**Southwest Regional Office**
**CLEAN WATER PROGRAM**

# NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

| | | | |
|---|---|---|---|
| Application Type | **Renewal** | Application No. | **PA0030082** |
| Facility Type | **Non-Municipal** | APS ID | **1115445** |
| Major / Minor | **Minor** | Authorization ID | **1488214** |

## Applicant and Facility Information

| | | | |
|---|---|---|---|
| Applicant Name | **Best Fayette Medical Center LP** | Facility Name | **Brownsville Gen Hospital** |
| Applicant Address | 125 Simpson Road | Facility Address | 125 Simpson Road |
| | Brownsville, PA 15417-9624 | | Brownsville, PA 15417-9624 |
| Applicant Contact | Belinda Strongosky | Facility Contact | Thomas Bibby |
| Applicant Phone | (412) 999-1050 | Facility Phone | (724)-366-5184 |
| Client ID | 294938 | Site ID | 271378 |
| Ch 94 Load Status | Not Overloaded | Municipality | Redstone Township |
| Connection Status | Dept. Imposed Connection Prohibitions | County | Fayette |
| Date Application Received | May 31, 2024 | EPA Waived? | Yes |
| Date Application Accepted | June 24, 2024 | If No, Reason | |

Purpose of Application: Application for a renewal of an NPDES permit for discharge of treated Sewage

| Approve | Deny | Signatures | Date |
|---|---|---|---|
| X | | Fahmida Amin<br>Fahmida Amin / Environmental Engineering Trainee | April 30, 2025 |
| X | | Mahbuba Iasmin<br>Mahbuba Iasmin, Ph.D., P.E. / Environmental Engineering Manager | May 5, 2025 |

**Summary of Review**

The applicant has applied for a renewal of NPDES Permit No. PA0030082. NPDES Permit No. PA0030082 was previously issued by the PA Department of Environmental Protection (DEP) on September 01, 2017. That permit expired on August 31, 2022.

WQM Permit No. 463S59, issued on August 14, 1963, authorized the construction of the plant to treat an average design flow of 0.045 MGD. The existing treatment process consists of extended aeration, final clarification and chlorination.

The receiving stream, Tributary 40161 to Dunlap Creek to Dunlap Creek, is currently classified as a WWF and is located in State Watershed No. 19-C.

The permittee has complied with Act 14 notifications as evidenced by updated letters sent to Redstone Township and Fayette County.

Changes since the last permit include:

- New Ammonia-Nitrogen Winter limits
- Addition of *E.Coli* monitoring
- New water quality-based effluent limitation for Total Residual Chlorine (TRC) with two years compliance schedule. First 24 months old TRC limits. New TRC limits from 25th month. Part C.IV condition - TRC Effluent Limitations Below Quantitation Limits has also been added.

**Anti-Backsliding**

Section 402(o) of the Clean Water Act (CWA), enacted in the Water Quality Act of 1987, establishes anti-backsliding rules governing two situations. The first situation occurs when a permittee seeks to revise a Technology-Based effluent limitation based on BPJ to reflect a subsequently promulgated effluent guideline which is less stringent. The second situation addressed by Section 402(o) arises when a permittee seeks relaxation of an effluent limitation which is based upon a State treatment standard of water quality standard.

Previous limits can be used pursuant to EPA's anti-backsliding regulation 40 CFR 122.44 (l) Reissued permits. (1) Except as provided in paragraph (l)(2) of this section when a permit is renewed or reissued. Interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit (unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification or revocation and reissuance under §122.62). (2) In the case of effluent limitations established on the basis of Section 402(a)(1)(B) of the CWA, a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under section 304(b) subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.

This facility is not seeking to revise the previously permitted effluent limits.

Public Participation

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

**Discharge, Receiving Waters and Water Supply Information**

| | | | |
|---|---|---|---|
| Outfall No. | 001 | Design Flow (MGD) | .045 |
| Latitude | 40º 0' 14" | Longitude | -79º 52' 23" |
| Quad Name | Fayette City | Quad Code | 40079A7 |
| Wastewater Description: | Sewage Effluent | | |
| Receiving Waters | Tributary 40161 to Dunlap Creek (WWF) | Stream Code | 40161 |
| NHD Com ID | 99411870 | RMI | 1.11 |
| Drainage Area | 0.069 | Yield (cfs/mi$^2$) | 0.00433 |
| $Q_{7-10}$ Flow (cfs) | 0.000299 | $Q_{7-10}$ Basis | USGS StreamStats |
| Elevation (ft) | 1168 | Slope (ft/ft) | |
| Watershed No. | 19-C | Chapter 93 Class. | WWF |
| Existing Use | | Existing Use Qualifier | |
| Exceptions to Use | | Exceptions to Criteria | |
| Assessment Status | Attaining Use(s); Supports Aquatic Life | | |
| Cause(s) of Impairment | **N/A** | | |
| Source(s) of Impairment | **N/A** | | |
| TMDL Status | **None** | Name | **N/A** |

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

| | | | |
|---|---|---|---|
| Nearest Downstream Public Water Supply Intake | Newell Municipal Authority | | |
| PWS Waters | Monongahela River | Flow at Intake (cfs) | 0.6 MGD |
| PWS RMI | 50.94 | Distance from Outfall (mi) | 12.5 |

Changes Since Last Permit Issuance:

- New ammonia-nitrogen winter limits. Winter limit is more stringent due to water quality modeling.
- New TRC limits, a two-years compliance schedule.

Other Comments: None

**Treatment Facility Summary**

**Treatment Facility Name:** Brownsville Gen Hospital STP

| WQM Permit No. | Issuance Date |
|---|---|
| 463S59 | 08/14/1963 |
| 463S59-T1 | 01/15/2013 |

| Waste Type | Degree of Treatment | Process Type | Disinfection | Avg Annual Flow (MGD) |
|---|---|---|---|---|
| Sewage | Secondary With Ammonia Reduction | Extended Aeration | Chlorine With Dechlorination | 0.001 |

| Hydraulic Capacity (MGD) | Organic Capacity (lbs/day) | Load Status | Biosolids Treatment | Biosolids Use/Disposal |
|---|---|---|---|---|
| 0.045 | | Not Overloaded | Dewatering | |

Changes Since Last Permit Issuance: None

Other Comments:

# Operations Compliance Check Summary Report

**Facility:** BROWNSVILLE GEN HOSP

**NPDES Permit No.:** PA0030082

**Compliance Review Period:** 3/1/20-2/28/25

**Inspection Summary:**

| INSPECTED DATE | INSP TYPE | AGENCY | INSPECTION RESULT DESC |
|---|---|---|---|
| 07/09/2021 | Administrative/File Review | PA Dept of Environmental Protection | No Violations Noted |
| 07/09/2021 | Compliance Evaluation | PA Dept of Environmental Protection | No Violations Noted |

**Violation Summary:**

No violations noted during review period

**Open Violations by Client ID:**

No open violations for Client ID 294938

**Enforcement Summary:**

No enforcements executed during review period

**Effluent Violation Summary:**

| MON_PD | PARAMETER | REPORTED VALUE | PERMIT LIMIT | UNIT | STAT_BASE_CODE |
|---|---|---|---|---|---|
| May-22 | Ammonia-Nitrogen | 2.35 | 1.5 | mg/L | Average Monthly |
| Sep-21 | Ammonia-Nitrogen | 2.3 | 1.5 | mg/L | Average Monthly |

**Compliance Status:** Facility is generally in compliance with no open violations or pending enforcements.

**Completed by:** Amanda Illar **Completed date:** 3/17/25

## Compliance History

**DMR Data for Outfall 001 (from March 1, 2024 to February 28, 2025)**

| Parameter | FEB-25 | JAN-25 | DEC-24 | NOV-24 | OCT-24 | SEP-24 | AUG-24 | JUL-24 | JUN-24 | MAY-24 | APR-24 | MAR-24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Flow (MGD) Average Monthly | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 |
| pH (S.U.) Minimum | 6.9 | 6.9 | 7.0 | 6.9 | 7.0 | 7.0 | 7.0 | 7.1 | 6.9 | 7.1 | 7.1 | 6.9 |
| pH (S.U.) Maximum | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.1 | 7.2 | 7.0 | 7.2 | 7.2 | 7.0 |
| DO (mg/L) Minimum | 6.1 | 6.1 | 5.6 | 5.6 | 5.8 | 5.7 | 5.7 | 5.3 | 5.5 | 6.1 | 5.7 | 5.9 |
| TRC (mg/L) Average Monthly | 0.22 | 0.16 | 0.21 | 0.12 | 0.34 | 0.2 | 0.21 | 0.26 | 0.35 | 0.15 | 0.18 | 0.13 |
| TRC (mg/L) Instantaneous Maximum | 0.28 | 0.23 | 0.47 | 0.29 | 0.51 | 0.2 | 0.36 | 0.41 | 0.58 | 0.31 | 0.37 | 0.28 |
| CBOD5 (mg/L) Average Monthly | 2.65 | 2.7 | < 2.0 | < 2.0 | < 2.0 | 2.6 | < 2.0 | < 2.0 | 4.35 | 5.6 | 2.25 | < 2.0 |
| CBOD5 (mg/L) Instantaneous Maximum | 3.8 | 3.4 | < 2.0 | < 2.0 | < 2.0 | 3.2 | < 2.0 | < 2.0 | 6.7 | 6.6 | 2.5 | < 2.0 |
| TSS (mg/L) Average Monthly | < 5.0 | 13.5 | 11.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | 15.5 | 8.5 | 5.5 | < 5.0 |
| TSS (mg/L) Instantaneous Maximum | < 5.0 | 22.0 | 17.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | < 5.0 | 26.0 | 11.0 | 6.0 | < 5.0 |
| Fecal Coliform (No./100 ml) Geometric Mean | 5 | 4 | 28 | 15 | 2 | 2 | 37 | 45 | 21 | 5 | 12 | 12 |
| Fecal Coliform (No./100 ml) Instantaneous Maximum | 24 | 19 | 47 | 217 | 2 | 2 | 191 | 103 | 147 | 24 | 137 | 146 |
| Total Nitrogen (mg/L) Daily Maximum | | | 18.4 | | | | | | | | | |
| Ammonia (mg/L) Average Monthly | 0.15 | 1.1 | 0.8 | 0.15 | 0.15 | 0.2 | 0.25 | 0.15 | 0.15 | 0.25 | 0.65 | 0.1 |
| Ammonia (mg/L) Instantaneous Maximum | 0.2 | 2.1 | 1.3 | 0.2 | 0.2 | 0.3 | 0.4 | 0.2 | 0.2 | 0.3 | 1.2 | 0.1 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Phosphorus (mg/L) Daily Maximum | | | 2.5 | | | | | | | | | |

