pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0252735**
Facility Type	**Non-Municipal**	APS ID	**688795**
Major / Minor	**Minor**	Authorization ID	**1389940**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Huston Farms LLC**	Facility Name	**Huston's Hickory Hollow Campground**
Applicant Address	626 Cross Road	Facility Address	New Centerville Road
	Rockwood, PA 15557-7415		Rockwood, PA 15557
Applicant Contact	Douglas Huston	Facility Contact	Douglas Huston
Applicant Phone	(724) 600-6127	Facility Phone	(724) 600-6127
Client ID	232785	Site ID	633723
Ch 94 Load Status	**Not overloaded**	Municipality	Milford Township
Connection Status	**No limitation**	County	Somerset
Date Application Received	March 17, 2022	EPA Waived?	Yes
Date Application Accepted	June 24, 2022	If No, Reason	

Purpose of Application: NPDES permit renewal.

Summary of Review

The PA Department of Environmental Protection (PADEP/Department) received an NPDES permit renewal application from Huston Farms LLC (permittee) on March 17, 2022 for permittee's Huston's Hickory Hollow Campground (facility). The facility is in Milford Township, Somerset County. The facility is a minor non-municipal facility with design flow of 0.014 MGD and discharges into an UNT to South Glade Creek (WWF) in state watershed 19-F. The current permit will expire on September 30, 2022. The terms and conditions of the current permit is automatically extended since the renewal application was received at least 180 days prior to the expiration date. Renewal NPDES permit applications under Clean Water Program are not covered by PADEP's PDG per 021-2100-001.

This fact sheet is developed in accordance with 40 CFR §124.56.

Changes in this renewal: TRC limits more stringent, E. Coli monitoring added

Sludge use and disposal description and location(s): Hauled off to other WWTP.

Public Participation

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

Approve	Deny	Signatures	Da/te
√		Reza H. Chowdhury, E.I.T. / Project Manager	August /4, 2022
X		Pravin Patel Pravin C. Patel, P.E. / Environmental Engineer Manager	08/08/2022

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.014
Latitude	39º 57' 28"	Longitude	-79º 10' 49"
Quad Name	Rockwood	Quad Code	1912
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary to South Glade Creek (WWF)	Stream Code	38929
NHD Com ID	69918049	RMI	0.36
Drainage Area	0.43 mi^2	Yield (cfs/mi^2)	0.05
Q_{7-10} Flow (cfs)	0.02	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	2047.19	Slope (ft/ft)	
Watershed No.	19-F	Chapter 93 Class.	WWF
Existing Use	**WWF**	Existing Use Qualifier	Ch. 93
Exceptions to Use	None	Exceptions to Criteria	N/A
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status	**None**	Name	

Background/Ambient Data		Data Source
pH (SU)	7.0	Default per 391-2000-007
Temperature (°C)	25	Default per 391-2000-007
Hardness (mg/L)	100	Default
Other:		

Nearest Downstream Public Water Supply Intake	Indian Creek Valley Water Authority at Saltlick Township, Fayette County		
PWS Waters	Ohiopile Yough River	Flow at Intake (cfs)	
PWS RMI	62.8	Distance from Outfall (mi)	34.94

Changes Since Last Permit Issuance: None

Other Comments:

Streamflow:

USGS's web based watershed delineation tool StreamStats (accessible at https://streamstats.usgs.gov/ss/, accessed on June 24, 2022) was utilized to determine the drainage area and low flow statistics of the receiving stream at discharge point. The drainage area was found to be 0.004 mi^2. Data from the nearby StreamGage 03079000 was also considered. This gage is located in Casselman River at Markelton, PA. Q_{7-10}, Q_{1-10}, and Q_{30-10} values at this gage are 18.4 cfs, 16.4 cfs, and 24.8 cfs respectively for the reporting years of 1922-2008. The drainage area at this gage was found to be 382 mi^2. These values were obtained from the latest USGS streamflow report (1).

Q_{7-10} runoff rate = 18.4 cfs/382 mi^2 = 0.05 cfs/mi^2
Q_{7-10} = 0.05 cfs/mi^2 * 0.43 mi^2 = 0.02 cfs
Q_{1-10}/Q_{7-10} = 16.4 cfs/18.4 cfs = 0.89
Q_{30-10}/Q_{7-10} = 24.8 cfs/18.4 cfs = 1.35

(1) Stuckey, M.H., Roland, M.A., 2011, Selected streamflow statistics for streamgage locations in and near Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2011-1070, PP 18, PP 31.

PWS Intake:
The nearest downstream public water supply is Indian Creek Valley Water Authority on Youghiogheny River at RMI 62.8 near Saltlick Township, Fayette County, which is approximately 34.94 miles downstream of the Outfall 001. Because of the distance, dilution with much larger stream, and effluent limits, the discharge is expected not to affect the intake. The distance is calculated as follows:

+ Outfall 001 RMI at UNT 38929 to South Glade Creek ---------- 0.36 mi
+ RMI on South Glade Creek at confluence with UNT 38929 ---------- 3.85 mi
+ RMI on Casselman River at confluence with South Glade Creek ---------- 20.87 mi
+ RMI on Youghiogheny River at confluence with Casselman River ---------- 72.66 mi
- PWS RMI at Monongahela River ---------- 62.8 mi

Total 34.94 miles

Wastewater Characteristics:
A median pH of 7.5 from eDMR during dry months July through September for the years 2018-2021, default discharge temperature of 20^0C and a default discharge hardness of 100 mg/l will be used for modeling, if needed.

Background data:
There is no nearby WQN station from the discharge point. A default pH of 7.0, default stream temperature of 25°C, and default hardness of 100 mg/l will be used, if needed.

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

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. The receiving streams are designated as Warm-Water Fishes (WWF). No High-Quality stream is impacted by this discharge. No Exceptional-Value stream is impacted by this discharge.

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

Biosolids Management: Biosolids are hauled-off to Johnstown WWTP.

Treatment Facility Summary

Treatment Facility Name: Huston's Hickory Hollow Campground STP

WQM Permit No.	Issuance Date
5604407	2/8/2005

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Activated Sludge	Chlorine with dechlor	0.014

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
			Holding tank	Other WWTP

Changes Since Last Permit Issuance: None

Other Comments:

Treatment Plant Description

Huston Farms LLC owns and operates a WWTP named Huston's Hickory Hollow Campground, located in Milford Township, Somerset County. The WWTP treats up to 14,000 GPD and treated effluent discharges into an UNT to South Glade Creek (WWF). The actual discharge for the years 2021, 2020, and 2019 is 0.0033 MGD, 0.0027 MGD, and 0.0048 MGD, respectively. This WWTP is an extended aeration activated sludge process that includes 1 EQ tank, 3 aeration tanks, 1 clarifier, 1 sludge holding tank, 1 baffled chlorine, and dechlorination tank. A Point of First Use survey was conducted on February 19, 2004 and the discharge point was determined to be POFU and receiving stream at discharge point was perennial. The permit application indicated there is no commercial or industrial contributor to this WWTP.

Existing limits

For 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)	0.014	XXX	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	9.0	XXX	Daily when Discharging	Grab
Dissolved Oxygen	XXX	XXX	4.0	XXX	XXX	XXX	Daily when Discharging	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.2	XXX	0.6	Daily when Discharging	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	XXX	XXX	XXX	25.0	XXX	50.0	2/month	Grab
Total Suspended Solids	XXX	XXX	XXX	30.0	XXX	60.0	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Ammonia-Nitrogen Nov 1 - Apr 30	XXX	XXX	XXX	7.5	XXX	15.0	2/month	Grab
Ammonia-Nitrogen May 1 - Oct 31	XXX	XXX	XXX	2.5	XXX	5.0	2/month	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab

Compliance History

DMR Data for Outfall 001 (from May 1, 2021 to April 30, 2022)

