Stream Code	09361
NHD Com ID	56400575	RMI	15.42
Drainage Area	481	Yield (cfs/mi^2)	
Q_{7-10} Flow (cfs)	66.7	Q_{7-10} Basis	USGS Gage Station
Elevation (ft)		Slope (ft/ft)	
Watershed No.	7-D	Chapter 93 Class.	WWF, MF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Not Assessed		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	

Background/Ambient Data		Data Source
pH (SU)		
Temperature (°F)		
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake	Veolia Water PA		
PWS Waters	Swatara Creek	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	5.2

Changes Since Last Permit Issuance: None

1.2.1 Water Supply Intake:

The closest water supply intake located downstream from the discharge is the Veolia Water PA on Swatara Creek in Hummelstown Borough, Dauphin County. The distance downstream from the discharges to the intake is approximately 5.2 miles. The discharge is not expected to have an impact on the intake.

1.3 Discharge, Receiving Waters and Water Supply Information

Outfall No.	002	Design Flow (MGD)	.2
Latitude	40º 18' 19"	Longitude	-76º 40' 10"
Quad Name		Quad Code	
Wastewater Description:	IW Process Effluent without ELG, Water Treatment Effluent		
Receiving Waters	Manada Creek (WWF, MF)	Stream Code	09546
NHD Com ID	56400575	RMI	0.10
Drainage Area	32	Yield (cfs/mi^2)	
Q_{7-10} Flow (cfs)	4.48	Q_{7-10} Basis	USGS Gage Station
Elevation (ft)		Slope (ft/ft)	
Watershed No.	7-D	Chapter 93 Class.	WWF, MF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status			
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	

Background/Ambient Data		Data Source
pH (SU)		
Temperature (°F)		
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake	Veolia Water PA		
PWS Waters	Swatara Creek	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	

Changes Since Last Permit Issuance: None

1.3.1 Water Supply Intake:

The closest water supply intake located downstream from the discharge is the Veolia Water PA on Swatara Creek in Hummelstown Borough, Dauphin County. The distance downstream from the discharges to the intake is approximately 5.3 miles. The discharge is not expected to have an impact on the intake.

1.4 Discharge, Receiving Waters and Water Supply Information

Outfall No.	003	Design Flow (MGD)	0
Latitude	40º 18' 36"	Longitude	-76º 40' 18"
Quad Name		Quad Code	
Wastewater Description:	IW Process Effluent without ELG, Water Treatment Effluent		
Receiving Waters	Manada Creek (WWF, MF)	Stream Code	09546
NHD Com ID	56400279	RMI	
Drainage Area		Yield (cfs/mi^2)	
Q_{7-10} Flow (cfs)		Q_{7-10} Basis	
Elevation (ft)		Slope (ft/ft)	
Watershed No.	7-D	Chapter 93 Class.	WWF, MF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Pathogens		
Source(s) of Impairment	Source Unknown		
TMDL Status		Name	

Background/Ambient Data		Data Source
pH (SU)		
Temperature (°F)		
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake			
PWS Waters		Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	

Changes Since Last Permit Issuance: None

1.5 Existing Limitation and Monitoring Requirements.

1.5.1 Outfall 001

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
TSS	Report	Report	XXX	30	60	75	1/week	24-Hr Composite
Nitrate-Nitrite	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	24-Hr Composite
Total Nitrogen	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
TKN	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	24-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	24-Hr Composite
Total Aluminum	Report	Report	XXX	4.0	8.0	10	1/week	24-Hr Composite
Total Iron	Report	Report	XXX	2.0	4.0	5	1/week	24-Hr Composite
Total Manganese	Report	Report	XXX	1.0	2.0	2.5	1/week	24-Hr Composite

1.5.2 Outfall 002,

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.37	XXX	1.22	1/day	Grab
TSS	Report	Report	XXX	30	60	75	1/week	24-Hr Composite
Nitrate-Nitrite	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	24-Hr Composite
Total Nitrogen	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
TKN	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	24-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	24-Hr Composite
Total Aluminum	Report	Report	XXX	4.0	8.0	10	1/week	24-Hr Composite
Total Iron	Report	Report	XXX	2.0	4.0	5	1/week	24-Hr Composite
Total Manganese	Report	Report	XXX	1.0	2.0	2.5	1/week	24-Hr Composite