## Development of Effluent Limitations

**Outfall No.** 001 **Design Flow (MGD)** .045
**Latitude** 40º 0' 14.00" **Longitude** -79º 52' 23.00"
**Wastewater Description:** Sewage Effluent

### Technology-Based Limitations

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

| Pollutant | Limit (mg/l) | SBC | Federal Regulation | State Regulation |
|---|---|---|---|---|
| $CBOD_5$ | 25 | Average Monthly | 133.102(a)(4)(i) | 92a.47(a)(1) |
| | 40 | Average Weekly | 133.102(a)(4)(ii) | 92a.47(a)(2) |
| Total Suspended Solids | 30 | Average Monthly | 133.102(b)(1) | 92a.47(a)(1) |
| | 45 | Average Weekly | 133.102(b)(2) | 92a.47(a)(2) |
| pH | 6.0 – 9.0 S.U. | Min – Max | 133.102(c) | 95.2(1) |
| Fecal Coliform (5/1 – 9/30) | 200 / 100 ml | Geo Mean | - | 92a.47(a)(4) |
| Fecal Coliform (5/1 – 9/30) | 1,000 / 100 ml | IMAX | - | 92a.47(a)(4) |
| Fecal Coliform (10/1 – 4/30) | 2,000 / 100 ml | Geo Mean | - | 92a.47(a)(5) |
| Fecal Coliform (10/1 – 4/30) | 10,000 / 100 ml | IMAX | - | 92a.47(a)(5) |
| Total Residual Chlorine | 0.5 | Average Monthly | - | 92a.48(b)(2) |

### Water Quality-Based Limitations (WQBELs)

Pursuant to EPA's approval of Pennsylvania's 2017 Triennial Review of Water Quality Standards and corresponding regulatory changes published in the *Pennsylvania Bulletin* on July 11, 2020, new water quality criteria for ammonia-nitrogen apply to waters of the commonwealth. Therefore, WQBELs for Outfall 001 are being re-evaluated even though there have been no changes to the treatment plant.

### WQM 7.0 Water Quality Modeling

DEP's WQM 7.0 version 1.1 model is a Microsoft Access Program used for sewage dischargers to determine whether TBELs are sufficient to meet in-stream water quality criteria for ammonia-nitrogen, carbonaceous biochemical oxygen demand ($CBOD_5$), and dissolved oxygen (DO). To accomplish this, the model simultaneously simulates mixing and degradation of ammonia-nitrogen and mixing and consumption of DO through $CBOD_5$ and ammonia-nitrogen degradation. WQM 7.0 determines the highest pollutant loadings that the stream can assimilate while still meeting water quality criteria under design conditions.

The model is a two-step process. The discharge is first modeled for the summer period (May through October) because warm temperatures are more likely to result in critical loading conditions. Reduced DO levels likely also play a role in ammonia toxicity and solubility of DO decreases at increased water temperature. If summer modeling determines that WQBELs are appropriate for the summer period, then modeling is completed for the winter period (November through April). This is in accordance with DEP's *Implementation Guidance of Section 93.7 Ammonia Criteria* [Do. No. 391-2000-013] (Ammonia Guidance).

River Mile Index (RMI) was measured in eMAP PA as the distance from the facility's outfall to Tributary 40161 to Dunlap Creek. Elevation was read by applying a topo map in eMAP PA. Discharge point and downstream drainage areas as well as $Q_{7-10}$ were generated by USGS Stream Stats. USGS Stream Stats output files are included in Attachment 1. In the absence of site-specific data, discharge temperature, stream temperature, and stream pH were assumed to be 20, 25, and 7 in accordance with the Ammonia Guidance. Stream width to depth was assumed to be 10 in accordance with DEP's *Technical Reference Guide (TRG) WQM 7.0 for Windows Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen Version 1* [Doc. No. 391-2000-007]. The previous effluent limitations for ammonia-nitrogen, dissolved oxygen, and $CBOD_5$ were used as the discharge concentrations.

