pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0033120**
Facility Type	**Non-Municipal**	APS ID	**1036866**
Major / Minor	**Minor**	Authorization ID	**1350714**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Warren County School District**	Facility Name	**Eisenhower Jr Sr High School**
Applicant Address	6820 Market Street	Facility Address	101 School Street
	Russell, PA 16345		Sugar Grove, PA 16350
Applicant Contact	David Undercoffer	Facility Contact	Dennis O'Toole
Applicant Phone	(814) 723-6903	Facility Phone	(814) 730-8328
Client ID	85819	Site ID	450883
Ch 94 Load Status	Not Overloaded	Municipality	Farmington Township
Connection Status	No Limitations	County	Warren County
Date Application Received	March 24, 2021	EPA Waived?	Yes
Date Application Accepted	April 23, 2021	If No, Reason	-
Purpose of Application	Renewal of an NPDES Permit for an existing discharge of treated sanitary wastewater from an STP serving a school.		

Summary of Review

Act 14 - Proof of Notification was submitted and received.

A Part II Water Quality Management permit is not required at this time.

The applicant should be able to meet the limits of this permit, which will protect the uses of the receiving stream.

I. OTHER REQUIREMENTS:

A. Stormwater into sewers
B. Right of way
C. Solids handling
D. Effluent Chlorine Optimization and Minimization

SPECIAL CONDITIONS:

II. Solids Management

There are no open violations in efacts associated with the subject Client ID (85819) as of 2/2/2022.

Approve	Deny	Signatures	Date
X		Stephen A. McCauley Stephen A. McCauley, E.I.T. / Environmental Engineering Specialist	2/2/2022
X		Justin C. Dickey Justin C. Dickey, P.E. / Environmental Engineer Manager	2/3/2022

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.013
Latitude	41º 57' 52.00"	Longitude	-79º 12' 15.00"
Quad Name	-	Quad Code	-
Wastewater Description:	Sewage Effluent		

Receiving Waters	Fairbanks Run (CWF)	Stream Code	56396
NHD Com ID	129446830	RMI	1.9
Drainage Area	1.47	Yield (cfs/mi^2)	0.069
Q_{7-10} Flow (cfs)	0.10	Q_{7-10} Basis	calculated
Elevation (ft)	1460	Slope (ft/ft)	0.01196
Watershed No.	16-B	Chapter 93 Class.	CWF
Existing Use	-	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment	-		
Source(s) of Impairment	-		
TMDL Status	-	Name	-

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

Nearest Downstream Public Water Supply Intake		Pennsylvania - New York State border	
PWS Waters	Kiantone Creek	Flow at Intake (cfs)	-
PWS RMI	-	Distance from Outfall (mi)	3.1

Sludge use and disposal description and location(s): Sludge is sent to an approved STP where it is land applied at the BPU Jamestown site in Chautauqua County or it is disposed of at an approved landfill.

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.

Narrative: This Fact Sheet details the determination of draft NPDES permit limits for an existing discharge of 0.013 MGD of treated sewage from an existing non-municipal STP in Farmington Township, Warren County.

Treatment permitted under Sewerage Permit 367S020 consisted of the following: A bar screen and comminutor, a 22,500 gallon diffused aeration tank with froth control sprayers, a 6,950 gallon final settling tank, tablet chlorine disinfection with a 2,430 gallon contact tank, and a 33,300 gallon concrete secondary pond prior to discharge.

Improvements permitted under WQM Permit 6212404 consist of the following: A new mechanical surface aeration/mixing system replaced the previous diffused air system, a grinder with bypass screen replaced the previous comminutor, and a 5,500 gallon aerated sludge digester tank was constructed inside the 33,300 gallon concrete secondary pond, reducing its volume to approximately 27,000 gallons.

1. Streamflow:

The yieldrate for the Fairbanks Run at the Outfall was calculated from the drainage area and the Q_{7-10} low flow of the nearest stream with a gage station:

Jackson Run near North Warren, PA:	Drainage Area:	12.8	sq. mi.	from StreamStats
(USGS Gage 03015280)	Q_{7-10}:	0.88	cfs	from StreamStats
	Yieldrate:	0.069	cfsm	calculated
Fairbanks Run @ Outfall 001:	Yieldrate:	0.069	cfsm	from above
	Drainage Area:	1.47	sq. mi.	from StreamStats
	% of stream allocated:	100%	Basis:	no nearby discharges
	Q_{7-10}:	0.10	cfs	calculated

2. Wasteflow: Outfall 001

Permitted discharge: 0.013 MGD = 0.020 cfs

Runoff flow period: 8.0 hours Basis: Runoff flow for a school

24 hour flow: 0.013 MGD x 24/8 = 0.039 MGD = 0.060 cfs

There is greater than 3 parts stream flow (Q7-10) to 1 part effluent (design flow). Therefore, the standards in DEP guidance (391-2000-014) will not be applied.

Flow will be required to be monitored as authorized under Chapter 92a.61, and as recommended in the SOP.

3. Parameters:

The following parameters were evaluated: pH, Total Suspended Solids, Fecal Coliform, Phosphorus, NH_3-N, $CBOD_5$, Dissolved Oxygen, and Total Residual Chlorine. NH_3-N, $CBOD_5$, and Dissolved Oxygen were evaluated using WQM 7.0 at the discharge point.

a. pH

Between 6.0 and 9.0 at all times

Basis: Application of Chapter 93.7 technology-based limits

The measurement frequency was previously set to 1/day as recommended in the SOP, based on Table 6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001), which will be retained.

b. Total Suspended Solids

Limits are 30.0 mg/l as a monthly average and 60.0 as an instantaneous maximum.

Basis: Application of Chapter 92a47 technology-based limits

c. Fecal Coliform

05/01 - 09/30: 200/100ml (monthly average geometric mean)
1,000/100ml (instantaneous maximum)

10/01 - 04/30: 2,000/100ml (monthly average geometric mean)
10,000/100ml (instantaneous maximum)

Basis: Application of Chapter 92a47 technology-based limits.

d. E. Coli

Monitoring was added for E. Coli at a frequency of 1/month.

Basis: Application of Chapter 92a.61 as recommended by the SOP for flows greater than 0.05 MGD but less than 1.0 MGD.

e. Total Phosphorus

☐ Limit necessary due to:

☐ Discharge to lake, pond, or impoundment
☐ Discharge to stream

☒ Limit not necessary

Basis: Chapter 96.5 does not apply. However, monitoring for Total Phosphorus was added in the previous renewal and will be retained in accordance with the SOP, based on Chapter 92a.61.

f. Total Nitrogen

Monitoring for Total Nitrogen was added in the previous renewal and will be retained in accordance with the SOP, based on Chapter 92a.61.

g. Ammonia-Nitrogen (NH_3-N)

Median discharge pH to be used: 6.9 Standard Units (S.U.)

Basis: Average pH value from DMR summary

Discharge temperature: 25°C (assumptive value used for modeling purposes)

Median stream pH to be used: 7.0 Standard Units (S.U.)

Basis: (Assumed in the absence of background data)

Stream Temperature: 20˚C (assumptive value used for CWF modeling purposes)

Background NH_3-N concentration: 0.1 mg/l

Basis: Default value.

Calculated NH_3-N Summer limits: 5.6 mg/l (monthly average)
11.2 mg/l (instantaneous maximum)

Calculated NH_3-N Winter limits: 16.8 mg/l (monthly average)
33.6 mg/l (instantaneous maximum)

Result: WQ modeling resulted in the calculated summer limits above (see Attachment 1), which are slightly less stringent than what was calculated during the previous renewal. The winter limits are calculated as 3 times the summer limits per the SOP. However, since the Permittee has not had any trouble meeting the more stringent limits of 3.5 mg/l average monthly and 10.5 mg/l instantaneous maximum, they will be retained in this renewal.

h. $CBOD_5$

Median discharge pH to be used: 6.9 Standard Units (S.U.)

Basis: Average pH value from DMR summary

Discharge temperature: 25°C (assumptive value used for modeling purposes)

Median stream pH to be used: 7.0 Standard Units (S.U.)

Basis: (Assumed in the absence of background data)

Stream Temperature: 20˚C (assumptive value used for CWF modeling)

Background $CBOD_5$ concentration: 2.0 mg/l

Basis: Default value

Calculated $CBOD_5$ Summer limits: 25.0 mg/l (monthly average)
50.0 mg/l (instantaneous maximum)

Calculated $CBOD_5$ Winter limits: 25.0 mg/l (monthly average)
50.0 mg/l (instantaneous maximum)

Result: WQ modeling resulted in the above summer limits (see Attachment 1), which are the same as the previous NPDES Permit. Since the summer limits are technology-based, the winter limits will also be technology-based. Per the SOP, since both the summer and winter limits are technology-based, the year-round limits set in the previous permit will be retained.

i. Dissolved Oxygen (DO)

- ☐ 3.0 mg/l - minimum required due to discharge going to a drainage swale or ditch.
- ☒ 4.0 mg/l - minimum desired in effluent to protect all aquatic life.
- ☐ 5.0 mg/l - desired in effluent for Warm Water / Trout-Stocked Fisheries.
- ☐ 6.0 mg/l - desired in effluent for Cold Water Fisheries.
- ☐ 7.0 mg/l - required due to discharge going to a High Quality / Exceptional Value stream

Discussion: A Dissolved Oxygen technology-based minimum of 4.0 mg/l is recommended by the WQ Model (see Attachment 1), and the SOP, based on Chapter 93.7, under the authority of Chapter 92a.61. However, since the previous limit of 5.0 mg/l is being met, it will be retained with this renewal.

The measurement frequency was previously set to 1/day as recommended in the SOP, based on Table 6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001), which will be retained.

j. Total Residual Chlorine (TRC)

- ☐ No limit necessary

☒ TRC limits: 0.25 mg/l (monthly average)
0.82 mg/l (instantaneous maximum)

Basis: The water quality-based TRC limits above were calculated using the Department's TRC Calculation Spreadsheet (see Attachment 2). The calculated limits are the same as the previous permits Based on the eDMR data, the Permittee should be able to meet the new reduced TRC limits so no interim compliance period will be added.

The measurement frequency was previously set to 1/day as recommended in the SOP, based on Table 6-3 in the "Technical Guidance for the Development and Specification of Effluent Limitations" (362-0400-001), which will be retained.

4. Reasonable Potential Analysis:

A Reasonable Potential Analysis was not performed in accordance with State practices for Outfall 001 by using the Department's Toxics Management Spreadsheet since no data was provided other than sewage related.

Result: No Reasonable potential was calculated for this renewal.

5. Reasonable Potential for Downstream Public Water Supply (PWS):

The Reasonable Potential Analysis performed above does not calculate limits for parameters that are based on PWS criteria (TDS, Chloride, Bromide, and Sulfate). However, since no non-sewage sample data was provided, no calculations were performed.

Nearest Downstream potable water supply (PWS): Pennsylvania - New York State border
Distance downstream from the point of discharge: 3.1 miles (approximate)

☒ No limits necessary
☐ Limits needed

Basis: Significant dilution available.

6. Attachment List:

Attachment 1 - WQ Modeling Printouts

Attachment 2 - TRC_Calc Spreadsheet

(The Attachments above can be found at the end of this document)

Compliance History

DMR Data for Outfall 001 (from January 1, 2021 to December 31, 2021)

Parameter	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21
Flow (MGD) Average Monthly	0.0095	0.0092	0.0094	0.0093	0.0091	0.0155	0.0076	0.0094	0.0098	0.0219	0.008	0.009
Flow (MGD) Daily Maximum				0.0219	0.064	0.333	0.0165	0.0293	0.0188	0.333	0.0146	0.0231
pH (S.U.) Minimum	6.71	6.49	6.33	6.66	7.12	6.87	6.56	6.59	6.53	6.89	6.93	7.2
pH (S.U.) Maximum	7.77	7.02	6.96	7.6	7.67	7.55	7.14	7.13	7.06	7.24	7.46	7.82
DO (mg/L) Minimum	10.4	9.51	8.58	8.2	7.12	7.95	8.11	8.85	9.34	10.21	11.47	11.56
TRC (mg/L) Average Monthly	0.1	0.08	0.07	0.08	0.093	0.08	0.08	0.07	0.08	0.10	0.15	0.14
TRC (mg/L) Instantaneous Maximum	0.29	0.18	0.18	0.24	0.33	0.22	0.20	0.17	0.22	0.19	0.44	0.29
CBOD5 (mg/L) Average Monthly	3.2	< 3	4.3	< 3	< 4.5	< 3.1	< 3	< 3	< 3	< 3	< 3	< 3
TSS (mg/L) Average Monthly	< 3	< 5	< 3	< 3	< 4	< 3	6	< 3	< 3	< 3	< 6	< 3
Fecal Coliform (CFU/100 ml) Geometric Mean	< 2	< 1	13	18	81	11	< 1	< 3	< 2	< 1	< 1	< 1
Fecal Coliform (CFU/100 ml) Instantaneous Maximum				22	132	21	< 1	11	5	< 1	1	< 1
Total Nitrogen (mg/L) Average Monthly				29.4	20.1	60	73.9	68.5	69.2	50.4	33.8	15
Ammonia (mg/L) Average Monthly	0.17	0.19	0.23	0.21	0.24	0.18	0.24	0.12	0.16	0.3	2.44	< 0.13
Total Phosphorus (mg/L) Average Monthly				3.19	3.27	7.68	7.46	5.57	5.22	3.96	2.29	2.15

Proposed Effluent Limitations and Monitoring Requirements

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

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0 Inst Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.25	XXX	0.82	1/day	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50	2/month	8-Hr Composite
TSS	XXX	XXX	XXX	30.0	XXX	60	2/month	8-Hr Composite
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/quarter	Grab
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	XXX	XXX	XXX	10.5	XXX	21	2/month	8-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	XXX	XXX	XXX	3.5	XXX	7	2/month	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite

Compliance Sampling Location: at Outfall 001, after disinfection.

Flow is monitor only based on Chapter 92a.61. The limits for pH and Dissolved Oxygen are technology-based on Chapter 93.7. The Total Residual Chlorine (TRC) limits are water quality-based on Chapter 93.7. The limits for $CBOD_5$, Total Suspended Solids, and Fecal Coliforms are technology-based on Chapter 92a.47. Monitoring for E. Coli is based on Chapter 92a.61. The limits for Ammonia-Nitrogen are water quality-based on Chapter 93.7. Monitoring for Total Nitrogen and Total Phosphorus is based on Chapter 92a.61.

Attachment 1

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
16B	56396	FAIRBANKS RUN

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)
1.900	Eisenhower	PA0033120	0.039	CBOD5	25		
				NH3-N	5.69	11.38	
				Dissolved Oxygen			4

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
16B	56396	FAIRBANKS RUN

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.900	0.039	21.865	6.960
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
5.747	0.376	15.277	0.075
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
10.58	0.985	2.12	0.808
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.660	24.364	Owens	6
Reach Travel Time (days)			
1.552			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.155	8.96	1.87	7.91
0.310	7.58	1.65	7.97
0.466	6.42	1.46	7.97
0.621	5.43	1.29	7.97
0.776	4.60	1.13	7.97
0.931	3.89	1.00	7.97
1.086	3.30	0.88	7.97
1.241	2.79	0.78	7.97
1.397	2.36	0.69	7.97
1.552	2.00	0.61	7.97

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		

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
16B	56396	FAIRBANKS RUN	**1.900**	1460.00	1.47	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	0.069	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	20.00	7.00
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
Eisenhower	PA0033120	0.0390	0.0000	0.0000	0.000	25.00	6.90

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	25.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
16B	56396	FAIRBANKS RUN	**0.000**	1340.00	6.11	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	0.069	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	20.00	7.00
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	0.00	7.00

Parameter Data

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

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
16B	56396	FAIRBANKS RUN

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
1.900	Eisenhower	14.33	29.75	14.33	29.75	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
1.900	Eisenhower	1.73	5.69	1.73	5.69	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)		
1.90	Eisenhower	25	25	5.69	5.69	4	4	0	0

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
16B	56396	FAIRBANKS RUN

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												
1.900	0.10	0.00	0.10	.0603	0.01196	.376	5.75	15.28	0.07	1.552	21.86	6.96
Q1-10 Flow												
1.900	0.06	0.00	0.06	.0603	0.01196	NA	NA	NA	0.06	1.791	22.41	6.95
Q30-10 Flow												
1.900	0.14	0.00	0.14	.0603	0.01196	NA	NA	NA	0.08	1.385	21.52	6.97

Attachment 2

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.1	= Q stream (cfs)	0.5	= CV Daily
0.039	= 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)	0	=Decay Coefficient (K)

Source	Reference	AFC Calculations		Reference	CFC Calculations	
TRC	1.3.2.iii	WLA afc =	0.548	1.3.2.iii	WLA cfc =	0.526
PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc =	0.581
PENTOXSD TRG	5.1b	LTA_afc=	0.204	5.1d	LTA_cfc =	0.306

Source		Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML MULT =	1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) =	0.251	AFC
		INST MAX LIMIT (mg/l) =	0.822	

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)**