pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

**Northwest Regional Office**
**CLEAN WATER PROGRAM**

| | | | |
|---|---|---|---|
| Application Type | **Renewal** | Application No. | **PA0039233** |
| Facility Type | **Non-Municipal** | APS ID | **1084087** |
| Major / Minor | **Minor** | Authorization ID | **1432073** |

# NPDES PERMIT FACT SHEET
# INDIVIDUAL SEWAGE

## Applicant and Facility Information

| | | | |
|---|---|---|---|
| Applicant Name | **Blair Enterprises, LLC** | Facility Name | **Horse Creek Manor** |
| Applicant Address | 5639 Emlenton Clintonville Road | Facility Address | 1431 Horsecreek Road |
| | Emlenton, PA 16373 | | Seneca, PA 16346 |
| Applicant Contact | Nicole Branan, Secretary (office@blairconstructionllc.com) | Facility Contact | Nicole Branan, Secretary (office@blairconstructionllc.com) |
| Applicant Phone | (724) 664-4403 | Facility Phone | (724) 664-4403 |
| Client ID | 323193 | Site ID | 246585 |
| Ch 94 Load Status | Not Overloaded | Municipality | Cranberry Township |
| Connection Status | No Limitations | County | Venango |
| Date Application Received | March 15, 2022 | EPA Waived? | Yes |
| Date Application Accepted | December 14, 2022 | If No, Reason | - |
| Purpose of Application | Renewal of an existing NPDES Permit for an existing discharge of treated sanitary wastewater from a non-municipal sewer system. This application also transfers ownership from Blaine Rhodes d/b/a Rhodes Country Court to the Blair Construction, LLC, and renames the facility from the Rhodes Country Court to the Horse Creek Manor | | |

## Summary of Review

Act 14 - Proof of Notification was submitted and received.

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

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

I. OTHER REQUIREMENTS:

A. Stormwater into Sewers
B. Right of Way
C. Solids Handling
D. Public Sewerage Availability
E. Effluent Chlorine Optimization and Minimization
F. Little or No Assimilative Capacity

SPECIAL CONDITIONS:

II. Solids Management

There are no open violations in efacts associated with the subject Client ID (323193) as of 9/20/2023. *9/22/2023 CWY*

| Approve | Deny | Signatures | Date |
|---|---|---|---|
| X | | Stephen A. McCauley<br>Stephen A. McCauley, E.I.T. / Environmental Engineering Specialist | 9/20/2023 |
| X | | Chad W. Yurisic<br>Chad W. Yurisic, P.E. / Environmental Engineer Manager | 9/22/2023 |

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

| | | | |
|---|---|---|---|
| Outfall No. | 001 | Design Flow (MGD) | 0.013 |
| Latitude | 41º 23' 20.00" | Longitude | -79º 40' 23.00" |
| Quad Name | - | Quad Code | - |
| Wastewater Description: | Sewage Effluent | | |
| Receiving Waters | Unnamed Tributary to the Sage Run (CWF) | Stream Code | N/A |
| NHD Com ID | 100476739 | RMI | N/A |
| Drainage Area | 0.19 | Yield (cfs/mi$^2$) | 0.1 |
| $Q_{7-10}$ Flow (cfs) | 0.019 | $Q_{7-10}$ Basis | calculated |
| Elevation (ft) | 1390 | Slope (ft/ft) | 0.01908 |
| Watershed No. | 16-E | Chapter 93 Class. | CWF |
| Existing Use | - | Existing Use Qualifier | - |
| Exceptions to Use | - | Exceptions to Criteria | - |
| Assessment Status | Attaining Use(s) | | |
| Cause(s) of Impairment | - | | |
| Source(s) of Impairment | - | | |
| TMDL Status | - | Name | - |

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

| | | | |
|---|---|---|---|
| Nearest Downstream Public Water Supply Intake | Aqua Pennsylvania, Inc. - Emlenton | | |
| PWS Waters | Allegheny River | Flow at Intake (cfs) | 1,250 |
| PWS RMI | 90.0 | Distance from Outfall (mi) | 46.8 |

Sludge use and disposal description and location(s): All sludge is hauled by Heffern Septic to the Franklin City General Authority STP where it is disposed of at an approved landfill.