WQM 7.0 modeling inputs are documented in the table below:

| Discharge Characteristics | | Basin/Stream Characteristics | |
|---|---|---|---|
| **Parameter** | **Value** | **Parameter** | **Value** |
| River Mile Index (RMI) | 1.11 | Drainage Area | 0.069 |
| Discharge Flow (MGD) | .045 | $Q_{7-10}$ (cfs) | 0.000299 |
| Discharge Temp ($^oC$) | 20 | Low-flow yield (cfs/$mi^2$) | 0.00433 |
| Summer Ammonia-Nitrogen (mg/L) | 1.5 | Elevation (ft) | 1168 |
| Winter Ammonia-Nitrogen (mg/L) | 2.65 | Stream Width/Depth | 10 |
| $CBOD_5$ (mg/L) | 25 | Stream Temp ($^oC$) | 25 |
| | | Stream pH (s.u.) | 7 |

The discharge was modeled using WQM 7.0 to evaluate the ammonia-nitrogen, $CBOD_5$, and DO parameters. The modeling confirmed that water quality-based effluent limits are necessary for ammonia-nitrogen, $CBOD_5$, and DO. In accordance with DEP's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 revised March 24, 2021, Version 1.9], winter ammonia-nitrogen limits are assessed by comparing winter WQM 7.0 output value with one calculated by multiplying the summer limit by a multiplier of three. The more restrictive limit is then imposed. For this facility, the more restrictive limit comes from the winter model. WQM 7.0 output files are included in Attachments 2 and 3.

**Water Quality-Based Limitations**

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

| Parameter | Limit (mg/l) | SBC | Model |
|---|---|---|---|
| CBOD5 | 25.0 | Average Monthly | WQM 7.0 Version 1.1 |
| Ammonia Nitrogen (May 1 to Oct 31) | 1.89 | Average Monthly | WQM 7.0 Version 1.1 |
| Ammonia Nitrogen (Nov 1 to Apr 30) | 2.65 | Average Monthly | WQM 7.0 Version 1.1 |
| Dissolved Oxygen | 5.0 (Minimum) | Average Monthly | WQM 7.0 Version 1.1 |
| TRC | 0.009 | Average Monthly | TRC Calculation |

Comments: Due to anti-backsliding, the previously permitted seasonal WQBEL for CBOD5 of 10 mg/L and Summer Ammonia Nitrogen of 1.5 mg/L will be re-imposed.

**Additional Considerations**

Monitoring frequency for the proposed effluent limits are based upon Table 6-3, Self-Monitoring Requirements for Sewage Dischargers, from the Departments Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits (Document No. 386-0400-001).

Sewage dischargers will include monitoring, at a minimum, for E. Coli, in new and reissued permits, with a monitoring frequency of 1/year for design flows 0.002 – 0.05 MGD per 25 Pa. Code § 92a.061, and Section I.A, Note 12, SOP No. BCW-PMT-033, Establishing Effluent Limitations for Individual Sewage Permits.

## Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (386-0400-001), SOPs and/or BPJ.

**Outfall 001, Effective Period: Permit Effective Date through Permit Expiration Date**.

| Parameter | Effluent Limitations | | | | | | Monitoring Requirements | |
|---|---|---|---|---|---|---|---|---|
| | Mass Units (lbs/day) (1) | | Concentrations (mg/L) | | | | Minimum (2) Measurement Frequency | Required Sample Type |
| | Average Monthly | Average Weekly | Minimum | Average Monthly | Maximum | Instant. Maximum | | |
| Flow (MGD) | 0.045 | Report Daily Max | XXX | XXX | XXX | XXX | 2/month | Measured |
| pH (S.U.) | XXX | XXX | 6.0 | XXX | 9.0 | XXX | 1/day | Grab |
| DO | XXX | XXX | 5.0 | XXX | XXX | XXX | 1/day | Grab |
| CBOD5 | XXX | XXX | XXX | 10.0 | XXX | 20.0 | 2/month | Grab |
| TSS | XXX | XXX | XXX | 25.0 | XXX | 50.0 | 2/month | Grab |
| 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 | XXX | Report | 1/year | Grab |
| Total Nitrogen | XXX | XXX | XXX | XXX | Report Daily Max | XXX | 1/year | Grab |
| Ammonia-Nitrogen Nov 1 - Apr 30 | XXX | XXX | XXX | 2.65 | XXX | 5.3 | 2/month | Grab |
| Ammonia-Nitrogen May 1 - Oct 31 | XXX | XXX | XXX | 1.5 | XXX | 3.0 | 2/month | Grab |
| Total Phosphorus | XXX | XXX | XXX | XXX | Report Daily Max | XXX | 1/year | Grab |

Compliance Sampling Location:

Other Comments:

## Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (386-0400-001), SOPs and/or BPJ.

**Outfall 001, Effective Period: Permit Effective Date through 24 month**.

| Parameter | Effluent Limitations | | | | | | Monitoring Requirements | |
|---|---|---|---|---|---|---|---|---|
| | Mass Units (lbs/day) (1) | | Concentrations (mg/L) | | | | Minimum (2) Measurement Frequency | Required Sample Type |
| | Average Monthly | Average Weekly | Minimum | Average Monthly | Maximum | Instant. Maximum | | |
| TRC | XXX | XXX | XXX | 0.5 | XXX | 1.6 | 1/day | Grab |

Compliance Sampling Location:

Other Comments:

## Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (386-0400-001), SOPs and/or BPJ.

