pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0046159**
Facility Type	**Municipal**	APS ID	**1054508**
Major / Minor	**Minor**	Authorization ID	**1381184**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Municipal Sewer Authority of Houtzdale Borough**	Facility Name	**Regional Water Pollution Control Facility**
Applicant Address	116 Sterling Avenue Houtzdale, PA 16651-1748	Facility Address	116 Sterling Avenue Houtzdale, PA 16651-1748
Applicant Contact	John Bumbarger	Facility Contact	Michael B. White
Applicant Phone	(814) 378-5739	Facility Phone	(814) 378-5739
Client ID	287392	Site ID	249443
Ch 94 Load Status	Not Overloaded	Municipality	Woodward Township
Connection Status	No Limitations	County	Clearfield
Date Application Received	January 7, 2022	EPA Waived?	Yes
Date Application Accepted	January 13, 2022	If No, Reason	
Purpose of Application	Renewal of an existing NPDES permit for the discharge of treated sewage.		

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		*Derek S. Garner* Derek S. Garner / Project Manager	10/20/2022
X		*Nicholas W. Hartranft* Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	10/21/2022

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.3
Latitude	40º 49' 44.35"	Longitude	-78º 20' 26.06"
Quad Name	Houtzdale	Quad Code	1219
Wastewater Description:	Sewage Effluent		

Receiving Waters	Beaver Run	Stream Code	25878
NHD Com ID	134238071	RMI	3.23
Drainage Area	5.35	Yield (cfs/mi^2)	0.239
Q_{7-10} Flow (cfs)	1.28	Q_{7-10} Basis	Streamgage No. 01546400
Elevation (ft)	1501	Slope (ft/ft)	n/a
Watershed No.	8-D	Chapter 93 Class.	CWF, MF
Existing Use	**n/a**	Existing Use Qualifier	n/a
Exceptions to Use	n/a	Exceptions to Criteria	n/a
Assessment Status	Impaired		
Cause(s) of Impairment	Metals, Siltation		
Source(s) of Impairment	Acid Mine Drainage		
TMDL Status	Final	Name	Moshannon Creek Watershed

Nearest Downstream Public Water Supply Intake	PA American Water Company		
PWS Waters	West Branch Susquehanna River	Flow at Intake (cfs)	668
PWS RMI	10.64	Distance from Outfall (mi)	171.37

Treatment Facility Summary

WQM Permit No.	Issuance Date
1772402	6/5/1972
1704401	3/22/2004

The facility's original water quality management (WQM) permit was issued June 5, 1972. The facility is a dual train contact stabilization treatment plant consisting of; one splitter box, two bar screens, two aeration tanks, two clarifiers, two chlorine contact tanks, and two aerobic sludge digesters.

WQM Permit No. 1704401 was issued on March 22, 2004 to rerate the facility's organic capacity from 500 to 600 lbs/day of BOD_5. No physical changes to the facility were made as part of the rerate. In a September 22, 2015 letter amendment DEP acknowledged that the existing comminutors, originally permitted in the 1972 WQM permit, have been taken offline.

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Contact Stabilization	Gas Chlorine	0.3
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.3	600	Existing Hydraulic Overload	Aerobic Digestion	Landfill

Compliance History

The following eDMR violations occurred during the existing permit's term:

Date	Description	Parameter	Sample Value	Violation Condition	Permit Value	Unit	SBC
6/28/2017	Violation of permit condition	Ammonia-Nitrogen	9	>	6.5	mg/L	Weekly Average
6/28/2017	Violation of permit condition	Fecal Coliform	2419.6	>	1000	No./100 ml	Instantaneous Maximum
7/27/2017	Violation of permit condition	Ammonia-Nitrogen	10	>	6.5	mg/L	Weekly Average
7/27/2017	Violation of permit condition	Ammonia-Nitrogen	5.1	>	4.5	mg/L	Average Monthly
7/27/2017	Violation of permit condition	Fecal Coliform	2419.6	>	1000	No./100 ml	Instantaneous Maximum
8/24/2017	Violation of permit condition	Ammonia-Nitrogen	4.9	>	4.5	mg/L	Average Monthly
8/24/2017	Violation of permit condition	Ammonia-Nitrogen	7.5	>	6.5	mg/L	Weekly Average
9/27/2017	Violation of permit condition	Ammonia-Nitrogen	5.3	>	4.5	mg/L	Average Monthly
9/27/2017	Violation of permit condition	Ammonia-Nitrogen	8	>	6.5	mg/L	Weekly Average
10/25/2017	Violation of permit condition	Ammonia-Nitrogen	10	>	6.5	mg/L	Weekly Average
10/25/2017	Violation of permit condition	Ammonia-Nitrogen	6.3	>	4.5	mg/L	Average Monthly
8/23/2018	Violation of permit condition	Ammonia-Nitrogen	8	>	6.5	mg/L	Weekly Average
8/23/2018	Violation of permit condition	Fecal Coliform	217	>	200	No./100 ml	Geometric Mean
8/23/2018	Violation of permit condition	Fecal Coliform	2419.6	>	1000	No./100 ml	Instantaneous Maximum
6/27/2019	Violation of permit condition	Fecal Coliform	2419.6	>	1000	No./100 ml	Instantaneous Maximum
8/26/2019	Violation of permit condition	Ammonia-Nitrogen	7	>	6.5	mg/L	Weekly Average
10/24/2019	Violation of permit condition	Fecal Coliform	2419.6	>	1000	No./100 ml	Instantaneous Maximum
11/27/2019	Violation of permit condition	Ammonia-Nitrogen	14	>	6.5	mg/L	Weekly Average
11/27/2019	Violation of permit condition	Ammonia-Nitrogen	23.8	>	16	lbs/day	Weekly Average
7/23/2020	Violation of permit condition	Fecal Coliform	1203.3	>	1000	No./100 ml	Instantaneous Maximum
11/24/2020	Violation of permit condition	Ammonia-Nitrogen	13.2	>	4.5	mg/L	Average Monthly
11/24/2020	Violation of permit condition	Ammonia-Nitrogen	17	>	11	lbs/day	Average Monthly
11/24/2020	Violation of permit condition	Ammonia-Nitrogen	25	>	6.5	mg/L	Weekly Average
11/24/2020	Violation of permit condition	Ammonia-Nitrogen	34.1	>	16	lbs/day	Weekly Average
3/31/2021	Late DMR Submission	n/a	n/a	n/a	n/a	n/a	n/a
7/26/2021	Violation of permit condition	Fecal Coliform	2419.6	>	1000	No./100 ml	Instantaneous Maximum

The Operations Section has been in contact with the permittee regarding the frequent ammonia-n violations.

The facility was most recently inspected March 8, 2022. No violations were noted.

There are no open violations associated with the permittee.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.3
Latitude 40º 49' 44.00" **Longitude** -78º 20' 27.00"
Wastewater Description: Sewage Effluent

Technology-Based Limitations ("TBELs")

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)

Water Quality-Based Limitations ("WQBELs")

DEP models in-stream conditions to determine if WQBELs are appropriate. Specifically, WQM 7.0 is used to determine the applicability of WQBELs for CBOD5, ammonia-n, and dissolved oxygen and the Toxics Management Spreadsheet ("TMS") is used for toxic pollutants.

Since there have been no noted changes to the receiving water or to the discharge that would impact CBOD5, ammonia-n, or dissolved oxygen concentration levels the previous model run from 2017 is still applicable and has been attached. The previous model results are as follows:

Parameter	Discharge Conc. (mg/l)	Effluent Limitations		
		30 Day Average (mg/l)	Maximum (mg/l)	Minimum (mg/l)
CBOD5	20	20	-	-
NH3-N	4.5	4.5	9	-
Dissolved Oxygen	3	-	-	3

Existing requirements for CBOD5, ammonia-n and dissolved oxygen remain in the permit. This includes the use of seasonal multipliers for CBOD5 (2x) and ammonia-N (3x), not to exceed technology-based secondary treatment limits. Seasonal multipliers are based on reduced biological treatment efficiencies and generally higher dilution during cold weather months.

Toxic parameters were evaluated in TMS. TMS is a single discharge model that assigns a partial mixing factor based upon surface water and discharge characteristics. Input concentrations were developed as follows:

1) When possible, effluent concentration data was pulled from eDMR and entered into TOXCONC. TOXCONC is a spreadsheet that develops average monthly input concentrations and daily coefficient of variations based on actual maximum daily concentrations.'

2) When no eDMR data was available, maximum concentrations were pulled from the effluent testing section of the application.

Based on the input data, only one effluent limit was recommended:

	Mass Limits		Concentration Limits						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Copper	0.088	0.099	35	39.5	87.6	µg/l	35.0	CFC	Discharge Conc ≥ 50% WQBEL RP

The recommended average monthly total copper limit is less stringent than the existing limit of 33.69 µg/l. Accordingly, DEP recommends the existing total copper limit remains in the permit. The TMS spreadsheet is attached.

Total residual chlorine ("TRC") limits were previously developed using the TRC_CALC spreadsheet. There have been no changes to the input values. Accordingly, DEP recommends that the existing TRC limits remain in the permit. The TRC_CALC spreadsheet developed during the last renewal is attached.

Moshannon Creek Watershed Total Maximum Daily Load (TMDL)

The Moshannon Creek Watershed TMDL was finalized on May 7, 2009. The TMDL establishes load allocations (LA) for non-point source discharges and waste load allocations for point source discharges for metals (Al, Fe, Mn) typically associated with abandoned mine drainage. A WLA was not developed for this facility. Two permit cycles ago, the permit established annual monitoring requirements for the three metals so that a future decision could be made if the discharge is contributing to the impairment. Based on the annual sampling results, only manganese was being discharged at concentrations above Chapter 93 water quality criteria. Any discharge above criteria not accounted for in the TMDL is considered to be contributing to the watershed's impairment. Accordingly, the previous permit established effluent limits for manganese and removed monitoring requirements for aluminum and iron.

Based on sampling results recorded in eDMR, manganese continues to be discharged above criteria at times. Additionally, it appears that aluminum may also be discharged above criteria. Accordingly, DEP recommends that existing manganese requirements remain in the permit and that aluminum limits are established at criteria.

Parameter	AML	MDL	IMAX	Units
Total Manganese	1.0	2.0	2.5	mg/l
Total Aluminum	0.75	0.75	0.75	mg/l

Best Professional Judgment (BPJ) Limitations

DEP recommends that dissolved oxygen effluent monitoring and influent monitoring for BOD5 and TSS remain in the permit to continue to characterize the wastewater.

DEP recommends quarterly E. Coli reporting per the 2017 Triennial Review of Water Quality Standards, published in the PA Bulletin on July 11, 2020.

Chesapeake Bay Considerations

The Regional Pollution Control Facility is classified as a Phase 4 facility (> 0.2 MGD, ≤ 0.4 MGD) in Pennsylvania's Chesapeake Bay Watershed Implementation Plan. Phase 4 facilities are required to perform, at a minimum, monthly monitoring for total nitrogen and total phosphorus. Accordingly, DEP recommends the existing monthly requirements remain in the permit.

Anti-Backsliding

No permit requirements are proposed to be less stringent. Anti-backsliding should not impact the permit.

Existing Effluent Limitations and Monitoring Requirements

The existing effluent limitations and monitoring requirements are as follows:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0	XXX	9.0 Max	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	Report	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.35	XXX	1.14	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5) Nov 1 - Apr 30	60	100	XXX	25.0	40.0	50	1/week	8-Hr Composite
Carbonaceous Biochemical Oxygen Demand (CBOD5) May 1 - Oct 31	50	75	XXX	20.0	30.0	40	1/week	8-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Total Suspended Solids	75	110	XXX	30.0	45.0	60	1/week	8-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
Total Nitrogen	Report	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	33	50 Wkly Avg	XXX	13.5	20.0	27	1/week	8-Hr Composite
Ammonia-Nitrogen May 1 – Oct 31	11	16 Wkly Avg	XXX	4.5	6.5	9	1/week	8-Hr Composite
Total Phosphorus	Report	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Copper, Total (µg/L)	0.08	0.16	XXX	33.69	67.38 Daily Max	84.22	1/week	8-Hr Composite
Lead, Total	XXX	Report	XXX	XXX	Report Daily Max	XXX	1/6 months	8-Hr Composite
Manganese, Total	2.5	5.0	XXX	1.00	2.00 Daily Max	2.5	1/week	8-Hr Composite

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)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	Report Inst Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.35	XXX	1.14	1/day	Grab
CBOD5 Nov 1 - Apr 30	60	100	XXX	25.0	40.0	50	1/week	8-Hr Composite
CBOD5 May 1 - Oct 31	50	75	XXX	20.0	30.0	40	1/week	8-Hr Composite
BOD5 Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	1/week	8-Hr Composite
TSS Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	1/week	8-Hr Composite
TSS	75	110	XXX	30.0	45.0	60	1/week	8-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	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite

Outfall 001, Continued (from Permit Effective Date through Permit Expiration Date)

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Ammonia Nov 1 - Apr 30	33	50 Wkly Avg	XXX	13.5	20.0	27	1/week	8-Hr Composite
Ammonia May 1 - Oct 31	11	16 Wkly Avg	XXX	4.5	6.5	9	1/week	8-Hr Composite
Total Phosphorus	Report	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite
Total Aluminum	1.87	1.87	XXX	0.75	0.75 Daily Max	0.75	1/week	8-Hr Composite
Total Copper (ug/L)	0.08	0.16	XXX	33.69	67.38 Daily Max	84.22	1/week	8-Hr Composite
Total Manganese	2.50	5.00	XXX	1.00	2.00 Daily Max	2.5	1/week	8-Hr Composite

Compliance Sampling Location: Outfall 001

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
08D	25878	BEAVER RUN	3.230	1501.00	5.35	0.00000	0.00	

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (els)	Stream Flow (els)	Reh Trav Time (days)	Reh Velocity (fps)	WD Ratio	Reh Width (ft)	Reh Depth (ft)	Tributary Temp ('C)	Tributary pH	Stream Temp ('C)	Stream pH
Q7-10	0.239	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	6.50	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
Houtzdale Bora	PA0046159	0.3000	0.3000	0.3000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Cone (mg/L)				
CB0D5	20.00	2,00	0,00	1.50	
Dissolved Oxygen	3.00	8.24	0,00	0,00	
NH3-N	4.50	0.00	0.00	0.70	

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (fl/ft)	PWS Withdrawal (mgd)	Apply FC
08D	25878	BEAVER RUN	**3.020**	1498.00	8.23	0.00000	0.00	

Stream Data

Design Cond.	LFY (efsm)	Trib Flow (els)	Stream Flow (els)	Reh Trav Time (days)	Reh Velocity (fps)	WD Ratio	Reh Width (ft)	Reh Depth (ft)	Tributary Temp ('C)	Tributary pH	Stream Temp ('C)	Stream pH
Q7-10	0.239	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	6.50	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 Cone (mg/L)	Trib Cone (mg/L)	Stream Cone (mg/L)	Fate Coef (1/days)
CBDD5	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

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
08D	25878	BEAVER RUN	1.020	1477.00	13.60	0.00000	0.00	

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Reh Trav Time (days)	Reh Velocity (fps)	WD Ratio	Reh Width (ft)	Reh Depth (ft)	Tributary Temp ('C)	Tributary pH	Stream Temp ('C)	Stream pH
Q7-10	0.239	0.00	0.00	0.000	0.000	a.a	0.00	0.00	20.00	7.00	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)
CB0D5	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 Hy:drody:namic Out uts

SWP Basin	Stream Code	Stream Name
08D	25878	BEAVER RUN

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (fl)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp ('C)	Analysis pH
Q7-10 Flow												
3.230	1.28	0.00	1.28	.4641	0.00271	.554	16.69	30.12	0.19	0.068	21.33	6.59
3.020	1.97	0.00	1.97	.4641	0.00199	.589	20.5	34.8	0.20	0.607	20.95	6.56
Q1-10 Flow												
3.230	1.23	0.00	1.23	.4641	0.00271	NA	NA	NA	0.19	0.069	21.37	6.59
3.020	1.89	0.00	1.89	.4641	0.00199	NA	NA	NA	0.20	0.618	20.99	6.56
Q30-10 Flow												
3.230	1.41	0.00	1.41	.4641	0.00271	NA	NA	NA	0.20	0.065	21.24	6.58
3.020	2.16	0.00	2.16	.4641	0.00199	NA	NA	NA	0.21	0.581	20.88	6.56

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☐
WLAMethod	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.96	**Use Inputted Reach Travel Times**	☐
Q30-10/Q7-10 Ratio	1.1	**Temperature Adjust Kr**	
0.0. Saturation	**90.00%**	**Use Balanced Technology**	
D.O. Goal	6		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
08D	25878	BEAVER RUN

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
3.230	Houtzdale Boro	10.59	9	10.59	9	0	0
3.020		NA	NA	10.97	NA	NA	NA

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
3.230	Houtzdale Boro	2.25	4.5	2.25	4.5	0	0
3.020		NA	NA	2.34	NA	NA	NA

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved O gen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
3.23	Houtzdale Boro	20	20	4.5	4.5	3	3	0	0
3.02		NA	NA	NA	NA	NA	NA	NA	NA

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
08D	25878	BEAVER RUN

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
3.230	0.300	21.332	6.587
Reach Width (ft)	Reach Depth (ft)	Reach WDRatio	Reach Velocity (fps)
16.690	0.554	30.117	0.188
Reach CBOD5 (mg/L)	Reach Kc (1/days)	Reach NH3-N (mg/L)	Reach Kn (1/days)
6.79	1.162	1.20	0.776
Reach DO (mg/L)	Reach Kr (1/days)	Kr Equation	Reach DO Goal (mg/L)
6.847	4.999	Tsivoglou	6
Reach Travel Time (days)			
0.068			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.007	6.74	1.19	6.80
0.014	6.68	1.19	6.76
0.020	6.62	1.18	6.73
0.027	6.57	1.17	6.69
0.034	6.51	1.17	6.66
0.041	6.46	1.16	6.63
0.048	6.40	1.15	6.60
0.054	6.35	1.15	6.57
0.061	6.30	1.14	6.54
0.068	6.25	1.14	6.52

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
3.020	0.300	20.955	6.561
Reach Width (ft)	Reach Depth (ft)	Reach WDRatio	Reach Velocity (fps)
20.500	0.589	34.797	0.201
Reach CBOD5 (mg/L)	Reach Kc (1/days)	Reach NH3-N (mg/L)	Reach Kn (1/days)
5.04	0.850	0.81	0.753
Reach DO (mg/L)	Reach Kr (1/days)	Kr Equation	Reach DO Goal (mg/L)
7.005	3.891	Tsivoglou	6
Reach Travel Time (days)			
0.607			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.061	4.78	0.78	6.92
0.121	4.53	0.74	6.88
0.182	4.29	0.71	6.88
0.243	4.06	0.68	6.89
0.304	3.85	0.65	6.93
0.364	3.65	0.62	6.98
0.425	3.46	0.59	7.03
0.486	3.28	0.57	7.10
0.546	3.10	0.54	7.16
0.607	2.94	0.52	7.23

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
08D	25878	BEAVER RUN

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)
3.230	**Houtzdale Soro**	PA0046159	0.300	CBOD5	20		
				NH3-N	4.5	9	
				Dissolved Oxygen			3

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

1.28	= Q stream (cfs)	0.5	=CV Daily
0.3	= Q discharge (MGD)	0.5	=CV Hourly
30	= no. samples	1	= AFC_Partlal Mix Factor
0.3	= Chlorine Demand of Stream	1	= CFC_Partlal Mix Factor
0	= Chlorine Demand of Discharge	15	= AFC_Criterla Compliance Time (min)
0.35	= **BAT/BPJ** Value	720	= **CFC_Criterla Compliance Time** (min)
0	= % **Factor of Safety (FOS)**		**=Decay Coefficient (K)**

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	**1.3.2.iii**	WLA ate = 0.899	**1.3.2.iii**	WLA etc = 0.869
PENTOXSD TRG	**5.1a**	LTAMULTafc= 0.373	**5.1c**	LTAMULT etc= 0.581
PENTOXSD TRG	**5.1b**	LTA_afc= 0.335	**5.1d**	LTA_cfc = 0.505

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AMLMULT= 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l)= 0.350	BAT/BPJ
		INST MAX LIMIT (mg/l)= 1.145	

WLAafc	**(,019/e(-k*AFC_tc))** + **[(AFC_Vc*Qs•.01g/Qd*e(-k*AFC_tc))...** ...+ **Xd** + **(AFC_Vc*Qs*Xs/Qd)l*(1-FOS/100)**
LTAMULT ale	EXP((0.5*LN(cvhA2+1))-2.326*LN(cvhA2+1)A0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	**(.011/e(-k*CFC_tc)** + **[(CFC_Vc*Qs*,011/Qd*e(-k*CFC_tc)**)... ...+ **Xd** + **(CFC_Vc*Qs*Xs/Qd)l*(1-FOS/100)**
LTAMULT_cfc	EXP((0.5*LN(cvdA2/no_samples+1))-2.326*LN(cvdA2/no_samples+1)A0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AMLMULT	EXP(2.326*LN((cvdA2/no_samples+1)AO.5)-0.5*LN(cvdA2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	1.5*((av_mon_limlt/AML_MULT)/LTAMULT_afc)

Discharge Information

Instructions | Discharge | Stream

Facility: **Houtzdale Borough Municipal Sewer Authority** NPDES Permit No.: **PA0046159** Outfall No.: **001**

Evaluation Type **Custom / Additives** Wastewater Description: **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
0.3	100	7						

				0 if left blank		*0.5 if left blank*		*0 if left blank*			*1 if left blank*	
Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Total Copper	µg/L		20.63			10						
Total Lead	µg/L		0.37			0.01						
Total Manganese	mg/L		1.23			0.51						
Total Zinc	mg/L		23.6									
Total Iron	mg/L	<	0.2									
Bromide	mg/L		2									
Total Dissolved Solids (PWS)	mg/L		282									
Chloride (PWS)	mg/L		75.1									
Sulfate (PWS)	mg/L		50.1									
Total Aluminum	mg/L	<	100									

Stream / Surface Water Information

Houtzdale Borough Municipal Sewer Authority, NPDES Permit No. PA0046159, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Beaver Run**

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	025878	3.23	1501	5.35			Yes
End of Reach 1	025878	3.02	1498	8.23			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	3.23	0.239										100	6.5		
End of Reach 1	3.02	0.239										100	6.5		

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	3.23														
End of Reach 1	3.02														

Model Results

Houtzdale Borough Municipal Sewer Authority, NPDES Permit No. PA0046159, Outfall 001

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

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 9.578 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 6.59

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 Copper	0	0		0	13.439	14.0	52.6	Chem Translator of 0.96 applied
Total Lead	0	0		0	64.581	81.6	307	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	117.180	120	450	Chem Translator of 0.978 applied
Total Iron	0	0		0	N/A	N/A	N/A	
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 Aluminum	0	0		0	750	750	2,816	

☑ ***CFC*** CCT (min): 9.578 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 6.59

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 Copper	0	0		0	8.956	9.33	35.0	Chem Translator of 0.96 applied
Total Lead	0	0		0	2.517	3.18	11.9	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	118.139	120	450	Chem Translator of 0.986 applied
Total Iron	0	0		0	1,500	1,500	5,633	WQC = 30 day average; PMF = 1
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 Aluminum	0	0		0	N/A	N/A	N/A	

☑ ***THH*** CCT (min): 9.578 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream	Stream	Trib Conc	Fate	WQC	WQ Obj	WLA (µg/L)	Comments

	Conc (µg/L)	CV	(µg/L)	Coef	(µg/L)	(µg/L)		
Total Copper	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	3,755	
Total Zinc	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
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	
Total Aluminum	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 5.203 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 Copper	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 Zinc	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
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 Aluminum	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	0.088	0.099	35.0	39.5	87.6	µg/L	35.0	CFC	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 Lead	11.9	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	3,755	µg/L	Discharge Conc ≤ 10% WQBEL
Total Zinc	288	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	5,633	µg/L	Discharge Conc ≤ 10% WQBEL
Bromide	N/A	N/A	No WQS
Total Dissolved Solids (PWS)	N/A	N/A	PWS Not Applicable
Chloride (PWS)	N/A	N/A	PWS Not Applicable

Sulfate (PWS)	N/A	N/A	PWS Not Applicable
Total Aluminum	1,805	µg/L	Discharge Conc ≤ 10% WQBEL

Facility: Municipal Sewer Authority of Houtzdale Borough
NPDES #: PA0046159
Outfall No: 001
n (Samples/Month): 4
Reviewer/Permit Engineer: Derek Garner

Parameter Name	Total Copper	Total Lead	Total Manganese										
Units	µg/L	µg/L	mg/L										
Detection Limit	0.005	0.005											
Sample Date	*When entering values below the detection limit, enter "ND" or use the < notation (eg. <0.02)*												
	0.01	ND	0.11										
	1	0.011	0.21										
	ND	ND	0.12										
	0.5	ND	0.11										
	0.5	ND	0.63										
	0.059	ND	1.21										
	5.9	0.005	0.41										
	0.049	ND	0.96										
	4.9	0.008	0.41										
	ND	0.008	0.17										
	0.5		0.04										
	0.009		0.22										
	0.9		0.06										
	0.005		0.06										
	0.5		0.04										
	ND		0.02										
	0.5		0.03										
	0.005		0.04										
	0.5		0.04										
	ND		0.04										
	0.5		0.08										
	0.008		0.07										
	0.8		0.13										
	0.007		0.04										
	0.7		0.06										
	0.008		0.05										
	0.8		0.05										
	0.008		0.08										
	0.8		0.06										
	0.006		0.8										
	0.6		0.18										
	0.01		0.08										
	1		0.06										
	0.009		0.04										
	0.9		0.04										
	ND		0.04										
	0.5		0.03										
	0.005		0.07										
	0.5		0.17										
	0.01		0.06										
	1		0.07										
	0.01		0.43										
	1		0.36										
	0.008		0.08										
	0.8		0.06										
	0.009		0.06										
	0.9		0.17										
	0.009		0.835										
	0.9		0.0566										

Parameter Name	Total Copper	Total Lead	Total Manganese										
Units	µg/L	µg/L	mg/L										
Detection Limit	0.005	0.005											
Sample Date	*When entering values below the detection limit, enter "ND" or use the < notation (eg. <0.02)*												
	0.05		0.19										
	5		0.0664										
	0.009		0.0464										
	0.9		0.0587										
	0.011		0.0655										
	1.1		0.107										
	0.009		0.526										
	0.9		0.3										
	0.009		0.0888										
	0.9		0.0703										
	0.01		0.0716										
	1		0.0739										
	0.01		0.206										
	1		0.0602										
	0.008		0.189										
	0.8												
	0.01												
	1												
	0.008												
	0.8												
	0.008												
	0.8												
	0.009												
	0.9												
	0.006												
	0.6												
	0.01												
	1												
	0.008												
	0.8												
	0.009												
	0.9												
	0.008												
	0.8												
	0.005												
	0.5												
	0.012												
	1.2												
	0.12												
	1.2												
	0.009												
	0.9												
	0.016												
	1.16												
	0.009												
	0.9												
	0.0115												
	1.15												
	0.0106												
	1.06												

Parameter Name												
Units												
Detection Limit												
Sample Date												

Parameter Name												
Units												
Detection Limit												
Sample Date												

Reviewer/Permit Engineer: Derek Garner

Facility: Municipal Sewer Authority of Houtzdale Borough
NPDES #: PA0046159
Outfall No: 001
n (Samples/Month): 4

Parameter	Distribution Applied	Coefficient of Variation (daily)	Avg. Monthly
Total Copper (µg/L)	Delta-Lognormal	14.9352188	20.6302392
Total Lead (µg/L)	Delta-Lognormal	0.3674671	0.0088859
Total Manganese (mg/L)	Lognormal	1.2270605	0.5144501