Pennsylvania Department of Environmental Protection

Southwest Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0094846**
Facility Type	**Non-Municipal**	APS ID	**1088338**
Major / Minor	**Minor**	Authorization ID	**1439439**

Applicant and Facility Information

Applicant Name	**UMH Properties, Inc.**	Facility Name	**Somerset Estates MHP STP**
Applicant Address	150 Clay Street	Facility Address	1873 Husband Road
	Morgantown, WV 26501-5942		Somerset, PA 15501-7251
Applicant Contact	Jeffery Yorick	Facility Contact	Belinda Baker, Community Manager
Applicant Phone	(304) 291-3380	Facility Phone	(814) 443-3533
Applicant Email	jyorick@umh.com	Facility Email	somerset@umh.com
Client ID	80550	Site ID	718877
Ch 94 Load Status	Not Overloaded	Municipality	Somerset Township
Connection Status		County	Somerset
Date Application Received	May 3, 2023	EPA Waived?	Yes
Date Application Accepted	May 10, 2023	If No, Reason	

Purpose of Application: NPDES permit renewal for discharges of treated sewage.

Summary of Review

On May 1, 2023, UMH Properties, Inc. (UMH) submitted an application to renew NPDES Permit PA0094846 for discharges from UMH's Somerset Estates Mobile Home Park STP. The application was received by DEP on May 3, 2023. The permit currently in effect was issued on October 16, 2018 with an effective date of November 1, 2018 and an expiration date of October 31, 2023. The renewal application was submitted at least 180 days before the permit expired (*i.e.*, was submitted before May 4, 2023), so the terms and conditions of UMH's previous permit were automatically continued past the expiration date in accordance with 25 Pa. Code § 92a.7.

Sludge use and disposal description and location(s): Sludge is hauled by Piles Concrete to the Somerset Township Municipal Authority's Lavansville Sewage Treatment Plant.

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	Return	Deny	Signatures	Date
✓			Ryan C. Decker Ryan C. Decker, P.E. / Environmental Engineer	1/29/2025
✓			Mahbuba Iasmin Mahbuba Iasmin, Ph.D., P.E. / Environmental Engineer Manager	1/31/2025

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.065
Latitude	40° 1' 45"	Longitude	-79° 5' 35"
Quad Name	1813	Quad Code	Somerset
Wastewater Description:	Treated sewage		
Receiving Waters	Unnamed Tributary to East Branch Coxes Creek (WWF)	Stream Code	39032
NHD Com ID	69915631	RMI	1.56
Drainage Area	1.75	Yield (cfs/mi^2)	0.0219
Q_{7-10} Flow (cfs)	0.0383	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	2,113	Slope (ft/ft)	0.0035
Watershed No.	19-F	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Siltation		
Source(s) of Impairment	Highway/Road/Bridge Runoff (Non-Construction Related), Urban Runoff/Storm Sewers		
TMDL Status	Final	Name	Coxes Creek Watershed

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

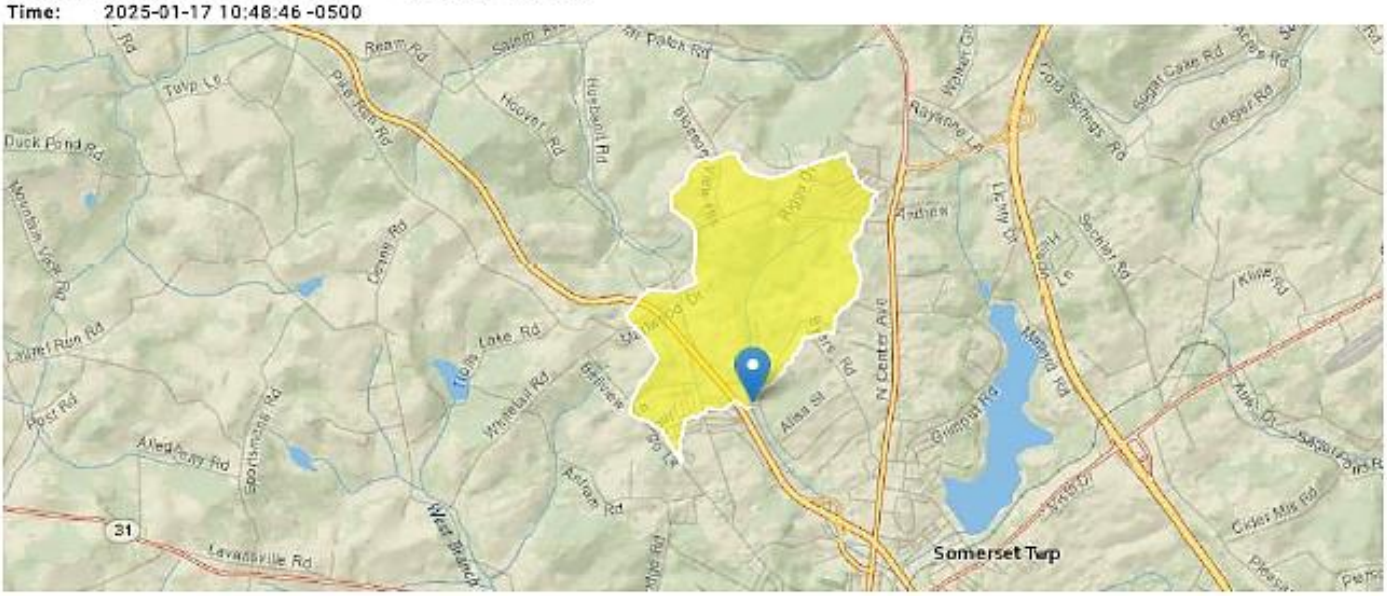
Nearest Downstream Public Water Supply Intake		Indian Creek Valley Water Authority – Ohiopyle	
PWS ID	5260011	PWS Withdrawal (MGD)	0.2592
PWS Waters	Youghiogheny River	Flow at Intake (cfs)	390
PWS RMI	62.0	Distance from Outfall (mi)	45.68

Changes Since Last Permit Issuance:

Other Comments:

StreamStats Report

Region ID: PA
Workspace ID: PA20250117154820196000
Clicked Point (Latitude, Longitude): 40.03149, -79.09289
Time: 2025-01-17 10:48:46 -0500



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	1.75	square miles
ELEV	Mean Basin Elevation	2218	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	1.75	square miles	2.26	1400
ELEV	Mean Basin Elevation	2218	feet	1050	2580

Low-Flow Statistics Disclaimers [Low Flow Region 4]

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

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

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.0887	ft^3/s
30 Day 2 Year Low Flow	0.173	ft^3/s
7 Day 10 Year Low Flow	0.0231	ft^3/s

Statistic	Value	Unit
30 Day 10 Year Low Flow	0.0503	ft^3/s
90 Day 10 Year Low Flow	0.115	ft^3/s

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: 4.25.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

Unnamed Tributary to East Branch Coxes Creek-69915631

Assessment Unit ID: PA-SCR-69915631

Waterbody Condition: Impaired (Issues Identified)

Existing Plans for Restoration: Yes

303(d) Listed: No

Year Reported: 2024

303(d) List Status: EPA Final Action

Other Years Reported: 2016, 2018, 2020, 2022 (opens new browser tab)

Organization Name (ID): Pennsylvania (21PA)

What type of water is this?

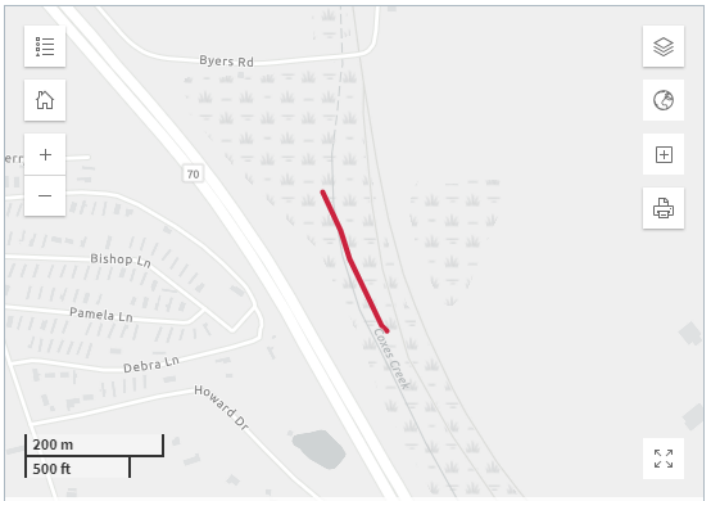
Stream/creek/river (0.1373 Miles)

Where is this water located?

SOMERSET TWP, 15501 (county: Somerset)

Advanced Filtering (opens new browser tab)

Download Waterbody Data (2024)



Assessment Information from 2024

State or Tribal Nation specific designated uses:

Information on Water Quality Standards — Expand All

Warm Water Fishes — Impaired

Probable sources contributing to impairment from 2024:

Click a column heading to sort... Clear Filters

Source	Parameter	Confirmed
Filter...	Filter...	Filter...
Highway/road/bridge Runoff (Non-Construction Related)	Siltation	Yes
Urban Runoff/storm Sewers	Siltation	Yes

Click a column heading to sort... Clear Filters

Assessment Documents

No documents are available

Plans to Restore Water Quality

What plans are in place to protect or restore water quality?

Links below open in a new browser tab.

Plan	Impairments	Type	Completion Date
Coxes Creek Watershed	Metals, pH, Siltation, Total Suspended Solids (TSS)	TMDL	2008-11-24

Treatment Facility / Water Quality Management (WQM) Permit Summary		
Treatment Facility: Somerset Estates Mobile Home Park STP		
WQM Permit No.	**Issuance Date**	**Purpose**
5672411	September 25, 1972	Permit issued to Somerset Township Supervisors for the construction and operation of a 0.012 MGD sewage treatment plant that consists of one (1) 0.2 MGD steel comminutor, one (1) 18,000-gallon aeration tank, one (1) 5,860-gallon final settling tank, one (1) chlorine contact tank, and one (1) 2,990-gallon sludge holding tank.
5672411 T-1	March 3, 1986	Permit transferred from Somerset Township Supervisors to John C. Bishop.
Re-rate (not permitted until A-1)	February 10, 1995	A Treatment Plant Evaluation Study dated February 10, 1995 provided data to support Mr. Bishop's claim that the STP was designed to treat an average design flow of 0.020 MGD. The WQM permit issued on September 25, 1972 indicated that the STP was designed for a capacity of 0.012 MGD. The permit was not amended to acknowledge the re-rating of the system's flow capacity at this time.
5672411 A-1	November 8, 2000	Permit issued to John C. Bishop for the construction and operation of a treatment plant expansion consisting of a 0.010 MGD package extended aeration treatment plant (Unit 2) in parallel with the existing treatment plant (Unit 1), and a new influent structure with a comminutor, coarse bar screen, and weirs to control the flow to each treatment plant located at the head of the parallel plants. Unit 2 includes one (1) 10,000-gallon aeration tank, one (1) 4,310-gallon final settling tank, and one (1) 1,321-gallon aerobic digestion tank. The design calls for the parallel plants to share the existing chlorination facilities and outfall sewer. This amendment also authorized an increase in the system's design flow to 0.030 MGD incorporating the 0.020 MGD re-rate of Unit 1 from 1995 and the 0.010 MGD expansion for Unit 2.
5672411 T-2	September 21, 2004	Permit transferred from John C. Bishop to United Mobile Homes, Inc.
5672411 A-2	January 16, 2007	Permit issued to United Mobile Homes, Inc. for the construction and operation of a treatment plant expansion consisting of a 0.035 MGD extended aeration activated sludge treatment plant (Unit 3) to treat additional flow from the Whispering Pines Development. The expansion includes a new headworks plant including a Parshall flume with flow meter, sewage grinder and bypass bar screen, and one (1) 10,000-gallon equalization tank with a pump to direct influent to a splitter box to distribute flow to the three treatment units. Unit 3 includes one (1) 40,000-gallon aeration tank with fine bubble diffusers, one (1) 6,667-gallon final settling tank, and one (1) 10,500-gallon aerobic digestion tank with overflow return to the head of the plant. The design calls for the parallel plants to share the existing chlorination facilities and outfall sewer. The expansion increases the design flow of the system from 0.03 MGD to 0.065 MGD. The permit also authorized the construction of 10,050 feet of 8" diameter gravity sewers, 750 feet of 3" diameter force main, and a submersible-type pump station (65 gpm @ 43 feet TDH).
5672411 A-3	July 16, 2009	Permit issued to UMH of PA, Inc. for the construction and operation of a dechlorination system including a PulsaFeeder Model LB02SA-VTC1 injector pump and 30-gallon tank to store 12.5% sodium bisulfite solution).

Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary with Ammonia Reduction	Extended aeration	Sodium Hypochlorite	0.065

Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.065		Not Overloaded	None	Hauled for disposal

Compliance History

DMR Data for Outfall 001 (from October 1, 2023 to September 30, 2024)

Parameter	SEP-24	AUG-24	JUL-24	JUN-24	MAY-24	APR-24	MAR-24	FEB-24	JAN-24	DEC-23	NOV-23	OCT-23
Flow (MGD) Average Monthly	0.008	0.012	0.013	0.009	0.010	0.014	0.011	0.013	0.016	0.011	0.013	0.012
pH (S.U.) Daily Minimum	6.3	6.1	6.5	6.8	6.6	6.3	6.3	6.45	6.4	6.5	6.6	6.3
pH (S.U.) Daily Maximum	8.0	6.7	7.2	7.5	7.3	7.3	7.2	7.08	7.3	7.1	7.3	7.2
DO (mg/L) Daily Minimum	6.0	6.0	6.0	6.0	6.0	6.1	6.2	6.03	6.0	6.3	5.9	5.3
TRC (mg/L) Average Monthly	0.04	0.09	0.03	0.03	0.04	0.06	0.06	0.05	0.06	0.05	0.05	0.05
TRC (mg/L) Instantaneous Maximum	0.07	0.65	0.09	0.11	0.09	0.09	0.09	0.09	0.08	0.14	0.09	0.09
CBOD5 (mg/L) Average Monthly	2.3	5.5	4.0	3.7	5.0	3.5	5.0	15.0	5.0	6.0	4.0	3.5
CBOD5 (mg/L) Instantaneous Maximum	3.0	7.0	5.0	5.0	5.0	5.0	6.0	22.0	5.0	7.0	5.0	4.0
TSS (mg/L) Average Monthly	4.0	14.5	5.5	7.7	11.5	6.0	8.5	18.5	6.0	8.0	4.0	4.5
TSS (mg/L) Instantaneous Maximum	5.0	18	8.0	11.0	16.0	7.0	10.0	28.0	6.0	10.0	5.0	5.0
Fecal Coliform (No./100 ml) Geometric Mean	5.6	68	4.1	77.2	303	258	185	402	73	53	7.4	18.9
Total Nitrogen (mg/L) Daily Maximum										34.6		
Ammonia (mg/L) Average Monthly	0.3	0.13	1.0	0.43	0.9	0.1	0.1	0.77	0.1	0.11	0.1	0.1
Ammonia (mg/L) Instantaneous Maximum	0.5	0.15	1.2	1.0	1.5	0.1	0.1	1.4	0.1	0.11	0.1	0.1
Total Phosphorus (mg/L) Daily Maximum										5.1		

Compliance History

Effluent Violations for Outfall 001, from: November 1, 2023 To: September 30, 2024

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Fecal Coliform	05/31/24	Geo Mean	303	No./100 ml	200	No./100 ml

Summary of Inspections:

Other Comments:

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.065
Latitude 40° 1' 54" **Longitude** -79° 5' 35"
Wastewater Description: Treated sewage

Technology-Based Effluent Limitations (TBELs)

25 Pa. Code § 92a.47 – Sewage Permits

Regulations at 25 Pa. Code § 92a.47 specify TBELs and effluent standards that apply to sewage discharges. Section 92a.47(a) requires that sewage be given a minimum of secondary treatment with significant biological treatment that achieves the following:

Table 1. Regulatory TBELs for Sanitary Wastewaters

Parameter	Average Monthly (mg/L)	Average Weekly (mg/L)	Instant. Max (mg/L)	Basis
$CBOD_5$	25	40	50†	25 Pa. Code § 92a.47(a)(1), (a)(2) & 40 CFR § 133.102(a)(4)(i)
Total Suspended Solids	30	45	60†	25 Pa. Code § 92a.47(a)(1), (a)(2) & 40 CFR § 133.102(b)(1)
Fecal Coliform (No./100 mL) May 1 – September 30	200 (Geometric Mean)	N/A	1,000	25 Pa. Code § 92a.47(a)(4)
Fecal Coliform (No./100 mL) October 1 – April 30	2,000 (Geometric Mean)	N/A	10,000	25 Pa. Code § 92a.47(a)(5)
Total Residual Chlorine	0.5 (or facility-specific)	N/A	1.0 (or facility-specific)	25 Pa. Code § 92a.47(a)(8) & § 92a.48(b)(2)
pH (s.u.)	not less than 6.0 and not greater than 9.0			25 Pa. Code § 92a.47(a)(7) & § 95.2(1), & 40 CFR § 133.102(c)

† Value is calculated as two times the monthly average in accordance with Chapter 2 of DEP's "Technical Guidance for the Development and Specification of Effluent Limitations. and Other Permit Conditions in NPDES Permits" [Doc. No. 362-0400-001].

The $CBOD_5$, TSS, and pH limits are the same as those in EPA's secondary treatment regulation (40 CFR § 133.102).

In accordance with Section I.A of DEP's "Standard Operating Procedure for Clean Water Program Establishing Effluent Limitations for Individual Sewage Permits" [SOP No. BCW-PMT-033, Version 2.0, February 5, 2024] and consistent with the previous permit, the average weekly TBELs for $CBOD_5$ and TSS from § 92a.47 are not imposed at Outfall 001 because the sampling frequencies for those parameters (2/month) are less than 1/week.

The minimum dissolved oxygen limit of 4.0 mg/L imposed in the previous permit will be maintained in the renewed permit pursuant to 25 Pa. Code § 92a.61(b) (regarding reasonable monitoring requirements) and 33 U.S.C. §1342(o) (regarding anti-backsliding).

In accordance with Section I.A of DEP's "Standard Operating Procedure for Clean Water Program Establishing Effluent Limitations for Individual Sewage Permits" and under the authority of 25 Pa. Code § 92a.61(b), annual reporting for Total Nitrogen and Total Phosphorus is required for sewage discharges with design flows greater than 2,000 gpd to help evaluate treatment effectiveness and to monitor nutrient loading to the receiving watershed. That reporting was required by the previous permit and will be reimposed in the renewed permit. Pursuant to that same SOP and under the authority of § 92a.61(b), a quarterly reporting requirement for *E. coli* will be added to Outfall 001. *E. coli* was recently added to the bacteria water quality criteria in 25 Pa. Code § 93.7(a); the monitoring will be used to determine if *E. coli* concentrations require additional controls.

Consistent with the previous permit, no mass limits are calculated for $CBOD_5$ or TSS and the average monthly flow is limited to the STP's hydraulic design capacity of 0.065 MGD.

Water Quality-Based Effluent Limitations (WQBELs)

Pursuant to EPA's March 2021 approval of Pennsylvania's 2017 Triennial Review of Water Quality Standards and corresponding regulatory changes published in the *Pennsylvania Bulletin* on July 11, 2020, new water quality criteria for

ammonia-nitrogen apply to waters of the Commonwealth. Therefore, WQBELs are re-evaluated even though there have been no changes to the STP.

WQM 7.0 Water Quality Modeling Program

WQM 7.0 is a water quality modeling program for Windows that determines Waste Load Allocations ("WLAs") and effluent limitations for carbonaceous biochemical oxygen demand ("$CBOD_5$"), ammonia-nitrogen, and dissolved oxygen for single and multiple point-source discharge scenarios. To accomplish this, the model simulates two basic processes. In the ammonia-nitrogen module, the model simulates the mixing and degradation of ammonia-nitrogen in the stream and compares calculated instream ammonia-nitrogen concentrations to ammonia-nitrogen water quality criteria. In the dissolved oxygen module, the model simulates the mixing and consumption of dissolved oxygen in the stream due to the degradation of $CBOD_5$ and ammonia-nitrogen and compares calculated instream dissolved oxygen concentrations to dissolved oxygen water quality criteria. WQM 7.0 then determines the highest pollutant loadings that the stream can assimilate while still meeting water quality criteria under design conditions.

Table 2. WQM 7.0 Inputs for Outfall 001

Discharge Characteristics		
Parameter		**Value**
Discharge Flow (MGD)		0.065
Discharge pH (s.u.)		6.8
Discharge Temp. (°C)		20
Receiving Stream Characteristics		
Parameter	**Outfall 001**	**End of Segment**
Stream Code	39032	39032
River Mile Index	1.56	1.19
Drainage Area (mi^2)	1.75	1.80
Q_{7-10} (cfs)	0.038346	0.0394416
Low-flow Yield (cfs/mi^2)	0.0219	0.0219
Elevation (ft)	2,113	2,106
Slope (ft/ft)	0.0035	0.0035
Stream Temp. (°C)	25.0	See output
Stream pH (s.u.)	7.0	

WQM 7.0 Modeling for Outfall 001

The WQM 7.0 model is run for Outfall 001 to determine whether WQBELs are necessary for $CBOD_5$, ammonia-nitrogen, and/or dissolved oxygen. Input values for the WQM 7.0 model for the discharge to the unnamed tributary to the East Branch of Coxes Creek are shown in Table 2.

DEP's modeling for sewage discharges is a conditional two-step process. First, a discharge is modeled for the summer period (May through October) using warm temperatures for the discharge and the receiving stream. Modeling for the summer period is done first because allowable ammonia-nitrogen concentrations in a discharge are lower at higher temperatures (*i.e.*, warm temperatures are more likely to result in critical loading conditions). Reduced dissolved oxygen levels also appear to increase ammonia toxicity and the maximum concentration of dissolved oxygen in water is lower at higher temperatures. The second step is to evaluate WQBELs for the winter period, but only if modeling shows that WQBELs are needed for the summer period.

For the summer period, pursuant to DEP's "Implementation Guidance of Section 93.7 Ammonia Criteria" [Doc. No. 386-2000-022] (Ammonia Guidance) and in the absence of site-specific data, the discharge temperature is assumed to be 20°C and the design stream temperature and pH are assumed to be 25°C and 7.0 s.u., respectively, based on the recommendations for free stone warm water streams in DEP's Ammonia Guidance (the receiving stream is designated for warm water fishes). The flow used for modeling is the average design flow (0.065 MGD). The discharge pH is the median of the pH values reported on UMH's DMRs. Input discharge concentrations for CBOD-5 and ammonia-nitrogen are the model's defaults: 25 mg/L for both. The input discharge concentration for dissolved oxygen is the 4.0 mg/L minimum dissolved oxygen limit in the current permit. The background dissolved oxygen concentration of the unnamed tributary at 25°C is assumed to be 8.38 mg/L based on the dissolved oxygen saturation concentration in water at that temperature. The width-to-depth ratio of the stream is assumed to be 10 based on DEP policy.

Q_{7-10} stream flow calculated by USGS's StreamStats web application as 0.0231 cfs. However, the drainage area of the unnamed tributary at the discharge point is less than the recommended minimum range for the web application's regression equations, so the standard error of 66% for the application's Q_{7-10} regression estimates is applied to the calculated flow resulting in an estimated Q_{7-10} of: 0.0231 cfs + (0.0231 cfs × 0.66) ≈ 0.038346 cfs. The low-flow yield is calculated as 0.038346 cfs ÷ 1.75 mi^2 ≈ 0.0219 cfs/mi^2.

The results of the modeling (see **Attachment A**) indicate that WQBELs of 2.69 mg/L average monthly and 5.38 mg/L IMAX for ammonia-nitrogen are required. According to the rounding guidelines in DEP's Ammonia Guidance, effluent limitations less than 10 mg/L are rounded down to the nearest 0.5 mg/L and effluent limitations greater than 10 mg/L are rounded down to the nearest 1 mg/L. Therefore, the summer period ammonia-nitrogen WQBELs would be 2.5 mg/L average monthly and 5.0 mg/L IMAX.

Since WQBELs are calculated for the summer period, winter limits also are evaluated. Pursuant to DEP's Ammonia Guidance, WQBELs for the winter period are set by multiplying the summer limits by three, unless modeling indicates that more stringent WQBELs are needed for the winter period.

For winter period modeling, the low-flow yield is doubled to 0.0438 cfs/mi^2 consistent with DEP's Ammonia Guidance. Default stream and discharge temperatures of 5°C and 15°C, respectively, also are assumed based on the Ammonia Guidance. The background dissolved oxygen concentration of the unnamed tributary at 5°C is assumed to be 12.8 mg/L based on the dissolved oxygen saturation concentration in water at that temperature. All other modeling inputs are unchanged from the summer period modeling inputs. The results of the modeling (see **Attachment B**) indicate that winter period limits for ammonia-nitrogen calculated using a summer limit multiplier of three (7.5 mg/L average monthly and 15.0 mg/L IMAX) are equal to the (rounded) winter period modeling results as summarized in Table 3. Therefore, summer and winter period WQBELs equivalent to the existing ammonia-nitrogen WQBELs will be maintained in the renewed permit.

Table 3. WQBELs for Outfall 001 versus Existing Limits

Parameter	Limit Basis	Average Monthly (mg/L)	Instant. Maximum (mg/L)
Ammonia-Nitrogen May 1 – October 31	Current Permit	2.5	5.0
	New (Modeled)	2.5 (rounded down from 2.69)	5.0 (rounded down from 5.38)
Ammonia-Nitrogen November 1 – April 30	Current Permit	7.5	15.0
	New (3x Multiplier)	7.5	15.0
	New (Modeled)	7.5 (rounded down from 7.65)	15.0 (rounded down from 15.3)

Total Residual Chlorine

To determine if WQBELs are required for discharges containing total residual chlorine (TRC), a discharge evaluation is performed using a DEP program called TRC_CALC created with Microsoft Excel for Windows. TRC_CALC calculates TRC Waste Load Allocations (WLAs) through the application of a mass balance model which considers TRC losses due to stream and discharge chlorine demands and first-order chlorine decay. Input values for the program include flow rates and chlorine demands for the receiving stream and the discharge, the number of samples taken per month, coefficients of TRC variability, partial mix factors, and an optional factor of safety. The mass balance model calculates WLAs for acute and chronic criteria that are then converted to long-term averages using calculated multipliers. The multipliers are functions of the number of samples taken per month and the TRC variability coefficients (normally kept at default values unless site specific information is available). The most stringent limitation between the acute and chronic long-term averages is converted to an average monthly limit for comparison to the BAT average monthly limit of 0.5 mg/l from 25 Pa. Code § 92a.48(b)(2). The more stringent of these average monthly TRC limitations is imposed in the permit.

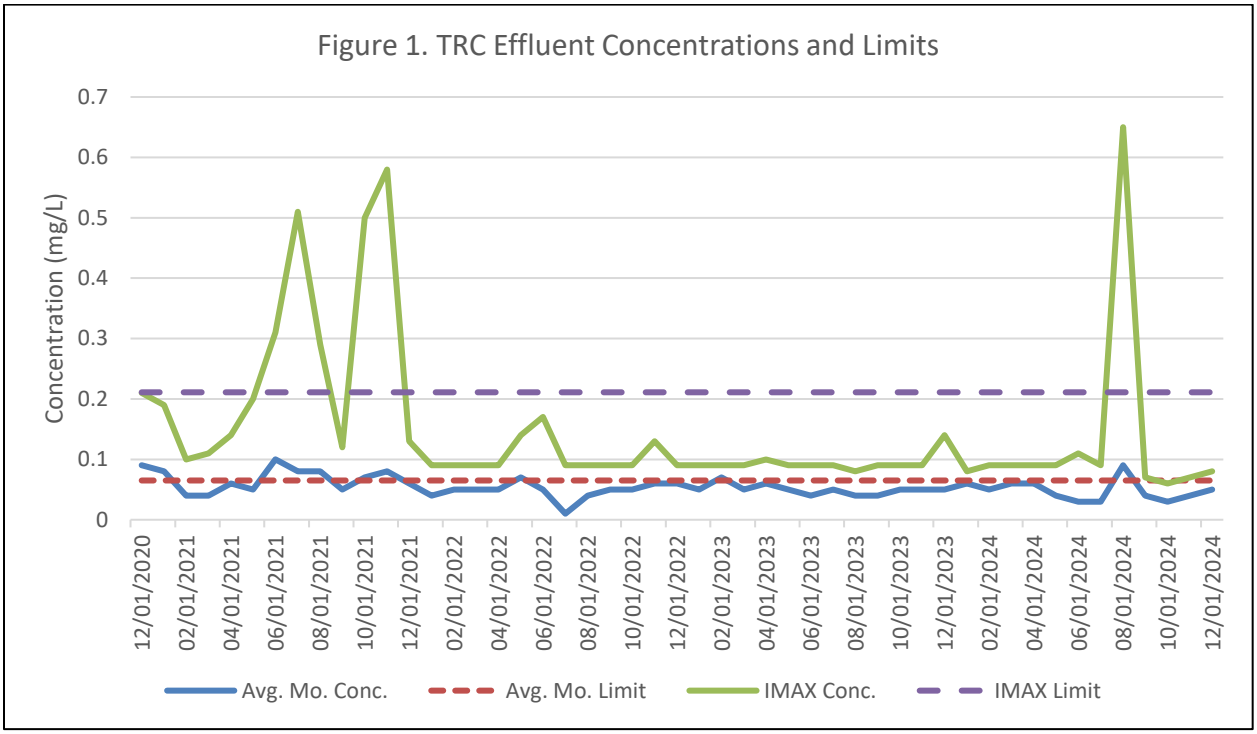
Acute and chronic partial mix factors calculated by the Toxics Management Spreadsheet (0.155 and 1.0, respectively) are used in TRC_CALC. The results of the modeling, included in **Attachment C**, indicate that the following WQBELs for TRC apply at Outfall 001.

Table 4. New and Existing TRC WQBELs for Outfall 001

Limit Basis	Average Monthly (mg/L)	Instantaneous Maximum (mg/L)
Current Permit	0.2	0.7
New	0.065	0.211

The TRC WQBEL are more stringent than those in the current permit because the $Q_{7\text{-}10}$ used for modeling is smaller than the $Q_{7\text{-}10}$ previously used.

Based on UMH's reported TRC effluent concentrations (see Figure 1, below), the margin for compliance with the new average monthly limits will be small. However, the STP is expected to comply with the new TRC WQBELs since it already has the ability to dechlorinate the effluent.



Coxes Creek Watershed Total Maximum Daily Load (TMDL)

Section 303(d) of the Clean Water Act and the U.S. Environmental Protection Agency's Water Quality Planning and Management Regulations (40 CFR part 130) require states to develop a TMDL for impaired water bodies. A TMDL establishes the amount of a pollutant that a water body can assimilate without exceeding the water quality criteria for that pollutant. TMDLs provide the scientific basis for a state to establish water quality-based controls to reduce pollution from both point and non-point sources to restore and maintain the quality of the state's water resources. A TMDL considers each river and tributary within the target watershed and its impairment sources. Stream data and discharger data are used to calculate minimum pollutant reductions that are necessary to attain water quality criteria. To achieve those reductions, the TMDL prescribes allocations to all contributing pollutant sources in the target watershed to minimally achieve water quality criteria (i.e., 100% use of a stream's assimilative capacity).

TMDL allocations include waste load allocations (WLA), load allocations (LA), and a margin of safety (MOS). The WLA is the portion of the allowable load assigned to point sources. The LA is the portion of the allowable load assigned to non-point sources. The MOS is applied to account for uncertainties in the computational process and may be expressed implicitly (documenting conservative processes in the computations) or explicitly (setting aside a portion of the allowable load). Absent a TMDL revision, loads included in the MOS cannot be reallocated to either the WLA or LA portion of the TMDL.

The aquatic life uses of various streams in the Coxes Creek watershed are impaired by elevated concentrations of aluminum, iron, and manganese from abandoned mine discharges and siltation (sediment) from various sources including agriculture, road runoff, and urban runoff/storm sewers. The Somerset Estates MHP STP was not assigned wasteload allocations by the Coxes Creek Watershed TMDL. However, for sewage discharges with design flows less than 0.1 MGD, DEP does not require applicants to report results for TMDL parameters. In the case of the Somerset Estates MHP STP, the contributions of aluminum, iron, and manganese to the watershed are expected to be negligible since those parameters generally are not characteristic of sanitary wastewaters from privately owned and operated mobile home parks. Also, even though no WLAs were assigned to the STP for sediment, the permit already controls sediment loading to the watershed. Therefore, no TMDL-based requirements are imposed at Outfall 001.

001.C. Effluent Limits and Monitoring Requirements for Outfall 001

In accordance with 25 Pa. Code §§ 92a.12 and 92a.61 and anti-backsliding requirements under either 33 U.S.C. 1342(o) or 40 CFR § 122.44(l)[1] (incorporated by reference in Pennsylvania regulations at 25 Pa. Code § 92a.44), effluent limits and

[1] *Reissued permits.* (1) Except as provided in paragraph (l)(2) of this section when a permit is renewed or reissued, interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous

monitoring requirements at Outfall 001 are 1) the more stringent of TBELs, WQBELs, regulatory effluent standards, and monitoring requirements developed for this permit renewal; and 2) effluent limits and monitoring requirements from the previous permit, subject to any exceptions to anti-backsliding discussed previously in this Fact Sheet. Applicable effluent limits and monitoring requirements are summarized in the table at the end of this section.

Monitoring frequencies and sample types are established pursuant to Table 6-3 in DEP's "Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits" and DEP's "Standard Operating Procedure for Clean Water Program Establishing Effluent Limitations for Individual Sewage Permits". Dissolved oxygen, TRC, and pH must be sampled 5/week using grab sampling. $CBOD_5$, TSS, Ammonia-Nitrogen, and Fecal Coliform must be sampled 2/month using grab sampling. *E. coli* must be sampled 1/quarter using grab sampling. Total nitrogen and total phosphorus must be sampled 1/year using grab sampling. Flow must be measured 2/month.

permit (unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification or revocation and reissuance under § 122.62.)

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) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Daily Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	0.065	XXX	XXX	XXX	XXX	XXX	2/month	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	9.0	XXX	5/week	Grab
Dissolved Oxygen	XXX	XXX	4.0	XXX	XXX	XXX	5/week	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.065	XXX	0.211	5/week	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	XXX	XXX	XXX	25.0	XXX	50.0	2/month	Grab
Total Suspended Solids	XXX	XXX	XXX	30.0	XXX	60.0	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	Report	XXX	1/quarter	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Ammonia-Nitrogen Nov 1 - Apr 30	XXX	XXX	XXX	7.5	XXX	15.0	2/month	Grab
Ammonia-Nitrogen May 1 - Oct 31	XXX	XXX	XXX	2.5	XXX	5.0	2/month	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab

Compliance Sampling Location: Outfall 001

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachments A and B)
☐	Toxics Management Spreadsheet (see Attachment)
☒	TRC Model Spreadsheet (see Attachment C)
☐	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, 386-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 386-2000-019, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 386-2000-018, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 386-2183-001, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 386-2183-002, 12/97.
☐	Pennsylvania CSO Policy, 386-2000-002, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 386-2000-008, 4/97.
☐	Determining Water Quality-Based Effluent Limits, 386-2000-004, 12/97.
☐	Implementation Guidance Design Conditions, 386-2000-007, 9/97.
☐	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 386-2000-016, 6/2004.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 386-2000-012, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 386-2000-009, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 386-2000-015, 5/2004.
☒	Implementation Guidance for Section 93.7 Ammonia Criteria, 386-2000-022, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 386-2000-013, 4/2008.
☒	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 386-2000-011, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 386-2000-001, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 386-2000-021, 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, 386-2000-020, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 386-2000-005, 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, 386-2000-010, 3/1999.
☐	Design Stream Flows, 386-2000-003, 9/98.
☐	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 386-2000-006, 10/98.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 386-3200-001, 6/97.
☐	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☒	Standard Operating Procedure (SOP) for Clean Water Program Establishing Effluent Limitations for Individual Sewage Permits, SOP No. BCW-PMT-033, Version 2.0, February 5, 2024
☒	Standard Operating Procedure (SOP) for Clean Water Program New and Reissuance Sewage Individual NPDES Permit Applications, SOP No. BCW-PMT-002, Version 2.0, February 3, 2022
☐	Other:

ATTACHMENT A

WQM 7.0 Modeling Results for Outfall 001 (Summer)

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
19F	39032	Trib 39032 to East Branch Coxes Cr	1.560	2113.00	1.75	0.00350	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	0.022	0.00	0.00	0.000	0.000	10.0	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
Outfall 001	PA0094846	0.0650	0.0000	0.0000	0.000	20.00	6.80

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	8.38	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19F	39032	Trib 39032 to East Branch Coxes Cr	1.190	2106.00	1.80	0.00350	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	0.022	0.00	0.00	0.000	0.000	10.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
19F	39032	Trib 39032 to East Branch Coxes Cr

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												
1.560	0.04	0.00	0.04	.1006	0.00350	.375	6.21	16.57	0.06	0.379	21.38	6.85
Q1-10 Flow												
1.560	0.02	0.00	0.02	.1006	0.00350	NA	NA	NA	0.06	0.402	20.98	6.83
Q30-10 Flow												
1.560	0.05	0.00	0.05	.1006	0.00350	NA	NA	NA	0.06	0.359	21.71	6.86

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	Uniform Treatme	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
19F	39032	Trib 39032 to East Branch Coxes Cr

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
1.560	Outfall 001	NA	50	17.59	21.89	1	56

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
1.560	Outfall 001	NA	25	1.77	2.69	1	89

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
1.56	Outfall 001	25	25	2.69	2.69	4	4	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19F	39032	Trib 39032 to East Branch Coxes Cr

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.560	0.065	21.380	6.847
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
6.208	0.375	16.565	0.060
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
18.65	1.440	1.95	0.778
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.209	20.853	Owens	5
Reach Travel Time (days)			
0.379			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.038	17.60	1.89	5.97
0.076	16.61	1.84	6.39
0.114	15.67	1.78	6.64
0.152	14.78	1.73	6.81
0.189	13.95	1.68	6.95
0.227	13.16	1.63	7.06
0.265	12.42	1.58	7.16
0.303	11.72	1.54	7.26
0.341	11.06	1.49	7.35
0.379	10.43	1.45	7.43

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
19F	39032	Trib 39032 to East Branch Coxes Cr

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
1.560	Outfall 001	PA0094846	0.065	CBOD5	25		
				NH3-N	2.69	5.38	
				Dissolved Oxygen			4

ATTACHMENT B

WQM 7.0 Modeling Results for Outfall 001 (Winter)

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
19F	39032	Trib 39032 to East Branch Coxes Cr	1.560	2113.00	1.75	0.00350	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	10.0	0.00	0.00	5.00	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
Outfall 001	PA0094846	0.0650	0.0000	0.0000	0.000	15.00	6.80

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	12.80	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19F	39032	Trib 39032 to East Branch Coxes Cr	1.190	2106.00	1.80	0.00350	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	10.0	0.00	0.00	5.00	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

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WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
19F	39032	Trib 39032 to East Branch Coxes Cr

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												
1.560	0.08	0.00	0.08	.1006	0.00350	.389	6.65	17.09	0.07	0.330	10.67	6.88
Q1-10 Flow												
1.560	0.05	0.00	0.05	.1006	0.00350	NA	NA	NA	0.06	0.363	11.72	6.86
Q30-10 Flow												
1.560	0.10	0.00	0.10	.1006	0.00350	NA	NA	NA	0.07	0.305	9.91	6.89

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	Uniform Treatme	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
19F	39032	Trib 39032 to East Branch Coxes Cr

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
1.560	Outfall 001	NA	50	27	40.18	1	20

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
1.560	Outfall 001	NA	25	3.76	7.65	1	69

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
1.56	Outfall 001	25	25	7.65	7.65	4	4	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19F	39032	Trib 39032 to East Branch Coxes Cr

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.560	0.065	10.675	6.876
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
6.653	0.389	17.095	0.068
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
15.05	1.399	4.34	0.342
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.806	16.526	Owens	5
Reach Travel Time (days)			
0.330			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.033	14.60	4.29	8.50
0.066	14.17	4.24	8.92
0.099	13.75	4.20	9.18
0.132	13.34	4.15	9.35
0.165	12.95	4.10	9.46
0.198	12.56	4.06	9.54
0.231	12.19	4.01	9.60
0.264	11.83	3.97	9.65
0.297	11.48	3.92	9.70
0.330	11.14	3.88	9.74

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WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
19F	39032	Trib 39032 to East Branch Coxes Cr

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
1.560	Outfall 001	PA0094846	0.065	CBOD5	25		
				NH3-N	7.65	15.3	
				Dissolved Oxygen			4

ATTACHMENT C

TRC Modeling Results for Outfall 001

TRC EVALUATION – Outfall 001

0.038346	**= Q stream (cfs)**	**0.5**	**= CV Daily**
0.065	**= 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)**
	= % Factor of Safety (FOS)		**=Decay Coefficient (K)**

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	**1.3.2.iii**	WLA afc = 0.141	**1.3.2.iii**	WLA cfc = 0.130
PENTOXSD TRG	**5.1a**	LTAMULT afc = 0.373	**5.1c**	LTAMULT cfc = 0.581
PENTOXSD TRG	**5.1b**	LTA_afc= 0.052	**5.1d**	LTA_cfc = 0.075

Source	Reference	Effluent Limit Calculations	
PENTOXSD TRG	**5.1f**	AML MULT = 1.231	
PENTOXSD TRG	**5.1g**	AVG MON LIMIT (mg/l) = 0.065	AFC
		INST MAX LIMIT (mg/l) = 0.211	

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)**