Public Participation

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

Narrative: This Fact Sheet details the determination of draft NPDES permit limits for an existing discharge of 0.013 MGD of treated sewage from an existing non-municipal STP in Cranberry Township, Venango County.

Treatment permitted under Water Quality Management (WQM) Permit No. 367S016 T-1 consists of the following:

A comminutor with bypass bar screen, a package plant with three 5,744 gallon aeration tanks in series, a 3,405 gallon settling tank, and liquid chlorine disinfection with a 970 gallon contact tank. A 14,000 gallon polishing pond

**1. Streamflow:**

Oil Creek at Rouseville, PA (1934-2008) - USGS Gage 03020500:

| | | | |
|---|---|---|---|
| Drainage Area: | 283 | sq. mi. | (USGS StreamStats) |
| $Q_{7-10}$: | 30.1 | cfs | (USGS StreamStats) |
| Yieldrate: | 0.1 | cfsm | Calculated) |

Unnamed Tributary to the Sage Run at Outfall 001:

| | | | |
|---|---|---|---|
| Yieldrate: | 0.1 | cfsm | |
| Drainage Area: | 0.19 | sq. mi. | (USGS StreamStats) |
| % of stream allocated: | 100% | Basis: | No nearby discharges |
| $Q_{7-10}$: | 0.019 | cfs | (USGS StreamStats) |

**2. Wasteflow:**

Maximum discharge: 0.013 MGD = 0.020 cfs

Runoff flow period: 16 hours Basis: Runoff flow for MHPs

24 hour flow: 0.013 MGD x 24/16 = 0.019 MGD = 0.030 cfs

The calculated stream flow is only slightly more than the proposed discharge flow. In accordance with the SOP, since there is less than 3 parts stream flow (Q7-10) to 1 part effluent (design flow), the treatment requirements in document number 391-2000-014, titled, "Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers", dated April 12, 2008, were evaluated. Based on eDMR data, the treatment requirements are not attainable, so they will not be implemented in this NPDES Permit renewal *because this is an existing discharge 9/22/2023 CWY*.

Flow will be required to be monitored as authorized under Chapter 92a.61, and as recommended in the SOP.

**3. Parameters:**

The following parameters were evaluated: pH, Total Suspended Solids, Fecal Coliform, E. Coli, Total Phosphorus, Total Nitrogen, $NH_3$-N, $CBOD_5$, Dissolved Oxygen, and Disinfection.

a. pH

Between 6.0 and 9.0 at all times

Basis: Application of Chapter 93.7 technology-based limits.

The measurement frequency was previously set to 2/week due to a Permittee request. The measurement frequency was increased to 1/day, as recommended in the SOP, based on Table

6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001).

b. Total Suspended Solids

Limits are 30.0 mg/l as a monthly average and 60.0 as an instantaneous maximum.

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

c. Fecal Coliform

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

Basis: Application of Chapter 92a47 technology-based limits

d. E. Coli

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

Basis: Application of Chapter 92a.61 as recommended by the SOP for flows between 0.002 MGD and 0.05 MGD.

e. Phosphorus

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

f. Total Nitrogen

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

g. Ammonia-Nitrogen ($NH_3$-N)

| | | |
|---|---|---|
| Median discharge pH to be used: | 7.4 | Standard Units (S.U.) |
| | | Basis: eDMR data from previous 12 months |
| Discharge temperature: | 25°C | (default value used in the absence of data) |
| Median stream pH to be used: | 7.0 | Standard Units (S.U.) |
| | | Basis: default value used in the absence of data |
| Stream Temperature: | 20˚C | (default value used for CWF modeling) |
| Background $NH_3$-N concentration: | 0.1 | mg/l |
| | | Basis: Default value |
| Calculated $NH_3$-N Summer limits: | 25.0 | mg/l (monthly average) |
| | 50.0 | mg/l (instantaneous maximum) |

Calculated $NH_3$-N Winter limits: 25.0 mg/l (monthly average)
50.0 mg/l (instantaneous maximum)

Result: WQ modeling resulted in the summer limits above (see Attachment 1). The winter limits are calculated as three times the summer limits, but since the technology-based limits would govern, they will be used. The calculated limits are less restrictive than the previous renewal, so the previous limits will be retained.

h. $CBOD_5$

Median discharge pH to be used: 7.4 Standard Units (S.U.)

