Pennsylvania Department of Environmental Protection

Southcentral Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0086045**
Facility Type	**Non-Municipal**	APS ID	**341952**
Major / Minor	**Minor**	Authorization ID	**1487298**

Applicant and Facility Information

Applicant Name	**Castle Hill MHP**	Facility Name	**Castle Hill MHP**
Applicant Address	20 Erford Road Suite 215	Facility Address	2581 Old Harrisburg Road
	Lemoyne, PA 17043-1163		Gettysburg, PA 17325-8100
Applicant Contact	David Remmel	Facility Contact	Kimberly Nicholson
Applicant Phone	(717) 635-2437	Facility Phone	(717) 635-2437
Client ID	148711	Site ID	258364
Ch 94 Load Status	Not Overloaded	Municipality	Straban Township
Connection Status		County	Adams
Date Application Received	May 29, 2024	EPA Waived?	Yes
Date Application Accepted	June 5, 2024	If No, Reason	

Purpose of Application: NPDES permit renewal.

Summary of Review

Quality Water Resources, Inc. on behalf of the Castle Hill MHP (Authority/Permittee), applied to the Pennsylvania Department of Environmental Protection (DEP) for issuance of the NPDES permit. The permit was reissued on November 21, 2019 and became effective on December 1, 2019. The permit expires on November 30, 2024.

The average annual design flow and hydraulic design capacity is 0.012 MGD. The treated effluent is discharged to UNT Rock Creek. The 2024 application states that there are no industrial users.

Sludge use and disposal description and location(s): N/A because sludge is hauling by Smith's Septic contractor.

Changes from the previous permit: The E. Coli. monitoring and report requirements will add to the proposed permit.

Based on the review outlined in this fact sheet, it is recommended that the permit be drafted. A public notice of the draft permit will be published in the *Pennsylvania Bulletin* for public comments for 30 days.

Approve	Deny	Signatures	Date
X		*Hilaryle* Hilary H. Le / Environmental Engineering Specialist	September 13, 2024
X		*Maria D. Bebenek for* Daniel W. Martin, P.E. / Environmental Engineer Manager	September 30, 2024

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.012
Latitude	39º 53' 17.54"	Longitude	-77º 11' 25.97"
Quad Name	Biglerville	Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary to Rock Creek (WWF)	Stream Code	59218
NHD Com ID	53319414	RMI	0.46 mile
Drainage Area	0.15 $mi.^2$	Yield (cfs/mi^2)	See comments below
Q_{7-10} Flow (cfs)	See comments below	Q_{7-10} Basis	
Elevation (ft)	540	Slope (ft/ft)	
Watershed No.	13-D	Chapter 93 Class.	WWF
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	City of Frederick, MD		
PWS Waters	Monocacy river	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	Approximate 48.0 miles

Changes Since Last Permit Issuance:

Drainage Area
The discharge is to Unnamed Tributary 59218 to Rock Creek at RMI 0.46 mile. A drainage area upstream of the discharge is estimated to be 0.15 mi^2, according to USGS PA StreamStats available at https://streamstats.usgs.gov/ss/.

Streamflow
There are no nearby stream gages with low flow data that have extensive or recent periods of record. Since USGS PA StreamStats estimated the drainage area that is below the minimum value allowed by USGS's regression equations, the USGS gage station No. 59041 on Rock Creek watershed (at the PA/MD border) will be used to calculate the Q_{7-10} at the point of discharge using a low flow yield method. The Q_{7-10} here is 2.71 cfs and the drainage area is 63.5 mi^2 which results in a Q_{7-10} low flow yield of 0.04 cfs/mi^2. This information is used to obtain a chronic or 30-day (Q_{30-10}), and an acute or 1-day (Q_{1-10}) exposure stream flow for the discharge point as follows (Guidance No. 391-2000-023):

$$\text{Low Flow Yield} = Q_{7\text{-}10gage} / \text{Drainage Area}_{gage} = 2.71 \text{ cfs} / 63.5 \text{ mi}^2 = 0.04 \text{ cfs/mi}^2$$
$$Q_{7\text{-}10discharge} = 0.04 \text{ cfs/mi}^2 * \text{Drainage Area}_{discharge} = 0.04 \text{ cfs/mi}^2 * 0.15 \text{ mi}^2 = 0.006 \text{ cfs}$$
$$Q_{30\text{-}10} = 1.36 * Q_{7\text{-}10discharge} = 1.36 * 0.006 \text{ cfs} = 0.008 \text{ cfs}$$
$$Q_{1\text{-}10} = 0.64 * Q_{7\text{-}10discharge} = 0.64 * 0.006 \text{ cfs} = 0.0038 \text{ cfs}$$

Potable Water Supply Intake
The nearest downstream public water supply intake is the City of Frederick, MD intake on the Monocacy River, approximately 48 miles from the point of discharge. Given the nature and dilution, the discharge is not expected to significantly impact the water supply.

Treatment Facility Summary				
Treatment Facility Name: Castle Hill MHP				
WQM Permit No.	**Issuance Date**			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Extended Aeration	Chlorine With Dechlorination	0.0122
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.0123		Not Overloaded	Aerobic Digestion	Other WWTP

Changes Since Last Permit Issuance:

Other Comments:
The WWTP train is as follows:

Bar Screen (1) – Equalization Tank (1) – Aeration Tanks (2) – Settling Tank (1) – Tablet Chlorinator / Chlorine Contact Tank (1) – Tablet De-chlorinator / De-chlorination Contact Tank (1) – Post Aeration Tank (1) – Discharge (Outfall to Unnamed Tributary to Rock Creek).

Calcium hypochlorite tablets are used for disinfection and dechlorination are used for reduces chlorine in effluent discharge. Soda ash and alum are used to control pH. A sludge holding tank is used for solids storage.

Compliance History	
Summary of DMRs:	A summary of past 12-month DMRs is presented on the next page.
Summary of Inspections:	**12/19/22:** Mr. Hoy, DEP WQ Environmental Trainee, conducted a compliance evaluation inspection. The field test results were within permit limits. There were no violations noted during inspection. DEP requests that the permittee maintain sludge hauling receipts on-site for a minimum of 5 years. DEP recommends testing alarms on a routine basis.
Other Comments:	There are currently no open violations associated with the permittee or the facility.

Other Comments:

Compliance History

DMR Data for Outfall 001 (from August 1, 2023 to July 31, 2024)

Parameter	JUL-24	JUN-24	MAY-24	APR-24	MAR-24	FEB-24	JAN-24	DEC-23	NOV-23	OCT-23	SEP-23	AUG-23
Flow (MGD) Average Monthly	0.0052	0.00668	0.00731 3	0.00704 7	0.00719 7	0.00815 5	0.00783 9	0.00702 6	0.00757 9	0.00671 9	0.00730 4	0.00816
Flow (MGD) Daily Maximum	0.0093	0.0171	0.00855	0.00875	0.0087	0.0117	0.0171	0.009	0.0086	0.0085	0.0114	0.0167
pH (S.U.) Daily Minimum	7.0	6.8	6.8	7.0	7.0	7.1	7.0	7.1	7.0	6.9	7.0	6.8
pH (S.U.) Instantaneous Maximum	7.2	7.3	7.5	7.3	7.4	7.7	7.5	7.8	7.3	7.4	7.4	7.3
DO (mg/L) Daily Minimum	9.0	9.9	8.5	8.9	8.6	9.4	8.1	7.3	6.8	9.2	8.4	7.1
TRC (mg/L) Average Monthly	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
TRC (mg/L) Instantaneous Maximum	0.10	0.02	0.02	< 0.02	0.02	0.02	0.03	0.03	0.03	0.04	0.02	< 0.02
CBOD5 (mg/L) Average Monthly	< 4.4	4.8	9.5	9.3	9.1	9.4	7.8	8.5	7.3	4.8	4.8	4.1
TSS (mg/L) Average Monthly	8	8	19	9	7	16	14	8	9	4	6	15
Fecal Coliform (No./100 ml) Geometric Mean	10	23	8	6	< 3	6	42	7	< 3	< 1	23	10
Fecal Coliform (No./100 ml) Instantaneous Maximum	17	23	24	36	8	36	866	46	10	< 1	267	17
Ammonia (mg/L) Average Monthly	< 0.11	0.25	0.24	< 0.1	0.25	< 0.1	0.15	0.45	< 0.1	< 0.1	< 0.1	< 0.1

Existing Effluent Limitations and Monitoring Requirements

Outfall 001,

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	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.05	XXX	0.16	1/day	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50.0	2/month	24-Hr Composite
TSS	XXX	XXX	XXX	30.0	XXX	60.0	2/month	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	Grab
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	6.0	XXX	12.0	2/month	24-Hr Composite
Ammonia May 1 - Oct 31	XXX	XXX	XXX	2.0	XXX	4.0	2/month	24-Hr Composite

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .012
Latitude 39º 53' 17.54" **Longitude** -77º 11' 25.97"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

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

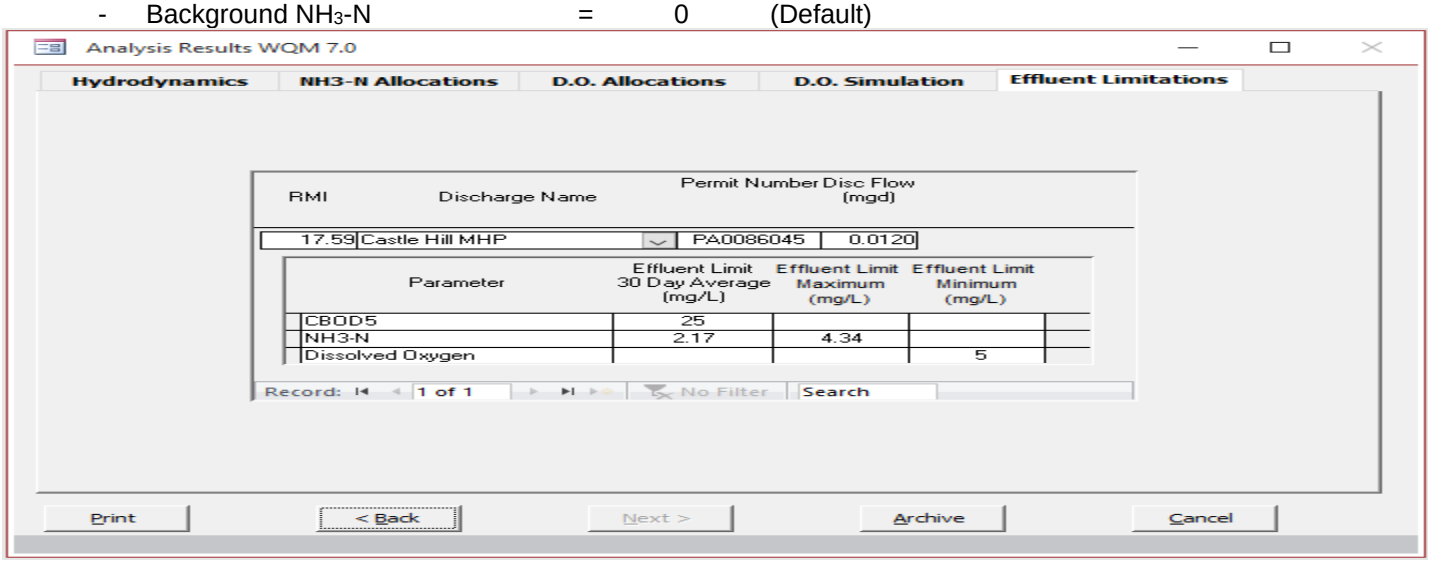
Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	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

Ammonia (NH_3-N):
NH_3-N calculations were first based on the Department's Implementation Guidance of Section 93.7 Ammonia Criteria, dated 11/4/97 (ID No. 391-2000-013). The following data is necessary to determine the in-stream NH_3-N criteria used in the attached computer model of the stream:

- Discharge pH = 7.0 (Default)
- Discharge Temperature = 25^{0}C (Default)
- Stream pH = 7.0 (Default)
- Stream Temperature = 20^{0}C (Default for WWF)
- Background NH_3-N = 0 (Default)



Regarding NH_3-N limits, the attached computer printout of the WQM 7.0 stream model (version 1.1) indicates that a limit of 2.17 (2.0)mg/L as a monthly average and 4.34 (4.0) mg/L instantaneous maximum (IMAX) are necessary to protect the aquatic life from toxicity effects at the point of discharge. Therefore, the existing summer limits of 2.0 mg/L monthly average & 4.0 mg/L IMAX will remain in the proposed permit. The existing winter average monthly limit of 6.0 mg/L & IMAX limit of 12.0 mg/L will remain in place. Recent DMRs and inspection reports show that the facility has been consistently achieving these limits.

Carbonaceous Biochemical Oxygen Demand ($CBOD_5$):
Only the minimum treatment requirements of secondary treatment will be necessary to protect water quality. The existing limits of 25.0 mg/L average monthly and 50.0 mg/L instantaneous maximum will remain in the renewal permit. Past DMRs and inspection reports show that the facility has been consistently achieving concentrations under these limits.

Dissolved Oxygen (D.O.):
A minimum D.O. of 5.0 mg/L is required per 25 Pa. Code § 93.7. This is consistent with the previous permit and current Department criteria.

pH:
The effluent discharge pH should remain above 6.0 and below 9.0 standard units according to 25 Pa. Code § 95.2(2).

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 (average monthly) and not greater than 1,000/100 ml (IMAX) and 25 Pa. Code § 92a.47(a)(5) requires a winter limit of 2,000/100 ml as a geometric mean (average monthly) and not greater than 10,000/100 ml (IMAX), respectively.

E. Coli:
As recommended by DEP's SOP No. BCW-PMT-033, version 2.0 revised February 5, 2024, a routine monitoring for E. Coli will be included in the proposed permit under 25 Pa. Code § 92a.61. This requirement applies to all sewage dischargers greater than 0.002 MGD in their new and reissued permits. A monitoring frequency of 1/year will be included in the permit to be consistent with the recommendation from this SOP.

Total Suspended Solids (TSS):
The existing limits of 30.0 mg/L average monthly and 60.0 mg/L instantaneous maximum will remain in the renewal permit based on the minimum level of effluent quality attainable be secondary treatment based on 25 Pa. Code § 92a.47. Past DMRs and inspection reports show that the facility has been consistently achieving concentrations under these limits.

Chesapeake Bay Strategy:
This facility falls in Phase 5 of the Pennsylvania's Chesapeake Bay Tributary Strategy Point Source Implementation Plan. At this time, the Department is not requiring a total maximum annual phosphorus or nitrogen loading cap. The Supplement to Phase II Watershed Implementation Plan states the following:

> *"For Phase 5 sewage facilities with individual permits (average annual design flow on August 29, 2005 >0.002 MGD and < 0.2 MGD), DEP will issue individual permits with monitoring and reporting for TN and TP throughout the permit term at a frequency no less than annually, unless 1) the facility has already conducted at least two years of nutrient monitoring and 2) a summary of the monitoring results are included in the next permit's fact sheet. If, however, Phase 5 facilities choose to expand, the renewed or amended permits will contain Cap Loads based on the lesser of a) existing TN/TP concentrations at existing average annual flow or b) 7,306 lbs/yr TN and 974 lbs/yr TP."*

Total Nitrogen (TN) and Total Phosphorus (TP) "Monitor & Report" requirements will not be necessary since the facility has already satisfied the data criteria of the Chesapeake Bay Strategy.

Total Phosphorus (TP):
eMAP PA lists the section of Rock Creek closest to this facility's discharge point as being impaired for nutrients (without a TMDL). As per the previous protection report, an aquatic biologist from the Department concluded from his studies that phosphorus is not currently a problem in this area.

Toxic:
This is a minor sewage facility receiving domestic wastewater only and the current application does not require sampling of toxic pollutants (or heavy metals) for those facilities with design flows less than 0.1 MGD. Therefore, no reasonable potential analysis for toxic pollutants has been performed for this permit renewal.

Total Residual Chlorine (TRC):

Based on the attached TRC Excel Spreadsheet calculator, which uses the equations and calculations from the Department's May 1, 2003 Implementation Guidance for Total Residual Chlorine (ID No. 391-2000-015), the facility's discharge must meet a monthly average limit of 0.056 mg/L and an instantaneous maximum limit of 0.183 mg/L. However, the existing limit of 0.05 mg/L for monthly average & 0.16 mg/L for IMAX are more stringent and will remain in the proposed permit. Based on the DMRs from the past year, the facility has been consistently achieving this limit.

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.006	= Q stream (cfs)	0.5	= CV Daily
0.012	= 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 =	0.122	1.3.2.iii	WLA cfc =	0.112
PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc =	0.581
PENTOXSD TRG	5.1b	LTA_afc=	0.045	5.1d	LTA_cfc =	0.065

Source		Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML MULT =	1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) =	0.056	AFC
		INST MAX LIMIT (mg/l) =	0.183	

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)

Additional Consideration

Flow Monitoring

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

Monitoring Frequency and Sample Type

The facility currently is required to collect daily effluent grab samples for DO, TRC, and pH; bi-monthly effluent 24-hr composite samples of $CBOD_5$, TSS, and ammonia-nitrogen; bi-monthly effluent grab samples of fecal coliform. Based on the best professional judgement of the author, the existing monitoring frequencies are sufficient and necessary. Therefore, the renewal permit monitoring frequencies will remain the same as those specified in the existing permit.

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. No High-Quality Waters are impacted by this discharge. No Exceptional Value Waters are impacted by this discharge.

303d Listed Streams

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

Class A Wild Trout Fisheries

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

Anti-Backsliding

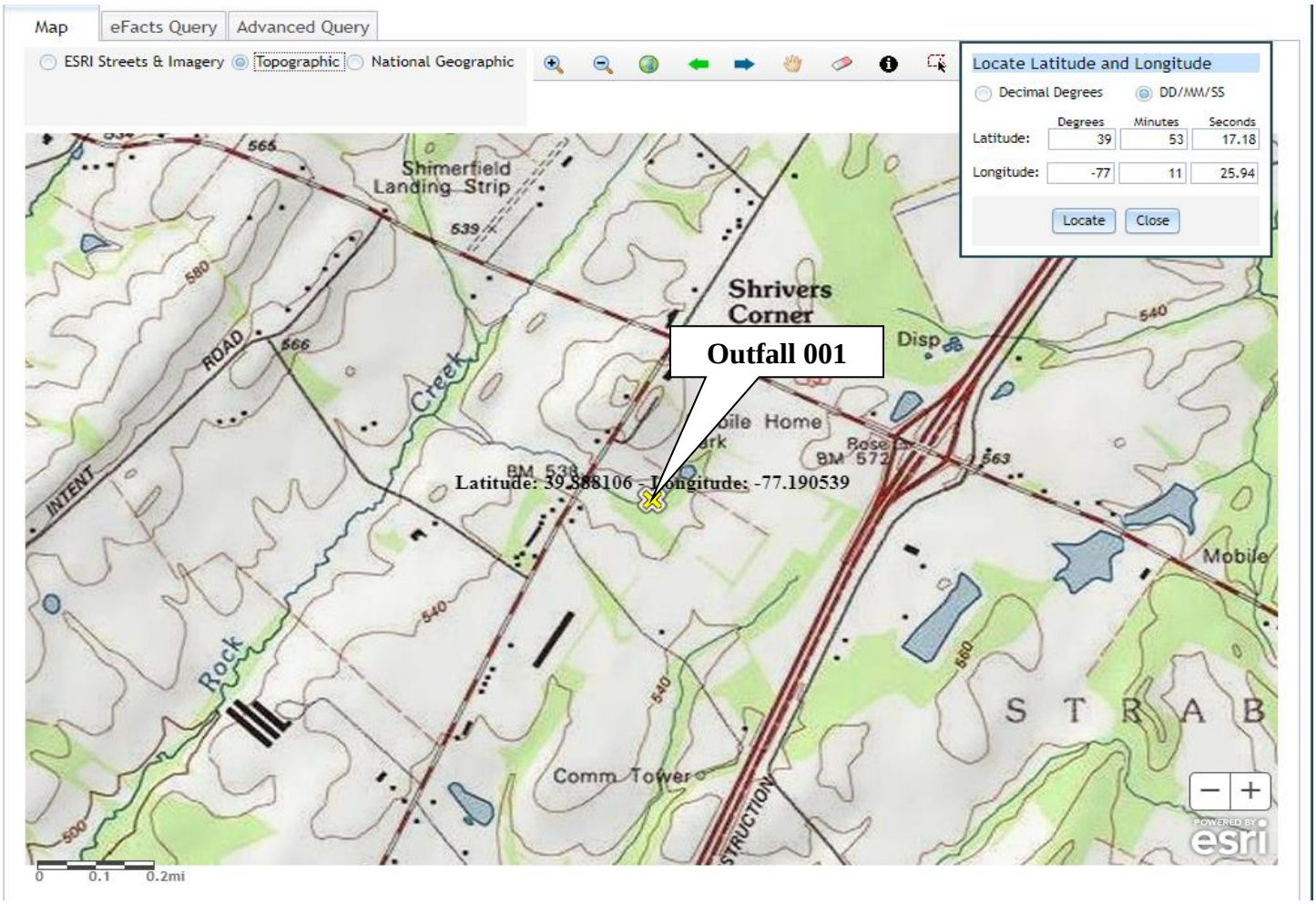
Unless stated otherwise in this fact sheet, all permit requirements proposed in this fact sheet are at least as stringent as existing permit requirements in accordance with 40 CFR §122.44(l)(1).

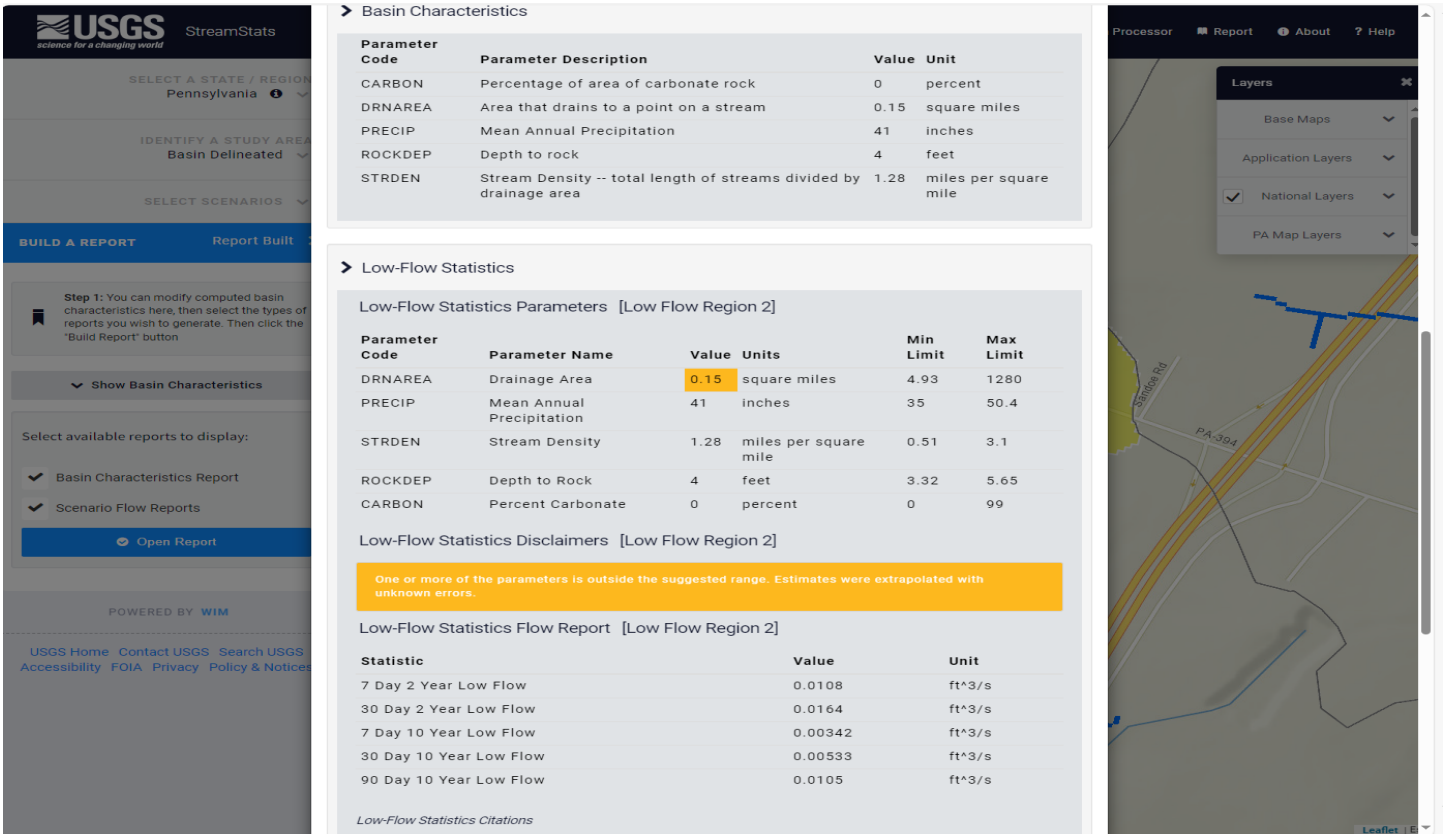
WQM 7.0 Data

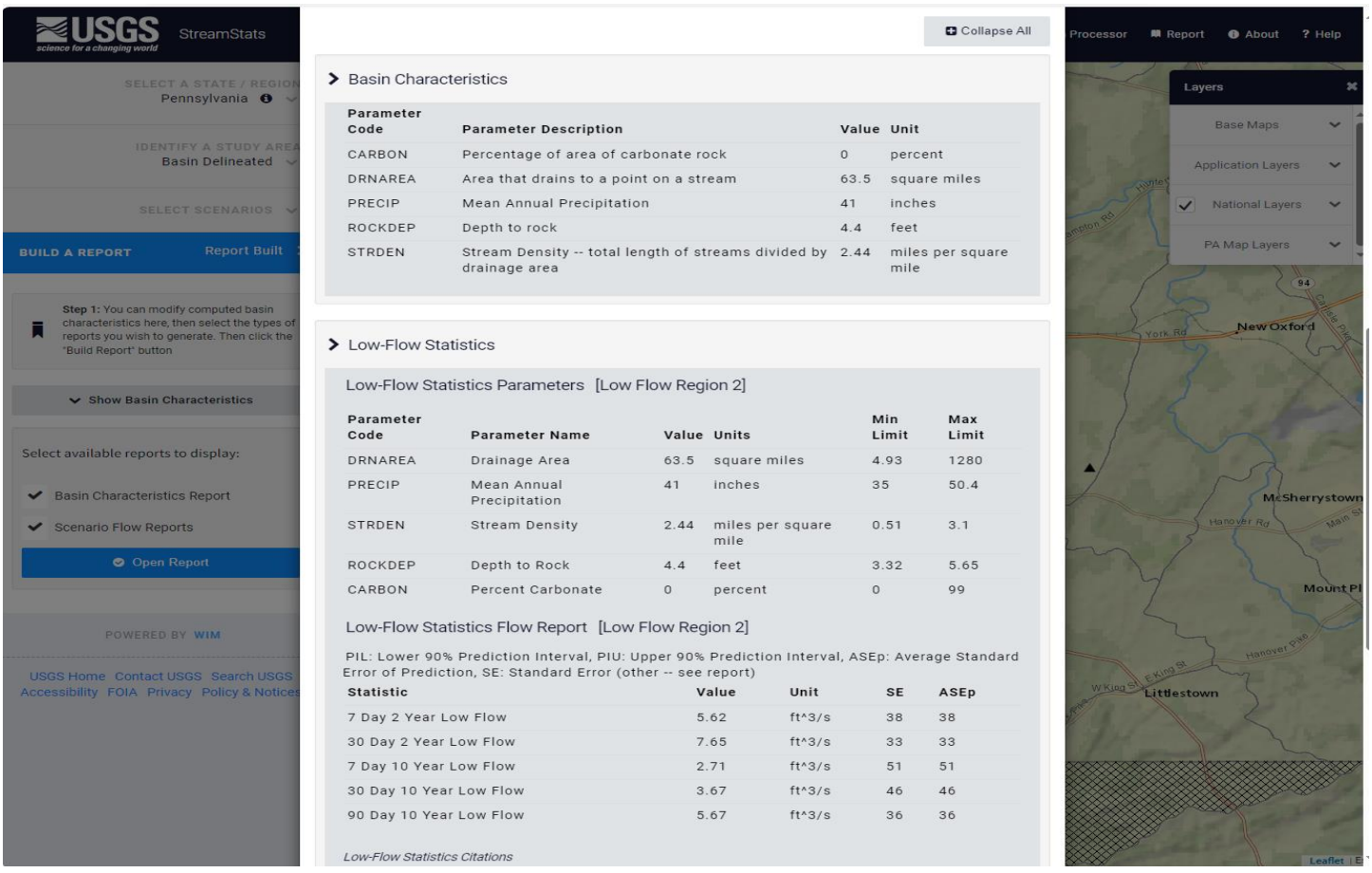
- Discharge pH = 7.0 (Default)
- Discharge Temperature = 25^{0}C (Default)
- Stream pH = 7.0 (Default)
- Stream Temperature = 20^{0}C (Default for WWF)
- Background NH_3-N = 0 (Default)

1. Outfall 001 on Trib 59218 to Rock Creek
   a. Elevation: 540 ft
   b. RMI: (17.13 + 0.46 = 17.59 miles) to Monocacy River located at PA & MD boundaries
   c. Drainage Area: 0.15 mi^2
   d. Low Flow Yield: 0.04 cfs/mi^2
   e. Discharge Flow: 0.012 MGD

2. Just before 59041 to Rock Creek
   a. Elevation: 516 ft
   b. RMI: (17.13 + 0.001 = 17.131 miles) to Monocacy River located at PA & MD boundaries
   c. Drainage Area: 0.23 mi^2
   d. Low Flow Yield: 0.04 cfs/mi^2
   e. Discharge Flow: 0.000 MGD




USGS StreamStats
science for a changing world
SELECT A STATE / REGION
Pennsylvania
IDENTIFY A STUDY AREA
Basin Delineated
SELECT SCENARIOS
BUILD A REPORT
Report Built
Step 1: You can modify computed basin characteristics here, then select the types of reports you wish to generate. Then click the "Build Report" button
Show Basin Characteristics
Select available reports to display:
Basin Characteristics Report
Scenario Flow Reports
Open Report
POWERED BY WIM
USGS Home Contact USGS Search USGS
Accessibility FOIA Privacy Policy & Notices
Basin Characteristics
Parameter Code | Parameter Description | Value | Unit
CARBON | Percentage of area of carbonate rock | 0 | percent
DRNAREA | Area that drains to a point on a stream | 0.15 | square miles
PRECIP | Mean Annual Precipitation | 41 | inches
ROCKDEP | Depth to rock | 4 | feet
STRDEN | Stream Density -- total length of streams divided by drainage area | 1.28 | miles per square mile
Low-Flow Statistics
Low-Flow Statistics Parameters [Low Flow Region 2]
Parameter Code | Parameter Name | Value | Units | Min Limit | Max Limit
DRNAREA | Drainage Area | 0.15 | square miles | 4.93 | 1280
PRECIP | Mean Annual Precipitation | 41 | inches | 35 | 50.4
STRDEN | Stream Density | 1.28 | miles per square mile | 0.51 | 3.1
ROCKDEP | Depth to Rock | 4 | 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 | 0.0108 | ft^3/s
30 Day 2 Year Low Flow | 0.0164 | ft^3/s
7 Day 10 Year Low Flow | 0.00342 | ft^3/s
30 Day 10 Year Low Flow | 0.00533 | ft^3/s
90 Day 10 Year Low Flow | 0.0105 | ft^3/s
Low-Flow Statistics Citations
Processor Report About Help
Layers
Base Maps
Application Layers
National Layers
PA Map Layers
Sandoe Rd
PA-394
Leaflet


USGS StreamStats
science for a changing world
SELECT A STATE / REGION
Pennsylvania
IDENTIFY A STUDY AREA
Basin Delineated
SELECT SCENARIOS
BUILD A REPORT
Report Built
Step 1: You can modify computed basin characteristics here, then select the types of reports you wish to generate. Then click the "Build Report" button
Show Basin Characteristics
Select available reports to display:
Basin Characteristics Report
Scenario Flow Reports
Open Report
POWERED BY WIM
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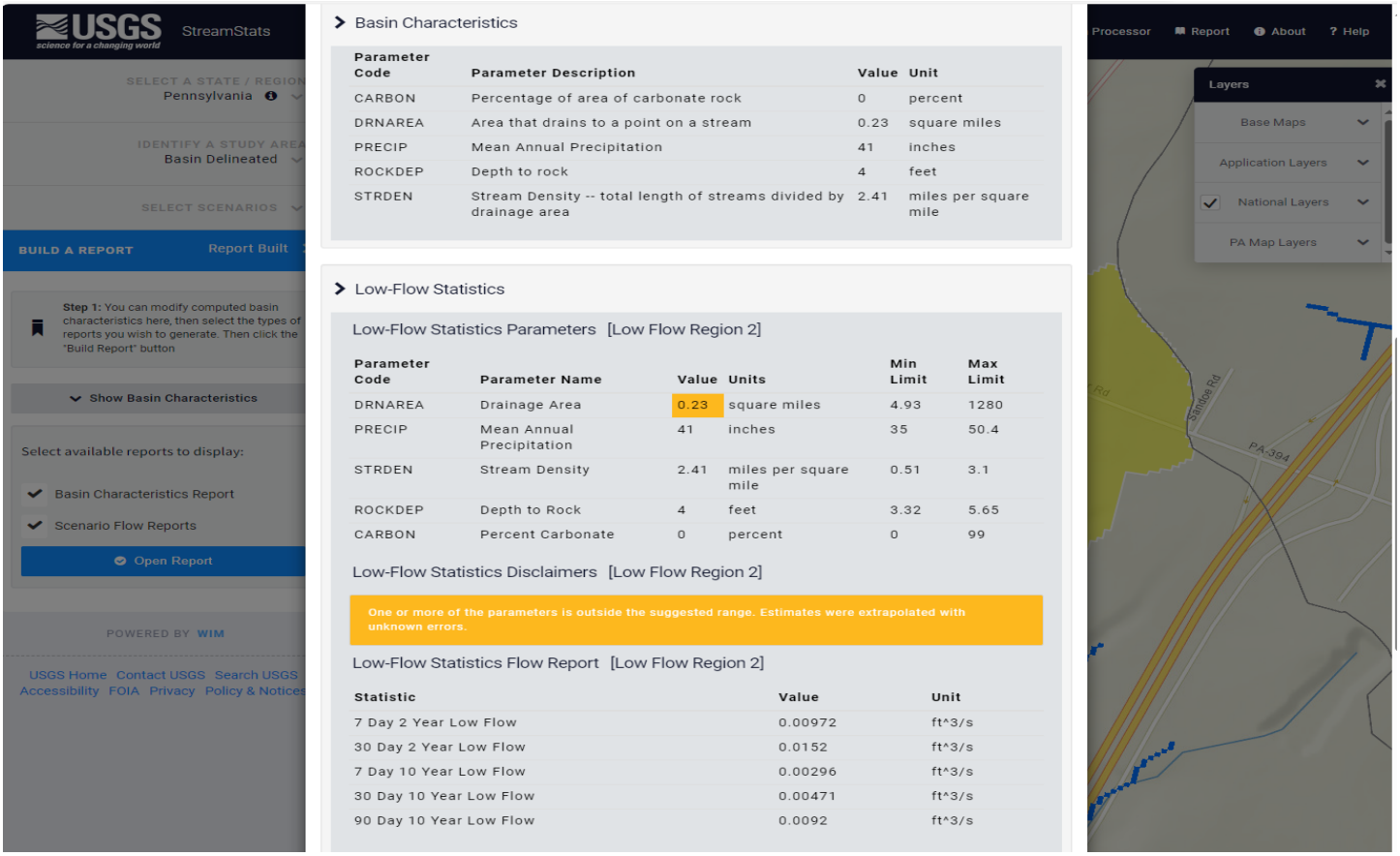
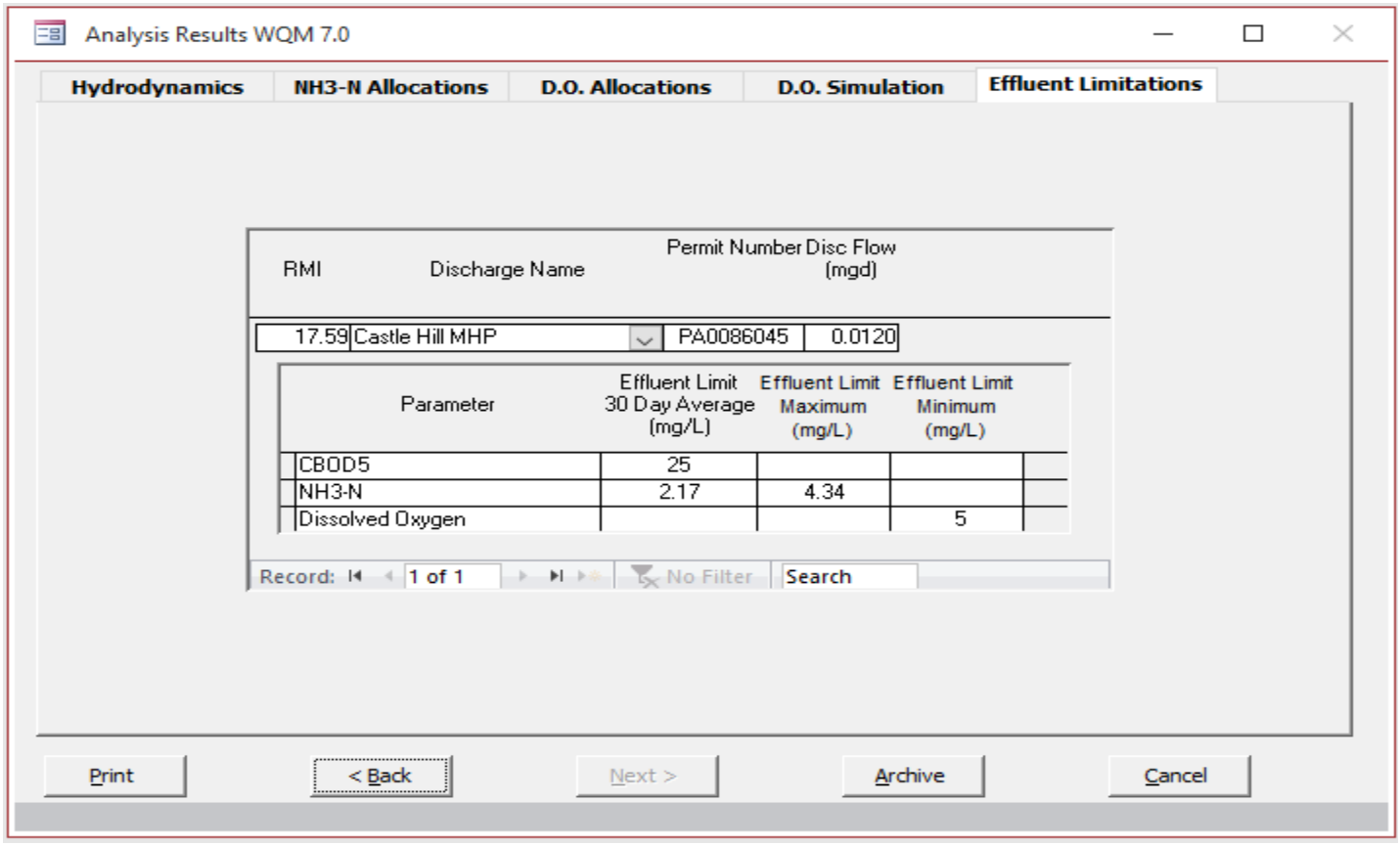
Collapse All
Basin Characteristics
Parameter Code | Parameter Description | Value | Unit
CARBON | Percentage of area of carbonate rock | 0 | percent
DRNAREA | Area that drains to a point on a stream | 63.5 | square miles
PRECIP | Mean Annual Precipitation | 41 | inches
ROCKDEP | Depth to rock | 4.4 | feet
STRDEN | Stream Density -- total length of streams divided by drainage area | 2.44 | miles per square mile
Low-Flow Statistics
Low-Flow Statistics Parameters [Low Flow Region 2]
Parameter Code | Parameter Name | Value | Units | Min Limit | Max Limit
DRNAREA | Drainage Area | 63.5 | square miles | 4.93 | 1280
PRECIP | Mean Annual Precipitation | 41 | inches | 35 | 50.4
STRDEN | Stream Density | 2.44 | miles per square mile | 0.51 | 3.1
ROCKDEP | Depth to Rock | 4.4 | feet | 3.32 | 5.65
CARBON | Percent Carbonate | 0 | percent | 0 | 99
Low-Flow Statistics Flow Report [Low Flow Region 2]
PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)
Statistic | Value | Unit | SE | ASEp
7 Day 2 Year Low Flow | 5.62 | ft^3/s | 38 | 38
30 Day 2 Year Low Flow | 7.65 | ft^3/s | 33 | 33
7 Day 10 Year Low Flow | 2.71 | ft^3/s | 51 | 51
30 Day 10 Year Low Flow | 3.67 | ft^3/s | 46 | 46
90 Day 10 Year Low Flow | 5.67 | ft^3/s | 36 | 36
Low-Flow Statistics Citations
Processor Report About Help
Layers
Base Maps
Application Layers
National Layers
PA Map Layers
New Oxford
Littlestown
Leaflet


USGS StreamStats
science for a changing world
SELECT A STATE / REGION
Pennsylvania
IDENTIFY A STUDY AREA
Basin Delineated
SELECT SCENARIOS
BUILD A REPORT
Report Built
Step 1: You can modify computed basin characteristics here, then select the types of reports you wish to generate. Then click the "Build Report" button
Show Basin Characteristics
Select available reports to display:
Basin Characteristics Report
Scenario Flow Reports
Open Report
POWERED BY WIM
USGS Home Contact USGS Search USGS
Accessibility FOIA Privacy Policy & Notices
Basin Characteristics
Parameter Code | Parameter Description | Value | Unit
CARBON | Percentage of area of carbonate rock | 0 | percent
DRNAREA | Area that drains to a point on a stream | 0.23 | square miles
PRECIP | Mean Annual Precipitation | 41 | inches
ROCKDEP | Depth to rock | 4 | feet
STRDEN | Stream Density -- total length of streams divided by drainage area | 2.41 | miles per square mile
Low-Flow Statistics
Low-Flow Statistics Parameters [Low Flow Region 2]
Parameter Code | Parameter Name | Value | Units | Min Limit | Max Limit
DRNAREA | Drainage Area | 0.23 | square miles | 4.93 | 1280
PRECIP | Mean Annual Precipitation | 41 | inches | 35 | 50.4
STRDEN | Stream Density | 2.41 | miles per square mile | 0.51 | 3.1
ROCKDEP | Depth to Rock | 4 | 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 | 0.00972 | ft^3/s
30 Day 2 Year Low Flow | 0.0152 | ft^3/s
7 Day 10 Year Low Flow | 0.00296 | ft^3/s
30 Day 10 Year Low Flow | 0.00471 | ft^3/s
90 Day 10 Year Low Flow | 0.0092 | ft^3/s
Processor Report About Help
Layers
Base Maps
Application Layers
National Layers
PA Map Layers
Simtop Rd
PA-394


Analysis Results WQM 7.0
Hydrodynamics
NH3-N Allocations
D.O. Allocations
D.O. Simulation
Effluent Limitations
RMI
Discharge Name
Permit Number
Disc Flow (mgd)
17.59
Castle Hill MHP
PA0086045
0.0120
Parameter
Effluent Limit 30 Day Average (mg/L)
Effluent Limit Maximum (mg/L)
Effluent Limit Minimum (mg/L)
CBOD5
25
NH3-N
2.17
4.34
Dissolved Oxygen
5
Record: 1 of 1
No Filter
Search
Print
< Back
Next >
Archive
Cancel

rptEffLimits

WQM 7.0 Effluent Limits

SWP Basin: 13D | Stream Code: 59218 | Stream Name: Trib 59218 to Rock Creek

RMI	Name	Permit Number	Disc. Flow (mgd)	Parameter	Eff. Limit 30-day Ave. (mg/L)	Eff. Limit Maximum (mg/L)	Eff. Limit Minimum (mg/L)
17.590	Castle Hill MHP	PA0086045	0.012	CBOD5	25		
				NH3-N	2.17	4.34	
				Dissolved Oxygen			5

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rpt_WLA

WQM 7.0 Wasteload Allocations

SWP Basin: 13D | Stream Code: 59218 | Stream Name: Trib 59218 to Rock 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
17.590	Castle Hill MHP	11.89	14.35	11.89	14.35	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
17.590	Castle Hill MHP	1.51	2.17	1.51	2.17	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5 Baseline (mg/L)	CBOD5 Multiple (mg/L)	NH3-N Baseline (mg/L)	NH3-N Multiple (mg/L)	Dissolved Oxygen Baseline (mg/L)	Dissolved Oxygen Multiple (mg/L)	Critical Reach	Percent Reduction
17.59	Castle Hill MHP	25	25	2.17	2.17	5	5	0	0

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rptDOSim

WQM 7.0 D.O. Simulation

SWP Basin: 13D | Stream Code: 59218 | Stream Name: Trib 59218 to Rock Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
17.590	0.012	23.779	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach W/D Ratio**	**Reach Velocity (fps)**
1.988	0.292	6.811	0.042
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
19.38	1.430	1.64	0.936
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.792	27.657	Owens	5
Reach Travel Time (days)			
0.662			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.066	17.32	1.54	6.52
0.132	15.47	1.45	6.80
0.199	13.82	1.36	6.99
0.265	12.35	1.28	7.15
0.331	11.04	1.20	7.29
0.397	9.86	1.13	7.41
0.464	8.81	1.06	7.53
0.530	7.87	1.00	7.63
0.596	7.03	0.94	7.70
0.662	6.28	0.88	7.70

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rptModelSpecs

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		

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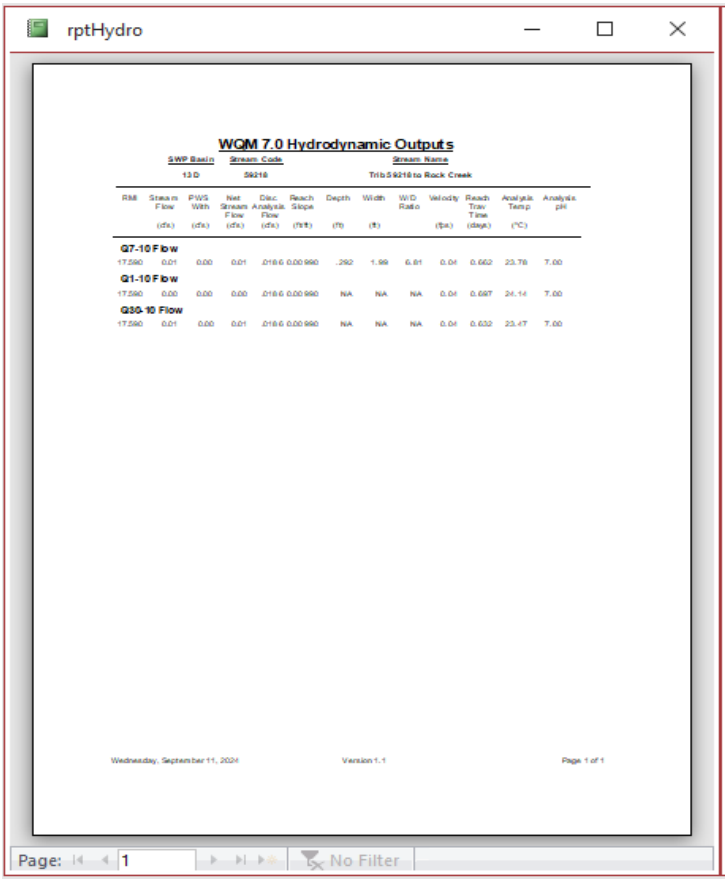
rptHydro
WQM 7.0 Hydrodynamic Outputs
SWP Basin
Stream Code
Stream Name
13D
59216
Trib 59216 to Rock Creek
RMI
Stream Flow (cfs)
PWS With (cfs)
Net Stream Flow (cfs)
Disc. Analysis Flow (cfs)
Reach Slope (ft/ft)
Depth (ft)
Width (ft)
W/D Ratio
Velocity (fps)
Reach Trav Time (days)
Analysis Temp (°C)
Analysis pH
Q7-10 Flow
17.590 0.01 0.00 0.01 .0186 0.00990 .292 1.99 6.81 0.01 0.662 23.78 7.00
Q1-10 Flow
17.590 0.00 0.00 0.00 .0186 0.00990 NA NA NA 0.01 0.687 24.14 7.00
Q30-10 Flow
17.590 0.01 0.00 0.01 .0186 0.00990 NA NA NA 0.01 0.632 23.47 7.00
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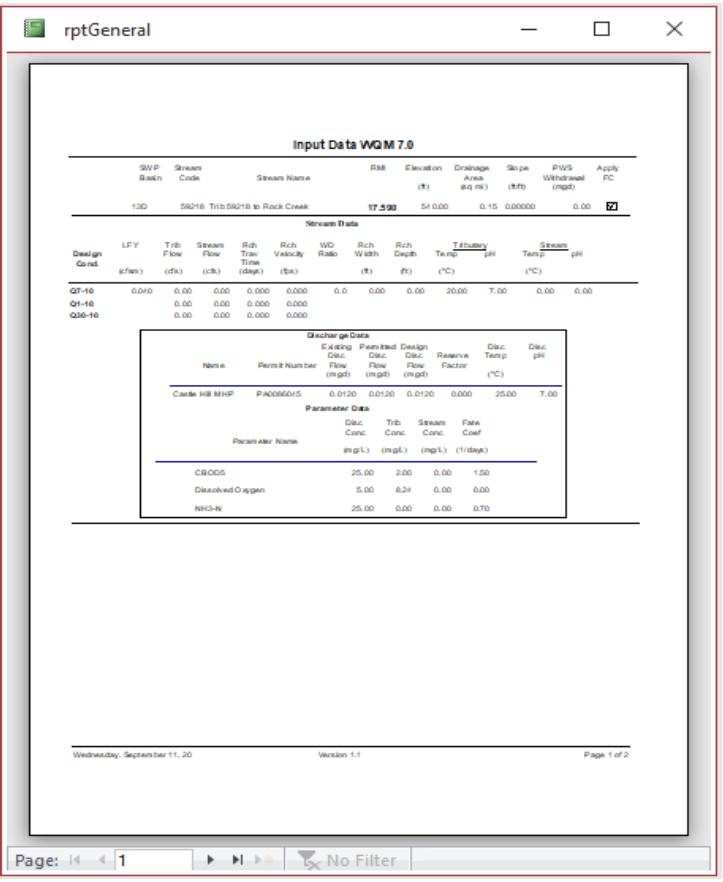
rptGeneral
Input Data WQM 7.0
SWP Basin
Stream Code
Stream Name
RMI
Elevation (ft)
Drainage Area (sq mi)
Slope (ft/ft)
PWS Withdrawal (mgd)
Apply FC
13D
59216 Trib 59216 to Rock Creek
17.590
51.00
0.15
0.00000
0.00
Stream Data
Design Cond.
LFY (cfm)
Trib Flow (cfs)
Stream Flow (cfs)
Rch Trav Time (days)
Rch Velocity (fps)
WD Ratio
Rch Width (ft)
Rch Depth (ft)
Tributary Temp (°C)
Tributary pH
Stream Temp (°C)
Stream pH
Q7-10 0.040 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
Castle Hill MHP PA0086045 0.0120 0.0120 0.0120 0.000 25.00 7.00
Parameter Data
Parameter Name
Disc. Conc (mg/L)
Trib Conc (mg/L)
Stream Conc (mg/L)
Fate Coef (1/days)
CBOD5 25.00 2.00 0.00 1.50
Dissolved Oxygen 5.00 8.24 0.00 0.00
NH3-N 25.00 0.00 0.00 0.70
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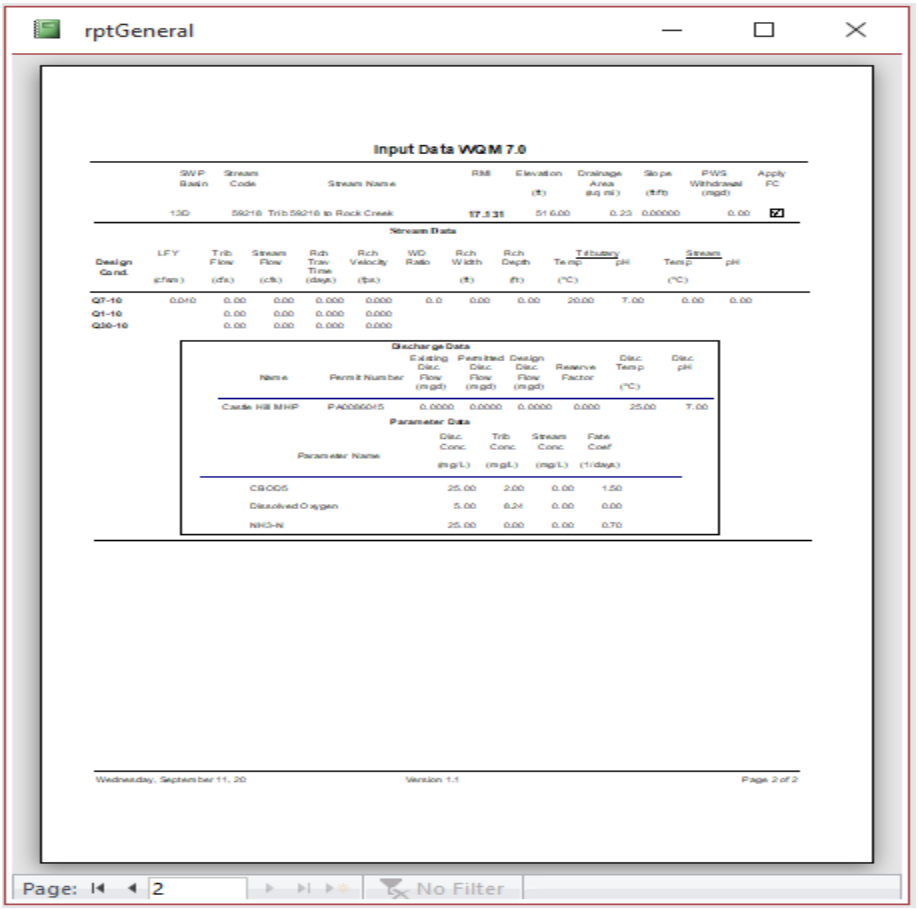
rptGeneral
Input Data WQM 7.0
SWP Basin
Stream Code
Stream Name
RMI
Elevation (ft)
Drainage Area (sq mi)
Slope (ft/ft)
PWS Withdrawal (mgd)
Apply FC
13D
59216 Trib 59216 to Rock Creek
17.331
51.00
0.23
0.00000
0.00
Stream Data
Design Cond.
LFY (cfm)
Trib Flow (cfs)
Stream Flow (cfs)
Rch Trav Time (days)
Rch Velocity (fps)
WD Ratio
Rch Width (ft)
Rch Depth (ft)
Tributary Temp (°C)
Tributary pH
Stream Temp (°C)
Stream pH
Q7-10 0.040 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
Castle Hill MHP PA0086045 0.0000 0.0000 0.0000 0.000 25.00 7.00
Parameter Data
Parameter Name
Disc. Conc (mg/L)
Trib Conc (mg/L)
Stream Conc (mg/L)
Fate Coef (1/days)
CBOD5 25.00 2.00 0.00 1.50
Dissolved Oxygen 5.00 8.24 0.00 0.00
NH3-N 25.00 0.00 0.00 0.70
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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	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.05	XXX	0.16	1/day	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50.0	2/month	24-Hr Composite
TSS	XXX	XXX	XXX	30.0	XXX	60.0	2/month	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	6.0	XXX	12.0	2/month	24-Hr Composite
Ammonia May 1 - Oct 31	XXX	XXX	XXX	2.0	XXX	4.0	2/month	24-Hr Composite

Compliance Sampling Location:

Other Comments:

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: BCW-PMT-033
☐	Other: