pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0094404**
Facility Type	**Non-Municipal**	APS ID	**1060324**
Major / Minor	**Minor**	Authorization ID	**1390969**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Antiochian Orthodox Christ Archdiocese of North American**	Facility Name	**Antiochian Village Camp & Conference Center STP**
Applicant Address	140 Church Camp Trail Bolivar, PA 15923-2512	Facility Address	140 Church Camp Trail Bolivar, PA 15923-2512
Applicant Contact	Christopher Shadid	Facility Contact	Christopher Shadid
Applicant Phone	(724) 238-9565 X 503	Facility Phone	(724) 238-9565 X 503
Client ID	57988	Site ID	262275
Ch 94 Load Status	Not Overloaded	Municipality	Fairfield Township
Connection Status		County	Westmoreland
Date Application Received	March 30, 2022	EPA Waived?	Yes
Date Application Accepted	September 29, 2022	If No, Reason	
Purpose of Application	NPDES permit renewal application.		

Summary of Review

The PA Department of Environmental Protection (PADEP/Department) received an NPDES renewal application from Antiochian Orthodox Christian Archdiocese of North America (permittee) on March 30, 2022 for permittee's Antiochian Village Camp & Conference Center STP (facility). The facility is in Fairfield Borough, Westmoreland County and the treated effluent is discharged into an UNT to Loves Hollow in state watershed 18-D. The current permit was expired on September 30, 2022. The terms and conditions of the current permit is automatically extended since the renewal application was received at least 180 days prior to the expiration date. Renewal NPDES permit applications under Clean Water program are not covered by PADEP's PDG per 021-2100-001.

This fact sheet is developed in accordance with 40 CFR §124.56.

Changes in this renewal: E. Coli monitoring added, TRC and NH3-N limits more stringent.

Sludge use and disposal description and location(s): The settled solids from clarifiers are hold into sludge holding tanks from where it is disposed offsite by contract hauler.

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.

Approve	Deny	Signatures	Date
√		Reza H. Chowdhury, E.I.T. / Project Manager	February 14, 2023
X		Pravin Patel Pravin C. Patel, P.E. / Environmental Engineer Manager	02/15/2023

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.048
Latitude	40º 18' 15"	Longitude	-79º 8' 45"
Quad Name	Wilpen	Quad Code	1612
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary of Loves Hollow (TSF)	Stream Code	44868
NHD Com ID	123725642	RMI	0.21
Drainage Area	0.22 mi^2	Yield (cfs/mi^2)	0.027
Q_{7-10} Flow (cfs)	0.0059	Q_{7-10} Basis	Please see below
Elevation (ft)	1324.36	Slope (ft/ft)	
Watershed No.	18-D	Chapter 93 Class.	TSF
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	Final, 01/29/2010	Name	Kiskiminetas-Conemaugh River Watersheds TMDL

Background/Ambient Data		Data Source
pH (SU)	7.0	Default
Temperature (°C)	20	Default
Hardness (mg/L)	100	Default
Other:		

Nearest Downstream Public Water Supply Intake		Saltsburg Municipal Waterworks, Saltsburg Borough, Indiana County	
PWS Waters	Conemaugh River	Flow at Intake (cfs)	
PWS RMI	0.5	Distance from Outfall (mi)	39.51

Changes Since Last Permit Issuance: None

Other Comments:

Streamflow:

There is no nearby WQN Station or Streamgage from the discharge point. Therefore, USGS's web based watershed delineation tool StreamStats (accessible at https://streamstats.usgs.gov/ss/, accessed on December 19, 2022) was utilized to determine the drainage area and low flow statistics of the receiving stream at discharge point. The StreamStats delineation report shows a drainage area at the Outfall 001 to be 0.22 mi^2. Since the drainage areas are outside of the suggested range, extrapolated estimates based on the drainage area might be resulted from unknown errors. Previous fact sheet calculated a low flow yield of 0.027 cfs/mi^2. A default Q_{30-10}:Q_{7-10} and Q_{1-10}:Q_{7-10} Q_{7-10} of 1.36 and 0.64 will be used, if needed.

$$Q_{7-10} = 0.22 * 0.027 \text{ or } 0.0059 \text{ cfs}$$

PWS Intake:

The nearby downstream PWS intake is Saltsburg Municipal Waterworks in Saltsburg Borough, Indiana County on Conemaugh River at 0.5 RMI, which is approximately 40 miles downstream of Outfall 001. Because of the distance, dilution, and effluent limitations, it is expected that the discharge from this facility won't affect the PWS intake.

Wastewater Characteristics:
A pH of 7.5 (median July- September 2022), default temperature of 25^{0}C (Default per 391-2000-007), and default Hardness value of 100 mg/l will be used, if needed.

Background data:
There is no nearby WQN station from the discharge point. In absence of site-specific data, a default pH of 7.0 S.U., default stream temperature of 20°C, and default hardness of 100 mg/l will be used, as appropriate.

Kiskiminetas-Conemaugh River Watersheds TMDL:
Kiskiminetas-Conemaugh River Watersheds TMDL was approved by EPA on January 29, 2010 for AMD discharges. This facility is considered a "Negligible Discharge Facility" as identified in Appendix C of the Kiskiminetas-Conemaugh River Watershed TMDL. There is no reason to believe the STP will be discharging these metals in high concentrations. The discharge of metals from a sewage treatment plant of this nature is expected to be less than water quality criteria and not contributing to stream impairment. PADEP's Southwest Region's policy is to determine the Reasonable Potential for those three toxic pollutants listed in the TMDL (Total Aluminum, Total Manganese, and Total Iron) from the sample results collected during the last permit term. If a RP is determined, then monitoring/limits will be applicable. If no RP is determined, then three effluent sample results will be requested in the next permit renewal application through a special condition in Part C of the permit to determine if no RP condition is still valid.

Antidegradation (93.4):
The effluent limits for this discharge have been developed to ensure that existing in-stream water uses and the level of water quality necessary to protect the existing uses are maintained and protected. The receiving streams are designated as Cold-Water Fishes (CWF). No High-Quality stream or Exceptional Value water is impacted by this discharge; therefore, no Antidegradation Analysis is performed for the discharge.

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

Treatment Facility Summary

Treatment Facility Name: Antiochian Village Camp & Conference Center STP

WQM Permit No.	Issuance Date
6584433	02/04/1985

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage			Gas Chlorine	0.048

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.048		Not Overloaded	Holding tank	Other WWTP

Changes Since Last Permit Issuance: None

Treatment Plant Description

Antiochian Village Camp & Conference Center STP is a minor non-municipal sewage treatment plant located in Fairfield Township, Westmoreland County which discharges treated sewage through Outfall 001 into an UNT to Loves Hollow AKA Hendricks Creek in state watershed 18-D. This is an extended aeration treatment system with chlorine disinfection. The application indicated the following treatment train: influent→EQ tanks → split into two train with each train → aeration tanks→ clarifiers → fixed media filters → wastewater comingles and conveyed to chlorine contact tank → dechlorination → discharged into receiving stream through Outfall 001.

