

Application Type Renewal
Facility Type Industrial
Major / Minor Minor

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

Application No. PA0264687
APS ID 1046850
Authorization ID 1367984

Applicant and Facility Information

Applicant Name	<u>PA American Water Company</u>	Facility Name	<u>PA American Water Ellwood</u>
Applicant Address	<u>852 Wesley Drive</u> <u>Mechanicsburg, PA 17055-4436</u>	Facility Address	<u>325 Industrial Park Drive</u> <u>New Beaver, PA 16157</u>
Applicant Contact	<u>Kristen Snyder</u> <u>(724) 822-3466</u> <u>(Kristen.snyder@amwater.com)</u>	Facility Contact	<u>Eric Blanchard (Production Supervisor)</u> <u>(724) 201-5904</u> <u>(eric.blanchard@amwater.com)</u>
Applicant Phone	<u>(724) 822-3466</u> <u>(Kristen.snyder@amwater.com)</u>	Facility Phone	<u>(724) 201-5904</u> <u>(eric.blanchard@amwater.com)</u>
Client ID	<u>87712</u>	Site ID	<u>262835</u>
SIC Code	<u>4941</u>	Municipality	<u>New Beaver Borough</u>
SIC Description	<u>Trans. & Utilities - Water Supply</u>	County	<u>Lawrence</u>
Date Application Received	<u>August 27, 2021</u>	EPA Waived?	<u>Yes</u>
Date Application Accepted	<u>Sept 7, 2021</u>	If No, Reason	<u></u>
Purpose of Application	<u>Renewal of a NPDES Permit for an existing discharge of industrial wastewater and stormwater.</u>		

Summary of Review

This facility is an 8 MGD capacity water treatment plant discharging clarified filter backwash and sludge dewatering wastewater.

Monitoring frequencies for TSS, total aluminum, total iron and total manganese were reduced from 1/week to 2/month in the proposed renewed draft permit as requested. This is being granted due to consistent effluent quality easily meeting the technology-based limits and is comparable to requirements for some similarly sized facilities in the region.

There are currently 2 violations open in EFACTS for this client (4/5/2024). All of these violations are at other facilities owned by the permittee.

Public Participation

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

Approve	Deny	Signatures	Date
X		Adam J. Pesek Adam J. Pesek, E.I.T. / Project Manager	April 5, 2024
X		Vacant / Environmental Engineer Manager	Okay to Draft JCD 4/8/2024

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	<u>001</u>	Design Flow (MGD)	<u>0.694</u>
Latitude	<u>40° 51' 18.02"</u>	Longitude	<u>-80° 19' 19.74"</u>
Quad Name	<u>Beaver Falls</u>	Quad Code	<u>01203</u>
Wastewater Description: <u>IW Process Effluent without ELG</u>			
Receiving Waters	<u>Beaver River (WWF)</u>	Stream Code	<u>33953</u>
NHD Com ID	<u>123918288</u>	RMI	<u>12.35</u>
Drainage Area	<u>2500 (at discharge)</u>	Yield (cfs/mi ²)	<u>0.2</u>
	<u>839 (entire Conno. Creek basin)</u>		<u>USGS# 03105500 '86-'11,</u>
Q ₇₋₁₀ Flow (cfs)	<u>67 (added from Conno. Creek)</u>	Q ₇₋₁₀ Basis	<u>03106000 '86-'11</u>
Elevation (ft)	<u>740</u>	Slope (ft/ft)	<u></u>
Watershed No.	<u>20-B</u>	Chapter 93 Class.	<u>WWF</u>
Existing Use	<u></u>	Existing Use Qualifier	<u></u>
Exceptions to Use	<u></u>	Exceptions to Criteria	<u></u>
Assessment Status	<u>Impaired</u>		
Cause(s) of Impairment	<u>CAUSE UNKNOWN, POLYCHLORINATED BIPHENYLS (PCBS)</u>		
Source(s) of Impairment	<u>SOURCE UNKNOWN</u>		
TMDL Status	<u></u>	Name	<u></u>
Background/Ambient Data		Data Source	
pH (SU)	<u>7.74</u>		<u>Table 2.1 submitted with PEL request</u>
Temperature (°C)	<u>25</u>		<u>Default (WWF)</u>
Hardness (mg/L)	<u>140</u>		<u>Table 2.1 submitted with PEL request</u>
Other:	<u>See Model</u>		<u>Table 2.1 submitted with PEL request</u>
Nearest Downstream Public Water Supply Intake	<u>Beaver Falls Municipal Authority – Eastvale Intake</u>		
PWS Waters	<u>Beaver River</u>	Flow at Intake (cfs)	<u></u>
PWS RMI	<u>3.5</u>	Distance from Outfall (mi)	<u>9.0</u>