Parameter	APR-22	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21
Flow (MGD) Average Monthly	0.00022						0.0035	0.00333	0.00335	0.0048	0.00295	0.00328
pH (S.U.) Minimum	7.3						7.4	7.1	6.8	7.6	7.6	7.0
pH (S.U.) Maximum	7.9						7.8	7.8	7.0	7.9	8.0	7.9
DO (mg/L) Minimum	7.2						5.3	5.1	4.2	4.9	5.3	4.2
TRC (mg/L) Average Monthly	0.20						0.14	0.16	0.16	0.18	0.2	0.20
TRC (mg/L) IMAX	0.30						0.40	0.50	0.5	0.40	0.3	0.50
CBOD5 (mg/L) Average Monthly	14.2						< 3.0	6.0	7.32	5.1	9.6	4.1
CBOD5 (mg/L) IMAX	23.2						< 3.0	9.0	8.89	7.1	13.2	5.2
TSS (mg/L) Average Monthly	7.6						11.6	24.6	30.0	15.0	13.4	12.0
TSS (mg/L) IMAX	12.0						16.4	28.0	58.0	16.0	13.6	20.4
Fecal Coliform (No./100 ml) Geometric Mean	14.6						9.0	14.14	8152.4	18314	98.38	1430
Fecal Coliform (No./100 ml) IMAX	214.2						10.0	< 20.0	9678.4	35658	9678.4	9678
Total Nitrogen (mg/L) Daily Maximum					2.6							
Ammonia (mg/L) Average Monthly	0.93						6.15	13.56	2.45	40.66	28.08	3.9
Ammonia (mg/L) IMAX	1.49						7.0	26.62	4.28	46.9	29.82	5.7
Total Phosphorus (mg/L) Daily Maximum					0.296							

Compliance History

Effluent Violations for Outfall 001, from: June 1, 2021 To: April 30, 2022

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Fecal Coliform	07/31/21	Geo Mean	18314	No./100 ml	200	No./100 ml
Fecal Coliform	08/31/21	Geo Mean	8152.4	No./100 ml	200	No./100 ml

Fecal Coliform	07/31/21	IMAX	35658	No./100 ml	1000	No./100 ml
Fecal Coliform	08/31/21	IMAX	9678.4	No./100 ml	1000	No./100 ml
Fecal Coliform	06/30/21	IMAX	9678.4	No./100 ml	1000	No./100 ml
Ammonia	07/31/21	Avg Mo	40.66	mg/L	2.5	mg/L
Ammonia	10/31/21	Avg Mo	6.15	mg/L	2.5	mg/L
Ammonia	06/30/21	Avg Mo	28.08	mg/L	2.5	mg/L
Ammonia	09/30/21	Avg Mo	13.56	mg/L	2.5	mg/L
Ammonia	10/31/21	IMAX	7.0	mg/L	5.0	mg/L
Ammonia	06/30/21	IMAX	29.82	mg/L	5.0	mg/L
Ammonia	09/30/21	IMAX	26.62	mg/L	5.0	mg/L
Ammonia	07/31/21	IMAX	46.9	mg/L	5.0	mg/L

Summary of Inspections: several chronic fecal coliform and ammonia nitrogen violations noted in last 12 months. The permittee indicated that high strength influent and low dose of chemicals were responsible for non-compliances. NOVs were issued for past violations. The permittee was advised to install continuous chemical feed instead of slug feed to achieve compliance.

Other Comments: Outstanding violations must be resolved before issuance of final NPDES permit.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .014
Latitude 39º 57' 28.00" **Longitude** -79º 10' 49.00"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

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

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

Water Quality-Based Limitations

WQM 7.0:

WQM 7.0 is a water quality model designed to assist DEP to determine appropriate permit requirements for $CBOD_5$, NH_3-N and DO. DEP's guidance no. 391-2000-007 provides the technical methods contained in WQM 7.0 for conducting wasteload allocation and for determining recommended NPDES effluent limits for point source discharges. DEP recently updated this model (ver. 1.1) to include new ammonia criteria that has been approved by US EPA as part of the 2017 Triennial Review. The model was utilized for this permit renewal by using updated Q_{7-10} and historic background water quality levels of the river. The following data were used in the attached computer model of the stream:

- Discharge pH 7.5 (median Jul-Sep, 2018-2021, eDMR data)
- Discharge Temperature 20°C (Default per 391-2000-007)
- Discharge Hardness 100 mg/l (Default data)
- Stream pH 7.0 (Default per 391-2000-013)
- Stream Temperature 25°C (Default per 391-2000-013, WWF)
- Stream Hardness 100 mg/l (Application data)

The following nodes were considered in modeling:

Node 1: At Outfall 001 on UNT To South Glade Creek (38929)
Elevation: 2048.19 ft (USGS National Map viewer, 06/24/2022)
Drainage Area: 0.43 mi^2 (StreamStat Version 3.0, 06/24/2022)
River Mile Index: 0.36 (PA DEP eMapPA)
Low Flow Yield: 0.05 cfs/mi^2
Discharge Flow: 0.014 MGD

