pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0253367**
Facility Type	**Non-Municipal**	APS ID	**760259**
Major / Minor	**Minor**	Authorization ID	**1365590**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Christian Youth Crusade**	Facility Name	**Teen Quest Ranch STP**
Applicant Address	293 Rich Road	Facility Address	293 Rich Road
	Somerset, PA 15501-9668		Somerset, PA 15501-9668
Applicant Contact	Mark Witt	Facility Contact	David Hottle
Applicant Phone	(814)-444-9500	Facility Phone	(814)-289-3785
Client ID	249150	Site ID	668122
Ch 94 Load Status	Not Overloaded	Municipality	Milford Township
Connection Status		County	Somerset
Date Application Received	August 9, 2021	EPA Waived?	Yes
Date Application Accepted	August 18, 2021	If No, Reason	

Purpose of Application: Application for renewal of an NPDES Permit for treated sewage effluent.

Summary of Review

The permittee has applied for a renewal of NPDES Permit No. PA0253367. NPDES Permit No. PA0253367 was previously issued by the PA Department of Environmental Protection (DEP) on April 6, 2017 and expires on April 30, 2022.

Sewage from this facility is treated with:

- A 5,000-gallon capacity flow equalization basin
- A total of 2 aeration tanks
- One final clarifier
- One chlorine contact tank

The applicant is currently enrolled in and will continue to use eDMR.

The Act-14 PL 834 Municipal Notification was provided by the June 28, 2021 letters from Kerry Bell at Widmer Engineering and no comments were received.

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*

Approve	Deny	Signatures	Date
X		Stephanie Conrad / Environmental Engineering Specialist	August 27, 2021
X		James Vanek James M. Vanek, P.E. / Environmental Engineer Manager	October 12, 2021

Summary of Review
Bulletin at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.01
Latitude	39º 59' 48.97"	Longitude	-79º 10' 22.55"
Quad Name		Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary to Middle Creek (TSF)	Stream Code	38914
NHD Com ID	69916979	RMI	0.39
Drainage Area	0.0435	Yield (cfs/mi^2)	0.005517
Q_{7-10} Flow (cfs)	0.00024	Q_{7-10} Basis	USGS Stream Stats
Elevation (ft)	2100	Slope (ft/ft)	
Watershed No.	19-F	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		Name	

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

Nearest Downstream Public Water Supply Intake		Indian Creek Water Authority	
PWS Waters	Youghiogheny River	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	

Changes Since Last Permit Issuance:

Other Comments:

Treatment Facility Summary

Treatment Facility Name: Teen Quest Ranch STP

WQM Permit No.	Issuance Date
5607403	February 7, 2008

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary with NH3-N removal	Extended Aeration	Chlorine	0.01

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.01	20	No overload	Aerobic Digester	Combination of methods

Changes Since Last Permit Issuance:

Other Comments:

Compliance History	
Summary of DMRs:	**Between August 2016 and August 2021, the facility has generally complied with submittal of Discharge Maintenance Reports. During the review period, no violations were issued. Four effluent violations occurred for either Fecal Coliform or Ammonia Nitrogen between July 2019 and July 2021. No additional exceedances occurred.**
Summary of Inspections:	**Between August 2016 and August 2021, the facility received three compliance evaluations (ID 2893293, 2659462, and2536998) and one Routine/Partial Inspection (ID 2542344).**

Other Comments:

Compliance History

DMR Data for Outfall 001 (from July 1, 2020 to June 30, 2021)

Parameter	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20	NOV-20	OCT-20	SEP-20	AUG-20	JUL-20
Flow (MGD) Average Monthly	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.010	0.001	0.001	0.002
pH (S.U.) Minimum	6.4	7.0	7.0	8.0	7.2	7.2	8.1	7.7	7.5	6.9	6.1	6.1
pH (S.U.) Maximum	7.4	8.2	7.7	8.6	8.6	8.5	8.6	8.4	8.3	8.0	8.0	7.9
DO (mg/L) Minimum	8.0	8.6	9.8	9.9	10.5	11.3	10.4	8.0	6.5	6.4	6.2	6.0
TRC (mg/L) Average Monthly	0.41	0.30	0.16	0.4	0.38	0.4	0.4	0.27	0.4	0.38	0.3	0.20
TRC (mg/L) Instantaneous Maximum	1.0	0.83	0.44	1.1	0.53	0.6	0.79	1.2	1.3	0.73	0.8	1.1
CBOD5 (mg/L) Average Monthly	2.0	2.0	3.0	4.0	2.0	3.0	2.0	2.0	2.0	2.0	5.0	2.0
CBOD5 (mg/L) Instantaneous Maximum	2.0	2.0	4.0	9.0	2.0	3.0	2.0	2.0	2.0	3.0	5.0	2.0
TSS (mg/L) Average Monthly	4.0	9.0	20.0	14.0	18.0	11.0	17.0	12.0	5.0	10.0	20.0	12.0
TSS (mg/L) Instantaneous Maximum	4.0	9.0	33.0	31.0	23.0	11.0	17.0	16.0	6.0	14.0	46.0	18.0
Fecal Coliform (No./100 ml) Geometric Mean	2	5	30	38	43	22	6	11	6	10	86	1.0
Fecal Coliform (No./100 ml) Instantaneous Maximum	3	21	304	484	87	23	9	42	21	42	190	9.0
Total Nitrogen (mg/L) Daily Maximum							29.0					
Ammonia (mg/L) Average Monthly	0.30	0.40	0.2	1.6	0.13	0.1	0.1	0.1	0.10	0.1	0.50	5.8
Ammonia (mg/L) Instantaneous Maximum	0.30	0.66	0.4	4.2	0.16	0.1	0.1	0.1	0.10	0.1	0.50	9.1

Total Phosphorus (mg/L) Daily Maximum							6.24					

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .01
Latitude 39º 59' 49.00" **Longitude** -79º 10' 23.00"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

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

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

Comments:

Water Quality-Based Limitations

The proposed discharge was evaluated using WQM 7.0 to evaluate the CBOD5, Ammonia Nitrogen and Dissolved Oxygen parameters. The modeling results show technology based effluent limitations for CBOD5 are appropriate as well as confirm that Ammonia-Nitrogen and Dissolved Oxygen limitations are necessary to meet in-stream water quality criterion.

Total Residual Chlorine was re-modeled with the TRC Spreadsheet, and it was determined that a stricter limit than previously imposed is necessary to meet in-stream water quality criterion. Based on eDMR data, the facility will not be able to comply with the new limits. The facility intends to install a tablet dechlorinator prior to April 30, 2022 and is therefore not requesting interim limits.

The winter Ammonia-Nitrogen limits for this permit are stricter than those previously imposed, however, the facility should be able to comply with the new limits based on previous eDMR data.

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

Parameter	Limit (mg/l)	SBC	Model
Total Residual Chlorine	0.01	Average Monthly	TRC Spreadsheet
Dissolved Oxygen	6.0	Instantaneous Minimum	WQM 7.0
Ammonia-Nitrogen (winter)	2.9	Average Monthly	WQM 7.0
Ammonia-Nitrogen (summer)	1.9	Average Monthly	WQM 7.0

Comments:

Anti-Backsliding

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

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

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

Additional Considerations

Sewage discharges will include monitoring, at a minimum, for E. coli, in new and reissued permits, with a monitoring frequency of 1/year for design flows >= 0.002 and < 0.05 MGD.

For pH, Dissolved Oxygen (DO) and TRC, the permittee requested that a monitoring frequency of less than 1/day be imposed because the standard frequency is a hardship. A sampling frequency of five (5) samples per week will be imposed for this cycle. The permittee has been advised that daily sampling will be imposed during the next permit cycle.

The receiving stream is not impaired for nutrients, therefore, annual sampling for nitrogen and phosphorus will be imposed per 25 PA Code §92a.6.

Monitoring frequency for the proposed effluent limits are based upon Table 6-3, Self-Monitoring Requirements for Sewage Dischargers, from the Departments Technical Guidance for the Development and Specification of Effluent Limitations.

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)	0.01	XXX	XXX	XXX	XXX	XXX	2/month	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	5/week	Grab
DO	XXX	XXX	6.0 Inst Min	XXX	XXX	XXX	5/week	Grab
TRC	XXX	XXX	XXX	0.011	XXX	0.036	5/week	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50.0	2/month	Grab
TSS	XXX	XXX	XXX	30.0	XXX	60.0	2/month	Grab
Fecal Coliform (No./100 ml) Nov 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Oct 31	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	2.9	XXX	5.9	2/month	Grab
Ammonia May 1 - Oct 31	XXX	XXX	XXX	1.9	XXX	3.9	2/month	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab

Compliance Sampling Location: Outfall #001
Other Comments:

ATTACHMENT A

WQM 7.0 Modeling Results

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19F	38914	Trib 38914 to Middle Creek	0.390	2100.00	0.04	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.006	0.00	0.00	0.000	0.000	10.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Teen Quest Ranc	PA0253367	0.0100	0.0000	0.0000	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	8.24	0.00	0.00
NH3-N	2.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19F	38914	Trib 38914 to Middle Creek	0.010	2020.00	0.19	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.006	0.00	0.00	0.000	0.000	10.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Teen Quest Ranc	PA0253367	0.0000	0.0000	0.0000	0.000	20.00	7.00

Parameter Data

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

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
19F	38914	Trib 38914 to Middle 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												
0.390	0.00	0.00	0.00	.0155	0.03987	.293	1.1	3.78	0.05	0.478	20.08	7.00
Q1-10 Flow												
0.390	0.00	0.00	0.00	.0155	0.03987	NA	NA	NA	0.05	0.479	20.05	7.00
Q30-10 Flow												
0.390	0.00	0.00	0.00	.0155	0.03987	NA	NA	NA	0.05	0.476	20.10	7.00

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	6		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
19F	38914	Trib 38914 to Middle 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
0.390	Teen Quest Ranc	9.64	4	9.64	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
0.390	Teen Quest Ranc	1.9	1.94	1.9	1.94	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
0.39	Teen Quest Ranc	25	25	1.94	1.94	6	6	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19F	38914	Trib 38914 to Middle Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.390	0.010	20.076	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
1.105	0.293	3.775	0.049
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
24.65	1.497	1.91	0.704
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.034	27.839	Owens	6
Reach Travel Time (days)			
0.478			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.048	22.94	1.85	6.76
0.096	21.35	1.79	7.05
0.143	19.87	1.73	7.23
0.191	18.50	1.67	7.36
0.239	17.21	1.62	7.48
0.287	16.02	1.56	7.59
0.334	14.91	1.51	7.69
0.382	13.88	1.46	7.78
0.430	12.92	1.41	7.87
0.478	12.02	1.37	7.95

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
19F	38914	Trib 38914 to Middle 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)
0.390	Teen Quest Ranc	PA0253367	0.010	CBOD5	25		
				NH3-N	1.94	3.88	
				Dissolved Oxygen			6

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19F	38914	Trib 38914 to Middle Creek	0.390	2100.00	0.04	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.011	0.00	0.00	0.000	0.000	10.0	0.00	0.00	5.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Teen Quest Ranc	PA0253367	0.0100	0.0000	0.0000	0.000	15.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	12.51	0.00	0.00
NH3-N	3.50	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
19F	38914	Trib 38914 to Middle Creek	0.010	2020.00	0.19	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.011	0.00	0.00	0.000	0.000	10.0	0.00	0.00	5.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Teen Quest Ranc	PA0253367	0.0000	0.0000	0.0000	0.000	20.00	7.00

Parameter Data

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

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
19F	38914	Trib 38914 to Middle 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												
0.390	0.00	0.00	0.00	.0155	0.03987	.293	1.11	3.78	0.05	0.474	14.70	7.00
Q1-10 Flow												
0.390	0.00	0.00	0.00	.0155	0.03987	NA	NA	NA	0.05	0.477	14.81	7.00
Q30-10 Flow												
0.390	0.00	0.00	0.00	.0155	0.03987	NA	NA	NA	0.05	0.471	14.60	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	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	6		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
19F	38914	Trib 38914 to Middle 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
0.390	Teen Quest Ranc	14.22	7	14.22	7	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
0.390	Teen Quest Ranc	2.86	2.98	2.86	2.98	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)		
0.39	Teen Quest Ranc	25	25	2.98	2.98	6	6	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19F	38914	Trib 38914 to Middle Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.390	0.010	14.699	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
1.109	0.293	3.778	0.049
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
24.31	1.495	2.90	0.466
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.196	24.512	Owens	6
Reach Travel Time (days)			
0.474			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.047	23.00	2.83	7.59
0.095	21.75	2.77	8.10
0.142	20.58	2.71	8.32
0.190	19.47	2.65	8.45
0.237	18.42	2.59	8.54
0.284	17.42	2.54	8.63
0.332	16.48	2.48	8.70
0.379	15.59	2.43	8.78
0.426	14.75	2.37	8.85
0.474	13.95	2.32	8.91

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
19F	38914	Trib 38914 to Middle 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)
0.390	Teen Quest Ranc	PA0253367	0.010	CBOD5	25		
				NH3-N	2.98	5.96	
				Dissolved Oxygen			6

ATTACHMENT B

TRC Modeling Results

Copy of TRC_CALC

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.00024	= Q stream (cfs)	0.5	= CV Daily
0.01	= 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 =	0.024	1.3.2.iii	WLA cfc =	0.016
PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc =	0.581
PENTOXSD TRG	5.1b	LTA_afc=	0.009	5.1d	LTA_cfc =	0.009

Source		Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML MULT =	1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) =	0.011	AFC
		INST MAX LIMIT (mg/l) =	0.036	

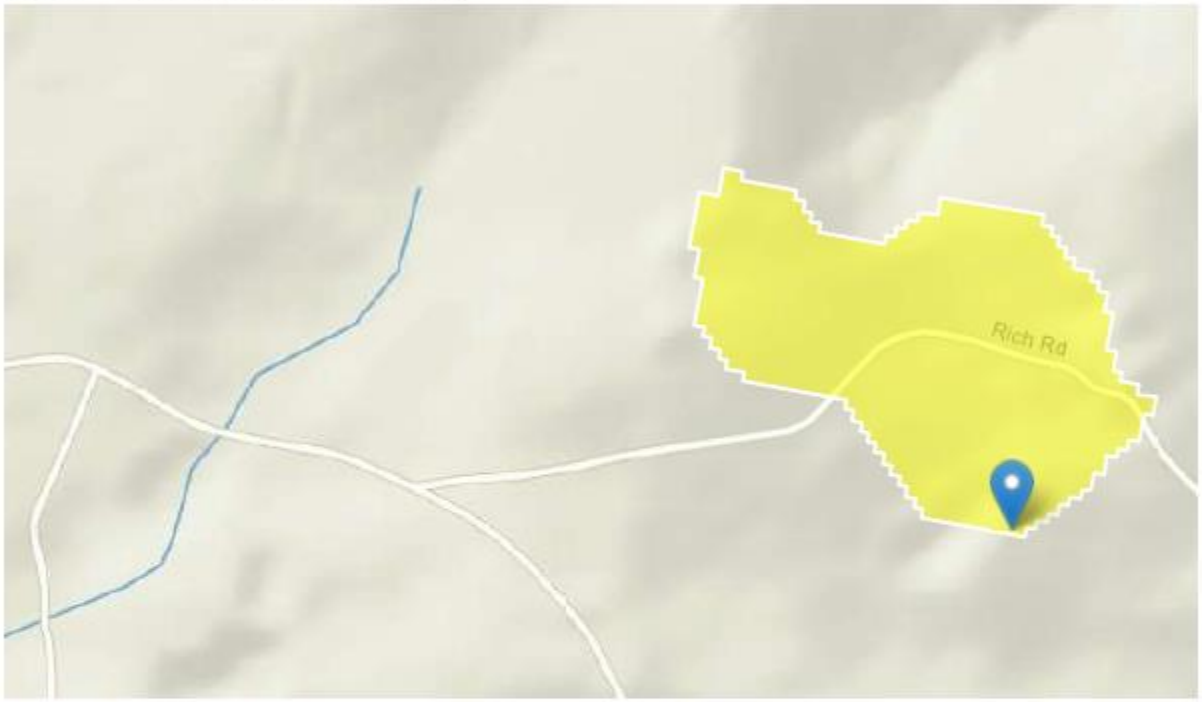
WLA afc	(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...
	...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...
	...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
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)

ATTACHMENT C

USGS Stream Stats Output File

StreamStats Report

Region ID: PA
Workspace ID: PA20210827145909601000
Clicked Point (Latitude, Longitude): 39.99681, -79.17293
Time: 2021-08-27 10:59:34 -0400



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.0435	square miles
ELEV	Mean Basin Elevation	2172	feet

Low-Flow Statistics Parameters [Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0435	square miles	2.26	1400

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
ELEV	Mean Basin Elevation	2172	feet	1050	2580

Low-Flow Statistics Disclaimers [Low Flow Region 4]

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

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

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.00129	ft^3/s
30 Day 2 Year Low Flow	0.00299	ft^3/s
7 Day 10 Year Low Flow	0.00024	ft^3/s
30 Day 10 Year Low Flow	0.000688	ft^3/s
90 Day 10 Year Low Flow	0.00187	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/)