pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0088650**
Facility Type	**Non-Municipal**	APS ID	**338206**
Major / Minor	**Minor**	Authorization ID	**1455871**

Applicant and Facility Information

Applicant Name	**Vibrant A Christian Church**	Facility Name	**Vibrant A Christian Church (formerly Capital Area Christian Church)**
Applicant Address	1775 Lambs Gap Road	Facility Address	1775 Lambs Gap Road
	Mechanicsburg, PA 17055		Mechanicsburg, PA 17050-1614
Applicant Contact	Tj George	Facility Contact	Tj George
Applicant Phone	(717) 732-1882	Facility Phone	(717) 732-1882
Client ID	147773	Site ID	538247
Ch 94 Load Status	Not Overloaded	Municipality	Hampden Township
Connection Status	No Limitations	County	Cumberland
Date Application Received	September 22, 2023	EPA Waived?	Yes
Date Application Accepted	October 11, 2023	If No, Reason	
Purpose of Application	NPDES Renewal.		

Summary of Review

Vibrant A Christian Church has applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of its NPDES permit. The permit was last reissued on September 17, 2018 and became effective on October 1, 2018. The permit expired on September 30, 2023.

Based on the review, it is recommended that the permit be drafted.

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
X		*Jinsu Kim* Jinsu Kim / Environmental Engineering Specialist	May 23, 2024
X		Maria D. Bebenek for Daniel W. Martin, P.E. / Environmental Engineer Manager	May 24, 2024
X		Maria D. Bebenek Maria D. Bebenek, P.E. / Program Manager	May 24, 2024

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.0021
Latitude	40º 16' 32"	Longitude	-77º 0' 42"
Quad Name	Wertzville	Quad Code	1629
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary of Conodoguinet Creek	Stream Code	10220
NHD Com ID	56403363	RMI	0.17
Drainage Area	0.17 sq.mi.	Yield (cfs/mi^2)	0.147
Q_{7-10} Flow (cfs)	0.025	Q_{7-10} Basis	USGS gage no. 01570000
Elevation (ft)		Slope (ft/ft)	
Watershed No.	7-B	Chapter 93 Class.	
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	
Nearest Downstream Public Water Supply Intake	Steelton Borough		
PWS Waters	Susquehanna River	Flow at Intake (cfs)	3575
PWS RMI	67.97	Distance from Outfall (mi)	18.9

Drainage Area
The discharge is to Unnamed Tributary of Conodoguinet Creek at RMI 0.17. A drainage area upstream of the point of discharge is estimated to be 0.17 sq.mi. according to USGS StreamStats available at https://streamstats.usgs.gov/ss/.

Streamflow
USGS StreamStats produced an estimated Q7-10 of 0.00213 cfs at the point of discharge. However, because the estimated drainage area of 0.17 sq.mi. is below a minimum drainage area requirement for USGS to properly estimate the Q7-10 flow using its regression equations, this estimated Q7-10 flow will not be used. Instead, a low-flow yield method using measured data from USGS gage station no. 01570000 has been used to calculate the Q7-10 as follows:

$$\text{Low-Flow Yield} = Q7\text{-}10_{gage} / \text{Drainage Area}_{gage} = 69.3 \text{ cfs}/470 \text{ sq.mi} = 0.147 \text{ cfs/sq.mi.}$$
$$Q7\text{-}10_{site} = \text{Low-Flow Yield} * \text{Drainage Area}_{site} = 0.147 \text{ cfs/sq.mi} * 0.17 \text{ sq.mi.} = 0.025 \text{ cfs}$$

Unnamed Tributary of Conodoguinet Creek
Under 25 Pa Code §93.9o, all unnamed tributaries of Conodoguinet Creek from PA 997 at Roxbury to Mouth are designated as warm water and migratory fishes. The mainstem, Conodoguinet Creek, from PA 997 at Roxbury to Mouth is also designated as warm water and migratory fishes. Therefore, no special protection water is impacted by this discharge. No Class A Wild Trout Fishery is also impacted by this discharge. DEP's latest integrated water quality report prepared in 2024 showed that the receiving stream is not impaired.