Basis: eDMR data from previous 12 months

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

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

Basis: default value used in the absence of data

Stream Temperature: 20˚C (default value used for CWF modeling)

Background $CBOD_5$ concentration: 2.0 mg/l

Basis: Default value

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

Result: WQ modeling resulted in the limits above (see Attachment 1). The calculated limits are the same as the previous permit and will be retained.

i. Dissolved Oxygen (DO)

The Dissolved Oxygen minimum of 4.0 mg/l will be retained with this renewal. The technology-based minimum of 4.0 mg/l is recommended by the WQ Model (see Attachment 1) and the SOP based on Chapter 93.7, under the authority of Chapter 92a.61.

The measurement frequency was previously set to 2/week due to a Permittee request. The measurement frequency was increased to 1/day, as recommended in the SOP, based on Table 6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001).

j. Disinfection

☐ Ultraviolet (UV) light

Basis: N/A

☒ TRC limits: 0.5 mg/l (monthly average)
1.6 mg/l (instantaneous maximum)

Basis: The TRC limits above were calculated using the Department's TRC Calculation Spreadsheet (see Attachment 2). The monthly average limit is the same as in the previous NPDES Permit and will be retained. The instantaneous maximum limit was previously set as 1.2 mg/l, but it will be reduced to 1.6 mg/l to comply with the SOP.

The measurement frequency was previously set to 2/week due to a Permittee request. The measurement frequency was increased to 1/day, as recommended in the SOP, based on

Table 6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001).

**4. Reasonable Potential Analysis for Receiving Stream:**

A Reasonable Potential Analysis was not performed in accordance with State practices for Outfall 001 using the Department's Toxics Management Spreadsheet since no sampling other than sewage-related parameters was performed for this facility with the renewal application.

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

The Department's Toxics Management Spreadsheet does not calculate limits for parameters that are based on PWS criteria (TDS, Chloride, Bromide, and Sulfate). Since no relevant sampling was provided, mass-balance calculations were not performed.

Nearest Downstream potable water supply (PWS): Aqua Pennsylvania, Inc. - Emlenton
Distance downstream from the point of discharge: 46.8 miles (approximate)

Result: No limits or monitoring are necessary as there is significant dilution available.

**6. Anti-Backsliding:**

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

**7. Attachment List:**

Attachment 1 - WQ Modeling Printouts

Attachment 2 - TRC Spreadsheet

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

## Compliance History

**DMR Data for Outfall 001 (from July 1, 2022 to June 30, 2023)**

| Parameter | JUN-23 | MAY-23 | APR-23 | MAR-23 | FEB-23 | JAN-23 | DEC-22 | NOV-22 | OCT-22 | SEP-22 | AUG-22 | JUL-22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Flow (MGD) Average Monthly | 0.0024 | 0.004 | 0.003 | 0.012 | 0.0057 | 0.0121 | 0.008 | 0.003 | 0.002 | 0.003 | 0.002 | 0.002 |
| pH (S.U.) Instantaneous Minimum | 7.45 | 7.08 | 7.09 | 7.19 | 7.36 | 7.06 | 7.17 | 7.21 | 7.45 | 7.24 | 7.39 | 7.37 |
| pH (S.U.) Instantaneous Maximum | 7.83 | 7.63 | 7.81 | 7.57 | 7.76 | 7.56 | 7.58 | 7.76 | 7.84 | 7.64 | 7.65 | 7.74 |
| DO (mg/L) Instantaneous Minimum | 5.62 | 5.88 | 6.60 | 8.09 | 9.04 | 8.35 | 9.01 | 7.74 | 7.84 | 6.23 | 6.04 | 5.52 |
| TRC (mg/L) Average Monthly | 0.32 | 0.24 | 0.34 | 0.40 | 0.29 | 0.35 | 0.31 | 0.40 | 0.44 | 0.38 | 0.32 | 0.32 |
| TRC (mg/L) Instantaneous Maximum | 0.53 | 0.51 | 0.61 | 0.54 | 0.62 | 0.62 | 0.53 | 0.53 | 0.56 | 0.58 | 0.61 | 0.47 |
| CBOD5 (mg/L) Average Monthly | 5.85 | 4.61 | 8.08 | 3.62 | 4.33 | 6.80 | 2.22 | 2.46 | 2.91 | 3.65 | 3.7 | 3.6 |
| TSS (mg/L) Average Monthly | < 5.0 | < 5.0 | 9.5 | < 5.0 | < 5.0 | 11.0 | < 5.0 | 6.5 | 5.5 | 9.5 | 6.5 | 6.5 |
| Fecal Coliform (No./100 ml) Geometric Mean | < 10.0 | < 10.0 | < 10.0 | < 10.0 | < 10.0 | < 10.0 | < 10.0 | < 10.0 | < 10.0 | < 10.0 | < 10.0 | < 10.0 |
| Fecal Coliform (No./100 ml) Instantaneous Maximum | < 10.0 | < 10.0 | < 10.0 | < 10.0 | < 10.0 | < 10.0 | < 10.0 | < 10.0 | < 10.0 | < 10.0 | < 10.0 | < 10.0 |
| Total Nitrogen (mg/L) Daily Maximum | 8.89 | | | 9.42 | | | 2.77 | | | 9.21 | | |
| Ammonia (mg/L) Average Monthly | < 0.2 | < 0.20 | | | | | | | 5.45 | 0.747 | 2.02 | 8.888 |
| Ammonia (mg/L) Daily Maximum | < 0.2 | < 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.10 | < 0.8 | < 0.8 | 5.45 | 0.747 | 2.02 | 8.888 |
| Total Phosphorus (mg/L) Daily Maximum | 0.96 | | | 2.08 | | | 5.45 | | | 9.12 | | |

## 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 | Daily Maximum | Instant. Maximum | | |
| Flow (MGD) | Report | XXX | XXX | XXX | XXX | XXX | 1/week | Estimate |
| pH (S.U.) | XXX | XXX | 6.0 Daily Min | XXX | 9.0 | XXX | 1/day | Grab |
| DO | XXX | XXX | 4.0 Daily Min | XXX | XXX | XXX | 1/day | Grab |
| TRC | XXX | XXX | XXX | 0.5 | XXX | 1.6 | 1/day | Grab |
| CBOD5 | XXX | XXX | XXX | 25.0 | XXX | 50 | 2/month | 8-Hr Composite |
| TSS | XXX | XXX | XXX | 30.0 | XXX | 60 | 2/month | 8-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 | XXX | Report | 1/year | Grab |
| Total Nitrogen | XXX | XXX | XXX | Report Avg Qrtly | XXX | XXX | 1/quarter | 8-Hr Composite |
| Ammonia Nov 1 - Apr 30 | XXX | XXX | XXX | Report Avg Qrtly | XXX | XXX | 1/quarter | 8-Hr Composite |
| Ammonia May 1 - Oct 31 | XXX | XXX | XXX | 17.0 Avg Qrtly | XXX | 34 | 1/quarter | 8-Hr Composite |
| Total Phosphorus | XXX | XXX | XXX | Report Avg Qrtly | XXX | XXX | 1/quarter | 8-Hr Composite |

Compliance Sampling Location: at Outfall 001, after disinfection.

Flow is monitor only based on Chapter 92a.61. The limits for pH and Dissolved Oxygen are technology-based on Chapter 93.7. The limits for Total Residual Chlorine (TRC) are technology based on Chapter 92a.47. The limits for $CBOD_5$, Total Suspended Solids (TSS), and Fecal Coliforms are technology-based on Chapter 92a.47. The limits for Ammonia-Nitrogen are water quality-based on Chapter 93.7. Monitoring for E. Coli, Total Nitrogen, and Total Phosphorus is based on Chapter 92a.61.

Attachment 1

## WQM 7.0 Effluent Limits (Perennial Reach Model)

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 16E | 54711 | SAGE RUN |

| RMI | Name | Permit Number | Disc Flow (mgd) | Parameter | Effl. Limit 30-day Ave. (mg/L) | Effl. Limit Maximum (mg/L) | Effl. Limit Minimum (mg/L) |
|---|---|---|---|---|---|---|---|
| 3.100 | perennial | 1 | 0.019 | CBOD5 | 3.3 | | |
| | | | | NH3-N | 6.94 | 13.88 | |
| | | | | Dissolved Oxygen | | | 2 |

Since the results are the same as the inputs for the Dry Reach Model, those inputs are protective of the receiving stream.

