pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0037711**
Facility Type	**Municipal**	APS ID	**30580**
Major / Minor	**Minor**	Authorization ID	**1183397**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Everett Borough Area Municipal Authority Bedford County**	Facility Name	**Everett STP**
Applicant Address	100 Mechanic Street	Facility Address	183 Sewer Plant Road
	Everett, PA 15537-1177		Everett, PA 15537-1177
Applicant Contact	Kirk Feaster	Facility Contact	Kirk Feaster
Applicant Phone	(814) 652-9202	Facility Phone	(814) 652-9202
Client ID	87467	Site ID	249247
Ch 94 Load Status	Not Overloaded	Municipality	Everett Borough
Connection Status	No Limitations	County	Bedford
Date Application Received	May 15, 2017	EPA Waived?	No
Date Application Accepted	May 25, 2017	If No, Reason	Significant CB Discharge

Purpose of Application: This is an application for NPDES renewal

Summary of Review

Approve	Deny	Signatures	Date
X		Nicholas Hong, P.E. / Environmental Engineer Nick Hong (via electronic signature)	February 10, 2021
		Daniel W. Martin, P.E. / Environmental Engineer Manager	
		Maria Bebenek, P.E. / Environmental Program Manager	

Summary of Review

The application submitted by the applicant requests a NPDES renewal permit for the Everett Area Wastewater Treatment Plant located at 183 Sewer Plant Road, Everett, PA 15537 in Bedford County, municipality of Everett Borough. The existing permit became effective on December 1, 2012 and expired on November 30, 2017. The application for renewal was received by DEP Southcentral Regional Office (SCRO) on May 15, 2017. The processing of the NPDES renewal was delayed until the Consent Order and Agreement was executed.

The purpose of this Fact Sheet is to present the basis of information used for establishing the proposed NPDES permit effluent limitations. The Fact Sheet includes a description of the facility, a description of the facility's receiving waters, a description of the facility's attainment/non-attainment assessment status, and a description of any changes to the proposed monitoring/sampling frequency. Section 6 provides the justification for the proposed NPDES effluent limits derived from technology based effluent limits (TBEL), water quality based effluent limits (WQBEL), total maximum daily loading (TMDL), antidegradation, anti-backsliding, and/or whole effluent toxicity (WET). A brief summary of the outlined descriptions has been included in the Summary of Review section.

The subject facility is a 1.08 MGD (hydraulic design) treatment facility. The annual average flow for the facility is 0.87 MGD. The annual average flow rate is used to determine allowable mass loadings in NPDES permits. VIA the Consent Order and Agreement dated for February 4, 2021, the applicant shall make necessary upgrades to eliminate the SSOs and hydraulic overload conditions by January 31, 2026. The NPDES application has been processed as a Minor Sewage Facility (Level 2) due to the type of sewage and the design flow rate for the facility. The applicant disclosed the Act 14 requirement to Bedford County Commissioners, Bedford County Planning Commission, Borough of Everett, Borough of Everett Area Municipal Authority, Everett Borough Planning Commission, Borough of Everett Area Municipal Authority, and West Providence Township and the notice was received by the parties in April 2017. A planning approval letter was not necessary as the facility is neither new or expanding.

Utilizing the DEP's web-based Emap-PA information system, the receiving waters has been determined to be Raystown Branch Juniata River. The sequence of receiving streams that the Raystown Branch Juniata River discharges into are the Juniata River and the Susquehanna River which eventually drains into the Chesapeake Bay. The subject site is subject to the Chesapeake Bay implementation requirements. The receiving water has protected water usage for migratory fishes (MF) and trout stocking fishes (TSF). No Class A Wild Trout fisheries are impacted by this discharge. The absence of high quality and/or exceptional value surface waters removes the need for an additional evaluation of anti-degradation requirements.

Raystown Branch Juniata River is a Category 2 stream listed in the 2020 Integrated List of All Waters (formerly 303d Listed Streams). This stream is an attaining stream that supports aquatic life. The receiving waters is not subject to a total maximum daily load (TMDL) plan to improve water quality in the subject facility's watershed.

The existing permit and proposed permit differ as follows:

- **Due to the Chesapeake Bay Implementation Plan, the monitoring frequency for nitrogen species and phosphorus will be increased to 2x/wk.**
- **Monitoring will be required for total copper at least 1x/quarter.**

The designated Sludge/Biosolids disposal location is West Providence Township (Bedford County), LoJo Farm Field 32 (Bedford County), and LoJo Farm Field 13 (Bedford County) for agricultural utilization.

The proposed permit will expire five (5) years from the effective date.

Based on the review in this report, it is recommended that the permit be drafted. 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.
Any additional information or public review of documents associated with the discharge or facility may be available at PA

Summary of Review
DEP Southcentral Regional Office (SCRO), 909 Elmerton Avenue, Harrisburg, PA 17110. To make an appointment for file review, contact the SCRO File Review Coordinator at 717.705.4700.

1.0 Applicant

1.1 General Information

This fact sheet summarizes PA Department of Environmental Protection's review for the NPDES renewal for the following subject facility.

Facility Name: Everett Area Wastewater Treatment Plant

NPDES Permit # PA0037711

Physical Address: 183 Sewer Plant Road
Everett, PA 15537

Mailing Address: 100 Mechanic Street
Everett, PA 15537

Contact: Kirk Feaster
Manager
watersewer@embarqmail.com

Consultant: Kevin Nester
Project Engineer
GHD
321 Washington Street
Huntingdon, PA 16652
Kevin.nester@ghd.com

1.2 Permit History

Summarize SSO

Sanitary sewer overflows occur due to hydraulic overload conditions created by inflow and infiltration and are discharged through Outfall 004 (Bloody Run SSO) and the SSO 002 (at the WWTP).

A COA was signed on September 21, 2012 to address ongoing SSOs caused by inflow and infiltration. The COA required the elimination of the SSOs by October 31, 2018.

An amended COA was signed on September 9, 2014 to revise timelines for completion of corrective actions. The timelines were not revised in the amendment.

A superseded COA was signed on February 4, 2021. The COA requires the facility to eliminate the SSOs by January 31, 2026. Refer to the COA for the complete correction actions and time schedules.

The permit submittal included the following information.

- NPDES Application
- Flow Diagrams

Correspondence

- Consent Order and Agreement dated March 21, 2012
- Borough of Everett Area MA Letter dated May 7, 2019
- DEP Letter dated for July 3, 2019
- DEP Letter dated August 21, 2019

- Borough of Everett Area MA Letter dated September 15, 2019
- Consent Order and Agreement dated February 4, 2021

2.0 Treatment Facility Summary

2.1 Site location

The physical address for the facility is 183 Sewer Plant Road, Everett, PA 15537. A topographical and an aerial photograph of the facility are depicted as Figure 1 and Figure 2.

Figure 1: Topographical map of the subject facility

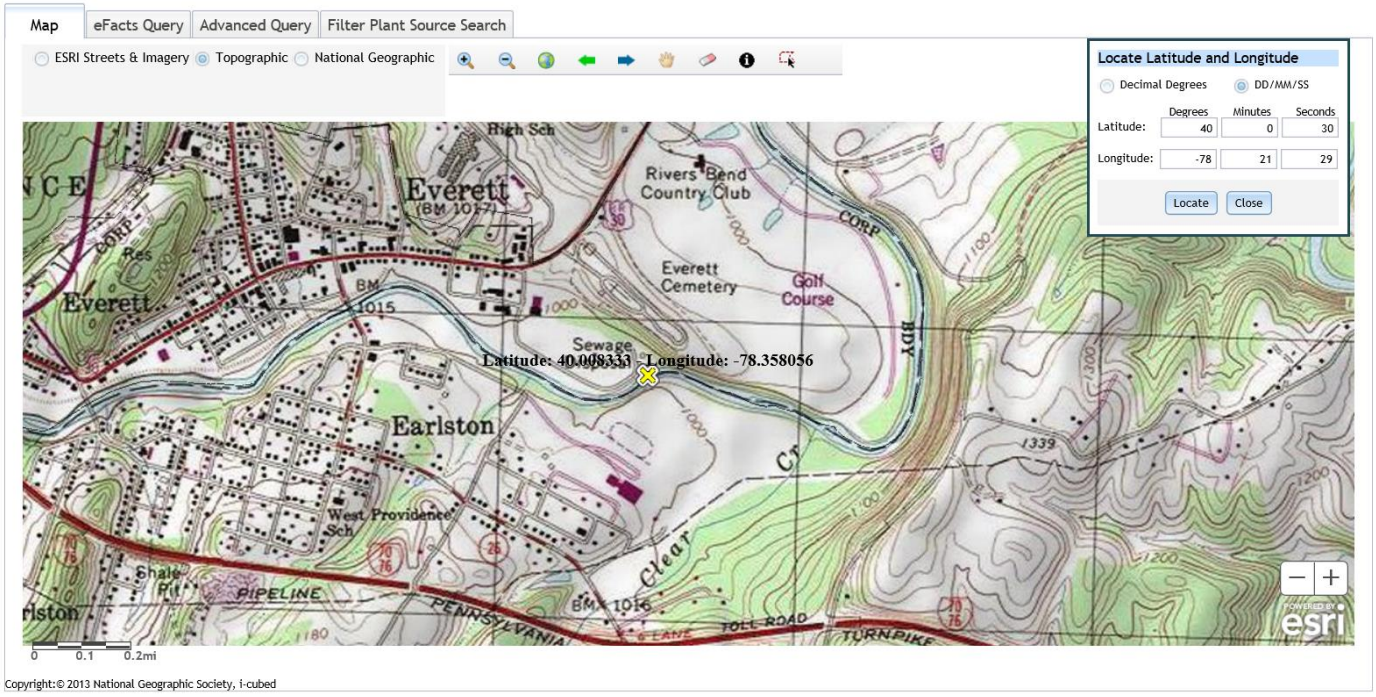
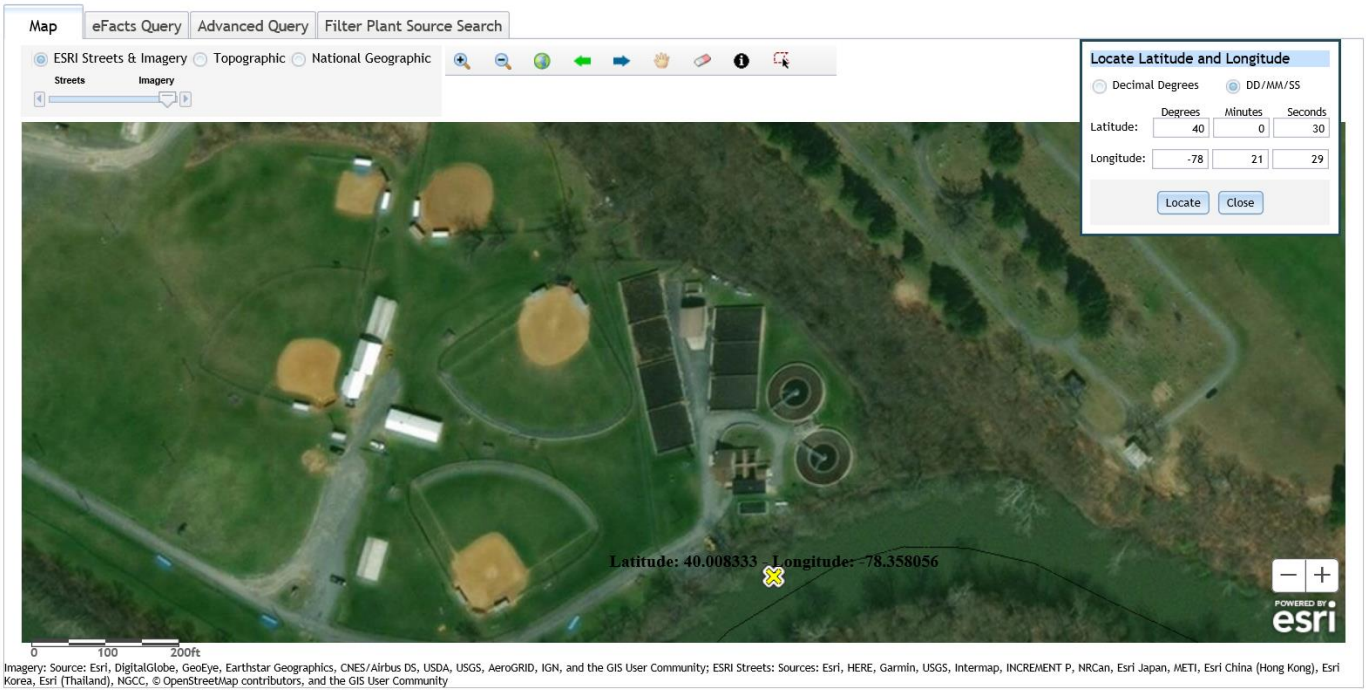


Figure 2: Aerial Photograph of the subject facility



2.1.2 Sources of Wastewater/Stormwater

The facility received contributions of flow from multiple municipalities and has contributions from an industrial user.

The following is a summary of municipalities served.

Municipalities Served	Flow Contribution	Population
Everett Borough	55%	1834
West Providence Township	45%	1742
Total	**100%**	**3576**

Industrial users

The facility has the following industrial users:

- Lampire Biological Laboratories with an average wastewater flow of 0.0024 MGD. Lampire is a business that prepares raw material blood, glands, tissues or organs.

Sanitary Sewer Overflow

The facility consists of two sanitary sewer outfalls. The table below summarizes the number of sanitary sewer overflows from 2012 to October 2020.

Number of Sanitary Sewer Overflows for SSO-002 (WWTP)

Month	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*
January	1	1	0	0	0	1	0	1	1
February	1	0	0	0	1	0	3	2	0
March	0	1	0	0	0	1	0	0	1
April	1	1	0	1	0	0	2	2	1
May	2	1	1	0	0	2	1	2	0
June	0	3	3	2	1	1	0	0	1
July	2	1	0	0	0	2	1	1	5
August	1	1	0	0	0	1	5	0	0
September	1	0	0	0	1	0	9	0	1
October	1	0	1	0	0	1	2	0	1
November	0	0	0	0	0	0	1	No data	No data
December	1	0	0	0	0	0	3	No data	No data
Total	***11***	***9***	***5***	***3***	***3***	***9***	***27***	***8***	***11***

Notes:

- Data for 2019 and 2020 abstracted from COA dated for February 4, 2021

Number of Sanitary Sewer Overflows for SSO-003 (Bloody Run PS)

Month	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	2019	2020
January	0	1	0	0	0	0	0	0	0
February	1	0	0	0	0	0	2	0	0
March	0	0	0	0	0	1	0	0	0
April	0	0	0	1	0	0	2	0	0
May	1	0	1	0	0	2	0	0	0
June	0	1	2	2	2	1	0	0	1
July	1	0	0	0	0	2	1	1	1
August	1	0	0	0	0	1	3	0	0
September	1	0	0	0	0	0	8	0	0
October	1	0	1	0	0	1	1	0	0
November	0	0	0	0	0	0	0	No data	No data
December	0	0	0	0	0	0	0	No data	No data
Total	***6***	***2***	***4***	***3***	***2***	**8**	**17**	**1**	**2**

Notes:

- Data for 2019 and 2020 abstracted from COA dated for February 4, 2021

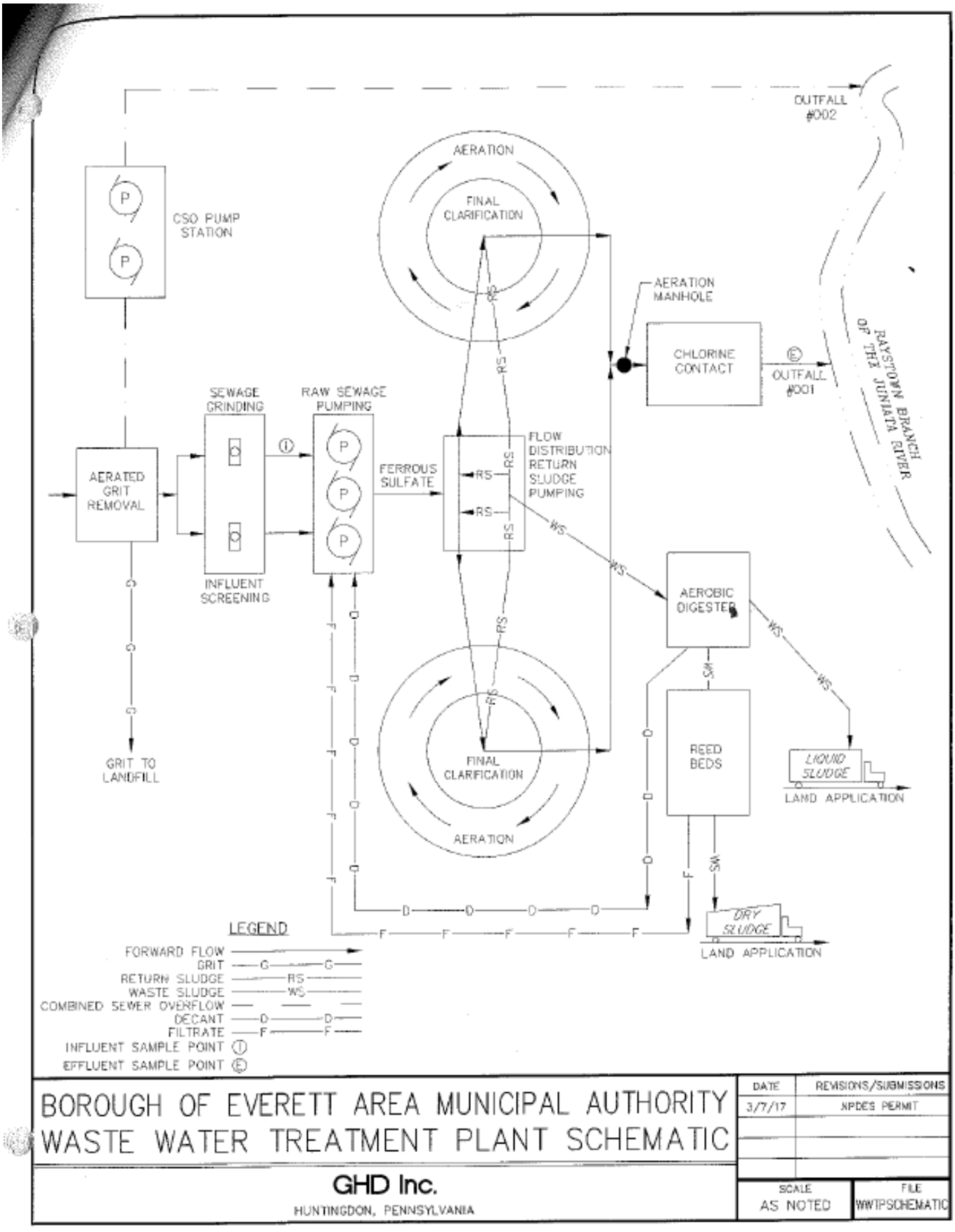
2.2 Description of Wastewater Treatment Process

The subject facility is a 1.08 MGD (hydraulic design capacity) design flow facility. The annual average design flow is 0.87 MGD. The subject facility treats wastewater using a Schreibers tank(s), a post aeration tank, a chlorine contact tank, an aerobic digester(s), and reed beds. The facility is being evaluated for flow, pH, dissolved oxygen, TRC, CBOD, TSS, fecal coliform, nitrogen species, and phosphorus. The existing permits limits for the facility is summarized in Section 2.4.

The treatment process is summarized in the table.

Treatment Facility Summary				
Treatment Facility Name: Everett STP				
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Counter Current	Gas Chlorine	0.87
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
1.08	1021	Not Overloaded		

A schematic of the process is shown in the figure.


OUTFALL #002
AERATION
FINAL CLARIFICATION
CSO PUMP STATION
AERATION MANHOLE
CHLORINE CONTACT
OUTFALL #001
RAYSTOWN BRANCH OF THE JUNIATA RIVER
SEWAGE GRINDING
RAW SEWAGE PUMPING
AERATED GRIT REMOVAL
FERROUS SULFATE
FLOW DISTRIBUTION RETURN SLUDGE PUMPING
INFLUENT SCREENING
AEROBIC DIGESTER
GRIT TO LANDFILL
REED BEDS
LIQUID SLUDGE
LAND APPLICATION
FINAL CLARIFICATION
AERATION
DRY SLUDGE
LAND APPLICATION
LEGEND
FORWARD FLOW
GRIT
RETURN SLUDGE
WASTE SLUDGE
COMBINED SEWER OVERFLOW
DECANT
FILTRATE
INFLUENT SAMPLE POINT
EFFLUENT SAMPLE POINT
BOROUGH OF EVERETT AREA MUNICIPAL AUTHORITY
WASTE WATER TREATMENT PLANT SCHEMATIC
GHD Inc.
HUNTINGDON, PENNSYLVANIA
DATE
REVISIONS/SUBMISSIONS
3/7/17
NPDES PERMIT
SCALE
AS NOTED
FILE
WWTPSCHEMATIC

2.3 Facility Outfall Information

The facility has the following outfall information.

Outfall No. 001 **Design Flow (MGD)** .87
Latitude 40º 0' 30.62" **Longitude** -78º 21' 29.17"
Wastewater Description: Effluent

The subject facility outfall is within the vicinity of another sewage/wastewater outfall. The downstream outfall is Snake Spring Township STP (PA0084077) which is about 6 miles from the subject facility.

2.3.1 Operational Considerations- Chemical Additives

Chemical additives are chemical products introduced into a waste stream that is used for cleaning, disinfecting, or maintenance and which may be detected in effluent discharged to waters of the Commonwealth. Chemicals excluded are those used for neutralization of waste streams, the production of goods, and treatment of wastewater.

The subject facility utilizes the following chemicals as part of their treatment process.

- Ferrous sulfate (Odophos) for phosphorus removal

2.4 Existing NPDES Permits Limits

The existing NPDES permit limits are summarized in the table.

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. A. For Outfall 001 , **Latitude** 40° 0' 30.61" , **Longitude** 78° 21' 29.16" , **River Mile Index** 81.99 , **Stream Code** 13349

Receiving Waters: Raystown Branch Juniata River

Type of Effluent: Sewage

1. The permittee is authorized to discharge during the period from December 1, 2012 through November 30, 2017.
2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements and Footnotes).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	181	290 Wkly Avg	XXX	25	40	50	1/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Total Suspended Solids	218	327 Wkly Avg	XXX	30	45	60	1/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	1/week	Grab
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	1/week	Grab
Total Phosphorus	15	XXX	XXX	2.0	XXX	4.0	1/week	24-Hr Composite

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): at Outfall 001

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. B. For Outfall 001 , **Latitude** 40° 0' 30.61" , **Longitude** 78° 21' 29.16" , **River Mile Index** 81.99 , **Stream Code** 13349

Receiving Waters: Raystown Branch Juniata River

Type of Effluent: Sewage

1. The permittee is authorized to discharge during the period from December 1, 2012 through November 30, 2017.

2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements and Footnotes).

Parameter [1]	Effluent Limitations					Monitoring Requirements	
	Mass Units (lbs)		Concentrations (mg/L)			Minimum [2] Measurement Frequency	Required Sample Type
	Monthly	Annual	Minimum	Monthly Average	Maximum		
Ammonia---N	Report	Report	XXX	Report	XXX	1/week	24-Hr Composite
Kjeldahl---N	Report	XXX	XXX	Report	XXX	1/week	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	1/week	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	1/week	24-Hr Composite
Net Total Nitrogen	Report	15,890	XXX	XXX	XXX	1/month	Calculation
Net Total Phosphorus	Report	2,119	XXX	XXX	XXX	1/month	Calculation

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): Outfall 001.

Footnotes:
(1) See Part C for Chesapeake Bay Requirements.
(2) This is the minimum number of sampling events required. Permittees are encouraged, and it may be advantageous in demonstrating compliance, to perform more than the minimum number of sampling events required.

3.0 Facility NPDES Compliance History

3.1 Summary of Inspections

A summary of the most recent inspections during the existing permit review cycle is as follows.

The DEP inspector noted the following during the inspection.

05/16/2013:

- The plant was recently approved to install a new vertical mechanical fine screen that will replace 1 of the 2 comminutors. The remaining comminutor will be used as a backup unit if needed. Both comminutors were in operation during inspection.
- The south Schreiber unit skimmer was rusted and corroded substantially. The weir contained solids. The facility stated that the scraper in the bottom of the unit does not function properly causing some sludge to remain on the bottom of the clarifier. The sludge denitrifies and was causing the floating solids in the weir. The facility stated they are planning to fix this issue as the weather becomes more dry and the north unit will be able to handle the load of the plant. Currently the facility will pump out the south unit and repair/replace the scraper.
- The chlorine contact tank had pin floc with some solids leaving in the effluent. The facility stated this is due to the south unit. When the unit is repaired this will eliminate the problem. The facility was advised to pump and clean solids from the chlorine contact tank.

05/06/2014:

- The North Schreiber clarifier had minor amount of algae and some minor pin-floc.
- The South Schreiber clarifier unit also had some algae and minor pin-floc. The skimmer appeared to be substantially rusted. The facility stated that a new skimmer will be installed once there is an opening with drier weather.
- The facility stated that they have been conducting smoke testing and have been removing I&I from the collection system which appeared to be aiding in reducing the occurrence of overflows from Outfall 002.

05/12/2015:

- Nothing significant to report

02/03/2016:

- The facility stated that they observed a sanitary sewer overflow at Outfall 002 and it was reported to the DEP.
- The chlorine contact was cloudy and had visible solids. Solids carryover from a portion of the clarifier in the North side of the Schreiber unit was noticed. The operator believes the solids loss is due to high flows entering the plant. The operator intends to retain the solids by temporarily shutting off the air the Schreiber unit and/or waste solids to the digester.
- The facility was advised to develop a High Flow Management Plan to mitigate solids loss during rain events.

05/26/2016:

- The facility stated that the solids washout in February 2016 was caused by a blockage in the conveyance line between the north side SBR and the post aeration tank. The facility decided to jet the line on a quarterly basis to prevent the possibility of the line clogging up in the future.
- The facility was advised that effluent composite samples should be flow proportional. The flow meter should be interfaced with composite sampler.
- The facility was advised that the monthly Chesapeake Bay nutrient report has been replaced with a new Annual Chesapeake Bay spreadsheet.

01/10/2017:

- Nothing significant to report

05/24/2017:

- The facility is currently servicing the fine screen and anticipates that it would be back in service in about 2 weeks. The unit needed a new basket and brushes.
- The facility replaced the metal scum baffles on both Schreiber tanks.
- One of the Schreiber units had the air line and diffuser replaced.
- The Borough is working on the SSO separation. The COA deadlines for the new sewer lines to be installed by December 15, 2017 and for the two SSOs to be eliminated by October 31, 2018.

10/01/2019:

- The influent comminutor was replaced with a standard bar screen. About half the influent flow goes through a fine screen and the remainder through the bar screen only.
- Collection systems repair under the COA were completed in 2017. Most lateral pipe repairs and replacement were completed but some still remain.
- COA required elimination of SSO for outfalls 002 and 004 by October 31, 2018. Several SSO discharges occurred from both outfalls since the deadline. SSO events occurred in September 2018, October 2018, April 2019, May 2019, and July 2019 due to heavy rain events.

12/24/2020:

- An administrative review of the annual Chesapeake Bay report was conducted. The facility was utilizing an older release of the Chesapeake Bay supplemental spreadsheet. The facility was advised to use a newer release of the supplemental form.

3.2 Summary of DMR Data

A review of approximately 1-year of DMR data shows that the monthly average flow data for the facility below the design capacity of the treatment system. The maximum average flow data for the DMR reviewed was 0.5233 MGD in April 2020. The hydraulic design capacity of the treatment system is 1.08 MGD.

DMR Data for Outfall 001 (from December 1, 2019 to November 30, 2020)

Parameter	NOV-20	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20	FEB-20	JAN-20	DEC-19
Flow (MGD) Average Monthly	0.3257	0.2881	0.3176	0.2822	0.3600	0.2844	0.3954	0.5233	0.4642	0.3695	0.4106	0.3286
Flow (MGD) Daily Maximum	0.9557	1.4355	1.0560	0.6715	1.1627	0.9275	1.1822	1.6657	1.5892	0.7771	1.5776	1.1036
pH (S.U.) Minimum	6.8	6.9	6.9	6.8	6.9	6.8	6.9	6.9	6.7	7.0	6.7	6.7
pH (S.U.) Maximum	7.3	7.4	7.3	7.4	7.3	7.3	7.3	7.3	7.3	7.2	7.3	7.3
DO (mg/L) Minimum	6.6	7.6	7.4	7.0	7.0	6.9	7.0	8.5	7.2	8.5	5.7	8.9
TRC (mg/L) Average Monthly	0.5	0.45	0.39	0.35	0.37	0.40	0.39	0.36	0.37	0.36	0.38	0.42
TRC (mg/L) Instantaneous Maximum	1.54	0.88	0.66	0.62	0.56	0.63	0.70	0.76	0.83	0.67	0.69	0.68
CBOD5 (lbs/day) Average Monthly	9.4	5.9	9.8	6.7	7.3	6.3	8.7	12.7	14.1	< 9.9	10.3	14.6
CBOD5 (lbs/day) Weekly Average	16.0	7.3	22.8	9.0	10.3	8.9	12.7	14.6	29.1	15.8	12.7	30.8
CBOD5 (mg/L) Average Monthly	4.1	3.0	3.2	< 3.0	3.0	3.2	< 3.1	3.5	4.1	< 3.6	< 3.56	4.2
CBOD5 (mg/L) Weekly Average	7.6	3.0	3.9	< 3.0	3.0	4.0	3.5	4.8	5.2	4.5	5.25	7.2
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	437	347	498	458	375	208	120	182	267	278	279	242
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	668	472	852	545	575	277	226	239	326	509	462	503
BOD5 (mg/L) Raw Sewage Influent Average Monthly	200	185	181	209	168	107	52	51	92	105	99	88
TSS (lbs/day) Average Monthly	12.5	6.7	13.4	6.9	7.4	4.7	4.8	13.9	10.9	< 4.5	< 7.2	15.5
TSS (lbs/day) Raw Sewage Influent Average Monthly	426	353	315	6.9	353	176	63	149	144	131	168	119

TSS (lbs/day) Raw Sewage Influent Daily Maximum	716	446	717	8.4	722	259	110	200	209	179	398	341
TSS (lbs/day) Weekly Average	17.4	9.6	28.2	8.4	13.7	10.1	6.8	19.0	25.7	5.6	10.3	44.2
TSS (mg/L) Average Monthly	5.5	3.6	4.3	3.1	2.9	2.4	1.8	4.0	3.2	< 1.7	< 2.60	3.7
TSS (mg/L) Raw Sewage Influent Average Monthly	193	184	109	3.1	152	88	25	39	52	50	65	42
TSS (mg/L) Weekly Average	8.2	5.6	11.0	3.6	4.0	5.6	2.0	6.4	4.8	2.0	4.40	5.2
Fecal Coliform (CFU/100 ml) Geometric Mean	74.1	10.0	9.7	11.6	14.9	20.3	12.1	9.9	18.4	43.2	17.4	8.6
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	2419.6	23.1	35.9	13.4	20.1	33.1	23.1	18.9	25.3	64.4	93.2	24.9
Nitrate-Nitrite (mg/L) Average Monthly	< 6.645	< 5.174	< 6.923	< 6.427	< 5.248	< 5.177	< 7.085	< 6.644	< 6.981	< 5.421	< 7.18	< 6.801
Nitrate-Nitrite (lbs) Total Monthly	< 482	< 307	< 575	< 432	< 396	< 305	< 609	< 791	< 770	< 416	< 679	< 813
Total Nitrogen (mg/L) Average Monthly	< 12.298	< 5.674	< 7.995	< 7.449	< 5.748	< 6.093	< 7.585	< 7.740	< 7.629	< 6.114	< 8.741	< 8.972
Total Nitrogen (lbs) Effluent Net Total Monthly	< 833	< 338	< 654	< 502	< 434	< 361	< 653	< 901	< 835	< 469	< 805	< 1036
Total Nitrogen (lbs) Total Monthly	< 833	< 338	< 654	< 502	< 434	< 361	< 653	< 901	< 835	< 469	< 805	< 1036
Total Nitrogen (lbs) Effluent Net Total Annual			< 1222									
Total Nitrogen (lbs) Total Annual			< 1222									
Ammonia (mg/L) Average Monthly	< 1.8510	< 0.1280	< 0.1000	< 0.1000	< 0.1000	< 0.1000	< 0.1000	< 0.5748	< 0.1850	< 0.1968	< 1.0678	< 1.406
Ammonia (lbs) Total Monthly	< 126	< 8	< 8.8	< 7	< 8	< 5.9	< 9	< 54	< 18.8	< 14	< 82	< 145
Ammonia (lbs) Total Annual			< 65									
TKN (mg/L) Average Monthly	< 5.6538	< 0.5000	< 1.072	1.0213	< 0.5000	< 0.916	< 0.5000	< 1.096	< 0.648	< 0.693	< 1.559	< 2.171

TKN (lbs) Total Monthly	< 351	< 30	< 79	70	< 38	< 56	< 44	< 110	< 65	< 53	< 126	< 224
Total Phosphorus (lbs/day) Average Monthly	1.7	1.9	4.8	3.0	3.3	2.6	2.2	4.0	3.2	2.2	1.8	3.16
Total Phosphorus (mg/L) Average Monthly	0.72	0.98	1.60	1.40	1.40	1.29	0.82	1.14	1.01	0.837	0.599	0.872
Total Phosphorus (lbs) Effluent Net Total Monthly	52	59	143	94	103	78	68	120	98	65	55	98
Total Phosphorus (lbs) Total Monthly	52	59	143	94	103	78	68	120	98	65	55	98
Total Phosphorus (lbs) Effluent Net Total Annual			150									
Total Phosphorus (lbs) Total Annual			150									

3.2.1 Chesapeake Bay Annual Nutrient Summary

The table below summarizes nitrogen and phosphorus loading on the Chesapeake Bay. The facility appears to be meeting the Chesapeake Bay TMDL cap loads.

The net effluent limits for 2019 are suspect. Upon reviewing the XLS, the net effluent limits were based upon 52 weeks rather than 365 days/yr. The facility was requested to re-submit a revision.

Chesapeake Bay Annual Nutrient Summary

Everett STP

PA0037711

Year for Truing Period (Oct 1 - Nov 28)	Net Effluent Limits		Compliant with Permit Limits (Yes/No)	
	Nitrogen (lbs)	Phosphorus (lbs)	Nitrogen	Phosphorus
	15,890	***2,119***		
2017	13,710	1,643	Yes	Yes
2018	15,417	1,700	Yes	Yes
2019	1747	185		
2020	8439	1036	Yes	Yes

Notes:

The net effluent limits for 2019 are suspect. Upon reviewing the XLS, the net effluent limits were based upon 52 weeks rather than 365 days/yr. The facility was requested to re-submit a revision.

3.3 Non-Compliance

3.3.1 Non-Compliance- NPDES Effluent

A summary of the non-compliance to the permit limits for the existing permit cycle is as follows.

From the DMR data beginning in December 1, 2012 to January 12, 2021, the table summarizes observed effluent non-compliances.

The table populates data subsequent to when the facility began using eDMR.

Summary of Non-Compliance with NPDES Effluent Limits
Beginning Date 12/01/2012 and Ending Date January 12, 2021

NON COMPLIANCE DATE	PARAMETER	SAMPLE VALUE	VIOLATION CONDITION	PERMIT VALUE	UNIT OF MEASURE	STATISTICAL BASE CODE
12/12/2015	Fecal Coliform	3300	>	1000	CFU/100 ml	Instantaneous Maximum
12/12/2015	Fecal Coliform	2000	>	1000	CFU/100 ml	Instantaneous Maximum
10/11/2016	Fecal Coliform	2419.6	>	1000	CFU/100 ml	Instantaneous Maximum
12/13/2016	Total Phosphorus	2.61	>	2.0	mg/L	Average Monthly
10/12/2017	Total Phosphorus	2.94	>	2.0	mg/L	Average Monthly
04/08/2018	Total Phosphorus	2.07	>	2.0	mg/L	Average Monthly
09/13/2018	Fecal Coliform	1553.1	>	1000	CFU/100 ml	Instantaneous Maximum
10/11/2018	Fecal Coliform	2966	>	1000	CFU/100 ml	Instantaneous Maximum

3.3.2 Non-Compliance- Enforcement Actions

A summary of the non-compliance enforcement actions for the current permit cycle is as follows:

No observed enforcement actions from the search beginning on December 1, 2012 to January 12, 2021.

3.4 Summary of Biosolids Disposal

A summary of the biosolids disposed of from the facility is as follows.

From the PAG-08 reporting form for biosolids in 2018, a total of 39.34 dry tons of sludge were applied to reed beds on-site at the wastewater treatment facility. The average volatile solids reduction was 40.3%.

No Sludge/Biosolids was reported disposed from January 2020 to November 2020.

The designated Sludge/Biosolids disposal location is West Providence Township (Bedford County), LoJo Farm Field 32 (Bedford County), and LoJo Farm Field 13 (Bedford County) for agricultural utilization.

3.5 Open Violations

The table summarizes open violations as of February 2021.

Summary of Open Violations

VIOLATION ID	VIOLATION DATE	VIOLATION CODE	VIOLATION
907276	02/04/2021	CSL201	CSL - Unauthorized, unpermitted discharge of sewage to waters of the Commonwealth
907277	02/04/2021	CSL201	CSL - Unauthorized, unpermitted discharge of sewage to waters of the Commonwealth

The facility entered into a Consent Order and Agreement on February 4, 2021. The SSOs shall be eliminated by January 31, 2026. Refer to the corrective actions in the COA for a complete schedule of milestones.

4.0 Receiving Waters and Water Supply Information Detail Summary

4.1 Receiving Waters

The receiving waters has been determined to be Raystown Branch Juniata River. The sequence of receiving streams that the Raystown Branch Juniata River discharges into are the Juniata River and the Susquehanna River which eventually drains into the Chesapeake Bay.

4.2 Public Water Supply (PWS) Intake

The closest PWS to the subject facility is Saxton Municipal Water Authority (PWS ID #4050021) located approximately 40.1 miles downstream of the subject facility on the Raystown Branch Juniata River. Based upon the distance and the flow rate of the facility, the PWS should not be impacted.

4.3 Class A Wild Trout Streams

Class A Wild Trout Streams are waters that support a population of naturally produced trout of sufficient size and abundance to support long-term and rewarding sport fishery. DEP classifies these waters as high-quality coldwater fisheries.

The information obtained from EMAP suggests that no Class A Wild Trout Fishery will be impacted by this discharge.

4.4 2020 Integrated List of All Waters (303d Listed Streams):

Section 303(d) of the Clean Water Act requires States to list all impaired surface waters not supporting uses even after appropriate and required water pollution control technologies have been applied. The 303(d) list includes the reason for impairment which may be one or more point sources (i.e. industrial or sewage discharges) or non-point sources (i.e. abandoned mine lands or agricultural runoff and the pollutant causing the impairment such as metals, pH, mercury or siltation).

States or the U.S. Environmental Protection Agency (EPA) must determine the conditions that would return the water to a condition that meets water quality standards. As a follow-up to listing, the state or EPA must develop a Total Maximum Daily Load (TMDL) for each waterbody on the list. A TMDL identifies allowable pollutant loads to a waterbody from both point and non-point sources that will prevent a violation of water quality standards. A TMDL also includes a margin of safety to ensure protection of the water.

The water quality status of Pennsylvania's waters uses a five-part categorization (lists) of waters per their attainment use status. The categories represent varying levels of attainment, ranging from Category 1, where all designated water uses are met to Category 5 where impairment by pollutants requires a TMDL for water quality protection.

The receiving waters is listed in the 2020 Pennsylvania Integrated Water Quality Monitoring and Assessment Report as a Category 2 waterbody. The surface waters is an attaining stream that supports aquatic life. The designated use has been classified as protected waters for migratory fishes (MF) and trout stocking fishes (TSF).

4.5 Low Flow Stream Conditions

Water quality modeling estimates are based upon conservative data inputs. The data are typically estimated using either a stream gauge or through USGS web based StreamStats program. The NPDES effluent limits are based upon the combined flows from both the stream and the facility discharge.

A conservative approach to estimate the impact of the facility discharge using values which minimize the total combined volume of the stream and the facility discharge. The volumetric flow rate for the stream is based upon the seven-day, 10-year low flow (Q710) which is the lowest estimated flow rate of the stream during a 7 consecutive day period that occurs once in 10 year time period. The facility discharge is based upon a known design capacity of the subject facility.

The closest WQN and gauge stations to the subject facility is the Raystown Branch Juniata River station at Saxton, PA (WQN223 or USGS station number 1562000). This WQN station is located approximately 38 miles downstream of the subject facility while the gauge station is located 38 miles downstream of the subject facility.

For WQM modeling, pH and stream water temperature data from the water quality network station was used. pH was estimated to be 8.0 and the stream water temperature was estimated to be 23.3 C.

The hardness was estimated from WQN as 96 mg/l.

The low flow yield and the Q710 for the subject facility was estimated as shown below.

Gauge Station Data		
USGS Station Number	1562000	
Station Name	Raystown Branch Juniata River at Saxton, PA	
Q710	67.1	ft^3/sec
Drainage Area (DA)	756	mi^2

Calculations

The low flow yield of the gauge station is:

Low Flow Yield (LFY) = Q710 / DA

LFY = (67.1 ft^3/sec / 756 mi^2)

LFY =	0.0888	$ft^3/sec/mi^2$

The low flow at the subject site is based upon the DA of 433 mi^2

Q710 = (LFY@gauge station)(DA@Subject Site)

Q710 = (0.0888 $ft^3/sec/mi^2$)(433 mi^2)

Q710 =	38.432	ft^3/sec

4.6.1 Summary of Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.87
Latitude	40Âº 0' 30.02"	Longitude	-78Âº 21' 28.86"
Quad Name		Quad Code	
Wastewater Description:	Effluent		

Receiving Waters	Raystown Branch Juniata River (TSF)	Stream Code	13349
NHD Com ID	65847407	RMI	79
Drainage Area	433	Yield (cfs/mi^2)	0.088
Q_{7-10} Flow (cfs)	38.4	Q_{7-10} Basis	StreamStats/StreamGauge
Elevation (ft)	1010	Slope (ft/ft)	
Watershed No.	11-C	Chapter 93 Class.	TSF, MF
Existing Use	Same as Chapter 93	Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	None
Assessment Status	Attaining Use(s) supports aquatic life		
Cause(s) of Impairment	Not appl.		
Source(s) of Impairment	Not appl.		
TMDL Status	Not appl.	Name	

Background/Ambient Data		Data Source
pH (SU)	8.0	WQN223; median July to Sept
Temperature (°C)	23.3	WQN223; median July to Sept
Hardness (mg/L)	96	WQN223; median historical
Other:		

Nearest Downstream Public Water Supply Intake		Saxton Municipal Authority	
PWS Waters	Raystown Branch Juniata River	Flow at Intake (cfs)	
PWS RMI	39	Distance from Outfall (mi)	40

4.6.2 Summary of Discharge, Receiving Waters and Water Supply Information

Outfall No.	002	Design Flow (MGD)	0
Latitude	40Âº 0' 29.15"	Longitude	-78Âº 21' 30.56"
Quad Name		Quad Code	
Wastewater Description:	Sanitary Sewer Overflow		

Receiving Waters	Raystown Branch Juniata River (TSF)	Stream Code	13349
NHD Com ID	65847407	RMI	79
Drainage Area		Yield (cfs/mi^2)	0.088
Q_{7-10} Flow (cfs)	38.4	Q_{7-10} Basis	StreamStats/StreamGauge
Elevation (ft)	1010	Slope (ft/ft)	
Watershed No.	11-C	Chapter 93 Class.	TSF, MF
Existing Use	Same as Chapter 93	Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	None
Assessment Status	Attaining Use(s) supports aquatic life		
Cause(s) of Impairment	Not appl.		
Source(s) of Impairment	Not appl.		
TMDL Status	Not appl.	Name	

Background/Ambient Data		Data Source
pH (SU)	8.0	WQN223; median July to Sept
Temperature (°C)	23.3	WQN223; median July to Sept
Hardness (mg/L)	96	WQN223; median historical
Other:		

Nearest Downstream Public Water Supply Intake		Saxton Municipal Authority	
PWS Waters	Raystown Branch Juniata River	Flow at Intake (cfs)	
PWS RMI	39	Distance from Outfall (mi)	40

4.6.3 Summary of Discharge, Receiving Waters and Water Supply Information

Outfall No.	003	Design Flow (MGD)	0
Latitude	40Âº 0' 35.95"	Longitude	-78Âº 22' 16.24"
Quad Name		Quad Code	
Wastewater Description:	Sanitary Sewer Overflow		

Receiving Waters	Bloody Run (WWF)	Stream Code	13349
NHD Com ID	65847385	RMI	79.76
Drainage Area		Yield (cfs/mi^2)	0.088
Q_{7-10} Flow (cfs)	38.4	Q_{7-10} Basis	StreamStats/StreamGauge
Elevation (ft)		Slope (ft/ft)	
Watershed No.	11-C	Chapter 93 Class.	TSF, MF
Existing Use	Same as Chapter 93	Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	None
Assessment Status	Impaired		
Cause(s) of Impairment	SILTATION		
Source(s) of Impairment	URBAN RUNOFF/STORM SEWERS		
TMDL Status	Not appl.	Name	

Background/Ambient Data		Data Source
pH (SU)	8.0	WQN223; median July to Sept
Temperature (°C)	23.3	WQN223; median July to Sept
Hardness (mg/L)	96	WQN223; median historical
Other:		

Nearest Downstream Public Water Supply Intake	Saxton Municipal Authority		
PWS Waters	Raystown Branch Juniata River	Flow at Intake (cfs)	
PWS RMI	39	Distance from Outfall (mi)	40

5.0: Overview of Presiding Water Quality Standards

5.1 General

There are at least six (6) different policies which determines the effluent performance limits for the NPDES permit. The policies are technology based effluent limits (TBEL), water quality based effluent limits (WQBEL), antidegradation, total maximum daily loading (TMDL), anti-backsliding, and whole effluent toxicity (WET) The effluent performance limitations enforced are the selected permit limits that is most protective to the designated use of the receiving waters. An overview of each of the policies that are applicable to the subject facility has been presented in Section 6.

5.2.1 Technology-Based Limitations

TBEL treatment requirements under section 301(b) of the Act represent the minimum level of control that must be imposed in a permit issued under section 402 of the Act (40 CFR 125.3). Available TBEL requirements for the state of Pennsylvania are itemized in PA Code 25, Chapter 92a.47.

The presiding sources for the basis for the effluent limitations are governed by either federal or state regulation. The reference sources for each of the parameters is itemized in the tables. The following technology-based limitations apply, subject to water quality analysis and best professional judgement (BPJ) where applicable:

Parameter	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)
	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
Total Suspended Solids	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)

5.2.2 Mass Based Limits

For publicly owned treatment works (POTW), mass loadings are calculated based upon design flow rate of the facility and the permit limit concentration. The generalized calculation for mass loadings is shown below:

$$Quantity\left(\frac{lb}{day}\right) = (MGD)(Concentration)(8.34)$$

5.3 Water Quality-Based Limitations

WQBEL are based on the need to attain or maintain the water quality criteria and to assure protection of designated and existing uses (PA Code 25, Chapter 92a.2). The subject facility that is typically enforced is the more stringent limit of either the TBEL or the WQBEL.

Determination of WQBEL is calculated by spreadsheet analysis or by a computer modeling program developed by DEP. DEP permit engineers utilize the following computing programs for WQBEL permit limitations: (1) MS Excel worksheet for Total Residual Chorine (TRC); (2) WQM 7.0 for Windows Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen Version 1.0 (WQM Model) and (3) PENTOXSD for Windows 2.0 (PENTOXSD) for Toxics pollutants.

5.3.1 Water Quality Modeling 7.0

The WQM Model is a computer model that is used to determine NPDES discharge effluent limitations for Carbonaceous BOD (CBOD5), Ammonia Nitrogen (NH3-N), and Dissolved Oxygen (DO) for single and multiple point source discharges scenarios. WQM Model is a complete-mix model which means that the discharge flow and the stream flow are assumed to instantly and completely mixed at the discharge node.

WQM recommends effluent limits for DO, CBOD5, and NH_3-N in mg/l for the discharge(s) in the simulation.

Four types of limits may be recommended. The limits are (a) a *minimum concentration for DO in the discharge as 30-day average; (b) a 30-day average concentration for CBOD5 in the discharge; (c) a 30-day average concentration for the NH_3-N in the discharge; (d) 24-hour average concentration for NH_3-N in the discharge*.

The WQM Model requires several input values for calculating output values. The source of data originates from either EMAP, the National Map, or Stream Stats. Data for stream gauge information, if any, was abstracted from USGS Low-Flow, Base-Flow, and Mean-Flow Regression Equations for Pennsylvania Streams authored by Marla H. Stuckey (Scientific Investigations Report 2006-5130).

The input values utilized for the modeling are summarized in the table which can be found in Attachment B.

The applicable WQM Effluent Limit Type are discussed in Section 6 under the corresponding parameter which is either DO, CBOD, or ammonia-nitrogen.

5.3.2 Toxics Modeling

The Toxics model is a computer model that is used to determine effluent limitations for toxics (and other substances) for single discharge wasteload allocations. This computer model uses a mass-balance water quality analysis that includes consideration for mixing, first-order decay, and other factors used to determine recommended water quality-based effluent limits. PENTOXSD does not assume that all discharges completely mix with the stream. The point of compliance with water quality criteria are established using criteria compliance times (CCTs). The available CCTs are either acute fish criterion (AFC), chronic fish criterion (CFC), or human health criteria (THH & CRL).

Acute Fish Criterion (AFC) measures the criteria compliance time as either the maximum criteria compliance time (i.e.15 minutes travel time downstream of the current discharge) or the complete mix time whichever comes first. AFC is evaluated at Q710 conditions.

Chronic Fish Criterion (CFC) measures the criteria compliance time as either the maximum criteria compliance time (i.e. 12 hours travel time downstream of the current discharge) or the complete mix time whichever comes first. CFC is evaluated at Q710 conditions.

Threshold Human Health (THH) measures the criteria compliance time as either the maximum criteria compliance time (i.e. 12 hours travel time downstream of the current discharge) or the estimated travel time downstream to the nearest potable water supply intake whichever comes first. THH is evaluated at Q710 conditions.

Cancer Risk Level (CRL) measures the criteria compliance time as either the maximum criteria compliance time (i.e. 12 hours travel time downstream of the current discharge) or the complete mix time whichever comes first. CRL is evaluated at Qh (harmonic mean or normal flow) conditions.

The PENTOXSD Model requires several input values for calculating output values. The source of data originates from either EMAP, the National Map, or Stream Stats. Data for stream gauge information, if any, was abstracted from USGS Low-Flow, Base-Flow, and Mean-Flow Regression Equations for Pennsylvania Streams authored by Marla H. Stuckey (Scientific Investigations Report 2006-5130).

The input values utilized for the modeling are summarized in the table which can be found in Attachment B.

5.3.3 Whole Effluent Toxicity (WET)

The facility is not subject to WETT.

5.3.2.1 Determining if NPDES Permit Will Require Monitoring/Limits in the Proposed Permit for Toxic Pollutants

To determine if toxics modeling is necessary, DEP has developed a Toxics Management Spreadsheet to identify toxics of concern. Toxic pollutants whose maximum concentrations as reported in the permit application or on DMRs are greater than the most stringent applicable water quality criterion are pollutants of concern. A Reasonable Potential Analysis was utilized to determine (a) if the toxic parameters modeled would require monitoring or (b) if permit limitations would be required for the parameters. The toxics reviewed for reasonable potential were total copper, total lead, and total zinc.

The sample data included in the NPDES reported total copper as 12.2 mg/l and total lead as <0.303 mg/l. The units were erroneously placed is mg/l. The corrected units is ug/l.

Due to laboratory sample detection limit results above that recommended by DEP, the facility was afforded the opportunity to re-sample. The laboratory results from the re-sample in June 2019 are as follows.

Summary of Re-Sampling Results

Parameter / Date	5/15/2019	5/22/2019	5/29/2019
Units	mg/l	mg/l	mg/l
Copper	<0.0100	0.0111	<0.0100
Hardness	175	209	163

Modeling recommends monitoring for Total Copper.

Based upon the SOP- Establishing Water Quality-Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants (Revised January 10, 2019), monitoring and/or limits will be established as follows.

(a) When reasonable potential is demonstrated, establish limits where the maximum reported concentration equals or exceeds 50% of the WQBEL.
(b) For non-conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 25% - 50% of the WQBEL.
(c) For conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 10% - 50% of the WQBEL.

The Toxics Management Spreadsheet output has been included in Attachment B.

5.4 Total Maximum Daily Loading (TMDL)

5.4.1 TMDL

The goal of the Clean Water Act (CWA), which governs water pollution, is to ensure that all of the Nation's waters are clean and healthy enough to support aquatic life and recreation. To achieve this goal, the CWA created programs designed to regulate and reduce the amount of pollution entering United States waters. Section 303(d) of the CWA requires states to assess their waterbodies to identify those not meeting water quality standards. If a waterbody is not meeting standards, it is listed as impaired and reported to the U.S. Environmental Protection Agency. The state then develops a plan to clean up the impaired waterbody. This plan includes the development of a Total Maximum Daily Load (TMDL) for the pollutant(s) that were found to be the cause of the water quality violations. A Total Maximum Daily Load (tmdl) calculates the maximum amount of a specific pollutant that a waterbody can receive and still meet water quality standards.

Pennsylvania has committed to restoring all impaired waters by developing TMDLs and TMDL alternatives for all impaired waterbodies. The TMDL serves as the starting point or planning tool for restoring water quality.

5.4.1.1 Local TMDL

The subject facility does not discharge into a local TMDL.

5.4.1.2 Chesapeake Bay TMDL Requirement

The Chesapeake Bay Watershed is a large ecosystem that encompasses approximately 64,000 square miles in Maryland, Delaware, Virginia, West Virginia, Pennsylvania, New York and the District of Columbia. An ecosystem is composed of interrelated parts that interact with each other to form a whole. All of the plants and animals in an ecosystem depend on each other in some way. Every living thing needs a healthy ecosystem to survive. Human activities affect the Chesapeake Bay ecosystem by adding pollution, using resources and changing the character of the land.

Most of the Chesapeake Bay and many of its tidal tributaries have been listed as impaired under Section 303(d) of the federal Water Pollution Control Act ("Clean Water Act"), 33 U.S.C. § 1313(d). While the Chesapeake Bay is outside the boundaries of Pennsylvania, more than half of the State lies within the watershed. Two major rivers in Pennsylvania are part of the Chesapeake Bay Watershed. They are (a) the Susquehanna River and (b) the Potomac River. These two rivers total 40 percent of the entire Chesapeake Bay watershed.

The overall management approach needed for reducing nitrogen, phosphorus and sediment are provided in the Bay TMDL document and the Phase I, II, and III WIPs which is described in the Bay TMDL document and Executive Order 13508.

The Bay TMDL is a comprehensive pollution reduction effort in the Chesapeake Bay watershed identifying the necessary pollution reductions of nitrogen, phosphorus and sediment across the seven Bay watershed jurisdictions of Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia and the District of Columbia to meet applicable water quality standards in the Bay and its tidal waters.

The Watershed Implementation Plans (WIPs) provides objectives for how the jurisdictions in partnership with federal and local governments will achieve the Bay TMDL's nutrient and sediment allocations.

Phase 3 WIP provides an update on Chesapeake Bay TMDL implementation activities for point sources and DEP's current implementation strategy for wastewater. The latest revision of the supplement was December 17, 2019.

The Chesapeake Bay TMDL (Appendix Q) categorizes point sources into four sectors:

- Sector A- significant sewage dischargers;
- Sector B- significant industrial waste (IW) dischargers;
- Sector C- non-significant dischargers (both sewage and IW facilities); and
- Sector D- combined sewer overflows (CSOs).

All sectors contain a listing of individual facilities with NPDES permits that were believed to be discharging at the time the TMDL was published (2010). All sectors with the exception of the non-significant dischargers have individual wasteload allocations (WLAs) for TN and TP assigned to specific facilities. Non-significant dischargers have a bulk or aggregate allocation for TN and TP based on the facilities in that sector that were believed to be discharging at that time and their estimated nutrient loads.

Based upon the supplement the subject facility has been categorized as a Sector A discharger. The supplement defines Sector A as a sewage facility that is considered significant if it has a design flow of at least 0.4 MGD. For rollout of its permitting strategy, DEP classified these facilities into three phases. Thirty IW facilities have individual WLAs in the TMDL.

Table 5 presents all NPDES permits for Significant Sewage dischargers with Cap Loads. The NPDES Permit No., phase, facility name, latest permit issuance date, expiration date, Cap Load compliance start date, TN and TP Cap Loads, and TN and TP Delivery Ratios are presented. In addition, if TN Offsets were incorporated into the TN Cap Loads when the permit was issued, the amount is shown; these Offsets will be removed from Cap Loads upon issuance of renewed permits to implement Section IV of the WIP document (i.e., a facility may use Offsets for compliance but may not register them as credits).

The total nitrogen (TN) and total phosphorus (TP) cap loads itemized by Table 5 for the subject facility are as follows:

TN Cap Load (lbs/yr)	15,980

TN Delivery Ratio	0.897
TP Cap Load (lbs/yr)	2,119
TP Delivery Ratio	0.436

Expansions by any Significant Sewage discharger will not result in any increase in Cap Loads. Where non-significant facilities expand to a design flow of 0.4 MGD or greater, the lesser of baseline Cap Loads of 7,306 lbs/yr TN and 974 lbs/yr TP or existing performance will be used for permits, and the load will be moved from the Non-Significant sector load to the Significant Sewage sector load. If considered necessary for environmental protection, DEP may decide to move load from the Point Source Reserve to the Significant Sewage sector in the future.

The minimum monitoring frequency for TN species and TP in new or renewed NPDES permits for Significant Sewage dischargers is 2/week.

This facility is subject to Sector A monitoring requirements. It is listed in Table 5 as a significant Chesapeake Bay contributor. Monitoring for nitrogen species and phosphorus has been recommended on a 2x/wk basis.

5.5 Anti-Degradation Requirement

Chapter 93.4a of the PA regulations requires that surface water of the Commonwealth of Pennsylvania may not be degraded below levels that protect the existing uses. The regulations specifically state that *Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected*. Antidegradation requirements are implemented through DEP's guidance manual entitled Water Quality Antidegradation Implementation Guidance (Document #391-0300-02).

The policy requires DEP to protect the existing uses of all surface waters and the existing quality of High Quality (HQ) and Exceptional Value (EV) Waters. Existing uses are protected when DEP makes a final decision on any permit or approval for an activity that may affect a protected use. Existing uses are protected based upon DEP's evaluation of the best available information (which satisfies DEP protocols and Quality Assurance/Quality Control (QA/QC) procedures) that indicates the protected use of the waterbody.

For a new, additional, or increased point source discharge to an HQ or EV water, the person proposing the discharge is required to utilize a nondischarge alternative that is cost-effective and environmentally sound when compared with the cost of the proposed discharge. If a nondischarge alternative is not cost-effective and environmentally sound, the person must use the best available combination of treatment, pollution prevention, and wastewater reuse technologies and assure that any discharge is nondegrading. In the case of HQ waters, DEP may find that after satisfaction of intergovernmental coordination and public participation requirements lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In addition, DEP will assure that cost-effective and reasonable best management practices for nonpoint source control in HQ and EV waters are achieved.

The subject facility's discharge will be to a non-special protection waters and the permit conditions are imposed to protect existing instream water quality and uses. Neither HQ waters or EV waters is impacted by this discharge.

5.6 Anti-Backsliding

Anti-backsliding is a federal regulation which prohibits a permit from being renewed, reissued, or modified containing effluent limitations which are less stringent than the comparable effluent limitations in the previous permit (40 CFR 122.l.1 and 40 CFR 122.l.2). A review of the existing permit limitations with the proposed permit limitations confirm that the facility is consistent with anti-backsliding requirements. The facility has proposed effluent limitations that are as stringent as the existing permit.

6.0 NPDES Parameter Details

The basis for the proposed sampling and their monitoring frequency that will appear in the permit for each individual parameter are itemized in this Section. The final limits are the more stringent of technology based effluent treatment (TBEL) requirements, water quality based (WQBEL) limits, TMDL, antidegradation, anti-degradation, or WET.

The reader will find in this section:

a) a justification of recommended permit monitoring requirements and limitations for each parameter in the proposed NPDES permit;
b) a summary of changes from the existing NPDES permit to the proposed permit; and
c) a summary of the proposed NPDES effluent limits.

6.1 Recommended Monitoring Requirements and Effluent Limitations

A summary of the recommended monitoring requirements and effluent limitations are itemized in the tables. The tables are categorized by (a) Conventional Pollutants and Disinfection, (b) Nitrogen Species and Phosphorus, and (c) Toxics.

6.1.1 Conventional Pollutants and Disinfection

Summary of Proposed NPDES Parameter Details for Conventional Pollutants and Disinfection Borough of Everett Area Municipal Authority, PA0037711			
Parameter	**Permit Limitation Required by[1]:**	**Recommendation**	
pH (S.U.)	TBEL	Monitoring:	The monitoring frequency shall be daily as a grab sample (Table 6-3).
		Effluent Limit:	Effluent limits may range from pH = 6.0 to 9.0
		Rationale:	The monitoring frequency has been assigned in accordance with Table 6-3 and the effluent limits assigned by Chapter 95.2(1).
Dissolved Oxygen	BPJ	Monitoring:	The monitoring frequency shall be daily as a grab sample (Table 6-3).
		Effluent Limit:	Effluent limits shall be greater than 5.0 mg/l.
		Rationale:	The monitoring frequency has been assigned in accordance with Table 6-3 and the effluent limits assigned by best professional judgement.
CBOD	TBEL	Monitoring:	The monitoring frequency shall be 1x/wk as a 24-hr composite sample (Table 6-3).
		Effluent Limit:	Effluent limits shall not exceed 25 mg/l as an average monthly and as 181 lbs/day as a monthly average.
		Rationale:	The monitoring frequency has been assigned in accordance with Table 6-3 and the effluent limits assigned by Chapter 92a.47(a)(1). WQM modeling indicates that the TBEL is more stringent than the WQBEL. Thus, the permit limit is confined to TBEL.
TSS	TBEL	Monitoring:	The monitoring frequency shall be 1/wk as a 24-hr composite sample (Table 6-3).
		Effluent Limit:	Effluent limits shall not exceed 30 mg/l as an average monthly and as 218 lbs/day as a monthly average.
		Rationale:	The monitoring frequency has been assigned in accordance with Table 6-3 and the effluent limits assigned by Chapter 92a.47(a)(1). While there is no WQM modeling for this parameter, the permit limit for TSS is generally assigned similar effluent limits as CBOD or BOD. Since the TBEL is more stringent than TBEL, TBEL will apply.
TRC	TBEL	Monitoring:	The monitoring frequency shall be on a daily basis as a grab sample (Table 6-3).
		Effluent Limit:	The average monthly limit should not exceed 0.5 mg/l and/or 1.6 mg/l as an instantaneous maximum.
		Rationale: Chlorine in both combined (chloramine) and free form is extremely toxic to freshwater fish and other forms of aquatic life (Implementation Guidance Total Residual Chlorine 1). The TRC effluent limitations to be imposed on a discharger shall be the more stringent of either the WQBEL or TBEL requirements and shall be expressed in the NPDES permit as an average monthly and instantaneous maximum effluent concentration (Implementation Guidance Total Residual Chlorine 4). Based on the stream flow rate (lowest 7-day flow rate in 10 years) and the design flow rate of the subject facility calculated by the TRC Evaluation worksheet, the TBEL is more stringent than the WQBEL. The monitoring frequency has been assigned in accordance with Table 6-3 and the effluent limits assigned by Chapter 92a.48(b)(2)	
Fecal Coliform	TBEL	Monitoring:	The monitoring frequency shall be 1x/wk as a grab sample (Table 6-3).
		Effluent Limit:	Summer effluent limits shall not exceed 200 mg/l as a geometric mean. Winter effluent limits shall not exceed 2000 mg/l as a geometric mean.
		Rationale:	The monitoring frequency has been assigned in accordance with Table 6-3 and the effluent limits assigned by Chapter 92a.47(a)(4) and 92a.47(a)(5).
Notes:			
1 The NPDES permit was limited by (a) anti-Backsliding, (b) Anti-Degradation, (c) SOP, (d) TBEL, (e) TMDL, (f) WQBEL, or (g) WET			
2 Monitoring frequency based on flow rate of 0.87 MGD.			
3 Table 6-3 (Self Monitoring Requirements for Sewage Discharges) in Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits) (Document # 362-0400-001) Revised 10/97			
4 Water Quality Antidegradation Implementaton Guidance (Document # 391-0300-002)			
5 Phase 2 Watershed Implementation Plan Wastewater Supplement, Revised September 6, 2017			

6.1.2 Nitrogen Species and Phosphorus

Summary of Proposed NPDES Parameter Details for Nitrogen Species and Phosphorus

Borough of Everett Area Municipal Authority, PA0037711

Parameter	Permit Limitation Required by[1]:	Recommendation	
Ammonia-Nitrogen	Cheapeake Bay TMDL	Monitoring:	The monitoring frequency shall be 2x/wk as an 24-hr composite sample
		Effluent Limit:	No effluent requirements. WQM modeling shows that amonia nitrogen will be greater than 15 mg/l. Limits greater than 15 mg/l do not require monitoring or limits.
		Rationale:	Due to the Chesapeake Bay Implementation Plan, the facility is required to be monitored on a frequency at 2x/wk basis.
Nitrate-Nitrite as N	Cheapeake Bay TMDL	Monitoring:	The monitoring frequency shall be 2x/wk as an 24-hr composite sample
		Effluent Limit:	No effluent requirements.
		Rationale:	Due to the Chesapeake Bay Implementation Plan, the facility is required to be monitored on a frequency at 2x/wk basis.
Total Nitrogen	Cheapeake Bay TMDL	Monitoring:	The monitoring frequency shall be 2x/wk.
		Effluent Limit:	No effluent requirements.
		Rationale:	Due to the Chesapeake Bay Implementation Plan, the facility will be monitored on a 2x/wk basis.
TKN	Cheapeake Bay TMDL	Monitoring:	The monitoring frequency shall be 2x/wk as an 24-hr composite sample
		Effluent Limit:	No effluent requirements.
		Rationale:	Due to the Chesapeake Bay Implementation Plan, the facility is required to be monitored on a frequency at 2x/wk basis.
Total Phosphorus	Antibacksliding	Monitoring:	The monitoring frequency shall be 2x/wk as an 24-hr composite sample
		Effluent Limit:	Effluent limits shall not exceed 2 mg/l as an average monthly and as 15 lbs/day as a monthly average.
		Rationale:	The concentration limit originated from the protection of Lake Raystown. It is being carried to the proposes permit due to antibacksliding.
Net Total Nitrogen	Chesapeake Bay TMDL	Monitoring:	The monitoring frequency shall be 1x/mo.
		Effluent Limit:	Mass loading is restricted to 15,890 lbs/yr.
		Rationale:	Annual mass loading is restricted by the Chesapeake Bay TMDL.
Net Phosphorus	Chesapeake Bay TMDL	Monitoring:	The monitoring frequency shall be 1x/mo.
		Effluent Limit:	Annual mass loading is restricted to 2,119 lbs/yr.
		Rationale:	Annual mass loading is restricted by the Chesapeake Bay TMDL.

Notes:

1 The NPDES permit was limited by (a) anti-Backsliding, (b) Anti-Degradation, (c) SOP, (d) TBEL, (e) TMDL, (f) WQBEL, or (g) WET

2 Monitoring frequency based on flow rate of 0.87 MGD.

3 Table 6-3 (Self Monitoring Requirements for Sewage Discharges) in Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits) (Document # 362-0400-001) Revised 10/97

4 Water Quality Antidegradation Implementaton Guidance (Document # 391-0300-002)

5 Phase 2 Watershed Implementation Plan Wastewater Supplement, Revised September 6, 2017

6.1.3 Toxics

6.1.3.2 Summary of Toxics Monitoring/Limits

Summary of Proposed NPDES Parameter Details for Toxics

Borough of Everett Area Municipal Authority, PA0037711

Parameter	Permit Limitation Required by[1]:	Recommendation	
Total Copper	WQBEL	Monitoring:	The monitoring frequency shall be 1x/quarter as a 24-hr composite sample (Table 6-3).
		Effluent Limit:	No effluent requirements.
		Rationale:	Toxics modeling suggests that monitoring be required. Pending favorable results from the sampling in the proposed permit, future renewals may reduce or eliminate the monitoring frequency.

Notes:

1 The NPDES permit was limited by (a) anti-Backsliding, (b) Anti-Degradation, (c) SOP, (d) TBEL, (e) TMDL, (f) WQBEL, or (g) WET

2 Monitoring frequency based on flow rate of 0.87 MGD.

3 Table 6-3 (Self Monitoring Requirements for Sewage Discharges) in Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits) (Document # 362-0400-001) Revised 10/97

4 Water Quality Antidegradation Implementaton Guidance (Document # 391-0300-002)

5 Phase 2 Watershed Implementation Plan Wastewater Supplement, Revised September 6, 2017

6.2 Summary of Changes From Existing Permit to Proposed Permit

A summary of how the proposed NPDES permit differs from the existing NPDES permit is summarized as follows.

Changes in Permit Monitoring or Effluent Quality

Parameter	Existing Permit	Draft Permit
Ammonia-Nitrogen	Monitoring is 1x/wk	Due to Chesapeake Bay WIP, monitoring shall be 2x/wk
Nitrate-Nitrite as N	Monitoring is 1x/wk	Due to Chesapeake Bay WIP, monitoring shall be 2x/wk
TKN	Monitoring is 1x/wk	Due to Chesapeake Bay WIP, monitoring shall be 2x/wk
Total Nitrogen	Monitoring is 1x/mo	Due to Chesapeake Bay WIP, monitoring shall be 2x/wk
Phosphorus	Monitoring is 1x/wk	Due to Chesapeake Bay WIP, monitoring shall be 2x/wk
Total Copper	No monitoring or effluent limits	Toxics modeling recommends monitoring. The monitoring frequency shall be 1x/quarter Based upon the sample results from the proposed renewal, the monitoring frequency may be decreased or eliminated in future renewals

6.3.1 Summary of Proposed NPDES Effluent Limits

The proposed NPDES effluent limitations are summarized in the table below.

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. A. For Outfall 001 , **Latitude** 40° 0' 30.62" , **Longitude** 78° 21' 29.17" , **River Mile Index** 79 , **Stream Code** 13349

Receiving Waters: Raystown Branch Juniata River (TSF)

Type of Effluent: Effluent

1. The permittee is authorized to discharge during the period from **Permit Effective Date** through **Permit Expiration Date**.
2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements and Footnotes).

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 Inst Min	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0 Inst Min	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	181	290	XXX	25	40	50	1/week	24-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Total Suspended Solids	218	327	XXX	30	45	60	1/week	24-Hr Composite
Total Suspended Solids 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

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	XXX	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Phosphorus	15	XXX	XXX	2.0	XXX	4	2/week	24-Hr Composite
Copper, Total	XXX	XXX	XXX	Report Avg Qrtly	XXX	XXX	1/quarter	24-Hr Composite

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

at Outfall 001

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. B. For Outfall 001, Latitude 40° 0' 30.62", Longitude 78° 21' 29.17", River Mile Index 79, Stream Code 13349

Receiving Waters: Raystown Branch Juniata River (TSF)

Type of Effluent: Effluent

1. The permittee is authorized to discharge during the period from **Permit Effective Date** through **Permit Expiration Date**.
2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements and Footnotes).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Ammonia--N	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Kjeldahl--N	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	2/week	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Net Total Nitrogen	Report	15890	XXX	XXX	XXX	XXX	1/month	Calculation
Net Total Phosphorus	Report	2119	XXX	XXX	XXX	XXX	1/month	Calculation

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

at Outfall 001

Footnotes:
(1) See Part C for Chesapeake Bay Requirements.

6.3.2 Summary of Proposed Permit Part C Conditions

The subject facility does not have Part C conditions.

- Chlorine Minimization
- Peak Flow Management Plan
- Hauled-In Waste Restrictions
- Chesapeake Bay Nutrient Definitions
- Solids Management for Non-Lagoon Treatment Systems
- Chesapeake Bay Nutrient Definitions
- Solids Management for Non-Lagoon Treatment Systems
- Monitoring/Sampling for SSO

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☒	PENTOXSD for Windows Model (see Attachment)
☐	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Toxics Screening Analysis Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
☐	Pennsylvania CSO Policy, 385-2000-011, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
☐	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
☐	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
☐	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 391-2000-019, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 391-2000-022, 3/1999.
☐	Design Stream Flows, 391-2000-023, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
☐	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☒	SOP: *New and Reissuance Sewage Individual NPDES Permit Applications, Revised, October 11, 2013*
☐	Other:

Attachment A

Stream Stats/Gauge Data

Table 1. List of U.S. Geological Survey streamgage locations in and near Pennsylvania with updated streamflow statistics.—Continued

[Latitude and Longitude in decimal degrees; mi², square miles]

Streamgage number	Streamgage name	Latitude	Longitude	Drainage area (mi²)	Regulated[1]
01561000	Brush Creek at Gapsville, Pa.	39.956	-78.254	36.8	N
01562000	Raystown Branch Juniata River at Saxton, Pa.	40.216	-78.265	756	N
01562500	Great Trough Creek near Marklesburg, Pa.	40.350	-78.130	84.6	N
01563200	Raystown Branch Juniata River below Rays Dam nr Huntingdon, Pa.	40.429	-77.991	960	Y
01563500	Juniata River at Mapleton Depot, Pa.	40.392	-77.935	2,030	Y
01564500	Aughwick Creek near Three Springs, Pa.	40.213	-77.925	205	N
01565000	Kishacoquillas Creek at Reedsville, Pa.	40.655	-77.583	164	N
01565700	Little Lost Creek at Oakland Mills, Pa.	40.605	-77.311	6.52	N
01566000	Tuscarora Creek near Port Royal, Pa.	40.515	-77.419	214	N
01566500	Cocolamus Creek near Millerstown, Pa.	40.566	-77.118	57.2	N
01567000	Juniata River at Newport, Pa.	40.478	-77.129	3,354	Y
01567500	Bixler Run near Loysville, Pa.	40.371	-77.402	15.0	N
01568000	Sherman Creek at Shermans Dale, Pa.	40.323	-77.169	207	N
01568500	Clark Creek near Carsonville, Pa.	40.460	-76.751	22.5	LF
01569000	Stony Creek nr Dauphin, Pa.	40.380	-76.907	33.2	N
01569800	Letort Spring Run near Carlisle, Pa.	40.235	-77.139	21.6	N
01570000	Conodoguinet Creek near Hogestown, Pa.	40.252	-77.021	470	LF
01570500	Susquehanna River at Harrisburg, Pa.	40.255	-76.886	24,100	Y
01571000	Paxton Creek near Penbrook, Pa.	40.308	-76.850	11.2	N
01571500	Yellow Breeches Creek near Camp Hill, Pa.	40.225	-76.898	213	N
01572000	Lower Little Swatara Creek at Pine Grove, Pa.	40.538	-76.377	34.3	N
01572025	Swatara Creek near Pine Grove, Pa.	40.533	-76.402	116	N
01572190	Swatara Creek near Inwood, Pa.	40.479	-76.531	167	N
01573000	Swatara Creek at Harper Tavern, Pa.	40.403	-76.577	337	N
01573086	Beck Creek near Cleona, Pa.	40.323	-76.483	7.87	N
01573160	Quittapahilla Creek near Bellegrove, Pa.	40.343	-76.562	74.2	N
01573500	Manada Creek at Manada Gap, Pa.	40.397	-76.709	13.5	N
01573560	Swatara Creek near Hershey, Pa.	40.298	-76.668	483	N
01574000	West Conewago Creek near Manchester, Pa.	40.082	-76.720	510	N
01574500	Codorus Creek at Spring Grove, Pa.	39.879	-76.853	75.5	Y
01575000	South Branch Codorus Creek near York, Pa.	39.921	-76.749	117	Y
01575500	Codorus Creek near York, Pa.	39.946	-76.755	222	Y
01576000	Susquehanna River at Marietta, Pa.	40.055	-76.531	25,990	Y
01576085	Little Conestoga Creek near Churchtown, Pa.	40.145	-75.989	5.82	N
01576500	Conestoga River at Lancaster, Pa.	40.050	-76.277	324	N
01576754	Conestoga River at Conestoga, Pa.	39.946	-76.368	470	N
01578310	Susquehanna River at Conowingo, Md.	39.658	-76.174	27,100	Y
01578400	Bowery Run near Quarryville, Pa.	39.895	-76.114	5.98	N
01580000	Deer Creek at Rocks, Md.	39.630	-76.403	94.4	N
01581500	Bynum Run at Bel Air, Md.	39.541	-76.330	8.52	N
01581700	Winters Run near Benson, Md.	39.520	-76.373	34.8	N
01582000	Little Falls at Blue Mount, Md.	39.604	-76.620	52.9	N
01582500	Gunpowder Falls at Glencoe, Md.	39.550	-76.636	160	Y
01583000	Slade Run near Glyndon, Md.	39.495	-76.795	2.09	N
01583100	Piney Run at Dover, Md.	39.521	-76.767	12.3	N

Table 2. Selected low-flow statistics for streamgage locations in and near Pennsylvania.—Continued

[ft³/s; cubic feet per second; —, statistic not computed; <, less than]

Streamgage number	Period of record used in analysis[1]	Number of years used in analysis	1-day, 10-year (ft³/s)	7-day, 10-year (ft³/s)	7-day, 2-year (ft³/s)	30-day, 10-year (ft³/s)	30-day, 2-year (ft³/s)	90-day, 10-year (ft³/s)
01546000	1912–1934	17	1.8	2.2	6.8	3.7	12.1	11.2
01546400	1986–2008	23	13.5	14.0	19.6	15.4	22.3	18.7
01546500	1942–2008	67	26.8	29.0	41.3	31.2	44.2	33.7
01547100	1969–2008	40	102	105	128	111	133	117
01547200	1957–2008	52	99.4	101	132	106	142	115
01547500	[2]1971–2008	38	28.2	109	151	131	172	153
01547500	[3]1956–1969	14	90.0	94.9	123	98.1	131	105
01547700	1957–2008	52	.5	.6	2.7	1.1	3.9	2.2
01547800	1971–1981	11	1.6	1.8	2.4	2.1	2.9	3.5
01547950	1970–2008	39	12.1	13.6	28.2	17.3	36.4	23.8
01548005	[2]1971–2000	25	142	151	206	178	241	223
01548005	[3]1912–1969	58	105	114	147	125	165	140
01548500	1920–2008	89	21.2	24.2	50.1	33.6	68.6	49.3
01549000	1910–1920	11	26.0	32.9	78.0	46.4	106	89.8
01549500	1942–2008	67	.6	.8	2.5	1.4	3.9	2.6
01549700	1959–2008	50	33.3	37.2	83.8	51.2	117	78.4
01550000	1915–2008	94	6.6	7.6	16.8	11.2	24.6	18.6
01551500	[2]1963–2008	46	520	578	1,020	678	1,330	919
01551500	[3]1901–1961	61	400	439	742	523	943	752
01552000	1927–2008	80	20.5	22.2	49.5	29.2	69.8	49.6
01552500	1942–2008	67	.9	1.2	3.1	1.7	4.4	3.3
01553130	1969–1981	13	1.0	1.1	1.5	1.3	1.8	1.7
01553500	[2]1968–2008	41	760	838	1,440	1,000	1,850	1,470
01553500	[3]1941–1966	26	562	619	880	690	1,090	881
01553700	1981–2008	28	9.1	10.9	15.0	12.6	17.1	15.2
01554000	[2]1981–2008	28	1,830	1,990	3,270	2,320	4,210	3,160
01554000	[3]1939–1979	41	1,560	1,630	2,870	1,880	3,620	2,570
01554500	1941–1993	53	16.2	22.0	31.2	25.9	35.7	31.4
01555000	1931–2008	78	33.5	37.6	58.8	43.4	69.6	54.6
01555500	1931–2008	78	4.9	6.5	18.0	9.4	24.3	16.6
01556000	1918–2008	91	43.3	47.8	66.0	55.1	75.0	63.7
01557500	1946–2008	63	2.8	3.2	6.3	4.2	8.1	5.8
01558000	1940–2008	69	56.3	59.0	79.8	65.7	86.2	73.7
01559000	1943–2008	66	104	177	249	198	279	227
01559500	1931–1958	28	9.3	10.5	15.0	12.4	17.8	15.8
01559700	1963–1978	16	.1	.1	.2	.1	.3	.2
01560000	1941–2008	68	8.5	9.4	15.6	12.0	20.2	16.2
01561000	1932–1958	27	.4	.5	1.6	.8	2.5	1.7
01562000	1913–2008	96	64.1	67.1	106	77.4	122	94.5
01562500	1931–1957	27	1.1	1.6	3.8	2.3	5.4	3.7
01563200	[2]1974–2008	35	—	—	—	112	266	129
01563200	[3]1948–1972	25	10.3	28.2	86.1	64.5	113	95.5
01563500	[2]1974–2008	35	384	415	519	441	580	493
01563500	[3]1939–1972	34	153	242	343	278	399	333
01564500	1940–2008	69	3.6	4.2	10.0	6.2	14.4	10.6

Attachment B
Modeling Input Values
WQM 7.0 Modeling Output Values
Toxics Management Spreadsheet Modeling Output Values

Master Input Sheet				
Borough of Everett Area Municipal Authority				
PA0037711				
October 2019				
General Data 1 (Modeling Point #1)	***Type***	***Default***	***Input Value***	***Units***
Stream Code	R		13349	
River Mile Index	R		79	miles
Elevation	R		993	feet
Latitude			40.008333	
Longitude			-78.358056	
Drainage Area	R		433	sq miles
Reach Slope	O		Default	ft/ft
Low Flow Yield	R	0.1	0.0888	cfs/sq mile
Potable Water Supply Withdrawal	O	0	Default	mgd
General Data 2 (Modeling Point #2)	***Type***	***Default***	***Input Value***	***Units***
Stream Code	R		13349	
River Mile Index	R		77.6	miles
Elevation	R		987	feet
Latitude			40.015903	
Longitude			-78.354043	
Drainage Area	R		451	sq miles
Reach Slope	O		Default	ft/ft
Low Flow Yield	R	0.1	0.0888	cfs/sq mile
Potable Water Supply Withdrawal	O	0	Default	mgd
General Data 3 (Modeling Point #3)	***Type***	***Default***	***Input Value***	***Units***
Stream Code	R		13349	
River Mile Index	R		75.66	miles
Elevation	R		979	feet
Latitude			40.011998	
Longitude			-78.331693	
Drainage Area	R		454	sq miles
Reach Slope	O		Default	ft/ft
Low Flow Yield	R	0.1	0.0888	cfs/sq mile
Potable Water Supply Withdrawal	O	0	Default	mgd
Hydrodynamic and Related Data	***Type***	***Default***	***Input Value***	***Units***
Tributary Flow	O		Default	cfs
Stream Flow	O		Default	cfs
Tributary Temperature	R	20	23.3	C
Tributary pH	R	7	8	pH units
Stream Temperature	O		Default	C
Stream pH	O		Default	pH Units
Hardness			96	mg/l

Discharge Data	*Type*	*Default*	*Input Value*	*Units*
Discharge Name	R		Everett STP	15 character
Permit Number	R		PA0037711	PA0000000
Existing Discharge Flow	R		0.87	mgd
Permitted Discharge Flow	R		0.87	mgd
Design Discharge Flow	R		0.87	mgd
Reserve Factor	O	0	Default	decimal percent
Discharge Temperature	R	25	25	C
Discharge pH	R	7	7.1	pH units
Discharge Hardness	R (Pentox)	100	182	mg/l

Parameter Data	*Type*	*Default*	*Input Value*	*Units*
CBOD				
Average Discharge Concentration	R	25	25	mg/l
Tributary Concentration	R	2	Default	mg/l
Stream Concentration	O		Default	mg/l
Discharge Deoxygenation Rate	R	1.5	Default	1/day
NH3-N				
Average Discharge Concentration	R	25	25	mg/l
Tributary Concentration	R	0	Default	mg/l
Stream Concentration	O		Default	mg/l
Stream Nitrification Rate	R	0.7	Default	1/day
DO				
Average Discharge Concentration	R	3	5	mg/l
Tributary Concentration	R	Calculated	Default	mg/l
Stream Concentration	O		Default	mg/l
Stream Reaeration Rate	O		Default	1/day
Tributary Saturation	R	90	Default	percent

Model Specifications	*Type*	*Default*	*Input Value*	*Units*
Parameters (DO/NH3-N)	R	Both	Both	NH3-N/DO/Both
WLA Method	R	EMPR	EMPR	UT/EMPR/DO
Use entered Q1-10 and Q30-10 data	R	Yes	Yes	Yes/No
Default Q1-10 /Q7-10 ratio	R	0.64	0.96	Dimensionless
Default Q30-10 / Q7-10 ratio	R	1.6	1.15	Dimensionless
Use input reach width/depth ratios	R	No	Default	Yes/No
Use input reach travel times	R	No	Default	Yes/No
Temperature Adjust Kr	R	Yes	Default	Yes/No
Default DO Goal	R	6	5	mg/l
Use Balanced Technology	R	Yes	Yes	Yes/No

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.1, October 2020

Discharge Information

Instructions | Discharge | Stream

Facility: **Borough of Everett Area MA** NPDES Permit No.: **PA0037711** Outfall No.: **001**

Evaluation Type **Major Sewage / Industrial Waste** Wastewater Description: **Sewage effluent**

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
0.87	182	7.1						

					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		444									
	Chloride (PWS)	mg/L		158									
	Bromide	mg/L		0.4									
	Sulfate (PWS)	mg/L		59.9									
	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		11.1									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L											
	Total Lead	µg/L	<	0.303									
	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		51									
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										
	Carbon Tetrachloride	µg/L	<										
	Chlorobenzene	µg/L											
	Chlorodibromomethane	µg/L	<										
	Chloroethane	µg/L	<										
	2-Chloroethyl Vinyl Ether	µg/L	<										

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Toxics Management Spreadsheet
Version 1.1, October 2020

Stream / Surface Water Information

Borough of Everett Area MA, NPDES Permit No. PA0037711, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Raystown Branch Juniata River**

No. Reaches to Model: **1**

- (●) Statewide Criteria
- ( ) Great Lakes Criteria
- ( ) ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi^2)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	013349	79	993	433			Yes
End of Reach 1	013349	75.66	979	454			Yes

$Q_{7\text{-}10}$

Location	RMI	LFY (cfs/mi^2)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	79	0.1										96	8		
End of Reach 1	75.66	0.1										96	8		

Q_h

Location	RMI	LFY (cfs/mi^2)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	79														
End of Reach 1	75.66														

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Toxics Management Spreadsheet
Version 1.1, October 2020

Model Results

Borough of Everett Area MA, NPDES Permit No. PA0037711, Outfall 001

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | ◉ All ○ Inputs ○ Results ○ Limits

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.161 Analysis Hardness (mg/l): 109.9 Analysis pH: 7.67

Pollutants	Stream Conc	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	14.689	15.3	94.7	Chem Translator of 0.96 applied
Total Lead	0	0		0	71.562	92.1	570	Chem Translator of 0.777 applied
Total Zinc	0	0		0	126.940	130	803	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): ###### PMF: 1 Analysis Hardness (mg/l): 98.593 Analysis pH: 7.92

Pollutants	Stream Conc	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	8.848	9.22	306	Chem Translator of 0.96 applied
Total Lead	0	0		0	2.478	3.12	104	Chem Translator of 0.793 applied
Total Zinc	0	0		0	116.729	118	3,927	Chem Translator of 0.986 applied

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

Pollutants	Stream Conc	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): ###### PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc	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	60.7	AFC	Discharge Conc > 10% WQBEL (no RP)

☐ ***Other Pollutants without Limits or Monitoring***

Attachment C

TRC Evaluation

Everett STP
PA0037711

February 2021

1A	B	C	D	E	F	G
2	**TRC EVALUATION**					
3	Input appropriate values in B4:B8 and E4:E7					
4	38.432	**= Q stream (cfs)**		0.5	**= CV Daily**	
5	1.08	**= Q discharge (MGD)**		0.5	**= CV Hourly**	
6	30	**= no. samples**		1	**= AFC_Partial Mix Factor**	
7	0.3	**= Chlorine Demand of Stream**		1	**= CFC_Partial Mix Factor**	
8	0	**= Chlorine Demand of Discharge**		15	**= AFC_Criteria Compliance Time (min)**	
9	0.5	**= BAT/BPJ Value**		720	**= CFC_Criteria Compliance Time (min)**	
	0	**= % Factor of Safety (FOS)**		0	**=Decay Coefficient (K)**	
10	Source	Reference	AFC Calculations		Reference	CFC Calculations
11	TRC	**1.3.2.iii**	WLA afc = 7.357		**1.3.2.iii**	WLA cfc = 7.165
12	PENTOXSD TRG	**5.1a**	LTAMULT afc = 0.373		**5.1c**	LTAMULT cfc = 0.581
13	PENTOXSD TRG	**5.1b**	LTA_afc= 2.741		**5.1d**	LTA_cfc = 4.165
14						
15	Source		Effluent Limit Calculations			
16	PENTOXSD TRG	5.1f	AML MULT = 1.231			
17	PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500		BAT/BPJ	
18			INST MAX LIMIT (mg/l) = 1.635			

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)**