2.0 Compliance History

2.1 DMR Data for Outfall 001 (from October 1, 2022 to September 30, 2023)

Parameter	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22
Nitrate-Nitrite (mg/L) Annual Average										1.70		
Total Nitrogen (mg/L) Annual Average										3.24		
TKN (mg/L) Annual Average										1.55		
Total Phosphorus (mg/L) Annual Average										0.12		

2.2 DMR Data for Outfall 002 (from October 1, 2022 to September 30, 2023)

Parameter	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22
Flow (MGD) Average Monthly	0.184	0.191	0.183	0.189	0.18	0.194	0.189	0.177	0.179	0.179	0.182	0.204
Flow (MGD) Daily Maximum	0.243	0.291	0.206	0.225	0.184	0.334	0.367	0.198	0.182	0.184	0.327	0.345
pH (S.U.) Daily Minimum	7.44	7.47	7.37	7.38	7.29	7.24	7.22	7.18	7.21	7.17	7.21	7.39
pH (S.U.) Daily Maximum	7.95	7.83	7.78	7.79	7.96	7.53	7.52	7.58	7.57	7.72	7.68	7.76
TRC (mg/L) Average Monthly	< 0.07	< 0.07	< 0.05	< 0.05	0.06	0.06	0.08	0.08	0.10	0.14	0.13	0.12
TRC (mg/L) Instantaneous Maximum	0.15	0.30	0.15	0.11	0.18	0.15	0.30	0.14	0.18	0.35	0.35	0.34
TSS (lbs/day) Average Monthly	< 10.0	< 10	< 8	< 6	< 7	< 8	< 6	< 9	< 7	< 6	< 7	< 9
TSS (lbs/day) Daily Maximum	16	17	11	7	8	< 8	< 6	18	8	8	< 11	11
TSS (mg/L) Average Monthly	< 7.0	< 6	< 5	< 4	< 4	< 4	< 4	< 6	< 4	< 4	< 4	< 4
TSS (mg/L) Daily Maximum	11.0	11	6.8	4.4	5.6	4	4	12	5.2	5	< 4	4
Nitrate-Nitrite (mg/L) Annual Average										3.97		
Total Nitrogen (mg/L) Annual Average										3.97		

TKN (mg/L) Annual Average										< 0.50		
Total Phosphorus (mg/L) Annual Average										< 0.10		
Total Aluminum (lbs/day) Average Monthly	< 0.1	< 0.2	< 0.2	< 0.2	< 0.1	< 0.2	< 0.1	< 0.1	< 0.1	< 0.2	< 0.2	< 0.2
Total Aluminum (lbs/day) Daily Maximum	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.1	< 0.2	< 0.2	< 0.2	< 0.3	< 0.3
Total Aluminum (mg/L) Average Monthly	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.10	< 0.1
Total Aluminum (mg/L) Daily Maximum	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1
Total Iron (lbs/day) Average Monthly	3.0	2	2	1	1	1	1	2	1	0.9	1	1
Total Iron (lbs/day) Daily Maximum	6.0	3	2	1	2	2	1	7	1	1	2	3
Total Iron (mg/L) Average Monthly	2.1	1.3	1.0	0.7	0.8	1.0	0.8	1.7	0.7	0.6	0.7	0.5
Total Iron (mg/L) Daily Maximum	3.9	2.3	1.5	0.879	1.67	1.18	0.878	4.67	0.91	0.745	1.56	0.95
Total Manganese (lbs/day) Average Monthly	0.3	0.2	0.4	0.3	0.3	0.4	0.2	0.1	0.1	0.09	0.3	0.3
Total Manganese (lbs/day) Daily Maximum	0.3	0.3	0.4	0.4	0.3	0.6	0.2	0.2	0.1	0.1	0.5	0.7
Total Manganese (mg/L) Average Monthly	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1
Total Manganese (mg/L) Daily Maximum	0.181	0.226	0.286	0.283	0.216	0.307	0.146	0.121	0.087	0.093	0.287	0.243

2.3 Effluent Violations for Outfall 002, from: November 1, 2022 To: September 30, 2023

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Total Iron	09/30/23	Avg Mo	2.1	mg/L	2.0	mg/L

2.4 Summary of DMRs:

Discharge Monitoring Reports (DMRs) review for the facility for the last 12 months of operation presented on the table 2.2 indicate permit limits have been met most of the time. One permit violation was noted on DMRs for Total Iron in September 2023 presented on table 2.3 during the period reviewed. The violation appear to be a onetime occurrence. Outfall 001 was used once during the past 12 months.

