pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0247821**
Facility Type	**Non-Municipal**	APS ID	**1065341**
Major / Minor	**Minor**	Authorization ID	**1399560**

Applicant and Facility Information

Applicant Name	**Planks Field Planned Comm Inc.**	Facility Name	**Planks Field Planned Comm STP**
Applicant Address	PO Box 4208	Facility Address	Double Play Drive
	Gettysburg, PA 17325-4208		Gettysburg, PA 17325
Applicant Contact	William Eyler	Facility Contact	Troy Martin
Applicant Phone	(443) 398-0560	Facility Phone	(717) 420-7331
Client ID	326676	Site ID	652312
Ch 94 Load Status	Not Overloaded	Municipality	Straban Township
Connection Status	No Limitations	County	Adams
Date Application Received	June 10, 2022	EPA Waived?	Yes
Date Application Accepted	June 15, 2022	If No, Reason	

Purpose of Application: NPDES permit renewal

Summary of Review

William. F. Hill & Assoc., on behalf of the Planks Field Planned Community Wastewater Treatment Plant, has applied to the Pennsylvania Department of Environmental Protection (DEP) for renewal and issuance of the NPDES permit. The permit was reissued on December 21, 2017 and became effective on January 1, 2018. The permit will be expired on December 31, 2022.

The facility has an average annual design flow of 0.018 MGD and a hydraulic design capacity of 0.024 MGD.

The WQM Part II No. 0105408 original was issued on January 26, 2006, and transferred from ADCIM LLC to Planks Field Planned Community, Inc. on March 31, 2016.

Sludge use and disposal description and location(s): N/A due to the sludge is hauled by Smith's Septic.

Changes from the previous permit: The TRC monthly average limit of 0.16 mg/L and IMAX limit of 0.5 mg/L, which are more stringent, will appear in the proposed permit. The E. Coli. monitoring and report requirements will add to the permit.

Based on the review outline in this fact sheet, it is recommended that the permit be drafted and published in the Pennsylvania Bulletin for public comments for 30 days.

Approve	Deny	Signatures	Date
X		*Hilaryle* Hilary H. Le / Environmental Engineering Specialist	November 4, 2022
X		/s/ Daniel W. Martin, P.E. / Environmental Engineer Manager	November 16, 2022

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.018
Latitude	39º 53' 6"	Longitude	-77º 12' 9"
Quad Name	Biglerville	Quad Code	1928
Wastewater Description:	Sewage Effluent		
Receiving Waters	Rock Creek (WWF)	Stream Code	59041
NHD Com ID	134238676	RMI	16.69 miles
Drainage Area	1.5 mi.^{2}	Yield (cfs/mi^2)	0.019
Q_{7-10} Flow (cfs)	0.028	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	506	Slope (ft/ft)	
Watershed No.	13-D	Chapter 93 Class.	WWF & MF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	NUTRIENTS, NUTRIENTS		
Source(s) of Impairment	AGRICULTURE, MUNICIPAL POINT SOURCE DISCHARGES		
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 50.0 miles

Changes Since Last Permit Issuance:

Drainage Area
The discharge is to Rock Creek at RMI 16.69 mile. A drainage area upstream of the discharge is estimated to be 1.5 mi.^{2}, according to USGS StreamStats available at https://streamstats.usgs.gov/ss/.

Stream Flow
According to StreamStats, the point of first use has a Q_{7-10} of 0.028 cfs and a drainage area of 1.5 mi.^{2}, which results in a Q_{7-10} low flow yield of 0.019 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):

Q_{7-10} = 0.028 cfs
Low Flow Yield = 0.028 cfs / 1.5 mi.^{2} = 0.019 cfs/mi.^{2}
Q_{30-10} = 1.36 * 0.028 cfs = 0.038 cfs
Q_{1-10} = 0.64 * 0.028 cfs = 0.018 cfs

The resulting Q_{7-10} dilution ratio is: Q_{stream} / $Q_{discharge}$ = 0.028 cfs / [0.018 MGD * (1.547 cfs/MGD)] = 1.01:1

Rock Creek
25 Pa. Code § 93.9z classifies Rock Creek as Warm Water and Migratory Fishes (WWF & MF) surface water. Based on the 2022 Integrated Report, Rock Creek, assessment unit ID 15114, is impaired for nutrients from an agriculture source & municipal point source discharge. A TMDL currently does not exist for this stream segment, therefore, no TMDL has been taken into consideration during this review.

Public Water Supply
The nearest downstream public water supply intake is the City of Frederick, MD on Monocacy River, which is more than 50.0 miles downstream of this discharge. Given the nature and dilution, the discharge is not expected to significantly impact the water supply.

Treatment Facility Summary				
Treatment Facility Name: Keller Farm Subdivision STP				
WQM Permit No.	**Issuance Date**			
0105408	1/26/2006			
0105408 T-1	3/31/2016			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Extended Aeration	Chlorine With Dechlorination	0.018
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.024	48	Not Overloaded		

Changes Since Last Permit Issuance: none

Per the site inspection dated December 4, 2017, the plant consists of the following treatment units:

- One bar screen
- One EQ tank
- One anoxic tank
- Three aeration tanks
- One clarifier
- One chlorine contact tank
- One post aeration
- One sludge holding

The WWTP train is proposed to be configured as follows:

Influent Screening (1) ⇒ Equalization Tank (1) ⇒ Anoxic Tank (1) ⇒ Aeration Tanks (3) ⇒ Clarifier (1) ⇒ Chlorine contact (1) ⇒ Post Aeration Unit (1) ⇒ Discharge

The chemicals used Alum for phosphorus removal, Sodium Sulfite 92% for dechlorination, and Chlorine solution 12% for disinfection.

Compliance History	
Summary of DMRs:	The DMRs reported from October 1, 2021 to September 30, 2022 are summarized in the Table below (Pages # 4, & 5).
Summary of Inspections:	7/18/2022: Mr. Hoy, DEP's WQET, conducted a compliance evaluation inspection. There were no violations noted during the inspection. Recommendations were keeping the composite sampler fridge temperature at 6 ^{o}C or cooler; and submit the sludge production & disposal for each month with check box when no sludge is hauled. The filed test results were within the permit limited. The outfall 001 was clear. 12/4/2017: Mr. Bowen, DEP WQS, conducted a compliance evaluation inspection. The field test results were within permitted limits. There were no violations identified during inspection. Effluent appeared clear. 10/17/2016: Mr. Haines, DEP WQS, conducted a compliance evaluation inspection. The field test results were within permitted limits. Effluent appeared clear. There were no violations identified during inspection.
Other Comments:	There are no open violations against the facility or the permittee.

Compliance History

DMR Data for Outfall 001 (from October 1, 2021 to September 30, 2022)

Parameter	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21
Flow (MGD) Average Monthly	0.00464	0.00483	0.00449	0.00497	0.00661	0.00572	0.00568	0.00511	0.00553	0.00462	0.00440	0.00418
	4	2	7	6	6	3	6	5	46	9	4	85
Flow (MGD) Daily Maximum	0.00798	0.00865	0.00702	0.01011		0.00999	0.01721	0.00908		0.00743	0.00692	0.00775
	1	9	4	9	0.02625	7	7	9	0.01342	6	7	1
pH (S.U.) Daily Minimum	7.4	7.4	7.2	7.1	7.1	7.4	7.5	7.2	7.2	7.6	7.6	7.3
pH (S.U.) Instantaneous Maximum	7.8	7.8	7.4	7.7	7.5	7.8	7.8	7.7	7.9	7.8	7.8	7.8
DO (mg/L) Daily Minimum	7.7	7.9	7.6	7.8	7.9	8.5	8.4	9.8	9.1	9.0	7.4	7.7
TRC (mg/L) Average Monthly	0.02	0.03	0.03	0.03	0.03	0.03	0.04	0.05	0.07	0.04	0.10	0.10
TRC (mg/L) Instantaneous Maximum	0.04	0.09	0.09	0.07	0.15	0.09	0.10	0.07	0.20	0.09	0.14	0.24
CBOD5 (mg/L) Average Monthly	< 2.0	< 2.0	< 2.0	< 3.0	3.0	< 2.0	3.0	3.0	< 3.0	< 2.4	< 2.9	< 2.4
TSS (mg/L) Average Monthly	3.0	5.0	3.0	2.0	7.0	5.0	2.0	2.0	8.0	1.0	1.0	1.5
Fecal Coliform (No./100 ml) Geometric Mean	< 1.0	< 1.0	< 13	< 2.0	< 2.0	6.0	< 2.0	< 1.0	< 1.0	1.0	18	< 2.0
Fecal Coliform (No./100 ml) Instantaneous Maximum	2.0	2.0	157	5.0	3.0	38	4.0	2.0	< 1.0	< 1.0	105	3.0
Nitrate-Nitrite (mg/L) Average Quarterly	< 38.02			< 58.8			< 43.07			< 5.9		
Nitrate-Nitrite (lbs) Total Quarterly	< 255			< 598			< 196			< 28		
Total Nitrogen (mg/L) Average Quarterly	< 39.56			< 60.39			< 44.68			< 18.7		
Total Nitrogen (lbs) Total Quarterly	< 265			< 613			< 203			< 88		
Ammonia (mg/L) Average Monthly	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	3.10	1.2	< 0.10	< 0.10
Ammonia (mg/L) Average Quarterly	< 1.0			< 0.10			< 1.1			< 0.46		

Ammonia (lbs) Total Quarterly	< 1.0			< 2.0			< 24			< 6		
TKN (mg/L) Average Quarterly	< 1.53			< 1.51			< 1.61			12.76		
TKN (lbs) Total Quarterly	< 10			< 15.0			< 7.0			60		
Total Phosphorus (mg/L) Average Monthly	1.2	0.60	1.7	1.6	0.60	1.2	0.50	0.50	0.40	0.40	0.60	0.80
Total Phosphorus (mg/L) Average Quarterly	1.18			1.10			0.49			0.57		
Total Phosphorus (lbs) Total Quarterly	15			22.0			8.0			9		

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.018
Latitude 39º 53' 6.00" **Longitude** -77º 12' 9.00"
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

Ammonia (NH_3-N), Carbonaceous Biochemical Oxygen Demand (CBOD5), & Dissolved Oxygen (D.O.):
WQM 7.0 version 1.1 is a water quality model designed to assist DEP to determine appropriate effluent limits for $CBOD_5$, NH_3-N and D.O. The model simulates two basic processes. In the NH_3-N module, the model simulates the mixing and degradation of NH_3-N in the stream and compares calculated instream NH_3-N concentrations to NH_3-N water quality criteria. In the D.O. module, the model simulates the mixing and consumption of D.O. in the stream due to the degradation of $CBOD_5$ and NH_3-N and compares calculated instream D.O. concentrations to D.O. water quality criteria. The model was utilized for this permit renewal by using Q_{7-10} and current background water quality levels of the stream.

Ammonia (NH_3-N):
NH_3-N calculations were 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 per 391-2000-007)
*	Discharge Temperature	25°C	(Default per 391-2000-007)
*	Stream pH	7.0	(Default per 391-2000-006)
*	Stream Temperature	20°C	(Default for WWF per 391-2000-003)
*	Background NH_3-N	0 mg/L	(Assumed since no nearby upstream WWTPs)

Regarding NH_3-N limits, the attached computer printout of the WQM 7.0 stream model (version 1.1) indicates that a limit of 3.94 mg/L NH_3-N as a monthly average (AML) and 7.88 mg/L NH_3-N instantaneous maximum (IMAX) are necessary to protect the aquatic life from toxicity effects. However, the existing permit limits of 3.5 mg/l average monthly & 7.0 mg/L IMAX for summer and 11.0 mg/l average monthly & 22.0 mg/L IMAX for winter are more stringent and will remain in the proposed permit. Monitoring frequency will also remain the same of 2/month. DMR data and site inspections reflect that the plant is capable of meeting this limit.

$CBOD_5$:
The WQM 7.0 model (ver. 1.1) suggests a monthly average $CBOD_5$ limit of 25.0 mg/l which is the same as existing permit. Instantaneous Maximum limit will be 50.0 mg/l. The minimum monitoring frequency will remain the same as 2/month.

Dissolved Oxygen (D.O.):
The D.O. goal is 6.0 mg/L. However, a minimum D.O. of 5.0 mg/L is required per 25 Pa. Code § 93.7. It is recommended that this limit be maintained in the proposed permit to ensure the protection of water quality standards. This approach is consistent with DEP's current Standard Operating Procedure (SOP) No. BPNPSM-PMT-033 and has been applied to other point source dischargers throughout the state.

pH:
The effluent discharge pH should remain above 6.0 and below 9.0 standard units according to 25 Pa. Code § 95.2(1).

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

E. Coli:
As recommended by DEP's SOP No. BCW-PMT-033, version 1.9 revised March 22, 2021, a routine monitoring for E. Coli will be included in the 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 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), and 0.028 cfs of $Q_{7\text{-}10}$ at discharge indicated monthly average limit of 0.16 mg/L and an instantaneous maximum limit of 0.5 mg/L are more stringent and will replace in the proposed permit. Based on the DMRs from the past year, the facility has been consistently achieving these limits.

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 proposed permit. Recent DMRs and inspection reports show that the facility has been consistently achieving concentrations below these limits.

Total Phosphorus:
The existing permit limits of 2.0 mg/l as a monthly average and 4.0 mg/l as an instantaneous maximum are being continued in this renewal, consistent with DEP's Technical Guidance for Phosphorus (391-2000-018) and 25 Pa. Code § 96.5.

Total Nitrogen:
Monitoring requirements for Total Nitrogen are being added to all NPDES permits in the State if the permit does not already include them, as authorized by 25 Pa. Code § 92a.61. Controlling nutrients in waterways requires data collection. The existing minimum monitoring and report calculation of monthly for Total Nitrogen permit will be remain in the proposed permit.

Toxics:
DEP utilizes a Toxics Management Spreadsheet (TMS) (last modified on March 2021, ver. 1.3) to facilitate calculations necessary for completing a reasonable potential analysis and determining WQBELs for toxic pollutants. The effluent testing information renewal application (page 7) indicates that there are no toxic pollutants of concern.

Stormwater:
There is no known stormwater outfall associated with this facility.

Chesapeake Bay Strategy:
According to DEP's Chesapeake Bay Phase II Watershed Implementation Plan (WIP) Wastewater Supplement, this facility is considered a phase 5 non-significant sewage discharger with design flow less than 0.2 MGD but greater than 0.002 MGD. In general, DEP will issue permits for all phase 5 facilities with monitoring and reporting for Total Nitrogen (TN) and Total Phosphorus (TP) throughout the permit term at a frequency no less than annually. Furthermore, DEP's SOP No. BPNPSM-PMT-033 states that in general, at a minimum, monitoring for TN and TP should be included in new and reissued permits for sewage discharges with design flows > 2,000 gpd. At this time, the Department is not requiring a total maximum annual nitrogen or phosphorus loading cap. Ammonia-Nitrogen, Nitrate-Nitrite as N, Total Kjeldahl Nitrogen, TN, and TP monitoring is already included in the existing permit and will remain in the proposed renewal.

The quarterly "Monitor & Report" requirements for Ammonia-Nitrogen, Nitrate-Nitrite as N, and Total Kjeldahl Nitrogen; and quarterly calculation "Monitor & Report" for TN will remain in the proposed permit. The yearly calculation "report" for TP & TN will remain in the proposed 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.

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

303(d) Listed Streams:
The stream is listed as attaining its designated use(s).

Additional Considerations

Flow Monitoring
Flow monitoring is recommended by the permit guidance and is also required by 25 Pa. Code §§ 92a.27 and 92a.61.

Influent Monitoring
As a result of negotiation with EPA, influent monitoring of TSS and BOD_5 are required for any POTWs; therefore, influent sampling of BOD_5 and TSS will be included in the draft permit. A 24-hr composite sample type will be required to be consistent with the proposed sampling frequency for TSS and $CBOD_5$ in the effluent.

WQM 7.0:
The following data were used in the attached computer model (WQM 7.0) of the stream:

• Discharge pH	7.0	(Default per 391-2000-007)
• Discharge Temperature	25°C	(Default per 391-2000-013)
• Stream pH	7.0	(Default per 392-2000-013)
• Stream Temperature	20°C	(Default per 392-2000-013)

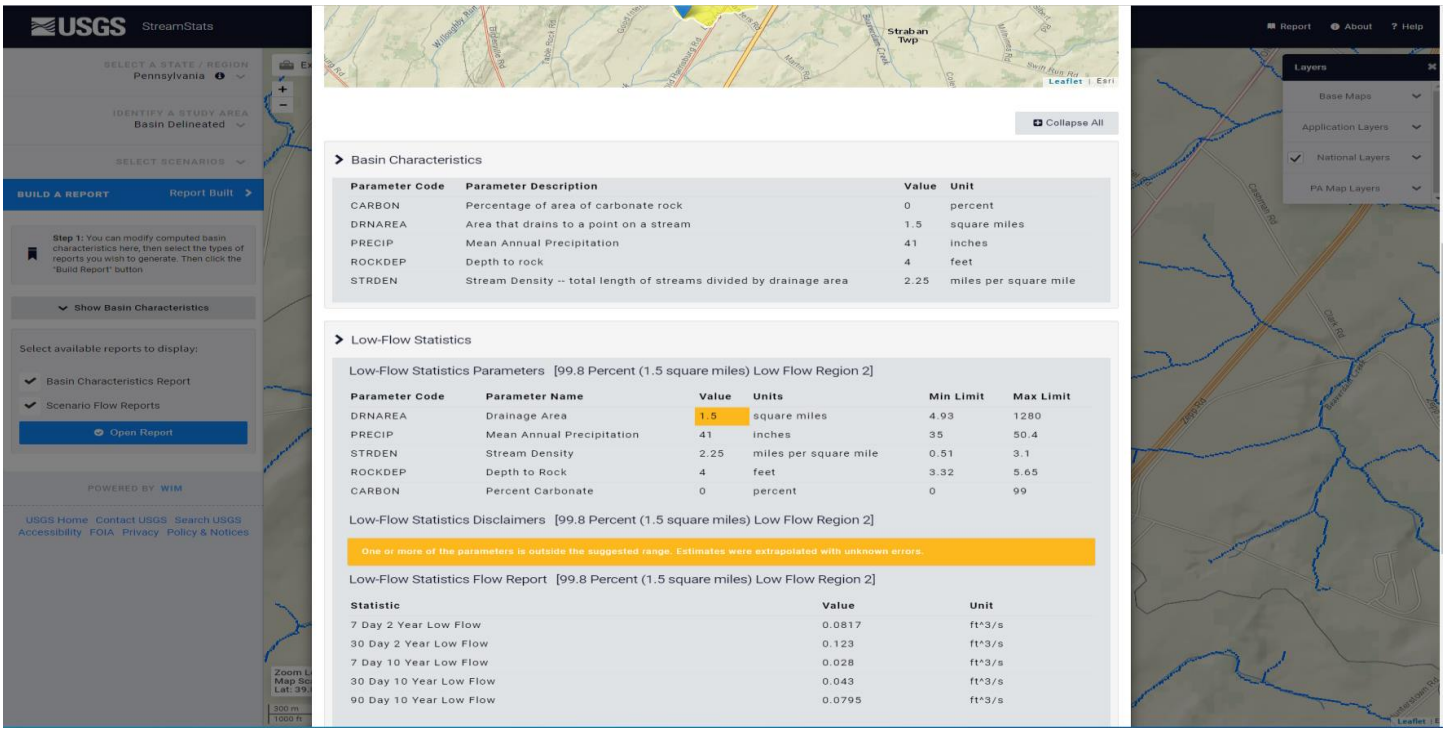
The following two nodes were used in modeling:

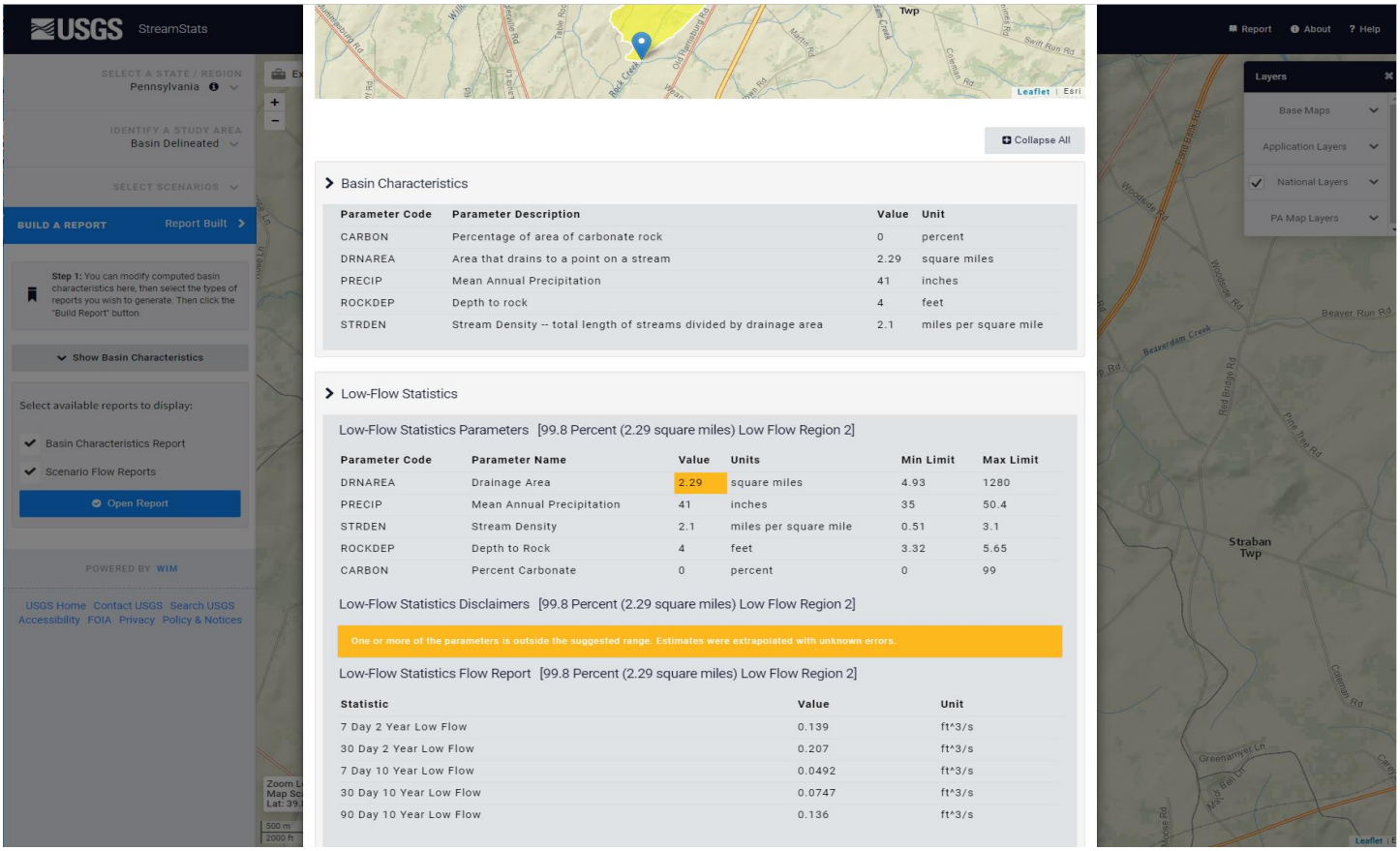
Node 1: Outfall 001 on Rock Creek (59041)

Elevation:	506 ft (USGS National Map Viewer)
Drainage Area:	1.5 mi^2 (USGS PA StreamStats)
River Mile Index:	16.69 (PA DEP eMapPA)
Low Flow Yield:	0.019 cfs/mi^2
Discharge Flow:	0.018 MGD

Node 2: At confluence with Unnamed Tributary 59195

Elevation:	487 ft (USGS National Map Viewer)
Drainage Area:	2.29 mi^2 (USGS PA StreamStats)
River Mile Index:	15.36 (PA DEP eMapPA)
Low Flow Yield:	0.019 cfs/mi^2
Discharge Flow:	0.0 MGD


USGS StreamStats
Straban Twp
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 | 1.5 | 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 | 2.25 | miles per square mile
Low-Flow Statistics
Low-Flow Statistics Parameters [99.8 Percent (1.5 square miles) Low Flow Region 2]
Parameter Code | Parameter Name | Value | Units | Min Limit | Max Limit
DRNAREA | Drainage Area | 1.5 | square miles | 4.93 | 1280
PRECIP | Mean Annual Precipitation | 41 | inches | 35 | 50.4
STRDEN | Stream Density | 2.25 | 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 [99.8 Percent (1.5 square miles) 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 [99.8 Percent (1.5 square miles) Low Flow Region 2]
Statistic | Value | Unit
7 Day 2 Year Low Flow | 0.0817 | ft^3/s
30 Day 2 Year Low Flow | 0.123 | ft^3/s
7 Day 10 Year Low Flow | 0.028 | ft^3/s
30 Day 10 Year Low Flow | 0.043 | ft^3/s
90 Day 10 Year Low Flow | 0.0795 | ft^3/s


USGS StreamStats
Straban Twp
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 | 2.29 | 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 | 2.1 | miles per square mile
Low-Flow Statistics
Low-Flow Statistics Parameters [99.8 Percent (2.29 square miles) Low Flow Region 2]
Parameter Code | Parameter Name | Value | Units | Min Limit | Max Limit
DRNAREA | Drainage Area | 2.29 | square miles | 4.93 | 1280
PRECIP | Mean Annual Precipitation | 41 | inches | 35 | 50.4
STRDEN | Stream Density | 2.1 | 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 [99.8 Percent (2.29 square miles) 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 [99.8 Percent (2.29 square miles) Low Flow Region 2]
Statistic | Value | Unit
7 Day 2 Year Low Flow | 0.139 | ft^3/s
30 Day 2 Year Low Flow | 0.207 | ft^3/s
7 Day 10 Year Low Flow | 0.0492 | ft^3/s
30 Day 10 Year Low Flow | 0.0747 | ft^3/s
90 Day 10 Year Low Flow | 0.136 | ft^3/s

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)
16.69	Planks Field	PA0247821	0.0180

Parameter	Effluent Limit 30 Day Average (mg/L)	Effluent Limit Maximum (mg/L)	Effluent Limit Minimum (mg/L)
CBOD5	25		
NH3-N	3.94	7.88	
Dissolved Oxygen			5

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rptEffLimits

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
13D	69041	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)
16.690	Planks Field	PA0247821	0.018	CBOD5	25		
				NH3-N	3.94	7.88	
				Dissolved Oxygen			5

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rpt_WLA

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
13D	69041	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
16.690	Planks Field	13.05	21.59	13.05	21.59	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
16.690	Planks Field	1.65	3.94	1.65	3.94	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
16.69	Planks Field	25	25	3.94	3.94	5	5	0	0

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rptDOSim

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
13D	59041	ROCK CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
16.690	0.018	22.471	7.000
Reach Width (ft)	Reach Depth (ft)	Reach W/D Ratio	Reach Velocity (fps)
4.713	0.328	14.383	0.036
Reach CBOD5 (mg/L)	Reach Kr (1/days)	Reach NH3-N (mg/L)	Reach Kn (1/days)
13.37	0.761	1.95	0.847
Reach DO (mg/L)	Reach Kr (1/days)	Kr Equation	Reach DO Goal (mg/L)
6.640	19.715	Owens	6
Reach Travel Time (days)			
2.228			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.223	11.05	1.61	7.66
0.445	9.14	1.34	7.86
0.668	7.56	1.11	7.88
0.891	6.25	0.92	7.88
1.114	5.17	0.76	7.88
1.337	4.28	0.63	7.88
1.560	3.54	0.52	7.88
1.783	2.92	0.43	7.88
2.005	2.42	0.36	7.88
2.228	2.00	0.30	7.88

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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	6		

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rptHydro

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
13D	59041	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												
16.690	0.03	0.00	0.03	.0278	0.00271	.328	4.71	14.38	0.04	2.228	22.47	7.00
Q1-10 Flow												
16.690	0.02	0.00	0.02	.0278	0.00271	NA	NA	NA	0.03	2.494	23.02	7.00
Q30-10 Flow												
16.690	0.04	0.00	0.04	.0278	0.00271	NA	NA	NA	0.04	2.029	22.09	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	59041	ROCK CREEK	16.690	506.00	1.50	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	W/D Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.019	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
Planks Field	PA0247821	0.0180	0.0180	0.0180	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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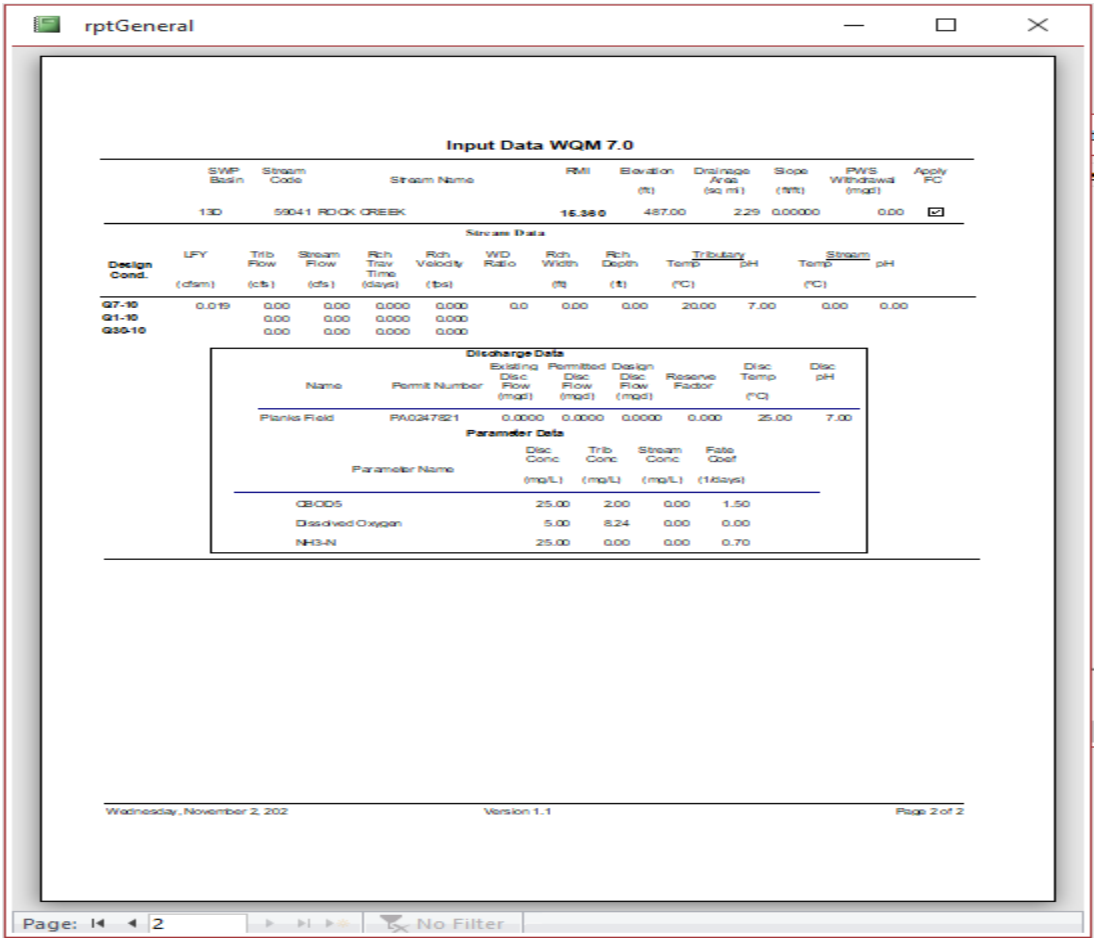
rptGeneral
Input Data WQM 7.0
SWP Basin
Stream Code
Stream Name
RMI
Elevation (ft)
Drainage Area (sq mi)
Slope (ft/ft)
PWS Withdrawal (mgd)
Apply FC
13D
59041 ROCK CREEK
15.360
487.00
2.29
0.00000
0.00
Stream Data
Design Cond.
LFY (cfsm)
Trib Flow (cfs)
Stream Flow (cfs)
Rch Trav Time (days)
Rch Velocity (fps)
WD Ratio
Rch Width (ft)
Rch Depth (ft)
Tributary Temp (°C)
Tributary pH
Stream Temp (°C)
Stream pH
Q7-10 0.019 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
Planks Field PA0247821 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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No Filter

TRC EVALUATION

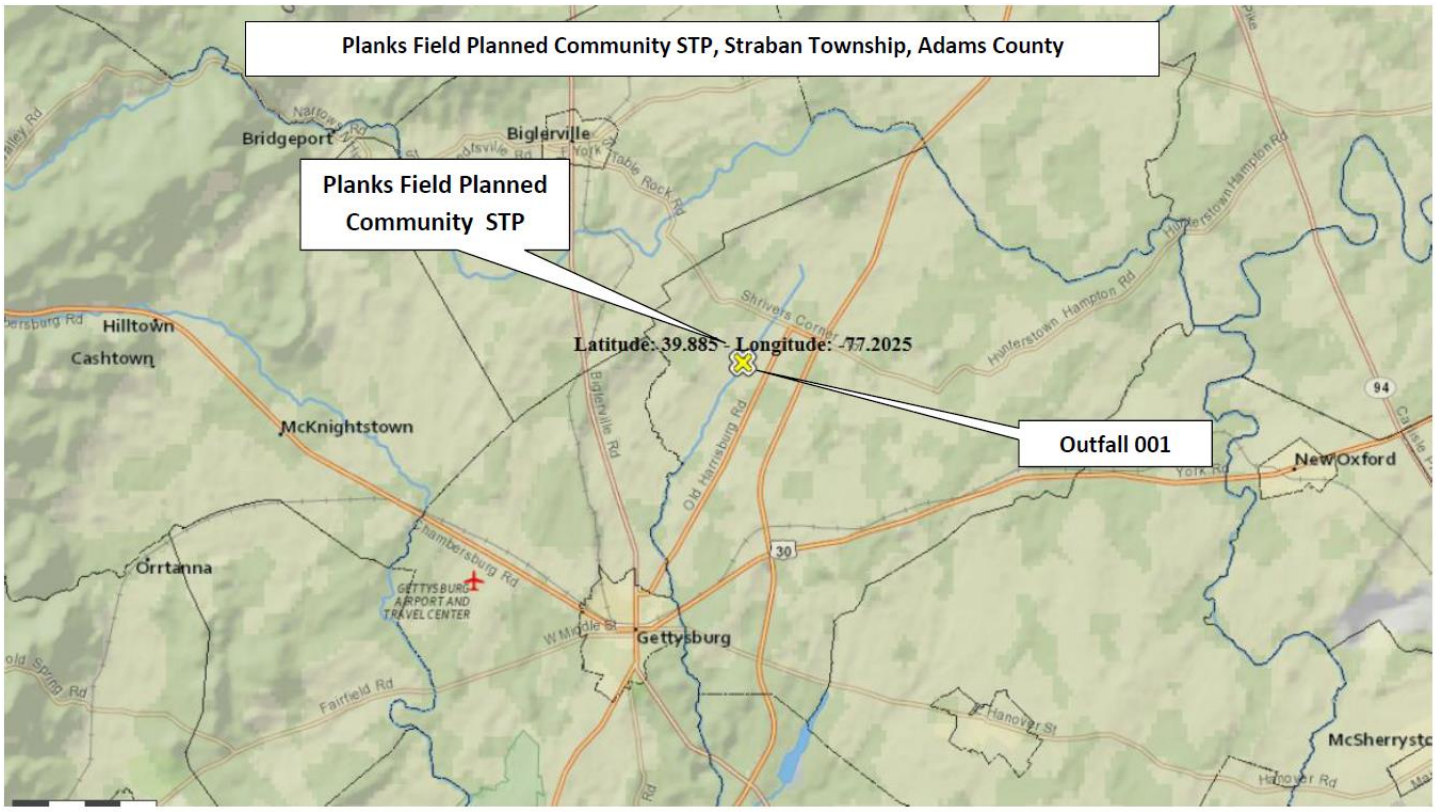
Input appropriate values in A3:A9 and D3:D9

0.028	= Q stream (cfs)	0.5	= CV Daily
0.018	= 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 = 0.340	1.3.2.iii	WLA cfc = 0.324
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.127	5.1d	LTA_cfc = 0.188

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.156	AFC
		INST MAX LIMIT (mg/l) = 0.510	

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)**



Existing Effluent Limitations and Monitoring Requirements

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
D.O.	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.2	XXX	0.6	1/day	Grab
$CBOD_5$	XXX	XXX	XXX	25.0	XXX	50	2/month	24-Hr Composite
TSS	XXX	XXX	XXX	30.0	XXX	60	2/month	24-Hr Composite
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/month	Grab
Ammonia May 1 - Oct 31	XXX	XXX	XXX	3.5	XXX	7	2/month	24-Hr Composite
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	11.0	XXX	22	2/month	24-Hr Composite
Total Phosphorus	XXX	XXX	XXX	2.0	XXX	4	2/month	24-Hr Composite

Existing Effluent Limitations and Monitoring Requirements

Chesapeake Bay

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 Total Qrtly	Report	XXX	Report Avg. Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Kjeldahl--N	Report Total Qrtly	XXX	XXX	Report Avg. Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Nitrate-Nitrite as N	Report Total Qrtly	XXX	XXX	Report Avg. Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Total Nitrogen	Report Total Qrtly	Report	XXX	Report Avg. Qrtly	XXX	XXX	1/quarter	Calculation
Total Phosphorus	Report Total Qrtly	Report	XXX	Report Avg. Qrtly	XXX	XXX	1/quarter	24-Hr Composite

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	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
D.O.	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.16	XXX	0.5	1/day	Grab
$CBOD_5$	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) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
Ammonia May 1 - Oct 31	XXX	XXX	XXX	3.5	XXX	7.0	2/month	24-Hr Composite
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	11.0	XXX	22.0	2/month	24-Hr Composite
Total Phosphorus	XXX	XXX	XXX	2.0	XXX	4.0	2/month	24-Hr Composite

Compliance Sampling Location:

Other Comments:

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
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Ammonia--N	Report Total Qrtly	Report	XXX	Report Avg. Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Kjeldahl--N	Report Total Qrtly	XXX	XXX	Report Avg. Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Nitrate-Nitrite as N	Report Total Qrtly	XXX	XXX	Report Avg. Qrtly	XXX	XXX	1/quarter	24-Hr Composite
Total Nitrogen	Report Total Qrtly	Report	XXX	Report Avg. Qrtly	XXX	XXX	1/quarter	Calculation
Total Phosphorus	Report Total Qrtly	Report	XXX	Report Avg. Qrtly	XXX	XXX	1/quarter	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, 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: