pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0028371**
Facility Type	**Municipal**	APS ID	**1037824**
Major / Minor	**Minor**	Authorization ID	**1353023**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Youngsville Borough**	Facility Name	**Youngsville Borough STP**
Applicant Address	40 Railroad Street	Facility Address	575 STP Road
	Youngsville, PA 16371-1427		Youngsville, PA 16371
Applicant Contact	Mark Theuret	Facility Contact	Stacey Cratty (Operator)
Applicant Phone	(814) 563-4604	Facility Phone	(814) 730-0505
Client ID	64400	Site ID	261210
Ch 94 Load Status	Not Overloaded	Municipality	Youngsville Borough
Connection Status	No Limitations	County	Warren
Date Application Received	April 13, 2021	EPA Waived?	Yes
Date Application Accepted	May 11, 2021	If No, Reason	

Purpose of Application: Renewal of an NPDES Permit for an existing discharge of treat municipal sewage.

Summary of Review

This is a publicly operated sewage treatment plant treating municipal sewage from Youngsville Borough, Warren County and parts of Brokenstraw Township and Sugar Grove Township. This facility is not accepting hauled in waste and does not have any industrial users.

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

There are currently no open violations in EFACTS for this permittee (11/16/2023). *11/222/2023 CWY*

Sludge use and disposal description and location(s): Sludge is dried in reed drying beds and hauled offsite for disposal at McKean County Landfill.

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	November 16, 2023
X		Chad W. Yurisic Chad W. Yurisic, P.E. / Environmental Engineer Manager	11/22/2023

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.624
Latitude	41º 51' 14"	Longitude	-79º 18' 23"
Quad Name	Youngsville	Quad Code	01062
Wastewater Description:	Sewage Effluent		
Receiving Waters	Brokenstraw Creek	Stream Code	55847
NHD Com ID	112375089	RMI	3.4
Drainage Area	324	Yield (cfs/mi^2)	0.107
Q_{7-10} Flow (cfs)	34.72	Q_{7-10} Basis	USGS 03015500 (1910-2005)
Elevation (ft)	1180	Slope (ft/ft)	0.00167
Watershed No.	16-B	Chapter 93 Class.	CWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	MERCURY		
Source(s) of Impairment	SOURCE UNKNOWN		
TMDL Status	**Pending**	Name	

Background/Ambient Data		Data Source
pH (SU)	7.0	USGS 03015500
Temperature (°C)	20	Default (CWF)
Hardness (mg/L)		
Other:	0.1	Default

Nearest Downstream Public Water Supply Intake		Aqua Pennsylvania, Inc. – Emlenton	
PWS Waters	Allegheny River	Flow at Intake (cfs)	1,801
PWS RMI	90.0	Distance from Outfall (mi)	96

Changes Since Last Permit Issuance:

Other Comments:

Treatment Facility Summary

Treatment Facility Name: Youngsville Borough STP

WQM Permit No.	Issuance Date
6200413 A-1	4/16/2021
6200413	1/23/2001
6200401	5/03/2000

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Contact Stabilization	Gas Chlorine	0.642

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.642	1020	Not Overloaded	Aerobic Digestion	Landfill

Changes Since Last Permit Issuance: WQM Permit No. 6200413 A-1 was issued permitting the replacement of the existing UV disinfection with a new UV disinfection system that will include two banks run in series (one bank running with the second bank as backup or maintenance) in a new heated building.

Other Comments:

Compliance History	
Summary of DMRs:	There have been six effluent violations reported since the permit was last issued. Two violations in the December 2016 reporting period for TSS and four in the April 2018 reporting period also for TSS.
Summary of Inspections:	The last compliance inspection was conducted on 2/17/2021. The inspection report did not note any violations but noted the facility was not using a NIST thermometer, the grit removal unit was not operating and was instead being removed manually, and scum was observed floating at the outfall.

Other Comments:

Compliance History

DMR Data for Outfall 001 (from July 1, 2022 to June 30, 2023)

Parameter	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22
Flow (MGD) Average Monthly	0.119	0.163	0.263	0.484	0.314	0.471	0.243	0.365	0.167	0.162	0.104	0.133
Flow (MGD) Daily Maximum	0.245	0.315	0.751	0.773	0.6	1.091	1.019	1.114	0.32	0.518	0.13	0.380
pH (S.U.) Minimum	6.52	6.45	6.43	6.5	6.65	6.57	6.69	6.61	6.75	6.75	6.67	6.58
pH (S.U.) Maximum	7.28	7.16	6.96	6.97	7.33	7.1	7.31	7.1	7.34	7.59	7.43	7.18
DO (mg/L) Minimum	5.67	6.52	6.46	7.35	6.99	6.06	7.02	6.94	6.17	5.26	5.87	5.88
CBOD5 (lbs/day) Average Monthly	5	6	9	17	< 7	8	< 7	12	4	8	4	4
CBOD5 (lbs/day) Weekly Average	7	8	12	23	6	12	16	29	5	9	8	11
CBOD5 (mg/L) Average Monthly	3.7	4.1	4.4	4.3	< 2.6	3.1	< 4.4	3.6	3.6	5.3	4.9	3.0
CBOD5 (mg/L) Weekly Average	5.1	6.1	6.0	6.4	3.0	5.1	9.1	5.6	4.7	7.9	9.8	3.6
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	393	442	259	271	424	297	185	403	393	424	263	344
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	699	624	382	289	706	451	239	511	457	490	374	397
BOD5 (mg/L) Raw Sewage Influent Average Monthly	318	332	129.1	76.3	160.6	127.1	144.4	198.6	314	300	282	327
TSS (lbs/day) Average Monthly	8	21	21	44	20	19	< 13	23	8	13	6	10
TSS (lbs/day) Raw Sewage Influent Average Monthly	530	564	311	338	667	364	212	493	478	511	312	499

TSS (lbs/day) Raw Sewage Influent Daily Maximum	1152	827	504	408	981	521	324	780	624	591	460	673
TSS (lbs/day) Weekly Average	12	32	34	63	14	33	29	73	12	20	8	19
TSS (mg/L) Average Monthly	6.5	14.1	9.9	10.5	6.4	7.4	< 8.5	6.0	6.9	9.0	6.4	7.8
TSS (mg/L) Raw Sewage Influent Average Monthly	404	422	152	91	268	164	154	231	387	356	334	437
TSS (mg/L) Weekly Average	9.0	16.0	14.5	15.0	7.5	11.5	16.5	9.0	11.5	13.0	9.0	10.5
Fecal Coliform (CFU/100 ml) Geometric Mean	< 2	< 1	2	< 1	< 1	< 1	< 1	< 1	< 2	< 2	< 2	< 1
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	4.1	1	3	1	< 1	3.1	3	1	5.2	12.4	4.1	< 1
Total Nitrogen (lbs/day) Average Quarterly	29			15			18			31		
Total Nitrogen (mg/L) Average Quarterly	7.5			14.23			12.803			30.89		
Ammonia (lbs/day) Average Monthly	3	3	1	1	1	2	4	1	5	7	0.6	0.6
Ammonia (mg/L) Average Monthly	1.089	1.235	0.417	0.418	0.614	1.109	2.46	1.31	4.235	6.506	0.647	0.67
Total Phosphorus (lbs/day) Average Quarterly	3			2			4			5		
Total Phosphorus (mg/L) Average Quarterly	0.805			2.1			2.74			4.9		
UV Dosage (mjoules/cm^2) Average Monthly	5.1	5.4	5.5	5.2	5.3	5.9	4.8	5	4.5	4.1	4.72	4.1

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.624
Latitude 41º 51' 14.00" **Longitude** -79º 18' 23.00"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

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

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	IMAX	-	92a.47(a)(4)
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geo Mean	-	92a.47(a)(5)
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	IMAX	-	92a.47(a)(5)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)
E. Coli	Report (No./100 ml)	IMAX	-	92a.61

Comments: Monitoring for E. Coli is placed in the permit in accordance with the Department's SOP entitled "Establishing Effluent Limitations for Individual Sewage Permits."

Water Quality-Based Limitations

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

Parameter	Limit (mg/l)	SBC	Model
N/A			

Comments: The Toxics Management Spreadsheet (TMS) was originally ran using the renewal application sample in 2021. This resulted in a recommended calculated effluent limit for total lead and monitoring for total copper and total zinc. After a Pre-Draft Permit Survey was resubmitted, it was discovered a major waterline replacement project had occurred in the Borough since the application was submitted to remove old lead pipes. The Department subsequently suggested, and the permittee agreed, to conduct additional sampling and testing for these metals to see if the waterline project helped in reducing levels of these pollutants at the plant. The additional sample results (5 sets) showed a major decrease in the levels of total lead and total zinc in the effluent from before the project. Rerunning the TMS by inputting the maximum effluent concentrations from the resampling effort, the spreadsheet no longer recommended limits or monitoring for total lead and total zinc. The TMS did however still recommend monitoring for total copper. Monitoring for total copper will be placed in the permit at a frequency of "1/month."

Best Professional Judgment (BPJ) Limitations

Comments: Influent BOD_5 and TSS monitoring will be placed in the permit in accordance with the Department's SOP entitled "New and Reissuance Sewage Individual NPDES Permit Applications."

A dissolved oxygen limit of a minimum of 4.0 mg/l, a TRC IMAX limit of 1.6 mg/l, and monitoring for ammonia nitrogen, total nitrogen, and total phosphorus will be placed in the permit in accordance with the Department's SOP entitled "Establishing Effluent Limitations for Individual Sewage Permits."

Anti-Backsliding

N/A

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	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	4.0 Daily Min	XXX	XXX	XXX	1/day	Grab
CBOD5	130	195	XXX	25.0	37.5	50	1/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
TSS	156	234	XXX	30.0	45.0	60	1/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
Total Nitrogen	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Ammonia	Report	XXX	XXX	Report	XXX	XXX	2/month	24-Hr Composite
Total Phosphorus	Report Avg Qrtly	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Total Copper	Report	XXX	XXX	Report	XXX	XXX	1/month	24-Hr Composite
UV Dosage (mjoules/cm²)	XXX	XXX	XXX	Report	XXX	XXX	1/day	Measured

Compliance Sampling Location: Outfall 001 (after disinfection)
Other Comments: N/A

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Toxics Management Spreadsheet
Version 1.4, May 2023

Discharge Information

Instructions | Discharge | Stream

Facility: **Youngsville Borough STP** NPDES Permit No.: **PA0028371** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Treated domestic sewage**

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
0.624	100	6.8						

					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		388									
	Chloride (PWS)	mg/L		93.9									
	Bromide	mg/L	<	0.116									
	Sulfate (PWS)	mg/L		24.3									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L											
	Total Antimony	µg/L											
	Total Arsenic	µg/L											
	Total Barium	µg/L											
	Total Beryllium	µg/L											
	Total Boron	µg/L											
	Total Cadmium	µg/L											
	Total Chromium (III)	µg/L											
	Hexavalent Chromium	µg/L											
	Total Cobalt	µg/L											
	Total Copper	µg/L		14.9									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L											
	Total Lead	µg/L	<	1.43									
	Total Manganese	µg/L											
	Total Mercury	µg/L											
	Total Nickel	µg/L											
	Total Phenols (Phenolics) (PWS)	µg/L											
	Total Selenium	µg/L											
	Total Silver	µg/L											
	Total Thallium	µg/L											
	Total Zinc	µg/L		44.8									
	Total Molybdenum	µg/L											
	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)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											

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Toxics Management Spreadsheet
Version 1.4, May 2023

Stream / Surface Water Information

Youngsville Borough STP, NPDES Permit No. PA0028371, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Paint 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	055847	96	1180	324	0.00167		Yes
End of Reach 1	042122	0	864	6390		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	96	0.107	34.72									100	7.73		
End of Reach 1	0	0.281	1801			350						75	8.1		

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	96														
End of Reach 1	0														

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Toxics Management Spreadsheet
Version 1.4, May 2023

Model Results

Youngsville Borough STP, NPDES Permit No. PA0028371, 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)
96	34.72		34.72	0.965	0.002	0.944	94.95	100.568	0.398	14.738	312.025
0	1801.00	0.155	1800.8453								

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)
96	164.99		164.99	0.965	0.002	1.857	94.95	51.14	0.941	6.232	118.139
0	5203.647	0.155	5203.49								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.219 Analysis Hardness (mg/l): 100 Analysis pH: 7.46

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	
Total Copper	0	0		0	13.439	14.0	124	Chem Translator of 0.96 applied
Total Lead	0	0		0	64.581	81.6	725	Chem Translator of 0.791 applied
Total Zinc	0	0		0	117.180	120	1,065	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): ###### PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.65

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	
Total Copper	0	0		0	8.956	9.33	345	Chem Translator of 0.96 applied
Total Lead	0	0		0	2.517	3.18	118	Chem Translator of 0.791 applied
Total Zinc	0	0		0	118.139	120	4,429	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): ###### THH PMF: 1 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 0 with a design stream flow of 1801 cfs
Chloride (PWS)	0	0		0	250,000	250,000	#########	WQC applied at RMI 0 with a design stream flow of 1801 cfs
Sulfate (PWS)	0	0		0	250,000	250,000	#########	WQC applied at RMI 0 with a design stream flow of 1801 cfs
Total Copper	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
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	
Total Copper	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

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

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Copper	Report	Report	Report	Report	Report	µg/L	79.7	AFC	Discharge Conc > 10% WQBEL (no RP)

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

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

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	933,344	mg/L	Discharge Conc ≤ 10% WQBEL

Chloride (PWS)	466,672	mg/L	Discharge Conc ≤ 10% WQBEL
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	466,672	mg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	118	µg/L	Discharge Conc ≤ 10% WQBEL
Total Zinc	682	µg/L	Discharge Conc ≤ 10% WQBEL

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
16B	55847	BROKENSTRAW CREEK	**3.400**	1180.00	324.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.107	34.72	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.73	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Youngsville STP	PA028371	0.6240	0.0000	0.0000	0.000	20.00	6.80

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	8.24	0.00	0.00
NH3-N	25.00	0.10	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
16B	55847	BROKENSTRAW CREEK	**0.001**	1150.00	328.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.107	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.73	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

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

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
16B	55847	BROKENSTRAW CREEK

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
3.400	34.72	0.00	34.72	.9653	0.00167	.944	94.94	100.56	0.40	0.522	20.00	7.65
Q1-10 Flow												
3.400	22.22	0.00	22.22	.9653	0.00167	NA	NA	NA	0.31	0.664	20.00	7.61
Q30-10 Flow												
3.400	47.22	0.00	47.22	.9653	0.00167	NA	NA	NA	0.47	0.441	20.00	7.67

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	6		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
16B	55847	BROKENSTRAW CREEK

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
3.400	Youngsville STP	7.76	50	7.76	50	0	0

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
3.400	Youngsville STP	1.18	25	1.18	25	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
3.40	Youngsville STP	25	25	25	25	4	4	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
16B	55847	BROKENSTRAW CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
3.400	0.624	20.000	7.650
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
94.944	0.944	100.564	0.398
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.62	0.289	0.77	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.128	3.104	Tsivoglou	6
Reach Travel Time (days)			
0.522			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.052	2.58	0.75	8.11
0.104	2.54	0.72	8.10
0.157	2.51	0.69	8.10
0.209	2.47	0.67	8.10
0.261	2.43	0.64	8.11
0.313	2.40	0.62	8.12
0.365	2.36	0.60	8.13
0.417	2.32	0.58	8.14
0.470	2.29	0.56	8.16
0.522	2.26	0.54	8.18

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
16B	55847	BROKENSTRAW CREEK

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
3.400	Youngsville STP	PA028371	0.624	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			4

Butler Area STP
Butler City, Butler County
PA0026697 Discharge pH

Outfall 001

Date	pH min	pH max	10^ -pH min	10^ -pH max	& pH max)	-Log (Ave pH)
Jul-20	6.9	7.17	1.26E-07	6.76E-08	9.68E-08	**7.0**
Aug-20	6.56	7.54	2.75E-07	2.88E-08	1.52E-07	**6.8**
Sep-20	7.12	7.54	7.59E-08	2.88E-08	5.23E-08	**7.3**
Jul-21	6.59	7.13	2.57E-07	7.41E-08	1.66E-07	**6.8**
Aug-21	6.42	7.26	3.8E-07	5.5E-08	2.18E-07	**6.7**
Sep-21	6.62	7.23	2.4E-07	5.89E-08	1.49E-07	**6.8**
Jul-22	6.58	7.18	2.63E-07	6.61E-08	1.65E-07	**6.8**
Aug-22	6.67	7.43	2.14E-07	3.72E-08	1.25E-07	**6.9**
Sep-22	6.75	7.59	1.78E-07	2.57E-08	1.02E-07	**7.0**
					Median:	**6.8**