2.5 Summary of Inspections:

The facility was inspected a couple of times during the past permit cycle. Inspection reports review for the facility during the period indicate permit limits have been met satisfactorily. The facility has good compliance record.

3.0 Development of Effluent Limitations

Outfall No.	001	**Design Flow (MGD)**	.2
Latitude	40º 18' 15.00"	**Longitude**	-76º 40' 7.00"
Wastewater Description:	IW Process Effluent without ELG, Water Treatment Effluent		

Outfall No.	002	**Design Flow (MGD)**	.2
Latitude	40º 18' 19.00"	**Longitude**	-76º 40' 10.00"
Wastewater Description:	IW Process Effluent without ELG, Water Treatment Effluent		

Outfall No.	003	**Design Flow (MGD)**	0
Latitude	40º 18' 36.00"	**Longitude**	-76º 40' 18.00"
Wastewater Description:	IW Process Effluent without ELG, Water Treatment Effluent		

3.1 Basis for Effluent Limitations

In general, the Clean Water Act (CWA) requires that the effluent limits for a particular pollutant be the more stringent of either technology-based limits or water quality-based limits. Technology-based limits are set according to the level of treatment that is achievable using available technology. A water quality-based effluent limit(WQBEL) is designed to ensure that the water quality standards applicable to a waterbody are being met and may be more stringent than technology-based effluent limits.

3.2 Technology-Based Limitations

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

Technology-based (BAT) effluent limits for water treatment plant wastewater discharges are presented in the Department's June 1989 Guidance document entitled, “Technology Based Controls for Discharges from Water Treatment Plants” as follows:

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

3.3 Water Quality-Based Limitations

3.3.1 Receiving Stream

The receiving streams are Manada Creek and Swatara Creek. According to 25 PA § 93.9, Manada Creek and Swatara Creek are protected for Warm Water Fishes (WWF) and Migratory Fishes (MF). They located in Drainage List N and State Watershed 7-D. Manada Creek and Swatara Creek have been assigned stream codes 09546 and 09361 respectively. According to eMapPA, the segment of Manada Creek receiving the discharge is impaired not supporting recreational use due to pathogens and aquatic life due to habitat modification and siltation. The segment of Swatara Creek receiving the discharge is attaining its uses

3.3.2 Streamflows

Streamflows for the water quality analysis were determined by correlating with the yield of USGS gauging station No. 01573560 on Swatara Creek near Hershey. The Q_{7-10} and drainage area at the gage is 67.7ft3/s and 483mi^2 respectively. The resulting yields are as follows:

- Q_{7-10} = (67.7ft^3/s)/483 mi^2 = 0.14ft^3/s/ mi^2

- $Q_{30-10} / Q_{7-10} = 0.89$
- $Q_{1-10} / Q_{7-10} = 1.23$

The drainage area at discharge to Swatara Creek(outfall 001) is determined to be 481 mi^2

The Q_{7-10} at discharge (Outfall 001) = 481 mi^2 x 0.14 $ft^3/s/mi^2$ = 66.7 ft^3/s.

The drainage area at discharge to Manada Creek (Outfall 002) is determined to be 32 mi^2

The Q_{7-10} at discharge (Outfall 002) = 32 mi^2 x 0.14 $ft^3/s/mi^2$ = 4.48 ft^3/s.

3.3.3 The following input data were used for Toxics Management Spreadsheet (TMS) model:

* Discharge pH = 7.4 (DMR median July – Sept.)
* Stream pH = 7.0 (Default)
* Discharge Hardness = 130 mg/l
* Stream Hardness = 100 mg/l

3.3.4 Toxics

A reasonable potential (RP) analysis was done for pollutant Groups 1 and 2 submitted with the application. All pollutants that were presented in the application sampling data and all pollutants in the existing permit were entered into DEP's TMS to calculate WQBELs. The calculated results from the TMS are presented in attachments B and C. The results indicate discharge levels are well below DEP's target quantitation limits and the calculated WQBELs, therefore, no monitoring or limitation was recommended for both outfalls 001 and 002. The existing technology quality-based limits for Total Aluminum, Total Iron, and Total Manganese will remain the permit with mass load reporting requirement. The recommended limitations follow the logic presented in DEPs SOP, to establish limits in the permit where the maximum reported concentration exceeds 50% of the WQBEL, or for non-conservative pollutants to establish monitoring requirements where the maximum reported concentration is between 25% - 50% of the WQBEL, or to establish monitoring requirements for conservative pollutants where the maximum reported concentration is between 10% - 50% of the WQBEL.