Changes Since Last Permit Issuance: There are 3 stormwater discharges listed for the facility. All are certified as "No Exposure" and discharge to an unnamed tributary(s) to the Beaver River. Therefore no limits or monitoring will be required in the renewed permit.

Other Comments: Design flow used for evaluating limits is based on the simultaneous discharge from filter backwash, decant from centrifuges, and gravity thickener effluent.

Treatment Facility Summary				
Treatment Facility Name: PA American Water Ellwood New Beaver Plant				
WQM Permit No.		Issuance Date		
3716201		5/10/2017		
Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Industrial	Primary	Sedimentation	Dechlorination	0.809
Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
3.2688			Centrifuges	Beneficial Reuse

Changes Since Last Permit Issuance: N/A

Other Comments: N/A

Compliance History	
Summary of DMRs:	There have been no effluent violations since this facility became operational.
Summary of Inspections:	The last Compliance Evaluation Inspection (CEI) was conducted on 9/9/2022. No violations or major issues were noted.

Other Comments: N/A

Compliance History

DMR Data for Outfall 001 (from March 1, 2023 to February 29, 2024)

Parameter	FEB-24	JAN-24	DEC-23	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23	MAR-23
Flow (MGD) Average Monthly	0.228	0.2043	0.2185	0.2253	0.2344	0.2249	0.1763	0.1987	0.2	0.1848	0.2113	0.1982
Flow (MGD) Daily Maximum	0.388	0.295	0.294	0.421	0.363	0.462	0.248	0.289	0.488	0.219	0.314	0.3058
pH (S.U.) Minimum	7.2	7.2	7.3	7.3	7.5	7.5	7.4	7.5	7.5	7.4	7.3	7.3
pH (S.U.) Maximum	7.6	7.4	7.4	7.6	7.7	7.6	7.7	7.7	7.7	7.6	7.5	7.5
TRC (mg/L) Average Monthly	0.18	0.23	0.20	0.20	0.10	0.12	0.12	0.09	0.10	0.12	0.13	0.16
TRC (mg/L) Daily Maximum	0.27	0.27	0.24	0.27	0.13	0.15	0.27	0.14	0.13	0.13	0.16	0.20
TRC (mg/L) Instantaneous Maximum	0.27	0.27	0.24	0.27	0.13	0.15	0.27	0.14	0.13	0.13	0.16	0.20
TSS (lbs/day) Average Monthly	9	< 5	< 6	< 4	< 6	8	< 3	< 4	< 4	< 3	< 4	< 3.0
TSS (lbs/day) Daily Maximum	11	7	9	6	13	12	4	5	< 5	< 4	5	5
TSS (mg/L) Average Monthly	4.3	< 4.0	< 3.0	< 2.4	< 3.0	3.5	< 2.2	< 2.3	< 2.0	< 2.0	< 2.0	< 2.6
TSS (mg/L) Daily Maximum	5.0	5.0	5.0	4.0	6.0	4.0	3.0	3.0	2.0	2.0	2.0	4.0
TSS (mg/L) Instantaneous Maximum	5.0	5.0	5.0	4.0	6.0	4.0	3.0	3.0	2.0	2.0	2.0	4.0
Total Aluminum (lbs/day) Average Monthly	1	0.7	0.9	0.6	0.8	0.6	0.5	0.5	0.5	0.6	0.6	0.6
Total Aluminum (lbs/day) Daily Maximum	2	1	1	1	1	0.8	0.8	0.7	1	0.8	0.8	1
Total Aluminum (mg/L) Average Monthly	0.55	0.46	0.45	0.40	0.35	0.30	0.30	0.28	0.25	0.36	0.30	0.44

