pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0044521**
Facility Type	**Municipal**	APS ID	**29413**
Major / Minor	**Minor**	Authorization ID	**1332534**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Franklin County General Authority**	Facility Name	**Rocket Road STP**
Applicant Address	5540 Coffey Avenue	Facility Address	3813 Rocket Road
	Chambersburg, PA 17201-4113		Chambersburg, PA 17201
Applicant Contact	Kip Feldman	Facility Contact	Ron Artley
Applicant Phone	(717) 267-9351 feldman@cvbp.com	Facility Phone	(717) 267-6025
Client ID	119241	Site ID	532837
Ch 94 Load Status	Not Overloaded	Municipality	Letterkenny Township
Connection Status	No Limitations	County	Franklin
Date Application Received	November 3, 2020	EPA Waived?	Yes
Date Application Accepted	November 10, 2020	If No, Reason	
Purpose of Application	NPDES Renewal.		

Summary of Review

Franklin County General Authority (FCGA) has applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of its NPDES permit. The permit was last reissued on February 24, 2016 and became effective on April 1, 2016. The permit will expire on March 31, 2021.

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

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	January 29, 2021
		Daniel W. Martin, P.E. / Environmental Engineer Manager	
		Maria D. Bebenek, P.E. / Program Manager	

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.008
Latitude	40° 0’ 45.00”	Longitude	77° 44’ 54.00”
Quad Name	Roxbury	Quad Code	1824
Wastewater Description:	Treated Sewage		
Receiving Waters	UNT Dennis Creek	Stream Code	60026
NHD Com ID	49482428	RMI	0.05
Drainage Area	See comments below	Yield (cfs/mi^2)	See comments below
Q_{7-10} Flow (cfs)	See comments below	Q_{7-10} Basis	See comments below
Elevation (ft)	632	Slope (ft/ft)	
Watershed No.	13-C	Chapter 93 Class.	CWF, MF
Existing Use	None	Existing Use Qualifier	N/A
Exceptions to Use	None	Exceptions to Criteria	N/A
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment	N/A		
Source(s) of Impairment	N/A		
TMDL Status	N/A	Name	N/A
Background/Ambient Data		Data Source	
pH (SU)	8.3	WQN501(median July-Sep, 2001-2014)	
Temperature (°C)	21	WQN501(median July-Sep, 2001-2014)	
Nearest Downstream Public Water Supply Intake		Hagerstown, MD	
PWS Waters		Potomac River	

Drainage Area
The discharge is to Unnamed Tributary (60026) to Dennis Creek at RM 0.05. In late 80’s, DEP determined that the discharge is to a dry stream and presumed based on the field analysis that a Point of First Use (POFU) is located approximately 2,000 ft. downstream from the point of discharge; which is on the main stem (Dennis Creek) at RM 5.4. As a result, DEP has been conducting (and will continue to conduct) the water quality analysis at the POFU. This approach is consistent with DEP’s technical guidance no. 391-2000-014. The drainage area at the POFU is estimated to be 2.42 sq.mi. using USGS StreamStats available at https://streamstats.usgs.gov/ss/.

Streamflow
USGS StreamStats produced a Q7-10 flow of 0.0823 cfs at the POFU. However, as the estimated drainage area is lower than the minimum required value to be used in regression equations, the Q7-10 value was potentially calculated with errors. Considering this, DEP used a low-flow yield method to determine a Q7-10 flow at the POFU using a nearest USGS gage no. 0.1614500:

Q_{7-10} runoff rate = 55/494 = 0.11 cfs/mi^2.
Q_{30-10}:Q_{7-10} = 65.3/55 = 1.19:1
Q_{1-10}:Q_{7-10} = 48.1/55 = 0.87:1
Q_{7-10} = 0.11*2.42=0.266 cfs

Unnamed Tributary of Dennis Creek
Dennis Creek with its entire watershed is classified as cold water fisheries and supports migratory fishes according to 25 PA Code §93.9z. Therefore, no special protection waters are impacted by the discharge. The discharge is located within a stream segment listed as attaining use(s).

Public Water Supply Intake
The closest downstream public water supply intake from the discharge point is at Hagerstown, MD on the Potomac River. The distance from the discharge to the intake is approximately 40 miles. The discharge will not impact the intake because of the distance, additional dilution from the Potomac River, and the effluent limits.

Treatment Facility Summary				
Treatment Facility Name: Franklin County Gen Authority - Rocket Rd STP				
WQM Permit No.	**Issuance Date**			
2808404	08/28/2008			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Extended Aeration	Hypochlorite	0.008
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.008	13.3	Not Overloaded	Sludge Holding	Landfill

FCGA owns and operates a sanitary wastewater treatment plant located at 3813 Rocket Road Chambersburg. The plant treats sanitary wastewater generated from Letterkenny Army Depot. The plant is designed for 0.008 MGD and utilizes an extended aeration activated sludge treatment process consisting of the following treatment units: comminutor, bar screen, aeration tank, clarifier, chlorine contact tank, and outfall structure. A sludge holding tank is available for any sludge generated from this plant prior to being sent to Cumberland County Landfill for ultimate treatment/disposal.

Compliance History	
Summary of DMRs:	A summary of 12-month DMR data is presented on the next page.
Summary of Inspections:	10/23,2017: Patrick Bowen, former DEP Water Quality Specialist, conducted a routine inspection. No violation was noted at the time of inspection.
Other Comments:	No effluent violations have been identified since the last issuance. DEP's database also revealed that there is no open violation associated with this permittee or facility.

Effluent Data

DMR Data for Outfall 001 (from December 1, 2019 to November 30, 2020)

Parameter	NOV-20	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20	FEB-20	JAN-20	DEC-19
Flow (MGD) Average Monthly	0.00129 29	0.00121 83	0.00128 35	0.00157 58	0.00172 75	0.00141	0.00100 28	0.00103 65	0.00055 83	0.00038 01	0.00041 75	0.00041 41
Flow (MGD) Daily Maximum	0.00412 78	0.00424 33	0.00317 95	0.00356 06	0.00616 21	0.00237 55	0.00174 72	0.00713 83	0.00242 59	0.00202 11	0.00347 28	0.00134 91
pH (S.U.) Minimum	6.9	7.2	6.9	7.2	7.2	7.1	7.2	6.7	7.2	7.1	6.5	7.2
pH (S.U.) Maximum	7.8	7.9	7.8	7.8	7.7	7.8	7.8	7.7	7.6	7.6	7.7	7.7
DO (mg/L) Minimum	8.4	7.8	7.6	7.5	7.4	7.9	8.2	6.5	8.8	8.8	10.3	9.9
TRC (mg/L) Average Monthly	0.10	0.1	0.3	0.2	0.20	0.2	0.20	0.1	0.1	0.1	0.1	0.1
TRC (mg/L) Instantaneous Maximum	0.15	0.29	0.67	0.25	0.29	0.5	0.49	0.66	0.22	0.18	0.16	0.24
CBOD5 (mg/L) Average Monthly	< 4	< 4	< 4	< 4	< 3	< 3	< 3.00	< 3	< 4.0	< 3	< 3	< 2.0
TSS (mg/L) Average Monthly	12	15	< 9	< 7	< 5	< 5	10	6	< 5	< 9	< 7	14
Fecal Coliform (CFU/100 ml) Geometric Mean	< 1	< 1	< 4	4	88	< 1	< 1	< 1	< 5	< 7	< 4	3
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	< 1	< 1	13	19	190	< 1	< 1	< 1	22	50	13	4
Nitrate-Nitrite (mg/L) Average Monthly	< 79.275	< 66.48	< 98.93	< 86.18	119.039 2	< 111.525	< 82.104	< 115	< 122.025	< 103.03	< 104.5	< 76.4
Nitrate-Nitrite (lbs) Total Monthly	< 24	< 18	< 39	< 59	46	< 33	< 26	< 19	< 17	< 11	< 11	< 8
Total Nitrogen (mg/L) Average Monthly	< 80.525	< 67.36	< 100.18	< 87.43	< 120.289 2	< 112.775	< 83.354	< 115.75	< 123.275	< 104.28	< 105.8	< 77.4
Total Nitrogen (lbs) Total Monthly	< 25	< 18	< 39	< 60	< 47	< 33	< 27	< 19	< 18	< 11	< 11	< 8
Total Nitrogen (lbs) Total Annual			< 366									
Ammonia (mg/L) Average Monthly	< 0.3	< 0.2	< 0.3	< 0.3	< 0.3	< 0.34	0.4	< 0.3	< 0.3	< 0.3	< 0.3	0.2

Parameter	NOV-20	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20	FEB-20	JAN-20	DEC-19
Ammonia (lbs) Total Monthly	< 0.09	< 0.07	< 0.1	< 0.2	< 0.1	< 0.1	0.1	< 0.05	< 0.04	< 0.03	< 0.03	0.02
TKN (mg/L) Average Monthly	< 1.25	< 0.88	< 1.25	< 1.25	< 1.25	< 1.25	< 1.25	< 1.25	< 1.25	< 1.25	< 1.3	< 1.0
TKN (lbs) Total Monthly	< 0.4	< 0.3	< 0.5	< 0.9	< 0.5	< 0.4	< 0.4	< 0.2	< 0.2	< 0.1	< 0.1	< 0.1
Total Phosphorus (mg/L) Average Monthly	0.4	0.52	0.32	0.285	0.174	0.1	0.38	0.3	0.212	0.3	0.3	0.3
Total Phosphorus (lbs) Total Monthly	0.1	0.1	0.1	0.2	0.07	0.03	0.1	0.04	0.03	0.03	0.02	0.03
Total Phosphorus (lbs) Total Annual			1									

Existing Effluent Limitations and Monitoring Requirements

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)					
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum	Minimum Measurement Frequency	Required Sample Type
Flow (MGD)	Report Avg Mo	Report	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	9.0	XXX	1/week	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/week	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/week	Grab
CBOD5	XXX	XXX	XXX	25	XXX	50	2/month	Grab
TSS	XXX	XXX	XXX	30	XXX	60	2/month	Grab
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) [1]		Concentrations (mg/L)				Minimum [2] Measurement Frequency	Required Sample Type
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Ammonia--N	Report	XXX	XXX	Report	XXX	XXX	2/month	Grab
Kjeldahl--N	Report	XXX	XXX	Report	XXX	XXX	2/month	Grab
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	2/month	Grab
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	2/month	Grab

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .008
Latitude 40º 0' 45.00" **Longitude** -77º 44' 54.00"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

The facility is subject to secondary treatment standards found in 25 Pa. Code § 92a.47(a) and 40 CFR § 133.102. These standards are as follows:

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: These standards apply, subject to water quality analysis and BPJ where applicable.

Water Quality-Based Limitations

The discharge was previously modeled using WQM 7.0 ver. 1.0b to determine if WQBELs are necessary for CBOD5, NH3-N and DO to protect existing water quality standards in the receiving stream. DEP determined that no modeling is needed for this permit renewal as previous modeling was performed properly and there has not been any change in the quality/quantity of effluent and stream conditions. Accordingly, no changes are recommended for this permit renewal. This permitting approach is consistent with DEP's Standard Operating Procedure (SOP) no. BCW-PMT-033. The results of the previous modeling effort are attached to the fact sheet. It is noteworthy that the previous permit renewal did not require ammonia limits in the permit as the model did not recommend any WQBELs. DEP's SOP no. BCW-PMT-033 however recommends a year-round monitoring requirement for ammonia-nitrogen. As a result, a monitoring requirement for ammonia-nitrogen will be established in the permit with the same monitoring frequency and sample type assigned to CBOD5 and TSS.

Since chlorine is used for disinfection, Total Residual Chlorine (TRC) effluent levels must be controlled for water quality protection. The discharge was modeled using DEP's TRC_CALC worksheet. The model output indicated that existing limits are still protective of water quality.

Best Professional Judgment (BPJ) Limitations

A minimum DO limit of 5.0 mg/L is recommended to ensure the facility continues to meet DO water quality criterion specified in 25 Pa. Code § 93.7(a). This requirement generally applies to all NPDES facilities discharging pollutants into waters of the Commonwealth.

Additional Considerations

Total Phosphorus and Total Nitrogen Monitoring

DEP's SOP no. BCW-PMT-033 recommends a routine monitoring of Total Phosphorus and Total Nitrogen for sewage facilities greater than 0.002 MGD. Also, DEP's current Chesapeake Bay Phase II Watershed Implementation Plan recommends monitoring of these nutrients. Consequently, existing monitoring requirements will be maintained in the permit.

Monitoring Frequency and Sample Type
Due to the low effluent volumes and compliance history, it is recommended that the monitoring frequency be changed from 2/month to 1/month for CBOD5, TSS and fecal coliform; and 2/month to 1/quarter for all nutrient related pollutants. No annual nutrient data is needed at this time given the discharge volume and the fact that the receiving stream is not impaired for nutrients. The existing weekly monitoring for flow, pH, DO and TRC will remain unchanged as they have already been reduced from the standard monitoring frequency listed in DEP's technical guidance no. 362-0400-001.

Flow Monitoring
The requirement to monitor the volume of effluent discharged from Outfall 001 is recommended per 40 CFR § 122.44(i)(1)(ii).

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

Class A Wild Trout Stream
No Class A Wild Trout Fishery is impacted by this discharge.

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)	Report	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	9.0	XXX	1/week	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/week	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/week	Grab
CBOD5	XXX	XXX	XXX	25	XXX	50	1/month	Grab
TSS	XXX	XXX	XXX	30	XXX	60	1/month	Grab
NH3-N	XXX	XXX	XXX	Report	XXX	XXX	1/month	Grab
Fecal Coliform Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/month	Grab
Fecal Coliform May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/month	Grab
Nitrate-Nitrite	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/quarter	Grab
TKN	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/quarter	Grab
Total Nitrogen	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/quarter	Calculation
Total Phosphorus	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/quarter	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, 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:

Attachment

StreamStats @ Discharge

StreamStats Report

Region ID: PA
Workspace ID: PA20210127191816131000
Clicked Point (Latitude, Longitude): 40.01227, -77.74814
Time: 2021-01-27 14:18:36 -0500

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.12	square miles
PRECIP	Mean Annual Precipitation		inches
STRDEN	Stream Density -- total length of streams divided by drainage area	3.67	miles per square mile
ROCKDEP	Depth to rock		feet
CARBON	Percentage of area of carbonate rock		percent

Low-Flow Statistics Parameters[Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.12	square miles	4.93	1280
PRECIP	Mean Annual Precipitation		inches	35	50.4
STRDEN	Stream Density	3.67	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock		feet	3.32	5.65
CARBON	Percent Carbonate		percent	0	99

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

Statistic	Value	Unit

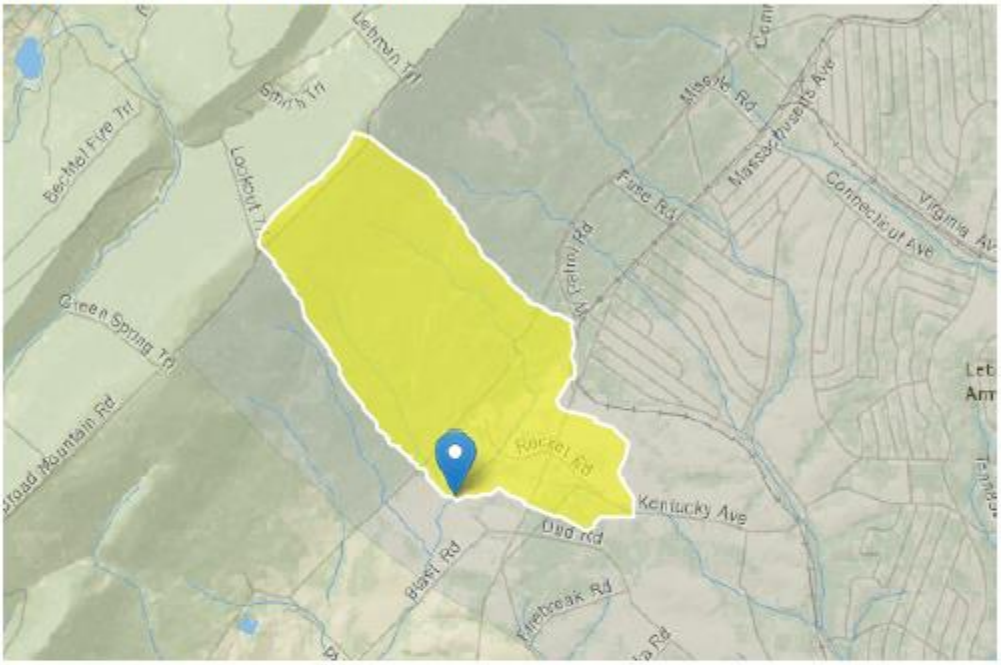
Low-Flow Statistics Citations

Application Version: 4.4.0

StreamStats @POFU

StreamStats Report

Region ID: PA
Workspace ID: PA20210129165435035000
Clicked Point (Latitude, Longitude): 40.00826, -77.75190
Time: 2021-01-29 11:54:52 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	2.24	square miles
PRECIP	Mean Annual Precipitation	40	inches
STRDEN	Stream Density -- total length of streams divided by drainage area	4.04	miles per square mile
ROCKDEP	Depth to rock	5.1	feet
CARBON	Percentage of area of carbonate rock	36.15	percent

Low-Flow Statistics Parameters[Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2.24	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	40	inches	35	50.4
STRDEN	Stream Density	4.04	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	5.1	feet	3.32	5.65
CARBON	Percent Carbonate	36.15	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	0.165	ft^3/s
30 Day 2 Year Low Flow	0.215	ft^3/s
7 Day 10 Year Low Flow	0.0823	ft^3/s
30 Day 10 Year Low Flow	0.104	ft^3/s
90 Day 10 Year Low Flow	0.141	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/)

WQM 7.0

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
13C	60002	DENNIS CREEK	**5.400**	614.00	2.42	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	0.110	0.00	0.27	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
Rocket Rd 3813	PA0044521	0.0080	0.0080	0.0080	0.000	20.00	7.25

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

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
13C	60002	DENNIS CREEK	0.000	532.00	13.00	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	0.110	0.00	1.43	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	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	5.00	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
13C	60002	DENNIS 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												
5.400	0.27	0.00	0.27	.0124	0.00288	.421	8.24	19.57	0.08	4.055	20.00	7.01
Q1-10 Flow												
5.400	0.23	0.00	0.23	.0124	0.00288	NA	NA	NA	0.08	4.368	20.00	7.01
Q30-10 Flow												
5.400	0.32	0.00	0.32	.0124	0.00288	NA	NA	NA	0.09	3.693	20.00	7.01

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	0.87	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.19	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
13C	60002	DENNIS 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
5.400	Rocket Rd 3813	9.61	50	9.61	50	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
5.400	Rocket Rd 3813	1.91	25	1.91	25	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)		
5.40	Rocket Rd 3813	25	25	25	25	5	5	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
13C	60002	DENNIS CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
5.400	0.008	20.000	7.008
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
8.241	0.421	19.573	0.081
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
3.01	0.101	1.10	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.101	20.020	Owens	5
Reach Travel Time (days)			
4.055			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.406	2.89	0.82	8.24
0.811	2.77	0.62	8.24
1.217	2.66	0.47	8.24
1.622	2.55	0.35	8.24
2.028	2.45	0.27	8.24
2.433	2.35	0.20	8.24
2.839	2.26	0.15	8.24
3.244	2.17	0.11	8.24
3.650	2.08	0.09	8.24
4.055	2.00	0.06	8.24

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
13C	60002	DENNIS 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)
5.400	Rocket Rd 3813	PA0044521	0.008	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			5

TRC_CALC

TRC_CALC

	B	C	D	E	F	G
2	**TRC EVALUATION**					
3	Input appropriate values in B4:B8 and E4:E7					
4	0.266	= Q stream (cfs)		0.5	= CV Daily	
5	0.008	= Q discharge (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 = 6.875		1.3.2.iii	WLA cfc = 6.695
12	PENTOXSD TRG	5.1a	LTAMULT afc = 0.373		5.1c	LTAMULT cfc = 0.581
13	PENTOXSD TRG	5.1b	LTA_afc= 2.562		5.1d	LTA_cfc = 3.892
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)