3.3.5 Total Suspended Solids (TSS):

There is no water quality criteria for TSS. The existing BPT TBEL referenced in section 3.2 will remain in the permit with mass load reporting requirement.

3.3.6 Instantaneous Maximum:

The existing IMAX limitations in the permit determined using multiplier of 2.5 will be carried forward.

3.3.7 Chesapeake Bay Strategy:

In 2003, EPA established state-wide cap loads for Total Nitrogen and Total Phosphorus for Pennsylvania that are needed to ensure compliance with new water quality standards enacted to restore the water quality of the Chesapeake Bay. DEP released Pennsylvania's Chesapeake Bay Tributary Strategy (CBTS) in January of 2005 to guide Pennsylvania's efforts to meet those cap loads and made revisions to the Strategy in 2006-2007 following a stakeholder process. Industrial discharges have been prioritized by Central Office based on their delivered TN and TP loadings to the Bay. Significant industrial wastewater dischargers are facilities that discharge more than 75 lbs/day of TN or 25 lbs/day of TP on an average annual basis and the rest are classified as non-significant dischargers. DEP developed Chesapeake Bay IW monitoring plan for all industrial facilities that discharge to the Chesapeake Bay. This facility is classified as a non-significant discharger with little or no potential to introduce nutrients to the receiving stream but has been monitoring TP and the TN series (nitrate-nitrite, TKN) and will continue monitoring them annually to collect data for future Chesapeake Bay modelling.

3.3.8 Total Residual Chlorine (TRC)

The attached TRC model results presented in attachments D and E utilize the equations and calculations as presented in the Department's May 1, 2003 Implementation Guidance for Total Residual Chlorine (TRC) (ID No. 391-2000-015) for developing chlorine limitations. The Guidance references Chapter 92a, Section 92a.48 (b) which establishes a standard BAT limit of 0.5 mg/l unless a facility-specific BAT has been developed. The attached results indicate that a technology limit of 0.5 mg/l and 1.6mg/l IMAX would be needed to prevent toxicity concerns for both outfalls 001 and 002. This is

consistent with the existing permit for outfall 001 but the existing monthly permit limit of 0.37mg/l and IMAX of 1.22mg/l for outfall 002 are more stringent and will remain in the permit. TRC will be monitored for outfall 003 if there is an emergency discharge.

3.3.9 Cleaning of Lagoons

The lagoons are cleaned periodically, and the solids removed. Conditions and reporting requirements prior and during lagoons cleaning can be found in PART C of the permit.

4.0 Other Requirements

4.1 Anti-backsliding

Not applicable to this permit

4.2 Anti-Degradation (93.4)

The effluent limits for this discharge have been developed to ensure that existing instream water uses and the level of water quality necessary to protect the existing uses are maintained and protected. No High-Quality Waters are impacted by this discharge. No Exceptional Value Waters are impacted by this discharge.

4.3 Class A Wild Trout Fisheries

No Class A Wild Trout Fisheries are impacted by this discharge.

4.4 303d Listed Streams

The discharge is not located on a 303d listed stream segment for Swatara Creek. The discharge is located on a 303d listed segment for Manada Creek. Manada Creek is not supporting recreational use due to pathogens and is impaired for aquatic life due to habitat modification and siltation. This is a category 5 impairment which does not warrant any action at this time.

4.5 Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality. The permittee is responsible for conducting the monitoring and for reporting results on Discharge Monitoring Reports (DMRs).

4.6 Effluent Monitoring

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Permittees have the option of taking more frequent samples than are required under the permit. These samples can be used for averaging if they are conducted using EPA-approved test methods (generally found in 40 CFR 136) and if the Method Detection Limits are less than the effluent limits. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

5.0 Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (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) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	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	0.5	XXX	1.6	1/day	Grab
TSS	Report	Report	XXX	30	60	75	1/week	24-Hr Composite
Nitrate-Nitrite	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	24-Hr Composite
Total Nitrogen	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
TKN	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	24-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	24-Hr Composite
Total Aluminum	Report	Report	XXX	4.0	8.0	10	1/week	24-Hr Composite
Total Iron	Report	Report	XXX	2.0	4.0	5	1/week	24-Hr Composite
Total Manganese	Report	Report	XXX	1.0	2.0	2.5	1/week	24-Hr Composite

Compliance Sampling Location: At Outfall 001

5.1 Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (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) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.37	XXX	1.22	1/day	Grab
TSS	Report	Report	XXX	30	60	75	1/week	24-Hr Composite
Nitrate-Nitrite	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	24-Hr Composite
Total Nitrogen	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
TKN	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	24-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	24-Hr Composite
Total Aluminum	Report	Report	XXX	4.0	8.0	10	1/week	24-Hr Composite
Total Iron	Report	Report	XXX	2.0	4.0	5	1/week	24-Hr Composite
Total Manganese	Report	Report	XXX	1.0	2.0	2.5	1/week	24-Hr Composite

Compliance Sampling Location: At Outfall 002

5.2 Proposed Effluent Limitations and Monitoring Requirements

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

Outfall 003, Effective Period: Permit Effective Date through Permit Expiration Date.

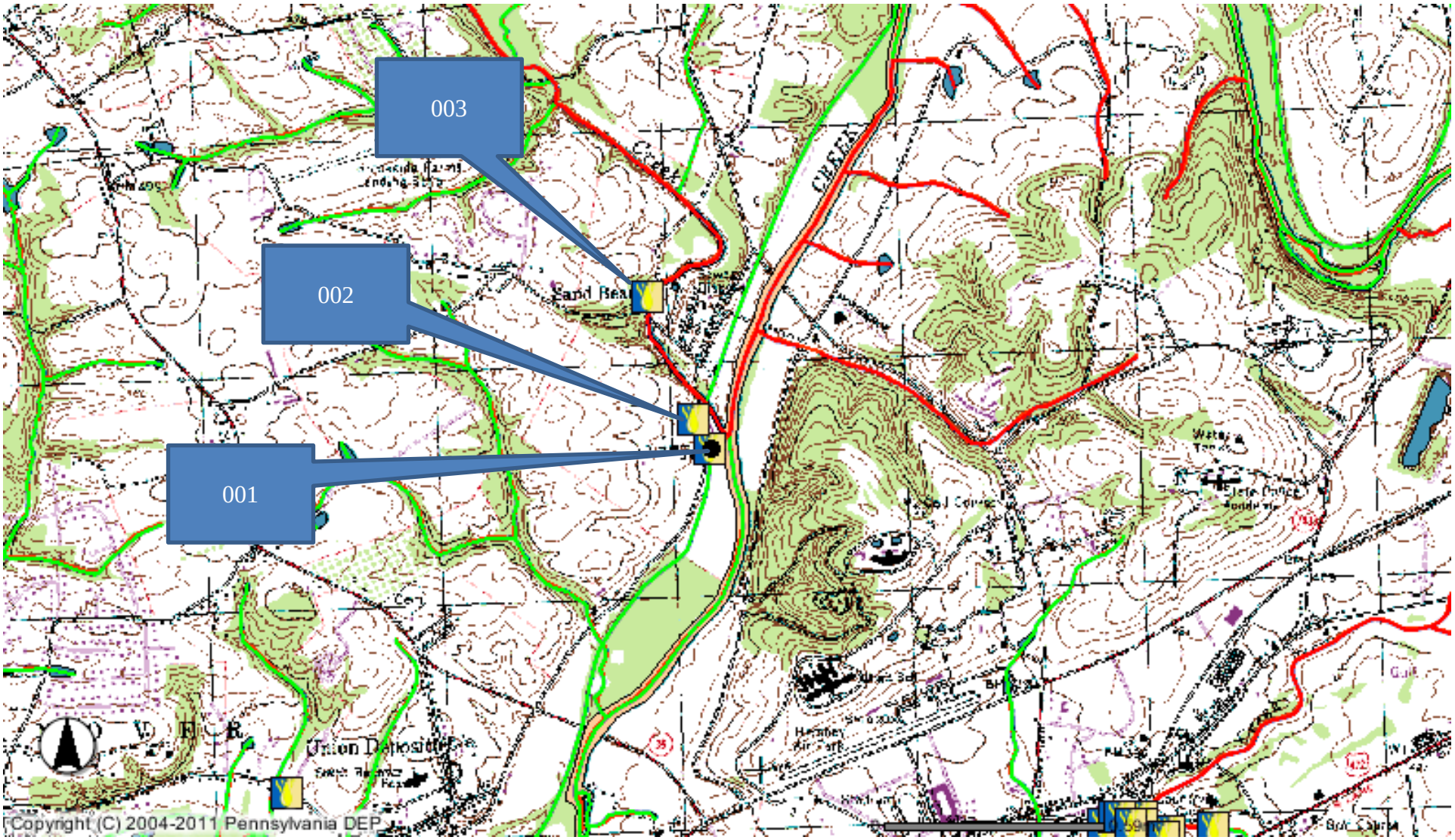
Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	XXX	Report Daily Max	XXX	XXX	XXX	XXX	1/discharge	Estimate
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/discharge	Grab
TRC	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/discharge	Grab

Compliance Sampling Location: At outfall 003

6.0 Tools and References Used to Develop Permit	
☐	WQM for Windows Model (see Attachment)
☒	Toxics Management Spreadsheet (see Attachment **B&C)**
☒	TRC Model Spreadsheet (see Attachment **D&E**)
☐	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.
☐	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: Establishing effluent limitation for individual industrial permit
☐	Other:

7. ATTACHMENTS

A. Topographical Map



B. Toxic Management Spreadsheet Results for Outfall 001

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Discharge Information

Instructions | Discharge | Stream

Facility: **PA American Water Co** NPDES Permit No.: **PA0046302** Outfall No.: **001**

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

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
0.2	130	7.44						

					0 if left blank		*0.5 if left blank*		*0 if left blank*			*1 if left blank*	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		263									
	Chloride (PWS)	mg/L		74.4									
	Bromide	mg/L	<	0.2									
	Sulfate (PWS)	mg/L		22.1									
	Fluoride (PWS)	mg/L	<	0.08									
Group 2	Total Aluminum	µg/L	<	0.007									
	Total Antimony	µg/L	<	0.0004									
	Total Arsenic	µg/L	<	0.001									
	Total Barium	µg/L		0.04									
	Total Beryllium	µg/L	<	0.0004									
	Total Boron	µg/L	<	0.06									
	Total Cadmium	µg/L	<	0.0001									
	Total Chromium (III)	µg/L		0.76									
	Hexavalent Chromium	µg/L		0.001									
	Total Cobalt	µg/L	<	0.001									
	Total Copper	mg/L		0.004									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L	<	0.005									
	Dissolved Iron	µg/L		0.012									
	Total Iron	µg/L		0.636									
	Total Lead	µg/L	<	0.001									
	Total Manganese	µg/L		0.106									
	Total Mercury	µg/L	<	0.0002									
	Total Nickel	µg/L		0.003									
	Total Phenols (Phenolics) (PWS)	µg/L	<	0.005									
	Total Selenium	µg/L	<	0.002									
	Total Silver	µg/L	<	0.0002									
	Total Thallium	µg/L	<	0.0004									
	Total Zinc	mg/L	<	0.004									
	Total Molybdenum	µg/L		0.002									
	Acrolein		<										

Stream / Surface Water Information

PA American Water Co, NPDES Permit No. PA0046302, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Swatara Creek**

No. Reaches to Model: 1

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

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi^2)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	009361	15.42	330	481			Yes
End of Reach 1	009361	14.6	318	505			Yes

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

Location	RMI	LFY (cfs/mi^2)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	15.42	0.14										100	7		
End of Reach 1	14.6	0.14													

Q_h

Location	RMI	LFY (cfs/mi^2)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	15.42														
End of Reach 1	14.6														

Model Results

PA American Water Co, NPDES Permit No. PA0046302, Outfall 001

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

☑ ***Hydrodynamics***

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

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
15.42	67.34		67.34	0.309	0.003	1.007	123.401	122.574	0.545	0.092	388.898
14.6	70.70		70.7								

Q_h

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
15.42	294.37		294.37	0.309	0.003	1.924	123.401	64.15	1.241	0.04	148.287
14.6	307.172		307.17								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.196 Analysis Hardness (mg/l): 100.69 Analysis pH: 7.01

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	32,808	
Total Antimony	0	0		0	1,100	1,100	48,119	
Total Arsenic	0	0		0	340	340	14,873	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	918,635	
Total Boron	0	0		0	8,100	8,100	354,331	
Total Cadmium	0	0		0	2.027	2.15	94.0	Chem Translator of 0.944 applied
Total Chromium (III)	0	0		0	572.962	1,813	79,316	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	713	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	4,156	
Total Copper	0	0		0	13.526	14.1	616	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	65.064	82.4	3,603	Chem Translator of 0.79 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	72.0	Chem Translator of 0.85 applied
Total Nickel	0	0		0	470.951	472	20,643	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	3.255	3.83	168	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	2,843	
Total Zinc	0	0		0	117.861	121	5,272	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): ###### PMF: 1 Analysis Hardness (mg/l): 100.14 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	48,102	
Total Arsenic	0	0		0	150	150	32,797	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	896,453	
Total Boron	0	0		0	1,600	1,600	349,835	
Total Cadmium	0	0		0	0.246	0.27	59.2	Chem Translator of 0.909 applied
Total Chromium (III)	0	0		0	74.198	86.3	18,864	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	2,273	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	4,154	
Total Copper	0	0		0	8.966	9.34	2,042	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	327,971	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.520	3.19	697	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	198	Chem Translator of 0.85 applied
Total Nickel	0	0		0	52.067	52.2	11,419	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	1,091	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	2,842	
Total Zinc	0	0		0	118.276	120	26,228	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	1,224	
Total Arsenic	0	0		0	10	10.0	2,186	
Total Barium	0	0		0	2,400	2,400	524,753	
Total Boron	0	0		0	3,100	3,100	677,806	
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	65,594	
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	218,647	
Total Mercury	0	0		0	0.050	0.05	10.9	
Total Nickel	0	0		0	610	610	133,375	
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	52.5	
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

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

☑ ***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 Aluminum	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	524,753	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	227,112	µg/L	Discharge Conc < TQL
Total Cadmium	59.2	µg/L	Discharge Conc < TQL
Total Chromium (III)	18,864	µg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	457	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cobalt	2,664	µg/L	Discharge Conc < TQL
Total Copper	0.4	mg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	65,594	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	327,971	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	697	µg/L	Discharge Conc < TQL
Total Manganese	218,647	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	10.9	µg/L	Discharge Conc < TQL
Total Nickel	11,419	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	Discharge Conc < TQL
Total Selenium	1,091	µg/L	Discharge Conc < TQL
Total Silver	107	µg/L	Discharge Conc < TQL
Total Thallium	52.5	µg/L	Discharge Conc < TQL
Total Zinc	3.38	mg/L	Discharge Conc < TQL
Total Molybdenum	N/A	N/A	No WQS

C. Toxic Management Spreadsheet Results for Outfall 002

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Discharge Information

Instructions | Discharge | Stream

Facility: **PA American Water Co** NPDES Permit No.: **PA0046302** Outfall No.: **002**

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

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
0.2	130	7.44						

	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		263									
	Chloride (PWS)	mg/L		74.4									
	Bromide	mg/L	<	0.2									
	Sulfate (PWS)	mg/L		22.1									
	Fluoride (PWS)	mg/L	<	0.08									
Group 2	Total Aluminum	µg/L	<	0.007									
	Total Antimony	µg/L	<	0.0004									
	Total Arsenic	µg/L	<	0.001									
	Total Barium	µg/L		0.04									
	Total Beryllium	µg/L	<	0.0004									
	Total Boron	µg/L	<	0.06									
	Total Cadmium	µg/L	<	0.0001									
	Total Chromium (III)	µg/L		0.76									
	Hexavalent Chromium	µg/L		0.001									
	Total Cobalt	µg/L	<	0.001									
	Total Copper	mg/L		0.004									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L	<	0.005									
	Dissolved Iron	µg/L		0.012									
	Total Iron	µg/L		0.636									
	Total Lead	µg/L	<	0.001									
	Total Manganese	µg/L		0.106									
	Total Mercury	µg/L	<	0.0002									
	Total Nickel	µg/L		0.003									
	Total Phenols (Phenolics) (PWS)	µg/L	<	0.005									
	Total Selenium	µg/L	<	0.002									
	Total Silver	µg/L	<	0.0002									
	Total Thallium	µg/L	<	0.0004									
	Total Zinc	mg/L	<	0.004									
	Total Molybdenum	µg/L		0.002									
	Acrolein	µg/L	<										

Stream / Surface Water Information

PA American Water Co, NPDES Permit No. PA0046302, Outfall 002

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Manada 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	009546	0.1	340	32			Yes
End of Reach 1	009546	0.01	331	39.1			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	0.1	0.14										100	7		
End of Reach 1	0.01	0.14													

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	0.1														
End of Reach 1	0.01														

Model Results

PA American Water Co, NPDES Permit No. PA0046302, Outfall 002

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

☑ ***Hydrodynamics***

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

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
0.1	4.48		4.48	0.309	0.019	0.695	26.176	37.651	0.263	0.021	10.3
0.01	5.47		5.474								

Q_h

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
0.1	27.56		27.56	0.309	0.019	1.509	26.176	17.349	0.706	0.008	3.601
0.01	32.83		32.83								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 10.300 PMF: 1 Analysis Hardness (mg/l): 101.94 Analysis pH: 7.02

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	11,610	
Total Antimony	0	0		0	1,100	1,100	17,028	
Total Arsenic	0	0		0	340	340	5,263	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	325,072	
Total Boron	0	0		0	8,100	8,100	125,385	
Total Cadmium	0	0		0	2.052	2.18	33.7	Chem Translator of 0.943 applied
Total Chromium (III)	0	0		0	578.791	1,832	28,353	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	252	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	1,471	
Total Copper	0	0		0	13.684	14.3	221	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	65.945	83.7	1,295	Chem Translator of 0.788 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	25.5	Chem Translator of 0.85 applied
Total Nickel	0	0		0	475.901	477	7,382	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	3.325	3.91	60.5	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	1,006	
Total Zinc	0	0		0	119.102	122	1,885	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 10.300 PMF: 1 Analysis Hardness (mg/l): 101.94 Analysis pH: 7.02

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	3,406	
Total Arsenic	0	0		0	150	150	2,322	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	63,467	
Total Boron	0	0		0	1,600	1,600	24,767	
Total Cadmium	0	0		0	0.249	0.27	4.25	Chem Translator of 0.908 applied
Total Chromium (III)	0	0		0	75.289	87.5	1,355	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	161	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	294	
Total Copper	0	0		0	9.104	9.48	147	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	23,219	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.570	3.26	50.5	Chem Translator of 0.788 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	14.0	Chem Translator of 0.85 applied
Total Nickel	0	0		0	52.858	53.0	821	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	77.2	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	201	
Total Zinc	0	0		0	120.076	122	1,885	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): 10.300 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	86.7	
Total Arsenic	0	0		0	10	10.0	155	
Total Barium	0	0		0	2,400	2,400	37,151	
Total Boron	0	0		0	3,100	3,100	47,987	
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	4,644	
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	15,480	
Total Mercury	0	0		0	0.050	0.05	0.77	
Total Nickel	0	0		0	610	610	9,443	
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	3.72	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 3.601 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	Discharge Conc < TQL
Total Aluminum	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	37,151	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	24,767	µg/L	Discharge Conc < TQL
Total Cadmium	4.25	µg/L	Discharge Conc < TQL
Total Chromium (III)	1,355	µg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	161	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cobalt	294	µg/L	Discharge Conc < TQL
Total Copper	0.14	mg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	4,644	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	23,219	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	50.5	µg/L	Discharge Conc < TQL
Total Manganese	15,480	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	0.77	µg/L	Discharge Conc < TQL
Total Nickel	821	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	Discharge Conc < TQL
Total Selenium	77.2	µg/L	Discharge Conc < TQL

Total Silver	38.8	µg/L	Discharge Conc < TQL
Total Thallium	3.72	µg/L	Discharge Conc < TQL
Total Zinc	1.21	mg/L	Discharge Conc < TQL
Total Molybdenum	N/A	N/A	No WQS

D. TRC Calculation Results for Outfall 001

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

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

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 69.448	1.3.2.iii	WLA cfc = 67.699
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 25.878	5.1d	LTA_cfc = 39.357

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)**

E. TRC Calculation Results for Outfall 002

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

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

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 4.638	1.3.2.iii	WLA cfc = 4.514
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 1.728	5.1d	LTA_cfc = 2.624

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)**

F. Process Flow Diagram