pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northwest Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0041645**
Facility Type	**Non-Municipal**	APS ID	**1039623**
Major / Minor	**Minor**	Authorization ID	**1355844**

Applicant and Facility Information

Applicant Name	**PA DOT Maintenance & Operations Bureau**	Facility Name	**PA DOT Rest Area L**
Applicant Address	PA DOT Bureau of Office Services, 400 North Street 5th Floor Harrisburg, PA 17120	Facility Address	I-90 East Springfield, PA 16411
Applicant Contact	Nicholaus Sahd (Consultant)	Facility Contact	Roderick Donghia – Contract Operator
Applicant Phone	(717) 886-5395 (nsahd@gfnet.com)	Facility Phone	(724) 813-8838 (rdonghia@gmail.com)
Client ID	189304	Site ID	453007
Ch 94 Load Status	Not Overloaded	Municipality	Springfield Township
Connection Status		County	Erie
Date Application Received	May 26, 2021	EPA Waived?	Yes
Date Application Accepted	June 15, 2021	If No, Reason	

Purpose of Application: Renewal of a NPDES Permit for an existing discharge of treated sewage

Summary of Review

This facility serves as a rest area along Interstate 90 Eastbound in Erie County. No major changes were proposed as part of this permit renewal.

The rest area is currently closed for rehab of the rest area and installation of the new wastewater treatment plant. The consultant expects that the facility will be operational in the second half of 2024.

There are currently 12 open violations listed in EFACTS for this client (1/3/2024). *The permittee will be notified of the open violations in the Draft Permit Cover Letter and given an opportunity to address the violations prior to final permit issuance. CWY 1/3/2024*

Sludge use and disposal description and location(s): Sludge is hauled offsite to NSSJMA WWTP for further processing.

Public Participation

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

Approve	Deny	Signatures	Date
X		Adam J. Pesek Adam J. Pesek, E.I.T. / Project Manager	January 3, 2024
X		Chad W. Yurisic Chad W. Yurisic, P.E. / Environmental Engineer Manager	1/3/2024

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.0066
Latitude	41º 56' 32.37"	Longitude	-80º 28' 31.16"
Quad Name	East Springfield	Quad Code	01024
Wastewater Description:	Treated domestic sewage		
Receiving Waters	Unnamed Tributary to Turkey Creek	Stream Code	62705
NHD Com ID	123922026	RMI	5.31
Drainage Area	0 (dry); 0.69 (perennial)	Yield (cfs/mi^2)	0 (dry); 0.01812 (perennial)
Q_{7-10} Flow (cfs)	0 (dry); 0.0125 (perennial)	Q_{7-10} Basis	Dry Stream/USGS Streamstats
Elevation (ft)	712	Slope (ft/ft)	0.00271
Watershed No.	15-A	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	

Background/Ambient Data		Data Source
pH (SU)	7.0	Default
Temperature (°F)	20	Default (CWF)
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake	Lake Erie		
PWS Waters	Lake Erie	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	4.45

Changes Since Last Permit Issuance:

Other Comments:

Treatment Facility Summary

Treatment Facility Name: PA DOT - Rest Area L - I-90 Info Center

WQM Permit No.	Issuance Date
2575401 A-1	9/13/2022

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary with Ammonia and Phosphorus	Extended Aeration	Tablet chlorination / liquid de-chlorination	0.0066

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.0066	22.3	Not Overloaded	Aerobic Digestion	Other WWTP

Changes Since Last Permit Issuance: New package extended aeration plant was permitted on 9/13/2022. The new plant is expected to be installed and operational sometime around or after late summer of 2024.

Other Comments: Treatment consists of a comminutor and bar screen, a 3,800-gallon EQ tank, two aeration tanks with a total capacity of 11,832-gallons, a 5,916-gallon anoxic tank, a 3,261-gallon clarifier, a 48 sq. ft. fixed media tank, a 456-gallon chlorine contact tank, a 2,970-gallon sludge holding tank, erosion tablet chlorination and liquid feed sodium bisulfate de-chlorination, sodium hydroxide for pH adjustments, and aluminum sulfate for phosphorus removal.

Compliance History	
Summary of DMRs:	One effluent limit violation in the last 5 years. Violation was an exceedance of the July 2023 ammonia nitrogen average monthly limit.
Summary of Inspections:	The last facility inspection was conducted on 10/5/2022. The inspection report did not indicate any violations but noted solids build-up below the outfall.

Other Comments:

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	0.0020	0.0030	0.0036	0.0031	0.0026	0.0026	0.0012	0.0015	0.0015	0.0014	0.0018	0.0020
Flow (MGD) Daily Maximum	0.0023	0.0035	0.0039	0.0037	0.0028	0.0032	0.0014	0.0016	0.0016	0.0016	0.0019	0.0026
pH (S.U.) Daily Minimum	7.0	7.0	7.0	7.1	7.0	7.0	7.1	6.9	6.7	7.1	7.0	7.0
pH (S.U.) Daily Maximum	7.5	7.4	7.4	7.5	7.4	7.4	7.4	7.4	7.4	7.4	7.5	7.5
DO (mg/L) Daily Minimum	7.0	7.0	7.1	7.0	7.1	7.0	7.0	7.1	7.1	7.1	7.1	7.0
TRC (mg/L) Average Monthly	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.2	0.2	0.3
TRC (mg/L) Instantaneous Maximum	0.3	0.4	0.3	0.7	0.3	0.3	0.4	0.4	0.4	0.3	0.4	0.4
CBOD5 (mg/L) Average Monthly	4.9	5.0	5.0	< 4.0	4.6	4.5	4.6	4.3	4.7	4.1	4.5	4.7
TSS (mg/L) Average Monthly	20.0	19.5	20.0	12.5	20.0	19.5	18.5	19.5	19.0	19.0	18.5	20.0
Fecal Coliform (No./100 ml) Geometric Mean	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Fecal Coliform (No./100 ml) Instantaneous Maximum	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	1	< 1	< 1	< 1
Total Nitrogen (mg/L) Annual Average											15.8	
Ammonia (mg/L) Average Monthly	4.3	4.2	4.2	5.9	4.3	4.2	4.2	4.7	4.0	4.2	4.2	4.4
Total Phosphorus (mg/L) Average Monthly	0.935	0.775	0.790	0.960	0.960	0.870	0.915	0.990	0.860	0.670	0.825	0.950

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.0066
Latitude 41º 56' 32.37" **Longitude** -80º 28' 31.16"
Wastewater Description: Treated domestic sewage

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)
E. Coli	Report (No./100 ml)	IMAX	-	92a.61

Comments: Monitoring for E. Coli is placed in the permit in accordance with the Department's SOP entitled "Establishing Effluent Limitations for Individual Sewage Permits."

Water Quality-Based Limitations

The following limitations were determined through water quality modeling (output files attached):

Parameter	Limit (mg/l)	SBC	Model
Ammonia Nitrogen (May-October)	5.0 mg/l	Average Monthly	WQM 7.0 (1.0b)
Ammonia Nitrogen (November-April)	15.0 mg/l	Average Monthly	WQM 7.0 (1.0b)

Comments: A seasonal multiplier of "3" is applied for ammonia nitrogen limits.

Best Professional Judgment (BPJ) Limitations

Comments: A total phosphorus average monthly limit of 1.0 mg/l is being retained in accordance with the IJC Agreement for discharges to Lake Erie. A dissolved oxygen limit of a minimum of 4.0 mg/l, an IMAX limit of 1.6 mg/l for TRC, and monitoring for total nitrogen is being placed in the permit in accordance with the Department's SOP entitled "Establishing Effluent Limitations for Individual Sewage Permits."

Anti-Backsliding

N/A

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.

	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	9.0 Daily Max	XXX	1/day	Grab
DO	XXX	XXX	4.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	XXX	XXX	XXX	25.0	XXX	50	2/month	8-Hr Composite
TSS	XXX	XXX	XXX	30.0	XXX	60	2/month	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
Total Nitrogen	XXX	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	8-Hr Composite
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	15.0	XXX	30	2/month	8-Hr Composite
Ammonia May 1 - Oct 31	XXX	XXX	XXX	5.0	XXX	10	2/month	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	1.0	XXX	XXX	2/month	8-Hr Composite

Compliance Sampling Location: Outfall 001 (after disinfection)

pennsylvania

Dry Reach

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
15	62705	UNT TURKEY CREEK	**5.450**	712.00	0.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.001	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.30	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
DOT Rest Area L	PA0041645	0.0066	0.0000	0.0000	0.000	20.00	7.30

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	0.00	0.00	1.50
Dissolved Oxygen	4.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

X		Chad W. Yurisic Chad W. Yurisic, P.E. / Environmental Engineer Manager	1/3/2024

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
15	62705	TURKEY CREEK	**5.310**	710.00	0.00	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.001	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.30	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
15	62705	TURKEY CREEK

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
5.450	0.00	0.00	0.00	.0102	0.00271	.502	.3	.6	0.07	0.116	20.00	7.30
Q1-10 Flow												
5.450	0.00	0.00	0.00	.0102	0.00271	NA	NA	NA	0.00	0.000	0.00	0.00
Q30-10 Flow												
5.450	0.00	0.00	0.00	.0102	0.00271	NA	NA	NA	0.00	0.000	0.00	0.00

WQM 7.0 Modeling Specifications

Parameters	D.O.	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	2		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
15	62705	TURKEY CREEK

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)		
5.45	DOT Rest Area L	25	25	20.26	20.26	4	4	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
15	62705	TURKEY CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
5.450	0.007	20.000	7.300
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
0.303	0.502	0.602	0.074
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
22.77	1.500	18.46	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
4.378	13.538	Owens	2
Reach Travel Time (days)			
0.116			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.012	22.38	18.31	3.90
0.023	21.99	18.16	3.50
0.035	21.61	18.01	3.18
0.046	21.24	17.87	2.91
0.058	20.87	17.72	2.70
0.070	20.51	17.58	2.53
0.081	20.16	17.44	2.40
0.093	19.81	17.30	2.31
0.104	19.47	17.16	2.24
0.116	19.14	17.02	2.19

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
15	62705	TURKEY 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)
5.450	DOT Rest Area L	PA0041645	0.007	CBOD5	25		
				NH3-N	20.26	40.52	
				Dissolved Oxygen			4

Perennial Reach

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
15	62705	TURKEY CREEK	**5.310**	710.00	0.69	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.018	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Rest Area L	PA0041645	0.0066	0.0000	0.0000	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	19.14	2.00	0.00	1.50
Dissolved Oxygen	2.19	8.24	0.00	0.00
NH3-N	17.02	0.10	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
15	62705	TURKEY CREEK	**4.450**	670.00	0.90	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.180	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

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

Parameter Data

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

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
15	62705	TURKEY CREEK

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
5.310	0.01	0.00	0.01	.0102	0.00881	.274	2.88	10.51	0.03	1.835	20.00	7.00
Q1-10 Flow												
5.310	0.01	0.00	0.01	.0102	0.00881	NA	NA	NA	0.03	2.076	20.00	7.00
Q30-10 Flow												
5.310	0.02	0.00	0.02	.0102	0.00881	NA	NA	NA	0.03	1.659	20.00	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	6		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
15	62705	TURKEY CREEK

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
5.310	Rest Area L	16.76	29.73	16.76	29.73	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
5.310	Rest Area L	1.89	4.84	1.89	4.84	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)		
5.31	Rest Area L	19.14	19.14	4.84	4.84	4	4	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
15	62705	TURKEY CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
5.310	0.007	20.000	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
2.883	0.274	10.515	0.029
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
9.73	0.862	2.24	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.329	21.994	Owens	6
Reach Travel Time (days)			
1.835			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.184	8.31	1.97	8.24
0.367	7.09	1.73	8.24
0.551	6.05	1.52	8.24
0.734	5.17	1.34	8.24
0.918	4.41	1.18	8.24
1.101	3.77	1.04	8.24
1.285	3.22	0.91	8.24
1.468	2.74	0.80	8.24
1.652	2.34	0.70	8.24
1.835	2.00	0.62	8.24

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
15	62705	TURKEY 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)
5.310	Rest Area L	PA0041645	0.007	CBOD5	19.14		
				NH3-N	4.84	9.68	
				Dissolved Oxygen			4

Since NH3,N output is less than input:
Ct=Coe^(-kt)
Co=Cte^(kt)
Co=4.84e^(0.7x0.116)
Co=5.25 mg/l

TRC_CALC - Rest Area L

1A	B	C	D	E	F	G
2	**TRC EVALUATION**			**PA DOT Rest Area L**		
3	Input appropriate values in B4:B8 and E4:E7					
4	0.125	= Q stream (cfs)		0.5	= CV Daily	
5	0.0066	= Q discharge (MGD)		0.5	= CV Hourly	
6	30	= no. samples		1	= AFC_Partial Mix Factor	
7	0.3	= Chlorine Demand of Stream		1	= CFC_Partial Mix Factor	
8	0	= Chlorine Demand of Discharge		15	= AFC_Criteria Compliance Time (min)	
9	0.5	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)	
	0	= % Factor of Safety (FOS)			=Decay Coefficient (K)	
10	Source	Reference	AFC Calculations		Reference	CFC Calculations
11	TRC	1.3.2.iii	WLA afc = 3.924		1.3.2.iii	WLA cfc = 3.818
12	PENTOXSD TRG	5.1a	LTAMULT afc = 0.373		5.1c	LTAMULT cfc = 0.581
13	PENTOXSD TRG	5.1b	LTA_afc= 1.462		5.1d	LTA_cfc = 2.220
14						
15	Source		Effluent Limit Calculations			
16	PENTOXSD TRG	5.1f	AML MULT = 1.231			
17	PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500		BAT/BPJ	
18			INST MAX LIMIT (mg/l) = 1.635			

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)**