Biosolids treatment and disposal: The settled solids from clarifiers are hold into sludge holding tanks from where it is disposed offsite by contract hauler.

Summary of inspection:
September 13, 2022: A CEI was conducted. Violations noted during the inspection include effluent limits violation and failure to calibrate flow meter annually.

Point of First Use (POFU) Survey:
On January 31, 2023, a POFU survey was conducted by Regional Aquatic Biologist and other staffs. The survey location was approximately 5 meters upstream of the Outfall 001. The drainage area at POFU was found to be 0.22 mi^2. During the survey, fifteen aquatic invertebrate taxa were found and identified at this location. Of the macroinvertebrate taxa identified, 8 taxa were considered to be long-lived. Findings of the study suggest that the Tributary 44868 to "Loves Hollow", at the point of the survey, is capable of supporting aquatic life and should be considered the POFU for the STP discharge. Based on this survey, all modeling efforts were conducted at the Outfall 001. The complete report is attached in the appendix.

Compliance History

DMR Data for Outfall 001 (from January 1, 2022 to December 31, 2022)

Parameter	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22
Flow (MGD) Average Monthly	0.0022	0.003	0.0056	0.0048	0.010	0.013	0.008	0.0033	0.002	0.0016	0.0039	0.0024
Flow (MGD) Daily Maximum	0.066	0.015	0.014	0.0087	0.027	0.018	0.014	0.018	0.006	0.0049	0.012	0.0058
pH (S.U.) Minimum	7.2	7.05	7.0	7.2	6.9	6.4	7.0	7.9	7.6	7.4	7.4	7.5
pH (S.U.) Maximum	7.7	7.92	8.0	8.0	8.3	8.0	8.7	8.1	8.2	8.1	8.0	8.1
DO (mg/L) Minimum	5.1	5.3	5.2	5.3	5.02	5.1	5.2	5.9	6.2	5.3	5.2	5.5
TRC (mg/L) Average Monthly	0.011	0.016	0.017	0.017	0.009	0.01	0.009	0.006	0.01	0.017	0.02	0.009
TRC (mg/L) Instantaneous Maximum	0.05	0.06	0.05	0.06	0.05	0.05	0.06	0.04	0.03	0.07	0.07	0.07
CBOD5 (mg/L) Average Monthly	8.0	3.0	5.0	3.0	6.0	4.0	5.0	4.0	4.0	5.0	6	3.0
CBOD5 (mg/L) Instantaneous Maximum	11.0	3.0	6.0	4.0	7.0	5.0	7.0	4.0	5.0	6	6	4.0
TSS (mg/L) Average Monthly	19.0	14.0	9.0	1.0	8.0	4.0	13.0	9.0	11.0	6.0	16	25.0
TSS (mg/L) Instantaneous Maximum	24.0	21.0	14.0	1.0	14.0	5.0	14.0	10.0	13.0	7.0	20	26.0
Fecal Coliform (No./100 ml) Geometric Mean	11.5	< 3.0	6.0	< 3.0	< 28	< 11.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Fecal Coliform (No./100 ml) Instantaneous Maximum	13.0	< 3.0	8.0	< 3.0	53	< 14.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Ammonia (mg/L) Average Monthly	0.1	0.1	0.1	0.1	0.1	0.1	2.8	0.2	0.1	0.1	6.8	0.15
Ammonia (mg/L) Instantaneous Maximum	0.1	0.1	0.1	0.1	0.1	0.1	5.0	0.3	0.1	0.1	12.3	0.2

Compliance History

Effluent Violations for Outfall 001, from: September 1, 2021 To: July 31, 2022

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
TSS	11/30/21	Avg Mo	34.0	mg/L	30	mg/L
Ammonia	02/28/22	Avg Mo	6.8	mg/L	4.5	mg/L
Ammonia	06/30/22	Avg Mo	2.8	mg/L	2.0	mg/L
Ammonia	06/30/22	IMAX	5.0	mg/L	4.0	mg/L
Ammonia	02/28/22	IMAX	12.3	mg/L	9.0	mg/L

Other Comments: The non-compliances were due to the conference center wasn't open due to Covid-19 which resulted in no flow.

Existing limits

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)	0.048	Report Daily Max	XXX	XXX	XXX	XXX	2/month	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	9.0	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Interim TRC (Oct 1, 2017 – Sept 30, 2020)	XXX	XXX	XXX	1.4	XXX	3.3	1/day	Grab
Final TRC (Oct 1, 2020 – Sept 30, 2022)	XXX	XXX	XXX	0.03	XXX	0.08	1/day	Grab
CBOD5	XXX	XXX	XXX	25	XXX	50	2/month	Grab
Total Suspended Solids	XXX	XXX	XXX	30	XXX	60	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

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		
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab
Ammonia-Nitrogen Nov 1 - Apr 30	XXX	XXX	XXX	4.5	XXX	9.0	2/month	Grab
Ammonia-Nitrogen May 1 - Oct 31	XXX	XXX	XXX	2.0	XXX	4.0	2/month	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab
Aluminum, Total	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab
Iron, Total	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab
Manganese, Total	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .028
Latitude 40º 18' 15.00" **Longitude** -79º 8' 45.00"
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

WQM 7.0:

WQM 7.0 version 1.0b is a water quality model designed to assist DEP to determine appropriate effluent limits for $CBOD_5$, NH_3-N and DO. The model simulates two basic processes. In the NH_3-N module, the model simulates the mixing and degradation of NH_3-N in the stream and compares calculated instream NH_3-N concentrations to NH_3-N water quality criteria. In the D.O. module, the model simulates the mixing and consumption of D.O. in the stream due to the degradation of $CBOD_5$ and NH_3N and compares calculated instream D.O. concentrations to D.O. water quality criteria. The model was utilized for this permit renewal by using updated Q_{7-10} and historic background water quality levels of the river. The following data were used in the attached computer model of the stream:

- Discharge pH 7.5 (median Jul-Sep, 2022, eDMR data)
- Discharge Temperature 25°C (Default)
- Discharge Hardness 100 mg/l (Default)
- Stream pH 7.0 (Default)
- Stream Temperature 20°C (Default)
- Stream Hardness 100 mg/l (Default)

The following nodes were considered in modeling:

Node 1: At Outfall 001 on UNT 44868 RMI 0.21
Elevation: 1324.36 ft (USGS National Map viewer, 12/22/2022)
Drainage Area: 0.22 mi^2 (StreamStat Version 3.0, 12/22/2022)
River Mile Index: 0.21 (PA DEP eMapPA)
Low Flow Yield: 0.027 cfs/mi^2
Discharge Flow: 0.048 MGD

Node 2: At confluence with Loves Hollow (44864)
Elevation: 1279.22 ft (USGS National Map viewer, 12/22/2022)
Drainage Area: 0.64 mi^2 (StreamStat Version 3.0, 2/14/2023)
River Mile Index: 0.0 (PA DEP eMapPA)
Low Flow Yield: 0.027 cfs/mi^2
Discharge Flow: 0.0 MGD