# WQM 7.0 D.O.Simulation

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 16E | 54711 | SAGE RUN |

| RMI | Total Discharge Flow (mgd) | Analysis Temperature (°C) | Analysis pH |
|---|---|---|---|
| 3.100 | 0.019 | 21.102 | 7.062 |
| **Reach Width (ft)** | **Reach Depth (ft)** | **Reach WDRatio** | **Reach Velocity (fps)** |
| 4.825 | 0.367 | 13.146 | 0.075 |
| **Reach CBOD5 (mg/L)** | **Reach Kc (1/days)** | **Reach NH3-N (mg/L)** | **Reach Kn (1/days)** |
| 2.29 | 0.051 | 1.53 | 0.762 |
| **Reach DO (mg/L)** | **Reach Kr (1/days)** | **Kr Equation** | **Reach DO Goal (mg/L)** |
| 6.867 | 25.162 | Owens | 6 |
| **Reach Travel Time (days)** | | | |
| 2.515 | | | |

**Subreach Results**

| TravTime (days) | CBOD5 (mg/L) | NH3-N (mg/L) | D.O. (mg/L) |
|---|---|---|---|
| 0.251 | 2.26 | 1.26 | 8.08 |
| 0.503 | 2.23 | 1.04 | 8.08 |
| 0.754 | 2.20 | 0.86 | 8.08 |
| 1.006 | 2.17 | 0.71 | 8.08 |
| 1.257 | 2.14 | 0.59 | 8.08 |
| 1.509 | 2.11 | 0.48 | 8.08 |
| 1.760 | 2.08 | 0.40 | 8.08 |
| 2.012 | 2.05 | 0.33 | 8.08 |
| 2.263 | 2.03 | 0.27 | 8.08 |
| 2.515 | 2.00 | 0.23 | 8.08 |

# 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 | 6 | | |

## 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 |
|---|---|---|---|---|---|---|---|---|
| 16E | 54711 | SAGE RUN | **3.100** | 1299.00 | 1.04 | 0.00000 | 0.00 | ☑ |

**Stream Data**

| Design Cond. | LFY (cfsm) | Trib Flow (cfs) | Stream Flow (cfs) | Rch Trav Time (days) | Rch Velocity (fps) | WD Ratio | Rch Width (ft) | Rch Depth (ft) | Tributary Temp (°C) | Tributary pH | Stream Temp (°C) | Stream pH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Q7-10** | 0.100 | 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 |
|---|---|---|---|---|---|---|---|
| perennial | 1 | 0.0190 | 0.0000 | 0.0000 | 0.000 | 25.00 | 7.40 |

**Parameter Data**

| Parameter Name | Disc Conc (mg/L) | Trib Conc (mg/L) | Stream Conc (mg/L) | Fate Coef (1/days) |
|---|---|---|---|---|
| CBOD5 | 3.30 | 2.00 | 0.00 | 1.50 |
| Dissolved Oxygen | 2.00 | 8.24 | 0.00 | 0.00 |
| NH3-N | 6.94 | 0.00 | 0.00 | 0.70 |

(inputs from th Dry Reach Model results)

## 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 |
|---|---|---|---|---|---|---|---|---|
| 16E | 54711 | SAGE RUN | **0.000** | 987.00 | 5.46 | 0.00000 | 0.00 | ☑ |

### Stream Data

| Design Cond. | LFY (cfsm) | Trib Flow (cfs) | Stream Flow (cfs) | Rch Trav Time (days) | Rch Velocity (fps) | WD Ratio | Rch Width (ft) | Rch Depth (ft) | Tributary Temp (°C) | Tributary pH | Stream Temp (°C) | Stream pH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Q7-10** | 0.100 | 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 Hydrodynamic Outputs

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 16E | 54711 | SAGE RUN |

| RMI | Stream Flow (cfs) | PWS With (cfs) | Net Stream Flow (cfs) | Disc Analysis Flow (cfs) | Reach Slope (ft/ft) | Depth (ft) | Width (ft) | W/D Ratio | Velocity (fps) | Reach Trav Time (days) | Analysis Temp (°C) | Analysis pH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Q7-10 Flow** | | | | | | | | | | | | |
| 3.100 | 0.10 | 0.00 | 0.10 | .0294 | 0.01906 | .367 | 4.82 | 13.15 | 0.08 | 2.515 | 21.10 | 7.06 |
| **Q1-10 Flow** | | | | | | | | | | | | |
| 3.100 | 0.07 | 0.00 | 0.07 | .0294 | 0.01906 | NA | NA | NA | 0.06 | 3.024 | 21.53 | 7.09 |
| **Q30-10 Flow** | | | | | | | | | | | | |
| 3.100 | 0.14 | 0.00 | 0.14 | .0294 | 0.01906 | NA | NA | NA | 0.09 | 2.189 | 20.86 | 7.05 |

# WQM 7.0 Wasteload Allocations

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 16E | 54711 | SAGE RUN |

## NH3-N Acute Allocations

| RMI | Discharge Name | Baseline Criterion (mg/L) | Baseline WLA (mg/L) | Multiple Criterion (mg/L) | Multiple WLA (mg/L) | Critical Reach | Percent Reduction |
|---|---|---|---|---|---|---|---|
| 3.100 | perennial | 13.59 | 13.88 | 13.59 | 13.88 | 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 |
|---|---|---|---|---|---|---|---|
| 3.100 | perennial | 1.75 | 6.94 | 1.75 | 6.94 | 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) | | |
| 3.10 | perennial | 3.3 | 3.3 | 6.94 | 6.94 | 2 | 2 | 0 | 0 |

# WQM 7.0 D.O.Simulation (Dry Reach Model)

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 16E | 54711 | SAGE RUN |

| RMI | Total Discharge Flow (mgd) | Analysis Temperature (°C) | Analysis pH |
|---|---|---|---|
| 4.000 | 0.019 | 23.037 | 7.198 |
| **Reach Width (ft)** | **Reach Depth (ft)** | **Reach WDRatio** | **Reach Velocity (fps)** |
| 2.412 | 0.323 | 7.464 | 0.062 |
| **Reach CBOD5 (mg/L)** | **Reach Kc (1/days)** | **Reach NH3-N (mg/L)** | **Reach Kn (1/days)** |
| 15.18 | 1.500 | 15.18 | 0.884 |
| **Reach DO (mg/L)** | **Reach Kr (1/days)** | **Kr Equation** | **Reach DO Goal (mg/L)** |
| 3.215 | 29.284 | Owens | 2 |
| **Reach Travel Time (days)** | | | |
| 0.886 | | | |

**Subreach Results**

| TravTime (days) | CBOD5 (mg/L) | NH3-N (mg/L) | D.O. (mg/L) |
|---|---|---|---|
| 0.089 | 13.03 | 14.04 | 2.00 |
| 0.177 | 11.19 | 12.98 | 2.00 |
| 0.266 | 9.60 | 12.00 | 2.00 |
| 0.354 | 8.24 | 11.10 | 2.00 |
| 0.443 | 7.07 | 10.26 | 2.00 |
| 0.532 | 6.07 | 9.49 | 2.00 |
| 0.620 | 5.21 | 8.77 | 2.00 |
| 0.709 | 4.47 | 8.11 | 2.00 |
| 0.797 | 3.84 | 7.50 | 2.00 |
| 0.886 | 3.30 | 6.94 | 2.00 |

(input results into Perennial Reach Model)

# WQM 7.0 Modeling Specifications

| | | | |
|---|---|---|---|
| Parameters | D.O. | Use Inputted Q1-10 and Q30-10 Flows | ☑ |
| WLA Method | Simulation | 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 | 2 | | |

## 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 |
|---|---|---|---|---|---|---|---|---|
| 16E | 54711 | SAGE RUN | **4.000** | 1390.00 | 0.19 | 0.00000 | 0.00 | ☑ |

### Stream Data

| Design Cond. | LFY (cfsm) | Trib Flow (cfs) | Stream Flow (cfs) | Rch Trav Time (days) | Rch Velocity (fps) | WD Ratio | Rch Width (ft) | Rch Depth (ft) | Tributary Temp (°C) | Tributary pH | Stream Temp (°C) | Stream pH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Q7-10** | 0.100 | 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 |
|---|---|---|---|---|---|---|---|
| Horse Creek | PA0039233 | 0.0190 | 0.0000 | 0.0000 | 0.000 | 25.00 | 7.40 |

### Parameter Data

| Parameter Name | Disc Conc (mg/L) | Trib Conc (mg/L) | Stream Conc (mg/L) | Fate Coef (1/days) |
|---|---|---|---|---|
| CBOD5 | 25.00 | 0.00 | 0.00 | 1.50 |
| Dissolved Oxygen | 4.00 | 2.00 | 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 |
|---|---|---|---|---|---|---|---|---|
| 16E | 54711 | SAGE RUN | **3.100** | 1299.00 | 1.04 | 0.00000 | 0.00 | ☑ |

### Stream Data

| Design Cond. | LFY (cfsm) | Trib Flow (cfs) | Stream Flow (cfs) | Rch Trav Time (days) | Rch Velocity (fps) | WD Ratio | Rch Width (ft) | Rch Depth (ft) | Tributary Temp (°C) | Tributary pH | Stream Temp (°C) | Stream pH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Q7-10** | 0.100 | 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 |
|---|---|---|---|---|---|---|---|
| perennial | 1 | 0.0190 | 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 | 3.30 | 2.00 | 0.00 | 1.50 |
| Dissolved Oxygen | 2.00 | 8.24 | 0.00 | 0.00 |
| NH3-N | 6.94 | 0.00 | 0.00 | 0.70 |

# WQM 7.0 Hydrodynamic Outputs

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 16E | 54711 | SAGE RUN |

| RMI | Stream Flow (cfs) | PWS With (cfs) | Net Stream Flow (cfs) | Disc Analysis Flow (cfs) | Reach Slope (ft/ft) | Depth (ft) | Width (ft) | W/D Ratio | Velocity (fps) | Reach Trav Time (days) | Analysis Temp (°C) | Analysis pH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Q7-10 Flow** | | | | | | | | | | | | |
| 4.000 | 0.02 | 0.00 | 0.02 | NA | 0.01915 | .323 | 2.41 | 7.46 | 0.06 | 0.886 | 23.04 | 7.20 |
| **Q1-10 Flow** | | | | | | | | | | | | |
| 4.000 | 0.01 | 0.00 | 0.00 | NA | 0.01915 | NA | NA | NA | 0.00 | 0.000 | 0.00 | 0.00 |
| **Q30-10 Flow** | | | | | | | | | | | | |
| 4.000 | 0.03 | 0.00 | 0.00 | NA | 0.01915 | NA | NA | NA | 0.00 | 0.000 | 0.00 | 0.00 |

Attachment 2

## TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

| | | | |
|---|---|---|---|
| 0.104 | = Q stream (cfs) | 0.5 | = CV Daily |
| 0.02 | = Q discharge (MGD) | 0.5 | = CV Hourly |
| 30 | = no. samples | 1 | = AFC_Partial Mix Factor |
| 0.3 | = Chlorine Demand of Stream | 1 | = CFC_Partial Mix Factor |
| 0 | = Chlorine Demand of Discharge | 15 | = AFC_Criteria Compliance Time (min) |
| 0.5 | = BAT/BPJ Value | 720 | = CFC_Criteria Compliance Time (min) |
| 0 | = % Factor of Safety (FOS) | 0 | =Decay Coefficient (K) |

| Source | Reference | AFC Calculations | Reference | CFC Calculations |
|---|---|---|---|---|
| TRC | 1.3.2.iii | WLA afc = 1.091 | 1.3.2.iii | WLA cfc = 1.056 |
| PENTOXSD TRG | 5.1a | LTAMULT afc = 0.373 | 5.1c | LTAMULT cfc = 0.581 |
| PENTOXSD TRG | 5.1b | LTA_afc= 0.407 | 5.1d | LTA_cfc = 0.614 |

| Source | | Effluent Limit Calculations | |
|---|---|---|---|
| PENTOXSD TRG | 5.1f | AML MULT = 1.231 | |
| PENTOXSD TRG | 5.1g | AVG MON LIMIT (mg/l) = 0.500 | BAT/BPJ |
| | | INST MAX LIMIT (mg/l) = 1.635 | |

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