**NPDES Permit Fact Sheet
PA American Water Ellwood**

NPDES Permit No. PA0264687

Total Aluminum (mg/L) Daily Maximum	0.7	0.7	0.80	0.7	0.5	0.4	0.4	0.3	0.4	0.50	0.3	0.8
Total Aluminum (mg/L) Instantaneous Maximum	0.70	0.70	0.80	0.70	0.50	0.40	0.40	0.30	0.40	0.50	0.30	0.80
Total Iron (lbs/day) Average Monthly	< 0.1	< 0.07	< 0.1	< 0.08	< 0.1	< 0.1	< 0.08	< 0.09	< 0.1	< 0.08	< 0.1	< 0.07
Total Iron (lbs/day) Daily Maximum	< 0.1	< 0.09	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.09	< 0.1	< 0.08
Total Iron (mg/L) Average Monthly	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Iron (mg/L) Daily Maximum	0.06	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Iron (mg/L) Instantaneous Maximum	0.06	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Manganese (lbs/day) Average Monthly	0.4	0.5	0.3	0.2	0.4	0.2	0.1	0.07	0.2	0.3	0.2	0.10
Total Manganese (lbs/day) Daily Maximum	0.7	0.6	0.7	0.7	0.9	0.4	0.3	0.1	0.3	1	0.5	0.30
Total Manganese (mg/L) Average Monthly	0.21	0.41	0.16	0.13	0.19	0.08	0.08	0.04	0.12	0.22	0.09	0.11
Total Manganese (mg/L) Daily Maximum	0.32	0.66	0.35	0.35	0.39	0.22	0.17	0.08	0.16	0.73	0.18	0.19
Total Manganese (mg/L) Instantaneous Maximum	0.32	0.66	0.35	0.35	0.39	0.22	0.17	0.08	0.16	0.73	0.18	0.19

Development of Effluent Limitations

Outfall No. 001 Design Flow (MGD) 0.694
 Latitude 40° 51' 18.02" Longitude -80° 19' 19.74"
 Wastewater Description: IW Process Effluent without ELG

Technology-Based Limitations

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

Parameter	Limit (mg/l)	SBC	Federal Regulation	State Regulation
Total Suspended Solids	30	Average Monthly		362-2183-003
Total Suspended Solids	40	Daily Maximum		362-2183-003
Aluminum	4.0	Average Monthly		362-2183-003
Aluminum	8.0	Daily Maximum		362-2183-003
Manganese	1.0	Average Monthly		362-2183-003
Manganese	2.0	Daily Maximum		362-2183-003
Total Iron	2.0	Average Monthly		362-2183-003
Total Iron	4.0	Daily Maximum		362-2183-003
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)
Total Residual Chlorine	1.0	Daily Maximum		362-2183-003
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)

Comments: 362-2183-003 References the Department’s technical guidance document entitled “Technology-based Control Requirements for Water Treatment Plant Wastes.” The limits are BPT (Best Practical Control Technology) and are not based on actual regulation.

Water Quality-Based Limitations

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

Parameter	Limit (mg/l)	SBC	Model
Total Residual Chlorine	1.2	IMAX	TRC Evaluation Spreadsheet

Comments: The Toxics Management Spreadsheet determined limits for total aluminum that were less stringent than the BPT limits.

Best Professional Judgment (BPJ) Limitations

Comments: See “Technology-Based Limitations” section above for BPT limits.

Other Considerations

The receiving stream is impaired due to PCBs. There are no known historical presence of PCB at this site, and there would be no known reason to suspect contribution of PCBs at this new facility (< 8 years old).

Anti-Backsliding

The WQBELs for total aluminum in the current permit are being removed and replaced with BPT limits in the proposed renewed permit. The previous WQBELs were calculated using the treatment plant design flow, while current modeling used the max daily flow which is significantly less than the treatment plant design flow.

Backsliding is permissible under 402(o)(1) of the CWA based on compliance with 303(d)(4)(A) – Nonattainment Water. Compliance with 303(d)(4)(A) is being met because the receiving stream – Clarion River, is not impaired for total aluminum, previous limits were not based on a TMDL and the backsliding of the effluent limits is consistent with PADEP's antidegradation policy located in 25 Pa. Code Chapter 93.4(a). The revised total aluminum effluent limits are meeting state antidegradation requirements because state water quality standards for total aluminum in 25 Pa. Code Chapter 93.7 will be achieved, as was demonstrated in the Toxics Management Spreadsheet that was done for this permit renewal.

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	Average Monthly	Daily Maximum	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/week	Grab
TRC	XXX	XXX	0.5	1.0	XXX	1.2	1/week	Grab
TSS	Report	Report	30.0	60.0	XXX	75.0	2/month	Grab
Total Aluminum	Report	Report	4.0	8.0	XXX	10.0	2/month	Grab
Total Iron	Report	Report	2.0	4.0	XXX	5.0	2/month	Grab
Total Manganese	Report	Report	1.0	2.0	XXX	2.5	2/month	Grab

Compliance Sampling Location: Outfall 001 (prior to mixing with any other waters)

Other Comments:



Discharge Information

Instructions Discharge Stream

Facility: PA American Water Ellwood NPDES Permit No.: PA0264687 Outfall No.: 001

Evaluation Type: Major Sewage / Industrial Waste Wastewater Description: WTP wastewater

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
0.694	165	7.4						

Discharge Pollutant	Units	Max Discharge Conc	0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
			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	347								
	Chloride (PWS)	mg/L	80								
	Bromide	mg/L	< 0.1								
	Sulfate (PWS)	mg/L	86.8								
	Fluoride (PWS)	mg/L	0.1								
Group 2	Total Aluminum	µg/L	4000								
	Total Antimony	µg/L	< 0.5								
	Total Arsenic	µg/L	1.1								
	Total Barium	µg/L	56.7								
	Total Beryllium	µg/L	< 0.5								
	Total Boron	µg/L	90								
	Total Cadmium	µg/L	< 0.1								
	Total Chromium (III)	µg/L	0.7								
	Hexavalent Chromium	µg/L	0.9								
	Total Cobalt	µg/L	0.2								
	Total Copper	µg/L	3.3								
	Free Cyanide	µg/L									
	Total Cyanide	µg/L	3								
	Dissolved Iron	µg/L	< 20								
	Total Iron	µg/L	2000								
	Total Lead	µg/L	< 0.2								
	Total Manganese	µg/L	1000								
	Total Mercury	µg/L	< 0.1								
	Total Nickel	µg/L	2								
	Total Phenols (Phenolics) (PWS)	µg/L	8								
	Total Selenium	µg/L	< 0.5								
	Total Silver	µg/L	< 0.1								
	Total Thallium	µg/L	< 0.1								
Total Zinc	µg/L	3.1									
Total Molybdenum	µg/L	< 10									
Acrolein	µg/L	<									
Acrylamide	µg/L	<									
Acrylonitrile	µg/L	<									
Benzene	µg/L	<									
Bromoform	µg/L	<									

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



Stream / Surface Water Information

PA American Water Ellwood, NPDES Permit No. PA0264687, Outfall 001

Instructions Discharge Stream

Receiving Surface Water Name: Beaver River No. Reaches to Model: 1

- Statewide Criteria
- Great Lakes Criteria
- ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi ²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	033953	12.36	740	2500			Yes
End of Reach 1	033953	3.5	737	3110		1	Yes

Q₇₋₁₀

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	12.36	0.2	450									140	7.74		
End of Reach 1	3.5	0.2	640									140	7.74		

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	12.36														
End of Reach 1	3.5														



Model Results

PA American Water Ellwood, NPDES Permit No. PA0264687, Outfall 001

Instructions

Results

RETURN TO INPUTS

SAVE AS PDF

PRINT

All

Inputs

Results

Limits

Hydrodynamics

Q₇₋₁₀

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)
12.36	450		450	1.074	0.00006	1.219	413.524	339.265	0.895	0.605	21646.635
3.5	640	1.547	638.453								

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)
12.36	1548.45		1548.45	1.074	0.00006	2.098	413.524	197.116	1.786	0.303	9619.026
3.5	2106.639	1.547	2105.09								

Wasteload Allocations

AFC

CCT (min):

PMF:

Analysis Hardness (mg/l):

Analysis pH:

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	9,025	
Total Antimony	0	0		0	1,100	1,100	13,237	
Total Arsenic	0	0		0	340	340	4,091	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	252,703	
Total Boron	0	0		0	8,100	8,100	97,471	
Total Cadmium	0	0		0	2.833	3.05	36.7	Chem Translator of 0.929 applied
Total Chromium (III)	0	0		0	759.649	2,404	28,928	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	196	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	1,143	
Total Copper	0	0		0	18.710	19.5	235	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	94.455	128	1,536	Chem Translator of 0.74 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	19.8	Chem Translator of 0.85 applied
Total Nickel	0	0		0	630.233	631	7,599	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	5.885	6.92	83.3	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	782	
Total Zinc	0	0		0	157.794	161	1,942	Chem Translator of 0.978 applied

CFC CCT (min): PMF: Analysis Hardness (mg/l): Analysis pH:

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	17,037	
Total Arsenic	0	0		0	150	150	11,616	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	317,513	
Total Boron	0	0		0	1,600	1,600	123,908	
Total Cadmium	0	0		0	0.311	0.35	26.9	Chem Translator of 0.895 applied
Total Chromium (III)	0	0		0	97.814	114	8,808	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	805	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	1,471	
Total Copper	0	0		0	11.963	12.5	965	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	630,215	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	3.632	4.9	379	Chem Translator of 0.742 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	70.2	Chem Translator of 0.85 applied
Total Nickel	0	0		0	69.267	69.5	5,380	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	386	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	1,007	
Total Zinc	0	0		0	157.418	160	12,364	Chem Translator of 0.986 applied

THH CCT (min): THH PMF: Analysis Hardness (mg/l): Analysis pH: PWS PMF:

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
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Total Dissolved Solids (PWS)	0	0	0	500,000	500,000	60,295,776	WQC applied at RMI 3.5 with a design stream flow of 640 cfs
Chloride (PWS)	0	0	0	250,000	250,000	30,147,888	WQC applied at RMI 3.5 with a design stream flow of 640 cfs
Sulfate (PWS)	0	0	0	250,000	250,000	30,147,888	WQC applied at RMI 3.5 with a design stream flow of 640 cfs
Fluoride (PWS)	0	0	0	2,000	2,000	241,183	WQC applied at RMI 3.5 with a design stream flow of 640 cfs
Total Aluminum	0	0	0	N/A	N/A	N/A	
Total Antimony	0	0	0	5.6	5.6	434	
Total Arsenic	0	0	0	10	10.0	774	
Total Barium	0	0	0	2,400	2,400	185,862	
Total Boron	0	0	0	3,100	3,100	240,071	
Total Cadmium	0	0	0	N/A	N/A	N/A	
Total Chromium (III)	0	0	0	N/A	N/A	N/A	
Hexavalent Chromium	0	0	0	N/A	N/A	N/A	
Total Cobalt	0	0	0	N/A	N/A	N/A	
Total Copper	0	0	0	N/A	N/A	N/A	
Dissolved Iron	0	0	0	300	300	23,233	
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	77,442	
Total Mercury	0	0	0	0.050	0.05	3.87	
Total Nickel	0	0	0	610	610	47,240	
Total Phenols (Phenolics) (PWS)	0	0	0	5	5.0	603	WQC applied at RMI 3.5 with a design stream flow of 640 cfs
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	18.6	
Total Zinc	0	0	0	N/A	N/A	N/A	

CRL CCT (min): PMF: Analysis Hardness (mg/l): Analysis pH:

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	0	N/A	N/A	N/A	
Chloride (PWS)	0	0	0	0	N/A	N/A	N/A	
Sulfate (PWS)	0	0	0	0	N/A	N/A	N/A	
Fluoride (PWS)	0	0	0	0	N/A	N/A	N/A	
Total Aluminum	0	0	0	0	N/A	N/A	N/A	
Total Antimony	0	0	0	0	N/A	N/A	N/A	
Total Arsenic	0	0	0	0	N/A	N/A	N/A	
Total Barium	0	0	0	0	N/A	N/A	N/A	
Total Boron	0	0	0	0	N/A	N/A	N/A	
Total Cadmium	0	0	0	0	N/A	N/A	N/A	
Total Chromium (III)	0	0	0	0	N/A	N/A	N/A	
Hexavalent Chromium	0	0	0	0	N/A	N/A	N/A	
Total Cobalt	0	0	0	0	N/A	N/A	N/A	
Total Copper	0	0	0	0	N/A	N/A	N/A	
Dissolved Iron	0	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			
Total Aluminum	33.5	52.2	5,785	9,025	14,462	µg/L	5,785	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)	60,296	mg/L	Discharge Conc ≤ 10% WQBEL
Chloride (PWS)	30,148	mg/L	Discharge Conc ≤ 10% WQBEL
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	30,148	mg/L	Discharge Conc ≤ 10% WQBEL
Fluoride (PWS)	241	mg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	N/A	N/A	Discharge Conc < TQL
Total Arsenic	774	µg/L	Discharge Conc ≤ 10% WQBEL
Total Barium	161,973	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	62,475	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cadmium	23.5	µg/L	Discharge Conc < TQL
Total Chromium (III)	8,808	µg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	126	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cobalt	733	µg/L	Discharge Conc ≤ 10% WQBEL
Total Copper	150	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	23,233	µg/L	Discharge Conc < TQL

Total Iron	630,215	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	379	µg/L	Discharge Conc < TQL
Total Manganese	77,442	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	3.87	µg/L	Discharge Conc < TQL
Total Nickel	4,871	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)	603	µg/L	Discharge Conc ≤ 10% WQBEL
Total Selenium	386	µg/L	Discharge Conc < TQL
Total Silver	53.4	µg/L	Discharge Conc < TQL
Total Thallium	18.6	µg/L	Discharge Conc < TQL
Total Zinc	1,244	µg/L	Discharge Conc ≤ 10% WQBEL
Total Molybdenum	N/A	N/A	No WQS

1A	B	C	D	E	F	G
2	TRC EVALUATION		PA American Water Ellwood			
3	Input appropriate values in B4:B8 and E4:E7					
4	450	= Q stream (cfs)		0.5	= CV Daily	
5	0.694	= Q discharge (MGD)		0.5	= CV Hourly	
6	4	= no. samples		0.026	= AFC_Partial Mix Factor	
7	0.3	= Chlorine Demand of Stream		0.182	= CFC_Partial Mix Factor	
8	0	= Chlorine Demand of Discharge		15	= AFC_Criteria Compliance Time (min)	
9	0.5	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)	
	0	= % Factor of Safety (FOS)		0	= Decay Coefficient (K)	
10	Source	Reference	AFC Calculations		Reference	CFC Calculations
11	TRC	1.3.2.iii	WLA_afc = 3.495		1.3.2.iii	WLA_cfc = 23.735
12	PENTOXSD TRG	5.1a	LTAMULT_afc = 0.373		5.1c	LTAMULT_cfc = 0.581
13	PENTOXSD TRG	5.1b	LTA_afc = 1.302		5.1d	LTA_cfc = 13.799
14						
15	Source	Effluent Limit Calculations				
16	PENTOXSD TRG	5.1f	AML_MULT = 1.720			
17	PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500		BAT/BPJ	
18			INST MAX LIMIT (mg/l) = 1.170			
	WLA_afc	$(.019/e^{-k \cdot AFC_tc}) + [(AFC_Yc \cdot Qs \cdot .019 / Qd \cdot e^{-k \cdot AFC_tc}) \dots + Xd + (AFC_Yc \cdot Qs \cdot Xs / Qd)] \cdot (1 - FOS / 100)$				
	LTAMULT_afc	$EXP((0.5 \cdot LN(cvh^2 + 1)) - 2.326 \cdot LN(cvh^2 + 1)^{0.5})$				
	LTA_afc	wla_afc * LTAMULT_afc				
	WLA_cfc	$(.011/e^{-k \cdot CFC_tc}) + [(CFC_Yc \cdot Qs \cdot .011 / Qd \cdot e^{-k \cdot CFC_tc}) \dots + Xd + (CFC_Yc \cdot Qs \cdot Xs / Qd)] \cdot (1 - FOS / 100)$				
	LTAMULT_cfc	$EXP((0.5 \cdot LN(cvd^2 / no_samples + 1)) - 2.326 \cdot LN(cvd^2 / no_samples + 1)^{0.5})$				
	LTA_cfc	wla_cfc * LTAMULT_cfc				
	AML_MULT	$EXP(2.326 \cdot LN((cvd^2 / no_samples + 1)^{0.5}) - 0.5 \cdot LN(cvd^2 / no_samples + 1))$				
	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)				