NH_3-N:
WQM 7.0 resulted in summer season's average monthly and IMAX limit to be 1.54 mg/l and 3.08 mg/l, respectively, which are more stringent than current limits of 2.0 mg/l and 4.0 mg/l, respectively. The winter average monthly and IMAX limits are calculated by multiplying the summer limit with a factor of 3, per *Implementation Guidance of Section 93.7 Ammonia Criteria, 391-2000-013.* That results in an AML of 4.62 mg/l and IMAX of 9.24 mg/l, which are less stringent than current permit (since current permit used a multiplication factor of 2.5 instead of 3). Since current limits are more stringent, due to anti-backsliding prohibition (40 CFR §402(o)) the more stringent current limits will be carried over. A review of the last 12 months DMR data indicates the facility will meet the more stringent limit with two exceptions. The February 2022 violation was due to sludge bulking which was corrected by increasing return rate. The cause for June 2022 violation was unknown. Since the winter limits will be carried over, only the June violation was taken into account while comparing the facility's ability to meet the new summer limits. It is expected that with proper operation and maintenance, the facility can meet the more stringent limits without the need of a compliance schedule.

$CBOD_5$:
The WQM 7.0 model confirms the existing limits are still protective. Existing limits will be carried over.

Dissolved Oxygen (DO):
The existing permit has a minimum DO of 5.0 mg/l which is supported by WQM output as protective and will be carried over.

Toxics:
Based on the available data, PADEP utilizes Toxics Management Spreadsheet (TMS) to (1) evaluate reasonable potential for toxic pollutants to cause or contribute to an excursion above the water quality standards and (2) develop WQBELs for those such toxic pollutants (i.e., 40 CFR § 122.44(d)(1)(i)). It is noteworthy that some of these pollutants that may be reported as "non-detect", but still exceeded the criteria, were determined to be candidates for modeling because the method detection levels used to analyze those pollutants were higher than target QLs and/or the most stringent Chapter 93 criteria. The model then recommended the appropriate action for the Pollutants of Concerns based on the following logic:

1. In general, establish limits in the draft permit where the effluent concentration determined in B.1 or B.2 equals or exceeds 50% of the WQBEL (i.e., RP is demonstrated). Use the average monthly, maximum daily and instantaneous maximum (IMAX) limits for the permit as recommended by the TMS (or, if appropriate, use a multiplier of 2 times the average monthly limit for the maximum daily limit and 2.5 times the average monthly limit for IMAX).

2. For non-conservative pollutants, in general, establish monitoring requirements where the effluent concentration determined in B.1 or B.2 is between 25% - 50% of the WQBEL.

3. For conservative pollutants, in general, establish monitoring requirements where the effluent concentration determined in B.1 or B.2 is between 10% - 50% of the WQBEL.

NOTE 4 – If the effluent concentration determined in B.1 or B.2 is "non-detect" at or below the target quantitation limit (TQL) for the pollutant as specified in the TMS and permit application, the pollutant may be eliminated as a candidate for WQBELs or monitoring requirements unless 1) a more sensitive analytical method is available for the pollutant under 40 CFR Part 136 where the quantitation limit for the method is less than the applicable water quality criterion and 2) a detection at the more sensitive method may lead to a determination that an effluent limitation is necessary, considering available dilution at design conditions.

NOTE 5 – If the effluent concentration determined in B.1 or B.2 is a detection below the TQL but above or equal to the applicable water quality criterion, WQBELs or monitoring may be established for the pollutant.

4. Application managers may, on a site- and pollutant-specific basis, deviate from these guidelines where there is specific rationale that is documented in the fact sheet.

As stated in page 3 of this fact sheet, TMS was utilized to determine the RP for TMDL parameters. The TMS output is as follows:

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Aluminum	Report	Report	Report	Report	Report	µg/L	750	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Iron	Report	Report	Report	Report	Report	µg/L	1,620	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Manganese	Report	Report	Report	Report	Report	µg/L	1,080	THH	Discharge Conc > 10% WQBEL (no RP)

The output shows no RP is demonstrated for Total Aluminum, Total Iron, and Total Manganese; therefore, existing yearly monitoring will be continued.

Additional Considerations

Fecal Coliform:
The recent coliform guidance in 25 Pa. code § 92a.47.(a)(4) requires a summer technology limit of 200/100 ml as a geometric mean and an instantaneous maximum not greater than 1,000/100ml and § 92a.47.(a)(5) requires a winter limit of 2,000/100ml as a geometric mean and an instantaneous maximum not greater than 10,000/100ml. These are existing limits that will be carried over.

E. Coli:
DEP's SOP titled "Establishing Effluent Limitations for Individual Sewage Permits (BCW-PMT-033, revised March 24, 2021) recommends annual E. Coli monitoring for all sewage dischargers with design flows > 0.002 MGD and ≤ 0.05 MGD. This is also supported by Pa Code 25 §92a.61. This requirement will be applied from this permit term.

pH:
The TBEL for pH is above 6.0 and below 9.0 S.U. (40 CFR §133.102(c) and Pa Code 25 § 95.2(1)) which are existing limits and will be carried over.

Total Suspended Solids (TSS):
There is no water quality criterion for TSS. The existing limits of 30 mg/L average monthly and 60 mg/L instantaneous maximum will remain in the permit based on the minimum level of effluent quality attainable by secondary treatment, 25 Pa. Code § 92a.47 and 40CFR 133.102(b). These are all existing limits that will be carried over.

Total Residual Chlorine (TRC):
The attached computer printout utilizes the equation and calculations as presented in the Department's 2003 Implementation Guidance for Total Residual Chlorine (TRC) (ID#391-2000-015) for developing chlorine limitations. The TRC spreadsheet calculated an average monthly and IMAX limit of 0.02 mg/l and 0.07 mg/l, respectively. The existing average monthly and IMAX limits are 0.03 mg/l and 0.08 mg/l, respectively. A review of the previous 12 months eDMR data indicated the facility can meet the more stringent 100% of the time with four values are equal to the proposed new limits. It is recommended that new limits will be effective from effective date of the permit.

Flow Monitoring Requirement:
The requirement to monitor the volume of effluent will remain in the draft permit per 40 CFR § 122.44(i)(1)(ii).

Best Professional Judgement (BPJ):

Total Phosphorus:
Pa Code 25 §92.61 requires monitoring TP. PADEP's SOP BCW-PMT-033 suggests monitoring requirement, at a minimum, for facilities with design flow greater than 2,000 GPD. This requirement is applied for all facilities meeting the flow criteria. This is an existing parameter with monitoring requirement that will be carried over.

Total Nitrogen:
Pa Code 25 §92.61 requires monitoring TN. PADEP's SOP BCW-PMT-033 suggests monitoring requirement, at a minimum, for facilities with design flow greater than 2,000 GPD. This requirement is applied for all facilities meeting the flow criteria. This is an existing parameter with monitoring requirement that will be carried over.

Monitoring Frequency and Sample Types:
Otherwise specified above, the monitoring frequency and sample type of compliance monitoring for existing parameters are recommended by DEP's SOP and Permit Writers Manual and/or on a case-by-case basis using best professional judgment (BPJ).