**Outfall 001, Effective Period: 25th Month through Permit Expiration Date**.

| Parameter | Effluent Limitations | | | | | | Monitoring Requirements | |
|---|---|---|---|---|---|---|---|---|
| | Mass Units (lbs/day) (1) | | Concentrations (mg/L) | | | | Minimum (2) Measurement Frequency | Required Sample Type |
| | Average Monthly | Average Weekly | Minimum | Average Monthly | Maximum | Instant. Maximum | | |
| TRC | XXX | XXX | XXX | 0.009 | XXX | 0.029 | 1/day | Grab |

Compliance Sampling Location:

Other Comments:

# Attachment 1 – USGS StreamStats Report

## StreamStats Report

**Region ID:** PA
**Workspace ID:** PA20250409172225550000
**Clicked Point (Latitude, Longitude):** 40.00394, -79.86815
**Time:** 2025-04-09 13:22:56 -0400


Collapse All

### Basin Characteristics

| Parameter Code | Parameter Description | Value | Unit |
|---|---|---|---|
| DRNAREA | Area that drains to a point on a stream | 0.069 | square miles |
| ELEV | Mean Basin Elevation | 1168 | feet |

## Low-Flow Statistics

### Low-Flow Statistics Parameters [Low Flow Region 4]

| Parameter Code | Parameter Name | Value | Units | Min Limit | Max Limit |
|---|---|---|---|---|---|
| DRNAREA | Drainage Area | 0.069 | square miles | 2.26 | 1400 |
| ELEV | Mean Basin Elevation | 1168 | feet | 1050 | 2580 |

### Low-Flow Statistics Disclaimers [Low Flow Region 4]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

### Low-Flow Statistics Flow Report [Low Flow Region 4]

| Statistic | Value | Unit |
|---|---|---|
| 7 Day 2 Year Low Flow | 0.00131 | ft^3/s |
| 30 Day 2 Year Low Flow | 0.00285 | ft^3/s |
| 7 Day 10 Year Low Flow | 0.000299 | ft^3/s |
| 30 Day 10 Year Low Flow | 0.000782 | ft^3/s |
| 90 Day 10 Year Low Flow | 0.00181 | ft^3/s |

*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/)**



Application Version: 4.28.1
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

**Attachment 2 – WQM 7.0 Version 1.1 – Summer Period**

## 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 |
|---|---|---|---|---|---|---|---|---|
| 19C | 40161 | Trib 40161 to Dunlap Creek | **1.110** | 1093.29 | 0.07 | 0.04900 | 0.00 | ☑ |

**Stream Data**

| Design Cond. | LFY (cfsm) | Trib Flow (cfs) | Stream Flow (cfs) | Rch Trav Time (days) | Rch Velocity (fps) | WD Ratio | Rch Width (ft) | Rch Depth (ft) | Tributary Temp (°C) | Tributary pH | Stream Temp (°C) | Stream pH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Q7-10** | 0.004 | 0.00 | 0.00 | 0.000 | 0.000 | 10.0 | 0.00 | 0.00 | 25.00 | 7.00 | 0.00 | 0.00 |
| **Q1-10** | | 0.00 | 0.00 | 0.000 | 0.000 | | | | | | | |
| **Q30-10** | | 0.00 | 0.00 | 0.000 | 0.000 | | | | | | | |

**Discharge Data**

| Name | Permit Number | Existing Disc Flow (mgd) | Permitted Disc Flow (mgd) | Design Disc Flow (mgd) | Reserve Factor | Disc Temp (°C) | Disc pH |
|---|---|---|---|---|---|---|---|
| Brownsville STP | PA0030082 | 0.0450 | 0.0450 | 0.0450 | 0.000 | 20.00 | 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 | 4.00 | 8.38 | 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 |
|---|---|---|---|---|---|---|---|---|
| 19C | 40161 | Trib 40161 to Dunlap Creek | **0.730** | 993.35 | 0.07 | 0.04900 | 0.00 | ☑ |

### Stream Data

| Design Cond. | LFY (cfsm) | Trib Flow (cfs) | Stream Flow (cfs) | Rch Trav Time (days) | Rch Velocity (fps) | WD Ratio | Rch Width (ft) | Rch Depth (ft) | Tributary Temp (°C) | Tributary pH | Stream Temp (°C) | Stream pH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Q7-10** | 0.004 | 0.00 | 0.00 | 0.000 | 0.000 | 10.0 | 0.00 | 0.00 | 25.00 | 7.00 | 0.00 | 0.00 |
| **Q1-10** | | 0.00 | 0.00 | 0.000 | 0.000 | | | | | | | |
| **Q30-10** | | 0.00 | 0.00 | 0.000 | 0.000 | | | | | | | |

### Discharge Data

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

### Parameter Data

| Parameter Name | Disc Conc (mg/L) | Trib Conc (mg/L) | Stream Conc (mg/L) | Fate Coef (1/days) |
|---|---|---|---|---|
| CBOD5 | 25.00 | 2.00 | 0.00 | 1.50 |
| Dissolved Oxygen | 3.00 | 8.38 | 0.00 | 0.00 |
| NH3-N | 25.00 | 0.00 | 0.00 | 0.70 |

# WQM 7.0 Hydrodynamic Outputs

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 19C | 40161 | Trib 40161 to Dunlap Creek |

| RMI | Stream Flow (cfs) | PWS With (cfs) | Net Stream Flow (cfs) | Disc Analysis Flow (cfs) | Reach Slope (ft/ft) | Depth (ft) | Width (ft) | W/D Ratio | Velocity (fps) | Reach Trav Time (days) | Analysis Temp (°C) | Analysis pH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Q7-10 Flow** | | | | | | | | | | | | |
| 1.110 | 0.00 | 0.00 | 0.00 | .0696 | 0.04900 | .378 | 1.79 | 4.74 | 0.10 | 0.225 | 20.02 | 7.00 |
| **Q1-10 Flow** | | | | | | | | | | | | |
| 1.110 | 0.00 | 0.00 | 0.00 | .0696 | 0.04900 | NA | NA | NA | 0.10 | 0.226 | 20.01 | 7.00 |
| **Q30-10 Flow** | | | | | | | | | | | | |
| 1.110 | 0.00 | 0.00 | 0.00 | .0696 | 0.04900 | NA | NA | NA | 0.10 | 0.225 | 20.03 | 7.00 |

# WQM 7.0 Modeling Specifications

| | | | |
|---|---|---|---|
| Parameters | Both | Use Inputted Q1-10 and Q30-10 Flows | ☑ |
| WLA Method | EMPR | Use Inputted W/D Ratio | ☐ |
| Q1-10/Q7-10 Ratio | 0.64 | Use Inputted Reach Travel Times | ☐ |
| Q30-10/Q7-10 Ratio | 1.36 | Temperature Adjust Kr | ☑ |
| D.O. Saturation | 90.00% | Use Balanced Technology | ☑ |
| D.O. Goal | 5 | | |

# WQM 7.0 Wasteload Allocations

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 19C | 40161 | Trib 40161 to Dunlap Creek |

## NH3-N Acute Allocations

| RMI | Discharge Name | Baseline Criterion (mg/L) | Baseline WLA (mg/L) | Multiple Criterion (mg/L) | Multiple WLA (mg/L) | Critical Reach | Percent Reduction |
|---|---|---|---|---|---|---|---|
| 1.110 | Brownsville STP | 16.74 | 16.79 | 16.74 | 16.79 | 0 | 0 |

## NH3-N Chronic Allocations

| RMI | Discharge Name | Baseline Criterion (mg/L) | Baseline WLA (mg/L) | Multiple Criterion (mg/L) | Multiple WLA (mg/L) | Critical Reach | Percent Reduction |
|---|---|---|---|---|---|---|---|
| 1.110 | Brownsville STP | 1.88 | 1.89 | 1.88 | 1.89 | 0 | 0 |

## Dissolved Oxygen Allocations

| RMI | Discharge Name | CBOD5 | | NH3-N | | Dissolved Oxygen | | Critical Reach | Percent Reduction |
|---|---|---|---|---|---|---|---|---|---|
| | | Baseline (mg/L) | Multiple (mg/L) | Baseline (mg/L) | Multiple (mg/L) | Baseline (mg/L) | Multiple (mg/L) | | |
| 1.11 | Brownsville STP | 25 | 25 | 1.89 | 1.89 | 5 | 5 | 0 | 0 |

# WQM 7.0 D.O.Simulation

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 19C | 40161 | Trib 40161 to Dunlap Creek |

| RMI | Total Discharge Flow (mgd) | Analysis Temperature (°C) | Analysis pH |
|---|---|---|---|
| 1.110 | 0.045 | 20.021 | 7.000 |
| **Reach Width (ft)** | **Reach Depth (ft)** | **Reach WDRatio** | **Reach Velocity (fps)** |
| 1.794 | 0.378 | 4.742 | 0.103 |
| **Reach CBOD5 (mg/L)** | **Reach Kc (1/days)** | **Reach NH3-N (mg/L)** | **Reach Kn (1/days)** |
| 24.90 | 1.499 | 1.89 | 0.701 |
| **Reach DO (mg/L)** | **Reach Kr (1/days)** | **Kr Equation** | **Reach DO Goal (mg/L)** |
| 5.014 | 28.617 | Owens | 5 |
| **Reach Travel Time (days)** | | | |
| 0.225 | | | |

**Subreach Results**

| TravTime (days) | CBOD5 (mg/L) | NH3-N (mg/L) | D.O. (mg/L) |
|---|---|---|---|
| 0.023 | 24.07 | 1.86 | 5.97 |
| 0.045 | 23.27 | 1.83 | 6.50 |
| 0.068 | 22.50 | 1.80 | 6.81 |
| 0.090 | 21.75 | 1.77 | 7.01 |
| 0.113 | 21.03 | 1.74 | 7.14 |
| 0.135 | 20.33 | 1.72 | 7.23 |
| 0.158 | 19.65 | 1.69 | 7.31 |
| 0.180 | 19.00 | 1.66 | 7.38 |
| 0.203 | 18.37 | 1.64 | 7.44 |
| 0.225 | 17.76 | 1.61 | 7.49 |