Node 2: At confluence with South Glade Creek
Elevation: 2020.35 ft (USGS National Map viewer, 05/10/2022)
Drainage Area: 2.92 mi^2 (StreamStat Version 3.0, 06/24/2022)
River Mile Index: 0.0 (PA DEP eMapPA)
Low Flow Yield: 0.05 cfs/mi^2
Discharge Flow: 0.0 MGD

NH_3-N:
WQM 7.0 suggested NH_3-N limit of 2.5 mg/l as monthly average and 5.0 mg/l as IMAX limit during summer to protect water quality standards. These are the same as existing limits and will be carried over. The winter limits are calculated by multiplying the summer limit with a factor of 3.

$CBOD_5$:
The WQM 7.0 model suggests a monthly average $CBOD_5$ limit of 25 mg/l. this is the same as existing limit and will be carried over. The IMAX limit is calculated by multiplying the average monthly value with a factor of 2.

Dissolved Oxygen (DO):
The existing permit has a minimum DO of 4.0 mg/l. Per Pa Code 25 Ch.93.7, a minimum DO of 5.0 is required for WWF. This is also supported by WQM 7.0 output. However, the model also shows no adverse effects on the receiving stream at 4.0 mg/l. The SOP BCW-PMT-033 recommends a minimum DO limit of 4.0 mg/l based on BPJ to ensure adequate operation and maintenance where there is no water quality concerns. It is recommended that the existing limit will be carried over.

Toxics:
Minor sewage permits with design flow less than 0.1 MGD are not required to report toxics unless they receive wastewater from industrial users. The permit application indicated the facility doesn't receive any industrial wastes. In absence of toxics data, a reasonable potential analysis couldn't be performed.

Additional Considerations

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 § 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. These are the same as existing permit limits and will be carried over.

E. Coli:
DEP's SOP titled "Establishing Effluent Limitations for Individual Sewage Permits (BCW-PMT-033, revised March 24, 2021) recommends annual E. Coli monitoring for all dischargers with flow between ≥0.002 MGD to <0.05 MGD. This requirement will be applied from this permit term.

pH:
The TBEL for pH is above 6.0 and below 9.0 S.U. (40 CFR §133.102(c) and Pa Code 25 § 95.2(1)) which are existing limits and will be carried over.

Total Suspended Solids (TSS):
There is no water quality criterion for TSS. The existing limits of 30 mg/L average monthly, 45 mg/l as weekly average, and 60 mg/L instantaneous maximum will remain in the permit based on the minimum level of effluent quality attainable by secondary treatment, 25 Pa. Code § 92a.47 and 40CFR 133.102(b).

Total Residual Chlorine (TRC):
The attached computer printout utilizes the equation and calculations as presented in the Department's 2003 Implementation Guidance for Total Residual Chlorine (TRC) (ID#391-2000-015) for developing chlorine limitations. The attached printout indicates that a water quality limit of 0.144 mg/l would be needed to prevent toxicity concerns at the discharge point for Outfall 001. The Instantaneous Maximum (IMAX) limit is 0.47 mg/l. The current permit has average monthly limit of 0.2 mg/l and IMAX of 0.6 mg/l. A review of last 12 months DMR data indicated that the facility can't meet the more stringent limit consistently. Therefore, a compliance schedule is proposed. The permit will have existing limits continued for the first three years from permit effective date, within which the permittee shall investigate ways to meet the more stringent limits. The new limits will be effective from 4th year of the permit.

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

Best Professional Judgement (BPJ):

Total Nitrogen:

PADEP's SOP BCW-PMT-033 suggests monitoring requirement, at a minimum, for facilities with design flow greater than 2,000 GPD. This requirement is applied for all facilities meeting the flow criteria. This is an existing requirement and will be carried over.

Total Phosphorus:

PADEP's SOP BCW-PMT-033 suggests monitoring requirement, at a minimum, for facilities with design flow greater than 2,000 GPD. This requirement is applied for all facilities meeting the flow criteria. This is an existing requirement and will be carried over.

Monitoring Frequency and Sample Types:

Otherwise specified above, the monitoring frequency and sample type of compliance monitoring for existing parameters are recommended by DEP's SOP and Permit Writers Manual and/or on a case-by-case basis using best professional judgment (BPJ).