Public Water Supply Intake
According to the fact sheet prepared for the last permit renewal, the nearest downstream public water supply intake is Steelton Borough located on the Susquehanna River, approximately 19 miles from the point of discharge. Considering the distance and nature, the discharge is not expected to impact the water supply.

Treatment Facility Summary				
Treatment Facility Name: Capital Area Christian Church				
WQM Permit No.	**Issuance Date**			
2101403				
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary With Ammonia Reduction	Sequencing Batch Reactor	Hypochlorite	0.001
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.0021	2	Not Overloaded	Aerated Digester	Other WWTP

CACC utilizes an on-site wastewater treatment facility to serve wastewater generated from the church located at 1775 Lamps Gap Road, Mechanicsburg PA 17055. The facility utilizes a sequencing batch reactor activated sludge treatment process. The treatment process consists of screening unit, equalization tank, Chromaglass CA-30 SBR unit, chlorine contact tank and outfall structure.

Calcium hypochlorite (tablets) is used for disinfection and lime is used for pH and alkalinity control. Sludge generated from the process is treated by an aerated digester prior to hauled off-site.

Compliance History	
Summary of DMRs:	A summary of past 12-month DMR data is presented on the next page.
Summary of Inspections:	06/22/2023: DEP conducted a routine inspection and noted no significant violations were found at the time of inspection. A number of minor recommendations were made at the time of inspection. 03/09/2020: DEP conducted a routine inspection and noted that the facility failed to develop SOPs for non-certified operators and a non-certified operator is performing meter calibrations and chemical additions. The facility also failed to submit required monitoring reports in all months of 2019 and Jan 2020. These were considered permit violations at the time of inspection.
Other Comments:	DEP's database shows there have been a number of permit violations identified since the last permit reissuance. These violations will be listed later in this fact sheet. DEP's database also shows that there is no open violation associated with this facility or permittee.

Effluent Data

DMR Data for Outfall 001 (from April 1, 2023 to March 31, 2024)

Parameter	MAR-24	FEB-24	JAN-24	DEC-23	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23
Flow (MGD) Average Monthly	0.000235	0.000287	0.00026	0.000226	0.000334	0.000461	0.000222	0.000312	0.000169	0.000301	0.000283	0.000236
Flow (MGD) Daily Maximum	0.000731	0.000864	0.000936	0.00078	0.001007	0.000949	0.000701	0.000705	0.000463	0.00068	0.000884	0.000673
pH (S.U.) Daily Minimum	7.4	7.6	7.8	7.9	7.8	7.8	7.7	7.7	7.7	7.1	6.6	7.5
pH (S.U.) Daily Maximum	7.9	8.1	8.2	8.3	8.8	8.2	8.2	8.0	8.8	8.2	7.8	8.4
DO (mg/L) Daily Minimum	5.5	6.5	7.0	6.6	5.8	6.0	5.6	5.6	5.7	5.1	5.3	5.6
TRC (mg/L) Average Monthly	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
TRC (mg/L) Instantaneous Maximum	0.4	0.4	0.4	0.3	0.3	0.3	0.05	0.4	0.4	0.5	0.4	0.4
CBOD5 (mg/L) Average Monthly	3.0	6.0	4.0	3.0	2.0	2.0	2.0	2.0	4.0	7.0	3.0	3.0
TSS (mg/L) Average Monthly	11.0	75.0	52.0	17.0	18.0	14.0	19.0	18.0	17.0	288.0	59.0	14.0
Fecal Coliform (No./100 ml) Geometric Mean	1.0	1.0	1.0	1.0	1.0	14.0	21.0	1354	17.0	912.0	28.0	2.0
Fecal Coliform (No./100 ml) Instantaneous Maximum	1.0	1.0	1.0	1.0	1.0	64.0	77.0	1990	70.0	8660	154.0	3.0
Nitrate-Nitrite (mg/L) Annual Average				20.4								
Total Nitrogen (mg/L) Annual Average				25.4								
Ammonia (mg/L) Average Monthly	0.8	6.3	1.4	0.9	0.5	0.3	0.4	0.2	0.3	0.3	1.1	0.8
TKN (mg/L) Annual Average				6.1								
Total Phosphorus (mg/L) Annual Average				3.2								

Permit Violations Since Last Permit Reissuance

Date	Description	Parameter	Results	Limits	Units	SBC
Dec-18	Violation of permit condition	Fecal Coliform	32100	10000	No./100 ml	Instantaneous Maximum
Dec-18	Violation of permit condition	Fecal Coliform	5942	2000	No./100 ml	Geometric Mean
May-19	Violation of permit condition	Total Suspended Solids	34	30	mg/L	Average Monthly
Jun-19	Violation of permit condition	Ammonia-Nitrogen	28.7	7.5	mg/L	Average Monthly
Jun-19	Violation of permit condition	Total Suspended Solids	45	30	mg/L	Average Monthly
Jul-19	Violation of permit condition	Ammonia-Nitrogen	9.7	7.5	mg/L	Average Monthly
Sep-19	Violation of permit condition	Fecal Coliform	1070	1000	No./100 ml	Instantaneous Maximum
Jan-20	Violation of permit condition	Total Suspended Solids	40	30	mg/L	Average Monthly
Feb-21	Late DMR Submission					
Mar-20	Late DMR Submission					
Jun-20	Violation of permit condition	Fecal Coliform	1140	1000	No./100 ml	Instantaneous Maximum
Jul-20	Violation of permit condition	Fecal Coliform	1160	1000	No./100 ml	Instantaneous Maximum
Jul-20	Violation of permit condition	Fecal Coliform	283	200	No./100 ml	Geometric Mean
Feb-21	Violation of permit condition	Fecal Coliform	1200000	10000	No./100 ml	Instantaneous Maximum
Feb-21	Violation of permit condition	Total Suspended Solids	36	30	mg/L	Average Monthly
Mar-21	Violation of permit condition	Total Suspended Solids	32	30	mg/L	Average Monthly
Jun-21	Violation of permit condition	Total Suspended Solids	34	30	mg/L	Average Monthly
Aug-21	Violation of permit condition	Fecal Coliform	270	200	No./100 ml	Geometric Mean
Dec-21	Violation of permit condition	Total Suspended Solids	38	30	mg/L	Average Monthly
Feb-22	Violation of permit condition	Total Suspended Solids	58	30	mg/L	Average Monthly
Mar-22	Violation of permit condition	Total Suspended Solids	32	30	mg/L	Average Monthly
Jul-22	Violation of permit condition	Fecal Coliform	318	200	No./100 ml	Geometric Mean
Sep-22	Violation of permit condition	Fecal Coliform	2419.6	1000	No./100 ml	Instantaneous Maximum
Jan-23	Violation of permit condition	Total Suspended Solids	34	30	mg/L	Average Monthly
Jan-24	Late DMR Submission					
Apr-23	Violation of permit condition	Total Suspended Solids	32	30	mg/L	Average Monthly
Jun-23	Violation of permit condition	Total Suspended Solids	59	30	mg/L	Average Monthly
Jul-23	Violation of permit condition	Fecal Coliform	8660	1000	No./100 ml	Instantaneous Maximum
Jul-23	Violation of permit condition	Fecal Coliform	912	200	No./100 ml	Geometric Mean
Jul-23	Violation of permit condition	Total Suspended Solids	288	30	mg/L	Average Monthly
Sep-23	Violation of permit condition	Fecal Coliform	1354	200	No./100 ml	Geometric Mean
Sep-23	Violation of permit condition	Fecal Coliform	1990	1000	No./100 ml	Instantaneous Maximum
Feb-24	Violation of permit condition	Total Suspended Solids	52	30	mg/L	Average Monthly
Mar-24	Violation of permit condition	Total Suspended Solids	75	30	mg/L	Average Monthly

Existing Effluent Limits and Monitoring Requirements

The table below summarizes effluent limits and monitoring requirements specified in the existing permit.

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	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	XXX	XXX	XXX	25.0	XXX	50	2/month	Grab
Total Suspended Solids	XXX	XXX	XXX	30.0	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
Nitrate-Nitrite as N	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Grab
Total Nitrogen	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
Ammonia-Nitrogen Nov 1 - Apr 30	XXX	XXX	XXX	22.0	XXX	44	2/month	Grab
Ammonia-Nitrogen May 1 - Oct 31	XXX	XXX	XXX	7.5	XXX	15	2/month	Grab
Total Kjeldahl Nitrogen	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Grab

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .0021
Latitude 40º 16' 32.00" **Longitude** -77º 0' 42.00"
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

CBOD5, NH3-N and Dissolved Oxygen (DO)
WQM 7.0 version 1.0b is a water quality model designed to assist DEP to determine appropriate permit requirements for CBOD5, NH3-N and DO. DEP's guidance no. 391-2000-007 provides the technical methods contained in WQM 7.0 for conducting wasteload allocation and for determining recommended NPDES effluent limits for point source discharges. The model output indicated that existing TBEL of 25 mg/L for CBOD5 and existing WQBEL of 7.5 mg/L are still adequate. No change is therefore recommended for this permit renewal.

Total Residual Chlorine
DEP's TRC_CALC worksheet indicates that the existing BAT effluent limit of 0.5 mg/L is still adequate. Therefore, no change is recommended.

Toxics
The facility only receives and treats sanitary wastewater. In addition, DEP's NPDES permit application for minor sewages less than 0.1 MGD does not require sampling of toxic pollutants. Consequently, there are no toxic pollutants of concern.

Best Professional Judgment (BPJ) Limitations

Dissolved Oxygen
A minimum of 5.0 mg/L for DO is an existing effluent limit and will remain unchanged in the draft permit as recommended by DEP's SOP. This requirement has also been assigned to other sewage treatment facilities in the region. 5.0 mg/L is taken directly from 25 Pa. Code § 93.7(a) and it is also determined to be appropriate according to water quality modeling.

Total Phosphorus & Total Nitrogen
As part of the existing permit renewal requirements, the facility was required to collect samples of Total Phosphorus and Total Nitrogen once a year. A continuation of monitoring requirements for Total Phosphorus and Total Nitrogen is recommended for this permit renewal. This approach is consistent with DEP's SOP no. BPNPSM-PMT-033 in which the SOP addresses such requirements for all sewage facilities with design flows greater than 0.002 MGD. Therefore, a routine monitoring for Total Phosphorus and Total Nitrogen will once again be included in the draft permit. Since the receiving

stream, Unnamed Tributary of Conodoguinet Creek is not impaired for nutrients, 2/month sampling is not required. Majorly because the facility has been consistently treating flows less than 1,000 gallons per day, DEP determines that 1/year sampling is adequate enough to collect nutrients samples that are representative of effluent discharged from this facility. Accordingly, the existing 1/year sampling requirement will remain unchanged in the draft permit.

Additional Considerations

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

E. Coli Monitoring Requirement
DEP's SOP no. BPNPSM-PMT-033 recommends an annual routine monitoring of E. Coli for all sewage facilities that have design flow less than 0.05 MGD but greater than 0.002 MGD. An annual monitoring for E. Coli will therefore be included in the permit.

Chesapeake Bay TMDL
DEP's Phase II Watershed Implementation Plan (WIP) categorizes this facility as a phase 5 non-significant sewage facility that has a design flow less than 0.2 MGD but greater than 0.002 MGD. The WIP recommends monitoring and reporting for Total Nitrogen and Total Phosphorus throughout the permit term at a frequency no less than annual. As mentioned above, monitoring of these pollutants will be written in the permit as recommended by DEP's SOP. Therefore, no additional requirements will be necessary.

Monitoring Frequency and Sample Type
All existing monitoring frequencies and sample types will remain unchanged in the permit.

Mass Loading Limitations
All effluent mass loading limits will be based on the formula: design flow x concentration limit x conversion factor of 8.34.

Antidegradation Requirements
All effluent limitations and monitoring requirements 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.

Anti-backsliding Requirements
Unless stated otherwise in this fact sheet, all permit requirements proposed in this fact sheet are at least as stringent as permit requirements specified in the existing permit renewal. This approach is consistent with 40 CFR §122.44(l)(1).

Proposed Effluent Limitations and Monitoring Requirements

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

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

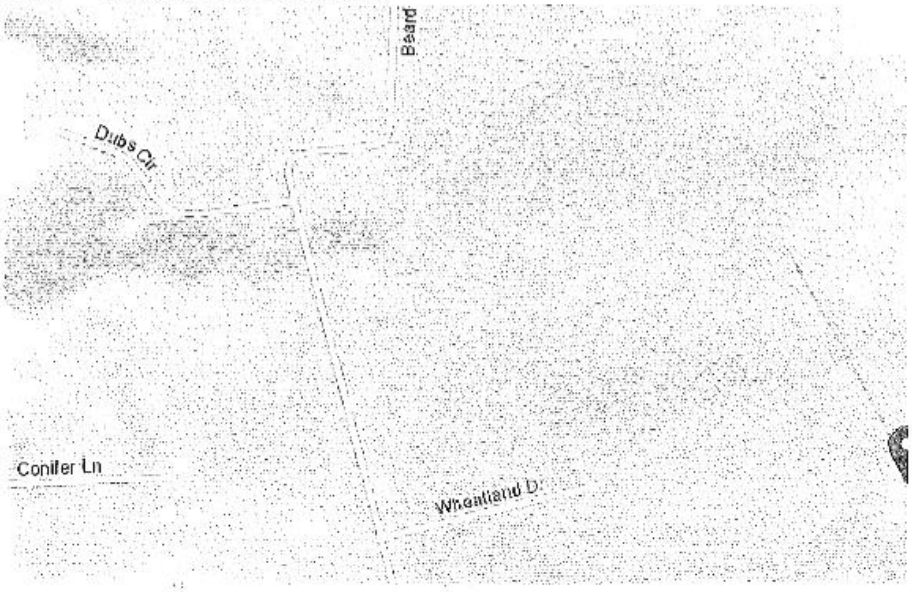
Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	5.0 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	Grab
TSS	XXX	XXX	XXX	30.0	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
Nitrate-Nitrite	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Grab
Total Nitrogen	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Calculation
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	22.0	XXX	44	2/month	Grab
Ammonia May 1 - Oct 31	XXX	XXX	XXX	7.5	XXX	15	2/month	Grab
TKN	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Grab
E. Coli (no. / 100 mL)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab

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

Attachments

StreamStats Report

Region ID: PA
Workspace ID: PA20180418123541266000
Clicked Point (Latitude, Longitude): 40.27563, -77.01154
Time: 2018-04-18 08:35:56 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.17	square miles
PRECIP	Mean Annual Precipitation	41	inches
STRDEN	Stream Density -- total length of streams divided by drainage area	1.3	miles per square mile
ROCKDEP	Depth to rock	3.3	feet
CARBON	Percentage of area of carbonate rock	0	percent

Low-Flow Statistics Parameters [Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.17	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	41	inches	35	50.4
STRDEN	Stream Density	1.3	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	3.3	feet	3.32	5.65
CARBON	Percent Carbonate	0	percent	0	99

Low-Flow Statistics Disclaimers [Low Flow Region 2]

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 2]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.00858	ft^3/s
30 Day 2 Year Low Flow	0.0141	ft^3/s
7 Day 10 Year Low Flow	0.00213	ft^3/s
30 Day 10 Year Low Flow	0.00375	ft^3/s
90 Day 10 Year Low Flow	0.00844	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/)

StreamStats Report

Region ID: PA
Workspace ID: PA20180418124812172000
Clicked Point (Latitude, Longitude): 40.25683, -76.98554
Time: 2018-04-18 08:48:27 -0400

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	1.4	square miles
PRECIP	Mean Annual Precipitation	41	inches
STRDEN	Stream Density -- total length of streams divided by drainage area	2.63	miles per square mile
ROCKDEP	Depth to rock	3.6	feet
CARBON	Percentage of area of carbonate rock	0	percent