# WQM 7.0 Effluent Limits

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 19C | 40161 | Trib 40161 to Dunlap 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) |
|---|---|---|---|---|---|---|---|
| 1.110 | Brownsville STP | PA0030082 | 0.045 | CBOD5 | 25 | | |
| | | | | NH3-N | 1.89 | 3.78 | |
| | | | | Dissolved Oxygen | | | 5 |

**Attachment 3 – WQM 7.0 Version 1.1 – Winter Period**

## 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 |
|---|---|---|---|---|---|---|---|---|
| 19C | 40161 | Trib 40161 to Dunlap Creek | **1.110** | 1093.29 | 0.07 | 0.04900 | 0.00 | ☑ |

**Stream Data**

| Design Cond. | LFY (cfsm) | Trib Flow (cfs) | Stream Flow (cfs) | Rch Trav Time (days) | Rch Velocity (fps) | WD Ratio | Rch Width (ft) | Rch Depth (ft) | Tributary Temp (°C) | Tributary pH | Stream Temp (°C) | Stream pH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Q7-10** | 0.009 | 0.00 | 0.00 | 0.000 | 0.000 | 10.0 | 0.00 | 0.00 | 5.00 | 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 |
|---|---|---|---|---|---|---|---|
| Brownsville STP | PA0030082 | 0.0450 | 0.0450 | 0.0450 | 0.000 | 15.00 | 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 | 4.00 | 12.80 | 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 |
|---|---|---|---|---|---|---|---|---|
| 19C | 40161 | Trib 40161 to Dunlap Creek | **0.730** | 993.35 | 0.07 | 0.04900 | 0.00 | ☑ |

### Stream Data

| Design Cond. | LFY (cfsm) | Trib Flow (cfs) | Stream Flow (cfs) | Rch Trav Time (days) | Rch Velocity (fps) | WD Ratio | Rch Width (ft) | Rch Depth (ft) | Tributary Temp (°C) | Tributary pH | Stream Temp (°C) | Stream pH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Q7-10** | 0.009 | 0.00 | 0.00 | 0.000 | 0.000 | 10.0 | 0.00 | 0.00 | 5.00 | 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 | 12.80 | 0.00 | 0.00 |
| NH3-N | 25.00 | 0.00 | 0.00 | 0.70 |

# WQM 7.0 Hydrodynamic Outputs

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 19C | 40161 | Trib 40161 to Dunlap Creek |

| RMI | Stream Flow (cfs) | PWS With (cfs) | Net Stream Flow (cfs) | Disc Analysis Flow (cfs) | Reach Slope (ft/ft) | Depth (ft) | Width (ft) | W/D Ratio | Velocity (fps) | Reach Trav Time (days) | Analysis Temp (°C) | Analysis pH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Q7-10 Flow** | | | | | | | | | | | | |
| 1.110 | 0.00 | 0.00 | 0.00 | .0696 | 0.04900 | .379 | 1.8 | 4.74 | 0.10 | 0.225 | 14.91 | 7.00 |
| **Q1-10 Flow** | | | | | | | | | | | | |
| 1.110 | 0.00 | 0.00 | 0.00 | .0696 | 0.04900 | NA | NA | NA | 0.10 | 0.225 | 14.95 | 7.00 |
| **Q30-10 Flow** | | | | | | | | | | | | |
| 1.110 | 0.00 | 0.00 | 0.00 | .0696 | 0.04900 | NA | NA | NA | 0.10 | 0.224 | 14.88 | 7.00 |

## WQM 7.0 Modeling Specifications

| | | | |
|---|---|---|---|
| Parameters | Both | Use Inputted Q1-10 and Q30-10 Flows | ☑ |
| WLA Method | EMPR | Use Inputted W/D Ratio | ☐ |
| Q1-10/Q7-10 Ratio | 0.64 | Use Inputted Reach Travel Times | ☐ |
| Q30-10/Q7-10 Ratio | 1.36 | Temperature Adjust Kr | ☑ |
| D.O. Saturation | 90.00% | Use Balanced Technology | ☑ |
| D.O. Goal | 5 | | |

# WQM 7.0 Wasteload Allocations

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 19C | 40161 | Trib 40161 to Dunlap Creek |

## NH3-N Acute Allocations

| RMI | Discharge Name | Baseline Criterion (mg/L) | Baseline WLA (mg/L) | Multiple Criterion (mg/L) | Multiple WLA (mg/L) | Critical Reach | Percent Reduction |
|---|---|---|---|---|---|---|---|
| 1.110 | Brownsville STP | 24.1 | 24.24 | 24.1 | 24.24 | 0 | 0 |

## NH3-N Chronic Allocations

| RMI | Discharge Name | Baseline Criterion (mg/L) | Baseline WLA (mg/L) | Multiple Criterion (mg/L) | Multiple WLA (mg/L) | Critical Reach | Percent Reduction |
|---|---|---|---|---|---|---|---|
| 1.110 | Brownsville STP | 2.62 | 2.65 | 2.62 | 2.65 | 0 | 0 |

## Dissolved Oxygen Allocations

| RMI | Discharge Name | CBOD5 | | NH3-N | | Dissolved Oxygen | | Critical Reach | Percent Reduction |
|---|---|---|---|---|---|---|---|---|---|
| | | Baseline (mg/L) | Multiple (mg/L) | Baseline (mg/L) | Multiple (mg/L) | Baseline (mg/L) | Multiple (mg/L) | | |
| 1.11 | Brownsville STP | 25 | 25 | 2.65 | 2.65 | 5 | 5 | 0 | 0 |

# WQM 7.0 D.O.Simulation

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 19C | 40161 | Trib 40161 to Dunlap Creek |

| RMI | Total Discharge Flow (mgd) | Analysis Temperature (°C) | Analysis pH |
|---|---|---|---|
| 1.110 | 0.045 | 14.915 | 7.000 |
| **Reach Width (ft)** | **Reach Depth (ft)** | **Reach WDRatio** | **Reach Velocity (fps)** |
| 1.795 | 0.379 | 4.743 | 0.103 |
| **Reach CBOD5 (mg/L)** | **Reach Kc (1/days)** | **Reach NH3-N (mg/L)** | **Reach Kn (1/days)** |
| 24.80 | 1.499 | 2.63 | 0.473 |
| **Reach DO (mg/L)** | **Reach Kr (1/days)** | **Kr Equation** | **Reach DO Goal (mg/L)** |
| 5.066 | 25.355 | Owens | 5 |
| **Reach Travel Time (days)** | | | |
| 0.225 | | | |

**Subreach Results**

| TravTime (days) | CBOD5 (mg/L) | NH3-N (mg/L) | D.O. (mg/L) |
|---|---|---|---|
| 0.022 | 24.15 | 2.60 | 6.42 |
| 0.045 | 23.52 | 2.58 | 7.21 |
| 0.067 | 22.90 | 2.55 | 7.67 |
| 0.090 | 22.29 | 2.52 | 7.95 |
| 0.112 | 21.71 | 2.50 | 8.13 |
| 0.135 | 21.14 | 2.47 | 8.25 |
| 0.157 | 20.58 | 2.44 | 8.34 |
| 0.180 | 20.04 | 2.42 | 8.40 |
| 0.202 | 19.51 | 2.39 | 8.46 |
| 0.225 | 19.00 | 2.37 | 8.51 |

# WQM 7.0 Effluent Limits

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 19C | 40161 | Trib 40161 to Dunlap 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) |
|---|---|---|---|---|---|---|---|
| 1.110 | Brownsville STP | PA0030082 | 0.045 | CBOD5 | 25 | | |
| | | | | NH3-N | 2.65 | 5.3 | |
| | | | | Dissolved Oxygen | | | 5 |

## Attachment 4 – TRC_CALC

**TRC EVALUATION**

Input appropriate values in A3:A9 and D3:D9

| | | | |
|---|---|---|---|
| 0.000299 | = Q stream (cfs) | 0.5 | = CV Daily |
| 0.045 | = Q discharge (MGD) | 0.5 | = CV Hourly |
| 30 | = no. samples | 1 | = AFC_Partial Mix Factor |
| 0.3 | = Chlorine Demand of Stream | 1 | = CFC_Partial Mix Factor |
| 0 | = Chlorine Demand of Discharge | 15 | = AFC_Criteria Compliance Time (min) |
| 0.5 | = BAT/BPJ Value | 720 | = CFC_Criteria Compliance Time (min) |
| 0 | = % Factor of Safety (FOS) | | =Decay Coefficient (K) |

| Source | Reference | AFC Calculations | Reference | CFC Calculations |
|---|---|---|---|---|
| TRC | 1.3.2.iii | WLA afc = 0.020 | 1.3.2.iii | WLA cfc = 0.012 |
| PENTOXSD TRG | 5.1a | LTAMULT afc = 0.373 | 5.1c | LTAMULT cfc = 0.581 |
| PENTOXSD TRG | 5.1b | LTA_afc= 0.008 | 5.1d | LTA_cfc = 0.007 |

| Source | | Effluent Limit Calculations | |
|---|---|---|---|
| PENTOXSD TRG | 5.1f | AML MULT = 1.231 | |
| PENTOXSD TRG | 5.1g | AVG MON LIMIT (mg/l) = 0.009 | CFC |
| | | INST MAX LIMIT (mg/l) = 0.029 | |

| | |
|---|---|
| WLA afc | (.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))... ...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100) |
| LTAMULT afc | EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5) |
| LTA_afc | wla_afc*LTAMULT_afc |
| WLA_cfc | (.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc) )... ...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100) |
| LTAMULT_cfc | EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5) |
| LTA_cfc | wla_cfc*LTAMULT_cfc |
| AML MULT | EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1)) |
| AVG MON LIMIT | MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT) |
| INST MAX LIMIT | 1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc) |