pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0228621**
Facility Type	**Municipal**	APS ID	**1088787**
Major / Minor	**Minor**	Authorization ID	**1440283**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Smithfield Township Board of Supervisors**	Facility Name	**Smithfield Township Wastewater Treatment Facility**
Applicant Address	PO Box 102 East Smithfield, PA 18817-0102	Facility Address	235 Park Lane East Smithfield, PA 18817
Applicant Contact	Raychel Boggs	Facility Contact	Douglas Williams
Applicant Phone	(570) 596-7770	Facility Phone	(570) 596-7216
Client ID	94250	Site ID	604634
Ch 94 Load Status	Not Overloaded	Municipality	Smithfield Township
Connection Status	No Limitations	County	Bradford
Date Application Received	May 15, 2023	EPA Waived?	Yes
Date Application Accepted	May 30, 2023	If No, Reason	
Purpose of Application	Renewal of an existing NPDES permit for the discharge of treated sewage.		

Public Participation

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

Approve	Deny	Signatures	Date
X		Derek S. Garner / Project Manager	April 18, 2024
X		Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	April 18, 2024

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.06
Latitude	41º 51' 31.95"	Longitude	-76º 37' 46.24"
Quad Name	East Troy	Quad Code	0432
Wastewater Description:	Sewage Effluent		

Receiving Waters	Tomjack Creek	Stream Code	30702
NHD Com ID	66397929	RMI	7.43
Drainage Area	4.7	Yield (cfs/mi^2)	0.01
Q_{7-10} Flow (cfs)	0.06	Q_{7-10} Basis	Streamgage No. 01517000
Elevation (ft)	1182	Slope (ft/ft)	0.019
Watershed No.	4-C	Chapter 93 Class.	TSF
Existing Use	n/a	Existing Use Qualifier	n/a
Exceptions to Use	n/a	Exceptions to Criteria	n/a
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment	n/a		
Source(s) of Impairment	n/a		
TMDL Status	n/a	Name	n/a

Nearest Downstream Public Water Supply Intake	Danville Municipal Water Authority		
PWS Waters	Susquehanna River	Flow at Intake (cfs)	1,120
PWS RMI	138	Distance from Outfall (mi)	144

Treatment Facility Summary

The Smithfield Township Wastewater Treatment Facility was constructed and operates under WQM Permit No. 0802403, issued March 19, 2003. The permit approved the construction and operation of the following treatment facilities: one comminutor, one manually cleaned bar screen, one equalization tank, two aeration tanks, two settling tanks, one chlorine contact tank with sodium hypochlorite disinfection, and one aerobic digestion/sludge holding tank. The permit was amended on April 20, 2015 to replace the chlorine disinfection system with ultraviolet light disinfection.

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Activated Sludge	Ultraviolet	0.06
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.06	136.2	Not Overloaded	Aerobic Digestion	Other WWTP

Compliance Review

The facility was most recently inspected by DEP on March 25, 2020. The associated report indicated that no violations were identified during the inspection.

The following eDMR violations occurred during the existing permit's term:

- The December 2021 monitoring period DMR was submitted late.
- April 24, 2022 capacity of the plant was exceeded. A flow of 0.071 MGD was reported, exceeding the permitted limit of 0.06 MGD.

The following open violation is associated with the permittee:

Program	Program Specific ID	Inspection ID	Violation ID	Inspection Category	Violation Date	Violation Code	Violation
WRM Water Obstructions & Encroachments	94250	3058831	889438	Clnt	7/22/2020	691.402COMPL	Failure to comply with permit conditions

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.06
Latitude 41º 51' 31.95" **Longitude** -76º 37' 46.24"
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)

Water Quality-Based Limitations

DEP models in-stream conditions to determine if water quality-based effluent limitations ("WQBELs") are appropriate. A model was created using WQM 7.0 v1.1 to determine if the existing limits for CBOD5, ammonia-N and dissolved oxygen are appropriate or if more stringent limits are necessary.

The water quality model WQM 7.0 v1.1 is used to determine the WQBELs for dissolved oxygen, CBOD5 and ammonia-n (NH3-N) based on a multiple-discharge analysis, if applicable. The model assumes complete and instantaneous mixing with the receiving surface water. The reach chosen to model the in-stream characteristics is appropriate as a recovery in dissolved oxygen levels is demonstrated. The modeling output is as follows:

Parameter	Discharge Conc. (mg/l)	Effluent Limitations		
		30 Day Average (mg/l)	Maximum (mg/l)	Minimum (mg/l)
CBOD5	25	25	-	-
NH3-N	3	2.99	5.98	-
Dissolved Oxygen	5	-	-	5

The input concentration for CBOD5 is the technology-based concentration limit in the existing permit and the input concentrations for ammonia-N and dissolved oxygen are the water quality-based concentration limits in the existing permit. Based on the model output, the existing limits are protective of the receiving surface water.

Best Professional Judgment (BPJ) Limitations

Influent monitoring for BOD5 and TSS based on Chapter 94 requirements are proposed to remain in the permit.

Since the facility uses ultraviolet light for disinfection, monitoring for UV intensity is proposed to remain in the permit.

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

Chesapeake Bay

From 2014 to 2018 the facility conducted annual monitoring for total nitrogen and total phosphorus. The results are summarized as follows:

Monitoring Period	Total Nitrogen		Total Phosphorus	
	Load (lbs/day)	Conc. (mg/l)	Load (lbs/day)	Conc. (mg/l)
2014	2.20	20.70	0.28	2.66
2015	3.42	15.20	0.76	3.36
2016	4.10	17.10	0.86	2.70
2017	5.32	23.62	0.62	2.76
2018	6.09	14.61	0.62	1.49
AVG	***4.23***	***18.25***	***0.63***	***2.59***

Since this Phase 5 facility has completed five years of monitoring, per Pennsylvania's Chesapeake Bay Watershed Implementation Plan (WIP) nutrient monitoring is no longer necessary and was removed during the permit's most recent renewal in 2018.

Anti-Backsliding

No limits are proposed to be made less stringent. Anti-backsliding should not impact the permit renewal.

Existing Effluent Limitations and Monitoring Requirements

The existing effluent limitations and monitoring requirements are as follows:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Instantaneous Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	12	20	XXX	25.0	40.0	50	2/month	8-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	2/month	Grab
Total Suspended Solids	15	22	XXX	30.0	45.0	60	2/month	8-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	2/month	Grab
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
Ultraviolet light intensity (mW/cm^2)	XXX	XXX	Report	XXX	XXX	XXX	Continuous	Metered
Ammonia-Nitrogen Nov 1 - Apr 30	4.5	6.5	XXX	9.0	13.0	18	2/month	8-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	1.5	2.0	XXX	3.0	4.5	6	2/month	8-Hr Composite

Compliance Sampling Location: Outfall 001

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (386-0400-001), SOPs and/or BPJ.

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Instantaneous Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
CBOD5	12	20	XXX	25.0	40.0	50	2/month	8-Hr Composite
BOD5 Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	2/month	Grab
TSS	15	22	XXX	30.0	45.0	60	2/month	8-Hr Composite
TSS Raw Sewage Influent	Report	XXX	XXX	Report	XXX	XXX	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
UV Intensity (mW/cm²)	XXX	XXX	Report	XXX	XXX	XXX	Continuous	Metered
Ammonia Nov 1 - Apr 30	4.5	6.5	XXX	9.0	13.0	18	2/month	8-Hr Composite
Ammonia May 1 - Oct 31	1.5	2.0	XXX	3.0	4.5	6	2/month	8-Hr Composite

Compliance Sampling Location: Outfall 001

Input Data WQM 7.0

Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
30702	TOMJACK CREEK	**7.430**	1182.00	4.70	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	0.100	0.00	0.06	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
Smithfield WWTP	PA0228621	0.0600	0.0600	0.0600	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	6.00	0.00	0.00	0.70

Input Data WQM 7.0

Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
30702	TOMJACK CREEK	**6.490**	1088.00	6.74	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	0.100	0.00	0.09	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
04C	30702	TOMJACK 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												
7.430	0.06	0.00	0.06	.0928	0.01894	.386	6.8	17.64	0.06	0.985	23.04	7.00
Q1-10 Flow												
7.430	0.05	0.00	0.05	.0928	0.01894	NA	NA	NA	0.06	1.022	23.24	7.00
Q30-10 Flow												
7.430	0.08	0.00	0.08	.0928	0.01894	NA	NA	NA	0.06	0.915	22.66	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	0.84	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		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
04C	30702	TOMJACK 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
7.430	Smithfield WWTP	12.81	12	12.81	12	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
7.430	Smithfield WWTP	1.59	2.99	1.59	2.99	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
7.43	Smithfield WWTP	25	25	2.99	2.99	3	3	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
04C	30702	TOMJACK CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (ºC)	Analysis pH
7.430	0.060	23.037	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
6.799	0.386	17.637	0.058
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
15.97	1.325	1.81	0.884
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.058	20.259	Owens	5
Reach Travel Time (days)			
0.985			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.099	13.74	1.66	6.47
0.197	11.83	1.52	6.88
0.296	10.18	1.40	7.13
0.394	8.76	1.28	7.33
0.493	7.54	1.17	7.50
0.591	6.49	1.08	7.65
0.690	5.59	0.99	7.78
0.788	4.81	0.90	7.80
0.887	4.14	0.83	7.80
0.985	3.56	0.76	7.80

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
04C	30702	TOMJACK 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)
7.430	Smithfield WWTP	PA0228621	0.060	CBOD5	25		
				NH3-N	2.99	5.98	
				Dissolved Oxygen			3