Pennsylvania Department of Environmental Protection

Northwest Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0037117**
Facility Type	**Non-Municipal**	APS ID	**1104283**
Major / Minor	**Minor**	Authorization ID	**1468319**

Applicant and Facility Information

Applicant Name	**Geo Group Inc. DBA Abraxas I**	Facility Name	**Abraxas I**
Applicant Address	PO Box 59 Blue Jay Village Forest Road	Facility Address	165 Abraxas Road
	Marienville, PA 16239-0059		Marienville, PA 16239
Applicant Contact	Scott Jackovitz	Facility Contact	Scott Jackovitz
Applicant Phone	(814) 927-6615	Facility Phone	(814) 927-6615
Client ID	39255	Site ID	243993
Ch 94 Load Status	Not Overloaded	Municipality	Howe Township
Connection Status	No Limitations	County	Forest
Date Application Received	December 26, 2023	EPA Waived?	Yes
Date Application Accepted		If No, Reason	

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

Summary of Review

1.0 General Discussion

This fact sheet supports the renewal of an existing NPDES permit for discharge of treated domestic wastewater from Abraxas I wastewater treatment facility. Geo Group Inc owns and operates the wastewater treatment facility. The extended aeration treatment plant with hydraulic design capacity of 0.04MGD discharge treated sewage to an unnamed tributary to The Branch which is classified for high-quality cold-water fishes (HQ-CWF). The existing NPDES permit was issued on June 27, 2019, with an effective date of July 1, 2019, and expiration date of June 30, 2024. The applicant submitted a timely permit renewal application to the Department and is currently operating under the terms and conditions in the existing permit under administrative extension provisions pending Department action on the renewal application. A topographic map showing the discharge location is presented in attachment A.

1.1 Sludge use and disposal description and location(s):

Digested sludge is hauled out periodically for land application or to Punxsutawney sewage treatment plant for further processing.

1.2 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

Approve	Deny	Signatures	Date
X		*J. Pascal Kwedza* J. Pascal Kwedza, P.E. / Environmental Engineer	May 8, 2025
X		Adam Olesnanik Adam Olesnanik, P.E. / Environmental Engineer Manager	May 13, 2025

Summary of Review

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.

1.3 Changes to the Existing Permit

Annual monitoring of E. coli has been added and TRC limitation has been revised.

1.4 Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.04
Latitude	41° 32’ 47.13”	Longitude	79° 7’ 41.40”
Quad Name	Mayburg	Quad Code	0612
Wastewater Description:	Treated domestic sewage		
Receiving Waters	Unnamed Tributary to The Branch (HQ-CWF)	Stream Code	55076
NHD Com ID	100473277	RMI	0.53
Drainage Area	0.34	Yield (cfs/mi^2)	0.07
Q_{7-10} Flow (cfs)	0.0238	Q_{7-10} Basis	USGS #03017500
Elevation (ft)	1755	Slope (ft/ft)	
Watershed No.	16-F	Chapter 93 Class.	HQ-CWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Cause Unknown		
Source(s) of Impairment	Municipal Point Source		
TMDL Status	Pending	Name	

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

Nearest Downstream Public Water Supply Intake	Aqua Pa in Emlenton, PA		
PWS Waters	Allegheny River	Flow at Intake (cfs)	
PWS RMI	90.57	Distance from Outfall (mi)	88.57

Changes Since Last Permit Issuance: None

Other Comments: The first downstream public water supply below the HQ designation is Aqua Pa in Emlenton on the Allegheny River about 88.57 mi. Due to the distance and dilution, no impact is expected from this discharge om the intake.

2.0 Treatment Facility Summary				
Treatment Facility Name: Abraxas I				
WQM Permit No.	**Issuance Date**			
2700401	7/18/2000			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Extended Aeration	Hypochlorite	0.04
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.04	82.6	Not Overloaded	Aerobic Digestion	Other WWTP

Changes Since Last Permit Issuance: None

2.1 Treatment Facility

The treatment system consists of a grease trap, comminution, equalization, parallel aeration, settling, filtration, disinfection, de-chlorination, post-aeration and aerobic sludge digestion. Chlorine is used for disinfection and Ferric Chloride as bonding agent/ Algae control.

3.0 Existing Effluent Limitations and Monitoring Requirements

Parameter	Effluent Limitations						Monitoring Requirements	
	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	XXX	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	3/week	Grab
DO Oct 1 - May 31	XXX	XXX	8.0 Daily Min	XXX	XXX	XXX	3/week	Grab
DO Jun 1 - Sep 30	XXX	XXX	7.0 Daily Min	XXX	XXX	XXX	3/week	Grab
TRC	XXX	XXX	XXX	0.1	XXX	0.3	3/week	Grab
CBOD5	XXX	XXX	XXX	10.0	XXX	20	2/month	Grab
TSS	XXX	XXX	XXX	10.0	XXX	20	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
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/month	Grab
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	7.5	XXX	15	2/month	Grab
Ammonia May 1 - Oct 31	XXX	XXX	XXX	2.5	XXX	5	2/month	Grab
Total Phosphorus	XXX	XXX	XXX	1.0	XXX	2	2/month	Grab

3.1 Compliance History

3.1.1 DMR Data for Outfall 001 (from April 1, 2024 to March 31, 2025)

Parameter	MAR-25	FEB-25	JAN-25	DEC-24	NOV-24	OCT-24	SEP-24	AUG-24	JUL-24	JUN-24	MAY-24	APR-24
Flow (MGD) Average Monthly			0.0047	0.0043	0.0056	0.0041	0.0049	0.0067	0.0067	0.0060	0.0047	0.0052
pH (S.U.) Instantaneous Minimum			7.92	7.8	8.27	8.11	7.93	7.66	7.51	7.56	6.67	7.4
pH (S.U.) Instantaneous Maximum			8.36	8.39	8.45	8.35	8.35	8.26	7.84	7.96	7.98	7.81
DO (mg/L) Daily Minimum			9.33	8.9	8.52	8.09	7.84	7.68	7.29	7.13	8.49	8.08
TRC (mg/L) Average Monthly			0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.02	0.02	0.01
CBOD5 (mg/L) Average Monthly			< 4.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
TSS (mg/L) Average Monthly			< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Fecal Coliform (No./100 ml) Geometric Mean			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 0.1	< 1.0
Total Nitrogen (mg/L) Average Monthly			< 1.20	< 1.20	< 1.20	< 1.20	< 1.20	< 1.20	< 1.20	< 1.20	< 1.20	< 1.20
Ammonia (mg/L) Average Monthly			< 0.1	< 0.1	< 0.1	< 0.1	< 1.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total Phosphorus (mg/L) Average Monthly			< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.11	< 0.1

3.1.2 Summary of DMRs:

DMRs review for the facility for the last 12 months of operation, presented on the table above in section 3.1.1 indicates permit limits have been met consistently. No effluent violations noted during the period reviewed.

3.1.3 Summary of Inspections:

The facility was last inspected on 3/29/2023. No effluent violations were found during the inspection. The inspection report indicated the facility is operated and maintained well.

4.0 Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .04
Latitude 41º 32' 47.13" **Longitude** -79º 7' 41.40"
Wastewater Description: Sewage Effluent

4.1 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
$CBOD_5$	10	Average Monthly		94.3 (Anti-Deg Guidance)
Total Suspended Solids	10	Average Monthly		94.3 (Anti-Deg Guidance)
Ammonia Nitrogen (5/1-10/31)	3	Average Monthly		94.3 (Anti-Deg Guidance)
Ammonia Nitrogen (11/1-4/30)	9	Average Monthly		94.3 (Anti-Deg Guidance)
Phosphorus	1.0	Average Monthly		94.3 (Anti-Deg Guidance)
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: None

4.2 Water Quality-Based Limitations

4.2.1 WQM 7.0 Stream Model

WQM 7.0 is a water quality model DEP utilizes to establish appropriate effluent limits for $CBOD_5$, NH_3-N and DO in permits. The model simulates mixing and degradation of NH_3-N in the stream and compares calculated instream NH_3-N concentrations to NH_3-N water quality criteria and also simulates mixing and consumption of D.O. in the stream due to the degradation of $CBOD_5$ and NH_3N and compares calculated instream D.O. concentrations to D.O. water quality criteria and recommends effluent limits.

4.2.2 Streamflows

The stream flows are based on USGS Gage Station #03017500 on Tionesta Creek at Lynch, PA. The modelled yield is 0.07-cfs per square mile. The drainage area at the discharge point taken from the previous factsheet = 0.34 mi^2. The resulting streamflows at the point of discharge are as follows:

$Q_{7\text{-}10}$ = 0.34 mi^2 x 0.07 cfs/mi^2 = 0.0238 cfs
$Q_{30\text{-}10}$/ $Q_{7\text{-}10}$ = 1.36
$Q_{7\text{-}10}$ (winter) / $Q_{7\text{-}10}$ = 1.17
$Q_{1\text{-}10}$/ $Q_{7\text{-}10}$ = 0.64

4.2.3 NH_3N Calculations

NH_3N calculations are based on the Department's Implementation Guidance of Section 93.7 Ammonia Criteria, dated 11/4/97 (ID #391-2000-013). The following data were used to determine the instream NH_3N criteria used in modelling of the stream: STP pH = 7.5 (DMR median between July – September) and STP Temp = 20°C (Default)

4.2.4 $CBOD_5$:

The attached model result of WQM 7.0 stream model (attachment B) indicates that, for ABRAXAS I discharge of 0.04MGD, a limitation of 25 mg/l CBOD5 as a monthly average limit (AML) and 50 mg/l as instantaneous maximum (IMAX) is adequate to protect the water quality of the stream. This limit is less stringent than the existing antidegradation ABACT tech limit and will not apply due to anti-backsliding and non-degradation restrictions. The existing ABACT tech limit of 10mg/L monthly average limit and 20mg/L IMAX will remain in the permit. The facility has been complying with the limitation.

4.2.5 NH_3-N:

The attached model result of the WQM 7.0 stream model (attachment B) also indicates that a limitation of 2.5mg/L NH_3-N as a monthly average is necessary to protect the aquatic life from toxicity effects during the summer months. This limit is consistent with the existing permit and will remain in the permit. DMR data indicate the facility meeting the limit. Winter months limit is 3 times the summer limit (7.5mg/L).

4.2.6 Dissolved Oxygen (DO)

The previous factsheet indicated that the existing seasonal DO limit in the permit was to address natural trout reproduction. Per 25 Pa. Code § 93.7, DO in flowing waters, the 7-day average is 6.0 mg/l with a minimum 5.0 mg/l. For naturally reproducing salmonid early life stages, applied in accordance with subsection (b), 7-day average is 9.0 mg/l with a minimum 8.0 mg/l. Per 25 Pa. Code § 93.7(b), For naturally reproducing salmonids, protected early life stages include embryonic and larval stages and juvenile forms to 30 days after hatching. The DO_1 standard for naturally reproducing salmonid early life stages applies October 1 through May 31. Modelling for June 1 through September 30 period recommends a 7.0-mg/L minimum daily dissolved oxygen limitation and for October 1 through May 31 an 8.0-mg/L minimum daily dissolved oxygen limitation applies per DO_1. Chapter 93 no longer contains a DO_4 criterion, however the facility is meeting 7.0 mg/L, therefore the seasonal limit of 7.0 mg/L for June 1 to September 30 and 8.0 mg/L for Oct 1 to May 31 will apply again for the current permit cycle.

4.2.7 Total Suspended Solids (TSS):

There is no water quality criterion for TSS. The existing antidegradation ABACT tech limit of 10mg/L is more stringent the minimum level of effluent quality attainable by secondary treatment as defined in 40 CFR 133.102b(1) and 25 PA § 92a.47(a)(1) and will remain in the permit for the current permit cycle.

4.2.8 Total Residual Chlorine:

The attached TRC results presented in attachment C utilizes the equations and calculations as presented in the Department's May 1, 2003 Implementation Guidance for Total Residual Chlorine (TRC) (ID No. 391-2000-015) for developing chlorine limitations. The Guidance references Chapter 92a, Section 92a.48 (b) which establishes a standard BAT limit of 0.5 mg/l unless a facility-specific BAT has been developed. The results presented in attachment C indicates that a water quality limit of 0.07 mg/l monthly average and IMAX of 0.2 mg/l would be needed to prevent toxicity concerns. The limitation recommended is slightly more stringent than the existing limit in the permit, but DMR indicate the facility can met the recommended permit limit.

4.2.9 Toxics

A reasonable potential (RP) analysis was done for pollutants in the discharge. The discharge consists entirely of domestic wastewater with no pollutants of concern that need further analysis.

4.2.10 The following limitations currently determined through water quality modeling:

Parameter	Period	Limit (mg/l)	SBC	Model
Dissolved Oxygen	6/1 – 9/30	7.0	Minimum	Pa Code Chapter 93
Dissolved Oxygen	10/1 – 5/31	8.0	Minimum	Pa Code Chapter 93
Ammonia Nitrogen	5/1 – 10/31	2.5	Average Monthly	WQM 7.0
Ammonia Nitrogen	11/1 – 4/30	7.5	Average Monthly	WQM 7.0
Total Residual Chlorine		0.07	Average Monthly	TRC Spreadsheet
Total Residual Chlorine		0.2	IMAX	TRC Spreadsheet

Comments: Seasonal DO requirements applied due to the Pa Fish and Boat Commission stream classification.

4.2.11 Fecal Coliform and E. Coli

The existing Fecal Coliform limit is consistent with the technology limits recommended in 92a.47(a)(4) and (a)(5) and will remain in the permit. In March of 2021, EPA approved DEP's Triennial Review of Water Quality Standards, which included a new swimming season criterion for E. coli. As a result, DEP is including monitoring requirements for E. Coli in new and renewed sewage permits above 2000gpd. Monitoring frequency is based on annual average flow as follows: 1/month for design flows >= 1 MGD, 1/quarter for design flows >= 0.05 and < 1 MGD and 1/year for design flows of 0.002 and < 0.05 MGD. Your discharge of 0.04 MGD requires 1/year monitoring as included in the permit.

4.2.12 Best Professional Judgement (BPJ) Limitations

Comments: The existing monitoring for Total Nitrogen recommended in Department SOP for establishing effluent limits will remain in the permit.

5.0 Other Requirements

5.1 Anti-backsliding

Not applicable to this permit

5.2 Stormwater:

No storm water outfall is associated with this facility

5.3 Anti-Degradation (93.4)

The effluent limits for this discharge have been developed to ensure that existing instream water uses and the level of water quality necessary to protect the existing uses are maintained and protected. The facility discharge to a stream segment designated as High-Quality Waters. The discharge is not expected to impact the stream negatively. No Exceptional Value Waters are impacted by this discharge.

5.4 Class A Wild Trout Fisheries

The limits have been developed for protection of Class A Wild Trout Fisheries.

5.5 303d Listed Streams

The discharge from this facility is to a stream segment that is listed as impaired from municipal point source, cause unknown. The effluent limits have been developed to ensure the facility does not contribute to the impairment. No further action is warranted at this time.

5.6 Other Permit requirements

The permit contains the following special conditions:

1. Stormwater Prohibition. 2. Approval Contingencies, 3. Management of collected screenings, slurries, sludges and other solids 4. Requirement to connect if a public sewer becomes available in the area. 5. Chlorine minimization and 6. Solids Management requirement.

6.0 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 , (from 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	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	XXX	XXX	XXX	XXX	XXX	1/week	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	3/week	Grab
DO Oct 1 - May 31	XXX	XXX	8.0 Daily Min	XXX	XXX	XXX	3/week	Grab
DO Jun 1 - Sep 30	XXX	XXX	7.0 Daily Min	XXX	XXX	XXX	3/week	Grab
TRC	XXX	XXX	XXX	0.07	XXX	0.2	3/week	Grab
CBOD5	XXX	XXX	XXX	10.0	XXX	20.0	2/month	Grab
TSS	XXX	XXX	XXX	10.0	XXX	20.0	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	XXX	Report	1/year	Grab
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/month	Grab
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	7.5	XXX	15.0	2/month	Grab
Ammonia May 1 - Oct 31	XXX	XXX	XXX	2.5	XXX	5.0	2/month	Grab
Total Phosphorus	XXX	XXX	XXX	1.0	XXX	2.0	2/month	Grab

Compliance Sampling Location: At Outfall 001

7.0 Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment **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.
☒	SOP: Establishing effluent limitation for individual sewage permit.
☐	Other:

Attachments

A. Topographical Map

B. WQM Model Results

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
16F	55076	Trib 55076 to Branch, The

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
0.530	Abraxas I	PA0037117	0.040	CBOD5	25		
				NH3-N	2.53	5.06	
				Dissolved Oxygen			7

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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
	16F	55076	Trib 55076 to Branch, The	**0.530**	1755.00	0.34	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	0.070	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
Abraxas I	PA0037117	0.0400	0.0400	0.0400	0.000	20.00	7.50

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	5.00	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
16F	55076	Trib 55076 to Branch, The	**0.001**	1650.00	0.51	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	0.070	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 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
16F	55076	Trib 55076 to Branch, The

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
0.530	Abraxas I	11.48	14.31	11.48	14.31	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
0.530	Abraxas I	1.66	2.53	1.66	2.53	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)		
0.53	Abraxas I	25	25	2.53	2.53	7	7	0	0

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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	7		

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WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
16F	55076	Trib 55076 to Branch, The

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												
0.530	0.02	0.00	0.02	.0619	0.03759	.356	3.02	8.49	0.08	0.406	20.00	7.30
Q1-10 Flow												
0.530	0.02	0.00	0.02	.0619	0.03759	NA	NA	NA	0.07	0.431	20.00	7.35
Q30-10 Flow												
0.530	0.03	0.00	0.03	.0619	0.03759	NA	NA	NA	0.08	0.385	20.00	7.26

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WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
16F	55076	Trib 55076 to Branch, The

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.530	0.040	20.000	7.296
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
3.024	0.356	8.490	0.080
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
18.61	1.439	1.83	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.345	26.870	Owens	7
Reach Travel Time (days)			
0.406			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.041	17.55	1.78	7.45
0.081	16.56	1.73	7.54
0.122	15.62	1.68	7.63
0.163	14.73	1.63	7.71
0.203	13.89	1.59	7.79
0.244	13.10	1.54	7.86
0.284	12.36	1.50	7.93
0.325	11.66	1.46	7.99
0.366	10.99	1.42	8.05
0.406	10.37	1.38	8.11

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C. TRC Calculations

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.0238	= Q stream (cfs)	0.5	= CV Daily
0.04	= Q discharge (MGD)	0.5	= CV Hourly
30	= no. samples	1	= AFC_Partial Mix Factor
0.3	= Chlorine Demand of Stream	1	= CFC_Partial Mix Factor
0	= Chlorine Demand of Discharge	15	= AFC_Criteria Compliance Time (min)
0.5	= BAT/BPJ Value	720	= CFC_Criteria Compliance Time (min)
0	= % Factor of Safety (FOS)	0	=Decay Coefficient (K)

Source	Reference	AFC Calculations		Reference	CFC Calculations	
TRC	1.3.2.iii	WLA afc =	0.142	1.3.2.iii	WLA cfc =	0.131
PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc =	0.581
PENTOXSD TRG	5.1b	LTA_afc=	0.053	5.1d	LTA_cfc =	0.076

Source		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) =	0.213	

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)**