Anti-Backsliding
The proposed limits are at least as stringent as are in existing permit, unless otherwise stated; therefore, anti-backsliding is not applicable.

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: 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)	0.048	Report Daily Max	XXX	XXX	XXX	XXX	2/month	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.02	XXX	0.07	1/day	Grab
CBOD5	XXX	XXX	XXX	25	XXX	50	2/month	Grab
TSS	XXX	XXX	XXX	30	XXX	60	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 Nov 1 - Apr 30	XXX	XXX	XXX	4.5	XXX	9.0	2/month	Grab
Ammonia May 1 - Oct 31	XXX	XXX	XXX	1.54	XXX	3.08	2/month	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab
Total Aluminum	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab

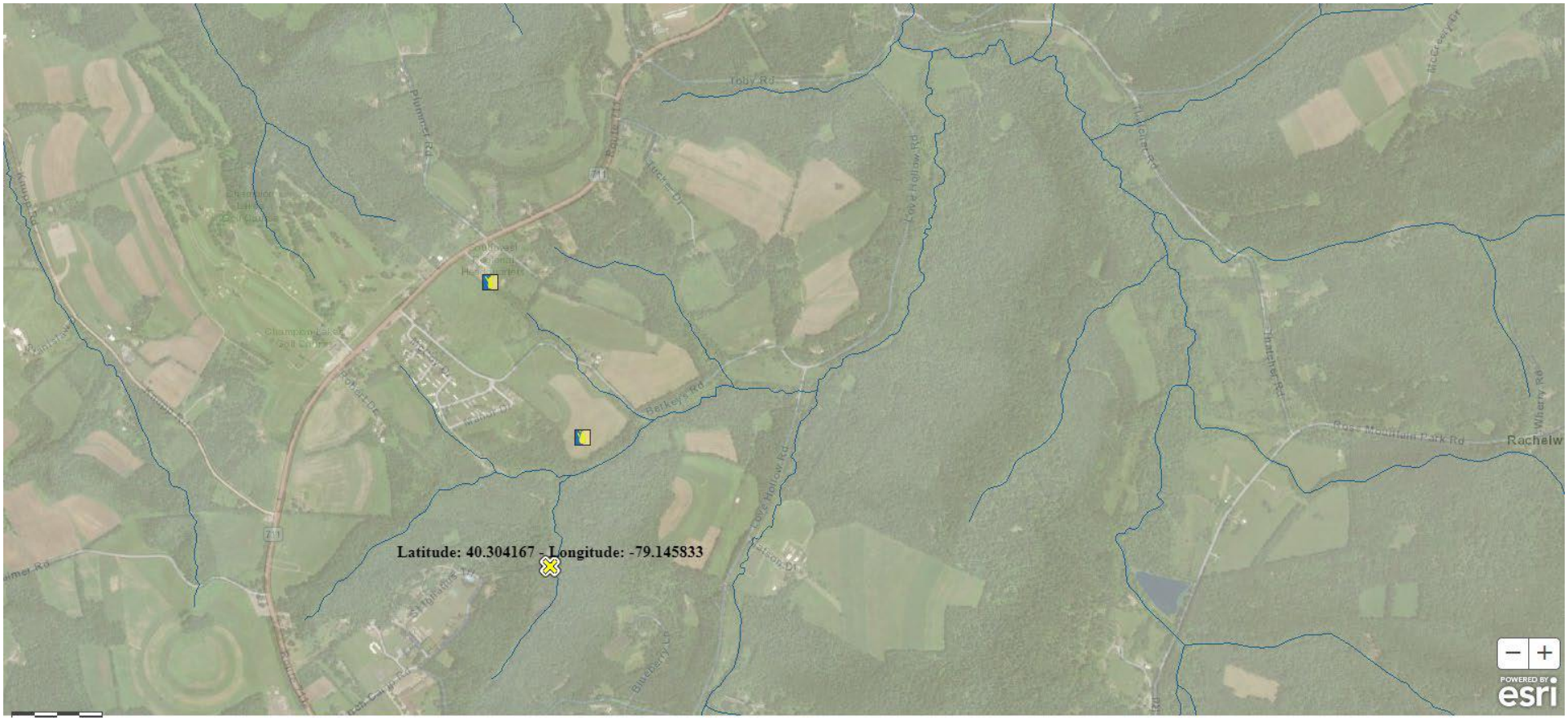
Outfall 001 , Continued (from Permit Effective Date through Permit Expiration Date)

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Total Iron	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab
Total Manganese	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab

Compliance Sampling Location: At Outfall 001

Other Comments: None

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☒	Toxics Management Spreadsheet (see Attachment)
☒	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model 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:
☐	Other:


Latitude: 40.304167 , Longitude: -79.145833
Toby Rd
Plummer Rd
Route 711
Berkey's Rd
Love Hollow Rd
Rachelw
esri

PA0094404 at Outfall 001

Region ID: PA
Workspace ID: PA20221220023332034000
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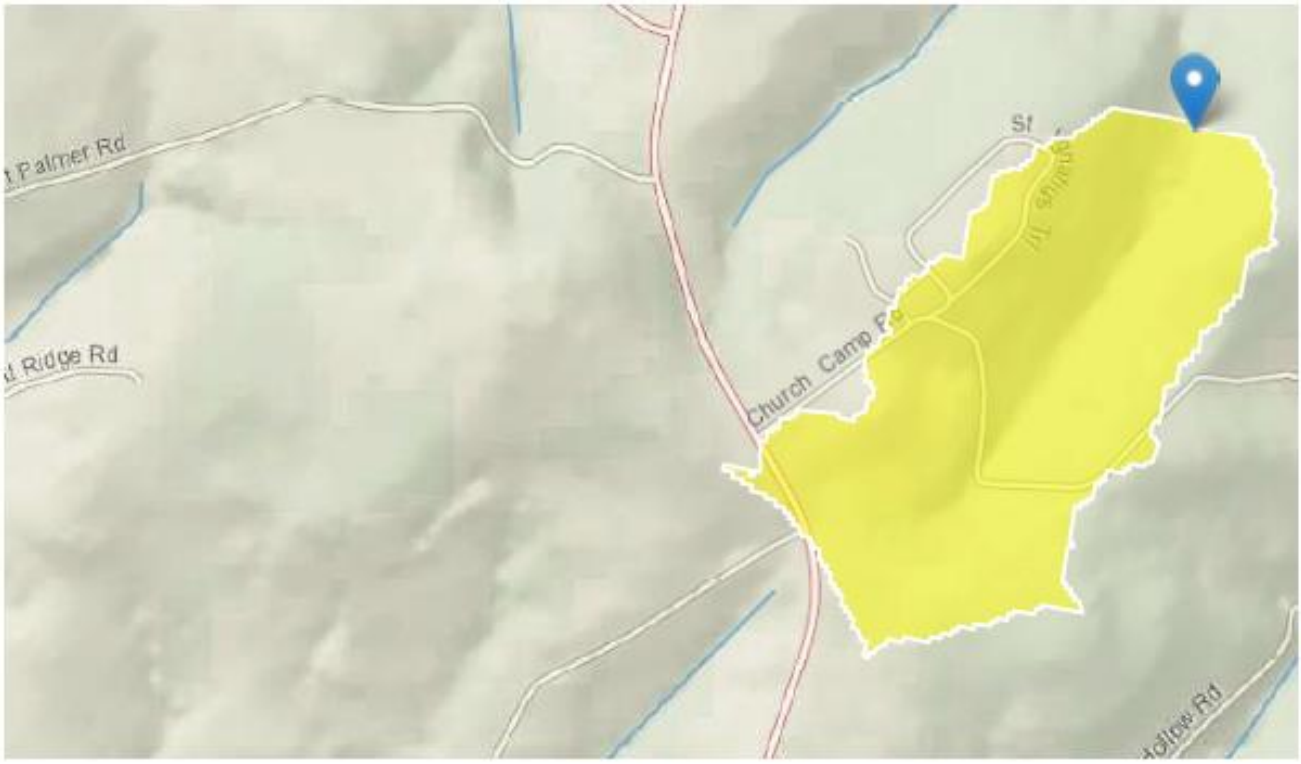
Time: 2022-12-19 21:33:51 -0500



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.22	square miles
ELEV	Mean Basin Elevation	1484	feet
PRECIP	Mean Annual Precipitation	45	inches

Low-Flow Statistics

Permit No. PA0094404

Low-Flow Statistics Parameters [Low Flow Region 3]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.22	square miles	2.33	1720
ELEV	Mean Basin Elevation	1484	feet	898	2700
PRECIP	Mean Annual Precipitation	45	inches	38.7	47.9

Low-Flow Statistics Disclaimers [Low Flow Region 3]

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 3]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.023	ft^3/s
30 Day 2 Year Low Flow	0.0356	ft^3/s
7 Day 10 Year Low Flow	0.00874	ft^3/s
30 Day 10 Year Low Flow	0.0131	ft^3/s
90 Day 10 Year Low Flow	0.02	ft^3/s

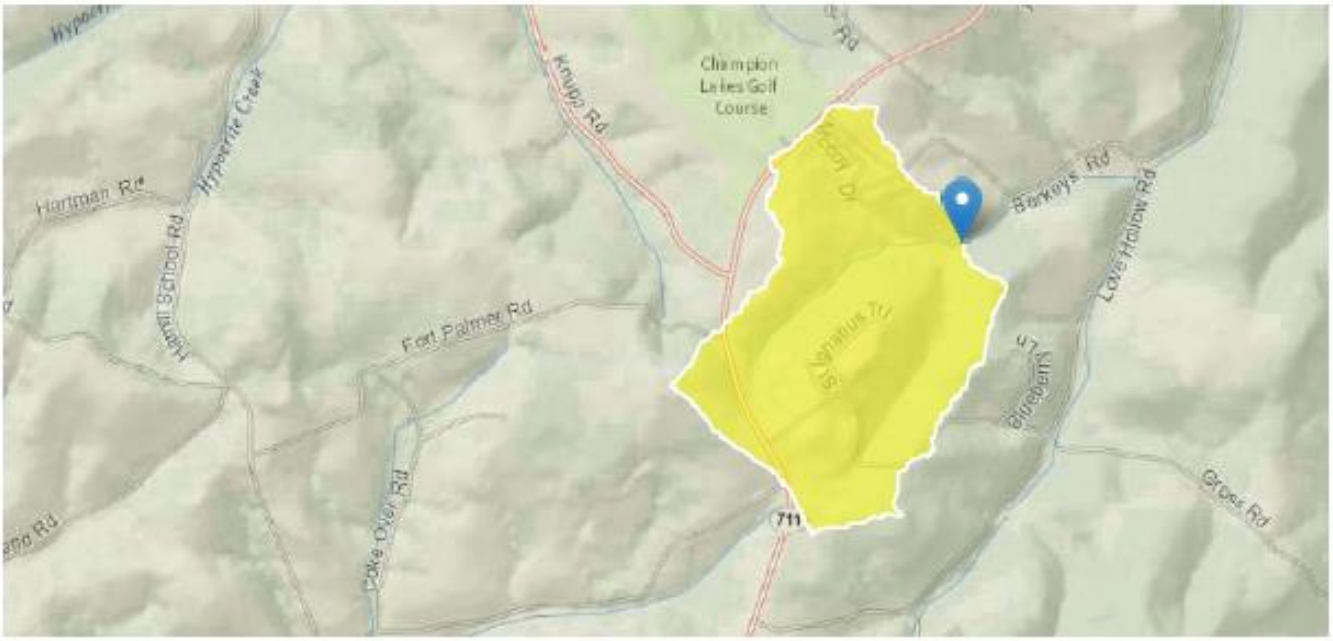
Low-Flow Statistics Citations

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/)

Permit No. PA0094404

PA0094404 at node 2

Region ID: PA
Workspace ID: PA20230215012840484000
Clicked Point (Latitude, Longitude): 40.30714, -79.14476
Time: 2023-02-14 20:29:00 -0500



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Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.64	square miles
ELEV	Mean Basin Elevation	1457	feet
PRECIP	Mean Annual Precipitation	45	inches

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 3]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.64	square miles	2.33	1720
ELEV	Mean Basin Elevation	1457	feet	898	2700
PRECIP	Mean Annual Precipitation	45	inches	38.7	47.9

Permit No. PA0094404

Low-Flow Statistics Disclaimers [Low Flow Region 3]

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 3]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.0674	ft^3/s
30 Day 2 Year Low Flow	0.103	ft^3/s
7 Day 10 Year Low Flow	0.0271	ft^3/s
30 Day 10 Year Low Flow	0.04	ft^3/s
90 Day 10 Year Low Flow	0.0601	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: 4.13.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

Permit No. PA0094404

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

MEMO

TO Reza Chowdhury
Environmental Engineering Specialist
Clean Water Program

FROM Jamie Detweiler
Aquatic Biologist 2
Clean Water Program

DATE February 8, 2023

RE Point of First Use Survey
Tributary 44868 of "Loves Hollow"
State Water Plan: 18D
Hydrologic Unit Code: 05010007
Stream Code: 44868
Aquatic Use Designation: TSF
Antiochian Village Camp and Conference Center
Sewage Treatment Facility
140 Church Camp Trail, Bolivar, PA 15923
Fairfield Township, Westmoreland County

INTRODUCTION

On January 31, 2023, at the request of Reza Chowdhury of the Clean Water Program, a Point of First Surface Water Use (POFU) survey was conducted on Tributary 44868 of "Loves Hollow", located in Fairfield Township, Westmoreland County (Figures 1 and 2). Kristin Gearhart, Clean Water Inspector, and Jordan Coldsmith, Clean Water Environmental Engineering Specialist, also attended the site visit. The objective of the survey was to determine if the tributary was capable of supporting an Aquatic Life Use as defined in 25 Pennsylvania Code §93.9q in the vicinity of a discharge from Antiochian Village Camp and Conference Center Sewage Treatment Facility (STF) at 140 Church Camp Trail, Bolivar, PA 15923 (Latitude: 40.304167, Longitude: -79.145833).

The survey location was approximately 5 meters upstream of the outfall location. In 2005, a Statewide Surface Waters Assessment Protocol survey had been conducted 1300 meters downstream from the outfall, after the stream joins Tributary 44865 of Loves Hollow. Long-lived taxa (Baetidae, Heptageniidae, Hydropsychidae, Leptophlebiidae, Aeshnidae, Perlidae, Elmidae, and Tipulidae) were found at the previous study location.

According to USGS StreamStats (Figure 3), the drainage area to the stream at the location of the POFU survey is 0.22 square miles, and the drainage area is approximately 74% forest and 1% urban. Tributary 44868 of "Loves Hollow" is in the Conemaugh River, Two Lick and Black Lick Creeks, State Water Plan (18D), and the Conemaugh Hydrologic Unit (Hydrologic Unit Code 05010007). This stream is listed as attaining its designated Aquatic Life Use for Trout Stocking (TSF).

SAMPLING PROTOCOLS

The point of first aquatic life use is the location at which a body of water is capable of supporting aquatic life as defined in 25 Pennsylvania Code §93. Guidance for determining the point of first aquatic life use is in the Department's guidance document #391-2000-014, Policy and Procedures for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers (revised April 12, 2008). Specifically, Appendix B of the guidance document provides additional guidance when making a point of first use determination.

On January 31, 2023, macroinvertebrates (Table 1) were examined in Tributary 44868 to "Loves Hollow". The station was established approximately 5 meters upstream from the point where the STF discharge enters the stream channel (Figures 4, 5). Macroinvertebrates were collected by examining the underside of rocks and according to the Department's Qualitative Benthic Macroinvertebrate Data Collection Protocol, found in the Water Quality Monitoring Protocols for Streams and Rivers 2021 (Monitoring Book), which can be found by accessing the following website:
http://files.dep.state.pa.us/Water/Drinking%20Water%20and%20Facility%20Regulation/WaterQualityPortalFiles/Technical%20Documentation/MONITORING_BOOK.pdf

RESULTS

On the day of the survey, the wetted width of the channel was approximately 1.5 meters. Fifteen aquatic invertebrate taxa were found and identified at this location. Of the macroinvertebrate taxa identified, 8 taxa are considered to be long-lived.

DISCUSSION AND CONCLUSIONS

The objective of this study was to examine aquatic life in Tributary 44868 to "Loves Hollow" to determine if and where the stream is capable of supporting an aquatic life use as defined in 25 Pennsylvania Code §93.9q, where water quality standards must be met.

Findings from this study suggest that Tributary 44868 to "Loves Hollow", at the point of the survey, is capable of supporting aquatic life (Latitude: 40.304691, Longitude: -79.145538), and should be considered the POFU for the STP discharge. Eight long-lived taxa were identified in the macroinvertebrate sample, and the stream exhibited defined bed and bank and substrate.

cc: Stream File – Tributary 44868 to "Loves Hollow"
Mahbuba Iasmin – SWRO, Environmental Group Manager
Stacey Greenwald – SWRO, Environmental Group Manager
Christopher Kriley – SWRO, Environmental Program Manager
Erika Arnold – CO, Environmental Group Manager

Permit No. PA0094404

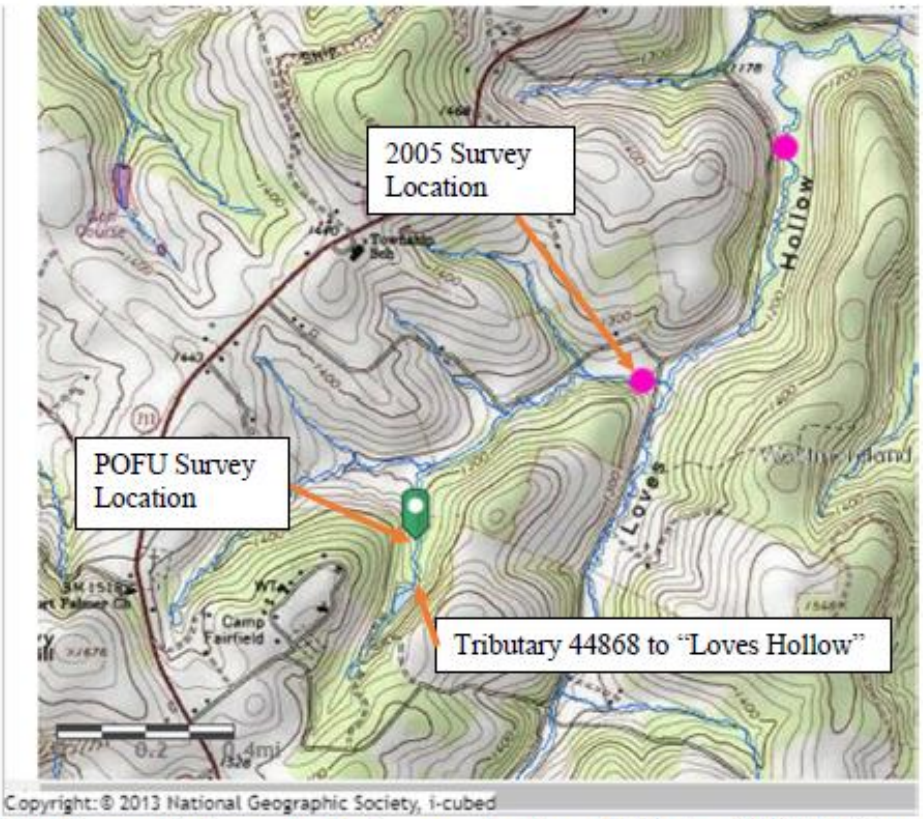

Figure 1. USGS Topographical map showing the survey location and Tributary 44868 to "Loves Hollow".

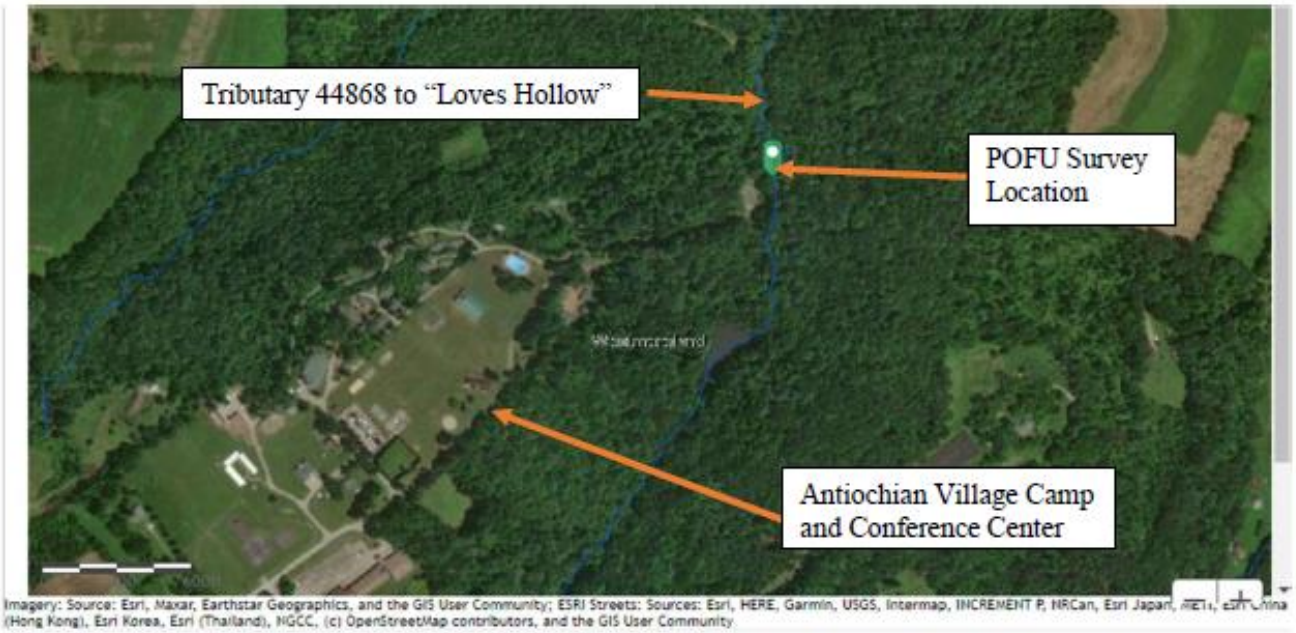

Figure 2. Aerial map showing Tributary 44868 to "Loves Hollow" and the survey location.

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Figure 3. USGS StreamStats report for the drainage area to the POFU survey location.

Table 1. Macroinvertebrates observed in Tributary 44868 to "Loves Hollow".

TAXA	Common Name	Abundance in sample	Long lived taxa
Chironomidae	Chironomidae (Non-biting Midge)	Abundant	No
Tipula	Tipulidae (Crane Fly)	Common	Yes
Pediciidae	Hairy-eyed Craneflies	Rare	No
Uenoidae	Stonecase Caddisflies	Common	No
Philopotamidae	Finger-net Caddisflies	Rare	Yes
Hydropsychidae	Netspinning Caddisflies	Common	Yes
Polycentropodidae	Finger-net Caddisflies	Rare	Yes
Dryopidae (Dryops)	Long-toed Water beetles	Rare	No
Perlodidae	Springflies	Common	Yes
Perlidae	Golden Stoneflies	Rare	Yes
Chloroperlidae	Green Stoneflies	Rare	No
Ameletidae	Combmouth Minnow Mayflies	Abundant	Yes
Ephemerellidae	Spiny Crawler Mayflies	Rare	Yes
Heptageniidae	Flatheaded Mayflies	Rare	Yes
Clitellata	Segmented Worms	Rare	No

Permit No. PA0094404

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
18D	44868	Trib 44868 of "Loves Hollow"	0.220	1324.36	0.22	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	0.027	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
Antiochian STP	PA0094404	0.0480	0.0480	0.0480	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	2.00	0.00	0.00	0.70

Permit No. PA0094404

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
18D	44868	Trib 44868 of "Loves Hollow"	0.000	1279.22	0.64	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	0.027	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

Permit No. PA0094404

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
18D	44868	Trib 44868 of "Loves Hollow"

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												
0.220	0.01	0.00	0.01	.0743	0.03886	.358	2.65	7.4	0.08	0.159	24.63	7.00
Q1-10 Flow												
0.220	0.00	0.00	0.00	.0743	0.03886	NA	NA	NA	0.08	0.161	24.76	7.00
Q30-10 Flow												
0.220	0.01	0.00	0.01	.0743	0.03886	NA	NA	NA	0.09	0.157	24.51	7.00

Permit No. PA0094404

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		

Permit No. PA0094404

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
18D	44868	Trib 44868 of "Loves Hollow"

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
0.220	Antiochian STP	6.88	4	6.88	4	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
0.220	Antiochian STP	1.39	1.54	1.39	1.54	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)		
0.22	Antiochian STP	25	25	1.54	1.54	5	5	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
18D	44868	Trib 44868 of "Loves Hollow"

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.220	0.048	24.630	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
2.648	0.358	7.397	0.085
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
23.30	1.489	1.42	1.000
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.240	30.955	Owens	5
Reach Travel Time (days)			
0.159			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.016	22.62	1.40	5.60
0.032	21.97	1.38	5.85
0.048	21.34	1.36	6.02
0.064	20.72	1.34	6.15
0.079	20.12	1.32	6.25
0.095	19.54	1.30	6.34
0.111	18.98	1.27	6.41
0.127	18.43	1.25	6.47
0.143	17.90	1.23	6.53
0.159	17.38	1.22	6.59

Permit No. PA0094404

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
18D	44868	Trib 44868 of "Loves Hollow"

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)
0.220	Antiochian STP	PA0094404	0.048	CBOD5	25		
				NH3-N	1.54	3.08	
				Dissolved Oxygen			5

Permit No. PA0094404

TRC_CALC

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.0059	= Q stream (cfs)	0.5	= CV Daily
0.048	= 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 =	0.044	1.3.2.iii	WLA cfc =	0.036
PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc =	0.581
PENTOXSD TRG	5.1b	LTA_afc=	0.017	5.1d	LTA_cfc =	0.021

Source		Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML MULT =	1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) =	0.020	AFC
		INST MAX LIMIT (mg/l) =	0.067	

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)

Permit No. PA0094404

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Antiochian Village Camp & Conf. Cntr STP** NPDES Permit No.: **PA0094404** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Treated sewage**

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.048	100	7.5						

					0 if left blank		0.5 if left blank		0 if left blank			1 if left blank	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L											
	Chloride (PWS)	mg/L											
	Bromide	mg/L											
	Sulfate (PWS)	mg/L											
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L		164									
	Total Antimony	µg/L											
	Total Arsenic	µg/L											
	Total Barium	µg/L											
	Total Beryllium	µg/L											
	Total Boron	µg/L											
	Total Cadmium	µg/L											
	Total Chromium (III)	µg/L											
	Hexavalent Chromium	µg/L											
	Total Cobalt	µg/L											
	Total Copper	µg/L											
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L		391									
	Total Lead	µg/L											
	Total Manganese	µg/L		118									
	Total Mercury	µg/L											
	Total Nickel	µg/L											
	Total Phenols (Phenolics) (PWS)	µg/L											
	Total Selenium	µg/L											
	Total Silver	µg/L											
	Total Thallium	µg/L											
	Total Zinc	µg/L											
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

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Group 3	Carbon Tetrachloride	µg/L	<										
	Chlorobenzene	µg/L											
	Chlorodibromomethane	µg/L	<										
	Chloroethane	µg/L	<										
	2-Chloroethyl Vinyl Ether	µg/L	<										
	Chloroform	µg/L	<										
	Dichlorobromomethane	µg/L	<										
	1,1-Dichloroethane	µg/L	<										
	1,2-Dichloroethane	µg/L	<										
	1,1-Dichloroethylene	µg/L	<										
	1,2-Dichloropropane	µg/L	<										
	1,3-Dichloropropylene	µg/L	<										
	1,4-Dioxane	µg/L	<										
	Ethylbenzene	µg/L	<										
	Methyl Bromide	µg/L	<										
	Methyl Chloride	µg/L	<										
	Methylene Chloride	µg/L	<										
	1,1,2,2-Tetrachloroethane	µg/L	<										
	Tetrachloroethylene	µg/L	<										
	Toluene	µg/L	<										
	1,2-trans-Dichloroethylene	µg/L	<										
	1,1,1-Trichloroethane	µg/L	<										
	1,1,2-Trichloroethane	µg/L	<										
	Trichloroethylene	µg/L	<										
	Vinyl Chloride	µg/L	<										
Group 4	2-Chlorophenol	µg/L	<										
	2,4-Dichlorophenol	µg/L	<										
	2,4-Dimethylphenol	µg/L	<										
	4,6-Dinitro-o-Cresol	µg/L	<										
	2,4-Dinitrophenol	µg/L	<										
	2-Nitrophenol	µg/L	<										
	4-Nitrophenol	µg/L	<										
	p-Chloro-m-Cresol	µg/L	<										
	Pentachlorophenol	µg/L	<										
	Phenol	µg/L	<										
	2,4,6-Trichlorophenol	µg/L	<										
Group 5	Acenaphthene	µg/L	<										
	Acenaphthylene	µg/L	<										
	Anthracene	µg/L	<										
	Benzidine	µg/L	<										
	Benzo(a)Anthracene	µg/L	<										
	Benzo(a)Pyrene	µg/L	<										
	3,4-Benzofluoranthene	µg/L	<										
	Benzo(ghi)Perylene	µg/L	<										
	Benzo(k)Fluoranthene	µg/L	<										
	Bis(2-Chloroethoxy)Methane	µg/L	<										
	Bis(2-Chloroethyl)Ether	µg/L	<										
	Bis(2-Chloroisopropyl)Ether	µg/L	<										
	Bis(2-Ethylhexyl)Phthalate	µg/L	<										
	4-Bromophenyl Phenyl Ether	µg/L	<										
	Butyl Benzyl Phthalate	µg/L	<										
	2-Chloronaphthalene	µg/L	<										
	4-Chlorophenyl Phenyl Ether	µg/L	<										
	Chrysene	µg/L	<										
	Dibenzo(a,h)Anthrancene	µg/L	<										
	1,2-Dichlorobenzene	µg/L	<										
	1,3-Dichlorobenzene	µg/L	<										
	1,4-Dichlorobenzene	µg/L	<										
	3,3-Dichlorobenzidine	µg/L	<										
	Diethyl Phthalate	µg/L	<										
	Dimethyl Phthalate	µg/L	<										
	Di-n-Butyl Phthalate	µg/L	<										
	2,4-Dinitrotoluene	µg/L	<										

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	2,6-Dinitrotoluene	µg/L	<											
	Di-n-Octyl Phthalate	µg/L	<											
	1,2-Diphenylhydrazine	µg/L	<											
	Fluoranthene	µg/L	<											
	Fluorene	µg/L	<											
	Hexachlorobenzene	µg/L	<											
	Hexachlorobutadiene	µg/L	<											
	Hexachlorocyclopentadiene	µg/L	<											
	Hexachloroethane	µg/L	<											
	Indeno(1,2,3-cd)Pyrene	µg/L	<											
	Isophorone	µg/L	<											
	Naphthalene	µg/L	<											
	Nitrobenzene	µg/L	<											
	n-Nitrosodimethylamine	µg/L	<											
	n-Nitrosodi-n-Propylamine	µg/L	<											
	n-Nitrosodiphenylamine	µg/L	<											
	Phenanthrene	µg/L	<											
	Pyrene	µg/L	<											
	1,2,4-Trichlorobenzene	µg/L	<											
Group 6	Aldrin	µg/L	<											
	alpha-BHC	µg/L	<											
	beta-BHC	µg/L	<											
	gamma-BHC	µg/L	<											
	delta BHC	µg/L	<											
	Chlordane	µg/L	<											
	4,4-DDT	µg/L	<											
	4,4-DDE	µg/L	<											
	4,4-DDD	µg/L	<											
	Dieldrin	µg/L	<											
	alpha-Endosulfan	µg/L	<											
	beta-Endosulfan	µg/L	<											
	Endosulfan Sulfate	µg/L	<											
	Endrin	µg/L	<											
	Endrin Aldehyde	µg/L	<											
	Heptachlor	µg/L	<											
	Heptachlor Epoxide	µg/L	<											
	PCB-1016	µg/L	<											
	PCB-1221	µg/L	<											
	PCB-1232	µg/L	<											
	PCB-1242	µg/L	<											
	PCB-1248	µg/L	<											
	PCB-1254	µg/L	<											
	PCB-1260	µg/L	<											
	PCBs, Total	µg/L	<											
	Toxaphene	µg/L	<											
	2,3,7,8-TCDD	ng/L	<											
Group 7	Gross Alpha	pCi/L												
	Total Beta	pCi/L	<											
	Radium 226/228	pCi/L	<											
	Total Strontium	µg/L	<											
	Total Uranium	µg/L	<											
	Osmotic Pressure	mOs/kg												

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Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Antiochian Village Camp & Conf. Cntr STP, NPDES Permit No. PA0094404, Outfall 001

Instructions | Discharge | Stream

Receiving Surface Water Name: _____ No. Reaches to Model: 1

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

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi^2)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	044868	0.22	1324.36	0.22			Yes
End of Reach 1	044868	0	1279.22	0.64			Yes

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

Location	RMI	LFY (cfs/mi^2)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	0.22	0.027										100	7		
End of Reach 1	0	0.027													

Q_h

Location	RMI	LFY (cfs/mi^2)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	0.22														
End of Reach 1	0														

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Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Antiochian Village Camp & Conf. Cntr STP, NPDES Permit No. PA0094404, Outfall 001

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

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 0.001 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.44

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Aluminum	0	0		0	750	750	810	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	

☑ ***CFC*** CCT (min): 0.001 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.44

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	1,620	WQC = 30 day average; PMF = 1
Total Manganese	0	0		0	N/A	N/A	N/A	

☑ ***THH*** CCT (min): 0.001 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	1,000	1,000	1,080	

☑ ***CRL*** CCT (min): 0.041 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Aluminum	0	0		0	N/A	N/A	N/A	

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Total Iron	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Aluminum	Report	Report	Report	Report	Report	µg/L	750	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Iron	Report	Report	Report	Report	Report	µg/L	1,620	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Manganese	Report	Report	Report	Report	Report	µg/L	1,080	THH	Discharge Conc > 10% WQBEL (no RP)

☑ ***Other Pollutants without Limits or Monitoring***

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments