pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0103098**
Facility Type	**Industrial**	APS ID	**1011118**
Major / Minor	**Minor**	Authorization ID	**1305160**

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

Applicant and Facility Information

Applicant Name	**Reynolds Water Company**	Facility Name	**Reynolds Water WTP**
Applicant Address	301 Arlington Drive	Facility Address	71 Crestview Drive Extension
	Greenville, PA 16125-8214		Greenville, PA 16125
Applicant Contact	Bradley Gosser	Facility Contact	
Applicant Phone	(724) 646-1144	Facility Phone	
Client ID	209741	Site ID	242295
SIC Code	4941	Municipality	Pymatuning Township
SIC Description	Trans. & Utilities - Water Supply	County	Mercer
Date Application Received	January 31, 2020	EPA Waived?	Yes
Date Application Accepted	February 18, 2020	If No, Reason	

Purpose of Application: Renewal of a NPDES Permit for an existing discharge of treated industrial waste

Summary of Review

This facility is primarily engaged in the production and distribution of potable water for municipal and commercial use.

No changes are being proposed to the discharge quantity and quality as part of this renewal.

This facility has been signed up for and using the eDMR system for reporting since September 2010.

There are currently no open violations in EFACTS for the permittee (10/26/2021).

The plant discharges to a segment of the Shenango River, which is known to contain threatened and endangered mussel species. A summary of threatened and endangered mussel species concerns and considerations is included on Page 8 of this Fact Sheet. Additionally, the draft permit will be forwarded to the US Fish & Wildlife Service.

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 Pesek Adam J. Pesek, E.I.T. / Environmental Engineer	October 26, 2021
X		Justin C. Dickey Justin C. Dickey, P.E. / Environmental Engineer Manager	October 29, 2021

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.066
Latitude	41º 21' 40"	Longitude	-80º 23' 6"
Quad Name	Sharpsville	Quad Code	0802
Wastewater Description:	Filter Backwash		

Receiving Waters	Shenango River	Stream Code	35482
NHD Com ID	130034264	RMI	55.72
Drainage Area	330	Yield (cfs/mi^2)	0.161
Q_{7-10} Flow (cfs)	53.13	Q_{7-10} Basis	USGS #03102850 (1967-2008)
Elevation (ft)	927	Slope (ft/ft)	0.0006
Watershed No.	20-A	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	

Background/Ambient Data		Data Source
pH (SU)	7.4	WQN 913 (geo mean-'00-'15)(June-Sept.)
Temperature (°C)	25	Default (WWF)
Hardness (mg/L)	139.4	WQN 913 (90th %-'00-'15)(June-Sept.)
Other:		

Nearest Downstream Public Water Supply Intake		Aqua PA Shenango Valley WTP	
PWS Waters	Shenango River	Flow at Intake (cfs)	143.8
PWS RMI	28.88	Distance from Outfall (mi)	26.84

Changes Since Last Permit Issuance: The Sharpsville Water Company water supply intake is no longer active.

Other Comments:

Treatment Facility Summary

Treatment Facility Name: Reynolds Water WTP

WQM Permit No.	Issuance Date
4374202	12/24/1974

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Industrial	Physical (Industrial Waste)	Sedimentation	No Disinfection	0.066

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.229		Not Overloaded		

Changes Since Last Permit Issuance:

Other Comments: Treatment consists of a earthen sedimentation pond measuring approx. 128 feet by 118 feet.

Discharge occurs 1/week after settling for 5 days.

Compliance History	
Summary of DMRs:	One effluent violation listed in the last five year. Violation was an exceedance of the TRC loading limit in April 2018.
Summary of Inspections:	Last facility inspection was conducted on 8/24/2021. Inspection report indicated a violation for failure to submit a Lab Accreditation Form with contract lab information and lab registration information for on-site analysis. The report also noted a violation for failure to use the updated electronic version of the Daily Effluent Monitoring Report.

Other Comments:

Compliance History

DMR Data for Outfall 001 (from September 1, 2020 to August 31, 2021)

Parameter	AUG-21	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20
Flow (MGD) Average Monthly	0.064	0.091	0.087	0.065	0.072	0.079	0.071	0.082	0.070	0.100	0.067	0.061
Flow (MGD) Daily Maximum	0.075	0.129	0.096	0.095	0.080	0.099	0.078	0.095	0.083	0.190	0.086	0.076
pH (S.U.) Minimum	7.59	7.50	7.60	7.18	7.43	7.41	7.32	7.31	7.46	7.53	7.40	7.76
pH (S.U.) Maximum	7.74	7.87	7.82	7.61	7.66	7.69	7.52	7.59	7.45	7.76	7.55	7.86
TRC (lbs/day) Average Monthly	0.011	0.022	0.020	0.017	0.008	0.029	0.032	0.042	0.023	0.029	0.016	0.011
TRC (mg/L) Average Monthly	0.02	0.03	0.03	0.03	0.01	0.04	0.05	0.06	0.04	0.03	0.03	0.02
TSS (lbs/day) Average Monthly	2.711	3.336	3.899	3.462	2.774	3.253	3.085	2.982	2.836	1.960	2.673	2.357
TSS (lbs/day) Daily Maximum	3.128	3.795	4.003	3.795	2.836	3.461	3.252	3.128	2.836	2.043	2.844	2.836
TSS (mg/L) Average Monthly	< 5.00	< 5.00	< 5.0	< 5.00	< 5.00	< 5.00	< 5.0	< 5.00	< 5.0	4.0	5.3	< 5.00
TSS (mg/L) Daily Maximum	< 5.00	< 5.00	< 5.0	< 5.00	5.00	< 5.00	< 5.0	< 5.00	5.0	5.0	5.5	< 5.00
Total Aluminum (lbs/day) Average Monthly	0.490	0.595	0.532	0.436	0.417	0.235	0.341	0.128	0.116	0.148	0.312	0.437
Total Aluminum (lbs/day) Daily Maximum	0.570	0.774	0.903	0.461	0.457	0.280	0.529	0.143	0.118	0.185	0.352	0.486
Total Aluminum (mg/L) Average Monthly	0.902	0.871	0.70	0.632	0.750	0.357	0.571	< 0.215	< 0.204	0.284	0.612	0.944
Total Aluminum (mg/L) Daily Maximum	0.912	1.02	1.19	0.655	0.806	0.404	0.906	0.230	0.208	0.296	0.682	1.030
Total Iron (lbs/day) Average Monthly	0.109	0.134	0.156	0.139	0.111	0.130	0.123	0.119	0.113	0.104	0.102	0.094
Total Iron (lbs/day) Daily Maximum	0.125	0.152	0.160	0.152	0.113	0.138	0.130	0.125	0.113	0.125	0.103	0.113

Total Iron (mg/L) Average Monthly	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	0.20	< 0.20	< 0.20	< 0.20	< 0.02	< 0.02
Total Iron (mg/L) Daily Maximum	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	0.20	< 0.20	< 0.02	< 0.20	< 0.02	< 0.20
Total Manganese (lbs/day) Average Monthly	0.067	0.080	0.031	0.046	0.021	0.026	0.035	0.042	0.039	0.033	0.033	0.028
Total Manganese (lbs/day) Daily Maximum	0.079	0.093	0.059	0.055	0.024	0.026	0.060	0.047	0.045	0.034	0.037	0.024
Total Manganese (mg/L) Average Monthly	0.123	0.119	0.041	0.069	0.039	0.041	0.060	0.071	0.069	0.066	0.065	0.063
Total Manganese (mg/L) Daily Maximum	0.127	0.122	0.078	0.088	0.043	0.043	0.103	0.075	0.079	0.082	0.072	0.082

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.066
Latitude 41º 21' 40" **Longitude** -80º 23' 6"
Wastewater Description: Filter Backwash

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. The Department has identified the TSD requirements as the Best Available Treatment (BAT) that, as a minimum, the permittee will be required to meet. Since no federal effluent limitation guidelines (ELGs) have been promulgated, the Department's Best Professional Judgment of BAT, as outlined in the TSD, satisfies the Federal requirements of the 40 CFR 125.3(d) regulations.

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 Calc Spreadsheet

Comments: No WQBELs or monitoring was determined as a result of running the Toxic Management Spreadsheet.

Best Professional Judgment (BPJ) Limitations

Comments: See Tech-Based Limitations section above.

Anti-Backsliding

The TRC mass limit was removed because TRC in not typically expressed in mass units and the concentration limits are technology-based.

Mass limits for other TSS, total aluminum, total iron, and total manganese were relaxed to due to reflect the increased design flow.

Threatened and Endangered Mussel Species Concerns and Considerations

The main segment of the Shenango River from Porter Road near Greenville, Pennsylvania, downstream to the point of inundation by Shenango River Lake near Big Bend, Mercer County, Pennsylvania was designated by the United States Fish and Wildlife Services (USFWS) as "Critical Habitat" for the rabbitsfoot mussel, a federally listed threatened species, and is known to also contain other threatened and endangered mussel species. Due to the discharge to the Shenango River, potential impacts to endangered mussel species were evaluated.

The USFWS has indicated in comment letters on other NPDES permits that in order to protect threatened and endangered mussel species, wastewater discharges containing ammonia-nitrogen (NH_3-N), chloride (Cl^-) and nickel, where mussels or their habitat exist, can be no more than 1.9 mg/l, 78 mg/l, 10 ug/l and 7.3 ug/l, respectively. The calculated site-specific criteria based on WQN Station 913 stream background pH data and default temperature for a WWF (pH of 7.41 and temperature of 25˚C) results in NH3-N criteria of 1.058 mg/l.

A summary of the sampling data for ammonia-nitrogen (NH3-N), chloride (Cl-) and nickel based on three effluent samples and one influent sample at Outfall 001 for the 2020 renewal application is as follows:

PARAMETER	UNITS	1/15/2020	1/20/2020	1/29/2020	Influent 1/15/2020
Outfall 001					
NH_3-N	mg/l	<0.04	<0.04	<0.04	<0.04
Chloride	mg/l	16.8	17.0	15.8	18.9
Nickel	µg/l	0.629	0.596	0.550	0.694

Outfall 001 consists of filter backwash from the water treatment plant operations. As seen from the application sampling above, influent quality from this facility are below levels of concern and the effluent quality is well below levels of concern for endangered mussel protection. There is no reason to expect significant seasonal variation in effluent quality as the industrial process and backwash wastewater treatment remains the same throughout the year and the source water is from Big Run Creek (there is also a backup intake on the Shenango River).

Based on this sampling data, type and frequency of wastewater being discharged, and use potable water from a public water supply, the Department does not believe there has been or will be any measurable impacts at Outfalls 001 due to ammonia-nitrogen, chlorides, total copper, and total nickel. No additional permit requirements are being proposed for this facility at this time due to the discharge to this designated critical habitat.

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

Outfall 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	1/day	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0	XXX	1/week	Grab
TRC	XXX	XXX	XXX	0.5	1.0	1.2	1/week	Grab
TSS	16	Report	XXX	30	60	75	2/month	8-Hr Composite
Total Aluminum	2.2	Report	XXX	4.0	8.0	10	2/month	8-Hr Composite
Total Iron	1.1	Report	XXX	2.0	4.0	5	2/month	8-Hr Composite
Total Manganese	0.55	Report	XXX	1.0	2.0	2.5	2/month	8-Hr Composite

Compliance Sampling Location: Outfall 001 (after disinfection)

Other Comments:

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Reynolds Water WTP** NPDES Permit No.: **PA0103098** Outfall No.: **001**

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

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
0.066	107.66	7.6						

					0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Strea m CV	Fate Coeff	FOS	Criteri a Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		174									
	Chloride (PWS)	mg/L		17									
	Bromide	mg/L		0.029									
	Sulfate (PWS)	mg/L		45.6									
	Fluoride (PWS)	mg/L		13									
Group 2	Total Aluminum	µg/L		210									
	Total Antimony	µg/L	<	0.2									
	Total Arsenic	µg/L	<	1									
	Total Barium	µg/L		17.8									
	Total Beryllium	µg/L	<	0.2									
	Total Boron	µg/L	<	30									
	Total Cadmium	µg/L	<	0.2									
	Total Chromium (III)	µg/L	<	2									
	Hexavalent Chromium	µg/L		0.37									
	Total Cobalt	µg/L	<	0.2									
	Total Copper	µg/L		0.793									
	Free Cyanide	µg/L		5									
	Total Cyanide	µg/L		5									
	Dissolved Iron	µg/L	<	20									
	Total Iron	µg/L		30									
	Total Lead	µg/L	<	0.2									
	Total Manganese	µg/L		92.9									
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L		0.629									
	Total Phenols (Phenolics) (PWS)	µg/L	<	5.6									
	Total Selenium	µg/L	<	1									
	Total Silver	µg/L		0.28									
	Total Thallium	µg/L	<	0.2									
	Total Zinc	µg/L	<	3									
	Total Molybdenum	µg/L		2.9									
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										
	Carbon Tetrachloride	µg/L	<										

Group 3	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)Anthrancene	µg/L	<										
	1,2-Dichlorobenzene	µg/L	<										
	1,3-Dichlorobenzene	µg/L	<										
	1,4-Dichlorobenzene	µg/L	<										
	3,3-Dichlorobenzidine	µg/L	<										
	Diethyl Phthalate	µg/L	<										
	Dimethyl Phthalate	µg/L	<										
	Di-n-Butyl Phthalate	µg/L	<										
	2,4-Dinitrotoluene	µg/L	<										
	2,6-Dinitrotoluene	µg/L	<										

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

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Reynolds Water WTP, NPDES Permit No. PA0103098, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Shenango 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	035482	55.72	927	330			Yes
End of Reach 1	035482	28.88	842	701		0.1	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	55.72	0.161										139.4	7.4		
End of Reach 1	28.88	0.161	143.8									139.4	7.4		

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	55.72														
End of Reach 1	28.88														

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Reynolds Water WTP, NPDES Permit No. PA0103098, 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)
55.72	53.13		53.13	0.102	0.0006	1.	116.896	116.946	0.456	3.6	762.321
28.88	143.80	0.155	143.6453								

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)
55.72	239.30		239.30	0.102	0.0006	1.937	116.896	60.352	1.057	1.551	283.458
28.88	571.308	0.155	571.15								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.140 Analysis Hardness (mg/l): 138.97 Analysis pH: 7.40

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	55,495	
Total Antimony	0	0		0	1,100	1,100	81,393	
Total Arsenic	0	0		0	340	340	25,158	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	1,553,857	
Total Boron	0	0		0	8,100	8,100	599,345	
Total Cadmium	0	0		0	2.773	2.98	221	Chem Translator of 0.93 applied
Total Chromium (III)	0	0		0	746.019	2,361	174,684	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	1,206	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	7,029	
Total Copper	0	0		0	18.325	19.1	1,412	Chem Translator of 0.96 applied

Free Cyanide	0	0		0	22	22.0	1,628	
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	92.234	124	9,185	Chem Translator of 0.743 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	122	Chem Translator of 0.85 applied
Total Nickel	0	0		0	618.555	620	45,861	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	5.666	6.67	493	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	4,810	
Total Zinc	0	0		0	154.866	158	11,717	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 720 PMF: 0.972 Analysis Hardness (mg/l): 139.34 Analysis pH: 7.40

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	111,477	
Total Arsenic	0	0		0	150	150	76,007	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	2,077,518	
Total Boron	0	0		0	1,600	1,600	810,739	
Total Cadmium	0	0		0	0.310	0.35	175	Chem Translator of 0.895 applied
Total Chromium (III)	0	0		0	97.251	113	57,300	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	5,267	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	9,628	
Total Copper	0	0		0	11.891	12.4	6,276	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	5.2	5.2	2,635	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	782,043	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	3.604	4.85	2,459	Chem Translator of 0.743 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	459	Chem Translator of 0.85 applied
Total Nickel	0	0		0	68.856	69.1	34,995	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	2,528	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	6,587	
Total Zinc	0	0		0	156.481	159	80,417	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): 720 THH PMF: 0.972 Analysis Hardness (mg/l): N/A Analysis pH: N/A PWS PMF: 1

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	#########	WQC applied at RMI 28.88 with a design stream flow of 143.8 cfs
Chloride (PWS)	0	0		0	250,000	250,000	#########	WQC applied at RMI 28.88 with a design stream flow of 143.8 cfs
Sulfate (PWS)	0	0		0	250,000	250,000	#########	WQC applied at RMI 28.88 with a design stream flow of 143.8 cfs
Fluoride (PWS)	0	0		0	2,000	2,000	2,818,791	WQC applied at RMI 28.88 with a design stream flow of 143.8 cfs
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	2,838	
Total Arsenic	0	0		0	10	10.0	5,067	
Total Barium	0	0		0	2,400	2,400	1,216,108	
Total Boron	0	0		0	3,100	3,100	1,570,806	
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	
Free Cyanide	0	0		0	4	4.0	2,027	
Dissolved Iron	0	0		0	300	300	152,013	
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	506,712	
Total Mercury	0	0		0	0.050	0.05	25.3	
Total Nickel	0	0		0	610	610	309,094	
Total Phenols (Phenolics) (PWS)	0	0		0	5	5.0	7,047	WQC applied at RMI 28.88 with a design stream flow of 143.8 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	122	
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	
Free Cyanide	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)	704,698	mg/L	Discharge Conc ≤ 10% WQBEL
Chloride (PWS)	352,349	mg/L	Discharge Conc ≤ 10% WQBEL
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	352,349	mg/L	Discharge Conc ≤ 10% WQBEL
Fluoride (PWS)	2,819	mg/L	Discharge Conc ≤ 10% WQBEL
Total Aluminum	35,570	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	995,960	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	384,156	µg/L	Discharge Conc < TQL
Total Cadmium	141	µg/L	Discharge Conc < TQL
Total Chromium (III)	57,300	µg/L	Discharge Conc < TQL
Hexavalent Chromium	773	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cobalt	4,506	µg/L	Discharge Conc < TQL

Total Copper	905	µg/L	Discharge Conc ≤ 10% WQBEL
Free Cyanide	1,043	µg/L	Discharge Conc ≤ 25% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	152,013	µg/L	Discharge Conc < TQL
Total Iron	782,043	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	2,459	µg/L	Discharge Conc < TQL
Total Manganese	506,712	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	25.3	µg/L	Discharge Conc < TQL
Total Nickel	29,395	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)	7,047	µg/L	Discharge Conc ≤ 10% WQBEL
Total Selenium	2,528	µg/L	Discharge Conc < TQL
Total Silver	316	µg/L	Discharge Conc ≤ 10% WQBEL
Total Thallium	122	µg/L	Discharge Conc < TQL
Total Zinc	7,510	µg/L	Discharge Conc < TQL
Total Molybdenum	N/A	N/A	No WQS

1A	B	C	D	E	F	G
2	**TRC EVALUATION**					
3	Input appropriate values in B4:B8 and E4:E7					
4	53.13	= Q stream (cfs)		0.5	= CV Daily	
5	0.066	= Q discharge (MGD)		0.5	= CV Hourly	
6	4	= no. samples		0.14	= AFC_Partial Mix Factor	
7	0.3	= Chlorine Demand of Stream		0.972	= 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 = 23.258		1.3.2.iii	WLA cfc = 157.312
12	PENTOXSD TRG	5.1a	LTAMULT afc = 0.373		5.1c	LTAMULT cfc = 0.581
13	PENTOXSD TRG	5.1b	LTA_afc= 8.667		5.1d	LTA_cfc = 91.454
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*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)**

Reynolds Water WTP
Pymatuning Township, Mercer County
NPDES# PA0103098

Date	pH min	pH max	10^ -pH min	10^ -pH max	Ave (10^pH min & pH max)	-Log (Ave pH)
Jul-19	7.38	7.69	4.17E-08	2.04E-08	3.11E-08	**7.5**
Aug-19	7.38	7.72	4.17E-08	1.91E-08	3.04E-08	**7.5**
Sep-19	7.49	7.81	3.24E-08	1.55E-08	2.39E-08	**7.6**
Jul-20	7.91	8.32	1.23E-08	4.79E-09	8.54E-09	**8.1**
Aug-20	7.75	8.09	1.78E-08	8.13E-09	1.3E-08	**7.9**
Sep-20	7.76	7.86	1.74E-08	1.38E-08	1.56E-08	**7.8**
Jul-21	7.50	7.87	3.16E-08	1.35E-08	2.26E-08	**7.6**
Aug-21	7.59	7.74	2.57E-08	1.82E-08	2.2E-08	**7.7**
Sep-21	7.20	7.68	6.31E-08	2.09E-08	4.2E-08	**7.4**
					Median:	**7.6**