pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0216216**
Facility Type	**Municipal**	APS ID	**1074899**
Major / Minor	**Minor**	Authorization ID	**1416212**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Burgettstown-Smith Township Joint Sewer Authority**	Facility Name	**Raccoon Creek WWTP**
Applicant Address	PO Box 389 377 Joffre Bulger Road	Facility Address	7 Columbia Drive
	Burgettstown, PA 15021-0389		Burgettstown, PA 15021
Applicant Contact	Shari Crawford	Facility Contact	Sam Duran
Applicant Phone	(724) 947-9609	Facility Phone	(724) 947-5365
Client ID	87542	Site ID	249843
Ch 94 Load Status	Not overloaded	Municipality	Smith Township
Connection Status	No limit	County	Washington
Date Application Received	October 31, 2022	EPA Waived?	Yes
Date Application Accepted	February 15, 2023	If No, Reason	
Purpose of Application	NPDES permit renewal.		

Summary of Review

1.0 General discussion: The PA Department of Environmental Protection received an NPDES permit renewal application from KLH Engineers, Inc. on October 31, 2022 on behalf of Burgettstown-Smith Township Joint Sewer Authority (permittee) for permittee's Raccoon Creek WWTP (facility), located in Smith Township, Washington County. This is a minor sewage facility with a design flow of 0.8 MGD that discharges into Raccoon Creek (WWF) in state watershed 19-B. The current permit will expire on April 30, 2023. The terms and conditions of the current permit is automatically extended since the renewal application was received at least 180 days prior to the expiration date. Renewal NPDES permit applications under Clean Water program are not covered by PADEP's PDG per 021-2100-001. This fact sheet is developed in accordance with 40 CFR §124.56.

1.1 Changes in this renewal: NH3-N, CBOD5, DO limits recalculated, E-coli monitoring added, lat/long for Outfall 001 is corrected.

1.2 Sludge use and disposal description and location(s): Generated biosolids are stabilized using two aerobic digesters. The digested solids are applied to Reed Beds for dewatering.

1.3 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
√		Reza H. Chowdhury, E.I.T. / Project Manager	March 1, 2023
X		Pravin Patel Pravin C. Patel, P.E. / Environmental Engineer Manager	03/02/2023

1.4 Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	0.8
Latitude	40º 23' 12.89"	Longitude	-80º 22' 9.88"
Quad Name	Clinton	Quad Code	1503
Wastewater Description:	Sewage Effluent		
Receiving Waters	Racoon Creek (WWF)	Stream Code	33564
NHD Com ID	99689786	RMI	38.78
Drainage Area	19 mi^2	Yield (cfs/mi^2)	0.044
Q_{7-10} Flow (cfs)	0.307	Q_{7-10} Basis	See section 1.4.2
Elevation (ft)	960.60	Slope (ft/ft)	
Watershed No.	19-B	Chapter 93 Class.	WWF
Existing Use	**WWF**	Existing Use Qualifier	Ch. 93
Exceptions to Use	None	Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status	**Final (4/7/2005)**	Name	**Raccoon Creek Watershed TMDL**
Background/Ambient Data		Data Source	
pH (SU)	7.0	Default	
Temperature (°C)	25	Default	
Hardness (mg/L)	100	Default	
Nearest Downstream Public Water Supply Intake		Denqusne Light Co-BVPS#1 in Shippingport Boro	
PWS Waters	Ohio River	Flow at Intake (cfs)	
PWS RMI	5.66	Distance from Outfall (mi)	44.12

Changes Since Last Permit Issuance: None

1.4.1 Public Water Supply Intake:

The nearest downstream PWS intake is Denqusne Light Co-BVPS#1 in Shippingport Borough. The PWS water is Ohio River at 5.66 RMI which is approximately 44 miles downstream of the discharge point. Due to the distance, dilution in Ohio River, and effluent limitations, it is believed that the discharge will not cause any negative effect on the water supply. The previous permit's fact sheet identified Midland Boro Water Authority on Ohio River as nearest downstream PWS intake, however, this PWS wasn't identified during a search in eMapPa for downstream PWS intakes.

1.4.2 Stream flow:

USGS's web based watershed delineation tool StreamStats (accessible at https://streamstats.usgs.gov/ss/, accessed on February 16, 2023) was utilized to determine the drainage area and low flow statistics of the receiving stream at discharge point. The StreamStats delineation report shows a drainage area at the Outfall 001 to be 19 mi^2, Q_{7-10} of 0.307 cfs, and Q_{30-10} of 0.525 cfs.

Yield: 0.307/19 or 0.016 cfs/mi^2
Q_{30-10}: Q_{1-10} = 0.525/0.307 or 1.71

The flow statistics values are significantly lower than the values used in previous permits. The previous permits calculated Q_{7-10} at the Outfall 001 by calculating yield of 0.044 cfs/mi^2 at Moffat's Mill gaging station (which is inactive now) for the reporting period of 1943-1992. The previous protection report also used a drainage area of 36 mi^2 at the Outfall 001. A yield of 0.044 cfs/mi^2 is acceptable since it was derived from historical stream data, therefore, it will be used during the permit renewal. However, a drainage area of 19 mi^2 instead of 36 mi^2 will be used for stream flow calculation and modeling since this is updated drainage area and the previous permits couldn't support the source of higher drainage area.

$Q_{7\text{-}10}$ = 0.044 cfs/mi^2*19 mi^2 or 0.836 cfs

Default $Q_{1\text{-}10}$:$Q_{7\text{-}10}$ and $Q_{30\text{-}10}$:$Q_{7\text{-}10}$ ratio of 0.64 and 1.36, respectively, will be used in modeling, if needed.

1.4.3 Outfall 001 location:

The previous permit used a lat/long of 40º 23' 31" and -80º 22' 21" which doesn't match with the issued permit, renewal application, or locational map provided with application, and identifies the WWTP in different township (Burgettstown Borough), different 7.5' quad map code (Ellsworth, 1805). The correct location per the NPDES permit application, locational map, and search in eMapPa is 40º 23' 12.89", -80º 22' 9.88". This results in the locational township as Smith Township, quad name Clinton, and quad code 1503. This also changes the NHD Com ID from 99411498 to 99689786 and RMI from 37.31 to 38.78. This corrected location explains the reduced drainage area at discharge point (as discussed in 1.4.2) since the next downstream confluence is at 38.4 mile (confluence with Burgetts Fork, 33846) where drainage area is 37.5 mi^2, very close to previous permit's drainage area of 36 m^2 at outfall 001.

1.4.4 Wastewater Characteristics:

A median pH of 7.0 was calculated from daily eDMR data for the months July-September for 2021-2022 reporting years. A default hardness of 100 mg/l and default discharge temperature of 25°C will be used for modeling, if needed.

1.4.5 Background Data:

There is no nearby WQN station from the Outfall 001, therefore, default values will be used. A default pH of 7.0, temperature of 25°C, and hardness of 100 mg/l will be used for modeling, as needed.

1.4.6 Raccoon Creek Watershed TMDL:

Raccoon Creek Watershed TMDL was finalized on February 3, 2025. The TMDL was needed to address the impairments in Acid Mine Drainage (AMD) affected segments, especially in Allegheny, Beaver, and Washington Counties. There is no WLA for this discharger, however, a monitoring requirement was added in previous permits to evaluate if the discharge from this facility is adding to existing impairment. A Reasonable Potential (RP) analysis will be conducted to determine if a numeric limitation is needed for the AMD parameters, i.e., Total Aluminum, Total Iron, and Total Manganese. If no RP is demonstrated, annual sampling will be carried over.

1.4.7 Antidegradation (93.4):

The effluent limits for this discharge have been developed to ensure that existing in-stream water uses and the level of water quality necessary to protect the existing uses are maintained and protected. The receiving streams are designated as Warm-Water Fishes (WWF.) No High-Quality stream or Exceptional Value water is impacted by this discharge; therefore, no Antidegradation Analysis is performed for the discharge.

2.0 Treatment Facility Summary

Treatment Facility Name: Raccoon Creek WWTP

WQM Permit No.	Issuance Date
6397402	1997

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Tertiary	SBR W/Solids removal	UV	0.8

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.8	1,468	Not Overloaded	Dewatering	Combination of methods

Changes Since Last Permit Issuance: None

2.0 Treatment Plant:

2.1 Summary:

Burgettstown-Smith Township Joint Sewer Authority (BSTJSA/permittee) owns and operates a minor sewage treatment facility named Raccoon Creek WWTP (facility), located in Smith Township, Washington County. The average annual design flow and hydraulic design capacity is 0.8 MGD and organic loading capacity is 1,468 lbs. BOD5/day at 220 mg/l influent BOD5 concentration.

2.2 Tributary information:

The facility receives flows from the following contributing municipalities:

TRIBUTARY INFORMATION				
		Type of Sewer System		
Municipalities Served	Flow Contribution (%)	Separate (%)	Combined (%)	Population
Burgettstown Borough	20%	100%		
Mount Pleasant Township	10%	100%		
Smith Township	70%	100%		2842 customers total

2.3 Treatment units:

The raw sewage pumped to grit removal and screening, flows to 2 SBR units, and disinfected by UV disinfection units before discharge. Per the inspection conducted in November 14, 2018, the facility consists of the following treatment units:

1. Three raw sewage pumps
2. One Pista grit system
3. Two bar screens (1 manual, 1 auto)
4. Two SBR tanks
5. Three blowers
6. Two aerobic digesters
7. Three sludge waste pumps
8. One UV disinfection system
9. Nine reed drying beds
10. Two utility pumps

2.4 Industrial/commercial contributors:

The following table shows the industrial/commercial contributors (not categorical or significant users):

INDUSTRIAL / COMMERCIAL WASTEWATER CONTRIBUTIONS					
List name, type of business, and the average wastewater flow of any industrial or commercial establishment/business connected to the sewer system. Use additional sheets as necessary. ☐ Check here if there are NO industrial or commercial users.					
Business Name	Type of Business	Significant Industrial User?	Non-Significant Categorical Industrial User?	Hauled-in Waste?	Average Wastewater Flow (MGD)
Union Electric Steel	Steel Mill	☐	☐	☐	0.0074
Langeloth	Producer of Molybdenum	☐	☐	☐	0.0072
		☐	☐	☐	
Does the facility have an EPA-approved pretreatment program? ☐ Yes ☒ No					

2.5 hauled-in waste:

The facility received hauled-in waste and is planning to receive in future.

	Type of Waste(s) Received	Location Where Received	Annual Average Volume Received (gallons)
Past Three Years	Septage &	Influent Manhole	80,625
	Porta-John waste		
Next Five Years	Septage &	Influent Manhole	59,500
	Porta-John Waste		

2.6 Biosolids management:

Generated biosolids are stabilized using two aerobic digesters. The digested solids are applied to Reed Beds for dewatering.

3.0 Compliance History

3.1 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	0.442	0.437	0.315	0.439	0.401	0.394	0.353	0.666	0.553	0.479	1.011	0.547
Flow (MGD) Daily Maximum	0.714	1.367	0.488	1.436	1.055	1.142	0.812	3.99	1.186	0.591	3.254	1.599
pH (S.U.) Instantaneous Minimum	7.04	6.98	6.87	6.8	6.8	6.77	6.7	6.8	6.63	6.71	6.79	6.7
pH (S.U.) IMAX	7.4	7.35	7.28	7.15	7.25	7.11	7.01	7.19	7.72	7.07	7.42	7.2
DO (mg/L) Instantaneous Minimum	7.0	7.36	7.64	7.05	6.95	6.78	7.0	7.1	6.35	8.11	8.51	7.75
CBOD5 (lbs/day) Average Monthly	< 10.0	< 9.0	< 7.0	< 10.0	< 9.0	< 8.0	< 9.0	< 11.0	< 16.0	< 12.0	< 18.0	< 12.0
CBOD5 (lbs/day) Weekly Average	< 10.0	< 11.0	< 8.0	< 14.0	< 13.0	< 10.0	< 12.0	< 16.0	< 22.0	< 15.0	< 35.0	< 16.0
CBOD5 (mg/L) Average Monthly	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
CBOD5 (mg/L) Weekly Average	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	308	263	351.0	344	222	300	357	354	283	253	404	272
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	369	320	656	452	290	375	400	492	323	312	704	331
BOD5 (mg/L) Raw Sewage Influent Average Monthly	95	93	144	94	79	115	127	102	61	66	72.0	72.0
TSS (lbs/day) Average Monthly	< 10.0	< 9.0	< 7.0	< 10.0	< 9.0	< 8.0	< 11.00	< 13.0	< 16.0	< 15.0	< 23.0	< 15.0
TSS (lbs/day) Raw Sewage Influent Average Monthly	252	211	365	439	152	341	264	279	288	185	325	217
TSS (lbs/day) Raw Sewage Influent Daily Maximum	302	268	800	723	180	635	297	488	610	222	532	334
TSS (lbs/day) Weekly Average	10.0	< 11.0	< 8.0	< 14.0	< 13.0	10.0	20.0	27.0	< 22.0	20.0	< 35.0	26.0

TSS (mg/L) Average Monthly	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	3.0	< 4.0	< 3.0	< 3.0	< 4.0	< 4.0	< 4.0
TSS (mg/L) Raw Sewage Influent Average Monthly	78	71	149	114	54	121	95	77	72	48	56	56.0
TSS (mg/L) Weekly Average	3.0	< 3.0	< 3.0	< 3.0	< 3.0	3.0	5.0	5.0	< 3.0	5.0	7.0	6.0
Fecal Coliform (No./100 ml) Geometric Mean	2.0	< 1.0	< 2.0	< 2.0	< 12	< 1.0	< 1.0	< 1.0	< 3.0	< 2.0	< 9.0	< 1.0
Fecal Coliform (No./100 ml) IMAX	3.0	4.0	6.0	17	207	2	< 1.0	< 1.0	18	41	94	3.0
Ammonia (lbs/day) Average Monthly	2.0	< 0.4	< 0.3	< 1.0	0.5	< 0.5	0.07	0.7	1.0	1.0	3.0	2.0
Ammonia (mg/L) Average Monthly	0.52	< 0.14	< 0.11	< 0.26	0.17	< 0.19	0.25	0.20	0.24	0.25	0.27	0.56
UV Dosage (mjoules/cm^2) Daily Minimum	2.7	2.48	2.63	2.44	2.29	2.45	2.25	2.06	1.81	1.61	1.8	2.47

3.2 Effluent Violation for Outfall 001 from February 1, 2022 to December 31, 2022

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Flow	02/28/22	Avg Mo	1.011	MGD	.8	MGD

3.3 Summary of Discharge Monitoring Reports (DMRs):

DMRs review for the facility for the last 12 months of operation, as presented on the above in section 3.1, indicate that the facility was meeting the permit limits almost 100% of the time.

3.4 Summary of inspection:

11/14/2018: CEI conducted. Violations noted including effluent limits in Part A and SSO. Recommendations were made including update onsite safety plan, ensure SSO are reported to PADEP, implement routine alarm testing, influent sampling prior to any treatment, replace thermometer at influent sampler, supplemental reports for sewage sludge/biosolids production & disposal submitted each month, document calibration for DO meter, and a written SOP to direct non-certified operator activity. An NOV was issued on later date.

4.0 Existing Effluent Limits and Monitoring Requirements

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Daily Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	0.8	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
Dissolved Oxygen	XXX	XXX	4.0 Inst Min	XXX	XXX	XXX	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	166.9	250.4	XXX	25.0	37.5	50	1/week	8-Hr Composite
Biochemical Oxygen Demand (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	200.3	300.4	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
Total Nitrogen	XXX	XXX	XXX	Report Daily Max	XXX	XXX	1/year	Grab
Ammonia-Nitrogen Nov 1 - May 31	46.7	XXX	XXX	7.0	XXX	14	1/week	8-Hr Composite
Ammonia-Nitrogen Jun 1 - Oct 31	20.0	XXX	XXX	3.0	XXX	6	1/week	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report Daily Max	XXX	XXX	1/year	Grab
Aluminum, Total	XXX	XXX	XXX	Report Daily Max	XXX	XXX	1/year	Grab
Iron, Total	XXX	XXX	XXX	Report Daily Max	XXX	XXX	1/year	Grab
Manganese, Total	XXX	XXX	XXX	Report Daily Max	XXX	XXX	1/year	Grab
Ultraviolet light dosage (mjoules/cm²)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Measured

5.0 Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.8
Latitude 40º 23' 12.89" **Longitude** -80º 22' 9.88"
Wastewater Description: Sewage Effluent

5.1 Basis for Effluent Limitations

In general, the Clean Water Act(AWA) requires that the effluent limits for a particular pollutant be the more stringent of either technology-based limits or water quality-based limits. Technology-based limits are set according to the level of treatment that is achievable using available technology. A water quality-based effluent limit is designed to ensure that the water quality standards applicable to a waterbody are being met and may be more stringent than technology-based effluent limits.

5.2 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)

5.3 Mass-Based Limits

The federal regulation at 40 CFR 122.45(f) requires that effluent limits be expressed in terms of mass, if possible. The regulation at 40 CFR 122.45(b) requires that effluent limitations for POTWs be calculated based on the design flow of the facility. The mass-based limits are expressed in pounds per day and are calculated as follows:

Mass based limit (lbs./day) = concentration limit (mg/L) × design flow (mgd) × 8.34

5.4 Water Quality-Based Limitations

5.4.1 WQM 7.0 Model input data:

WQM 7.0 version 1.0b is a water quality model designed to assist DEP to determine appropriate effluent limits for $CBOD_5$, NH_3-N and DO. The model simulates two basic processes. In the NH_3-N module, the model simulates the mixing and degradation of NH_3-N in the stream and compares calculated instream NH_3-N concentrations to NH_3-N water quality criteria. In the D.O. module, the model simulates the mixing and consumption of D.O. in the stream due to the degradation of $CBOD_5$ and NH_3N and compares calculated instream D.O. concentrations to D.O. water quality criteria. The model was utilized for this permit renewal by using $Q_{7\text{-}10}$ and current background water quality levels of the stream. The following data were used in the attached computer model (WQM 7.0) of the stream:

- Discharge pH 7.0 (median July-Sep, 2021-22, eDMR data)
- Discharge Temperature 25°C (Default)
- Discharge Hardness 100 mg/l (Default)

- Stream pH 7.0 (Default)
- Stream Temperature 25°C (Default)
- Stream Hardness 100 mg/l (Default)

The following three nodes were used in modeling:

Node 1: At the outfall 001 on Raccoon Creek (33564)
Elevation: 960.60 ft (USGS TNM 2.0 viewer, 2/16/2023)
Drainage Area: 19 mi^2 (StreamStat Version 3.0, 2/16/2023)
River Mile Index: 39.13 (PA DEP eMapPA)
Low Flow Yield: 0.044 cfs/mi^2
Discharge Flow: 0.8 MGD

Node 2: At confluence with Burgetts Fork (33846)
Elevation: 955.89 ft (USGS TNM 2.0 viewer, 2/16/2023)
Drainage Area: 37.5 mi^2 (StreamStat Version 3.0, 2/16/2023)
River Mile Index: 38.4 (PA DEP eMapPA)
Low Flow Yield: 0.044 cfs/mi^2
Discharge Flow: 0.0 MGD

Node 2 At confluence with UNT 33839
Elevation: 926.84 ft (USGS TNM 2.0 viewer, 2/28/2023)
Drainage Area: 44.2 mi^2 (StreamStat Version 3.0, 2/28/2023)
River Mile Index: 34.3 (PA DEP eMapPA)
Low Flow Yield: 0.044 cfs/mi^2
Discharge Flow: 0.0 MGD

5.4.2 NH_3-N

The attached results of the WQM 7.0 stream model indicates a summer monthly average limit (AML) of 2.38 mg/l and IMAX of 4.76 mg/l of NH_3-N is necessary to protect the aquatic life from toxicity effects. The current permit has summer AML of 3.0 mg/l which is less stringent. The winter limits are calculated by multiplying the summer limits with a factor of 3, per *Implementation Guidance of Section 93.7 Ammonia Criteria, 391-2000-013*. That results in winter AML of 7.14 mg/l and IMAX of 14.28 mg/l. The current permit has winter AML of 7.0 mg/l and IMAX of 14.0 mg/l, which are more stringent and will govern. Mass based summer and winter AMLs are calculated to be 15.88 lbs./day and 47.64 lbs./day, respectively. The summer mass limit is more stringent than previous permit but winter mass limit is more stringent in current permit (46.7 lbs./day). More stringent limits will be applied on this renewal. Mass limits are calculated using the equation presented in section 5.3. A review of the past 12 months eDMR data, as presented in section 3.1, indicates that the facility is discharging at an average concentration of <0.25 mg/l and mass loading of <1 lbs./day. Since the facility will be meeting more stringent limits year-round, more stringent limits will be applied from permit effective date without a compliance schedule.

5.4.3 $CBOD_5$

The model output shows an AML of 7.95 mg/l is required to protect the water quality of the stream. The current permit has the AML of 25 mg/l, Average Weekly Limit (AWL) of 37.5 mg/l, and IMAX of 50 mg/l. A review of the past 12 months eDMR data indicated that the facility is discharging at a concentration of <3.0 mg/l year-round. Therefore, more stringent limit will be applied from the permit effective date without a compliance schedule. The AWL and IMAX limits are calculated by multiplying the AML with a factor of 1.5 and 2, respectively, which results in AWL of 11.93 mg/l and IMAX of 15.9 mg/l. The calculated bass-based AML and AWL limits are 53 lbs./day and 79.6 lbs./day.

5.4.4 Dissolved Oxygen

The existing permit contains a limit of 4 mg/l for Dissolved Oxygen (DO). DEP's Technical Guidance for the Development and Specification of Effluent Limitations (362-0400-001, 10/97) suggests that either the adopted minimum stream D.O. criteria for the receiving stream or the effluent level determined through water quality modeling be used for the limit. 25 Pa Code §93.7 requires a minimum DO of 5.0 mg/l for WWF, which is also supported by model run with 5.0 mg/l as DO

target. A review of past 12 months' eDMR data indicates that the facility is discharging at a minimum concentration of >7 mg/l, therefore, is able to meet the more stringent limit. More stringent limit of 5.0 mg/l will be applied from this renewal.

5.4.5 Total Suspended Solids (TSS)

There is no water quality criterion for TSS. A limit of 30 mg/l AML, 45 mg/l of AWL, and 60 mg/l as IMAX are applied in the existing permit which was based on the minimum level of effluent quality attainable by secondary treatment as defined in 40 CFR 133.102b(1), 40CFR 133.102(b)(2), 25 PA § 92a.47(a)(1) and 25 PA § 92a.47(a)(2). Mass-based limits are calculated based on the equation presented in section 5.3. The resulting mass-based AML and AWL is 200.2 lbs./day and 300.24 lbs./day which are very close to the existing limits. Existing limits will be carried over.

5.4.6 Total Nitrogen and Total Phosphorus

The current permit has annual monitoring for TN and TP which will be carried over. The monitoring requirements are supported by 25 Pa Code §92a.61.

5.4.7 Ultraviolet Irradiation Disinfection

PADEP's SOP BCW-PMT-033 recommends UV parameter monitoring where UV is used as a method of disinfection, with the same frequency as would be if Chlorine was used for disinfection. The existing permit has a daily UV dosage monitoring in mJ/cm^2, which will be carried over.

5.4.8 pH

The TBEL for pH is above 6.0 and below 9.0 S.U. (40 CFR §133.102(c) and Pa Code 25 §§ 95.2(1), 92a.47) which are existing limits and will be carried over.

5.4.9 Fecal Coliform

25 Pa. code § 92a.47.(a)(4) requires a summer technology limit of 200/100 ml as a geometric mean and an instantaneous maximum not greater than 1,000/100ml and § 92a.47.(a)(5) requires a winter limit of 2,000/100ml as a geometric mean and an instantaneous maximum not greater than 10,000/100ml. These are existing limits and will be carried over.

5.4.10 E. Coli

Pa Code 25 § 92a. 61 requires monitoring of E. Coli. DEP's SOP titled "Establishing Effluent Limitations for Individual Sewage Permits (BCW-PMT-033, revised March 24, 2021) recommends quarterly E. Coli monitoring for sewage dischargers with design flow between 0.05 MGD to <1.0 MGD. This requirement will be applied from this permit term.

5.4.11 Flow, influent BOD_5, and influent TSS monitoring

The requirement to monitor the volume of effluent will remain in the draft permit per 40 CFR §122.44(i)1(ii). Influent BOD5 and TSS monitoring requirements are established in the permit per the requirements set in 25 Pa Code § 94.

5.4.12 Toxics

5.4.12.1 General Discussion on TMS

Based on the available data, PADEP utilizes Toxics Management Spreadsheet (TMS) to (1) evaluate reasonable potential for toxic pollutants to cause or contribute to an excursion above the water quality standards and (2) develop WQBELs for those such toxic pollutants (i.e., 40 CFR § 122.44(d)(1)(i)). It is noteworthy that some of these pollutants that may be reported as "non-detect", but still exceeded the criteria, were determined to be candidates for modeling because the method detection levels used to analyze those pollutants were higher than target QLs and/or the most stringent Chapter 93 criteria. The model then recommended the appropriate action for the Pollutants of Concerns based on the following logic:

1. In general, establish limits in the draft permit where the effluent concentration determined in B.1 or B.2 equals or exceeds 50% of the WQBEL (i.e., RP is demonstrated). Use the average monthly, maximum daily and instantaneous

maximum (IMAX) limits for the permit as recommended by the TMS (or, if appropriate, use a multiplier of 2 times the average monthly limit for the maximum daily limit and 2.5 times the average monthly limit for IMAX).

2. For non-conservative pollutants, in general, establish monitoring requirements where the effluent concentration determined in B.1 or B.2 is between 25% - 50% of the WQBEL.

3. For conservative pollutants, in general, establish monitoring requirements where the effluent concentration determined in B.1 or B.2 is between 10% - 50% of the WQBEL.

NOTE 4 – If the effluent concentration determined in B.1 or B.2 is "non-detect" at or below the target quantitation limit (TQL) for the pollutant as specified in the TMS and permit application, the pollutant may be eliminated as a candidate for WQBELs or monitoring requirements unless 1) a more sensitive analytical method is available for the pollutant under 40 CFR Part 136 where the quantitation limit for the method is less than the applicable water quality criterion and 2) a detection at the more sensitive method may lead to a determination that an effluent limitation is necessary, considering available dilution at design conditions.

NOTE 5 – If the effluent concentration determined in B.1 or B.2 is a detection below the TQL but above or equal to the applicable water quality criterion, WQBELs or monitoring may be established for the pollutant.

4. Application managers may, on a site- and pollutant-specific basis, deviate from these guidelines where there is specific rationale that is documented in the fact sheet.

5.4.12.2 Sampled toxic pollutants and model results

Minor sewage facilities with design flow more than 0.1 MGD and receiving flows from industrial/commercial contributors are required to collect and analyze at lease one sample for Total Copper, Total Lead, Total Zinc, and any other parameters that are known or suspected. The facility is in an approved AMD TMDL watershed which requires annual sampling of Total Aluminum, Total Iron, and Total Manganese. These pollutants were analyzed through TMS to determine if an RP is demonstrated. The model input data were presented in section 5.4.1. Maximum reported concentration for these pollutants were entered into the TMS model since the sample size is <10. The below table provides the output from TMS:

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Aluminum	Report	Report	Report	Report	Report	µg/L	805	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Copper	Report	Report	Report	Report	Report	µg/L	15.0	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	129	AFC	Discharge Conc > 10% WQBEL (no RP)

Since no RP is demonstrated, no numeric limitations are applicable. Existing monitoring requirements will be continued.

6.0 Other requirements

6.1 Anti-backsliding

Since proposed limits are at least as stringent as were in current permit unless otherwise noted, anti-backsliding policy isn't applicable.

6.2 Anti-degradation

The receiving stream is designated as WWF. No special protection watershed is impacted by this discharge, therefore, anti-degradation analysis wasn't performed.

6.3 Class A Wild Trout Fisheries

The receiving isn't listed as Class A trout stocking fisheries.

6.4 Effluent monitoring frequency

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Permittees have the option of taking more frequent samples than are required under the permit. These samples can be used for averaging if they are conducted using EPA-approved test methods (generally found in 40 CFR 136) and if the Method Detection Limits are less than the effluent limits. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

7.0 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	Daily Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	0.8	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
Dissolved Oxygen	XXX	XXX	5.0 Inst Min	XXX	XXX	XXX	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	53.0	79.6	XXX	7.95	11.93	15.9	1/week	8-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Total Suspended Solids	200.3	300.4	XXX	30.0	45.0	60	1/week	8-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	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/quarter	Grab
Total Nitrogen	XXX	XXX	XXX	Report Daily Max	XXX	XXX	1/year	Grab
Ammonia-Nitrogen Nov 1 - May 31	46.7	XXX	XXX	7.0	XXX	14	1/week	8-Hr Composite
Ammonia-Nitrogen Jun 1 - Oct 31	15.88	XXX	XXX	2.38	XXX	4.76	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) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Daily Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Total Phosphorus	XXX	XXX	XXX	Report Daily Max	XXX	XXX	1/year	Grab
Aluminum, Total	XXX	XXX	XXX	Report Daily Max	XXX	XXX	1/year	Grab
Iron, Total	XXX	XXX	XXX	Report Daily Max	XXX	XXX	1/year	Grab
Manganese, Total	XXX	XXX	XXX	Report Daily Max	XXX	XXX	1/year	Grab
Ultraviolet light dosage (mjoules/cm^2)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Measured

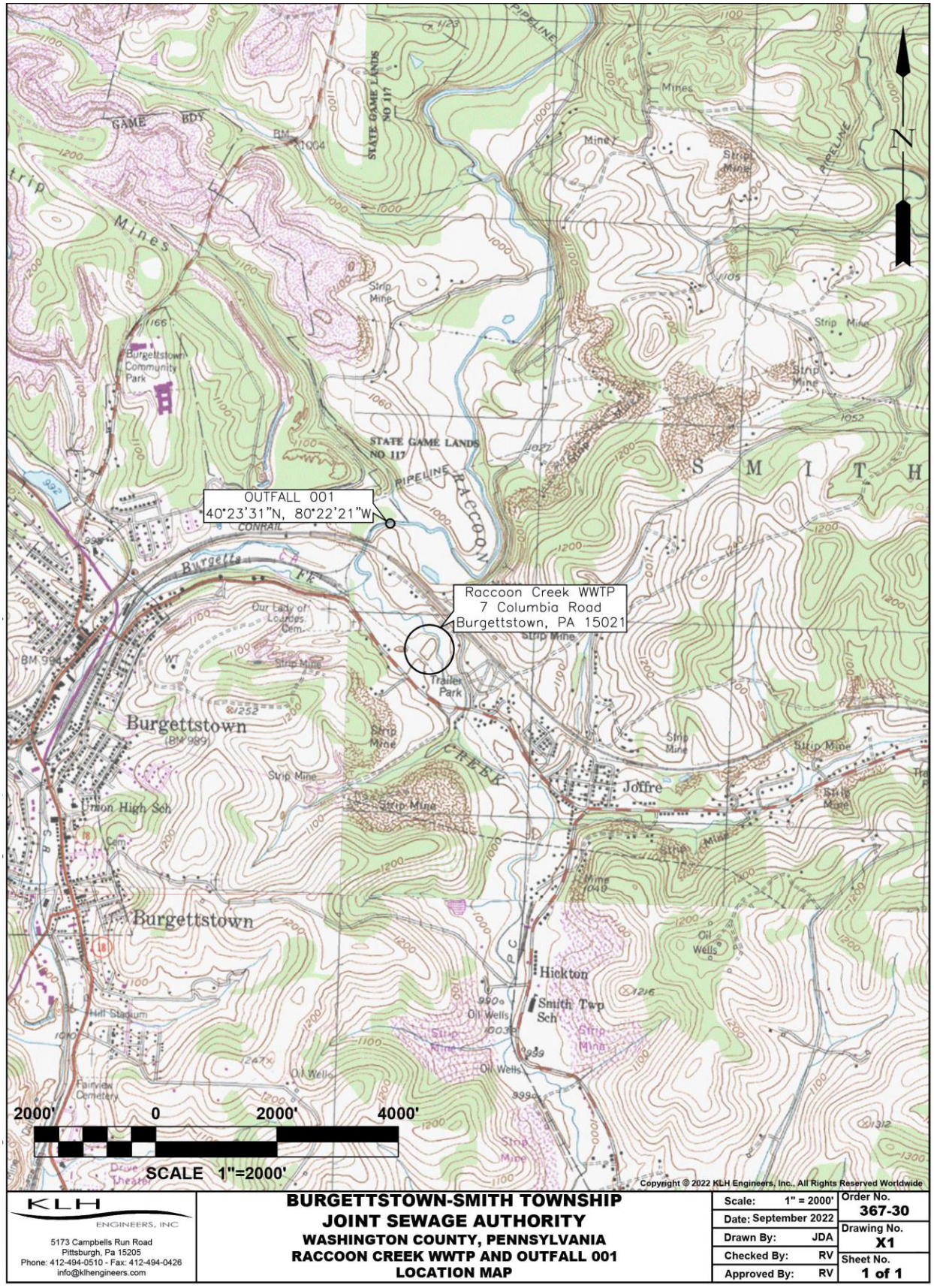
Compliance Sampling Location: At Outfall 001

Other Comments: none

8.0 Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment **B**)
☒	Toxics Management Spreadsheet (see Attachment **C**)
☐	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
☐	Pennsylvania CSO Policy, 385-2000-011, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
☐	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
☐	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
☐	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 391-2000-019, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 391-2000-022, 3/1999.
☐	Design Stream Flows, 391-2000-023, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
☐	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☐	SOP: BCW-PMT-033
☐	Other:

Permit No. PA0216216

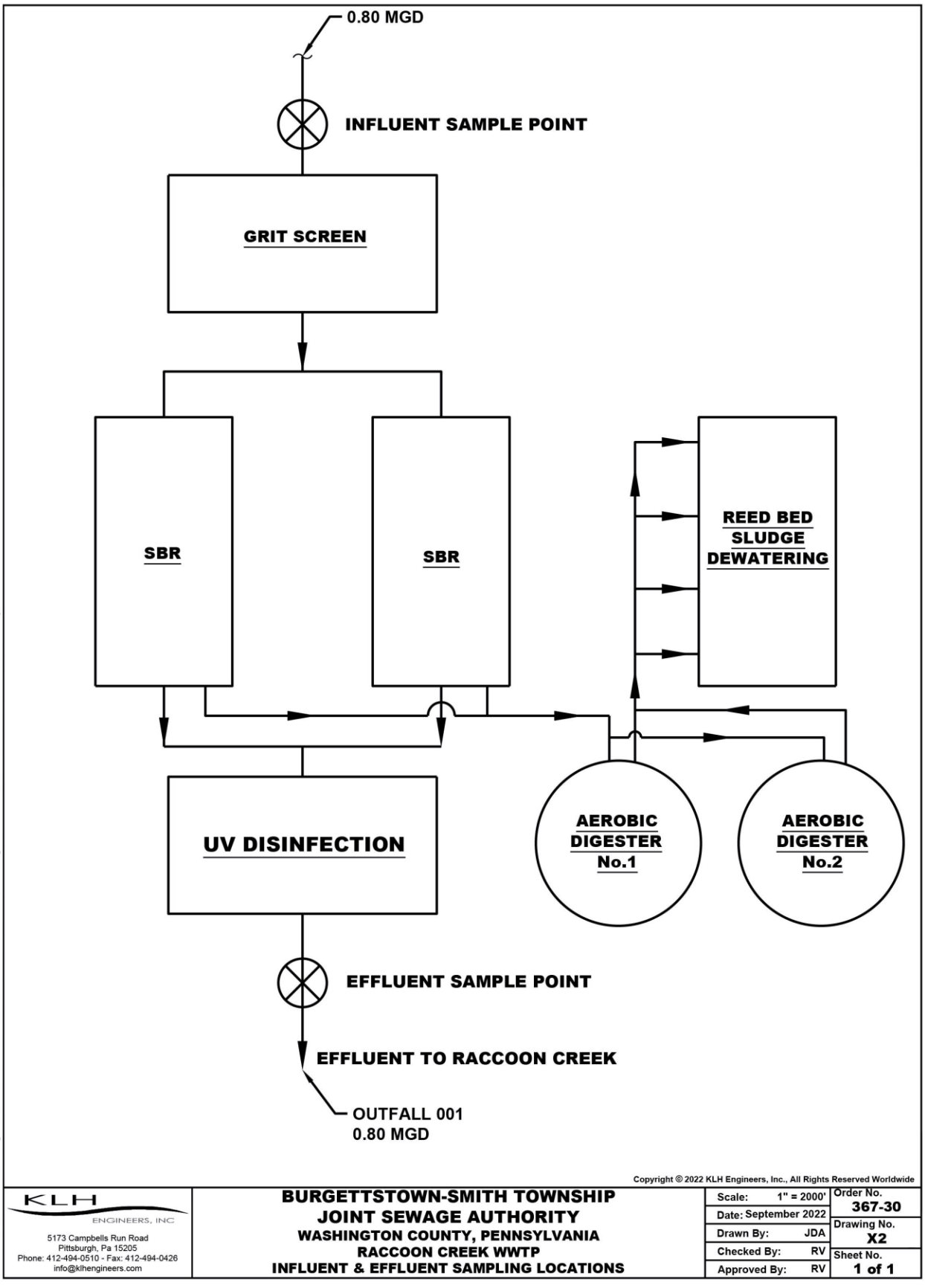
9.0 Locational map



KLH ENGINEERS, INC 5173 Campbells Run Road Pittsburgh, Pa 15205 Phone: 412-494-0510 - Fax: 412-494-0426 info@klhengineers.com	**BURGETTSTOWN-SMITH TOWNSHIP JOINT SEWAGE AUTHORITY** **WASHINGTON COUNTY, PENNSYLVANIA** **RACCOON CREEK WWTP AND OUTFALL 001** **LOCATION MAP**	Scale: 1" = 2000' Date: September 2022 Drawn By: JDA Checked By: RV Approved By: RV Order No. 367-30 Drawing No. X1 Sheet No. 1 of 1

Permit No. PA0216216

10.0 Process flow diagram



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BURGETTSTOWN-SMITH TOWNSHIP
JOINT SEWAGE AUTHORITY
WASHINGTON COUNTY, PENNSYLVANIA
RACCOON CREEK WWTP
INFLUENT & EFFLUENT SAMPLING LOCATIONS

Scale:	1" = 2000'
Date:	September 2022
Drawn By:	JDA
Checked By:	RV
Approved By:	RV
Order No.	367-30
Drawing No.	X2
Sheet No.	1 of 1

Permit No. PA0216216

11.0 Attachments

Attachment A StreamStats

PA0216216 at 001

Region ID: PA
Workspace ID: PA20230217022845943000
Clicked Point (Latitude, Longitude): 40.38688, -80.36945
Time: 2023-02-16 21:29:05 -0500

Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	19	square miles
ELEV	Mean Basin Elevation	1176	feet

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	19	square miles	2.26	1400
ELEV	Mean Basin Elevation	1176	feet	1050	2580

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

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

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	0.791	ft^3/s	43	43
30 Day 2 Year Low Flow	1.33	ft^3/s	38	38
7 Day 10 Year Low Flow	0.307	ft^3/s	66	66
30 Day 10 Year Low Flow	0.525	ft^3/s	54	54
90 Day 10 Year Low Flow	0.927	ft^3/s	41	41

Low-Flow Statistics Citations

Permit No. PA0216216

PA0216216 at Node 2

Region ID: PA
Workspace ID: PA20230217023135865000
Clicked Point (Latitude, Longitude): 40.38925, -80.37387
Time: 2023-02-16 21:31:55 -0500

Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	37.5	square miles
ELEV	Mean Basin Elevation	1172	feet

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	37.5	square miles	2.26	1400
ELEV	Mean Basin Elevation	1172	feet	1050	2580

Permit No. PA0216216

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

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

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	1.71	ft^3/s	43	43
30 Day 2 Year Low Flow	2.78	ft^3/s	38	38
7 Day 10 Year Low Flow	0.708	ft^3/s	66	66
30 Day 10 Year Low Flow	1.15	ft^3/s	54	54
90 Day 10 Year Low Flow	1.97	ft^3/s	41	41

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

Application Version: 4.13.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

Permit No. PA0216216

PA0216216 at node 3

Region ID: PA
Workspace ID: PA20230301023050986000
Clicked Point (Latitude, Longitude): 40.42348, -80.36875
Time: 2023-02-28 21:31:10 -0500

Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	44.2	square miles
ELEV	Mean Basin Elevation	1162	feet

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 4]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	44.2	square miles	2.26	1400
ELEV	Mean Basin Elevation	1162	feet	1050	2580

Permit No. PA0216216

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

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

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	2.05	ft^3/s	43	43
30 Day 2 Year Low Flow	3.3	ft^3/s	38	38
7 Day 10 Year Low Flow	0.863	ft^3/s	66	66
30 Day 10 Year Low Flow	1.39	ft^3/s	54	54
90 Day 10 Year Low Flow	2.34	ft^3/s	41	41

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

Application Version: 4.13.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

Permit No. PA0216216

Attachment B. WQM 7.0

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
20D	33564	RACCOON CREEK	39.130	960.60	19.00	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 (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.044	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
Raccoon Crk STP	PA0216216	0.8000	0.8000	0.8000	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	5.00	8.24	0.00	0.00
NH3-N	3.00	0.00	0.00	0.70

Permit No. PA0216216

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
20D	33564	RACCOON CREEK	38.400	955.89	37.50	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	0.044	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	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

Permit No. PA0216216

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
20D	33564	RACCOON CREEK	34.300	926.84	44.20	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	0.044	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

Permit No. PA0216216

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
20D	33564	RACCOON 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												
39.130	0.84	0.00	0.84	1.2376	0.00122	.602	23.4	38.85	0.15	0.303	25.00	7.00
38.400	1.65	0.00	1.65	1.2376	0.00134	.646	29.06	44.96	0.15	1.630	25.00	7.00
Q1-10 Flow												
39.130	0.54	0.00	0.54	1.2376	0.00122	NA	NA	NA	0.13	0.331	25.00	7.00
38.400	1.06	0.00	1.06	1.2376	0.00134	NA	NA	NA	0.14	1.855	25.00	7.00
Q30-10 Flow												
39.130	1.14	0.00	1.14	1.2376	0.00122	NA	NA	NA	0.16	0.281	25.00	7.00
38.400	2.24	0.00	2.24	1.2376	0.00134	NA	NA	NA	0.17	1.468	25.00	7.00

Permit No. PA0216216

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		

Permit No. PA0216216

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
20D	33564	RACCOON 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
39.130	Raccoon Crk ST	6.76	6	6.76	6	0	0
38.400		NA	NA	6.76	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
39.130	Raccoon Crk ST	1.34	2.57	1.34	2.57	1	0
38.400		NA	NA	1.34	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)		
39.13	Raccoon Crk STP	7.95	7.95	2.38	2.38	5	5	0	0
38.40		NA	NA	NA	NA	NA	NA	NA	NA

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WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20D	33564	RACCOON CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
39.130	0.800	25.000	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
23.400	0.602	38.849	0.147
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
5.55	0.402	1.42	1.029
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.307	1.923	Tsivoglou	5
Reach Travel Time (days)			
0.303			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.030	5.47	1.38	6.11
0.061	5.38	1.34	5.93
0.091	5.30	1.30	5.76
0.121	5.22	1.26	5.62
0.152	5.14	1.22	5.49
0.182	5.06	1.18	5.37
0.212	4.99	1.14	5.27
0.243	4.91	1.11	5.18
0.273	4.83	1.07	5.10
0.303	4.76	1.04	5.03

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
38.400	0.800	25.000	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
29.064	0.646	44.958	0.154
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
3.98	0.287	0.75	1.029
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.936	2.206	Tsivoglou	5
Reach Travel Time (days)			
1.630			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.163	3.76	0.63	5.95
0.326	3.54	0.53	6.04
0.489	3.34	0.45	6.17
0.652	3.15	0.38	6.33
0.815	2.97	0.32	6.50
0.978	2.80	0.27	6.66
1.141	2.64	0.23	6.82
1.304	2.49	0.20	6.96
1.467	2.34	0.17	7.10
1.630	2.21	0.14	7.22

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WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
20D	33564	RACCOON 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)
39.130	Raccoon Crk STP	PA0216216	0.800	CBOD5	7.95		
				NH3-N	2.38	4.76	
				Dissolved Oxygen			5

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Attachment C. TMS

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Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Raccoon Creek WWTP** NPDES Permit No.: **PA0216216** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Treated sewage**

Discharge Characteristics									
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.8	100	7						

	Discharge Pollutant	Units	Max Discharge Conc		0 if left blank: Trib Conc	Stream Conc	0.5 if left blank: Daily CV	Hourly CV	0 if left blank: Stream CV	Fate Coeff	FOS	1 if left blank: Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		452									
	Chloride (PWS)	mg/L		90.3									
	Bromide	mg/L	<	0.1									
	Sulfate (PWS)	mg/L		96.3									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L	<	100									
	Total Antimony	µg/L											
	Total Arsenic	µg/L											
	Total Barium	µg/L											
	Total Beryllium	µg/L											
	Total Boron	µg/L											
	Total Cadmium	µg/L											
	Total Chromium (III)	µg/L											
	Hexavalent Chromium	µg/L											
	Total Cobalt	µg/L											
	Total Copper	µg/L		7									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L		20									
	Total Lead	µg/L	<	1									
	Total Manganese	µg/L		30									
	Total Mercury	µg/L											
	Total Nickel	µg/L											
	Total Phenols (Phenolics) (PWS)	µg/L											
	Total Selenium	µg/L											
	Total Silver	µg/L											
	Total Thallium	µg/L											
	Total Zinc	µg/L		57									
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

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Group 3	Carbon Tetrachloride	µg/L	<										
	Chlorobenzene	µg/L											
	Chlorodibromomethane	µg/L	<										
	Chloroethane	µg/L	<										
	2-Chloroethyl Vinyl Ether	µg/L	<										
	Chloroform	µg/L	<										
	Dichlorobromomethane	µg/L	<										
	1,1-Dichloroethane	µg/L	<										
	1,2-Dichloroethane	µg/L	<										
	1,1-Dichloroethylene	µg/L	<										
	1,2-Dichloropropane	µg/L	<										
	1,3-Dichloropropylene	µg/L	<										
	1,4-Dioxane	µg/L	<										
	Ethylbenzene	µg/L	<										
	Methyl Bromide	µg/L	<										
	Methyl Chloride	µg/L	<										
	Methylene Chloride	µg/L	<										
	1,1,2,2-Tetrachloroethane	µg/L	<										
	Tetrachloroethylene	µg/L	<										
	Toluene	µg/L	<										
	1,2-trans-Dichloroethylene	µg/L	<										
	1,1,1-Trichloroethane	µg/L	<										
	1,1,2-Trichloroethane	µg/L	<										
	Trichloroethylene	µg/L	<										
	Vinyl Chloride	µg/L	<										
Group 4	2-Chlorophenol	µg/L	<										
	2,4-Dichlorophenol	µg/L	<										
	2,4-Dimethylphenol	µg/L	<										
	4,6-Dinitro-o-Cresol	µg/L	<										
	2,4-Dinitrophenol	µg/L	<										
	2-Nitrophenol	µg/L	<										
	4-Nitrophenol	µg/L	<										
	p-Chloro-m-Cresol	µg/L	<										
	Pentachlorophenol	µg/L	<										
	Phenol	µg/L	<										
	2,4,6-Trichlorophenol	µg/L	<										
Group 5	Acenaphthene	µg/L	<										
	Acenaphthylene	µg/L	<										
	Anthracene	µg/L	<										
	Benzidine	µg/L	<										
	Benzo(a)Anthracene	µg/L	<										
	Benzo(a)Pyrene	µg/L	<										
	3,4-Benzofluoranthene	µg/L	<										
	Benzo(ghi)Perylene	µg/L	<										
	Benzo(k)Fluoranthene	µg/L	<										
	Bis(2-Chloroethoxy)Methane	µg/L	<										
	Bis(2-Chloroethyl)Ether	µg/L	<										
	Bis(2-Chloroisopropyl)Ether	µg/L	<										
	Bis(2-Ethylhexyl)Phthalate	µg/L	<										
	4-Bromophenyl Phenyl Ether	µg/L	<										
	Butyl Benzyl Phthalate	µg/L	<										
	2-Chloronaphthalene	µg/L	<										
	4-Chlorophenyl Phenyl Ether	µg/L	<										
	Chrysene	µg/L	<										
	Dibenzo(a,h)Anthrancene	µg/L	<										
	1,2-Dichlorobenzene	µg/L	<										
	1,3-Dichlorobenzene	µg/L	<										
	1,4-Dichlorobenzene	µg/L	<										
	3,3-Dichlorobenzidine	µg/L	<										
	Diethyl Phthalate	µg/L	<										
	Dimethyl Phthalate	µg/L	<										
	Di-n-Butyl Phthalate	µg/L	<										
	2,4-Dinitrotoluene	µg/L	<										

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	2,6-Dinitrotoluene	µg/L	<											
	Di-n-Octyl Phthalate	µg/L	<											
	1,2-Diphenylhydrazine	µg/L	<											
	Fluoranthene	µg/L	<											
	Fluorene	µg/L	<											
	Hexachlorobenzene	µg/L	<											
	Hexachlorobutadiene	µg/L	<											
	Hexachlorocyclopentadiene	µg/L	<											
	Hexachloroethane	µg/L	<											
	Indeno(1,2,3-cd)Pyrene	µg/L	<											
	Isophorone	µg/L	<											
	Naphthalene	µg/L	<											
	Nitrobenzene	µg/L	<											
	n-Nitrosodimethylamine	µg/L	<											
	n-Nitrosodi-n-Propylamine	µg/L	<											
	n-Nitrosodiphenylamine	µg/L	<											
	Phenanthrene	µg/L	<											
	Pyrene	µg/L	<											
	1,2,4-Trichlorobenzene	µg/L	<											
Group 6	Aldrin	µg/L	<											
	alpha-BHC	µg/L	<											
	beta-BHC	µg/L	<											
	gamma-BHC	µg/L	<											
	delta BHC	µg/L	<											
	Chlordane	µg/L	<											
	4,4-DDT	µg/L	<											
	4,4-DDE	µg/L	<											
	4,4-DDD	µg/L	<											
	Dieldrin	µg/L	<											
	alpha-Endosulfan	µg/L	<											
	beta-Endosulfan	µg/L	<											
	Endosulfan Sulfate	µg/L	<											
	Endrin	µg/L	<											
	Endrin Aldehyde	µg/L	<											
	Heptachlor	µg/L	<											
	Heptachlor Epoxide	µg/L	<											
	PCB-1016	µg/L	<											
	PCB-1221	µg/L	<											
	PCB-1232	µg/L	<											
	PCB-1242	µg/L	<											
	PCB-1248	µg/L	<											
	PCB-1254	µg/L	<											
	PCB-1260	µg/L	<											
	PCBs, Total	µg/L	<											
	Toxaphene	µg/L	<											
	2,3,7,8-TCDD	ng/L	<											
Group 7	Gross Alpha	pCi/L												
	Total Beta	pCi/L	<											
	Radium 226/228	pCi/L	<											
	Total Strontium	µg/L	<											
	Total Uranium	µg/L	<											
	Osmotic Pressure	mOs/kg												

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Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Raccoon Creek WWTP, NPDES Permit No. PA0216216, Outfall 001

Instructions | Discharge | Stream

Receiving Surface Water Name: Raccoon Creek

No. Reaches to Model: 1

- (●) Statewide Criteria
- ( ) Great Lakes Criteria
- ( ) ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi^2)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	033564	39.13	960.6	19			Yes
End of Reach 1	033564	38.4	955.89	37.5			Yes

$Q_{7\text{-}10}$

Location	RMI	LFY (cfs/mi^2)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	39.13	0.044										100	7		
End of Reach 1	38.4	0.044													

Q_h

Location	RMI	LFY (cfs/mi^2)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	39.13														
End of Reach 1	38.4														

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Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Raccoon Creek WWTP, NPDES Permit No. PA0216216, Outfall 001

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | (•) All ( ) Inputs ( ) Results ( ) Limits

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 7.465 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	1,257	
Total Copper	0	0		0	13.439	14.0	23.5	Chem Translator of 0.96 applied
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	64.581	81.6	137	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	117.180	120	201	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 7.465 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	8.956	9.33	15.6	Chem Translator of 0.96 applied
Total Iron	0	0		0	1,500	1,500	2,513	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.517	3.18	5.33	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	118.139	120	201	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): 7.465 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Permit No. PA0216216

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	1,000	1,000	1,676	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 13.662 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Aluminum	Report	Report	Report	Report	Report	µg/L	805	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Copper	Report	Report	Report	Report	Report	µg/L	15.0	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	129	AFC	Discharge Conc > 10% WQBEL (no RP)

☑ ***Other Pollutants without Limits or Monitoring***

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	N/A	N/A	PWS Not Applicable

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Chloride (PWS)	N/A	N/A	PWS Not Applicable
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	N/A	N/A	PWS Not Applicable
Total Iron	2,513	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	N/A	N/A	Discharge Conc < TQL
Total Manganese	1,676	µg/L	Discharge Conc ≤ 10% WQBEL