pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0020788**
Facility Type	**Municipal**	APS ID	**690033**
Major / Minor	**Minor**	Authorization ID	**1312688**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Derry Borough Municipal Authority**	Facility Name	**Derry Borough**
Applicant Address	620 North Chestnut Street	Facility Address	1 Reed Street
	Derry, PA 15627		Derry, PA 15627
Applicant Contact	Amy Forsha	Facility Contact	Amy Forsha
Applicant Phone	(724) 756-1121	Facility Phone	(724) 756-1121
Client ID	66183	Site ID	271323
Ch 94 Load Status	Not Overloaded	Municipality	Derry Borough
Connection Status	No Limitations	County	Westmoreland County
Date Application Received	April 21, 2020	EPA Waived?	Yes
Date Application Accepted	April 30, 2020	If No, Reason	-
Purpose of Application	Renewal of an NPDES Permit for an existing discharge of treated sanitary wastewater from a municipal sewer system.		

Summary of Review

Act 14 - Proof of Notification was submitted and received.

A Part II Water Quality Management permit is not required at this time.

The applicant should be able to continue to meet the limits of this permit, which will protect the uses of the receiving stream.

I. OTHER REQUIREMENTS:

A. Stormwater into Sewers
B. Right of Way
C. Solids Handling
D. Effluent Chlorine Optimization and Minimization
E. Hauled in waste restrictions

SPECIAL CONDITIONS:

II. Solids Management

There is 1 open violation in efacts associated with the subject Client ID (66183) as of 3/30/2021 (see Attachment 4).

Approve	Return	Deny	Signatures	Date
X			Stephen A. McCauley Stephen A. McCauley, E.I.T. / Environmental Engineering Specialist	3/30/2021
X			Justin C. Dickey Justin C. Dickey, P.E. / Environmental Engineer Manager	April 5, 2021

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.654
Latitude	40º 20' 33.00"	Longitude	-79º 17' 50.00"
Quad Name	-	Quad Code	-
Wastewater Description:	Sewage Effluent		
Receiving Waters	McGee Run (TSF)	Stream Code	44716
NHD Com ID	123718021	RMI	7.9
Drainage Area	3.82	Yield (cfs/mi^2)	0.2
Q_{7-10} Flow (cfs)	0.76	Q_{7-10} Basis	calculated
Elevation (ft)	1107	Slope (ft/ft)	0.00310
Watershed No.	18-D	Chapter 93 Class.	TSF
Existing Use	-	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Impaired		
Cause(s) of Impairment	Algae, Siltation		
Source(s) of Impairment	On-Site Treatment Systems (Septic Systems and Similar Decentralized Systems)		
TMDL Status	Final	Name	Kiskiminetas-Conemaugh River Watersheds TMDL*

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

Nearest Downstream Public Water Supply Intake	Westmoreland County Municipal Authority		
PWS Waters	Conemaugh River	Flow at Intake (cfs)	274
PWS RMI	28.0	Distance from Outfall (mi)	30

* - The receiving stream is impaired, but this facility is not listed as a cause. Also, there is a TMDL for manganese, pH, siltation, metals, total suspended solids, turbidity, aluminum, and iron in the Kiskiminetas-Conemaugh River Watershed. Considering that the Kiskiminetas River is over 30 miles downstream of the discharge, a sewage plant of this nature is not expected to contribute to the stream impairment. No additional monitoring will be added with this renewal.

Sludge use and disposal description and location(s): Sludge is disposed of at an approved 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.

Narrative: This Fact Sheet details the determination of draft NPDES permit limits for an existing discharge of 0.654 MGD of treated sewage from a Municipal STP in Derry Borough, Westmoreland County.

Treatment permitted under Sewerage Permit no. 463S85 consists of the following: 3 primary clarifiers, 2 trickling filters, 2 biotowers, 2 secondary clarifiers, chlorine disinfection with a contact tank and dechlorination. Sludge is pressed and hauled off site.

1. Streamflow:

Conemaugh River at Tunnelton, PA (USGS gage 03044000):

Q_{7-10}:	277	cfs	(USGS StreamStats)
Drainage Area:	1358	sq. mi.	(USGS StreamStats)
Yieldrate:	0.2	cfsm	calculated

McGee Run at Outfall 001:

Yieldrate:	0.2	cfsm	calculated above
Drainage Area:	3.82	sq. mi.	(USGS StreamStats)
Q_{7-10}:	0.76	cfs	calculated

% of stream allocated: 100% Basis: No nearby discharges

2. Wasteflow:

Maximum discharge: 0.654 MGD = 1.01 cfs

Runoff flow period: 24 hours Basis: Runoff flow for a municipal STP

There is less than 3 parts stream flow (Q7-10) to 1 part effluent (design flow). However, since this is an existing discharge, the more stringent treatment requirements cannot be achieved, and the receiving stream is not impaired by the discharge, the standards in DEP guidance (391-2000-014) will not be applied. Flow will be required to be monitored as authorized under Chapter 92a.61, and as recommended in the SOP.

3. Parameters:

The following parameters were evaluated: pH, Total Suspended Solids, Fecal Coliform, Phosphorus, NH_3-N, $CBOD_5$, Dissolved Oxygen, and Total Residual Chlorine. NH_3-N, $CBOD_5$, and Dissolved Oxygen were evaluated using WQM 7.0 at the discharge point.

a. pH

Between 6.0 and 9.0 at all times

Basis: Application of Chapter 93.7 technology-based limits. The measurement frequency was previously set to 1/day as recommended in the SOP, based on Table 6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001), which will be retained.

b. Total Suspended Solids

Limits are 30 mg/l as a monthly average and 60 as an instantaneous maximum.

Basis: Application of Chapter 92a47 technology-based limits.

c. Fecal Coliform

05/01 - 09/30:	200/100ml	(monthly average geometric mean)
	1,000/100ml	(instantaneous maximum)
10/01 - 04/30:	2,000/100ml	(monthly average geometric mean)
	10,000/100ml	(instantaneous maximum)

Basis: Application of Chapter 92a47 technology-based limits

d. E. Coli

Monitoring was added for E. Coli at a frequency of 1/quarter.

Basis: Application of Chapter 92a.61 as recommended by the SOP.

d. Phosphorus

☐ Limit necessary due to:

☐ Discharge to lake, pond, or impoundment
☐ Discharge to stream

Basis: N/A

☒ Limit not necessary

Basis: Chapter 96.5 does not apply. However, the previous monitoring for Total Phosphorus will be retained in accordance with the SOP, based on Chapter 92a.61.

e. Total Nitrogen

The previous monitoring for Total Nitrogen will be retained in accordance with the SOP, based on Chapter 92a.61.

f. Ammonia-Nitrogen (NH_3-N)

Median discharge pH to be used:	6.9	Standard Units (S.U.)
		Basis: eDMR data
Discharge temperature:	25°C	(default value used in the absence of data)
Median stream pH to be used:	7.0	Standard Units (S.U.)
		Basis: default value used in the absence of data
Stream Temperature:	25˚C	(default value used for TSF modeling)
Background NH_3-N concentration:	0.1	mg/l
		Basis: Default value.
Calculated NH_3-N Summer limits:	2.8	mg/l (monthly average)
	5.6	mg/l (instantaneous maximum)
Calculated NH_3-N Winter limits:	8.4	mg/l (monthly average)
	16.8	mg/l (instantaneous maximum)

Result: WQ modeling resulted in the NH_3-N summer limits above (see Attachment 1). The winter limits are calculated as three times the summer limits. However, the previous limits are more restrictive and are attainable, so they will be retained.

g. $CBOD_5$

Median discharge pH to be used: 6.9 Standard Units (S.U.)

Basis: eDMR data

Discharge temperature: 25°C (default value used in the absence of data)

Median stream pH to be used: 7.0 Standard Units (S.U.)

Basis: default value used in the absence of data

Stream Temperature: 25˚C (default value used for TSF modeling)

Background $CBOD_5$ concentration: 2.0 mg/l

Basis: Default value

$CBOD_5$ Summer limits: 17.4 mg/l (monthly average)
34.8 mg/l (instantaneous maximum)

$CBOD_5$ Winter limits: 25.0 mg/l (monthly average)
50.0 mg/l (instantaneous maximum)

Result: WQ modeling resulted in the $CBOD_5$ summer limits above (see Attachment 1). The calculated summer limits are more restrictive than in the previous permit. However, since the new limits are attainable, they will be set without a compliance schedule. The winter limits are calculated as three times the summer limits, but since they would exceed the technology-based limits, the technology-based limits will be retained.

h. Dissolved Oxygen (DO)

- ☒ 4.0 mg/l - minimum desired in effluent to protect all aquatic life
- ☐ 5.0 mg/l - desired in effluent for CWF, WWF, or TSF
- ☐ 6.0 mg/l - minimum required due to discharge falling under guidance document 391-2000-014
- ☐ 8.0 mg/l - required due to discharge going to a naturally reproducing salmonid stream

Discussion: The technology-based minimum of 4.0 mg/l is recommended by the WQ Model (see Attachment 1) and the SOP based on Chapter 93.7, under the authority of Chapter 92a.61. The Dissolved Oxygen minimum of 6.0 mg/l will be retained with this renewal as it is attainable. The measurement frequency was previously set to 1/day as recommended in the SOP, based on Table 6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001), which will be retained.

i. Total Residual Chlorine (TRC)

☐ No limit necessary

Basis: N/A

☒ TRC limits: 0.1 mg/l (monthly average)
0.3 mg/l (instantaneous maximum)

Basis: The water quality-based TRC limits above were calculated using the TRC_Calc spreadsheet (see Attachment 2). Since the previous limits are the same, they will be retained. The measurement frequency was previously set to 1/day as recommended in the SOP, based on Table 6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001), which will be retained.

j. Influent Total Suspended Solids and BOD_5

Monitoring for these two parameters will be retained as recommended in the SOP for POTWs, and as authorized under Chapter 92a.61.

k. Anti-Backsliding

Since all the permit limits in this renewal are the same or more restrictive than the previous NPDES Permit, anti-backsliding is not applicable.

4. Reasonable Potential Analysis for Receiving Stream:

A Reasonable Potential Analysis was performed in accordance with State practices for Outfall 001 by the Department's Toxics Management Spreadsheet (see Attachment 3). Based on the spreadsheet, none of the parameters sampled in the renewal application will be required to be monitored or will be given limits.

Result: No WQBELs are necessary for this renewal.

5. Reasonable Potential for Downstream Public Water Supply (PWS):

The Reasonable Potential Analysis performed above does not calculate limits for parameters that are based on PWS criteria (TDS, Chloride, Bromide, and Sulfate). However, since the sample data was provided, mass-balance calculations were performed (see below).

Nearest Downstream potable water supply (PWS): Westmoreland County Municipal Authority
Distance downstream from the point of discharge: 30.0 miles (approximate)

PWS Evaluation:

Stream flow (sf) at the potable water supply intake = 274 cfs
Waste flow (wf) from the STP = 0.654 MGD = 1.01 cfs
Total flow = 275.01 cfs
Background Concentrations: No data available (assumed zero)

Mass balance for TDS at the potable water supply intake:
(sf @ PWS)(bkrd. conc.) + (wf)(x) = (tot. flow)(criteria)
(274 cfs)(0 mg/l) + (1.01 cfs)(x) = (275.01 cfs)(500 mg/l)

x = 136,143 mg/l (maximum from eDMR was 753 mg/l - ok)

Mass balance for Chlorides at the potable water supply intake:
(sf @ PWS)(bkrd. conc.) + (wf)(x) = (tot. flow)(criteria)
(274 cfs)(0 mg/l) + (1.01 cfs)(x) = (275.01 cfs)(250 mg/l)

x = 68,071 mg/l (maximum from eDMR was 335 mg/l - ok)

Mass balance for Bromide at the potable water supply intake:
(sf @ PWS)(bkrd. conc.) + (wf)(x) = (tot. flow)(criteria)
(274 cfs)(0 mg/l) + (1.01 cfs)(x) = (275.01 cfs)(1 mg/l)

x = 272 mg/l (maximum from eDMR was 1.102 mg/l - ok)

Mass balance for Sulfates at the potable water supply intake:

(sf @ PWS)(bkrd. conc.) + (wf)(x) = (tot. flow)(criteria)

(274 cfs)(0 mg/l) + (1.01 cfs)(x) = (275.01 cfs)(250 mg/l)

x = 68,071 mg/l (renewal application maximum was 36.7 mg/l - ok)

☒ No limits necessary

☐ Limits needed

Basis: Significant dilution available. The previous monitoring for TDS, Bromide, and Chloride will be retained with this renewal.

6. Flow Information:

94.2% of the wastewater flow comes from the Derry Borough. 5.8% of the wastewater flow comes from the Derry Township. All the sewers in the Derry Borough and Derry Township systems are separate sewers.

Among the residential wastewater received, the STP also receives wastewater from Tech Spec, a machine components manufacturer, two banks, a grocery store, and miscellaneous shops.

7. Attachment List:

Attachment 1 - WQ Modeling Printouts

Attachment 2 - TRC_Calc Spreadsheet

Attachment 3 - Toxics Management Spreadsheet

Attachment 4 - Open violations in efacts for client ID

(The Attachments above can be found at the end of this document)

Compliance History

DMR Data for Outfall 001 (from February 1, 2020 to January 31, 2021)

Parameter	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20	FEB-20
Flow (MGD) Average Monthly	0.623	0.771	0.452	0.362	0.419	0.511	0.522	0.361	0.548	0.794	0.883	1.053
Flow (MGD) Daily Maximum	1.948	2.339	1.601	1.145	1.389	2.877	3.056	0.507	0.960	1.756	3.276	2.434
pH (S.U.) Minimum	6.53	6.6	6.52	6.4	6.65	6.4	6.61	6.67	6.9	7.01	6.9	6.94
pH (S.U.) Maximum	7.35	7.5	7.33	7.42	7.55	7.58	7.55	7.34	7.39	7.47	7.81	7.63
DO (mg/L) Minimum	11.3	9.4	8.7	8.0	7.8	7.2	6.7	7.5	7.6	9.3	9.6	9.2
TRC (mg/L) Average Monthly	0.10	0.1	0.1	0.09	0.1	0.1	0.1	0.1	0.01	0.08	0.1	0.1
TRC (mg/L) Instantaneous Maximum	0.19	0.19	0.2	0.19	0.2	0.019	0.19	0.19	0.19	0.19	0.19	0.19
CBOD5 (lbs/day) Average Monthly	29	28	12	13	12	19	13	14	17	23	35	33
CBOD5 (lbs/day) Weekly Average	47	49	16	16	17	49	17	20	21	38	59	47
CBOD5 (mg/L) Average Monthly	6.0	5.0	4.0	5.0	3.0	5.0	4.0	5.0	4.0	4.0	5.0	4.0
CBOD5 (mg/L) Weekly Average	6.0	6.0	5.0	6.0	5.0	10.0	5.0	7.0	6.0	7.0	6.0	7.0
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	467	401	311	410	347	310	404	349	451	372	486	391
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	511	492	343	559	557	374	624	412	586	462	927	469
BOD5 (mg/L) Raw Sewage Influent Average Monthly	98	75	103	146	103	96	114	121	109	64	72	53
BOD5 (mg/L) Raw Sewage Influent Weekly Average	123	118	119	206	128	142	167	130	127	72	97	65
TSS (lbs/day) Average Monthly	26	31	15	14	22	26	18	15	21	29	34	40

TSS (lbs/day) Raw Sewage Influent Average Monthly	261	315	366	447	384	340	413	350	21	355	489	464
TSS (lbs/day) Raw Sewage Influent Daily Maximum	541	480	728	761	575	355	731	449	26	497	877	618
TSS (lbs/day) Weekly Average	39	62	16	17	40	59	28	16	26	36	49	59
TSS (mg/L) Average Monthly	5.0	5.0	5.0	5.0	6.0	7.0	5.0	5.0	5.0	5.0	5.0	5.0
TSS (mg/L) Raw Sewage Influent Average Monthly	55	61	122	159	111	105	112	122	5	62	81	71
TSS (mg/L) Raw Sewage Influent Weekly Average	122	130	248	280	128	144	130	158	5	92	164	138
TSS (mg/L) Weekly Average	5.0	5.0	5.0	5.0	12.0	12.0	5.0	5.0	5.0	5.0	5.0	5.0
Total Dissolved Solids (lbs/day) Average Monthly	2364	2417	905	868	1387	987	1185	888	1414	1706	2296	2655
Total Dissolved Solids (mg/L) Average Monthly	477	374	298	308	322	294	316	305	345	292	335	337
Total Dissolved Solids (mg/L) Daily Maximum	753	450	334	327	349	349	365	322	373	319	365	369
Fecal Coliform (CFU/100 ml) Geometric Mean	< 9	< 6	< 9	< 46	< 8	< 6	< 6	< 9	< 5	< 5	< 5	< 319
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	42	72	42	2442	43	10	10	106	5	5	5	12100
Total Nitrogen (mg/L) Daily Maximum		8.6										
Ammonia (lbs/day) Average Monthly	6.0	5.0	2.6	2.9	3.0	4.0	4.0	2.0	3.3	4.7	6.0	6.0
Ammonia (mg/L) Average Monthly	1.3	0.8	0.9	1.0	0.8	1.1	1.2	0.7	0.8	0.8	0.8	0.8
Ammonia (mg/L) Weekly Average	2.5	0.8	0.9	1.4	0.8	1.8	2.2	0.8	0.8	0.8	0.8	0.8
Total Phosphorus (mg/L) Daily Maximum		1.7										

Chloride (mg/L) Average Monthly	183	102	88	87	92	84	< 0.1	91	90	98	117	139
Chloride (mg/L) Daily Maximum	335	163	92	97	97	111	< 0.2	102	105	108	144	293
Bromide (mg/L) Average Monthly	< 0.351	< 0.1	< 0.1	< 0.141	0.128	< 0.1	98	< 0.1	0.2	< 0.2	< 0.3	< 0.1
Bromide (mg/L) Daily Maximum	1.102	< 0.1	< 0.1	0.265	0.241	< 0.2	106	< 0.1	0.2	< 0.5	< 0.5	< 0.1

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (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	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	6.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.1	XXX	0.3	1/day	Grab
CBOD5 Nov 1 - Apr 30	136	204	XXX	25.0	37.5	50	1/week	8-Hr Composite
CBOD5 May 1 - Oct 31	92	136	XXX	17.0	25.0	34	1/week	8-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	Report	XXX	1/week	8-Hr Composite
TSS	163	245	XXX	30.0	45.0	60	1/week	8-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	Report	XXX	1/week	8-Hr Composite
Total Dissolved Solids	Report	XXX	XXX	Report	Report Daily Max	XXX	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	XXX	XXX	XXX	Report Annual Avg	XXX	XXX	1/year	8-Hr Composite

Outfall 001, Continued (from 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		
Ammonia-Nitrogen Dec 1 - Apr 30	30.0	XXX	XXX	5.5	8.3	11	1/week	8-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	10.9	XXX	XXX	2.0	3.0	4	1/week	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report Annual Avg	XXX	XXX	1/year	8-Hr Composite
Chloride	XXX	XXX	XXX	Report	Report Daily Max	XXX	1/week	8-Hr Composite
Bromide	XXX	XXX	XXX	Report	Report Daily Max	XXX	1/week	8-Hr Composite

Compliance Sampling Location: at Outfall 001, after disinfection.

Flow is monitor only based on Chapter 92a.61. The limits for pH and Dissolved Oxygen are technology-based on Chapter 93.7. The limits for $CBOD_5$, Total Suspended Solids, and Fecal Coliforms are technology-based on Chapter 92a47. Monitoring for influent BOD5 and Total Suspended Solids is based on Chapter 92a.61. The limits for Ammonia-Nitrogen are water quality-based on Chapter 93.7. Monitoring for E. Coli, Total Nitrogen, Total Phosphorus, Chloride, and Bromide is based on Chapter 92a.61.

Attachment 1

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
18D	44716	McGEE 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)
7.900	Derry Borough	PA0020788	0.654	CBOD5	17.41		
				NH3-N	2.8	5.6	
				Dissolved Oxygen			4

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
18D	44716	McGEE RUN

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
7.900	0.654	25.000	6.940
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
15.507	0.552	28.068	0.207
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
10.78	0.948	1.60	1.029
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.826	6.824	Tsivoglou	5
Reach Travel Time (days)			
0.236			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.024	10.48	1.56	5.63
0.047	10.19	1.52	5.48
0.071	9.91	1.48	5.36
0.094	9.63	1.45	5.28
0.118	9.37	1.41	5.22
0.142	9.11	1.38	5.19
0.165	8.85	1.35	5.17
0.189	8.61	1.31	5.17
0.212	8.37	1.28	5.18
0.236	8.14	1.25	5.21

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	5		

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
18D	44716	McGEE RUN	**7.900**	1107.00	3.82	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	0.200	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	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
Derry Borough	PA0020788	0.6540	0.0000	0.0000	0.000	25.00	6.90

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	0.00	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
18D	44716	McGEE RUN	**7.100**	1094.00	7.25	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	0.200	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	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)
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 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
18D	44716	McGEE 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
7.900	Derry Borough	7.07	10.49	7.07	10.49	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
7.900	Derry Borough	1.38	2.8	1.38	2.8	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)		
7.90	Derry Borough	17.41	17.41	2.8	2.8	4	4	0	0

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
18D	44716	McGEE RUN

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												
7.900	0.76	0.00	0.76	1.0117	0.00308	.552	15.51	28.07	0.21	0.236	25.00	6.94
Q1-10 Flow												
7.900	0.49	0.00	0.49	1.0117	0.00308	NA	NA	NA	0.19	0.259	25.00	6.93
Q30-10 Flow												
7.900	1.04	0.00	1.04	1.0117	0.00308	NA	NA	NA	0.22	0.218	25.00	6.95

Attachment 2

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

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

Source	Reference	AFC Calculations		Reference	CFC Calculations	
TRC	1.3.2.iii	WLA afc =	0.259	1.3.2.iii	WLA cfc =	0.245
PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc =	0.581
PENTOXSD TRG	5.1b	LTA_afc=	0.096	5.1d	LTA_cfc =	0.142

Source		Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML MULT =	1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) =	0.119	AFC
		INST MAX LIMIT (mg/l) =	0.388	

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)**

Attachment 3

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Derry Borough STP** NPDES Permit No.: **PA0020788** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Municipal 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
0.654	100	6.9						

					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		337									
	Chloride (PWS)	mg/L		117									
	Bromide	mg/L		0.092									
	Sulfate (PWS)	mg/L		36.7									
	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		8									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L											
	Total Lead	µg/L		0.74									
	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		47									
	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 1.3, March 2021

Stream / Surface Water Information

Derry Borough STP, NPDES Permit No. PA0020788, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **McGee Run**

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	044716	7.9	1107	3.82			Yes
End of Reach 1	044716	7.1	1094	7.25			Yes

Q_{7-10}

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	7.9	0.2										100	7		
End of Reach 1	7.1	0.2													

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	7.9														
End of Reach 1	7.1														

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Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Derry Borough STP, NPDES Permit No. PA0020788, Outfall 001

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

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 2.678 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 6.94

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	24.6	Chem Translator of 0.96 applied
Total Lead	0	0		0	64.581	81.6	143	Chem Translator of 0.791 applied
Total Zinc	0	0		0	117.180	120	210	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 2.678 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 6.94

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	16.4	Chem Translator of 0.96 applied
Total Lead	0	0		0	2.517	3.18	5.58	Chem Translator of 0.791 applied
Total Zinc	0	0		0	118.139	120	210	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): 2.678 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	

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): 4.305 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	0.086	0.13	15.7	24.6	39.4	µg/L	15.7	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Lead	Report	Report	Report	Report	Report	µg/L	5.58	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	135	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)	N/A	N/A	PWS Not Applicable
Chloride (PWS)	N/A	N/A	PWS Not Applicable
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	N/A	N/A	PWS Not Applicable

Attachment 4

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

WATER MANAGEMENT SYSTEM
OPEN VIOLATIONS BY CLIENT

Client ID: 66183
Client: All

Open Violations: 1

CLIENT ID	CLIENT	INSP PROGRAM	PROGRAM SPECIFIC ID	INSP ID	VIOLATION ID	INSPECTION CATEGORY	VIOLATION DATE	VIOLATION CODE	VIOLATION	INSP REGION
66183	DERRY BORO MUNI AUTH WESTMORELAND CNTY	Pollution Prevention & Compliance Assistance	164849	2931826	861856	Clnt	09/11/2019	C3F	FAILURE TO TEST ALARM AND SHUTDOWN CAPABILITIES OR RESPOND TO ALARM AND SHUTDOWN EQUIPMENT FAILURES	SWRO