pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

**Southcentral Regional Office**
**CLEAN WATER PROGRAM**

# NPDES PERMIT FACT SHEET
# INDIVIDUAL SEWAGE

| | | | |
|---|---|---|---|
| Application Type | **Renewal** | Application No. | **PA0029335** |
| Facility Type | **Non-Municipal** | APS ID | **81** |
| Major / Minor | **Minor** | Authorization ID | **1214797** |

## Applicant and Facility Information

| | | | |
|---|---|---|---|
| Applicant Name | **PA Lions Beacon Lodge Camp** | Facility Name | **Beacon Lodge Camp** |
| Applicant Address | 114 SR103 South | Facility Address | 114 SR 103 South |
| | Mount Union, PA 17066-9601 | | Mount Union, PA 17066-9601 |
| Applicant Contact | Jonathan Carver | Facility Contact | Jonathan Carver |
| Applicant Phone | (814) 542-2511 | Facility Phone | (814) 542-2511 |
| Client ID | 57000 | Site ID | 260265 |
| Ch 94 Load Status | Not Overloaded | Municipality | Wayne Township |
| Connection Status | | County | Mifflin |
| Date Application Received | December 11, 2017 | EPA Waived? | Yes |
| Date Application Accepted | February 1, 2018 | If No, Reason | |

Purpose of Application: NPDED permit renewal

## Summary of Review

### 1.0 General Discussion

This fact sheet supports the re-issuance of an existing NPDES permit for discharge of treated domestic wastewater from PA Lions Beacon Lodge Camp's wastewater treatment plant located in Wayne Township, Mifflin County. The camp is a seasonal recreational camp for blind children and adults. The treatment plant has a hydraulic design capacity of 0.02MGD. PA Lions Beacon Lodge Camp owns and operates the wastewater treatment plant. The discharge goes to Sugar Valley Run (stream code 12745) which is designated in the Pa Code Chapter 93.9 drainage List N as Cold Water Fishes (CWF) and Migratory Fishes (MF). The use designation for Sugar Valley Run basin was inadvertently omitted from Chapter 93.9n and Sugar Valley Run was classified as UNT to Juniata River with a use designation of High Quality-Cold Water Fishes (HQ-CWF) in error. The CWF designation became effective on September 5, 1998. The existing permit limits were developed to protect the HQ-CWF designation of the Sugar Valley Run which is no longer valid. The current water quality analysis for the permit renewal will treat Sugar Valley Run as CWF, MF. The existing NPDES permit was issued on June 14, 2013 with an effective date of July 1, 2013 and expiration date of June 30, 2018. The applicant submitted permit renewal application to the Department on December 11, 2017. The permittee is currently operating under the terms and conditions in the existing permit under administrative extension provisions pending Department action on the renewal application.

A topographic map showing the discharge location is presented in attachment A

| Approve | Deny | Signatures | Date |
|---|---|---|---|
| X | | J. Pascal Kwedza, P.E. / Environmental Engineer | August 5, 2019 |
| | | Daniel W. Martin, P.E. / Environmental Engineer Manager | |
| | | Maria D. Bebenek, P.E., Program Manager | |

## Summary of Review

### 1.1 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.

### 1.2 Changes to the existing Permit

TRC is slightly more stringent in the current permit.

### 1.3 Existing Permit Limits and Monitoring Requirements

| DISCHARGE LIMITATIONS | | | | | | | MONITORING REQUIREMENTS | |
|---|---|---|---|---|---|---|---|---|
| | Mass Units (lbs/day) | | Concentrations (mg/l) | | | | | |
| Discharge Parameter | Average Monthly | Maximum Daily | Inst. Minimum | Average Monthly | Maximum Daily | Inst. Maximum | Monitoring Frequency | Sample Type |
| Flow (mgd) | Monitor & Report | Monitor & Report | XXX | XXX | XXX | XXX | continuous | Measured |
| pH (S.U.) | XXX | XXX | 6.0 | XXX | XXX | 9.0 | 1/day | Grab |
| D.O. | XXX | XXX | 5.0 | XXX | XXX | XXX | 1/day | Grab |
| Total Residual Chlorine | XXX | XXX | XXX | 0.4 | XXX | 1.0 | 1/day | Grab |
| Total Suspended Solids | XXX | XXX | XXX | 30 | XXX | 60 | 2/month | 8-hour comp |
| $CBOD_5$ | XXX | XXX | XXX | 25 | XXX | 50 | 2/month | 8-hour comp |
| Fecal Coliform | XXX | XXX | XXX | 200 | XXX | 1,000 | 2/month | Grab |
| Ammonia Nov 1 - Apr 30 | XXX | XXX | XXX | 9.0 | XXX | 18 | 2/month | 8-Hr Composite |
| Ammonia May 1 - Oct 31 | XXX | XXX | XXX | 3.0 | XXX | 6 | 2/month | 8-Hr Composite |
| Total Nitrogen | XXX | XXX | XXX | Report Annl Avg | XXX | XXX | 2/month | Calculation |
| Total Phosphorus | XXX | XXX | XXX | Report Annl Avg | XXX | XXX | 2/month | 8-Hr Composite |

| **Discharge, Receiving Waters and Water Supply Information** | | | |
|---|---|---|---|
| Outfall No. | 001 | Design Flow (MGD) | .02 |
| Latitude | 40º 22' 25.48" | Longitude | -77º 48' 44.35" |
| Quad Name | | Quad Code | |
| Wastewater Description: | Sewage Effluent | | |
| Receiving Waters | Sugar Valley Run | Stream Code | 12745 |
| NHD Com ID | 66209949 | RMI | 0.01 |
| Drainage Area | 2.7 | Yield (cfs/mi$^2$) | 0.02 |
| $Q_{7-10}$ Flow (cfs) | 0.057 | $Q_{7-10}$ Basis | USGS Gage Station |
| Elevation (ft) | 580 | Slope (ft/ft) | |
| Watershed No. | 12-A | Chapter 93 Class. | CWF, MF |
| 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 | Mifflintown Borough Municipal Authority | | |
| PWS Waters | Juniata River | Flow at Intake (cfs) | |
| PWS RMI | | Distance from Outfall (mi) | 39 |

Changes Since Last Permit Issuance: None

### 1.4.1 Water Supply Intake

The nearest downstream water supply intake is approximately 39 miles downstream for Mifflintown Borough Municipal Authority on Juniata River in Juniata County. No impact is expected from this discharge on the intake

| Treatment Facility Summary | | | | |
|---|---|---|---|---|
| **Treatment Facility Name:** Beacon Lodge Camp | | | | |
| **WQM Permit No.** | **Issuance Date** | | | |
| | | | | |
| | | | | |
| **Waste Type** | **Degree of Treatment** | **Process Type** | **Disinfection** | **Avg Annual Flow (MGD)** |
| Sewage | Secondary | Extended Aeration | Hypochlorite | 0.02 |
| | | | | |
| **Hydraulic Capacity (MGD)** | **Organic Capacity (lbs/day)** | **Load Status** | **Biosolids Treatment** | **Biosolids Use/Disposal** |
| 0.02 | | Not Overloaded | Dewatering | Other WWTP |

Changes Since Last Permit Issuance:

Other Comments:

## 2.1 Treatment Facility

The treatment plant is a 0.020 MGD facility with a comminutor, Flow Equalization, Aeration Tank and Clarification Tank, Chlorine Contact Tank, sludge Holding tank and sludge drying beds. Effluent is disinfected with chlorine tabs and de-chlorinated before being discharged continuously to Sugar Valley Run.

## Compliance History

**DMR Data for Outfall 001 (from December 1, 2017 to June 30, 2019)**

| Parameter | JUN-19 | MAY-19 | APR-19 | MAR-19 | OCT-18 | SEP-18 | AUG-18 | JUL-18 | JUN-18 | MAY-18 | APR-18 | MAR-18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Flow (MGD) Average Monthly | 0.001 | 0.001 | 0.000 | 0.000 | 0.001 | 0.001 | 0.002 | 0.002 | 0.001 | 0.000 | 0.000 | 0.000 |
| Flow (MGD) Daily Maximum | 0.004 | 0.005 | 0.003 | 0.004 | 0.005 | 0.005 | 0.007 | 0.007 | 0.005 | 0.003 | 0.004 | 0.001 |
| pH (S.U.) Minimum | 7.49 | 7.63 | 7.73 | 7.60 | 7.24 | 7.32 | 6.98 | 6.84 | 7.18 | 7.58 | 7.59 | 7.71 |
| pH (S.U.) Maximum | 8.19 | 8.06 | 8.36 | 8.20 | 7.57 | 7.96 | 7.63 | 7.32 | 7.85 | 7.75 | 7.86 | 8.00 |
| DO (mg/L) Minimum | 7.79 | 6.37 | 9.57 | 9.37 | 7.15 | 8.53 | 7.96 | 8.06 | 8.34 | 8.64 | 10.84 | 11.83 |
| TRC (mg/L) Average Monthly | < 0.01 | < 0.01 | < 0.01 | < 0.01 | 0.02 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.07 | 0.02 |
| TRC (mg/L) Instantaneous Maximum | 0.03 | 0.02 | 0.02 | < 0.01 | 0.20 | 0.05 | 0.07 | 0.03 | 0.01 | 0.02 | 0.32 | 0.05 |
| CBOD5 (mg/L) Average Monthly | < 3.00 | < 3.33 | < 3.0 | < 3.00 | < 3.23 | < 3.00 | < 3.00 | < 3.00 | < 3.73 | < 3.15 | < 5.67 | 5.45 |
| TSS (mg/L) Average Monthly | 3.8 | < 3.5 | 9.8 | 16.4 | 4.40 | 4.4 | 4.00 | 10.00 | 4.7 | 5.60 | 10.2 | 12.00 |
| Fecal Coliform (CFU/100 ml) Geometric Mean | 2.74 | 3.22 | < 1.0 | < 1.0 | 19.1 | 2.0 | < 3.46 | 32.9 | 1.42 | < 0.1 | < 1.76 | 1.41 |
| Fecal Coliform (CFU/100 ml) Instantaneous Maximum | 7.5 | 5.2 | < 1.0 | < 1.0 | 365.4 | 2.0 | 12.0 | 172.5 | 2.0 | < 0.1 | 3.1 | 2.0 |
| Total Nitrogen (mg/L) Annual Average | | | | | | < 1.000 | | | | | | |
| Total Nitrogen (lbs) Total Annual | | | | | | < 3.044 | | | | | | |
| Ammonia (mg/L) Average Monthly | < 0.1000 | < 0.1000 | < 1.000 | 0.241 | < 0.1000 | < 0.1000 | < 0.1000 | < 0.1000 | < 0.1000 | 0.354 | 0.609 | 0.131 |
| Total Phosphorus (mg/L) Annual Average | | | | | | 1.78 | | | | | | |
| Total Phosphorus (lbs) Total Annual | | | | | | 5.42 | | | | | | |

| **3.2 Compliance History** | |
|---|---|
| | |
| **Summary of DMRs:** | Discharge Monitoring Reports (DMRs) review for the facility for the last 15 months of operation presented on the table above indicate permit limits have been met consistently. No permit violation noted on DMRs during the period reviewed. |
| **Summary of Inspections:** | The facility was inspected 6 times during the past permit cycle. Inspection reports review for the facility during the period indicate permit limits have been met satisfactorily. Ammonia Nitrogen permit violation occurred during facility inspection on 6/28/16. A response to an NOV sent for the violation indicated the violation was due to a malfunctioning blower bearing. The equipment has been repaired and no violations noted after the repairs. The reports indicate good operation and maintenance of the facility. |

## 4.0 Development of Effluent Limitations

**Outfall No.** 001 **Design Flow (MGD)** .02
**Latitude** 40º 22' 25.00" **Longitude** -77º 48' 44.00"
**Wastewater Description:** Sewage Effluent

### 4.1 Basis for Effluent Limitations

In general, the Clean Water Act(AWA) requires that the effluent limits for a particular pollutant be the more stringent of either technology-based limits or water quality-based limits. Technology-based limits are set according to the level of treatment that is achievable using available technology. A water quality-based effluent limit is designed to ensure that the water quality standards applicable to a waterbody are being met and may be more stringent than technology-based effluent limits.

### 4.1.1 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) |

Comments: Weekly averages are not applicable to this discharge. The facility operates mainly during summer months; therefore, a winter Fecal Coliform limit is unnecessary. Summer Fecal Coliform limit will apply year-round.

### 4.2 Water Quality-Based Limitations

### 4.2.1 Receiving Stream

The receiving stream is the Sugar Valley Run. According to 25 PA § 93.9n, this stream is protected for Cold Water Fishes (CWF) and Migratory Fishes (MF). It is located in Drainage List N and State Watershed 12-A. It has been assigned stream code 12745. According to the Department's *Integrated Water Quality Monitoring and Assessment Report*, this stream is attaining its designated uses

### 4.2.2 Streamflows

Nearest USGS Stream gage is 01564500 on Aughwick Creek near Three Springs, PA. Recent stream flow retrievals resulted in a $Q_{7\text{-}10}$, $Q_{1\text{-}10}$, and $Q_{30\text{-}10}$ of 4.2 cfs, 3.6 cfs, and 6.2 cfs respectively at this gage for record period of 1939-2005. These values were obtained from the latest USGS streamflow report from StreamStats version 3.0. The drainage area is reported to be 205 $mi^2$ at the gage station. The resulted run off rate and ratio calculations are shown below:

- $Q_{7\text{-}10}$ runoff rate = 4.2/205 = 0.020 cfs/$mi^2$
- $Q_{30\text{-}10}$ / $Q_{7\text{-}10}$ = 1.48
- $Q_{1\text{-}10}$ / $Q_{7\text{-}10}$ = 0.86

The drainage area at discharge point calculated from StreamStat version 3.0 = 2.84 $mi^2$
The $Q_{7-10}$ at discharge = 2.84 $mi^2$ x 0.02 $ft^3/s/mi^2$ = 0.057 $ft^3/s$.

**4.2.3 $NH_3N$ Calculations**

$NH_3N$ calculations will be based on the Department's Implementation Guidance of Section 93.7 Ammonia Criteria, dated 11/4/97 (ID No. 391-2000-013). The following data is necessary to determine the instream $NH_3N$ criteria used in the attached computer model of the stream:

- Discharge pH = 7.0 (DMR median from Jul. to Sept.)
- Discharge Temperature = 25 $^o$ C (Default)
* Stream pH = 7.0(Default))
* Stream Temperature = 20$^o$C (Default))
- Background $NH_3$-N = 0.0 (default)
- Discharge flow =0.02MGD

**4.2.4 $CBOD_5$:**

The attached result of WQM 7.0 stream model (attachment B) indicates that, for PA Beacon Lodge's discharge of 0.020MGD, a limitation of 25 mg/l $CBOD_5$ as a monthly average limit (AML) and 50 mg/l as instantaneous maximum (IMAX) is adequate to protect the water quality of the stream. This limit is consistent with the existing permit and the STP has been complying with this limitation. Therefore, a limit of 25mg/l AML, and 50 mg/l IMAX is again recommended for this permit cycle.

**4.2.5 $NH_3$-N:**

The attached result of WQM 7.0 stream model (attachment B) also indicates that a summer limitation of 6.46mg/l $NH_3$-N as a monthly average is necessary to protect the aquatic life from toxicity effects. However, the existing monthly average summer limit of 3.0 mg/l which was based on measurable change analysis conducted during the past permit renewals due to the HG-CWF designation will remain in the permit since the facilities has been meeting the limitation. Limit for winter months is 3 times the limit for summer months. (9.0 mg/l)

**4.2.6 Dissolved Oxygen**

The existing permit contains a limit of 5 mg/l for Dissolved Oxygen (DO). DEP's Technical Guidance for the Development and Specification of Effluent Limitations (362-0400-001, 10/97) suggests that either the adopted minimum stream D.O. criteria for the receiving stream or the effluent level determined through water quality modeling be used for the limit. Since the WQM 7.0 model was run using a minimum D.O. of 5.0 mg/l, this limit will be continued in the renewed permit with a daily monitoring requirement per DEP guidance.

**4.2.7 Total Suspended Solids(TSS):**

There is no water quality criterion for TSS. A limit of 30 mg/l AML will be required based on the minimum level of effluent quality attainable by secondary treatment as defined in 40 CFR 133.102b(1) and 25 PA § 92a.47(a)(1)

**4.2.8 Total Residual Chlorine:**

The attached computer printout presented in attachment C utilizes the equations and calculations as presented in the Department's 2003 Implementation Guidance for Residual Chlorine (TRC) (ID # 391-2000-015) for developing chlorine limitations. The results presented in attachment C indicates that a water quality limit of 0.28 mg/l monthly average and IMAX of 0.91 mg/l would be needed to prevent toxicity concerns. The recommended limitation slightly more stringent than the existing limit; however, DMR and inspection reports indicate the facility can meet the recommended limits.

**4.2.9 Toxics**

A reasonable potential (RP) analysis was done for pollutants in the discharge. The discharge consists entirely of domestic wastewater with no pollutants of concern that need further analysis.

**4.2.10 Chesapeake Bay Strategy:**

The Department formulated a strategy in April 2007, to comply with the EPA and Chesapeake Bay Foundation requirements to reduce point source loadings of Total Nitrogen (TN) and Total Phosphorus (TP) to the Bay. In the Strategy, sewage dischargers have been prioritized by Central Office based on their delivered TN loadings to the Bay. The highest priority (Phases 1, 2, and 3) dischargers will receive annual loading caps based on their design flow on August 29, 2005 and concentrations of 6 mg/l TN and 0.8 mg/l TP. Phase 4 (0.2 -0.4mgd) and Phase 5(below 0.2mdg) will be required to monitor and report TN and TP during permit renewal at a monitoring frequency following Table 6-3 of DEP's Technical Guidance for Development and Specification of effluent Limitations (No. 362-0400-001). Any facility in Phases 4 and 5 that undergoes expansion is subjected to cap load right away.

EPA published the Chesapeake Bay Total Maximum Daily Load (TMDL) in December of 2010. Despite extensive restoration efforts during the past 25 years, the TMDL was prompted by insufficient progress and continued poor water quality in the Chesapeake Bay and its tidal tributaries.

In order to address the TMDL, Pennsylvania developed in addition to the Bay Strategy, a Chesapeake Watershed Implementation Plan (WIP) Phase 1 in January 2011 and Phase 2 in March 2012. In accordance with the Phase 2 WIP and its supplement, re-issuing permits for significant dischargers follow the same phased approach formulated in the original Bay strategy, whilst Phase 4 and Phase 5 will be required to monitor and report TN and TP during permit renewal. This facility is, classified as a phase 5, and has been monitoring Total Phosphorus, Nitrate-Nitrite as N, Total Kjeldahl Nitrogen and Total Nitrogen annually and will continue to monitor them during the next permit cycle.

**5.0 Other Requirements**

**5.1 Anti-backsliding**

Not applicable to this permit

**5.2 Stormwater**:

No storm water outfall is associated with this facility

**5.3 Biosolids Management**

Sludge is hold up in a sludge holding tank and hauled out by a licensed hauler periodically to Shade Gap wastewater treatment plant.

**5.4 Anti-Degradation (93.4)**

The effluent limits for this discharge have been developed to ensure that existing instream water uses and the level of water quality necessary to protect the existing uses are maintained and protected. No High-Quality Waters are impacted by this discharge. No Exceptional Value Waters are impacted by this discharge.

**5.5 Class A Wild Trout Fisheries**

No Class A Wild Trout Fisheries are impacted by this discharge.

**5.6 303d Listed Streams:**

The discharge is not located on a 303d listed stream segment.

**5.7 Basis for Effluent and Surface Water Monitoring**

Section 308 of the CWA and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional

effluent limitations are required and/or to monitor effluent impacts on receiving water quality. The permittee is responsible for conducting the monitoring and for reporting results on Discharge Monitoring Reports (DMRs).

## 5.8 Effluent Monitoring

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Permittees have the option of taking more frequent samples than are required under the permit. These samples can be used for averaging if they are conducted using EPA-approved test methods (generally found in 40 CFR 136) and if the Method Detection Limits are less than the effluent limits. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

## Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

**Outfall 001, Effective Period: Phase 1 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) | Report | Report Daily Max | XXX | XXX | XXX | XXX | 1/week | 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 |
| TRC | XXX | XXX | XXX | 0.28 | XXX | 0.91 | 1/day | Grab |
| CBOD5 | XXX | XXX | XXX | 25 | XXX | 50 | 2/month | 8-Hr Composite |
| TSS | XXX | XXX | XXX | 30 | XXX | 60 | 2/month | 8-Hr Composite |
| Fecal Coliform (CFU/100 ml) | XXX | XXX | XXX | 200 Geo Mean | XXX | 1000 | 2/month | Grab |
| Ammonia Nov 1 - Apr 30 | XXX | XXX | XXX | 9.0 | XXX | 18 | 2/month | 8-Hr Composite |
| Ammonia May 1 - Oct 31 | XXX | XXX | XXX | 3.0 | XXX | 6 | 2/month | 8-Hr Composite |
| Nitrate-Nitrite | XXX | XXX | XXX | XXX | Report Daily Max | XXX | 1/year | 8-Hr Composite |
| Total Nitrogen | XXX | XXX | XXX | XXX | Report Daily Max | XXX | 1/year | Calculation |
| TKN | XXX | XXX | XXX | XXX | Report Daily Max | XXX | 1/year | 8-Hr Composite |
| Total Phosphorus | XXX | XXX | XXX | XXX | Report Daily Max | XXX | 1/year | 8-Hr Composite |

Compliance Sampling Location: Outfall 001

| **7.0 Tools and References Used to Develop Permit** | |
|---|---|
| | |
| ☒ | WQM for Windows Model (see Attachment **B**) |
| ☐ | PENTOXSD for Windows Model (see Attachment ) |
| ☒ | TRC Model Spreadsheet (see Attachment **C**) |
| ☐ | Temperature Model Spreadsheet (see Attachment ) |
| ☐ | Toxics Screening Analysis Spreadsheet (see Attachment ) |
| ☐ | Water Quality Toxics Management Strategy, 361-0100-003, 4/06. |
| ☐ | Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97. |
| ☐ | Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98. |
| ☒ | Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96. |
| ☐ | Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97. |
| ☐ | Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97. |
| ☐ | Pennsylvania CSO Policy, 385-2000-011, 9/08. |
| ☒ | Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03. |
| ☐ | Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97. |
| ☒ | Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97. |
| ☐ | Implementation Guidance Design Conditions, 391-2000-006, 9/97. |
| ☐ | Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004. |
| ☐ | Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997. |
| ☐ | Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99. |
| ☐ | Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004. |
| ☒ | Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97. |
| ☐ | Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008. |
| ☒ | Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994. |
| ☐ | Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09. |
| ☐ | Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 10/97. |
| ☐ | Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 391-2000-019, 10/97. |
| ☐ | Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 3/99. |
| ☐ | Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 391-2000-022, 3/1999. |
| ☒ | Design Stream Flows, 391-2000-023, 9/98. |
| ☐ | Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98. |
| ☐ | Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97. |
| ☐ | Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07. |
| ☒ | SOP: Establishing Effluent limitation for individual sewage permit |
| ☐ | Other: WIP 2 and supplement |

**Attachments**

**A. Topographical MAP**

## B. WQM Model Results

### WQM 7.0 Effluent Limits

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 12A | 12745 | SUGAR VALLEY 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) |
|---|---|---|---|---|---|---|---|
| 0.100 | PA Beacon Lodge | PA0029335 | 0.020 | CBOD5 | 25 | | |
| | | | | NH3-N | 6.46 | 12.92 | |
| | | | | Dissolved Oxygen | | | 5 |

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## 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 |
|---|---|---|---|---|---|---|---|---|
| 12A | 12745 | SUGAR VALLEY RUN | **0.100** | 580.00 | 2.84 | 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** | 0.020 | 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 |
|---|---|---|---|---|---|---|---|
| PA Beacon Lodge | PA0029335 | 0.0200 | 0.0200 | 0.0200 | 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 |

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## 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 |
|---|---|---|---|---|---|---|---|---|
| 12A | 12745 | SUGAR VALLEY RUN | **0.010** | 575.00 | 2.92 | 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** | 0.020 | 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 | 5.00 | 8.24 | 0.00 | 0.00 |
| NH3-N | 25.00 | 0.00 | 0.00 | 0.70 |

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# WQM 7.0 Hydrodynamic Outputs

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 12A | 12745 | SUGAR VALLEY 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** | | | | | | | | | | | | |
| 0.100 | 0.06 | 0.00 | 0.06 | .0309 | 0.01052 | .345 | 5.6 | 16.23 | 0.05 | 0.121 | 21.76 | 7.00 |
| **Q1-10 Flow** | | | | | | | | | | | | |
| 0.100 | 0.05 | 0.00 | 0.05 | .0309 | 0.01052 | NA | NA | NA | 0.04 | 0.128 | 21.94 | 7.00 |
| **Q30-10 Flow** | | | | | | | | | | | | |
| 0.100 | 0.08 | 0.00 | 0.08 | .0309 | 0.01052 | NA | NA | NA | 0.05 | 0.104 | 21.35 | 7.00 |

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# 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 | 0.86 | Use Inputted Reach Travel Times | ☐ |
| Q30-10/Q7-10 Ratio | 1.48 | Temperature Adjust Kr | ☑ |
| D.O. Saturation | 90.00% | Use Balanced Technology | ☑ |
| D.O. Goal | 5 | | |

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# WQM 7.0 Wasteload Allocations

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 12A | 12745 | SUGAR VALLEY 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 |
|---|---|---|---|---|---|---|---|
| 0.100 | PA Beacon Lodg | 8.41 | 21.68 | 8.41 | 21.68 | 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 |
|---|---|---|---|---|---|---|---|
| 0.100 | PA Beacon Lodg | 1.74 | 6.46 | 1.74 | 6.46 | 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) | | |
| 0.10 | PA Beacon Lodge | 25 | 25 | 6.46 | 6.46 | 5 | 5 | 0 | 0 |

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# WQM 7.0 D.O.Simulation

| SWP Basin | Stream Code | Stream Name |
|---|---|---|
| 12A | 12745 | SUGAR VALLEY RUN |

| RMI | Total Discharge Flow (mgd) | Analysis Temperature (°C) | Analysis pH |
|---|---|---|---|
| 0.100 | 0.020 | 21.763 | 7.000 |
| **Reach Width (ft)** | **Reach Depth (ft)** | **Reach WDRatio** | **Reach Velocity (fps)** |
| 5.596 | 0.345 | 16.225 | 0.045 |
| **Reach CBOD5 (mg/L)** | **Reach Kc (1/days)** | **Reach NH3-N (mg/L)** | **Reach Kn (1/days)** |
| 10.11 | 1.291 | 2.28 | 0.802 |
| **Reach DO (mg/L)** | **Reach Kr (1/days)** | **Kr Equation** | **Reach DO Goal (mg/L)** |
| 7.099 | 20.446 | Owens | 5 |
| **Reach Travel Time (days)** | | | |
| 0.121 | | | |

**Subreach Results**

| TravTime (days) | CBOD5 (mg/L) | NH3-N (mg/L) | D.O. (mg/L) |
|---|---|---|---|
| 0.012 | 9.94 | 2.26 | 7.17 |
| 0.024 | 9.77 | 2.24 | 7.23 |
| 0.036 | 9.61 | 2.21 | 7.29 |
| 0.048 | 9.45 | 2.19 | 7.33 |
| 0.060 | 9.29 | 2.17 | 7.37 |
| 0.073 | 9.13 | 2.15 | 7.41 |
| 0.085 | 8.98 | 2.13 | 7.44 |
| 0.097 | 8.83 | 2.11 | 7.47 |
| 0.109 | 8.68 | 2.09 | 7.50 |
| 0.121 | 8.54 | 2.07 | 7.52 |

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## C. TRC Calculations

Copy of TRC_CALC1

**TRC EVALUATION**

Input appropriate values in A3:A9 and D3:D9

| | | | |
|---|---|---|---|
| 0.057 | = 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 = 0.607 | 1.3.2.iii | WLA cfc = 0.584 |
| PENTOXSD TRG | 5.1a | LTAMULT afc = 0.373 | 5.1c | LTAMULT cfc = 0.581 |
| PENTOXSD TRG | 5.1b | LTA_afc= 0.226 | 5.1d | LTA_cfc = 0.339 |

| Source | | Effluent Limit Calculations | |
|---|---|---|---|
| PENTOXSD TRG | 5.1f | AML MULT = 1.231 | |
| PENTOXSD TRG | 5.1g | AVG MON LIMIT (mg/l) = 0.278 | AFC |
| | | INST MAX LIMIT (mg/l) = 0.910 | |

| | |
|---|---|
| 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) |

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