pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

Application Type	Renewal	Application No.	**PA0034878**
Facility Type	Non-Municipal	APS ID	**997576**
Major / Minor	Minor	Authorization ID	**1280644**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Thomas P Buie**	Facility Name	**Springhill Estates MHP**
	DBA Springhill Estates MHP		
Applicant Address	11822 W Lake Road	Facility Address	13279 Ridge Road
	East Springfield, PA 16411-9792		West Springfield, PA 16443-9725
Applicant Contact	Thomas Buie	Facility Contact	
Applicant Phone	(814) 774-8550	Facility Phone	
Client ID	273174	Site ID	257485
Ch 94 Load Status	Not Overloaded	Municipality	Spring Township
Connection Status	No Limitations	County	Crawford
Application Received	July 1, 2019	EPA Waived?	Yes
Application Accepted	July 24, 2019	If No, Reason	

Purpose of Application: NPDES permit renewal

Summary of Review

Facility in compliance as of July 14, 2017 with the correction of effluent violations of March 23, 2017.
New effluent violations have been reported with no WMS follow-up.

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		William H. Mentzer William H. Mentzer, P.E. Environmental Engineering Specialist	November 2, 2020
X		Justin C. Dickey Justin C. Dickey, P.E. Environmental Engineer Manager	November 9, 2020

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.00275
Latitude NHD	41º 50' 18.44"	Longitude NHD	-80º 23' 43.20"
Latitude DP	41º 50' 20.00"	Longitude DP	-80º 23' 2.00"
Quad Name	Beaver Center	Quad Code	0402
Wastewater:	Treated mobile home park domestic wastes		

Receiving Waters	Unnamed Tributary to Conneaut Creek	Stream Code	unknown
NHD Com ID	123926088	RMI	0.63
Drainage Area	0.01	Yield (cfs/mi^2)	0
Q_{7-10} Flow (cfs)	0	Q_{7-10} Basis	Dry stream
Elevation (ft)	1030	Slope (ft/ft)	
Watershed No.	15-A	Chapter 93 Class.	CWF, MF
Existing Use	**statewide**	Existing Use Qualifier	none
Exceptions to Use	none	Exceptions to Criteria	none

Comments: Assumed perennial stream flow is at the confluence with tributary 63513 at RMI 0.52 and 0.9 Above a pond. Drainage swale drainage is 0.09-Square miles. Basin drainage 0.74-square mile drainage. Pond Inlet drainage is 0.77-square mile and total basin drainage is 1.12 square miles at 860-feet elevation.

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)	68	CWF default
Alkalinity (mg/L)		
Hardness (mg/L)		
CBOD5 (mg/L)	2.0	default
Ammonia Nitrogen (mg/L)	0.1	default
Other:		

Nearest Downstream Public Water Supply Intake

PWS Waters	Lake Erie	Flow at Intake (cfs)	NA
PWS RMI		Distance from Outfall (mi)	

Changes Since Last Permit Issuance: none

Other Comments: none

Treatment Facility Summary				
Treatment Facility Name: Springhill Estates MHP				
WQM Permit No.	**Issuance Date**			
2072402				
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Septic Tank Sand Filter	*Ultraviolet (UV)*	0.0028
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.0028		Not Overloaded		

Changes Since Last Permit Issuance: none

Other Comments: Septic tank sand filter system with chemical addition for phosphorus control. The EPA questions compliance for this design.

Permitted treatment consists of: A 5,000 gallon septic tank with an effluent filer, a 1,500-galling dosing tank, two 625 square foot recirculating sand filters, and Ultraviolet (UV) light disinfection.

Compliance History

DMR Data for Outfall 001 (from June 1, 2018 to May 31, 2019)

Parameter	MAY-19	APR-19	MAR-19	FEB-19	JAN-19	DEC-18	NOV-18	OCT-18	SEP-18	AUG-18	JUL-18	JUN-18
Flow (MGD) Average Monthly	0.0008	0.0008	0.000825	0.0008	0.0008	0.0008	0.0008	0.000825	0.000825	0.00085	0.00085	0.00085
Flow (MGD) Daily Maximum	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.0009	0.000925	0.0009	0.0009	0.000925	0.00095
pH (S.U.) Minimum	7.6	7.6	7.6	7.5	7.5	7.5	7.5	7.4	7.4	7.4	7.4	7.3
pH (S.U.) Maximum	7.7	7.6	7.7	7.6	7.6	7.6	7.6	7.5	7.5	7.5	7.5	7.4
DO (mg/L) Minimum	4.0	4.2	4.6	4.1	4.2	4.8	4.1	4.6	4.3	4.1	4.5	4.2
CBOD5 (mg/L) Average Monthly	8.8	4	4	4	4.1	4.3	5.05	6.03	6.54	< 3	3.0	4
TSS (mg/L) Average Monthly	6.25	5	5	5	5	5	5	7.5	10.75	5	4.655	23
Fecal Coliform (#/100 ml) Geometric Mean	1	48.98	1	5	1	1	1	1	1	1	1	1
Fecal Coliform (#/100 ml) Instant Maximum	1	**2400**	1	25	1	1	1	1	1	1	1	1
Total Nitrogen (mg/L) Average Monthly	16.75	16.66	21.89	24.6	19.09	21.65	21.06	11.21	16	15.25	12.1308	15.96
Ammonia (mg/L) Average Monthly	7.45	0.625	0.94	0.315	0.675	2.835	4.17	1.93	**10.715**	0.623	0.517	0.83
Total P (mg/L) Average Monthly	0.926	0.416	0.357	0.297	0.14	0.1535	0.2015	0.3945	**1.43**	**1.495**	**1.565**	**1.35**

Compliance History

Effluent Violations for Outfall 001, from: July 1, 2018 To: May 31, 2019

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Ammonia	05/31/19	Avg Mo	7.45	mg/L	6.5	mg/L
Ammonia	09/30/18	Avg Mo	10.715	mg/L	6.5	mg/L
Total Phosphorus	08/31/18	Avg Mo	1.495	mg/L	1.0	mg/L
Total Phosphorus	07/31/18	Avg Mo	1.565	mg/L	1.0	mg/L
Total Phosphorus	09/30/18	Avg Mo	1.43	mg/L	1.0	mg/L

Summary of Inspections: April 2017 inspections reported poor maintenance that resulted in effluent violations.
The phosphorus violations are typical of low flow sewage system

DMR Data for Outfall 001 (from September 1, 2019 to August 31, 2020)

Parameter	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20	FEB-20	JAN-20	DEC-19	NOV-19	OCT-19	SEP-19
Flow (MGD) Average Monthly	0.000825	0.000825	0.000825	0.000825	0.00085	0.00085	0.00085	0.00085	0.000825	0.000825	0.000825	0.00085
Flow (MGD) Daily Maximum	0.000875	0.00085	0.00085	0.000875	0.0009	0.000875	0.0009	0.000875	0.000875	0.0009	0.0009	0.0009
pH (S.U.) Minimum	7.5	7.5	7.5	7.4	7.5	7.4	7.4	7.4	7.3	7.5	7.4	7.4
pH (S.U.) Maximum	7.6	7.6	7.5	7.5	7.5	7.5	7.4	7.5	7.5	7.5	7.5	7.5
DO (mg/L) Minimum	4.2	4.0	4.1	4.0	4.1	4.1	4.0	4.2	4.0	4.2	4.0	4.1
CBOD5 (mg/L) Average Monthly	4	< 4	**32**	9.85	22.8	4	4.25	4.65	6.8	6.15	4	4
TSS (mg/L) Average Monthly	5	27	27	8	20	5	5.25	6.75	5	6.25	5	5
Fecal Coliform (#/100 ml) Geometric Mean	1	1	16.73	1	1	2	1	1	1	58.68	1	1
Fecal Coliform (#/100 ml) Instant Maximum	1	1	280	1	1	4	1	1	1	82	1	1
Total Nitrogen (mg/L) Average Monthly	20.48	16.99	21.53	22.55	27.73	14.76	21.33	16.33	16.45	22.34	21.14	18.58
Ammonia (mg/L) Average Monthly	0.325	0.625	**18.05**	5.51	10.47	2.6	2.045	FF	FF	6.445	0.46	0.3
Total Phosphorus (mg/L) Ave Monthly	0.889	0.8215	**1.59**	0.718	**1.2855**	**1.0123**	0.553	0.328	0.3205	0.28	**1.25025**	0.862

Effluent Violations for Outfall 001, from: October 1, 2019 To: August 31, 2020

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
CBOD5	06/30/20	Avg Mo	32	mg/L	25	mg/L
Ammonia	06/30/20	Avg Mo	18.05	mg/L	6.5	mg/L
Total Phosphorus	03/31/20	Avg Mo	1.0123	mg/L	1.0	mg/L
Total Phosphorus	10/31/19	Avg Mo	1.25025	mg/L	1.0	mg/L
Total Phosphorus	04/30/20	Avg Mo	1.2855	mg/L	1.0	mg/L
Total Phosphorus	06/30/20	Avg Mo	1.59	mg/L	1.0	mg/L

The phosphorus violations are typical of low flow sewage system

	Month	Year	MGD	PPD	mg/L	mg/L	mg/L	#
Annual Average Design Flow			0.002800					
Annual average		2018	0.000825					
		2017	0.000825					
		2016	0.000925					
Highest Monthly Average	March		0.001100					
Organic Design Load								
pH					7.0		7.6	192
DO					4.0	5.5		730
Fecal Coliform					1	1	1	48
CBOD5						5	25	48
TSS						5	30	48
Ammonia						2.5	6.5	48
P						0.98	1.0	48

No sludge removal reported.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.00275
Latitude 41º 50' 20.00" **Longitude** -80º 23' 2.00"
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)
DO	4.0	Average monthly		BPJ

Comments: none

Water Quality-Based Limitations

A Sewerage Program "Reasonable Potential Analysis" determined the following parameters were candidates for limitations:

The following limitations were determined through water quality modeling (output files attached):

Parameter		Limit (mg/l)			SBC	Model		
Name	Period	Minimum	Average	Maximum		Minimum	Average	Maximum
CBOD5			25	25			25	25
TSS			30	60			30	60
Nitrogen			Report					
Ammonia	Summer		6.5	13.0			6.92	13.84
	Winter		19.5	39.0			20.76	41.52
DO		4.0				4.0		
Phosphorus		1.0					1.0	

Comments:

Phosphorus is an international Lake Erie basin requirement. Direct stream modelling at perennial stream flow based on Elk Creek recommended ammonia requirements that could be rounded down to the existing limitations. Two stage modelling with separate stream attenuation based on Woodcock Creek relaxed the ammonia requirements slightly. Integrated single stage modelling also recommended a 5.0-mg/L minimum daily DO.

Two stage modelling two variations depending on the downstream drainage as the tributary drainage is 0.09-square mile and the total basin drainage is 0.74-square mile. Modelled was a 16-hour run-off (0.0041-MGD).

UV monitoring will be required through a Part C Condition utilizing the Daily Effluent Monitoring Form (3800-FM-BCW0435) Supplemental Report.

Anti-Backsliding

Backsliding will not provide compliance

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	4.0 Daily Min	XXX	XXX	XXX	1/day	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50.0	2/month	8-Hr Composite
TSS	XXX	XXX	XXX	30.0	XXX	60.0	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
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	19.5	XXX	39.0	2/month	8-Hr Composite
Ammonia May 1 - Oct 31	XXX	XXX	XXX	6.5	XXX	13.0	2/month	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	1.0	XXX	2.0	2/month	8-Hr Composite

Compliance Sampling Location: Outfall 001 after disinfection

			Ammonia-		CBOD5		Dissolved Oxygen		Fecal Coliform				Flow		pH				Total Nitrogen		Total Phosphorus		Total Suspended	
			00610		80082		00300		74055				50050		00400				00600		00665		00530	
			mg/L		mg/L		mg/L		CFU/100				MGD		SU				mg/L		mg/L		mg/L	
			Average	Monthly	Average	Monthly	Minimum		Geometric		Instantane		Average		Minimum		Maximum		Average		Average		Average	
01/01/2019	01/31/2019	03/02/2019	0.675	19.5	4.1	25	4.2	4.0	1	2000	1		0.0009	report	7.50	6.0	7.60	9	19.09	report	0.14	1.0	5	30
02/01/2019	02/28/2019	03/03/2019	0.315	19.5	4	25	4.1	4.0	5	2000	25		0.0008	report	7.50	6.0	7.60	9	24.6	report	0.297	1.0	5	30
03/01/2019	03/31/2019	04/30/2019	0.94	19.5	4	25	4.6	4.0	1	2000	1		0.0009	report	7.60	6.0	7.70	9	21.89	report	0.357	1.0	5	30
04/01/2019	04/30/2019	04/30/2019	0.625	19.5	4	25	4.2	4.0	48.98	2000	2400	10000	0.0008	report	7.60	6.0	7.60	9	16.66	report	0.416	1.0	5	30
05/01/2019	05/31/2019	06/26/2019	7.45	6.5	8.8	25	4.0	4.0	1	200	1		0.000825	report	7.60	6.0	7.70	9	16.75	report	0.926	1.0	6.25	30
06/01/2019	06/30/2019	07/30/2019	5.16	6.5	15.05	25	4.3	4.0	1	200	1		0.0009	report	7.40	6.0	7.50	9	17.59	report	0.913	1.0	10.5	30
07/01/2019	07/31/2019	08/28/2019	0.655	6.5	4	25	4.1	4.0	1	200	1		0.0008	report	7.50	6.0	7.00	9	48.12	report	0.7945	1.0	5	30
08/01/2019	08/31/2019	10/02/2019	3.515	6.5	6.2	25	4.0	4.0	1.73	200	3		0.0009	report	7.40	6.0	7.50	9	22.39	report	**1.2**	1.0	5	30
09/01/2019	09/30/2019	11/04/2019	0.3	6.5	4	25	4.1	4.0	1	200	1		0.0008	report	7.40	6.0	7.50	9	18.58	report	0.862	1.0	5	30
10/01/2019	10/31/2019	12/02/2019	0.46	6.5	4	25	4.0	4.0	1	200	1		0.0009	report	7.40	6.0	7.50	9	21.14	report	**1.25025**	1.0	5	30
11/01/2019	11/30/2019	12/23/2019	6.445	19.5	6.15	25	4.2	4.0	1	2000	1		0.000875	report	7.40	6.0	7.50	9	22.34	report	0.28	1.0	6.25	30
12/01/2019	12/31/2019	01/30/2020	FF	19.5	6.8	25	4.0	4.0	58.68	2000	82		0.0008	report	7.50	6.0	7.50	9	16.45	report	0.3205	1.0	5	30
01/01/2020	01/31/2020	02/28/2020	FF	19.5	4.65	25	4.2	4.0	1	2000	1		0.0008	report	7.30	6.0	7.50	9	16.33	report	0.328	1.0	6.75	30
02/01/2020	02/29/2020	03/26/2020	2.045	19.5	4.25	25	4.0	4.0	1	2000	1		0.000875	report	7.40	6.0	7.50	9	21.33	report	0.553	1.0	5.25	30
03/01/2020	03/31/2020	04/30/2020	2.6	19.5	4	25	4.1	4.0	2	2000	4		0.0008	report	7.40	6.0	7.40	9	14.76	report	**1.0123**	1.0	5	30
01/01/2019	01/31/2019	03/02/2019											0.0009	report	7.40	6.0	7.50	9						
01/01/2019	01/31/2019	03/02/2019											0.0009	report										
01/01/2019	01/31/2019	03/02/2019											0.00085	report										
02/01/2019	02/28/2019	03/03/2019											0.000825	report										
02/01/2019	02/28/2019	03/03/2019											0.0009	report										
03/01/2019	03/31/2019	04/30/2019											0.0009	report										
03/01/2019	03/31/2019	04/30/2019											0.000825	report										
04/01/2019	04/30/2019	04/30/2019											0.000875	report										
04/01/2019	04/30/2019	04/30/2019											0.000825	report										
05/01/2019	05/31/2019	06/26/2019											0.00085	report										
05/01/2019	05/31/2019	06/26/2019											0.000875	report										
06/01/2019	06/30/2019	07/30/2019											0.00085	report										
06/01/2019	06/30/2019	07/30/2019											0.0009	report										
07/01/2019	07/31/2019	08/28/2019											0.00085	report										
07/01/2019	07/31/2019	08/28/2019											0.000875	report										

7.50

9f7:

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WQM Model Notes

The review had two Water Quality created problems.

The first was adoption of WQM 7 modelling with stream code based nodes. The modelling stream code used was that of the main stem Conneaut Creek. The unnamed tributary stream code 63513 was never reported.

Later with WMS implementation the NHD river mile was set at 0.09. By checking e-map this is a stream point above a pond and below 900-feet above sea level. It is also 0.02-mile below the measured drainage swale confluence.

Tributary 63513 total basin drainage is 1.1-squatre miles measures and 1.12-square miles according to stream stats, measured basin drainage at the in-stream pond is 0.77-square miles and the measured basin drainage with the Springhill Estates discharge is 0.74-quare miles.

The Springhill Estates discharge is to a dry drainage swale with a 0.01-square mile drainage area at the outfall and a 0.09-square mile sub-basin drainage. The 0.09-square mile sub-basin drainage limits downstream assimilation capacity.

The river mile indexes do not significantly change modelling recommendations. Changing the mid-stream drainage does affect the modelling recommendations through limiting stream assimilative capacity.

With Elk Creek as a reference low flow stream, direct discharge to tributary 63513 and a 16-hour run-off period a 6.5-mg/L ammonia limit is recommended.

Regional procedures for two step modelling with Woodcock Creek as the reference low flow stream recommended similar ammonia requirements.

Modelling the dry stream as part of tributary 63513 without aquatic life toxicity only raised the effluent DO to 5.0-mg/L without changing the ammonia effluent recommendation.

Changing the downstream drainage from 0.09 to 0.74-square miles does significantly affect the effluent ammonia requirement's when natural instream attenuation is assumed.

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
15	63513	Trib 63513 to Conneaut Creek	**1.100**	1030.00	0.01	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	0.001	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
Springhill	PA0034878O	0.0041	0.0041	0.0041	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	25.00	0.10	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
15	63513	Trib 63513 to Conneaut Creek	**0.520**	910.00	0.02	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	0.075	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
		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
15	63513	Trib 63513 to Conneaut 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												
1.100	0.00	0.00	0.00	NA	0.03918	.286	.55	1.93	0.04	0.878	20.00	7.50
Q1-10 Flow												
1.100	0.00	0.00	0.00	NA	0.03918	NA	NA	NA	0.00	0.000	0.00	0.00
Q30-10 Flow												
1.100	0.00	0.00	0.00	NA	0.03918	NA	NA	NA	0.00	0.000	0.00	0.00

WQM 7.0 Modeling Specifications

Parameters	D.O.	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	Simulation	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	2		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
15	63513	Trib 63513 to Conneaut Creek

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
15	63513	Trib 63513 to Conneaut Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.100	0.004	20.000	7.499
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
0.551	0.286	1.928	0.040
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
24.96	1.500	24.96	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
4.007	25.667	Owens	2
Reach Travel Time (days)			
0.878			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.088	21.89	23.47	4.15
0.176	19.19	22.08	4.55
0.263	16.82	20.76	4.93
0.351	14.75	19.52	5.28
0.439	12.93	18.36	5.60
0.527	11.33	17.27	5.89
0.614	9.94	16.24	6.15
0.702	8.71	15.27	6.39
0.790	7.64	14.36	6.61
0.878	6.70	13.50	6.81

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
15	63513	Trib 63513 to Conneaut Creek

RMI	Name	Permit Number	Disc Flow (mgd)
1.100	Springhill	PA0034878O	0.004

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
15	63513	Trib 63513 to Conneaut Creek	**1.100**	1030.00	0.01	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	0.001	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
Springhill	PA0034878O	0.0041	0.0041	0.0041	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	4.00	8.24	0.00	0.00
NH3-N	25.00	0.10	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
15	63513	Trib 63513 to Conneaut Creek	**0.520**	910.00	0.09	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	0.075	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
Spinghill	PA0034878S	0.0000	0.0000	0.0000	0.000	0.00	0.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	6.70	2.00	0.00	1.50
Dissolved Oxygen	6.81	8.24	0.00	0.00
NH3-N	13.50	0.10	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
15	63513	Trib 63513 to Conneaut Creek	**0.000**	860.00	1.12	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	0.075	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
		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 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
15	63513	Trib 63513 to Conneaut 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												
1.100	0.00	0.00	0.00	.0063	0.03918	.286	.55	1.93	0.04	0.878	24.99	7.00
0.520	0.01	0.00	0.01	.0063	0.01821	.263	1.38	5.25	0.03	0.937	22.57	7.00
Q1-10 Flow												
1.100	0.00	0.00	0.00	.0063	0.03918	NA	NA	NA	0.04	0.878	24.99	7.00
0.520	0.00	0.00	0.00	.0063	0.01821	NA	NA	NA	0.03	1.043	23.11	7.00
Q30-10 Flow												
1.100	0.00	0.00	0.00	.0063	0.03918	NA	NA	NA	0.04	0.877	24.99	7.00
0.520	0.01	0.00	0.01	.0063	0.01821	NA	NA	NA	0.04	0.856	22.18	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	0.64	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		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
15	63513	Trib 63513 to Conneaut 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
1.100	Springhill	NA	50	6.77	30.47	2	39
0.520	Spinghill	NA	NA	7.73	NA	NA	NA

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
1.100	Springhill	NA	25	1.34	8.91	2	64
0.520	Spinghill	NA	NA	1.64	NA	NA	NA

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)		
1.10	Springhill	25	25	8.91	8.91	6	6	0	0
0.52	Spinghill	NA	NA	NA	NA	NA	NA	NA	NA

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
15	63513	Trib 63513 to Conneaut Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.100	0.004	24.992	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
0.551	0.286	1.928	0.040
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
24.96	1.500	8.90	1.028
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.004	25.667	Owens	NA
Reach Travel Time (days)			
0.878			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.088	21.16	8.13	4.55
0.176	17.93	7.43	4.85
0.263	15.19	6.79	5.28
0.351	12.88	6.20	5.66
0.439	10.91	5.67	6.00
0.527	9.25	5.18	6.29
0.614	7.84	4.73	6.54
0.702	6.64	4.33	6.76
0.790	5.63	3.95	6.95
0.878	4.77	3.61	7.12

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.520	0.004	22.567	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
1.382	0.263	5.247	0.034
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
3.42	0.510	1.91	0.853
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.666	26.519	Owens	6
Reach Travel Time (days)			
0.937			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.094	3.25	1.76	7.87
0.187	3.08	1.62	7.87
0.281	2.91	1.50	7.87
0.375	2.76	1.38	7.87
0.468	2.62	1.28	7.87
0.562	2.48	1.18	7.87
0.656	2.35	1.09	7.87
0.749	2.23	1.01	7.87
0.843	2.11	0.93	7.87
0.937	2.00	0.86	7.87

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
15	63513	Trib 63513 to Conneaut 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)
1.100	Springhill	PA0034878O	0.004	CBOD5	25		
				NH3-N	8.91	17.82	
				Dissolved Oxygen			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
15	63513	Trib 63513 to Conneaut Creek	**0.420**	910.00	0.74	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
Springhill	PA0034878T	0.0041	0.0040	0.0041	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	25.00	0.10	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
15	63513	Trib 63513 to Conneaut Creek	**0.000**	860.00	1.12	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
		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 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
15	63513	Trib 63513 to Conneaut 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												
0.420	0.01	0.00	0.01	.0063	0.02255	.269	2.62	9.75	0.03	0.900	20.00	7.11
Q1-10 Flow												
0.420	0.01	0.00	0.01	.0063	0.02255	NA	NA	NA	0.02	1.054	20.00	7.15
Q30-10 Flow												
0.420	0.02	0.00	0.02	.0063	0.02255	NA	NA	NA	0.03	0.795	20.00	7.08

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	Uniform Treatme	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		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
15	63513	Trib 63513 to Conneaut 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
0.420	Springhill	NA	50	8.64	20.51	1	59

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
0.420	Springhill	NA	25	1.83	6.92	1	72

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)		
0.42	Springhill	25	25	6.92	6.92	4	4	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
15	63513	Trib 63513 to Conneaut Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.420	0.004	20.000	7.106
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
2.622	0.269	9.754	0.029
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
9.26	1.108	2.25	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.905	22.759	Owens	6
Reach Travel Time (days)			
0.900			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.090	8.38	2.11	8.05
0.180	7.58	1.99	8.24
0.270	6.86	1.86	8.24
0.360	6.21	1.75	8.24
0.450	5.62	1.64	8.24
0.540	5.09	1.54	8.24
0.630	4.61	1.45	8.24
0.720	4.17	1.36	8.24
0.810	3.77	1.28	8.24
0.900	3.41	1.20	8.24

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
15	63513	Trib 63513 to Conneaut 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)
0.420	Springhill	PA0034878T	0.004	CBOD5	25		
				NH3-N	6.92	13.84	
				Dissolved Oxygen			4

Discharger	Springhill Estates MHP	Tuesday, October 27, 2020
Site	Springhill Estates MHP STP	Revised Tuesday, November 10, 2020
Municipality	Spring Township	
County	Crawford	
NPDES Permit	PA0034878	

TRC EVALUATION

Input appropriate values in B4:B8 and E4:E7

0.1377	**= Q stream (cfs)**	**0.5**	**= CV Daily**
0.0028	**= Q discharge (MGD)**	**0.5**	**= CV Hourly**
30	**= no. samples**	**1**	**= AFC_Partial Mix Factor**
0.4	**= 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 = 13.586	**1.3.2.iii**	WLA cfc = 13.319
PENTOXSD TRG	**5.1a**	LTAMULT afc = 0.373	**5.1c**	LTAMULT cfc = 0.581
PENTOXSD TRG	**5.1b**	LTA_afc= 5.062	**5.1d**	LTA_cfc = 7.743

Source		Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML MULT = 1.231		
PENTOXSD TRG	5.1g	LIMIT (mg/l) = 0.500	BAT/BPJ	
		X 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)**

(0.011/EXP(-K*CFC_tc/1440))+(((CFC_Yc*Qs*0.011)/(1.547*Qd)....
....*EXP(-K*CFC_tc/1440)))+Xd+(CFC_Yc*Qs*Xs/1.547*Qd))*(1-FOS/100)

Chlorine Required = 2 perennial Chlorine Demand + Chlorine Residual

Stream	Reach/Node			1	2
Stream	Flow	Conditions		dry	perennial
Stream	Code			unknown	63513
	Function				unknown
Samples				30	30
reach	outfall		RMI	1.10	0.52
	Reach End		RMI	0	0
reach			feet	5808	2745.6
drainage			sq miles	0.01	0.74
TRC	limitation	average	mg/L	0.093	0.500
		maximum	mg/L	0.303	1.635
elevation		modelled	feet	1030	910
elevation		modelled	feet	910	860
slope		modelled	foot/foot	0.021	0.018
low flow			cfs/sq mi	0.186	0.186
discharge			mgd	0.0028	0.0028
Runoff	Period		hours	24.000	24.000

Dry stream discharge where most chlorine is expected to be air stripped within a few feet of the discharge.

stream	flow		cfs	0.00186	0.13775
stream	flow		MGD	0.001203	0.089027
stream	flow	total	MGD	0.003953	0.091777
stream	chlorine	demand	mg/L	0.4	0.4
discharge	discharge	demand	mg/L		
stream	Total Stream/Waste		ratio	1.4	33.4

When directly applied at perennial stream flow 0.5-mg/L TRC should not impair stream uses.