pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0096229**
Facility Type	**Municipal**	APS ID	**1021517**
Major / Minor	**Minor**	Authorization ID	**1323502**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Marianna-West Bethlehem Joint Sewage Authority**	Facility Name	**Marianna-West Bethlehem Joint Sewage Authority WWTP**
Applicant Address	PO Box 428 Marianna, PA 15345-0428	Facility Address	East End Of Broad Street Marianna, PA 15345
Applicant Contact	Sarah Boyce	Facility Contact	Edgar Harris
Applicant Phone	(724) 288-1550	Facility Phone	(724) 966-2278
Client ID	44051	Site ID	237624
Ch 94 Load Status	Not Overloaded	Municipality	West Bethlehem Township
Connection Status	No Limitations	County	Washington

Date Application Received: August 11, 2020 EPA Waived? Yes Date Application Accepted: August 19, 2020 If No, Reason: Purpose of Application: Renewal of an existing NPDES permit for the discharge of treated sewage.

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	Date
X		*Derek S. Garner* Derek S. Garner / Project Manager	May 20, 2021
X		*Nicholas W. Hartranft* Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	May 20, 2021

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.142
Latitude	40º 1' 29.60"	Longitude	-80º 5' 6.34"
Quad Name	Ellsworth	Quad Code	1805
Wastewater Description:	Sewage Effluent		

Receiving Waters	Tenmile Creek	Stream Code	40285
NHD Com ID	99412040	RMI	10.1
Drainage Area	117	Yield (cfs/mi^2)	0.0204
Q_{7-10} Flow (cfs)	2.39	Q_{7-10} Basis	Streamgage No. 03072840
Elevation (ft)	859	Slope (ft/ft)	n/a
Watershed No.	19-B	Chapter 93 Class.	TSF
Existing Use	n/a	Existing Use Qualifier	n/a
Exceptions to Use	n/a	Exceptions to Criteria	n/a
Assessment Status	Impaired		
Cause(s) of Impairment	Habitat Alterations, Metals, Siltation		
Source(s) of Impairment	Acid Mine Drainage, Streambank Modifications/Destabilization		
TMDL Status	n/a	Name	n/a

Nearest Downstream Public Water Supply Intake Tri-County Joint Municipal Authority on the Monongahela River

Treatment Facility Summary

The Marianna-West Bethlehem Joint Sewage Authority (“MWBJSA”) Wastewater Treatment Plant (“WWTP”) was constructed and operates under WQM Permit No. 6386410, issued February 24, 1987. The WWTP has an average annual design flow of 0.142 MGD, hydraulic capacity of 0.307 MGD, and an organic capacity of 345 lbs/day. Treatment at the facility consists of:

- One (1) comminutor,
- One (1) grit removal chamber,
- Two (2) aeration tanks,
- Two (2) final clarifiers,
- Two (2) chlorine contact tanks
- Two (2) aerated sludge holding tanks, and
- Two (2) sludge drying beds

Disinfected effluent is ultimately discharged via Outfall 001 to Tenmile Creek.

When necessary, sludge is hauled offsite by Liquid Assets Disposal.

Compliance History

No effluent violations have occurred during the existing permit’s term.

There are no open violations associated with the permittee.

The facility was most recently inspected by DEP on April 8, 2021. The inspection report indicates that all necessary treatment equipment is operable. No impacts to Tenmile Creek were noted. The inspection did not yield any violations.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.142
Latitude 40º 1' 29.00" **Longitude** -80º 5' 6.00"
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

The applicability of WQBELs for ammonia-nitrogen, CBOD5, and dissolved oxygen were evaluated using DEP's WQM 7.0 v1.1. All input/output data and supporting documentation is attached. Reaches were created in WQM 7.0 along Tenmile Creek starting at Outfall 001 until a recovery in dissolved oxygen was observed. Existing effluent limits for ammonia-nitrogen, CBOD5, and dissolved oxygen were used for input values. The model results are as follows:

Parameter	Effluent Limit (mg/l)		
	Average Monthly	Maximum	Minimum
CBOD5	20	-	-
Ammonia-nitrogen	5.0	10	-
Dissolved Oxygen	-	-	4

Based on the above model output, the existing effluent limits are protective of Tenmile Creek.

The existing TRC limit of 0.5 mg/l was evaluated using the TRC_CALC spreadsheet (attached). The results indicate the existing requirements are protective of Tenmile Creek.

Best Professional Judgment (BPJ) Limitations

DEP proposes to continue requiring an effluent limit of 4 mg/l dissolved monitoring for total nitrogen and phosphorus to help characterize the wastewater.

The permit has historically included seasonal limits for CBOD5 and ammonia-n, based on the treatability of wastewater being significantly impacted by temperature and seasonal variances in stream flow. Since the facility has demonstrated compliance with the existing limits and no impacts to Tenmile Creek have been documented in relation to these parameters, DEP recommends the existing seasonal limits remain in the permit.

The permit currently requires influent monitoring for BOD5 and TSS to help characterize the wastewater for Chapter 94 reporting requirements. DEP recommends that these requirements remain in the permit.

An annual monitoring requirement for E. Coli is proposed per the 2017 Triennial Review of Water Quality Standards, published in the PA Bulletin on July 11, 2020.

Anti-Backsliding

Proposed loading limits are slightly less stringent than the existing limits. The existing loading limits are based on a design flow of 0.14 MGD, instead of the correct flow of 0.142 MGD. Less stringent effluent limitations are allowed under 40 CFR 122.44(l)(2)(i)(B)(2) when a technical error was previously made.

Existing Effluent Limitations and Monitoring Requirements

The existing effluent limitations and monitoring requirements are as follows:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	4.0	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5 May 1 - Oct 31	23.4	35.0	XXX	20	30	40	1/week	8-Hr Composite
CBOD5 Nov 1 - Apr 30	29.2	43.8	XXX	25	37.5	50	1/week	8-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Total Suspended Solids	35.0	52.5	XXX	30	45	60	1/week	8-Hr Composite
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	1/week	Grab
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	1/week	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab
Ammonia-Nitrogen May 1 - Oct 31	5.8	8.8	XXX	5.0	7.5	10.0	1/week	8-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	17.5	26.3	XXX	15.0	22.5	30.0	1/week	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab

Compliance Sampling Location: Outfall 001

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)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	4.0 Inst Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5 Nov 1 - Apr 30	29.6	44.4	XXX	25.0	37.5	50	1/week	8-Hr Composite
CBOD5 May 1 - Oct 31	23.7	35.5	XXX	20.0	30.0	40	1/week	8-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
TSS	35.5	53.3	XXX	30.0	45.0	60	1/week	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	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	17.8	26.6	XXX	15.0	22.5	30	1/week	8-Hr Composite

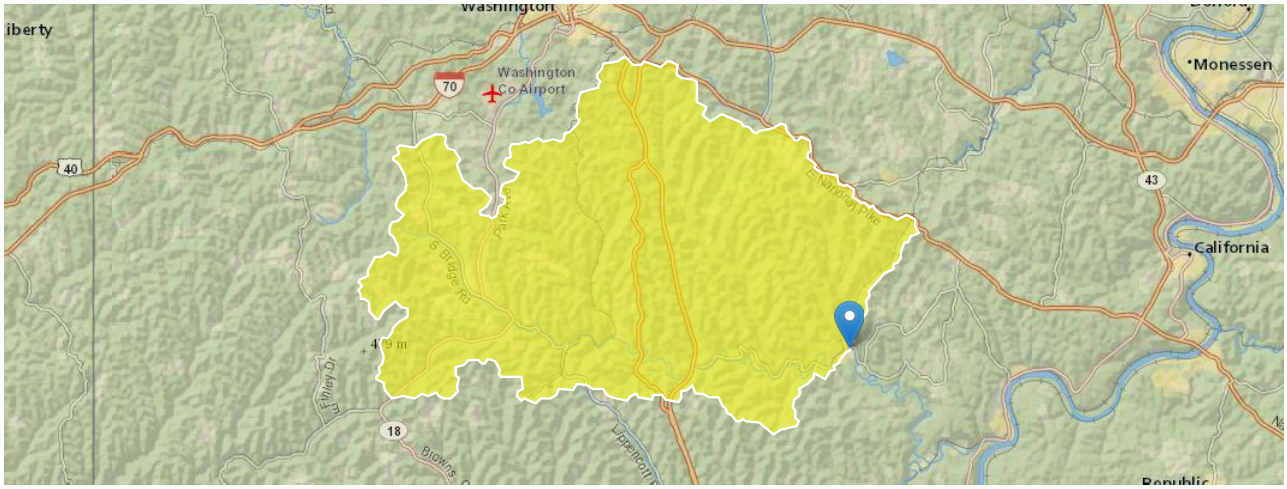
Outfall 001, Continued (from Permit Effective Date through Permit Expiration Date)

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Ammonia May 1 - Oct 31	5.9	8.9	XXX	5.0	7.5	10	1/week	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	Grab

Compliance Sampling Location: Outfall 001

Marianna West Bethlehem Joint Sewage Authority WWTP

Region ID:	PA
Workspace ID:	PA20210210205609055000
Clicked Point (Latitude, Longitude):	40.02476, -80.08538
Time:	2021-02-10 15:56:29 -0500



Outfall 001 drainage area

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
BSLOPD	Mean basin slope measured in degrees	10.0566	degrees
BSLOPDRAW	Unadjusted basin slope, in degrees	10.2909	degrees
BSLPDRPA20	Unadjusted basin slope, in degrees, from PA v1	11.4413	degrees
CARBON	Percentage of area of carbonate rock	0	percent
CENTROXA83	X coordinate of the centroid, in NAD_1983_Albers, meters	-188427.6336	meters
CENTROYA83	Basin centroid horizontal (y) location in NAD 1983 Albers	120551.1378	meters
DRN	Drainage quality index from STATSGO	3.6	dimensionless
DRNAREA	Area that drains to a point on a stream	117	square miles
ELEV	Mean Basin Elevation	1176	feet
ELEVMAX	Maximum basin elevation	1534	feet
FOREST	Percentage of area covered by forest	55.7916	percent
GLACIATED	Percentage of basin area that was historically covered by glaciers	0	percent
IMPNLCD01	Percentage of impervious area determined from NLCD 2001 impervious dataset	0.616	percent
LC01DEV	Percentage of land-use from NLCD 2001 classes 21-24	7.9619	percent
LC11DEV	Percentage of developed (urban) land from NLCD 2011 classes 21-24	8.0843	percent
LC11IMP	Average percentage of impervious area determined from NLCD 2011 impervious dataset	0.7004	percent
LONG_OUT	Longitude of Basin Outlet	-80.085423	degrees
MAXTEMP	Mean annual maximum air temperature over basin area from PRISM 1971-2000 800-m grid	61	degrees F
OUTLETXA83	X coordinate of the outlet, in NAD_1983_Albers,meters	-177999.7189	meters
OUTLETYA83	Y coordinate of the outlet, in NAD_1983_Albers, meters	115878.4172	meters
PRECIP	Mean Annual Precipitation	39	inches
ROCKDEP	Depth to rock	4.8	feet

Input Data WQM 7.0

Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
40285	TENMILE CREEK	**10.100**	859.00	117.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (ºC)	Tributary pH	Stream Temp (ºC)	Stream pH
Q7-10	0.020	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 (ºC)	Disc pH
MWBJSA WWTP	PA0096229	0.1420	0.1420	0.1420	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	20.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	8.24	0.00	0.00
NH3-N	5.00	0.00	0.00	0.70

Input Data WQM 7.0

Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
40285	TENMILE CREEK	**7.960**	846.00	122.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (ºC)	Tributary pH	Stream Temp (ºC)	Stream pH
Q7-10	0.020	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 (ºC)	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

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
19B	40285	TENMILE 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 (ºC)	Analysis pH
Q7-10 Flow												
10.100	2.39	0.00	2.39	.2197	0.00115	.692	33.75	48.76	0.11	1.172	25.00	7.00
Q1-10 Flow												
10.100	1.62	0.00	1.62	.2197	0.00115	NA	NA	NA	0.09	1.424	25.00	7.00
Q30-10 Flow												
10.100	4.30	0.00	4.30	.2197	0.00115	NA	NA	NA	0.15	0.862	25.00	7.00

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	0.68	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.8	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
19B	40285	TENMILE 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
10.100	MWBJSA WWTP	11.07	10	11.07	10	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
10.100	MWBJSA WWTP	1.37	5	1.37	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)		
10.10	MWBJSA WWTP	20	20	5	5	4	4	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19B	40285	TENMILE CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (ºC)	Analysis pH
10.100	0.142	25.000	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
33.754	0.692	48.756	0.112
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
3.52	0.377	0.42	1.029
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.885	1.373	Tsivoglou	5
Reach Travel Time (days)			
1.172			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.117	3.33	0.37	7.49
0.234	3.15	0.33	7.20
0.352	2.98	0.29	6.98
0.469	2.82	0.26	6.82
0.586	2.66	0.23	6.72
0.703	2.52	0.20	6.65
0.821	2.38	0.18	6.62
0.938	2.25	0.16	6.62
1.055	2.13	0.14	6.63
1.172	2.02	0.13	6.67

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
19B	40285	TENMILE 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)
10.100	MWBJSA WWTP	PA0096229	0.142	CBOD5	20		
				NH3-N	5	10	
				Dissolved Oxygen			4

TRC EVALUATION

Input appropriate values in B4:B8 and E4:E7

2.39	= Q stream (cfs)	0.5	= CV Daily
0.142	= Q discharge (MGD)	0.5	= CV Hourly
30	= no. samples	0.476	= 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 = 1.671	1.3.2.iii	WLA cfc = 3.395
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.623	5.1d	LTA_cfc = 1.973

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500	BAT/BPJ
		INST MAX LIMIT (mg/l) = 1.635	

WLA afc	(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))... ...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))... ...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)