Anti-Backsliding

The proposed limits are at least as stringent as are in existing permit, unless otherwise stated; therefore, anti-backsliding is not applicable.

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	0.014	XXX	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	Daily when Discharging	Grab
DO	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	Daily when Discharging	Grab
TRC (interim)	XXX	XXX	XXX	0.2	XXX	0.6	Daily when Discharging	Grab
TRC (final)	XXX	XXX	XXX	0.14	XXX	0.47	Daily when Discharging	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50.0	2/month	Grab
TSS	XXX	XXX	XXX	30.0	XXX	60.0	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	7.5	XXX	15.0	2/month	Grab
Ammonia May 1 - Oct 31	XXX	XXX	XXX	2.5	XXX	5.0	2/month	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab

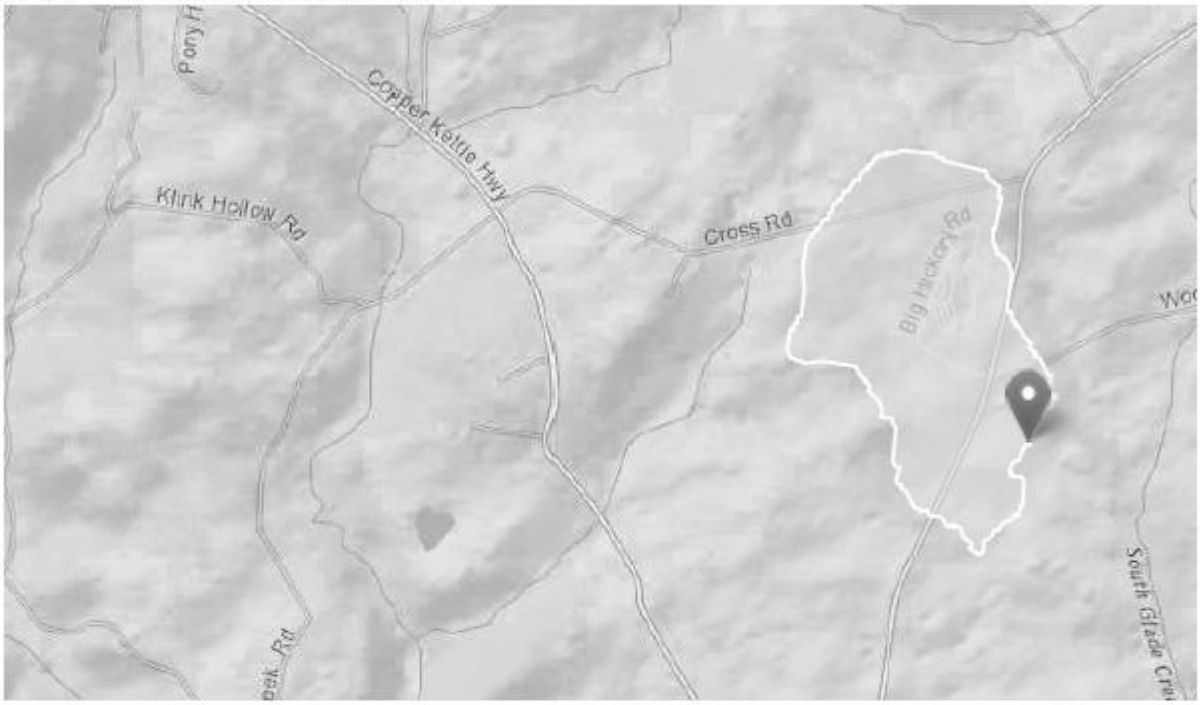
Compliance Sampling Location: At Outfall 001

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:

Permit No. PA0252735

PA0252735 at Outfall 001

Region ID: PA
Workspace ID: PA20220625033210792000
Clicked Point (Latitude, Longitude): 39.95793, -79.17997
Time: 2022-06-24 23:32:30 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.43	square miles
ELEV	Mean Basin Elevation	2131	feet

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.43	square miles	2.26	1400
ELEV	Mean Basin Elevation	2131	feet	1050	2580

Low-Flow Statistics Disclaimers [Low Flow Region 4]

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

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

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.0173	ft^3/s
30 Day 2 Year Low Flow	0.036	ft^3/s
7 Day 10 Year Low Flow	0.004	ft^3/s
30 Day 10 Year Low Flow	0.00965	ft^3/s
90 Day 10 Year Low Flow	0.0234	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/)

Permit No. PA0252735

PA0252735 at node 2

Region ID: PA
Workspace ID: PA20220625033425479000
Clicked Point (Latitude, Longitude): 39.95587, -79.17413
Time: 2022-06-24 23:34:47 -0400

Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	2.92	square miles
ELEV	Mean Basin Elevation	2115	feet

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	2.92	square miles	2.26	1400
ELEV	Mean Basin Elevation	2115	feet	1050	2580

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

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	0.153	ft^3/s	43	43
30 Day 2 Year Low Flow	0.29	ft^3/s	38	38
7 Day 10 Year Low Flow	0.0423	ft^3/s	66	66
30 Day 10 Year Low Flow	0.0882	ft^3/s	54	54
90 Day 10 Year Low Flow	0.195	ft^3/s	41	41

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/)

Application Version: 4.10.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

Table 1. List of U.S. Geological Survey streamgage locations in and near Pennsylvania with updated streamflow statistics.—Continued

[Latitude and Longitude in decimal degrees; mi², square miles]

Streamgage number	Streamgage name	Latitude	Longitude	Drainage area (mi²)	Regulated[1]
03070000	Cheat River at Rowlesburg, W.Va.	39.346	-79.665	939	N
03070420	Stony Fork Tributary near Gibbon Glade, Pa.	39.764	-79.587	.93	N
03070500	Big Sandy Creek at Rockville, W.Va.	39.616	-79.705	200	N
03072000	Dunkard Creek at Shannopin, Pa.	39.759	-79.971	229	N
03072655	Monongahela River near Masontown, Pa.	39.825	-79.923	4,440	Y
03072840	Tenmile Creek near Clarksville, Pa.	39.998	-80.042	133	N
03073000	South Fork Tenmile Creek at Jefferson, Pa.	39.923	-80.073	180	N
03074300	Lick Run at Hopwood, Pa.	39.868	-79.694	3.80	N
03074500	Redstone Creek at Waltersburg, Pa.	39.980	-79.764	73.7	N
03075070	Monongahela River at Elizabeth, Pa.	40.262	-79.901	5,340	Y
03075500	Youghiogheny River near Oakland, Md.	39.422	-79.424	134	N
03076500	Youghiogheny River at Friendsville, Md.	39.654	-79.408	295	LF
03076600	Bear Creek at Friendsville, Md.	39.656	-79.394	48.9	N
03077500	Youghiogheny River at Youghiogheny River Dam, Pa.	39.805	-79.364	436	Y
03078000	Casselman River at Grantsville, Md.	39.702	-79.136	62.5	N
03078500	Big Piney Run near Salisbury, Pa.	39.726	-79.048	24.5	N
03079000	Casselman River at Markleton, Pa.	39.860	-79.228	382	N
03080000	Laurel Hill Creek at Ursina, Pa.	39.820	-79.321	121	N
03081000	Youghiogheny River below Confluence, Pa.	39.828	-79.373	1,029	Y
03082200	Poplar Run near Normalville, Pa.	40.016	-79.426	9.27	N
03082500	Youghiogheny River at Connellsville, Pa.	40.018	-79.594	1,326	Y
03083000	Green Lick Run at Green Lick Reservoir, Pa.	40.105	-79.500	3.07	N
03083500	Youghiogheny River at Sutersville, Pa.	40.240	-79.806	1,715	Y
03084000	Abers Creek near Murrysville, Pa.	40.450	-79.714	4.39	N
03085000	Monongahela River at Braddock, Pa.	40.391	-79.858	7,337	Y
03085500	Chartiers Creek at Carnegie, Pa.	40.401	-80.096	257	N
03086000	Ohio River at Sewickley, Pa.	40.549	-80.206	19,500	Y
03086500	Mahoning River at Alliance, Ohio	40.933	-81.095	89.2	N
03090500	Mahoning River bl Berlin Dam nr Berlin Center, Ohio	41.048	-81.001	248	Y
03091500	Mahoning River at Pricetown, Ohio	41.131	-80.971	273	Y
03092000	Kale Creek near Pricetown, Ohio	41.140	-80.995	21.9	N
03092090	West Branch Mahoning River near Ravenna, Ohio	41.161	-81.197	21.8	N
03092460	West Branch Mahoning River at Wayland, Ohio	41.157	-81.072	81.7	Y
03092500	West Branch Mahoning River near Newton Falls, Ohio	41.172	-81.021	96.3	Y
03093000	Eagle Creek at Phalanx Station, Ohio	41.261	-80.954	97.6	N
03094000	Mahoning River at Leavittsburg, Ohio	41.239	-80.881	575	Y
03095500	Mosquito Creek below Mosquito Creek Dam near Cortland, Ohio	41.300	-80.758	97.5	Y
03097550	Mahoning River at Ohio Edison P Plt at Niles, Ohio	41.173	-80.757	854	Y
03098000	Mahoning River at Youngstown, Ohio	41.111	-80.673	898	Y
03098500	Mill Creek at Youngstown, Ohio	41.072	-80.690	66.3	N
03098600	Mahoning River below West Ave at Youngstown, Ohio	41.105	-80.663	978	Y
03099500	Mahoning River at Lowellville, Ohio	41.037	-80.536	1,073	Y
03100000	Shenango River near Turnersville, Pa.	41.513	-80.471	152	N
03101500	Shenango River at Pymatuning Dam, Pa.	41.498	-80.460	167	Y
03102000	Shenango River near Jamestown, Pa.	41.458	-80.425	181	Y

Table 2. Selected low-flow statistics for streamgage locations in and near Pennsylvania.—Continued

[ft³/s; cubic feet per second; —, statistic not computed; <, less than]

Streamgage number	Period of record used in analysis[1]	Number of years used in analysis	1-day, 10-year (ft³/s)	7-day, 10-year (ft³/s)	7-day, 2-year (ft³/s)	30-day, 10-year (ft³/s)	30-day, 2-year (ft³/s)	90-day, 10-year (ft³/s)
03044000	[3]1941–1951	11	266	277	350	293	402	391
03045000	1941–2008	68	2.2	3.2	12.9	6.3	22.2	14.8
03045500	1921–1940	17	11.6	17.0	35.5	23.0	49.6	32.4
03047000	1943–1991	49	1.7	9.8	43.5	29.0	55.2	47.6
03047500	1909–1937	29	141	155	335	190	412	276
03048500	[2]1943–2008	66	182	232	385	307	496	392
03049000	1942–2008	67	3.2	3.8	8.5	5.7	13.5	9.4
03049500	[2]1967–2008	42	1,950	2,390	3,490	2,860	4,420	3,510
03049500	[3]1940–1965	26	1,030	1,200	1,600	1,380	2,000	1,850
03049800	1964–2008	45	<.1	<.1	.2	.1	.5	.3
[5]03061500	1909–2008	83	.6	1.0	3.7	1.9	6.7	4.6
03062400	1966–2002	33	0	0	.1	<.1	.5	.1
03062500	1947–2008	28	.7	1.1	3.0	1.8	4.8	3.3
[5]03065000	1942–2008	64	10.4	12.4	34.8	20.7	64.0	54.9
[5]03066000	1923–2008	86	4.0	5.1	11.6	7.6	19.4	16.5
03068800	1975–2008	17	12.0	15.4	32.8	26.0	57.7	53.6
[5]03069000	1912–1993	67	9.1	11.6	37.6	21.0	67.6	59.6
[5]03069500	1914–2008	95	31.8	37.6	98.3	60.2	178	146
[5]03070000	1925–1996	72	35.8	40.2	114	66.8	209	173
03070420	1979–1995	17	0	<.1	<.1	<.1	.1	.1
[5]03070500	1911–2008	94	2.3	2.9	13.2	5.5	22.9	14.8
03072000	1942–2008	67	1.2	1.7	5.4	2.7	9.5	5.7
03072655	1940–2008	69	295	484	845	618	1,150	944
03072840	1970–1979	10	1.9	2.7	5.5	4.9	9.2	9.3
03073000	1933–1995	63	.3	.4	1.8	1.0	4.0	2.8
03074300	1969–1979	11	<.1	.1	.2	.2	.4	.4
03074500	1944–2008	65	8.5	10.2	18.7	13.0	23.3	17.8
03075070	1935–2008	74	354	512	908	688	1,220	1,060
[4]03075500	1943–2008	66	5.4	6.3	16.2	10.0	25.2	18.2
[4]03076500	[2]1941–2008	67	19.9	48.0	83.2	67.6	117	98.0
[4]03076600	1966–2008	43	2.6	3.0	6.2	4.1	8.4	6.5
03077500	1945–1991	47	15.6	24.6	162	132	288	292
[4]03078000	1949–2008	60	1.2	1.6	5.0	2.8	8.4	5.6
03079000	1922–2008	87	16.4	18.4	37.5	24.8	56.3	43.0
03080000	1920–2008	89	3.9	5.1	12.1	8.4	20.6	15.6
03081000	1942–2008	67	240	283	535	358	644	518
03082200	1963–1978	16	0	.1	.4	.2	.7	.5
03082500	[2]1926–2008	83	155	214	526	283	655	460
03082500	[3]1910–1924	13	23.0	30.8	129	53.6	208	144
03083000	1943–1979	37	.1	.1	.2	.1	.3	.2
03083500	[2]1926–2008	74	262	332	644	416	776	621
03084000	1951–1994	44	0	<.1	.2	.2	.5	.3
03085000	1940–2004	65	1,060	1,230	1,950	1,440	2,380	1,950
03085500	1921–2008	80	26.7	30.8	52.4	36.5	62.4	48.5
03086000	1935–2008	74	2,760	3,060	5,030	3,650	6,230	4,930

Permit No. PA0252735

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19F	38929	Trib 38929 to South Glade Creek	0.360	2048.19	0.43	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	0.050	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Huston's Hkry	PA0252735	0.0140	0.0140	0.0140	0.000	20.00	7.50

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	8.24	0.00	0.00
NH3-N	2.50	0.00	0.00	0.70

Permit No. PA0252735

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19F	38929	Trib 38929 to South Glade Creek	0.000	2020.35	2.92	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	0.050	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

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

Parameter Data

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

Permit No. PA0252735

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
19F	38929	Trib 38929 to South Glade Creek

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
0.360	0.02	0.00	0.02	.0217	0.01465	.307	2.96	9.65	0.05	0.462	22.49	7.18
Q1-10 Flow												
0.360	0.02	0.00	0.02	.0217	0.01465	NA	NA	NA	0.05	0.477	22.35	7.20
Q30-10 Flow												
0.360	0.03	0.00	0.03	.0217	0.01465	NA	NA	NA	0.05	0.423	22.86	7.15

Permit No. PA0252735

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	0.89	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.35	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	4		

Permit No. PA0252735

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
19F	38929	Trib 38929 to South Glade Creek

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
0.360	Huston's Hkry	6.98	5	6.98	5	0	0

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
0.360	Huston's Hkry	1.43	2.5	1.43	2.5	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
0.36	Huston's Hkry	25	25	2.5	2.5	4	4	0	0

Permit No. PA0252735

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19F	38929	Trib 38929 to South Glade Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.360	0.014	22.491	7.183
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
2.958	0.307	9.650	0.048
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
13.54	1.340	1.25	0.848
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.114	26.659	Owens	4
Reach Travel Time (days)			
0.462			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.046	12.63	1.21	7.08
0.092	11.79	1.16	7.42
0.139	10.99	1.12	7.57
0.185	10.26	1.07	7.66
0.231	9.57	1.03	7.74
0.277	8.93	0.99	7.80
0.324	8.33	0.95	7.86
0.370	7.77	0.92	7.88
0.416	7.25	0.88	7.88
0.462	6.76	0.85	7.88

Permit No. PA0252735

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
19F	38929	Trib 38929 to South Glade Creek

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
0.360	Huston's Hkry	PA0252735	0.014	CBOD5	25		
				NH3-N	2.5	5	
				Dissolved Oxygen			4

Permit No. PA0252735

TRC_CALC

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.02	= Q stream (cfs)	0.5	= CV Daily
0.014	= 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 =	0.314	1.3.2.iii	WLA cfc =	0.298
PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc =	0.581
PENTOXSD TRG	5.1b	LTA_afc=	0.117	5.1d	LTA_cfc =	0.173

Source		Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML MULT =	1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) =	0.144	AFC
		INST MAX LIMIT (mg/l) =	0.470	

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)