pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0239739**
Facility Type	**Municipal**	APS ID	**892031**
Major / Minor	**Minor**	Authorization ID	**1372262**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Bear Creek Watershed Authority**	Facility Name	**Karns City STP**
Applicant Address	259 Argyle Street	Facility Address	Kittanning Pike
	Petrolia, PA 16050		Karns City, PA 16041
Applicant Contact	Chris Dunmyre, STP Operator (bearcreekwater@zoominternet.net)	Facility Contact	Chris Dunmyre, STP Operator (bearcreekwater@zoominternet.net)
Applicant Phone	(724) 756-0600	Facility Phone	(724) 756-0600
Client ID	62798	Site ID	724619
Ch 94 Load Status	Not Overloaded	Municipality	Fairview Township
Connection Status	No Limitations	County	Butler
Date Application Received	October 12, 2021	EPA Waived?	Yes
Date Application Accepted	October 12, 2021	If No, Reason	-

Purpose of Application: Renewal of an NPDES Permit for an existing discharge of treated sanitary wastewater from an STP.

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 (62798) as of 2/24/2023. *3/23/2023 CWY*

Approve	Deny	Signatures	Date
X		Stephen A. McCauley Stephen A. McCauley, E.I.T. / Environmental Engineering Specialist	2/24/2023
X		Chad W. Yurisic Chad W. Yurisic, P.E. / Environmental Engineer Manager	3/23/2023

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.0344
Latitude	41º 00' 2.08"	Longitude	-79º 43' 14.35"
Quad Name	-	Quad Code	-
Wastewater Description:	Sewage Effluent		
Receiving Waters	South Branch Bear Creek (WWF)	Stream Code	49141
NHD Com ID	123851410	RMI	4.27
Drainage Area	2.11	Yield (cfs/mi^2)	0.047
Q_{7-10} Flow (cfs)	0.099	Q_{7-10} Basis	calculated
Elevation (ft)	1195	Slope (ft/ft)	0.0033
Watershed No.	17-C	Chapter 93 Class.	WWF
Existing Use	-	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Impaired*		
Cause(s) of Impairment	Metals		
Source(s) of Impairment	Acid Mine Drainage**		
TMDL Status	pending	Name	-

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

Nearest Downstream Public Water Supply Intake	PA American Water Co. - Butler		
PWS Waters	Allegheny River	Flow at Intake (cfs)	~950
PWS RMI	69.9	Distance from Outfall (mi)	21.0

* - This discharge consists of treated municipal sewage only and does not contribute to the impairment of the receiving stream. However, since the stream is impaired for AMD metals, per the SOP, monitoring for Total Aluminum, Total Iron, and Total Manganese will be added with this renewal.

Sludge use and disposal description and location(s): All sludge is hauled to an approved landfill by Dalton's Service Company, LLC.

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 0.0344 MGD of treated sewage from a municipal STP in Fairview Township, Butler County.

Treatment permitted under Water Quality Management Permit No. 1083405 consists of the following: A flow splitter box, two aeration tanks, two clarifiers, tablet chlorine disinfection with a contact tank, and a sludge holding tank.

1. Streamflow:

Buffalo Creek at Freeport, PA (1976-1996) - used for most Connoquenessing Creek discharges:

Drainage Area:	137	sq. mi.	(USGS StreamStats)
Q_{7-10}:	6.37	cfs	(USGS StreamStats)
Yieldrate:	0.047	cfsm	calculated

South Branch Bear Creek at Outfall 001:

Yieldrate:	0.047	cfsm	calculated above
Drainage Area:	4.59	sq. mi.	(USGS StreamStats)
Q_{7-10}:	0.215	cfs	calculated

% of stream allocated: 100% Basis: No nearby discharges

2. Wasteflow:

Maximum discharge: 0.0344 MGD = 0.053 cfs

Runoff flow period: 24 hours Basis: Runoff flow for municipal STPs

There is greater than 3 parts stream flow (Q7-10) to 1 part effluent (design flow), so 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, E. Coli, Total Phosphorus, Total Nitrogen, NH_3-N, $CBOD_5$, Dissolved Oxygen, and Total Residual Chlorine.

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/year.

Basis: Application of Chapter 92a.61 as recommended by the SOP for flows between 0.002 MGD and 0.05 MGD.

e. Phosphorus

Chapter 96.5 does not apply. The previous monitoring for Total Phosphorus will be retained in accordance with the SOP, based on Chapter 92a.61. However, the monitoring frequency will be reduced from 2/month to 1/year since the receiving stream is not impaired for nutrients, per the SOP.

f. Total Nitrogen

The previous monitoring for Total Nitrogen will be retained in accordance with the SOP, based on Chapter 92a.61. However, the monitoring frequency will be reduced from 1/month to 1/year since the receiving stream is not impaired, per the SOP.

g. Ammonia-Nitrogen (NH_3-N)

Median discharge pH to be used:	7.4	Standard Units (S.U.)
		Basis: eDMR data
Discharge temperature:	25°C	(default value used in the absence of data)
Median stream pH to be used:	7.0	Standard Units (S.U.)
		Basis: default value used in the absence of data
Stream Temperature:	25˚C	(default value used for WWF modeling)
Background NH_3-N concentration:	0.1	mg/l
		Basis: Default value
Calculated NH_3-N Summer limits:	4.6	mg/l (monthly average)
	9.2	mg/l (instantaneous maximum)
Calculated NH_3-N Winter limits:	13.8	mg/l (monthly average)
	27.6	mg/l (instantaneous maximum)

Result: WQ modeling resulted in the summer limits above (see Attachment 1). The winter limits are calculated as three times the summer limits. The calculated limits are less stringent than the current limits. Since the current limits are being attained, the previous, more restrictive limits will be retained.

h. $CBOD_5$

Median discharge pH to be used: 7.4 Standard Units (S.U.)

Basis: eDMR data

Discharge temperature: 25°C (default value used in the absence of data)

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

Basis: default value used in the absence of data

Stream Temperature: 25˚C (default value used for WWF modeling)

Background $CBOD_5$ concentration: 2.0 mg/l

Basis: Default value

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

Result: WQ modeling resulted in the limits above (see Attachment 1). The calculated limits are less restrictive than the previous limits. Since the previous limits are being attained, they will be retained. Also, the seasonal limits were replaced with year round limits.

i. Influent Total Suspended Solids and BOD_5

Monitoring for these two parameters will be retained as recommended in the SOP for POTWs, as authorized under Chapter 92a.61.

j. Dissolved Oxygen (DO)

The Dissolved Oxygen minimum of 4.0 mg/l will be retained with this renewal. The 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.

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.

k. Disinfection

☐ Ultraviolet (UV) light

Basis: N/A

☒ TRC limits: 0.5 mg/l (monthly average)
1.6 mg/l (instantaneous maximum)

Basis: The TRC limits above were calculated using the Department's TRC Calculation Spreadsheet (see Attachment 2). The limits are the same as in the previous NPDES Permit and will be retained.

The measurement frequency will remain as 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).

4. Reasonable Potential Analysis for Receiving Stream:

A Reasonable Potential Analysis was not performed in accordance with State practices for Outfall 001 using the Department's Toxics Management Spreadsheet since no sampling other than sewage-related parameters was performed for this facility with the renewal application.

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

The Department's Toxics Management Spreadsheet does not calculate limits for parameters that are based on PWS criteria (TDS, Chloride, Bromide, and Sulfate). Since no relevant sampling was provided, mass-balance calculations were not performed.

Nearest Downstream potable water supply (PWS): PA American Water Company - Butler

Distance downstream from the point of discharge: 21.0 miles (approximate)

Result: No limits or monitoring are necessary as there is significant dilution available.

6. Flow Information:

79% of the wastewater flow comes from the Fairview Township, and 21% of the wastewater flow comes from the Karns City Borough. All the sewers flowing to the Karns City STP are separate sewers.

7. Anti-Backsliding:

Since all the permit limits in this renewal are the same or more restrictive than the previous NPDES Permit, anti-backsliding is not applicable.

8. Attachment List:

Attachment 1 - WQ Modeling Printouts

Attachment 2 - TRC Spreadsheet

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

Compliance History

DMR Data for Outfall 001 (from January 1, 2022 to December 31, 2022)

Parameter	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22	JUN-22	MAY-22	APR-22	MAR-22	FEB-22	JAN-22
Flow (MGD) Average Monthly	0.0234	0.0222	0.0203	0.0168	0.0154	0.0156	0.0168	0.0237	0.0240	0.0258	0.0370	0.0196
Flow (MGD) Weekly Average	0.0271	0.0296	0.0273	0.0201	0.0193	0.0173	0.0189	0.0293	0.0339	0.0314	0.0399	0.0252
pH (S.U.) Minimum	7.42	7.42	7.40	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.42	7.42
pH (S.U.) Maximum	7.44	7.45	7.44	7.44	7.45	7.45	7.45	7.44	7.43	7.46	7.46	7.45
DO (mg/L) Minimum	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
TRC (mg/L) Average Monthly	0.34	0.33	0.33	0.33	0.3	0.33	0.31	0.33	0.39	0.36	0.32	0.33
TRC (mg/L) Instantaneous Maximum	0.44	0.41	0.47	0.44	0.47	0.45	0.50	0.53	0.49	0.45	0.59	0.55
CBOD5 (lbs/day) Average Monthly	1.1	1.2	0.5	0.4	0.5	1.1	0.8	0.94	1.3	2.1	3.1	0.7
CBOD5 (lbs/day) Weekly Average	1.9	2.4	0.7	0.5	0.8	1.3	1.4	1.60	2.3	2.6	4.7	1.2
CBOD5 (mg/L) Average Monthly	5.6	6.6	3.0	3.03	4.0	8.5	6.0	4.7	6.3	9.7	10.2	4.2
CBOD5 (mg/L) Weekly Average	8.2	9.7	3.0	3.05	5.0	8.9	8.6	6.5	8.3	10.0	14.0	5.5
BOD5 (lbs/day) Influent Average Monthly	25.2	50.9	45.5	25.2	47.9	61.9	74.3	39.3	24.0	29.5	41.6	24.7
BOD5 (mg/L) Influent Average Monthly	129	275	269	180	373	476	53	199	120.0	137.1	133	151
TSS (lbs/day) Average Monthly	0.8	1.5	1.3	0.7	1.3	0.7	0.7	1.30	1.4	2.1	3.3	1.6
TSS (lbs/day) Influent Average Monthly	27.9	48.9	35.9	68.2	58.9	69.1	47.1	15.0	12.8	19.4	28.4	17.8
TSS (lbs/day) Weekly Average	1.0	2.4	1.8	1.0	2.7	0.8	0.8	1.90	2.0	3.0	3.9	2.5
TSS (mg/L) Average Monthly	4.0	7.9	7.4	5.0	9.8	5.0	4.8	6.60	7.1	9.8	10.8	9.6
TSS (mg/L) Influent Average Monthly	143	264	212	492	459	531	336	76.0	64.0	90.0	92	109
TSS (mg/L) Weekly Average	4.4	9.7	8.0	6.0	16.8	5.6	4.8	7.60	7.2	11.6	11.6	12.0

Fecal Coliform (No./100 ml) Geometric Mean	286	141.5	77.4	25.4	36	190	82	68.0	104	224.5	421	330
Fecal Coliform (No./100 ml) Instantaneous Maximum	374	143	109	34.0	83	373	86	74.0	109	504.0	576	420
Total Nitrogen (mg/L) Average Monthly	0.5	2.1	1.5	1.4	0.4	6.4	3.9	5.7	4.4	2.5	1.9	1.1
Ammonia (lbs/day) Average Monthly	0.1	0.22	0.06	0.1	0.3	0.9	0.7	1.0	0.44	0.40	0.06	0.08
Ammonia (mg/L) Average Monthly	0.5	1.2	0.35	0.49	2.7	3.2	3.5	2.1	2.2	1.84	0.2	0.5
Total Phosphorus (mg/L) Average Monthly	2.2	4.3	2.8	3.8	7.0	5.9	3.4	2.95	2.4	1.62	1.0	2.4

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	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	4.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	5.7	8.5	XXX	20.0	30.0	40	2/month	8-Hr Composite
BOD5 Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
TSS	8.5	12.8	XXX	30.0	45.0	60	2/month	8-Hr Composite
TSS Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	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/year	Grab
Total Nitrogen	Report Annl Avg	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	8-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	3.4	XXX	XXX	12.0	XXX	24	2/month	8-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	1.1	XXX	XXX	4.0	XXX	8	2/month	8-Hr Composite

Outfall 001, Continued (from 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	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Total Phosphorus	Report Annl Avg	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	8-Hr Composite
Total Aluminum	Report Annl Avg	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Grab
Total Iron	Report Annl Avg	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Grab
Total Manganese	Report Annl Avg	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	Grab

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 technology-based on Chapter 92a.48. The limits for $CBOD_5$ are water-quality based on Chapter 93.7. The limits for Total Suspended Solids (TSS) and Fecal Coliforms are technology-based on Chapter 92a.47. The limits for Ammonia-Nitrogen are water quality-based on Chapter 93.7. Monitoring for E. Coli, Total Nitrogen, Total Phosphorus, Total Aluminum, Total Iron, and Total Manganese is based on Chapter 92a.61.

Attachment 1

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
17C	49141	SOUTH BRANCH BEAR 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)
4.270	Karns City STP	PA0239739	0.034	CBOD5	25		
				NH3-N	4.67	9.34	
				Dissolved Oxygen			4

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
17C	49141	SOUTH BRANCH BEAR CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
4.270	0.034	25.000	7.102
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
6.626	0.380	17.419	0.060
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
10.03	1.141	1.63	1.029
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.304	22.295	Owens	5
Reach Travel Time (days)			
0.748			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.075	9.01	1.51	6.98
0.150	8.09	1.40	7.21
0.224	7.27	1.30	7.33
0.299	6.53	1.20	7.44
0.374	5.87	1.11	7.53
0.449	5.27	1.03	7.54
0.524	4.73	0.95	7.54
0.598	4.25	0.88	7.54
0.673	3.82	0.82	7.54
0.748	3.43	0.76	7.54

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	5		

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
17C	49141	SOUTH BRANCH BEAR CREEK	**4.270**	1196.00	2.11	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	0.047	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
Karns City STP	PA0239739	0.0344	0.0000	0.0000	0.000	25.00	7.40

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	7.54	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
17C	49141	SOUTH BRANCH BEAR CREEK	**3.530**	1182.00	7.36	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	0.047	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

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
17C	49141	SOUTH BRANCH BEAR 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
4.270	Karns City STP	9.68	21.23	9.68	21.23	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
4.270	Karns City STP	1.32	4.67	1.32	4.67	1	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)		
4.27	Karns City STP	25	25	4.67	4.67	4	4	0	0

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
17C	49141	SOUTH BRANCH BEAR 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												
4.270	0.10	0.00	0.10	.0532	0.00358	.38	6.63	17.42	0.06	0.748	25.00	7.10
Q1-10 Flow												
4.270	0.06	0.00	0.06	.0532	0.00358	NA	NA	NA	0.05	0.868	25.00	7.14
Q30-10 Flow												
4.270	0.13	0.00	0.13	.0532	0.00358	NA	NA	NA	0.07	0.665	25.00	7.08

Attachment 2

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.215	= Q stream (cfs)	0.5	= CV Daily
0.0344	= 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 = 1.308	1.3.2.iii	WLA cfc = 1.267
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.487	5.1d	LTA_cfc = 0.737

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)**