Low-Flow Statistics Parameters [Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	1.4	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	41	inches	35	50.4
STRDEN	Stream Density	2.63	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	3.6	feet	3.32	5.65
CARBON	Percent Carbonate	0	percent	0	99

Low-Flow Statistics Disclaimers [Low Flow Region 2]

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

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

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.054	ft^3/s
30 Day 2 Year Low Flow	0.0857	ft^3/s
7 Day 10 Year Low Flow	0.0159	ft^3/s
30 Day 10 Year Low Flow	0.0263	ft^3/s
90 Day 10 Year Low Flow	0.0523	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/)

TRC_CALC

	B	C	D	E	F	G
1A						
2	**TRC EVALUATION**					
3	Input appropriate values in B4:B8 and E4:E7					
4	0.025	= Qstream (cfs)		0.5	= CV Daily	
5	0.0021	= Qdischarge (MGD)		0.5	= CV Hourly	
6	30	= no. samples		1	= AFC_Partial Mix Factor	
7	0.3	= Chlorine Demand of Stream		1	= CFC_Partial Mix Factor	
8	0	= Chlorine Demand of Discharge		15	= AFC_Criteria Compliance Time (min)	
9	0.5	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)	
	0	= % Factor of Safety (FOS)			=Decay Coefficient (K)	
10	Source	Reference	AFC Calculations		Reference	CFC Calculations
11	TRC	1.3.2.iii	WLA afc = 2.474		1.3.2.ii	WLA cfc = 2.404
12	PENTOXSD TRG	5.1a	LTAMULT afc = 0.373		5.1c	LTAMULT cfc = 0.581
13	PENTOXSD TRG	5.1b	LTA_afc= 0.922		5.1d	LTA_cfc = 1.398
14						
15	Source		Effluent Limit Calculations			
16	PENTOXSD TRG	5.1f	AML MULT = 1.231			
17	PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500		BAT/BPJ	
18			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)**

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
07B	10220	Trib 10220 of Conodoguinet Creek	**0.170**	449.00	0.17	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	0.147	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Capital Area CC	PA0088650	0.0021	0.0021	0.0021	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	7.50	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
07B	10220	Trib 10220 of Conodoguinet Creek	**0.000**	345.00	1.40	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	0.147	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

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

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07B	10220	Trib 10220 of Conodoguinet Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.170	0.002	25.000	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
1.542	0.335	4.603	0.055
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
4.65	0.864	0.86	1.029
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.870	26.335	Owens	5
Reach Travel Time (days)			
0.190			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.019	4.55	0.85	7.54
0.038	4.46	0.83	7.54
0.057	4.37	0.81	7.54
0.076	4.28	0.80	7.54
0.095	4.19	0.78	7.54
0.114	4.10	0.77	7.54
0.133	4.02	0.75	7.54
0.152	3.94	0.74	7.54
0.171	3.86	0.72	7.54
0.190	3.78	0.71	7.54

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
07B	10220	Trib 10220 of Conodoguinet Creek

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
0.170	0.02	0.00	0.02	.0032	0.11586	.335	1.54	4.6	0.05	0.190	25.00	7.00
Q1-10 Flow												
0.170	0.02	0.00	0.02	.0032	0.11586	NA	NA	NA	0.04	0.236	25.00	7.00
Q30-10 Flow												
0.170	0.03	0.00	0.03	.0032	0.11586	NA	NA	NA	0.06	0.163	25.00	7.00

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
07B	10220	Trib 10220 of Conodoguinet Creek

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
0.170	Capital Area CC	11.07	15	11.07	15	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
0.170	Capital Area CC	1.37	7.5	1.37	7.5	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)		
0.17	Capital Area CC	25	25	7.5	7.5	5	5	0	0

WQM 7.0 Modeling Specifications

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

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
07B	10220	Trib 10220 of Conodoguinet Creek

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
0.170	Capital Area CC	PA0088650	0.002	CBOD5	25		
				NH3-N	7.5	15	
				Dissolved Oxygen			5