

Application Type Renewal  
 Facility Type Non-Municipal  
 Major / Minor Minor

**NPDES PERMIT FACT SHEET  
INDIVIDUAL SEWAGE**

Application No. PA0082201  
 APS ID 1010963  
 Authorization ID 1420443

**Applicant and Facility Information**

|                           |   |                  |   |
|---------------------------|---|------------------|---|
| Applicant Name            | <u>The York Water Co.</u>                                   | Facility Name    | <u>Letterkenny Township STP</u>                               |
| Applicant Address         | <u>130 East Market Street</u><br><u>York, PA 17401-1219</u> | Facility Address | <u>10110 Cardinal Drive</u><br><u>Orrstown, PA 17244-9536</u> |
| Applicant Contact         | <u>Mark Wheeler</u>   | Facility Contact | <u>Vaughn Wenger</u>  |
| Applicant Phone           | <u>(717) 845-3601</u>                                       | Facility Phone   | <u>(717) 845-3601</u>   |
| Client ID                 | <u>69800</u>  | Site ID          | <u>623</u>  |
| Ch 94 Load Status         | <u>Projected Hydraulic Overload</u>                         | Municipality     | <u>Letterkenny Township</u>                                   |
| Connection Status         | <u>No Exceptions Allowed</u>                                | County           | <u>Franklin</u>   |
| Date Application Received | <u>December 1, 2022</u>                                     | EPA Waived?      | <u>Yes</u>  |
| Date Application Accepted | <u>December 15, 2022</u>                                    | If No, Reason    | <u></u>   |
| Purpose of Application    | <u>This is an application for NPDES renewal.</u>            |                  |   |

| Approve | Deny | Signatures   | Date             |
|---------|------|--|------------------|
| X       |      | Nicholas Hong, P.E. / Environmental Engineer<br>Nick Hong (via electronic signature) | February 1, 2024 |
| x       |      | Daniel W. Martin, P.E. / Environmental Engineer Manager<br>Maria D. Bebenek for      | February 1, 2024 |
| x       |      | Maria D. Bebenek, P.E. / Environmental Program Manager<br>Maria D. Bebenek           | February 1, 2024 |

### Summary of Review

The application submitted by the applicant requests a NPDES renewal permit for the The York Water Company- Letterkenny located at 10110 Cardinal Drive, Orrstown, PA 17244 in Franklin County, municipality of Letterkenny. The existing permit became effective on June 1, 2018 and expired on May 31, 2023. The application for renewal was received by DEP Southcentral Regional Office (SCRO) on December 1, 2022.

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 receiving waters 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 0.042 MGD treatment facility. The applicant does not anticipate any proposed upgrades to the treatment facility in the next five years. The NPDES application has been processed as a Minor Sewage Facility (Level 1) due to the type of sewage and the design flow rate for the facility. USPS tracking showed that the applicant disclosed the Act 14 requirement and the notice was received by the parties on November 22, 2022. A copy of the letter was not included in the NPDES renewal application. 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 the Conodoguinet Creek. The sequence of receiving streams that the Conodoguinet Creek discharges into 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 warm water fishes (WWF) and migratory fishes (MF). 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.

The Conodoguinet Creek is a Category 2 stream listed in the 2022 Integrated List of All Waters (formerly 303d Listed Streams). This stream is an attaining stream that supports aquatic life and recreational uses. 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 EPA Triennial review, monitoring shall be required for E. Coli.**

Sludge use and disposal description and location(s): Biosolids/sewage sludge disposed by Pecks Septic Service at South Middleton, Cumberland County under PAG-08-3532 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 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: The York Water Company- Letterkenny Township

NPDES Permit # PA0082201

Physical Address: 10110 Cardinal Drive  
Orrstown, PA 17244

Mailing Address: 130 East Market Street  
York, PA 17401

Contact: Mark Wheeler  
Chief Operating Officer  
[markw@yorkwater.com](mailto:markw@yorkwater.com)

Vaughn Wenger  
Wastewater Services Superintendent  
vaughnw@yorkwater.com

Consultant: There was not a consultant utilized for this NPDES renewal.

### **1.2 Permit History**

The WQM permit issued on September 8, 2021 permitted the relocation of the outfall. Aeration within the polishing tank produced water level disturbances resulting in inaccurate flow measurements. As a result, a new 4 ft.-diameter dedicated metering manhole was installed downstream of the UV disinfection system.

The outfall location was placed approximately 300 feet from the previous outfall. The discharge is to the Conodoguinet Creek.

Permit submittal included the following information.

- NPDES Application
- Effluent Sample Data

## **2.0 Treatment Facility Summary**

### **2.1.1 Site location**

The physical address for the facility is 10110 Cardinal Drive, Orrstown, PA 17244. 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

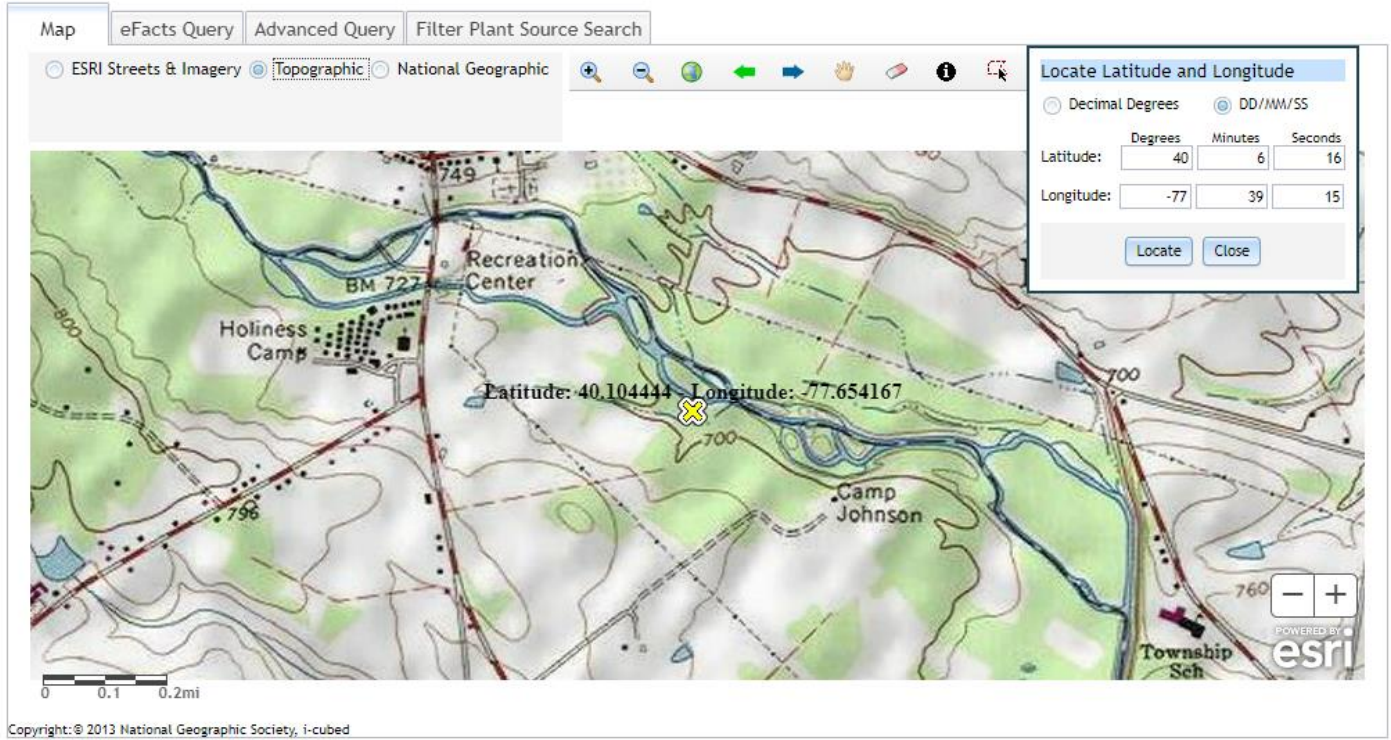
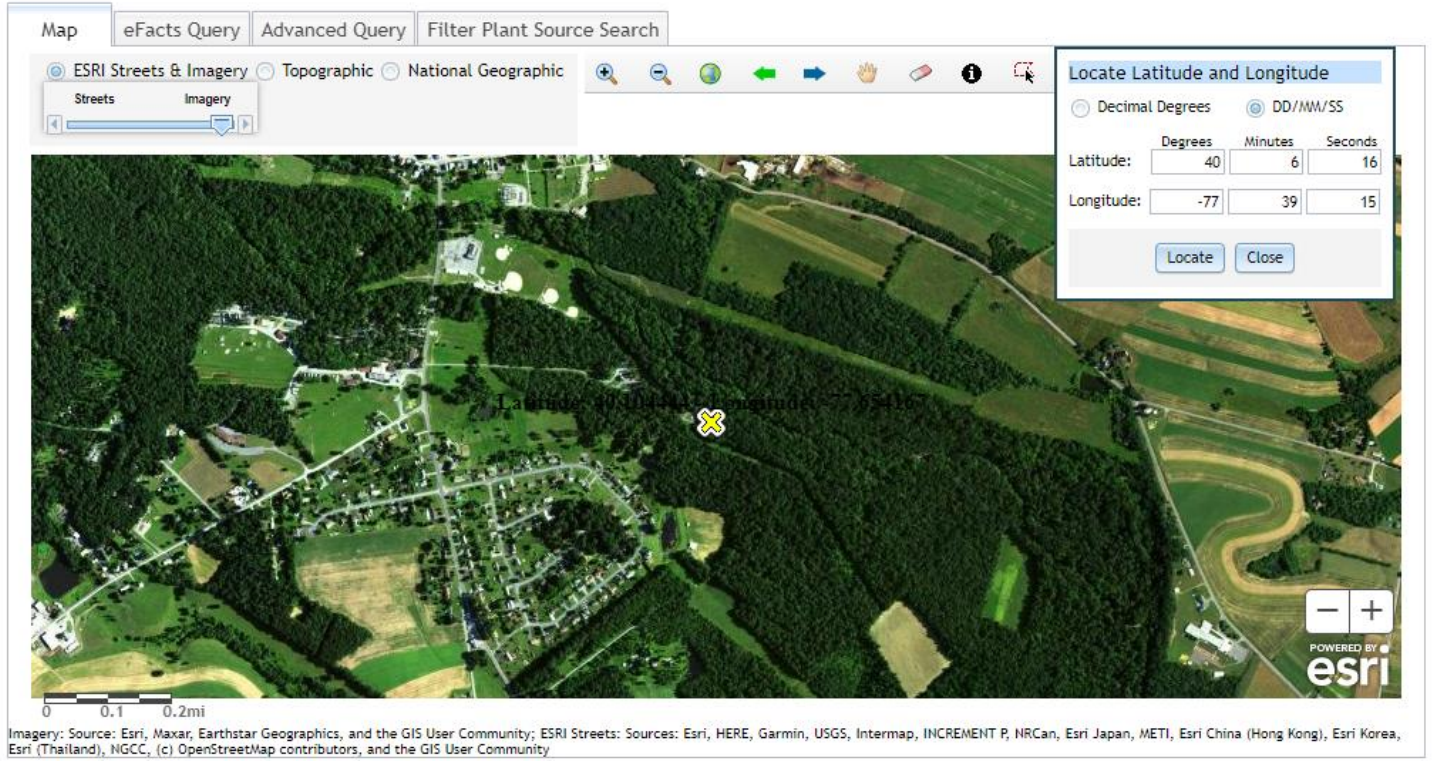


Figure 2: Aerial Photograph of the subject facility



**2.1.2 Sources of Wastewater/Stormwater**

The treatment plant receives 100% of their wastewater from Letterkenny Township.

**2.2 Description of Wastewater Treatment Process**

The subject facility is a 0.042 MGD design flow facility. The subject facility treats wastewater using a bar screen/comminutor, an equalization tank, an aeration tank, a clarifier, reaeration, and an UV system for disinfection prior to discharge through the outfall to Conodoguinet Creek. The facility is being evaluated for flow, pH, dissolved oxygen, UV, CBOD5, 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                               |                                     |                              |                            |                               |
|--|-------------------------------------|------------------------------|----------------------------|-------------------------------|
| <b>Treatment Facility Name:</b> Letterkenny Township STP |                                     |                              |                            |                               |
| <b>WQM Permit No.</b>                                    | <b>Issuance Date</b>                |                              |                            |                               |
| 2895401 T-1  | 12/4/2020                           |                              |                            |                               |
| 2895401 A-1  | 05/18/2018                          |                              |                            |                               |
| 2895401 A-3  | 9/8/2021                            |                              |                            |                               |
| <b>Waste Type</b>  | <b>Degree of Treatment</b>          | <b>Process Type</b>          | <b>Disinfection</b>        | <b>Avg Annual Flow (MGD)</b>  |
| Sewage   | Secondary With Phosphorus Reduction | Extended Aeration            | Ultraviolet                | 0.042                         |
| <b>Hydraulic Capacity (MGD)</b>                          | <b>Organic Capacity (lbs/day)</b>   | <b>Load Status</b>           | <b>Biosolids Treatment</b> | <b>Biosolids Use/Disposal</b> |
| 0.042  | 82                                  | Projected Hydraulic Overload |                            | Combination of methods        |

**2.3 Facility Outfall Information**

The facility has the following outfall information for wastewater.

|                                |                        |                          |                        |
|--------------------------------|------------------------|--------------------------|------------------------|
| <b>Outfall No.</b>             | <u>001</u>             | <b>Design Flow (MGD)</b> | <u>.042</u>            |
| <b>Latitude</b>                | <u>40° 6' 16.00"</u>   | <b>Longitude</b>         | <u>-77° 39' 15.00"</u> |
| <b>Wastewater Description:</b> | <u>Sewage Effluent</u> |                          |                        |

The subject facility outfall is within the vicinity of another sewage/wastewater outfall. An outfall upstream of the subject facility is the Roxbury Holiness Camp. Inc. (PA0082511) which is about 0.7 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.

- Aluminum sulfate for clarification and phosphorus removal
- Soda ash for alkalinity

**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. B. For Outfall 001, Latitude 40° 6' 16.00", Longitude 77° 39' 15.00", River Mile Index 82.15, Stream Code 10194

Receiving Waters: Conodoguinet Creek

Type of Effluent: Sewage Effluent

1. The permittee is authorized to discharge during the period from **June 1, 2019** through **May 31, 2023**.
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) <sup>(1)</sup> |                  | Concentrations (mg/L) |                 |                |                  | Minimum <sup>(2)</sup> Measurement Frequency | Required Sample Type |
|   | Average Monthly                     | Weekly Average   | Daily 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                   | XXX             | 9.0 Daily Max  | XXX              | 1/day  | Grab                 |
| Dissolved Oxygen                                  | XXX                                 | XXX              | 5.0                   | XXX             | XXX            | XXX              | 1/day  | Grab                 |
| Ultraviolet light intensity (mW/cm <sup>2</sup> ) | XXX                                 | XXX              | Report                | XXX             | XXX            | XXX              | 1/day  | Recorded             |
| Carbonaceous Biochemical Oxygen Demand (CBOD5)    | 8.8                                 | 14               | XXX                   | 25.0            | 40.0           | 50               | 2/month                                      | 24-Hr Composite      |
| Total Suspended Solids                            | 10.5                                | 15.7             | XXX                   | 30.0            | 45.0           | 60               | 2/month                                      | 24-Hr Composite      |
| Fecal Coliform (No./100 ml) Oct 1 - Apr 30        | XXX                                 | XXX              | XXX                   | 2000 Geo Mean   | XXX            | 10000            | 2/month                                      | Grab                 |
| Fecal Coliform (No./100 ml) May 1 - Sep 30        | XXX                                 | XXX              | XXX                   | 200 Geo Mean    | XXX            | 1000             | 2/month                                      | Grab                 |
| Ammonia-Nitrogen Nov 1 - Apr 30                   | 8.4                                 | XXX              | XXX                   | 24.0            | XXX            | XXX              | 2/month                                      | 24-Hr Composite      |
| Ammonia-Nitrogen May 1 - Oct 31                   | 2.8                                 | XXX              | XXX                   | 8.0             | XXX            | 16               | 2/month                                      | 24-Hr Composite      |
| Total Phosphorus                                  | Report                              | XXX              | XXX                   | Report          | XXX            | XXX              | 2/month                                      | 24-Hr Composite      |

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

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

I. C. For Outfall 001, Latitude 40° 6' 16.00", Longitude 77° 39' 15.00", River Mile Index 82.15, Stream Code 10194

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| Parameter  | Effluent Limitations                |               |                       |                 |                  |                  | Monitoring Requirements                      |                      |
|--|-------------------------------------|---------------|-----------------------|-----------------|------------------|------------------|--|----------------------|
|  | Mass Units (lbs/day) <sup>(1)</sup> |               | Concentrations (mg/L) |                 |                  |                  | Minimum <sup>(2)</sup> Measurement Frequency | Required Sample Type |
|  | Average Monthly                     | Daily Maximum | Minimum               | Average Monthly | Maximum          | Instant. Maximum |  |                      |
| Biochemical Oxygen Demand (BOD5) Raw Sewage Influent | Report                              | Report        | XXX                   | Report          | XXX              | XXX              | 2/month                                      | 24-Hr Composite      |
| Total Suspended Solids Raw Sewage Influent           | Report                              | Report        | XXX                   | Report          | XXX              | XXX              | 2/month                                      | 24-Hr Composite      |
| Nitrate-Nitrite as N                                 | XXX                                 | Report        | XXX                   | XXX             | Report Daily Max | XXX              | 1/quarter                                    | 24-Hr Composite      |
| Total Nitrogen                                       | XXX                                 | Report        | XXX                   | XXX             | Report Daily Max | XXX              | 1/quarter                                    | Calculation          |
| Total Kjeldahl Nitrogen                              | XXX                                 | Report        | XXX                   | XXX             | Report Daily Max | 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 discharge from facility (Total Nitrogen is the sum of Total Kjeldahl-N (TKN) plus Nitrite-Nitrate as N (NO<sub>2</sub>+NO<sub>3</sub>-N), where TKN and NO<sub>2</sub>+NO<sub>3</sub>-N are measured in the same sample.)

**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.

12/03/2019:

- Letterkenny Township signed a Consent Order and Agreement (COA) with the DEP on 9/10/18. The COA requires Letterkenny Township to relocate Outfall 001. A preliminary investigation report for the relocation project was received on 10/17/18 by the DEP; however, no WQM permit was received by DEP.
- The facility stated that the Township’s effluent flow meter service technician collected flow measurements from the current location. The data was reported to the DEP on the monthly discharge monitoring report may not be accurate. A Water Quality Management amendment may be required to complete this work.

05/05/2022:

- The operator expressed recent issues with the clarifiers from fats, oils, and greases. The facility believes that the source of these issue may be from a local pizza restaurant since it has opened.
- NIST thermometers were not viewed in either sampler. The facility stated plans to add them soon. DEP recommends that NIST thermometers are added to each sampler.
- York Water Co replaced the equalization tank pump controls after taking ownership in Q4 of 2020. The equalization tank high level float alarm was activated during the inspection and the audible/visual alarms were observed to be operational.
- Several holes were observed in the bottom of Train #1’s clarifier effluent trough. The operator stated that this occurred over the winter and the facility plans to make repairs dependent on temperature to properly weld. DEP recommended that this repair takes place as soon as possible and that DEP is informed of when this repair has taken place.
- A new final flow meter and totalizer were installed at the effluent UV discharge in January 2022 and calibrated in March 2022. A review of the April 2022 daily flows indicates that the monthly average flow exceeded the STP

hydraulic design of 0.042 MGD. Most daily flows exceed 0.042 MGD. York Water intended on investigating this issue and will also have the flow meter recalibrated to ensure accuracy of STP flow measurement

- The new STP Outfall 001 was observed.

### **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 exceeding the design capacity of the treatment system. The maximum average flow data for the DMR reviewed was 0.05 MGD. The design capacity of the treatment system is 0.042 MGD.

In December 2022 and January 2023, the facility had two consecutive months with flows exceeding the hydraulic capacity of the treatment plant. Flows in February 2023 was below hydraulic flow rate. In March 2023, the flows again exceeded the hydraulic capacity.

The facility may be considered hydraulic overloaded and should evaluate the plant for upgrade due to exceedance of hydraulic flow rate.

The off-site laboratory used for the analysis of the parameters was Laboratory, Analytical & Biological Services, Inc. located at 125 Enterprise Drive, New Oxford, PA 17350 and also at Franklin Analytical located at 419 Limekiln Drive, Chambersburg, PA 17201.



DMR Data for Outfall 001 (from December 1, 2022 to November 30, 2023)

| Parameter   | NOV-23 | OCT-23 | SEP-23 | AUG-23 | JUL-23 | JUN-23 | MAY-23 | APR-23 | MAR-23 | FEB-23 | JAN-23 | DEC-22 |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Flow (MGD)<br>Average Monthly                                     | 0.0325 | 0.0335 | 0.0321 | 0.0362 | 0.041  | 0.033  | 0.035  | 0.0378 | 0.0457 | 0.0391 | 0.05   | 0.0456 |
| Flow (MGD)<br>Daily Maximum                                       | 0.0644 | 0.0443 | 0.0521 | 0.0485 | 0.0734 | 0.045  | 0.051  | 0.064  | 0.0808 | 0.054  | 0.0806 | 0.0901 |
| pH (S.U.)<br>Daily Minimum  | 6.8    | 6.9    | 7.0    | 6.8    | 6.8    | 6.7    | 6.5    | 6.7    | 7.0    | 7.0    | 6.9    | 7.0    |
| pH (S.U.)<br>Daily Maximum  | 7.6    | 7.9    | 7.7    | 7.6    | 7.5    | 7.7    | 7.6    | 7.6    | 7.5    | 7.5    | 7.5    | 7.5    |
| DO (mg/L)<br>Daily Minimum  | 5.8    | 6.0    | 6.1    | 5.9    | 5.1    | 4.7    | 6.2    | 6.5    | 5.4    | 6.0    | 5.8    | 6.5    |
| CBOD5 (lbs/day)<br>Average Monthly                                | < 0.9  | 1.2    | < 0.7  | < 0.9  | < 1.0  | 0.8    | < 0.7  | 1.0    | 2.0    | < 1.0  | 2.0    | 2.0    |
| CBOD5 (lbs/day)<br>Weekly Average                                 | 1.1    | 1.4    | < 0.9  | 1.0    | 2.0    | 1.0    | < 0.7  | 1.0    | 3.0    | < 0.8  | 2.0    | 3.0    |
| CBOD5 (mg/L)<br>Average Monthly                                   | < 3.3  | 3.6    | < 2.0  | < 3.0  | < 3.0  | 4.0    | < 2.0  | 5.0    | 7.0    | < 4.0  | 4.0    | 5.0    |
| CBOD5 (mg/L)<br>Weekly Average                                    | 4.2    | 4.1    | < 2.0  | 3.0    | 3.0    | 5.0    | 6.0    | 5.0    | 8.0    | < 2.0  | 4.0    | 9.1    |
| BOD5 (lbs/day)<br>Raw Sewage Influent<br><br/> Average<br>Monthly | 29     | 110    | 50     | 99.0   | 74.0   | 25     | 34     | 65     | 37     | 58     | 104    | 41     |
| BOD5 (lbs/day)<br>Raw Sewage Influent<br><br/> Daily Maximum      | 38     | 180    | 52     | 169.0  | 83.0   | 27     | 34     | 83     | 45     | 79     | 125    | 52     |
| BOD5 (mg/L)<br>Raw Sewage Influent<br><br/> Average<br>Monthly    | 108    | 325    | 198    | 270.0  | 203    | 110    | 115    | 237    | 121    | 167    | 226    | 96     |
| TSS (lbs/day)<br>Average Monthly                                  | 3.2    | 2.1    | 3.0    | 4.0    | 5.0    | 2.0    | 2.0    | 5.0    | 5.0    | 2.0    | 4.0    | 9.0    |
| TSS (lbs/day)<br>Raw Sewage Influent<br><br/> Average<br>Monthly  | 21     | 130    | 65     | 191.0  | 112    | 12     | 19     | 90     | 37     | 102    | 191    | 32     |
| TSS (lbs/day)<br>Raw Sewage Influent<br><br/> Daily Maximum       | 30     | 242    | 83     | 373.0  | 188    | 13     | 20     | 124    | 58     | 187    | 196    | 48     |
| TSS (lbs/day)<br>Weekly Average                                   | 5.8    | 2.1    | 6.0    | 7.0    | 6.0    | 3.0    | 2.0    | 6.0    | 5.0    | 1.0    | 6.0    | 13.0   |

**NPDES Permit Fact Sheet  
Letterkenny Township STP**

**NPDES Permit No. PA0082201**

|   |        |        |        |        |        |        |        |        |        |        |       |        |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|--------|
| TSS (mg/L)<br>Average Monthly                                 | 12.5   | 7.0    | 11.0   | 11.0   | 12.0   | 9.0    | 6.0    | 17.0   | 16.0   | 7.0    | 8.0   | 20.0   |
| TSS (mg/L)<br>Raw Sewage Influent<br><br/> Average<br>Monthly | 80     | 380    | 284    | 500.0  | 354    | 54     | 64     | 332    | 118    | 292    | 406   | 74     |
| TSS (mg/L)<br>Weekly Average                                  | 23.0   | 7.0    | 18.0   | 18.0   | 12.0   | 13.0   | 7.0    | 22.0   | 16.0   | 3.0    | 11.0  | 27.0   |
| Fecal Coliform<br>(No./100 ml)<br>Geometric Mean              | 2      | 59     | 29     | < 11   | 7.0    | 1      | 4      | 4.0    | < 2.0  | 55     | < 3   | 12     |
| Fecal Coliform<br>(No./100 ml)<br>Instantaneous<br>Maximum    | 2      | 66     | 35     | 116    | 13.0   | 2      | 8      | 10.0   | < 4.0  | 152    | 9     | 19     |
| UV Intensity (mW/cm <sup>2</sup> )<br>Daily Minimum           | 0.2    | 0.5    | 0.9    | 1.0    | 0.7    | 0.1    | 0.9    | 1.0    | 0.7    | 1.2    | 2.6   | 1.3    |
| Nitrate-Nitrite (lbs/day)<br>Daily Maximum                    |        |        | 9.0    |        |        | 8.0    |        |        | 10.0   |        |       | 9.0    |
| Nitrate-Nitrite (mg/L)<br>Daily Maximum                       |        |        | 29.0   |        |        | 28.0   |        |        | 20.0   |        |       | 31.0   |
| Total Nitrogen<br>(lbs/day)<br>Daily Maximum                  |        |        | < 9.1  |        |        | < 8.0  |        |        | < 11   |        |       | < 9    |
| Total Nitrogen (mg/L)<br>Daily Maximum                        |        |        | < 30.0 |        |        | < 28.5 |        |        | < 20.5 |        |       | < 31.5 |
| Ammonia (lbs/day)<br>Average Monthly                          | < 0.03 | < 0.03 | < 0.03 | < 0.04 | < 0.05 | 0.6    | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.4 | 0.5    |
| Ammonia (mg/L)<br>Average Monthly                             | < 0.1  | < 0.1  | < 0.1  | < 0.13 | < 0.13 | 2.7    | < 0.1  | < 0.1  | < 0.1  | < 0.1  | < 0.7 | 1.08   |
| TKN (lbs/day)<br>Daily Maximum                                |        |        | < 0.1  |        |        | < 0.1  |        |        | < 0.3  |        |       | < 0.1  |
| TKN (mg/L)<br>Daily Maximum                                   |        |        | < 0.5  |        |        | < 0.5  |        |        | < 0.5  |        |       | < 0.5  |
| Total Phosphorus<br>(lbs/day)<br>Average Monthly              | 0.6    | 0.7    | 0.6    | 0.7    | 1.0    | 0.5    | 18.0   | 0.4    | 0.5    | 0.7    | 0.6   | 0.6    |
| Total Phosphorus<br>(mg/L)<br>Average Monthly                 | 2.4    | 2.1    | 2.1    | 2.1    | 2.5    | 2.1    | 2.0    | 1.6    | 1.8    | 1.9    | 1.3   | 1.3    |

**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 June 1, 2018 to January 26, 2024, the table summarizes observed effluent non-compliances.

| Summary of Non-Compliance with NPDES Effluent Limits<br>Beginning June 1, 2018 and Ending January 26, 2024 |                            |                     |                                      |                              |                  |              |                     |              |                 |                       |  |  |
|--|----------------------------|---------------------|--------------------------------------|------------------------------|------------------|--------------|---------------------|--------------|-----------------|-----------------------|--|--|
| MONITORING_PERIOD_BEGIN_DATE   | MONITORING_PERIOD_END_DATE | NON_COMPLIANCE_DATE | NON_COMPLIANCE_TYPE_DESC             | NON_COMPLIANCE_CATEGORY_DESC | PARAMETER        | SAMPLE_VALUE | VIOLATION_CONDITION | PERMIT_VALUE | UNIT_OF_MEASURE | STAT_BASE_CODE        | DISCHARGE_COMMENTS   | FACILITY_COMMENTS  |
| 6/1/2018   | 6/30/2018                  | 7/9/2018            | Violation of permit condition        | Effluent                     | Fecal Coliform   | 300          | >                   | 200          | No./100 ml      | Geometric Mean        |  |  |
| 9/1/2018   | 9/30/2018                  | 10/17/2018          | Violation of permit condition        | Effluent                     | Dissolved Oxygen | 3.0          | <                   | 5.0          | mg/L            | Daily Minimum         |  |  |
| 9/1/2018   | 9/30/2018                  | 10/17/2018          | Violation of permit condition        | Effluent                     | Fecal Coliform   | 1757         | >                   | 200          | No./100 ml      | Geometric Mean        |  |  |
| 9/1/2018   | 9/30/2018                  | 10/17/2018          | Violation of permit condition        | Effluent                     | Fecal Coliform   | 6300         | >                   | 1000         | No./100 ml      | Instantaneous Maximum |  |  |
| 6/1/2019   | 6/30/2019                  | 7/10/2019           | Violation of permit condition        | Effluent                     | Dissolved Oxygen | 4.8          | <                   | 5.0          | mg/L            | Daily Minimum         |  |  |
| 10/1/2020  | 10/31/2020                 | 11/23/2020          | Sample collection less frequent than | Other Violations             |                  |              |                     |              |                 |                       |  |  |
| 11/1/2020  | 11/30/2020                 | 12/23/2020          |                                      | Unauthorized Discharges      |                  |              |                     |              |                 |                       | overload condition believed to have been due to faulty EQ pump and high MLSS in aeration tanks |  |
| 11/1/2020  | 11/30/2020                 | 12/23/2020          |                                      | Unauthorized Discharges      |                  |              |                     |              |                 |                       | overload condition due to faulty equalization pumping equipment                                |  |
| 2/1/2021   | 2/28/2021                  | 3/22/2021           |                                      | Unauthorized Discharges      |                  |              |                     |              |                 |                       | Clogged return line in clarifier resulting in clarifier burping solids.                        |  |
| 7/1/2021   | 7/31/2021                  | 8/24/2021           | Sample collection less frequent than | Other Violations             | Total Phosphorus |              |                     |              |                 |                       |  |  |
| 9/1/2021   | 9/30/2021                  | 10/22/2021          | Sample collection less frequent than | Other Violations             |                  |              |                     |              |                 |                       |  |  |
| 10/1/2021  | 10/31/2021                 | 11/15/2021          |                                      | Unauthorized Discharges      |                  |              |                     |              |                 |                       | sewer main blockage between manholes LT28 and LT27.  |  |
| 7/1/2022   | 7/31/2022                  | 8/25/2022           | Sample collection less frequent than | Other Violations             |                  |              |                     |              |                 |                       |  |  |
| 6/1/2023   | 6/30/2023                  | 7/17/2023           | Violation of permit condition        | Effluent                     | Dissolved Oxygen | 4.7          | <                   | 5.0          | mg/L            | Daily Minimum         |  | On 6/21/23 the final effluent grab for dissolved oxygen was 4.7. It was discovered the airline supplying air to the final aeration tank was broken. Staff immediately replaced and repaired the airline resolving the issue. |

**3.3.2 Non-Compliance- Enforcement Actions**

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

Beginning in June 1, 2018 to January 26, 2024, the table summarizes observed enforcement actions.

Summary of Enforcement Actions  
 Beginning June 1, 2018 and Ending January 26, 2024

| ENF ID                 | ENF TYPE | ENF TYPE DESC               | VIOLATIONS                                   | ENF FINALSTATUS | ENF CLOSED DATE |
|------------------------|----------|-----------------------------|--|-----------------|-----------------|
| <a href="#">392882</a> | COA      | Consent Order and Agreement | 92A.41(A)5;<br>92A.41(C); CSL201;<br>CSL611A | Comply/Closed   | 08/17/2022      |
| <a href="#">367275</a> | COA      | Consent Order and Agreement | 92A.41(C)                                    | Superseded      | 03/01/2021      |
| <a href="#">382749</a> | NOV      | Notice of Violation         | 92A.41(A)5; CSL611A                          | Comply/Closed   | 12/01/2020      |
| <a href="#">392073</a> | NOV      | Notice of Violation         | CSL201                                       | Comply/Closed   | 03/01/2021      |

**3.4 Summary of Biosolids Disposal**

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

| 2023  |         |          |          |
|---|---------|----------|----------|
| Sewage Sludge / Biosolids Production Information  |         |          |          |
| Hauled Off-Site   |         |          |          |
| 2023  | Gallons | % Solids | Dry Tons |
| January   |         |          |          |
| February  | 8,000   | 0.75     | 0.25     |
| March   | 6,000   | 0.75     | 0.188    |
| April   |         |          |          |
| May   | 6,000   | 0.75     | 0.188    |
| June  | 7,000   | 0.75     | 0.219    |
| July  |         |          |          |
| August  | 7,000   | 1        | 0.292    |
| September   | 5,000   | 1        | 0.209    |
| October   |         |          |          |
| November  |         |          |          |
| Notes:  |         |          |          |
| Biosolids/sewage sludge disposed by Pecks Septic Service at South Middleton, Cumberland County under PAG-08-3532 for agricultural utilization |         |          |          |

**3.5 Open Violations**

As of January 2024, the table summarizes open violations. The final executed NPDES maybe withheld until the open violations have been resolved.

**Summary of Open Violations**

| INSP ID | VIOLATION ID | VIOLATION DATE | VIOLATION CODE | VIOLATION   |
|---------|--------------|----------------|----------------|---|
| 3666955 | 8169876      | 12/13/2023     | 127.402        | Construction, Modification, Reactivation and Operation of Sources, Operating Permit Requirements, General provisions. Violation for operating an air contaminant source(s) or cleaning device without an operating permit.    |
| 3666955 | 8169877      | 12/13/2023     | 127.443        | Construction, Modification, Reactivation and Operation of Sources, Operating Permit Requirements. Failure to obtain an operating permit before construction, modification, or reactivation of a new source or control device. |
| 3418993 | 967146       | 08/20/2022     | 91.33(A)       | CSL - Failure to immediately report to DEP a pollution incident   |
| 3418993 | 967147       | 08/20/2022     | CSL401         | CSL - Unauthorized, unpermitted discharge of polluting substances to waters of the Commonwealth resulting in pollution  |
| 3601112 | 8155603      | 08/16/2023     | D2E            | FAILURE TO SUBMIT OR REVISE A MONITORING PLAN FOR THE LEAD AND COPPER RULE  |
| 3601112 | 8155604      | 08/16/2023     | D2G            | FAILURE TO SUBMIT OR REVISE A COMPREHENSIVE MONITORING PLAN   |
| 3601112 | 8155605      | 08/16/2023     | D2I            | FAILURE TO COMPLY WITH UNINTERRUPTED SYSTEM SERVICE PLAN REQUIREMENTS   |
| 3601112 | 8155606      | 08/16/2023     | C4A            | FAILURE TO OPERATE AND MAINTAIN THE WATER SYSTEM  |
| 3601112 | 8155607      | 08/16/2023     | C1A            | FAILURE TO MEET DESIGN AND CONSTRUCTION STANDARDS   |
| 3601112 | 8155608      | 08/16/2023     | D2C            | FAILURE TO SUBMIT OR REVISE A MONITORING PLAN FOR THE STAGE 2 DISINFECTION BYPRODUCTS RULE  |
| 3601112 | 8155609      | 08/16/2023     | D6E            | FAILURE OF A CWS TO DEVELOP AND/OR UPDATE AN EMERGENCY RESPONSE PLAN  |
| 3601112 | 8155610      | 08/16/2023     | D2A            | FAILURE TO SUBMIT OR REVISE A MONITORING PLAN FOR THE TOTAL COLIFORM RULE   |
| 3601112 | 8155611      | 08/16/2023     | D2B            | FAILURE TO SUBMIT OR REVISE A MONITORING PLAN FOR THE DISINFECTION REQUIREMENTS RULE  |
| 3539563 | 991729       | 04/17/2023     | B6A            | OTHER VIOLATIONS DEEMED TO BE SIGNIFICANT DEFICIENCIES  |
| 3502361 | 984739       | 02/10/2023     | 02             | EXCEEDED THE CHEMICAL AVERAGE MAXIMUM CONTAMINANT LEVEL   |
| 3542426 | 992289       | 04/24/2023     | 02             | EXCEEDED THE CHEMICAL AVERAGE MAXIMUM CONTAMINANT LEVEL   |
| 3604333 | 8156356      | 08/23/2023     | 02             | EXCEEDED THE CHEMICAL AVERAGE MAXIMUM CONTAMINANT LEVEL   |
| 3646212 | 8165460      | 11/16/2023     | 27             | DISINFECTION/DISINFECTION BYPRODUCTS MONITORING/REPORTING VIOLATION   |
| 3646226 | 8165462      | 11/16/2023     | 27             | DISINFECTION/DISINFECTION BYPRODUCTS MONITORING/REPORTING VIOLATION   |
| 3646228 | 8165463      | 11/16/2023     | 27             | DISINFECTION/DISINFECTION BYPRODUCTS MONITORING/REPORTING VIOLATION   |

#### **4.0 Receiving Waters and Water Supply Information Detail Summary**

##### **4.1 Receiving Waters**

The receiving waters has been determined to be the Conodoguinet Creek. The sequence of receiving streams that the Conodoguinet Creek discharges into 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 Carlisle Water Treatment Plant (PWS ID #7210002) located approximately 47 miles downstream of the subject facility on the Conodoguinet Creek. 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 2022 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 2022 Pennsylvania Integrated Water Quality Monitoring and Assessment Report as a Category 2 waterbody. The surface waters is an attaining stream that supports aquatic life and recreational uses. The designated use has been classified as protected waters for warm water fishes (WWF) and migratory fishes (MF).**

##### **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.

For WQM modeling, default values for pH and stream water temperature data were utilized. pH was estimated to be 7.0 and the stream water temperature was estimated to be 25 C.

DEP previously used 50% of the actual stream flow due to the fact that the discharge is to Conodoguinet Creek where the stream is split into two (2) channels. First, the actual percent split of these channels is unknown and “first” confluence of these channels is about 300 feet downstream from the point of discharge (i.e., these channels join and then the stream is split once again within one river mile stretch). DEP has utilized StreamStats for determining low flow. (Courtesy Fact Sheet January 2018)

The low flow yield is 0.0693 ft<sup>3</sup>/s/mi<sup>2</sup> and the Q710 is 2.96 ft<sup>3</sup>/s for the subject facility.

**4.6 Summary of Discharge, Receiving Waters and Water Supply Information**

|  |                      |                   |                        |
|--|----------------------|-------------------|------------------------|
| Outfall No.                                    | <u>001</u>           | Design Flow (MGD) | <u>.042</u>            |
| Latitude                                       | <u>40° 6' 16.87"</u> | Longitude         | <u>-77° 39' 15.01"</u> |
| Quad Name                                      | <u></u>              | Quad Code         | <u></u>                |
| Wastewater Description: <u>Sewage Effluent</u> |                      |                   |                        |

|                              |   |                              |                    |
|------------------------------|---|------------------------------|--------------------|
| Receiving Waters             | <u>Conodoguinet Creek (WWF)</u>                                   | Stream Code                  | <u>10811</u>       |
| NHD Com ID                   | <u>56409317</u>   | RMI                          | <u>83.6</u>        |
| Drainage Area                | <u>42.7</u>   | Yield (cfs/mi <sup>2</sup> ) | <u>0.0693</u>      |
| Q <sub>7-10</sub> Flow (cfs) | <u>2.96</u>   | Q <sub>7-10</sub> Basis      | <u>StreamStats</u> |
| Elevation (ft)               | <u>694</u>  | Slope (ft/ft)                | <u></u>            |
| Watershed No.                | <u>7-B</u>  | Chapter 93 Class.            | <u>WWF, MF</u>     |
| Existing Use                 | <u></u>   | Existing Use Qualifier       | <u></u>            |
| Exceptions to Use            | <u></u>   | Exceptions to Criteria       | <u></u>            |
| Assessment Status            | <u>Attaining uses support aquatic life and recreational uses.</u> |                              |                    |
| Cause(s) of Impairment       | <u>Not applicable</u>   |                              |                    |
| Source(s) of Impairment      | <u>Not applicable</u>   |                              |                    |
| TMDL Status                  | <u>Not applicable</u>   | Name                         | <u></u>            |

|                         |           |               |         |
|-------------------------|-----------|---------------|---------|
| Background/Ambient Data |           | Data Source   |         |
| pH (SU)                 | <u>7</u>  | Default value | <u></u> |
| Temperature (°C)        | <u>25</u> | Default value | <u></u> |
| Hardness (mg/L)         | <u></u>   |               | <u></u> |
| Other:                  | <u></u>   |               | <u></u> |

|   |                                       |                            |           |
|---|---------------------------------------|----------------------------|-----------|
| Nearest Downstream Public Water Supply Intake | <u>Carlisle Water Treatment Plant</u> |                            |           |
| PWS Waters                                    | <u>Conodoguinet Creek</u>             | Flow at Intake (cfs)       | <u></u>   |
| PWS RMI                                       | <u></u>                               | Distance from Outfall (mi) | <u>47</u> |



**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 <sub>5</sub>            | 25              | Average Monthly | 133.102(a)(4)(i)   | 92a.47(a)(1)     |
|                              | 40              | Average Weekly  | 133.102(a)(4)(ii)  | 92a.47(a)(2)     |
| Total Suspended Solids       | 30              | Average Monthly | 133.102(b)(1)      | 92a.47(a)(1)     |
|                              | 45              | Average Weekly  | 133.102(b)(2)      | 92a.47(a)(2)     |
| pH                           | 6.0 – 9.0 S.U.  | Min – Max       | 133.102(c)         | 95.2(1)          |
| Fecal Coliform (5/1 – 9/30)  | 200 / 100 ml    | Geo Mean        | -                  | 92a.47(a)(4)     |
| Fecal Coliform (5/1 – 9/30)  | 1,000 / 100 ml  | IMAX            | -                  | 92a.47(a)(4)     |
| Fecal Coliform (10/1 – 4/30) | 2,000 / 100 ml  | Geo Mean        | -                  | 92a.47(a)(5)     |
| Fecal Coliform (10/1 – 4/30) | 10,000 / 100 ml | IMAX            | -                  | 92a.47(a)(5)     |
| Total Residual Chlorine      | 0.5             | Average Monthly | -                  | 92a.48(b)(2)     |

**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 Chlorine (TRC); (2) WQM 7.0 for Windows Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen Version 1.1 (WQM Model) and (3) Toxics using DEP Toxics Management Spreadsheet for Toxics pollutants.

The modeling point nodes utilized for this facility are summarized below.

| <b>General Data 1</b> | <b>(Modeling Point #1)</b> | <b>(Modeling Point #2)</b> | <b>(Modeling Point #3)</b> | <b>Units</b> |
|-----------------------|----------------------------|----------------------------|----------------------------|--------------|
| Stream Code           | 10811                      | 10811                      | 10811                      |              |
| River Mile Index      | 83.6                       | 82.17                      | 84.32                      | miles        |
| Elevation             | 694                        | 650                        | 729                        | feet         |
| Latitude              | 40.10455                   | 40.0924                    | 40.108325                  |              |
| Longitude             | -77.65242                  | -77.64701                  | -77.664642                 |              |
| Drainage Area         | 42.7                       | 43.7                       | 42.1                       | sq miles     |
| Low Flow Yield        | 0.0693                     | 0.0693                     | 0.0693                     | cfs/sq mile  |

**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 NH3-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 NH3-N in the discharge;
- (d) 24-hour average concentration for NH3-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 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 facility is not subject to toxics modeling.

**5.3.3 Whole Effluent Toxicity (WET)**

The facility is not subject to WET.

**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.

A TMDL for a given pollutant and waterbody is composed of the sum of individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background levels. In addition, the TMDL must include an implicit or explicit margin of safety (MOS) to account for the uncertainty in the relationship between pollutant loads and the quality of the receiving waterbody. The TMDL components are illustrated using the following equation:

$$\text{TMDL} = \Sigma \text{WLAs} + \Sigma \text{LAs} + \text{MOS}$$

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 September 13, 2021.

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.

Cap Loads will be established in permits as Net Annual TN and TP loads (lbs/yr) that apply during the period of October 1 – September 30. For facilities that have received Cap Loads in any other form, the Cap Loads will be modified accordingly when the permits are renewed.

Offsets have been incorporated into Cap Loads in several permits issued to date. From this point forward, permits will be issued with the WLAs as Cap Loads and will identify Offsets separately to facilitate nutrient trading activities and compliance with the TMDL.

Based upon the supplement the subject facility has been categorized as a Sector C discharger. The supplement defines Sector C as a non-significant dischargers include sewage facilities (Phase 4 facilities:  $\geq 0.2$  MGD and  $< 0.4$  MGD and Phase 5 facilities:  $> 0.002$  MGD and  $< 0.2$  MGD), small flow/single residence sewage treatment facilities ( $\leq 0.002$  MGD), and non-significant IW facilities, all of which may be covered by statewide General Permits or may have individual NPDES permits.

At this time, there are approximately 850 Phase 4 and 5 sewage facilities, approximately 715 small flow sewage treatment facilities covered by a statewide General Permit, and approximately 300 non-significant IW facilities.

For Phase 5 sewage facilities with individual permits (average annual design flow on August 29, 2005  $> 0.002$  MGD and  $< 0.2$  MGD), DEP will issue individual permits with monitoring and reporting for TN and TP throughout the permit term at a frequency no less than annually, unless 1) the facility has already conducted at least two years of nutrient monitoring and 2) a summary of the monitoring results are included in the next permit's fact sheet. If, however, Phase 5 facilities choose to expand, the renewed or amended permits will contain Cap Loads based on the lesser of a) existing TN/TP concentrations at current design average annual flow or b) 7,306 lbs/yr TN and 974 lbs/yr TP.

If no data are available to determine existing concentrations for expanding Phase 4 or 5 facilities, default concentrations of 25 mg/l TN and 4 mg/l TP may be used (these are the average estimated concentrations of all non-significant sewage facilities).

DEP will not issue permits to existing Phase 4 and 5 facilities containing Cap Loads unless it is done on a broad scale or unless the facilities are expanding.

For new Phase 4 and 5 sewage discharges, in general DEP will issue new permits containing Cap Loads of "0" and new facilities will be expected to purchase credits and/or apply offsets to achieve compliance, with the exception of small flow and single residence facilities.

**Due to the Chesapeake Bay WIP, this facility is subject to Sector C monitoring requirements. Monitoring for nitrogen species and phosphorus shall be at least 1x/quarter.**

### **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 122.1.1 and 40 CFR 122.1.2). 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 and (b) Nitrogen Species and Phosphorus.

**6.1.1 Conventional Pollutants and Disinfection**

| Summary of Proposed NPDES Parameter Details for Conventional Pollutants and Disinfection |  |                 |   |
|--|--|-----------------|---|
| The York Water Company - Letterkenny; PA0082201  |  |                 |   |
| Parameter  | Permit Limitation Required by <sup>1</sup> : | 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 2x/month as a 24-hr composite sample (Table 6-3).   |
|  |  | Effluent Limit: | Effluent limits shall not exceed 8.8 lbs/day and 25 mg/l as an average monthly.   |
|  |  | 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 2x/month as a 24-hr composite sample (Table 6-3).   |
|  |  | Effluent Limit: | Effluent limits shall not exceed 10.5 lbs/day and 25 mg/l as an average monthly.  |
|  |  | 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. |
| UV disinfection  | SOP  | Monitoring:     | The monitoring frequency is 1x/day. The facility will be required to record the UV intensity.   |
|  |  | Effluent Limit: | No effluent requirements  |
|  |  | Rationale:      | Consistent with the SOP- Establishing Effluent Limitations for Individual Sewage Permits (Revised January 10, 2019), the facility will be required to have routine monitoring for UV transmittance, UV dosage, or UV intensity.   |
| Fecal Coliform   | TBEL   | Monitoring:     | The monitoring frequency shall be 2x/month as a grab sample (Table 6-3).  |
|  |  | Effluent Limit: | Summer effluent limits shall not exceed 200 No./100 mL as a geometric mean. Winter effluent limits shall not exceed 2000 No./100 mL 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).  |
| E. Coli  | SOP; Chapter 92a.61                          | Monitoring:     | The monitoring frequency shall be 1x/year as a grab sample (SOP).   |
|  |  | Effluent Limit: | No effluent requirements.   |
|  |  | Rationale:      | Consistent with the SOP- Establishing Effluent Limitations for Individual Sewage Permits (Revised March 22, 2019) and under the authority of Chapter 92a.61, the facility will be required to monitor for E.Coli.   |

**Notes:**

- 1 The NPDES permit was limited by (a) anti-Backsliding, (b) Anti-Degradation, (c) SOP, (d) TBEL, (e) TMDL, (f) WQBEL, (g) WET, or (h) Other
- 2 Monitoring frequency based on flow rate of 0.042 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 Chesapeake Bay Phase 3 Watershed Implementation Plan Wastewater Supplement, Revised September 13, 2021

**6.1.2 Nitrogen Species and Phosphorus**

| Summary of Proposed NPDES Parameter Details for Nitrogen Species and Phosphorus   |  |                 |   |
|---|--|-----------------|---|
| The York Water Company - Letterkenny; PA0082201   |  |                 |   |
| Parameter   | Permit Limitation Required by <sup>1</sup> : | Recommendation  |   |
| Ammonia-Nitrogen  | Anti-Backsliding                             | Monitoring:     | The monitoring frequency shall be 2x/month as a 24-hr composite sample  |
|   |  | Effluent Limit: | During the months of May 1 to October 31, the effluent limit shall not exceed 2.8 lbs/day and 8.0 mg/l as an average monthly. During the months of November 1 to April 30, the effluent limit shall not exceed 8.4 lbs/day and 24.0 mg/l as an average monthly. |
|   |  | Rationale:      | Due to anti-backsliding regulations, the current permit shall continue to the proposed permit.  |
| Nitrate-Nitrite as N  | Chesapeake Bay TMDL                          | Monitoring:     | The monitoring frequency shall be 1x/quarter as a 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 least 1x/quarter.   |
| Total Nitrogen  | Chesapeake Bay TMDL                          | Monitoring:     | The monitoring frequency shall be 1x/quarter as a 24-hr calculation   |
|   |  | Effluent Limit: | No effluent requirements.   |
|   |  | Rationale:      | Due to the Chesapeake Bay Implementation Plan, the facility is required to be monitored on a frequency at least 2x/yr.  |
| TKN   | Chesapeake Bay TMDL                          | Monitoring:     | The monitoring frequency shall be 1x/quarter as a 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 least 1x/quarter.   |
| Total Phosphorus  | Anti-backsliding                             | Monitoring:     | The monitoring frequency shall be 2x/month as a 24-hr composite sample  |
|   |  | Effluent Limit: | No effluent requirements.   |
|   |  | Rationale:      | Lower reaches of the Conodoguinet Creek had limits to reduce dissolved oxygen and algae issues in the 1980s. Phosphorus monitoring was included before 1987. Due to anti-backsliding, monitoring shall continue to the proposed permit                          |
| <b>Notes:</b>   |  |                 |   |
| 1 The NPDES permit was limited by (a) anti-Backsliding, (b) Anti-Degradation, (c) SOP, (d) TBEL, (e) TMDL, (f) WQBEL, (g) WET, or (h) Other   |  |                 |   |
| 2 Monitoring frequency based on flow rate of 0.042 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 Chesapeake Bay Phase 3 Watershed Implementation Plan Wastewater Supplement, Revised September 13, 2021  |  |                 |   |

**6.1.3.1 Implementation of Regulation- Chapter 92a.61**

Chapter 92a.61 provides provisions to DEP to monitor for pollutants that may have an impact on the quality of waters of the Commonwealth. Based upon DEP policy directives issued on March 22, 2021 and in conjunction with EPA's 2017 Triennial Review, monitoring for E. Coli shall be required.

**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.

- Due to the EPA Triennial review, monitoring shall be required for E. Coli.

**6.3.1 Summary of Proposed NPDES Effluent Limits**

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.

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° 6' 16.00", Longitude 77° 39' 15.00", River Mile Index \_\_\_\_\_, Stream Code \_\_\_\_\_

Receiving Waters: Conodoguinet Creek (WWF)

Type of Effluent: Sewage 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) <sup>(1)</sup> |                  | Concentrations (mg/L) |                 |                  |                  | Minimum <sup>(2)</sup> Measurement Frequency | Required Sample Type |
|  | Average Monthly                     | Weekly Average   | Daily 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                   | XXX             | 9.0 Daily Max    | XXX              | 1/day  | Grab                 |
| Dissolved Oxygen                                     | XXX                                 | XXX              | 5.0                   | XXX             | XXX              | XXX              | 1/day  | Grab                 |
| Carbonaceous Biochemical Oxygen Demand (CBOD5)       | 8.8                                 | 14               | XXX                   | 25.0            | 40.0             | 50               | 2/month                                      | 24-Hr Composite      |
| Biochemical Oxygen Demand (BOD5) Raw Sewage Influent | Report                              | Report Daily Max | XXX                   | Report          | XXX              | XXX              | 2/month                                      | 24-Hr Composite      |
| Total Suspended Solids                               | 10.5                                | 15.7             | XXX                   | 30.0            | 45.0             | 60               | 2/month                                      | 24-Hr Composite      |
| Total Suspended Solids Raw Sewage Influent           | Report                              | Report Daily Max | XXX                   | Report          | XXX              | XXX              | 2/month                                      | 24-Hr Composite      |
| Fecal Coliform (No./100 ml) Oct 1 - Apr 30           | XXX                                 | XXX              | XXX                   | 2000 Geo Mean   | XXX              | 10000            | 2/month                                      | Grab                 |
| Fecal Coliform (No./100 ml) May 1 - Sep 30           | XXX                                 | XXX              | XXX                   | 200 Geo Mean    | XXX              | 1000             | 2/month                                      | Grab                 |
| E. Coli (No./100 ml)                                 | XXX                                 | XXX              | XXX                   | XXX             | Report Daily Max | XXX              | 1/year                                       | Grab                 |



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

| Parameter   | Effluent Limitations                |                  |                       |                 |                  |  | Monitoring Requirements |                  |
|---|-------------------------------------|------------------|-----------------------|-----------------|------------------|--|-------------------------|------------------|
|   | Mass Units (lbs/day) <sup>(1)</sup> |                  | Concentrations (mg/L) |                 |                  | Minimum <sup>(2)</sup> Measurement Frequency | Required Sample Type    |                  |
|   | Average Monthly                     | Weekly Average   | Daily Minimum         | Average Monthly | Weekly Average   |  |                         | Instant. Maximum |
| Ultraviolet light intensity (mW/cm <sup>2</sup> ) | XXX                                 | XXX              | Report                | XXX             | XXX              | XXX  | 1/day                   | Recorded         |
| Nitrate-Nitrite as N                              | XXX                                 | Report Daily Max | XXX                   | XXX             | Report Daily Max | XXX  | 1/quarter               | 24-Hr Composite  |
| Total Nitrogen                                    | XXX                                 | Report Daily Max | XXX                   | XXX             | Report Daily Max | XXX  | 1/quarter               | Calculation      |
| Ammonia-Nitrogen<br>Nov 1 - Apr 30                | 8.4                                 | XXX              | XXX                   | 24.0            | XXX              | XXX  | 2/month                 | 24-Hr Composite  |
| Ammonia-Nitrogen<br>May 1 - Oct 31                | 2.8                                 | XXX              | XXX                   | 8.0             | XXX              | 16   | 2/month                 | 24-Hr Composite  |
| Total Kjeldahl Nitrogen                           | XXX                                 | Report Daily Max | XXX                   | XXX             | Report Daily Max | XXX  | 1/quarter               | 24-Hr Composite  |
| Total Phosphorus                                  | Report                              | XXX              | XXX                   | Report          | XXX              | XXX  | 2/month                 | 24-Hr Composite  |

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

at Outfall 001

**6.3.2 Summary of Proposed Permit Part C Conditions**

The subject facility has the following Part C conditions.

- Hauled-in Waste Restrictions
- Chesapeake Bay Nutrient Definitions
- Solids Management for Non-Lagoon Treatment Systems
- Facility should investigate possibility of hydraulic overloading at plant

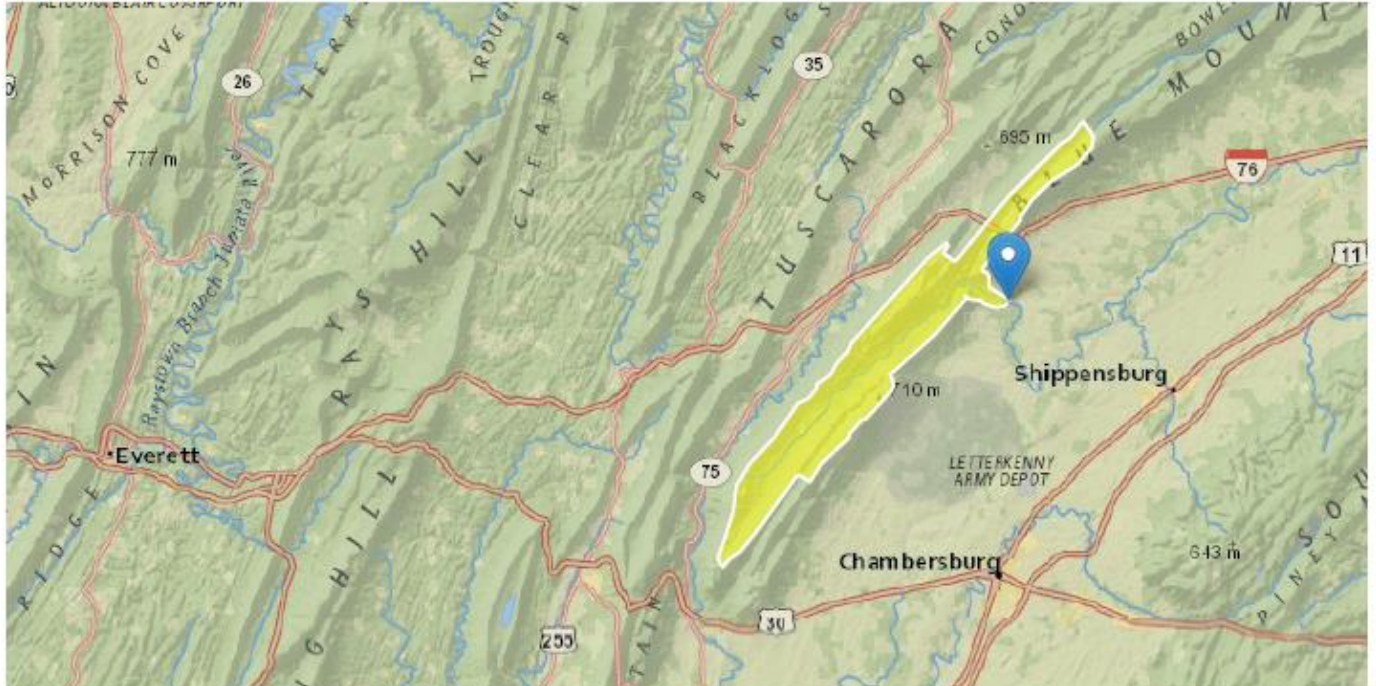
| Tools and References Used to Develop Permit |  |
|---|--|
| <input checked="" type="checkbox"/>         | WQM for Windows Model (see Attachment [redacted])  |
| <input type="checkbox"/>                    | Toxics Management Spreadsheet (see Attachment [redacted])  |
| <input type="checkbox"/>                    | TRC Model Spreadsheet (see Attachment [redacted])  |
| <input type="checkbox"/>                    | Temperature Model Spreadsheet (see Attachment [redacted])  |
| <input type="checkbox"/>                    | Water Quality Toxics Management Strategy, 361-0100-003, 4/06.  |
| <input type="checkbox"/>                    | Technical Guidance for the Development and Specification of Effluent Limitations, 386-0400-001, 10/97.   |
| <input type="checkbox"/>                    | Policy for Permitting Surface Water Diversions, 386-2000-019, 3/98.  |
| <input type="checkbox"/>                    | Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 386-2000-018, 11/96.  |
| <input type="checkbox"/>                    | Technology-Based Control Requirements for Water Treatment Plant Wastes, 386-2183-001, 10/97.   |
| <input type="checkbox"/>                    | Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 386-2183-002, 12/97.  |
| <input type="checkbox"/>                    | Pennsylvania CSO Policy, 386-2000-002, 9/08.   |
| <input type="checkbox"/>                    | Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.  |
| <input type="checkbox"/>                    | Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 386-2000-008, 4/97.   |
| <input type="checkbox"/>                    | Determining Water Quality-Based Effluent Limits, 386-2000-004, 12/97.  |
| <input type="checkbox"/>                    | Implementation Guidance Design Conditions, 386-2000-007, 9/97.   |
| <input type="checkbox"/>                    | Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 386-2000-016, 6/2004.  |
| <input type="checkbox"/>                    | Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 386-2000-012, 10/1997.   |
| <input type="checkbox"/>                    | Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 386-2000-009, 3/99.   |
| <input type="checkbox"/>                    | Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 386-2000-015, 5/2004.  |
| <input type="checkbox"/>                    | Implementation Guidance for Section 93.7 Ammonia Criteria, 386-2000-022, 11/97.  |
| <input type="checkbox"/>                    | Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 386-2000-013, 4/2008.   |
| <input type="checkbox"/>                    | Implementation Guidance Total Residual Chlorine (TRC) Regulation, 386-2000-011, 11/1994.   |
| <input type="checkbox"/>                    | Implementation Guidance for Temperature Criteria, 386-2000-001, 4/09.  |
| <input type="checkbox"/>                    | Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 386-2000-021, 10/97.   |
| <input type="checkbox"/>                    | 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, 386-2000-020, 10/97.       |
| <input type="checkbox"/>                    | Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 386-2000-005, 3/99.   |
| <input type="checkbox"/>                    | 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, 386-2000-010, 3/1999. |
| <input type="checkbox"/>                    | Design Stream Flows, 386-2000-003, 9/98.   |
| <input type="checkbox"/>                    | Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 386-2000-006, 10/98.                                     |
| <input type="checkbox"/>                    | Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 386-3200-001, 6/97.   |
| <input type="checkbox"/>                    | Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.   |
| <input checked="" type="checkbox"/>         | SOP: New and Reissuance Sewage Individual NPDES Permit Applications, rev 02/03/2022  |
| <input type="checkbox"/>                    | Other: [redacted]  |

# Attachment A

## Stream Stats/Gauge Data

## StreamStats Report

Region ID: PA  
 Workspace ID: PA20240131103402657000  
 Clicked Point (Latitude, Longitude): 40.10455, -77.65242  
 Time: 2024-01-31 05:34:25 -0500



The York Water Company - Letterkenny PA0082201 Modeling Point #1 January 2024

[+ Collapse All](#)

### Basin Characteristics

| Parameter Code | Parameter Description  | Value | Unit                  |
|----------------|--|-------|-----------------------|
| CARBON         | Percentage of area of carbonate rock                               | 0     | percent               |
| DRNAREA        | Area that drains to a point on a stream                            | 42.7  | square miles          |
| PRECIP         | Mean Annual Precipitation  | 41    | inches                |
| ROCKDEP        | Depth to rock  | 4.7   | feet                  |
| STRDEN         | Stream Density -- total length of streams divided by drainage area | 1.74  | miles per square mile |

➤ Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 2]

| Parameter Code | Parameter Name            | Value | Units                 | Min Limit | Max Limit |
|----------------|---------------------------|-------|-----------------------|-----------|-----------|
| DRNAREA        | Drainage Area             | 42.7  | square miles          | 4.93      | 1280      |
| PRECIP         | Mean Annual Precipitation | 41    | inches                | 35        | 50.4      |
| STRDEN         | Stream Density            | 1.74  | miles per square mile | 0.51      | 3.1       |
| ROCKDEP        | Depth to Rock             | 4.7   | feet                  | 3.32      | 5.65      |
| CARBON         | Percent Carbonate         | 0     | percent               | 0         | 99        |

Low-Flow Statistics Flow Report [Low Flow Region 2]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

| Statistic               | Value | Unit               | SE | ASEp |
|-------------------------|-------|--------------------|----|------|
| 7 Day 2 Year Low Flow   | 5.59  | ft <sup>3</sup> /s | 38 | 38   |
| 30 Day 2 Year Low Flow  | 7.32  | ft <sup>3</sup> /s | 33 | 33   |
| 7 Day 10 Year Low Flow  | 2.96  | ft <sup>3</sup> /s | 51 | 51   |
| 30 Day 10 Year Low Flow | 3.81  | ft <sup>3</sup> /s | 46 | 46   |
| 90 Day 10 Year Low Flow | 5.69  | ft <sup>3</sup> /s | 36 | 36   |

*Low-Flow Statistics Citations*

**Stuckey, M.H., 2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p.**  
(<http://pubs.usgs.gov/sir/2006/5130/>)

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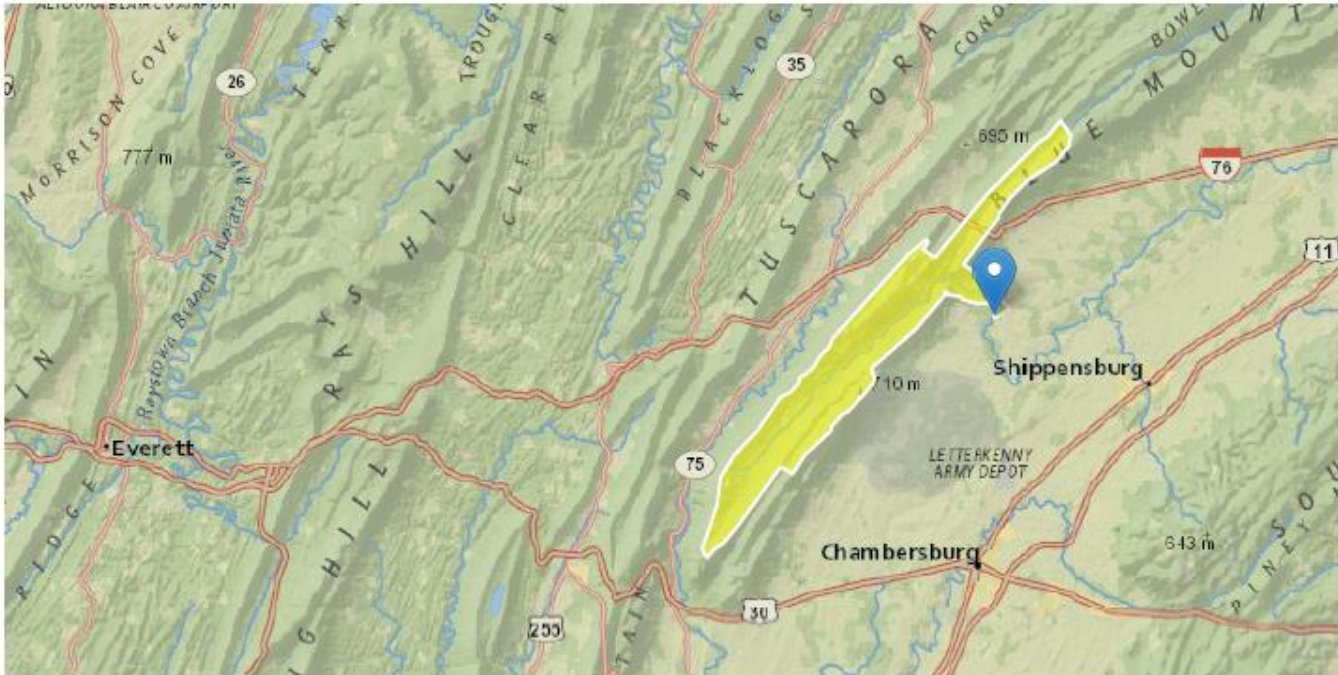
Application Version: 4.19.3

StreamStats Services Version: 1.2.22

NSS Services Version: 2.2.1

## StreamStats Report

Region ID: PA  
 Workspace ID: PA20240131103808273000  
 Clicked Point (Latitude, Longitude): 40.09240, -77.64701  
 Time: 2024-01-31 05:38:31 -0500



The York Water Company - Letterkenny PA0082201 Modeling Point #2 January 2024

Collapse All

### > Basin Characteristics

| Parameter Code | Parameter Description  | Value | Unit                  |
|----------------|--|-------|-----------------------|
| CARBON         | Percentage of area of carbonate rock                               | 0     | percent               |
| DRNAREA        | Area that drains to a point on a stream                            | 43.7  | square miles          |
| PRECIP         | Mean Annual Precipitation  | 41    | inches                |
| ROCKDEP        | Depth to rock  | 4.7   | feet                  |
| STRDEN         | Stream Density -- total length of streams divided by drainage area | 1.81  | miles per square mile |

➤ Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 2]

| Parameter Code | Parameter Name            | Value | Units                 | Min Limit | Max Limit |
|----------------|---------------------------|-------|-----------------------|-----------|-----------|
| DRNAREA        | Drainage Area             | 43.7  | square miles          | 4.93      | 1280      |
| PRECIP         | Mean Annual Precipitation | 41    | inches                | 35        | 50.4      |
| STRDEN         | Stream Density            | 1.81  | miles per square mile | 0.51      | 3.1       |
| ROCKDEP        | Depth to Rock             | 4.7   | feet                  | 3.32      | 5.65      |
| CARBON         | Percent Carbonate         | 0     | percent               | 0         | 99        |

Low-Flow Statistics Flow Report [Low Flow Region 2]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

| Statistic               | Value | Unit               | SE | ASEp |
|-------------------------|-------|--------------------|----|------|
| 7 Day 2 Year Low Flow   | 5.53  | ft <sup>3</sup> /s | 38 | 38   |
| 30 Day 2 Year Low Flow  | 7.25  | ft <sup>3</sup> /s | 33 | 33   |
| 7 Day 10 Year Low Flow  | 2.92  | ft <sup>3</sup> /s | 51 | 51   |
| 30 Day 10 Year Low Flow | 3.77  | ft <sup>3</sup> /s | 46 | 46   |
| 90 Day 10 Year Low Flow | 5.62  | ft <sup>3</sup> /s | 36 | 36   |

*Low-Flow Statistics Citations*

**Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p.**  
 (<http://pubs.usgs.gov/sir/2006/5130/>)

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Application Version: 4.19.3

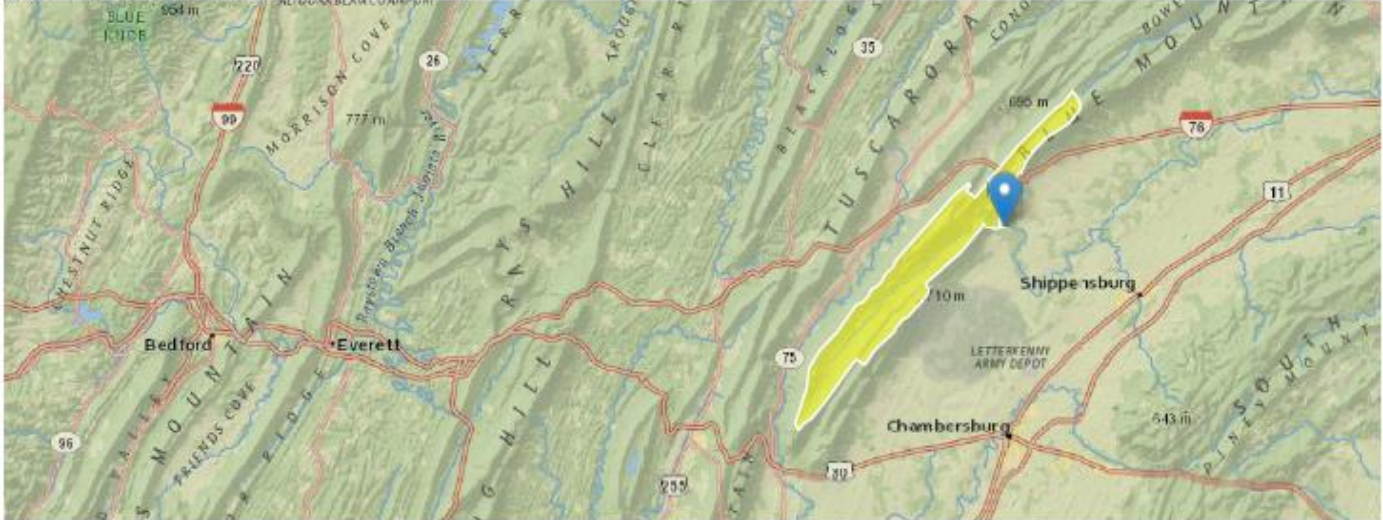
StreamStats Services Version: 1.2.22

NSS Services Version: 2.2.1



## StreamStats Report

Region ID: PA  
 Workspace ID: PA20240201150152318000  
 Clicked Point (Latitude, Longitude): 40.10703, -77.66448  
 Time: 2024-02-01 10:02:14 -0500



The York Water Company - Letterkenny PA0082201 Modeling Point #A (Roxbury Holiness Camp Inc) February 2024

Collapse All

### Basin Characteristics

| Parameter Code | Parameter Description  | Value | Unit                  |
|----------------|--|-------|-----------------------|
| CARBON         | Percentage of area of carbonate rock                               | 0     | percent               |
| DRNAREA        | Area that drains to a point on a stream                            | 42.1  | square miles          |
| PRECIP         | Mean Annual Precipitation  | 41    | inches                |
| ROCKDEP        | Depth to rock  | 4.8   | feet                  |
| STRDEN         | Stream Density -- total length of streams divided by drainage area | 1.71  | miles per square mile |

### Low-Flow Statistics

#### Low-Flow Statistics Parameters [Low Flow Region 2]

| Parameter Code | Parameter Name            | Value | Units                 | Min Limit | Max Limit |
|----------------|---------------------------|-------|-----------------------|-----------|-----------|
| DRNAREA        | Drainage Area             | 42.1  | square miles          | 4.93      | 1280      |
| PRECIP         | Mean Annual Precipitation | 41    | inches                | 35        | 50.4      |
| STRDEN         | Stream Density            | 1.71  | miles per square mile | 0.51      | 3.1       |
| ROCKDEP        | Depth to Rock             | 4.8   | feet                  | 3.32      | 5.65      |
| CARBON         | Percent Carbonate         | 0     | percent               | 0         | 99        |

#### Low-Flow Statistics Flow Report [Low Flow Region 2]

PLI: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

| Statistic               | Value | Unit               | SE | ASEp |
|-------------------------|-------|--------------------|----|------|
| 7 Day 2 Year Low Flow   | 5.82  | ft <sup>3</sup> /s | 38 | 38   |
| 30 Day 2 Year Low Flow  | 7.54  | ft <sup>3</sup> /s | 33 | 33   |
| 7 Day 10 Year Low Flow  | 3.16  | ft <sup>3</sup> /s | 51 | 51   |
| 30 Day 10 Year Low Flow | 4.02  | ft <sup>3</sup> /s | 46 | 46   |
| 90 Day 10 Year Low Flow | 5.92  | ft <sup>3</sup> /s | 36 | 36   |

*Low-Flow Statistics Citations*

**Stuckey, M.H., 2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (<http://pubs.usgs.gov/sir/2006/5130/>)**

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Application Version: 4.19.3

StreamStats Services Version: 1.2.22

NSS Services Version: 2.2.1

# Attachment B

## WQM 7.0 Modeling Output Values

### WQM 7.0 Effluent Limits

| <u>SWP Basin</u> |             | <u>Stream Code</u> |                 | <u>Stream Name</u>               |                                |                            |                            |
|------------------|-------------|--------------------|-----------------|----------------------------------|--------------------------------|----------------------------|----------------------------|
| 07B              |             | 10811              |                 | Trib 10811 to Conodoguinet Creek |                                |                            |                            |
| RMI              | Name        | Permit Number      | Disc Flow (mgd) | Parameter                        | Effl. Limit 30-day Ave. (mg/L) | Effl. Limit Maximum (mg/L) | Effl. Limit Minimum (mg/L) |
| 84.320           | Roxbury     | PA0082511          | 0.030           | CBOD5                            | 25                             |                            |                            |
|                  |             |                    |                 | NH3-N                            | 25                             | 50                         |                            |
|                  |             |                    |                 | Dissolved Oxygen                 |                                |                            | 5                          |
| 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) |
| 83.600           | Letterkenny | PA0082201          | 0.042           | CBOD5                            | 25                             |                            |                            |
|                  |             |                    |                 | NH3-N                            | 25                             | 50                         |                            |
|                  |             |                    |                 | Dissolved Oxygen                 |                                |                            | 5                          |

### WQM 7.0 Wasteload Allocations

|                  |                    |                                  |
|------------------|--------------------|----------------------------------|
| <u>SWP Basin</u> | <u>Stream Code</u> | <u>Stream Name</u>               |
| 07B              | 10811              | Trib 10811 to Conodoguinet Creek |

#### NH3-N Acute Allocations

| RMI    | Discharge Name | Baseline<br>Criterion<br>(mg/L) | Baseline<br>WLA<br>(mg/L) | Multiple<br>Criterion<br>(mg/L) | Multiple<br>WLA<br>(mg/L) | Critical<br>Reach | Percent<br>Reduction |
|--------|----------------|---------------------------------|---------------------------|---------------------------------|---------------------------|-------------------|----------------------|
| 84.320 | Roxbury        | 16.59                           | 50                        | 16.59                           | 50                        | 0                 | 0                    |
| 83.600 | Letterkenny    | 16.45                           | 50                        | 16.3                            | 50                        | 0                 | 0                    |

#### NH3-N Chronic Allocations

| RMI    | Discharge Name | Baseline<br>Criterion<br>(mg/L) | Baseline<br>WLA<br>(mg/L) | Multiple<br>Criterion<br>(mg/L) | Multiple<br>WLA<br>(mg/L) | Critical<br>Reach | Percent<br>Reduction |
|--------|----------------|---------------------------------|---------------------------|---------------------------------|---------------------------|-------------------|----------------------|
| 84.320 | Roxbury        | 1.88                            | 25                        | 1.88                            | 25                        | 0                 | 0                    |
| 83.600 | Letterkenny    | 1.88                            | 25                        | 1.87                            | 25                        | 0                 | 0                    |

#### Dissolved Oxygen Allocations

| RMI   | Discharge Name | <u>CBOD5</u>       |                    | <u>NH3-N</u>       |                    | <u>Dissolved Oxygen</u> |                    | Critical<br>Reach | Percent<br>Reduction |
|-------|----------------|--------------------|--------------------|--------------------|--------------------|-------------------------|--------------------|-------------------|----------------------|
|       |                | Baseline<br>(mg/L) | Multiple<br>(mg/L) | Baseline<br>(mg/L) | Multiple<br>(mg/L) | Baseline<br>(mg/L)      | Multiple<br>(mg/L) |                   |                      |
| 84.32 | Roxbury        | 25                 | 25                 | 25                 | 25                 | 5                       | 5                  | 0                 | 0                    |
| 83.60 | Letterkenny    | 25                 | 25                 | 25                 | 25                 | 5                       | 5                  | 0                 | 0                    |

**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                            |
|-----------|-------------|-----------------------------|--------|----------------|-----------------------|---------------|----------------------|-------------------------------------|
| 07B       | 10811 Trib  | 10811 to Conodoguinet Creek | 84.320 | 729.00         | 42.10                 | 0.00000       | 0.00                 | <input checked="" type="checkbox"/> |

**Stream Data**

| Design Cond. | LFY    | Trib Flow | Stream Flow | Rch Trav Time | Rch Velocity | WD Ratio | Rch Width | Rch Depth | Tributary |      | Stream    |      |
|--------------|--------|-----------|-------------|---------------|--------------|----------|-----------|-----------|-----------|------|-----------|------|
|              | (cfsm) | (cfs)     | (cfs)       | (days)        | (fps)        |          | (ft)      | (ft)      | Temp (°C) | pH   | Temp (°C) | pH   |
| Q7-10        | 0.069  | 0.00      | 0.00        | 0.000         | 0.000        | 0.0      | 0.00      | 0.00      | 20.00     | 7.00 | 0.00      | 0.00 |
| Q1-10        |        | 0.00      | 0.00        | 0.000         | 0.000        |          |           |           |           |      |           |      |
| Q30-10       |        | 0.00      | 0.00        | 0.000         | 0.000        |          |           |           |           |      |           |      |

**Discharge Data**

| Name    | Permit Number | Existing Disc Flow (mgd) | Permitted Disc Flow (mgd) | Design Disc Flow (mgd) | Reserve Factor | Disc Temp (°C) | Disc pH |
|---------|---------------|--------------------------|---------------------------|------------------------|----------------|----------------|---------|
| Roxbury | PA0082511     | 0.0300                   | 0.0300                    | 0.0300                 | 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 | 5.00             | 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                            |
|-----------|-------------|-----------------------------|--------|----------------|-----------------------|---------------|----------------------|-------------------------------------|
| 07B       | 10811 Trib  | 10811 to Conodoguinet Creek | 83.600 | 694.00         | 42.70                 | 0.00000       | 0.00                 | <input checked="" type="checkbox"/> |

**Stream Data**

| Design Cond. | LFY   | Trib Flow | Stream Flow | Rch Trav Time | Rch Velocity | WD Ratio | Rch Width | Rch Depth | Tributary |      | Stream    |      |
|--------------|-------|-----------|-------------|---------------|--------------|----------|-----------|-----------|-----------|------|-----------|------|
|              | (cfs) | (cfs)     | (cfs)       | (days)        | (fps)        |          | (ft)      | (ft)      | Temp (°C) | pH   | Temp (°C) | pH   |
| Q7-10        | 0.069 | 0.00      | 0.00        | 0.000         | 0.000        | 0.0      | 0.00      | 0.00      | 20.00     | 7.00 | 0.00      | 0.00 |
| Q1-10        |       | 0.00      | 0.00        | 0.000         | 0.000        |          |           |           |           |      |           |      |
| Q30-10       |       | 0.00      | 0.00        | 0.000         | 0.000        |          |           |           |           |      |           |      |

**Discharge Data**

| Name        | Permit Number | Existing Disc Flow (mgd) | Permitted Disc Flow (mgd) | Design Disc Flow (mgd) | Reserve Factor | Disc Temp (°C) | Disc pH |
|-------------|---------------|--------------------------|---------------------------|------------------------|----------------|----------------|---------|
| Letterkenny | PA0082201     | 0.0420                   | 0.0420                    | 0.0420                 | 0.000          | 25.00          | 7.22    |

**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 | 5.00             | 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                            |
|-----------|-------------|----------------------------------|--------|----------------|-----------------------|---------------|----------------------|-------------------------------------|
| 07B       | 10811       | Trib 10811 to Conodoguinet Creek | 82.170 | 650.00         | 43.70                 | 0.00000       | 0.00                 | <input checked="" type="checkbox"/> |

**Stream Data**

| Design Cond. | LFY    | Trib Flow | Stream Flow | Rch Trav Time | Rch Velocity | WD Ratio | Rch Width | Rch Depth | Tributary |      | Stream    |      |
|--------------|--------|-----------|-------------|---------------|--------------|----------|-----------|-----------|-----------|------|-----------|------|
|              | (cfsm) | (cfs)     | (cfs)       | (days)        | (fps)        |          | (ft)      | (ft)      | Temp (°C) | pH   | Temp (°C) | pH   |
| Q7-10        | 0.069  | 0.00      | 0.00        | 0.000         | 0.000        | 0.0      | 0.00      | 0.00      | 20.00     | 7.00 | 0.00      | 0.00 |
| Q1-10        |        | 0.00      | 0.00        | 0.000         | 0.000        |          |           |           |           |      |           |      |
| Q30-10       |        | 0.00      | 0.00        | 0.000         | 0.000        |          |           |           |           |      |           |      |

**Discharge Data**

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

**Parameter Data**

| Parameter Name   | Disc Conc (mg/L) | Trib Conc (mg/L) | Stream Conc (mg/L) | Fate Coef (1/days) |
|------------------|------------------|------------------|--------------------|--------------------|
| 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 D.O. Simulation

| <u>SWP Basin</u>                | <u>Stream Code</u>                | <u>Stream Name</u>               |              |                             |  |
|---------------------------------|-----------------------------------|----------------------------------|--------------|-----------------------------|--|
| 07B                             | 10811                             | Trib 10811 to Conodoguinet Creek |              |                             |  |
| <hr/>                           |                                   |                                  |              |                             |  |
| <u>RMI</u>                      | <u>Total Discharge Flow (mgd)</u> | <u>Analysis Temperature (°C)</u> |              | <u>Analysis pH</u>          |  |
| 84.320                          | 0.030                             | 20.078                           |              | 7.000                       |  |
| <u>Reach Width (ft)</u>         | <u>Reach Depth (ft)</u>           | <u>Reach WDRatio</u>             |              | <u>Reach Velocity (fps)</u> |  |
| 26.057                          | 0.638                             | 40.859                           |              | 0.178                       |  |
| <u>Reach CBOD5 (mg/L)</u>       | <u>Reach Kc (1/days)</u>          | <u>Reach NH3-N (mg/L)</u>        |              | <u>Reach Kn (1/days)</u>    |  |
| 2.36                            | 0.213                             | 0.39                             |              | 0.704                       |  |
| <u>Reach DO (mg/L)</u>          | <u>Reach Kr (1/days)</u>          | <u>Kr Equation</u>               |              | <u>Reach DO Goal (mg/L)</u> |  |
| 8.192                           | 15.633                            | Tsivoglou                        |              | 5                           |  |
| <u>Reach Travel Time (days)</u> |                                   |                                  |              |                             |  |
| 0.247                           |                                   |                                  |              |                             |  |
|                                 | <u>Subreach Results</u>           |                                  |              |                             |  |
|                                 | <u>TravTime</u>                   | <u>CBOD5</u>                     | <u>NH3-N</u> | <u>D.O.</u>                 |  |
|                                 | (days)                            | (mg/L)                           | (mg/L)       | (mg/L)                      |  |
|                                 | 0.025                             | 2.35                             | 0.38         | 8.23                        |  |
|                                 | 0.049                             | 2.34                             | 0.38         | 8.23                        |  |
|                                 | 0.074                             | 2.32                             | 0.37         | 8.23                        |  |
|                                 | 0.099                             | 2.31                             | 0.37         | 8.23                        |  |
|                                 | 0.123                             | 2.30                             | 0.36         | 8.23                        |  |
|                                 | 0.148                             | 2.29                             | 0.35         | 8.23                        |  |
|                                 | 0.173                             | 2.27                             | 0.35         | 8.23                        |  |
|                                 | 0.197                             | 2.26                             | 0.34         | 8.23                        |  |
|                                 | 0.222                             | 2.25                             | 0.33         | 8.23                        |  |
|                                 | 0.247                             | 2.24                             | 0.33         | 8.23                        |  |
| <hr/>                           |                                   |                                  |              |                             |  |
| <u>RMI</u>                      | <u>Total Discharge Flow (mgd)</u> | <u>Analysis Temperature (°C)</u> |              | <u>Analysis pH</u>          |  |
| 83.600                          | 0.072                             | 20.181                           |              | 7.004                       |  |
| <u>Reach Width (ft)</u>         | <u>Reach Depth (ft)</u>           | <u>Reach WDRatio</u>             |              | <u>Reach Velocity (fps)</u> |  |
| 27.589                          | 0.637                             | 43.286                           |              | 0.175                       |  |
| <u>Reach CBOD5 (mg/L)</u>       | <u>Reach Kc (1/days)</u>          | <u>Reach NH3-N (mg/L)</u>        |              | <u>Reach Kn (1/days)</u>    |  |
| 2.72                            | 0.332                             | 0.85                             |              | 0.710                       |  |
| <u>Reach DO (mg/L)</u>          | <u>Reach Kr (1/days)</u>          | <u>Kr Equation</u>               |              | <u>Reach DO Goal (mg/L)</u> |  |
| 8.163                           | 9.710                             | Tsivoglou                        |              | 5                           |  |
| <u>Reach Travel Time (days)</u> |                                   |                                  |              |                             |  |
| 0.500                           |                                   |                                  |              |                             |  |
|                                 | <u>Subreach Results</u>           |                                  |              |                             |  |
|                                 | <u>TravTime</u>                   | <u>CBOD5</u>                     | <u>NH3-N</u> | <u>D.O.</u>                 |  |
|                                 | (days)                            | (mg/L)                           | (mg/L)       | (mg/L)                      |  |
|                                 | 0.050                             | 2.67                             | 0.82         | 8.22                        |  |
|                                 | 0.100                             | 2.63                             | 0.79         | 8.22                        |  |
|                                 | 0.150                             | 2.58                             | 0.76         | 8.22                        |  |
|                                 | 0.200                             | 2.54                             | 0.73         | 8.22                        |  |
|                                 | 0.250                             | 2.50                             | 0.71         | 8.22                        |  |
|                                 | 0.300                             | 2.46                             | 0.68         | 8.22                        |  |
|                                 | 0.350                             | 2.42                             | 0.66         | 8.22                        |  |
|                                 | 0.400                             | 2.38                             | 0.64         | 8.22                        |  |
|                                 | 0.450                             | 2.34                             | 0.61         | 8.22                        |  |
|                                 | 0.500                             | 2.30                             | 0.59         | 8.22                        |  |

### WQM 7.0 Hydrodynamic Outputs

| <u>SWP Basin</u>   |                      | <u>Stream Code</u> |                          |                             |                        | <u>Stream Name</u>               |               |           |                   |                           |                       |             |
|--------------------|----------------------|--------------------|--------------------------|-----------------------------|------------------------|----------------------------------|---------------|-----------|-------------------|---------------------------|-----------------------|-------------|
| 07B                |                      | 10811              |                          |                             |                        | Trib 10811 to Conodoguinet Creek |               |           |                   |                           |                       |             |
| RMI                | Stream Flow<br>(cfs) | PWS With<br>(cfs)  | Net Stream Flow<br>(cfs) | Disc Analysis Flow<br>(cfs) | Reach Slope<br>(ft/ft) | Depth<br>(ft)                    | Width<br>(ft) | W/D Ratio | Velocity<br>(fps) | Reach Trav Time<br>(days) | Analysis Temp<br>(°C) | Analysis pH |
| <b>Q7-10 Flow</b>  |                      |                    |                          |                             |                        |                                  |               |           |                   |                           |                       |             |
| 84.320             | 2.92                 | 0.00               | 2.92                     | .0464                       | 0.00921                | .638                             | 26.06         | 40.86     | 0.18              | 0.247                     | 20.08                 | 7.00        |
| 83.600             | 2.96                 | 0.00               | 2.96                     | .1114                       | 0.00583                | .637                             | 27.59         | 43.29     | 0.17              | 0.500                     | 20.18                 | 7.00        |
| <b>Q1-10 Flow</b>  |                      |                    |                          |                             |                        |                                  |               |           |                   |                           |                       |             |
| 84.320             | 1.87                 | 0.00               | 1.87                     | .0464                       | 0.00921                | NA                               | NA            | NA        | 0.14              | 0.315                     | 20.12                 | 7.00        |
| 83.600             | 1.89                 | 0.00               | 1.89                     | .1114                       | 0.00583                | NA                               | NA            | NA        | 0.14              | 0.635                     | 20.28                 | 7.01        |
| <b>Q30-10 Flow</b> |                      |                    |                          |                             |                        |                                  |               |           |                   |                           |                       |             |
| 84.320             | 4.67                 | 0.00               | 4.67                     | .0464                       | 0.00921                | NA                               | NA            | NA        | 0.23              | 0.190                     | 20.05                 | 7.00        |
| 83.600             | 4.73                 | 0.00               | 4.73                     | .1114                       | 0.00583                | NA                               | NA            | NA        | 0.23              | 0.388                     | 20.11                 | 7.00        |

### WQM 7.0 Modeling Specifications

|                    |        |                                     |                                     |
|--------------------|--------|-------------------------------------|-------------------------------------|
| Parameters         | Both   | Use Inputted Q1-10 and Q30-10 Flows | <input type="checkbox"/>            |
| WLA Method         | EMPR   | Use Inputted W/D Ratio              | <input type="checkbox"/>            |
| Q1-10/Q7-10 Ratio  | 0.64   | Use Inputted Reach Travel Times     | <input type="checkbox"/>            |
| Q30-10/Q7-10 Ratio | 1.6    | Temperature Adjust Kr               | <input checked="" type="checkbox"/> |
| D.O. Saturation    | 90.00% | Use Balanced Technology             | <input checked="" type="checkbox"/> |
| D.O. Goal          | 5      |                                     |                                     |