Pennsylvania Department of Environmental Protection

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0090344**
Facility Type	**Municipal**	APS ID	**1106696**
Major / Minor	**Minor**	Authorization ID	**1471724**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Ohio Township Sanitary Authority**	Facility Name	**Windyknoll STP**
Applicant Address	1719 Roosevelt Road	Facility Address	186 Toms Run Road
	Pittsburgh, PA 15237-1050		Pittsburgh, PA 15237
Applicant Contact	Justin Klingenberg	Facility Contact	Edward Bricker
Applicant Phone	(412) 364-4549	Facility Phone	412-366-2700
Client ID	45245	Site ID	253321
Ch 94 Load Status	Not Overloaded	Municipality	Ohio Township
Connection Status	No Limitations	County	Allegheny
Date Application Received	February 1, 2024	EPA Waived?	Yes
Date Application Accepted	February 5, 2024	If No, Reason	

Purpose of Application: Application for a renewal of an NPDES permit for discharge of treated sewage effluent.

Summary of Review

The Ohio Township Sanitary Authority has applied for a renewal of the NPDES Permit PA0090344, which was last issued on July 3rd, 2019. The permit expired on July 31, 2024 and the renewal permit application was submitted to the Department on February 1, 2024 which considered timely.

WQM Part II Permit No. 0279411 was originally issued on September 14, 1979 to authorize the construction of the treatment facility. The plant was upgraded on July 7, 1995 to accommodate a hydraulic capacity expansion from 0.02 MGD to 0.10 MGD. The upgraded facility now consists of a comminutor, two (2) aerated sequencing batch reactor (SBR) tanks, disinfection via an ultraviolet light unit.

The receiving stream is the Unnamed Tributary to Toms Run (WWF), which is classified as a Warm Water Fishery (WWF) per CH93 Designated Use and is located in the State watershed 20-G.

Per application, the Authority is currently working on an Act 537 Plan Update which will recommend replacement of the internal components of the SBR tanks in order to upgrade the plant to an organic loading capacity of 240 lbs/day. This upgrade seems necessary per the CH94 report of 2023 as this plant is projected to have an organic overload within the next five years.

The previous permit stated that the facility organic capacity is 82.1 lbs BOD5/day, which conflicts with the renewal application. The 2023 CH94 report also stated organic capacity as 200 lbs/day. DEP asked the applicant's consultant about this issue, and it seems that the organic capacity was not updated in the NPDES permit when the facility was expanded in 1995 to an organic capacity of 200 lbs/day.

Approve	Deny	Signatures	Date
X		Hazim Aldalli Hazim Aldalli / Environmental Engineering Specialist	December 2, 2024
X		Mahbuba Iasmin Mahbuba Iasmin, Ph.D., P.E. / Environmental Engineering Manager	January 10, 2025

Summary of Review

Per the reviewed application and CH94 reports, the collection system is totally separated with one pumping station (Roosevelt O'Neil PS).
No industrial users are discharging to this facility per the application.

Operations compliance report on May 17, 2024 concluded that the permittee is in compliance. Last time this facility was inspected on September 27, 2023 showed that one violation for NPDES permit limit was noted over the DMR report for August 2023 with no other remarks concerning the facility operation..

The Act – 14 PL 834 Municipal Notifications were provided by the November 28, 2023 letters and no comments were received.

Sludge use and disposal description and location(s): Off site (the hauled decanted sludge been treated within Pine Creek STP), as there is no sludge being applied or disposed on site.

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)	0.1
Latitude	40º 32' 36"	Longitude	-80º 6' 18"
Quad Name	Emsworth	Quad Code	40080E1
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary to Toms Run (WWF)	Stream Code	36745
NHD Com ID	99683364	RMI	2.27
Drainage Area	0.16	Yield (cfs/mi^2)	0.0052
Q_{7-10} Flow (cfs)	0.000843	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	1166	Slope (ft/ft)	0.02
Watershed No.	20-G	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use	None	Exceptions to Criteria	None
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	

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

Nearest Downstream Public Water Supply Intake		Moon Township Municipal Authority	
PWS Waters	Ohio River	Flow at Intake (cfs)	4800
PWS RMI	28.8	Distance from Outfall (mi)	6.08

Changes Since Last Permit Issuance:

- Q_{7-10} flow, elevation, drainage area, and low flow yield were all updated to match USGS Stream Stats new data (see Appendix A).
- DEP updated its WQM 7.0 criteria for Ammonia-Nitrogen (NH_3-N) in 2019. Limits and conditions of this permit need to be redeveloped to an adequate level to protect water quality.
- *E. Coli* monitoring requirements will be introduced to this renewal which is in compliance with DEP SOP No. BCW-PMT-033 revised February 5, 2024.

Other Comments: None.

Treatment Facility Summary

Treatment Facility Name: Windyknoll STP

WQM Permit No.	Issuance Date
0279411	7/7/1995

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Tertiary	Sequencing Batch Reactor	No Disinfection	0.043

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.1	200	Not Overloaded	Aerobic Digestion	Off Site

Changes Since Last Permit Issuance: The previous permit set the organic capacity at 82.1 lbs/day.

Compliance History

Operations Compliance Check Summary Report

Facility: Windyknoll STP
NPDES Permit No.: PA0090344
Compliance Review Period: 05/2019– 05/2024

Inspection Summary:

INSP ID	INSPECTED DATE	INSP TYPE	AGENCY	INSPECTION RESULT DESC
3739564	03/13/2024	Compliance Evaluation	County Health Dept	No Violations Noted
3622541	09/27/2023	Compliance Evaluation	County Health Dept	Violation(s) Noted
3388709	06/29/2022	Compliance Evaluation	County Health Dept	Violation(s) Noted
3187661	04/28/2021	Compliance Evaluation	County Health Dept	Violation(s) Noted
3096711	05/19/2020	Compliance Evaluation	County Health Dept	No Violations Noted

Violation Summary:

VIOL ID	VIOLATION DATE	VIOLATION TYPE DESC	RESOLVED DATE	INSP ID	INSPECTED DATE
8160525	09/27/2023	NPDES - Violation of effluent limits in Part A of permit	01/26/2024	3622541	09/27/2023
961075	06/29/2022	NPDES - Violation of effluent limits in Part A of permit	08/19/2022	3388709	06/29/2022
916158	04/28/2021	NPDES - Violation of effluent limits in Part A of permit	10/29/2021	3187661	04/28/2021

Open Violations by Client ID:

No CW violations for client ID 45245

Enforcement Summary:

ENF ID	ENF TYPE	EXECUTED DATE	ENF FINALSTATUS	ENF CLOSED DATE
420736	NOV	10/11/2023	Administrative Close Out	03/13/2024
405220	NOV	07/07/2022	Administrative Close Out	01/02/2024
394215	NOV	05/06/2021	Administrative Close Out	01/02/2024

DMR Violation Summary:

START	END	NON COMPLIANCE CATEGORY	PARAMETER	SAMPLE	PERMIT	UNIT OF MEASURE	STATISTICAL BASE CODE
08/01/2023	08/31/2023	Concentration 3 Effluent Violation	Carbonaceous Biochemical Oxygen Demand (CBOD5)	22	15	mg/L	Weekly Average

04/01/2022	04/30/2022	Concentration 2 Effluent Violation	Total Suspended Solids	11	10	mg/L	Average Monthly
04/01/2022	04/30/2022	Concentration 3 Effluent Violation	Carbonaceous Biochemical Oxygen Demand (CBOD5)	19	15	mg/L	Weekly Average
04/01/2022	04/30/2022	Concentration 3 Effluent Violation	Total Suspended Solids	16	15	mg/L	Weekly Average
09/01/2021	09/30/2021	Concentration 3 Effluent Violation	Fecal Coliform	2420	1000	No./100 ml	Instantaneous Maximum
06/01/2021	06/30/2021	Concentration 3 Effluent Violation	Fecal Coliform	2420	1000	No./100 ml	Instantaneous Maximum
05/01/2021	05/31/2021	Concentration 3 Effluent Violation	Fecal Coliform	2420	1000	No./100 ml	Instantaneous Maximum
12/01/2020	12/31/2020	Concentration 3 Effluent Violation	Carbonaceous Biochemical Oxygen Demand (CBOD5)	16.4	15	mg/L	Weekly Average
10/01/2020	10/31/2020	Concentration 3 Effluent Violation	Ammonia-Nitrogen	5.9	3.0	mg/L	Weekly Average

Compliance Status:
In compliance
Completed by: John Murphy
Completed date: 5/17/2024

Other Comments: None.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.1
Latitude 40º 32' 36.00" **Longitude** -80º 6' 18.00"
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)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Comments: The existing discharge was evaluated using WQM 7.0 for $CBOD_5$, Ammonia Nitrogen and Dissolved Oxygen.

The Total Suspended Solids (TSS), pH, and Fecal Coliform parameters are not evaluated using WQM 7.0. The bases for the proposed technology-based limitations are listed in the above table.

Stream flow (Q_{7-10}) to wastewater discharge ratio = 0.000843 cfs/ 0.15472 cfs= 0.0054. The stream flow (Q_{7-10}) to wastewater flow (design flow) ratio is less than 3:1. Per the dry stream definition that can be checked over the DEP's regulation *Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 2008*, the STP receiving stream (UNT to Toms Run) is not a dry stream or impaired (see page 3); therefore Advanced Treatment Requirements stated under DEP's SOP "*Establishing Effluent Limitations for Individual Sewage Permits* Revised, February 5, 2024" Part I.C.1 &3 is not applicable.

Water Quality-Based Limitations

The following limitations were determined through water quality modeling (output files attached, see Appendix B&C):

Parameter	Limit (mg/l)	SBC	Model
$CBOD_5$ (May1-Oct 31)	25	Average Monthly	WQM7.0
$CBOD_5$ (Nov 1- Apr 30)	25	Average Monthly	WQM7.0
NH3-N (May1-Oct 31)	1.9	Average Monthly	WQM7.0
NH3-N (Nov 1- Apr 30)	2.8	Average Monthly	WQM7.0
Dissolved Oxygen	5.0	Minimum	WQM7.0

Best Professional Judgment (BPJ) Limitations

A minimum Dissolved Oxygen (DO) WQBEL of 5.0 mg/L should be maintained based on DEP water quality model WQM 7.0 version 1.10 (Appendix B) and on Best Professional Judgment (BPJ) to ensure adequate operation and maintenance as listed in the table under Technology-Based Limitations section.

WQM 7.0 was used to generate a warm period seasonal limits for Ammonia-Nitrogen NH_3-N AML of 1.9 mg/L, Weekly Average of 2.9 mg/L, and Ins. Max of 3.8 mg/, also the model generated cold period seasonal limits of AML 2.8 mg/L, Weekly Average of 4.2 mg/L, and Ins. Max of 5.6 mg/L. The new WQBELs are more stringent than the previous permit limits for Ammonia Nitrogen.

Checking on the application effluent sampling and the eDMRs, the facility can meet the newly imposed WQBELs for Ammonia-Nitrogen as the plant has achieved effluent sampling results of NH_3-N lower than this limit; no compliance schedule is necessary. Weekly monitoring will be imposed for this renewal.

WQM 7.0 generated $CBOD_5$ WQBEL year around limits of AML 25.0 mg/L, Weekly Average of 37.0 mg/L, and Ins. Max of 50.0 mg/L, the new seasonal limits are less stringent than the previous permit limits.

Anti-Backsliding

The previously imposed limits for pH Effluent seasonal limitation of (6.0 Minimum, and 9.0 Maximum SIU), Fecal Coliform AML Geo Mean seasonal limits of (200 & 2000 CFU/100 ml), $CBOD_5$ AML, Weekly Average, and Ins. Max of (10, 15, and 20 mg/L), and TSS AML, Weekly Average, and Ins. Max of (10, 15, and 20 mg/L); will be all unchanged due to Anti-Backsliding as stated in 40 CFR Section 122.44(l).

TN and TP Monitoring

Nutrient monitoring is required to establish the nutrient load from the wastewater treatment facility and the impacts that load may have on the quality of the receiving stream(s). Sewage discharges with design flows > 2,000 gpd require monitoring. The receiving stream is not impaired with nutrients (per PA eMAP), and since the renewal application's effluent sampling and DMRs showed no water criteria limit violations, no limits are needed to be imposed or monitoring frequency increments per DEP-SOP No. BCW-PMT-033 Part I.C.1 &3 revised February 5, 2024, Annual monitoring for Total Nitrogen and Total Phosphorus will be applied at Outfall 001.

Total Dissolved Solids (TDS) and its Major Constituents

Total Dissolved Solids (TDS) and its major constituents including sulfate, chloride, and bromide have emerged as pollutants of concern. The conservative nature of these solids allows them to accumulate in surface waters and they may remain a concern even if the immediate downstream public water supply is not directly impacted. Bromide has been linked to formation of disinfection byproducts at increased levels in public water systems.

Because of actions associated with Triennial Review 13, the Environmental Quality Board has directed DEP to collect additional data if the Bromide is greater than 1 mg/L, and the TDS is greater than 1000 mg/L or the TDS exceeds 20,000 lbs/day. The maximum reported concentration for Bromide is <0.1 mg/L as listed in the renewal application dated 1/26/2024. The maximum reported concentration for TDS is 398 mg/L as listed in the renewal application dated 1/26/2024. Therefore, monitoring is not required for TDS, Bromide, Chloride, and Sulfate.

Disinfection

Per DEP SOP BCW-PMT-033 - *Establishing Effluent Limitations for Individual Sewage Permits* Revised, February 5, 2024, permittee can even report (at a minimum) UV transmittance (%), UV dosage (µWs/cm2 or mWs/cm2 or mjoules/cm2) or UV intensity (µW/cm2 or mW/cm2). The previous permit required Ultraviolet Disinfection Light Transmittance be measured in mjoules/cm^2. The renewal permit will carry over the limit with the same frequency and units.

Part C33 will be added to the renewal permit.

E. Coli

Pursuant to 25 Pa. code § 92a.61(b) Quarterly monitoring for *E. Coli* will be imposed at Outfall (001) to determine if *E. Coli* will be a pollutant of concern, which is consistent with DEP SOP No. BCW-PMT-033 revised February 5, 2024.

Mass Loadings

Mass loading limits are applicable for publicly owned treatment works. Current policy requires average monthly mass loading limits be established for $CBOD_5$, TSS, and NH_3-N and average weekly mass loading limits be established for $CBOD_5$ and TSS. Average weekly limits for NH_3-N were re-imposed to be consistent with the previous permits.

Average monthly mass loading limits (lbs/day) are based on the formula: design flow (MGD) x concentration limit (mg/L) x conversion factor (8.34).

Influent Monitoring

For POTWs with design flows greater than 2,000 GPD, influent BOD_5 and TSS monitoring must be established in the permit, and the monitoring should be consistent with the same frequency and sample type as is used for other effluent parameters. BOD_5 and TSS influent loads will once again be reported for monthly average and daily maximum values in lbs/day and monthly average concentrations in mg/L.

Monitoring Frequency Considerations

Pursuant to 25 Pa. code § 92a.12 and 92a.61 effluent limits applicable at Outfall 001 are the more stringent of TBELs, WQBELs, regulatory standards, and monitoring requirements as summarized in the table in the following page.

Monitoring frequencies and sample types are established pursuant to DEPs “Technical Guidance for the Development and Specification of Effluent Limitations, and Other Permit Conditions in NPDES Permits”, and per DEP SOP - Establishing Effluent Limitations for Individual Sewage Permits SOP No. BCW-PMT-033 Revised, February 5, 2024.

The daily monitoring frequencies are consistent with current policy and the Table 6-3 of DEP’s Technical Guidance mentioned above.

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.

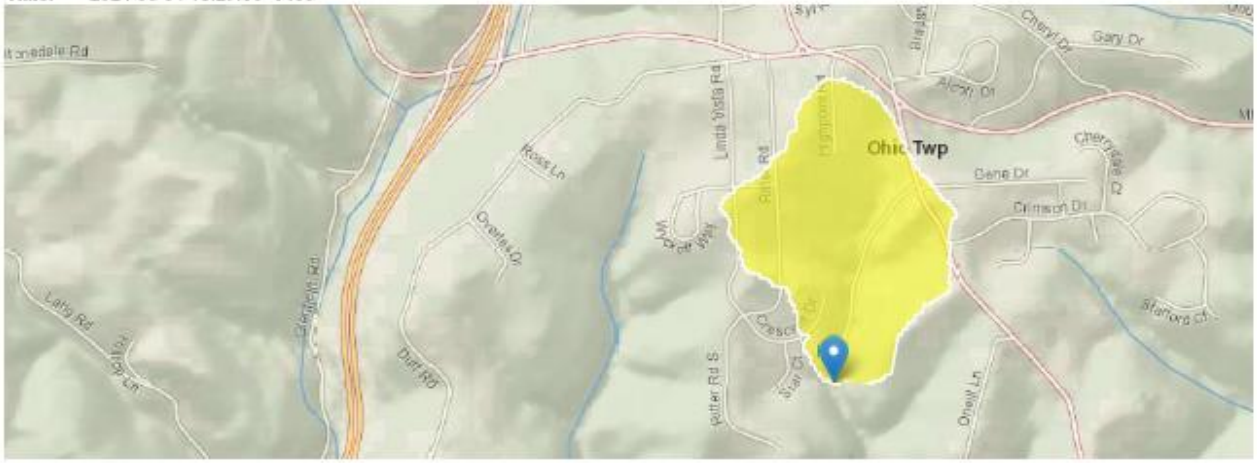
Parameter	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Instantaneous Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
CBOD5	8.3	12.5	XXX	10	15	20	1/week	8-Hr Composite
BOD5 Raw Sewage Influent	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite
TSS	8.3	12.5	XXX	10	15	20	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
UV Transmittance (%)	XXX	XXX	Report	Report	XXX	XXX	1/day	Measured
E. Coli (No./100ml)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	2.3	3.5	XXX	2.8	4.2	5.6	1/week	8-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	1.5	2.4	XXX	1.9	2.9	3.8	1/week	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	24-Hr Composite

Compliance Sampling Location: at Outfall 001.
Other Comments: None.

Appendix A – StreamStats Report –

StreamStats Report

Region ID: PA
Workspace ID: PA20240604192734999000
Clicked Point (Latitude, Longitude): 40.54337, -80.10447
Time: 2024-06-04 15:27:56 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.16	square miles
ELEV	Mean Basin Elevation	1166	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	0.16	square miles	2.26	1400
ELEV	Mean Basin Elevation	1166	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	0.0034	ft^3/s
30 Day 2 Year Low Flow	0.00713	ft^3/s
7 Day 10 Year Low Flow	0.000843	ft^3/s
30 Day 10 Year Low Flow	0.00207	ft^3/s
90 Day 10 Year Low Flow	0.00459	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: 4.20.1
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

Appendix B – WQM 7.0 Modeling – Summer Conditions

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
20G	36745	TOMS RUN	2.270	1166.00	0.16	0.02000	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	0.005	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
Windyknoll STP	PA0090344	0.0100	0.1000	0.1000	0.000	20.00	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	4.00	8.24	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
20G	36745	TOMS RUN	0.100	1069.00	2.26	0.02000	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	0.009	0.02	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
Windyknoll STP	PA0090344	0.1000	0.1000	0.1000	0.000	20.00	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	4.00	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
20G	36745	TOMS RUN

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												
2.270	0.00	0.00	0.00	.1547	0.02000	.404	3.1	7.67	0.12	1.066	20.03	7.00
Q1-10 Flow												
2.270	0.00	0.00	0.00	.1547	0.02000	NA	NA	NA	0.12	1.067	20.02	7.00
Q30-10 Flow												
2.270	0.00	0.00	0.00	.1547	0.02000	NA	NA	NA	0.12	1.065	20.04	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	0.64	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 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20G	36745	TOMS RUN

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
2.270	0.100	20.027	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
3.097	0.404	7.671	0.124
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
24.88	1.498	1.92	0.701
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.018	28.785	Owens	5
Reach Travel Time (days)			
1.066			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.107	21.20	1.78	7.12
0.213	18.07	1.65	7.47
0.320	15.40	1.53	7.71
0.426	13.12	1.42	7.91
0.533	11.18	1.32	8.08
0.639	9.53	1.22	8.23
0.746	8.12	1.14	8.24
0.853	6.92	1.05	8.24
0.959	5.90	0.98	8.24
1.066	5.03	0.91	8.24

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
20G	36745	TOMS RUN

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
2.270	Windyknoll STP	9.66	9.69	9.66	9.69	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
2.270	Windyknoll STP	1.91	1.93	1.91	1.93	0	0

Dissolved Oxygen Allocations

		CBOD5		NH3-N		Dissolved Oxygen			
RMI	Discharge Name	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Critical Reach	Percent Reduction
2.27	Windyknoll STP	25	25	1.93	1.93	5	5	0	0

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
20G	36745	TOMS RUN

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)
2.270	Windyknoll STP	PA0090344	0.010	CBOD5	25		
				NH3-N	1.93	3.86	
				Dissolved Oxygen			5

Appendix C – WQM 7.0 Modeling – Winter Conditions

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
20G	36745	TOMS RUN	2.270	1166.00	0.16	0.02000	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	0.010	0.00	0.00	0.000	0.000	0.0	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
Windyknoll STP	PA0090344	0.0100	0.1000	0.1000	0.000	15.00	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	4.00	12.51	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
20G	36745	TOMS RUN	0.100	1069.00	2.26	0.02000	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	0.019	0.02	0.00	0.000	0.000	0.0	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
Windyknoll STP	PA0090344	0.1000	0.1000	0.1000	0.000	15.00	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	4.00	12.51	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
20G	36745	TOMS RUN

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												
2.270	0.00	0.00	0.00	.1547	0.02000	.404	3.1	7.67	0.12	1.066	14.95	7.00
Q1-10 Flow												
2.270	0.00	0.00	0.00	.1547	0.02000	NA	NA	NA	0.12	1.067	14.97	7.00
Q30-10 Flow												
2.270	0.00	0.00	0.00	.1547	0.02000	NA	NA	NA	0.12	1.065	14.93	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	0.64	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 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20G	36745	TOMS RUN

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
2.270	0.100	14.946	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
3.097	0.404	7.671	0.124
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
24.88	1.499	2.80	0.474
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.041	25.517	Owens	5
Reach Travel Time (days)			
1.066			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.107	21.92	2.66	8.08
0.213	19.31	2.53	8.47
0.320	17.01	2.40	8.66
0.426	14.99	2.29	8.82
0.533	13.21	2.17	8.96
0.639	11.64	2.07	9.08
0.746	10.25	1.96	9.10
0.853	9.03	1.87	9.10
0.959	7.96	1.78	9.10
1.066	7.01	1.69	9.10

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
20G	36745	TOMS RUN

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
2.270	Windyknoll STP	14.05	14.1	14.05	14.1	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
2.270	Windyknoll STP	2.79	2.81	2.79	2.81	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)		
2.27	Windyknoll STP	25	25	2.81	2.81	5	5	0	0

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
20G	36745	TOMS RUN

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)
2.270	Windyknoll STP	PA0090344	0.010	CBOD5	25		
				NH3-N	2.81	5.62	
				Dissolved Oxygen			5