

Application Type Renewal
Facility Type Municipal
Major / Minor Minor

**NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE**

Application No. PA0061361
APS ID 563600
Authorization ID 1348206

Applicant and Facility Information

| | | | |
|---------------------------|--|------------------|---|
| Applicant Name | <u>Smithfield Sewer Authority</u> | Facility Name | <u>Smithfield Wastewater Treatment Plant</u> |
| Applicant Address | <u>1155 Red Fox Road</u> <u>East Stroudsburg, PA 18301-9106</u> | Facility Address | <u>Ivy Lane</u> <u>East Stroudsburg, PA 18301-9106</u> |
| Applicant Contact | <u>Russel Albert, Chairman</u> | Facility Contact | <u>Terri Timko, Assistant Secretary</u> |
| Applicant Phone | <u>(570) 223-5082</u> | Facility Phone | <u>(570) 223-5082</u> |
| Client ID | <u>74938</u> | Site ID | <u>243472</u> |
| Ch 94 Load Status | <u>Not Overloaded</u> | Municipality | <u>Smithfield Township</u> |
| Connection Status | <u>No Limitations</u> | County | <u>Monroe</u> |
| Date Application Received | <u>April 1, 2021</u> | EPA Waived? | <u>Yes</u> |
| Date Application Accepted | <u>April 8, 2021</u> | If No, Reason | <u>-</u> |
| Purpose of Application | <u>Renewal of NPDES permit for discharge of treated sewage.</u> | | |

Summary of Review

The applicant is requesting the renewal of an NPDES permit to discharge up to 0.40 MGD of treated sewage into an Unnamed Tributary to Sambo Creek, a Cold-Water Fishery, Migratory Fish (CWF, MF) receiving stream in State Water Plan Basin 1-E (Brodhead Creek). As per the Department's current existing use list, the receiving stream does not have an existing use classification that is more protective than its designated use. This stream segment is designated as a naturally reproducing trout stream as per PA Fish & Boat Commission. This discharge is not expected to affect public water supplies.

Limitations for pH, Dissolved Oxygen (DO), Total Suspended Solids (TSS), and Fecal Coliform are technology-based and carried over from the previous permit.

Limitations for Ammonia-Nitrogen are water quality-based and carried over from the previous permit. WQM 7.0 did not recommend stricter limitation for Ammonia-Nitrogen.

WQM modeling did recommend stricter limitations for CBOD₅ (23.0 mg/L monthly average). A multiplier of 1.5 was used to calculate the average weekly limitation (34.5 mg/L) and a multiplier of 2.0 was used to calculate the IMAX limitation (46.0 mg/L). These limitations will come into effect four (4) years after the permit effective date. eDMR data from the previous year (November 1, 2022 to October 31, 2023) indicates the facility should be able to meet the proposed limits (eDMR data can be seen on pages 5-6 of this act sheet).

The Total Residual Chlorine (TRC) average monthly effluent limitation has been removed because UV Disinfection is used as the primary disinfection method. In the event the facility uses chlorine for cleaning purposes or as a back-up disinfection option, Total Residual Chlorine (TRC) should be sampled "daily when discharging" (see requirements under Part C.I.C). The TRC Calculation Spreadsheet recommends a stricter IMAX limitation than the previous permit. The permittee will be required to meet the new water quality-based limit for TRC starting four (4) years after the effective date of the permit. The TRC IMAX limitation from the previously issued permit will be in effect for the first four years after the permit effective date.

| Approve | Deny | Signatures | Date |
|---------|------|--|------------------|
| X | | /s/ Allison Seyfried / Project Manager | December 6, 2023 |
| X | | /s/ Amy M. Bellanca, P.E. / Program Manager | 12-21-23 |

Summary of Review

The quarterly monitoring and reporting for Total Nitrogen, Total Phosphorous, Total Kjeldahl Nitrogen, and Nitrate-Nitrite as N has been maintained in this permit.

Sewage discharges now require monitoring and reporting for E. Coli. A monitoring frequency of 1/month for design flows \geq 1 MGD, 1/quarter for design flows \geq 0.05 and $<$ 1 MGD, 1/year for design flows of 0.002 – 0.05 MGD will be utilized.

Per current Standard Operating Procedures for Publicly Owned Treatment Plants, the raw sewage influent monitoring/reporting for TSS and CBOD₅ has been maintained in the permit.

Pollutant sampling results submitted with the permit application were entered into the Toxic Management Spreadsheet (TMS). The highest reported Total Copper concentration was 0.017 mg/L, the highest Total Zinc concentration was 0.088 mg/L, and the highest Total Lead concentration was $<$ 0.010 mg/L. The TMS recommended limits for all three pollutants listed above. The permittee was given the opportunity to conduct a minimum of 10 additional effluent samples for these parameters, using a quantitation limit (QL) that is no greater than the Target QLs identified in the permit application

The permittee collected 10 additional samples during January 2, 2022 through March 10, 2022 and provided the results to the Department via email on October 25, 2022. These updated results were used to re-run the modeling. A summary of the additional sample results provided by the permittee can be seen in the table on page 11 of this fact sheet. The modeling indicated that Copper limits and Total Zinc monitoring/reporting shall be established. Limits were no longer recommended for Total Lead. Results/inputs can be seen on page 12 and 13 of this fact sheet.

Therefore, Total Copper limitations were added to the permit and will come into effect four years after the permit effective date. Monitoring/reporting requirements are included in the permit until the limitations come into effect. Monthly monitoring/reporting for Total Zinc has also been included. The Part C. III. condition regarding Toxics Reduction Evaluations (TREs) is added to the permit and applies to the Total Copper limitations. The permittee will have the option to accept the implementation of the limitations or to perform site-specific studies to verify or refine the WQBELs.

DRBC Docket No. D-92-17 CP does not contain more stringent or additional requirements beyond the NPDES permit.

24-hour composite sampling is now required for every pollutant except pH, DO and Fecal Coliform.

For this permit renewal, all monitoring frequencies for parameters with limitations are consistent with the Department's *Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits* (document no. 362-0400-001).

The previous permit utilized stream gage 01442500 (Brodhead Creek near Minisink, PA) as a reference gage to develop the Low Flow Yield (LFY) of 0.20 cfs/mi², which was used to model the discharge. The previous permit calculated a Q₇₋₁₀ Flow of 0.842 cfs/mi². Updated stream data from this same gage was used to calculate a LFY of 0.19 cfs/mi² and Q₇₋₁₀ Flow of 0.8113 cfs (calculations can be seen on page 8 of this fact sheet). The drainage area at Outfall 001 is too small for USGS StreamStats to estimate accurate low flow values and the state-wide default LFY of 0.1 cfs/mi² was significantly smaller than the previous permit. For modeling inputs, RMI values were obtained using the "PA Historic Streams" feature of eMapPA, drainage areas were delineated using USGS's StreamStats Interactive Map, and elevations were obtained using the elevation profile feature of StreamStats.

The existing permit expired on September 30, 2021 and the application for renewal was received on time.

A Water Management System Inspection query indicated that on October 31, 2023 a Compliance Evaluation was performed.

There is currently one open violation for this client that may need to be resolved before issuance of the final permit:

1. 03/29/2023 - Violation ID 989752 – Violation Code ACT167(11)B – Failure of municipality to adopt or amend and implement stormwater management ordinances or regulations (Program Specific ID: PA1132266).

Sludge use and disposal description and location(s): As per the permittee's NPDES permit renewal application, sludge is hauled to Lehigh County's Pretreatment Facility in Allentown, PA by All State Septic.

Summary of Review

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.

| Discharge, Receiving Waters and Water Supply Information | | | |
|--|--|------------------------------|------------------|
| Outfall No. | 001 | Design Flow (MGD) | 0.40 |
| Latitude | 41° 1' 57.00" | Longitude | -75° 10' 31.00" |
| Quad Name | East Stroudsburg | Quad Code | 1044 |
| Wastewater Description: Sewage Effluent | | | |
| Receiving Waters | Unnamed Tributary to Sambo Creek (CWF, MF) | Stream Code | 4926 |
| NHD Com ID | 26141228 | RMI | 0.84 |
| Drainage Area | 4.27 mi ² | Yield (cfs/mi ²) | 0.19 |
| Q ₇₋₁₀ Flow (cfs) | 0.8113 | Q ₇₋₁₀ Basis | USGS Stream Gage |
| Elevation (ft) | 465.75 | Slope (ft/ft) | - |
| Watershed No. | 01E | Chapter 93 Class. | CWF, MF |
| Existing Use | - | Existing Use Qualifier | - |
| Exceptions to Use | - | Exceptions to Criteria | - |
| Assessment Status | Attaining Use(s) | | |
| Cause(s) of Impairment | - | | |
| Source(s) of Impairment | - | | |
| TMDL Status | - | Name | - |
| Nearest Downstream Public Water Supply Intake | Easton Area Water System | | |
| PWS Waters | Delaware River | Flow at Intake (cfs) | - |
| PWS RMI | 110.4 | Distance from Outfall (mi) | ~ 37.5 |

| Treatment Facility Summary | | | | |
|--|----------------------------|---|---------------------|------------------------|
| Treatment Facility Name: Smithfield Wastewater Treatment Plant | | | | |
| Waste Type | Degree of Treatment | Process Type | Disinfection | Avg Annual Flow (MGD) |
| Sewage | Secondary | Extended Aeration/ Sequencing Batch Reactor | Ultraviolet | 0.184 (2018-2020) |
| Hydraulic Capacity (MGD) | Organic Capacity (lbs/day) | Load Status | Biosolids Treatment | Biosolids Use/Disposal |
| 0.40 | 801 | Not Overloaded | Holding Tank | Hauled |

Compliance History

DMR Data for Outfall 001 (from November 1, 2022 to October 31, 2023)

| Parameter | OCT-23 | SEP-23 | AUG-23 | JUL-23 | JUN-23 | MAY-23 | APR-23 | MAR-23 | FEB-23 | JAN-23 | DEC-22 | NOV-22 |
|--|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Flow (MGD) Average Monthly | 0.229 | 0.262 | 0.281 | 0.296 | 0.231 | 0.268 | 0.228 | 0.219 | 0.215 | 0.208 | 0.165 | 0.147 |
| Flow (MGD) Daily Maximum | 0.265 | 0.37 | 0.333 | 0.374 | 0.289 | 0.731 | 0.299 | 0.308 | 0.267 | 0.346 | 0.259 | 0.20 |
| pH (S.U.) Minimum | 6.8 | 7.2 | 7.0 | 7.0 | 7.0 | 7.1 | 7.0 | 7.07 | 7.0 | 7.0 | 7.2 | 7.1 |
| pH (S.U.) Maximum | 7.5 | 7.6 | 7.7 | 7.7 | 7.7 | 7.6 | 7.8 | 7.55 | 7.6 | 7.6 | 7.6 | 7.6 |
| DO (mg/L) Minimum | 7.3 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.1 | 7.0 |
| TRC (mg/L) Daily Maximum | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG | GG |
| CBOD5 (lbs/day) Average Monthly | 4 | < 4.0 | < 6 | < 4 | 4.0 | < 7.0 | < 5 | < 4 | < 12 | < 22 | < 8.0 | < 7.0 |
| CBOD5 (lbs/day) Weekly Average | 4 | 5.0 | < 14 | < 5 | 4.0 | 23.0 | < 8 | 6 | 15 | < 57 | < 10.0 | < 9.0 |
| CBOD5 (mg/L) Average Monthly | 2.1 | < 1.80 | < 2.6 | < 1.6 | 2.0 | < 3.5 | < 2.6 | < 1.9 | < 6.6 | < 12.9 | < 5.7 | < 5.7 |
| CBOD5 (mg/L) Intake Average Monthly | < 124.4 | 431 | < 205 | 104.1 | 180 | 177 | 177.1 | 130 | 164 | 87.2 | 165 | 174 |
| CBOD5 (mg/L) Weekly Average | 2.5 | 2.0 | < 5.9 | < 2.1 | 2.2 | < 6.5 | < 4.4 | 3.2 | 9.2 | < 33.6 | < 7.2 | < 6.8 |
| TSS (lbs/day) Average Monthly | < 9 | < 9.0 | < 9 | < 10 | < 8.0 | < 10.0 | < 8 | < 7 | < 7.0 | < 16 | < 5.0 | < 6.0 |
| TSS (lbs/day) Weekly Average | 13 | < 9.0 | < 10 | < 11 | 11.0 | 11 | < 8 | < 8 | < 8.0 | 44 | < 6.0 | 9.0 |
| TSS (mg/L) Average Monthly | < 5.0 | < 4.0 | < 4.0 | < 4.0 | < 5.0 | < 5.0 | < 4.0 | < 4.0 | < 4.0 | < 10.0 | < 4.0 | < 5.0 |
| TSS (mg/L) Intake Average Monthly | 174 | 420 | 166 | 165 | < 5.0 | 166 | 168 | 89 | 45 | 72.0 | 95.0 | 56 |
| TSS (mg/L) Weekly Average | 7.0 | 4.0 | < 4.0 | < 4.0 | 7.0 | 6.0 | 4.0 | 4.0 | < 4.0 | 26.0 | < 4.0 | 10.0 |
| Fecal Coliform (CFU/100 ml) Geometric Mean | < 2 | 2.0 | < 2 | < 1 | < 1.0 | < 1.0 | < 1 | < 1 | < 1.0 | < 1.0 | < 1.0 | < 1 |

**NPDES Permit Fact Sheet
Smithfield Wastewater Treatment Plant**

NPDES Permit No. PA0061361

| | | | | | | | | | | | | |
|---|-------|--------|--------|--------|-------|-------|------|--------|--------|--------|--------|--------|
| Fecal Coliform (CFU/100 ml) Instantaneous Maximum | 23.3 | 3.0 | 17.3 | 1 | < 1.0 | < 1.0 | < 1 | < 1 | < 1.0 | < 1.0 | < 1.0 | 4.1 |
| Total Nitrogen (mg/L) Average Quarterly | | 26.4 | | | 47.2 | | | 20.1 | | | 17.5 | |
| Ammonia (lbs/day) Average Monthly | < 0.2 | < 0.20 | < 0.4 | < 0.4 | 0.3 | 0.6 | 0.4 | < 0.2 | < 0.4 | < 0.2 | < 0.2 | < 0.4 |
| Ammonia (mg/L) Average Monthly | 0.12 | < 0.11 | < 0.19 | < 0.17 | 0.19 | 0.27 | 0.22 | < 0.12 | < 0.22 | < 0.16 | < 0.12 | < 0.34 |
| Nitrate (mg/L) Average Quarterly | | 25.3 | | | 45.5 | | | 19.1 | | | 16.3 | |
| TKN (mg/L) Average Quarterly | | 1.1 | | | 1.7 | | | < 1 | | | < 1.2 | |
| Total Phosphorus (mg/L) Average Quarterly | | 3.4 | | | 7.8 | | | 2.4 | | | 2.0 | |

Development of Effluent Limitations

| | |
|---|---|
| Outfall No. <u>001</u> | Design Flow (MGD) <u>0.4</u> |
| Latitude <u>41° 2' 0.00"</u> | Longitude <u>-75° 10' 25.00"</u> |
| Wastewater Description: <u>Sewage Effluent</u> | |

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 |
|------------------------------|-----------------|-----------------|--------------------|------------------|
| Total Suspended Solids | 30.0 | Average Monthly | 133.102(b)(1) | 92a.47(a)(1) |
| | 45.0 | Average Weekly | 133.102(b)(2) | 92a.47(a)(2) |
| | 60.0 | IMAX | | |
| 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) |
| Dissolved Oxygen | 5.0 | Minimum | - | BPJ |
| E. Coli | Report | IMAX | - | 92a.61 |

Water Quality-Based Limitations

The following limitations were determined through water quality modeling:

| Parameter | Limit (mg/l) | SBC | Model |
|--|--------------|-------------------|----------------------------------|
| CBOD ₅ | 23.0 | Average Monthly | WQM 7.0 |
| | 34.5 | Average Weekly | |
| | 46.0 | IMAX | |
| Ammonia-Nitrogen Nov 1 - Apr 30 | 7.5 | Average Monthly | Previous Modeling |
| | 15.0 | IMAX | |
| Ammonia-Nitrogen May 1 - Oct 31 | 2.5 | Average Monthly | TRC Calculation Spreadsheet |
| | 5.0 | IMAX | |
| Total Residual Chlorine | 0.66 | IMAX | |
| Total Zinc | Report | Average Monthly | Toxic Modeling Spreadsheet (TMS) |
| | | Daily Max | |
| Total Copper | 0.021 | Average Monthly | |
| | | 0.032 | Daily Max |
| | | 0.052 | IMAX |
| Carbonaceous Biochemical Oxygen Demand (CBOD ₅) Raw Sewage Influent | Report | Average Monthly | POTW Requirement |
| Total Suspended Solids Raw Sewage Influent | Report | Average Monthly | |
| Nitrate as N | Report | Average Quarterly | Previous Permit |
| Total Kjeldahl Nitrogen | | | |
| Total Phosphorus | | | |
| Total Nitrogen | | | |

Anti-Backsliding

No limitations were made less stringent.

Modeling with USGS Stream Gage 01442500 – Broadhead Creek at Minisink Hills, PA:

Period of Record: 9/30/1950 – 2/07/2023

Drainage Area: 259 mi²

| Low-Flow Statistics | | | | | | | |
|------------------------|-------|-----------------------|------------|-----------------|-------------------------|----------|---|
| Statistic Name | Value | Units | Preferred? | Years of Record | Standard Error, percent | Citation | Comments |
| 1 Day 10 Year Low Flow | 44.7 | cubic feet per second | ✓ | 57 | | 49 | Statistic Date Range 4/1/1951 - 3/31/2008 |
| 7 Day 2 Year Low Flow | 80.6 | cubic feet per second | ✓ | 57 | | 49 | Statistic Date Range 4/1/1951 - 3/31/2008 |
| 7 Day 10 Year Low Flow | 48.4 | cubic feet per second | ✓ | 57 | | 49 | Statistic Date Range 4/1/1951 - 3/31/2008 |

$$LFY = \frac{Q_{7-10}}{\text{Stream Gage Drainage Area}} \times \frac{48.4 \text{ cfs}}{259 \text{ mi}^2} = 0.19$$

$$\text{Stream Flow} = \text{Outfall 001 Drainage Area} \times LFY = 4.27 \text{ mi}^2 \times 0.19 = 0.8113 \text{ cfs}$$

Modeling with State-Wide default LFY of 0.1 cfs/mi²:

$$\frac{0.1 \text{ ft}^3/\text{sec}}{\text{mi}^2} \times 4.27 \text{ mi}^2 = \frac{0.427 \text{ ft}^3}{\text{sec}}$$

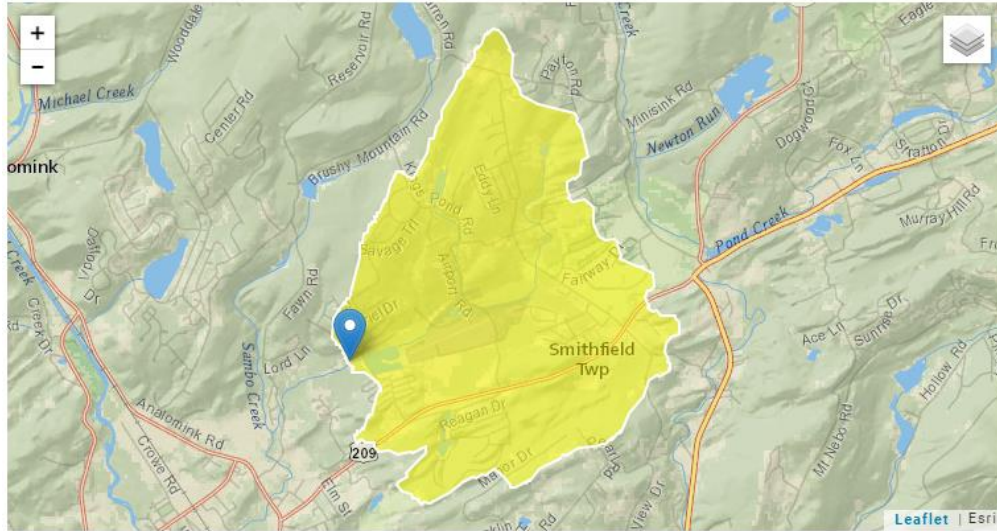
Modeling Using StreamStats:

| RMI | Elevation (ft) | Drainage Area (mi ²) | Q ₇₋₁₀ Flow (cfs) |
|------|----------------|----------------------------------|------------------------------|
| 0.84 | 465.75 | 4.27 | 0.182 |

$$\text{Low Flow Yield using StreamStats} = \frac{0.182 \text{ ft}^3/\text{sec}}{4.27 \text{ mi}^2} = 0.0426 \frac{\text{ft}^3/\text{sec}}{\text{mi}^2}$$

StreamStats Report

Region ID: PA
 Workspace ID: PA20211202164349485000
 Clicked Point (Latitude, Longitude): 41.03335, -75.17356
 Time: 2021-12-02 11:44:10 -0500



Low-Flow Statistics Parameters [Low Flow Region 5]

| Parameter Code | Parameter Name | Value | Units | Min Limit | Max Limit |
|----------------|---------------------------|---------|--------------|-----------|-----------|
| DRNAREA | Drainage Area | 4.27 | square miles | 4.84 | 982 |
| PRECIP | Mean Annual Precipitation | 47 | inches | 33.1 | 47.1 |
| GLACIATED | Percent of Glaciation | 100 | percent | 0 | 100 |
| FOREST | Percent Forest | 78.0203 | percent | 41 | 100 |

Low-Flow Statistics Disclaimers [Low Flow Region 5]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors

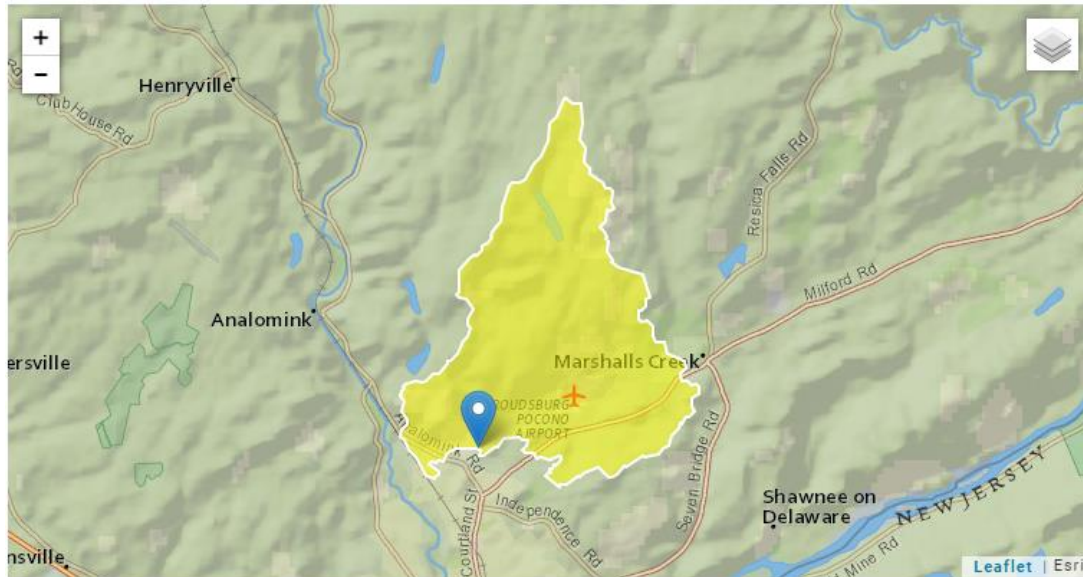
| Statistic | Value | Unit |
|------------------------|-------|--------------------|
| 7 Day 2 Year Low Flow | 0.509 | ft ³ /s |
| 30 Day 2 Year Low Flow | 0.735 | ft ³ /s |
| 7 Day 10 Year Low Flow | 0.182 | ft ³ /s |

At confluence with Sambo Creek:

| RMI | Elevation (ft) | Drainage Area (mi ²) |
|-----------------------|----------------|----------------------------------|
| 0.00 | 449.70 | 8.91 |
| 1.96 (on Sambo Creek) | | |

StreamStats Report

Region ID: PA
 Workspace ID: PA20211202165116923000
 Clicked Point (Latitude, Longitude): 41.02624, -75.18352
 Time: 2021-12-02 11:51:37 -0500



| Parameter Code | Parameter Description | Value | Unit |
|----------------|---|-------|--------------|
| DRNAREA | Area that drains to a point on a stream | 8.91 | square miles |

Modeling with State-Wide default LFY of 0.1 cfs/mi²:

$$\frac{0.1 \text{ ft}^3/\text{sec}}{\text{mi}^2} \times 4.27 \text{ mi}^2 = \frac{0.427 \text{ ft}^3}{\text{sec}}$$

WQM 7.0 Effluent Limits

| SWP Basin | Stream Code | Stream Name | | | | | |
|-----------|-------------|---------------------------|-----------------|------------------|--------------------------------|----------------------------|----------------------------|
| 01E | 4926 | Trib 04926 to Sambo Creek | | | | | |
| RMI | Name | Permit Number | Disc Flow (mgd) | Parameter | Effl. Limit 30-day Ave. (mg/L) | Effl. Limit Maximum (mg/L) | Effl. Limit Minimum (mg/L) |
| 0.840 | Smithfield | PA0061361 | 0.400 | CBOD5 | 23.04 | | |
| | | | | NH3-N | 4.69 | 9.38 | |
| | | | | Dissolved Oxygen | | | 3 |

| TRC EVALUATION | | | | | |
|---|--|-------------------------------|-----|--------------------------------------|---------------------|
| Input appropriate values in A3:A9 and D3:D9 | | | | | |
| 0.8113 | = Q stream (cfs) | | 0.5 | = CV Daily | |
| 0.4 | = 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) | | | =Decay Coefficient (K) | |
| Source | Reference | AFC Calculations | | Reference | CFC Calculations |
| TRC | 1.3.2.iii | WLA_afc = 0.437 | | 1.3.2.iii | WLA_cfc = 0.419 |
| PENTOXSD TRG | 5.1a | LTAMULT_afc = 0.373 | | 5.1c | LTAMULT_cfc = 0.581 |
| PENTOXSD TRG | 5.1b | LTA_afc = 0.163 | | 5.1d | LTA_cfc = 0.243 |
| Source | Effluent Limit Calculations | | | | |
| PENTOXSD TRG | 5.1f | AML_MULT = 1.231 | | | |
| PENTOXSD TRG | 5.1g | AVG MON LIMIT (mg/l) = 0.201 | | AFC | |
| | | INST MAX LIMIT (mg/l) = 0.656 | | | |
| 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) | | | | |

Additional Sample Results for Copper, Lead, and Zinc:

| Date | Copper (mg/L) | Lead (mg/L) | Zinc (mg/L) |
|---------------|---------------|-------------|-------------|
| 1/6/2022 | 0.005 | <0.001 | 0.056 |
| 1/13/2022 | 0.017 | <0.001 | 0.065 |
| 1/20/2022 | 0.007 | <0.001 | 0.06 |
| 1/27/2022 | 0.021 | <0.001 | 0.087 |
| 2/3/2022 | 0.005 | <0.001 | 0.06 |
| 2/10/2022 | 0.018 | <0.001 | 0.06 |
| 2/17/2022 | 0.03 | <0.001 | 0.103 |
| 2/24/2022 | 0.02 | 0.001 | 0.092 |
| 3/3/2022 | 0.026 | <0.001 | 0.085 |
| 3/10/2022 | 0.031 | <0.001 | 0.09 |
| Total (mg/L): | 0.018 | 0.001 | 0.0758 |
| ug/L | 18 | 1 | 75.8 |



WQM 7.0
Results.pdf



DRBC Docket
1992-017 CP Smithfi



TMS PA0061361
Updated.pdf



Smithfield
WWTP-Effluent-WQ



Discharge Information

Instructions Discharge Stream

Facility: Smithfield Sewer Authority NPDES Permit No.: PA0061361 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 |
| 0.4 | 100 | 7 | | | | | | |

| Discharge Pollutant | Units | Max Discharge Conc | 0 if left blank | | 0.5 if left blank | | 0 if left blank | | | 1 if left blank | |
|---------------------|---------------------------------|--------------------|-----------------|-------------|-------------------|-----------|-----------------|------------|-----|-----------------|-------------|
| | | | Trib Conc | Stream Conc | Daily CV | Hourly CV | Stream CV | Fate Coeff | FOS | Criteria Mod | Chem Transl |
| Group 1 | Total Dissolved Solids (PWS) | mg/L | 848 | | | | | | | | |
| | Chloride (PWS) | mg/L | 137 | | | | | | | | |
| | Bromide | mg/L | < 2.5 | | | | | | | | |
| | Sulfate (PWS) | mg/L | 40.4 | | | | | | | | |
| | Fluoride (PWS) | mg/L | | | | | | | | | |
| Group 2 | Total Aluminum | µg/L | | | | | | | | | |
| | 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 | 18 | | | | | | | | |
| | Free Cyanide | µg/L | | | | | | | | | |
| | Total Cyanide | µg/L | | | | | | | | | |
| | Dissolved Iron | µg/L | | | | | | | | | |
| | Total Iron | µg/L | | | | | | | | | |
| | Total Lead | µg/L | < 1 | | | | | | | | |
| | Total Manganese | µg/L | | | | | | | | | |
| | 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 | 75.8 | | | | | | | | | |
| Total Molybdenum | µg/L | | | | | | | | | | |
| Acrolein | µg/L | < | | | | | | | | | |
| Acrylamide | µg/L | < | | | | | | | | | |
| Acrylonitrile | µg/L | < | | | | | | | | | |
| Benzene | µg/L | < | | | | | | | | | |
| Bromoform | µg/L | < | | | | | | | | | |

Recommended WQBELs & Monitoring Requirements

No. Samples/Month: 4

| Pollutants | Mass Limits | | Concentration Limits | | | | Governing WQBEL | WQBEL Basis | Comments |
|--------------|---------------|---------------|----------------------|--------|--------|-------|-----------------|-------------|------------------------------------|
| | AML (lbs/day) | MDL (lbs/day) | AML | MDL | IMAX | Units | | | |
| Total Copper | 0.060 | 0.11 | 20.7 | 32.4 | 51.8 | µg/L | 20.7 | AFC | Discharge Conc ≥ 50% WQBEL (RP) |
| Total Zinc | Report | Report | Report | Report | Report | µg/L | 177 | 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 |
| 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 Lead | N/A | N/A | Discharge Conc < TQL |