

Application Type Renewal
 Facility Type Non-Municipal
 Major / Minor Minor

**NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE**

Application No. PA0081841
 APS ID 799894
 Authorization ID 1254665

Applicant and Facility Information

Applicant Name	<u>MHC TT Inc.(DBA Hershey Preserve)</u>	Facility Name	<u>Hershey Preserve</u>
Applicant Address	<u>493 S Mt Pleasant</u> <u>Lebanon, PA 17042-8945</u>	Facility Address	<u>493 S Mount Pleasant Road</u> <u>Lebanon, PA 17042-4870</u>
Applicant Contact	<u>Kim Miller</u>	Facility Contact	<u>Kim Miller</u>
Applicant Phone	<u>(717) 867-1981</u>	Facility Phone	<u>(717) 867-1891</u>
Client ID	<u>300788</u>	Site ID	<u>454753</u>
Ch 94 Load Status	<u>Not Overloaded</u>	Municipality	<u>South Annville Township</u>
Connection Status		County	<u>Lebanon</u>
Date Application Received	<u>December 3, 2018</u>	EPA Waived?	<u>Yes</u>
Date Application Accepted	<u>December 18, 2018</u>	If No, Reason	
Purpose of Application	<u>. Renewal of NPDES permit for discharge of treated sewage</u>		

Summary of Review

1.0 General Discussion

This fact sheet supports the re-issuance of an existing NPDES permit for discharge of treated domestic wastewater from a wastewater treatment plant that serves an existing seasonal campground known as Hershey Preserve, (formerly Thousand Trails). MHC TT **Inc** owns and operates the campground located in South Annville Township, Lebanon County. The treatment plant receives flow from the RV campground and from RV dump station. Effluent from the 0.04 mgd extended aeration package treatment plant is discharged to an unnamed tributary of Gingrich Run classified for trout stocking fishes. Previous protection reports document that aquatic life was found in the receiving stream just downstream of the discharge point, and the Point of First Use (POFU) was set at just below the discharge point. The existing NPDES permit was issued on May 27, 2014 with an effective date of June 1, 2014 and expiration date of May 31, 2019. 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 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

Approve	Deny	Signatures	Date
X		J. Pascal Kwedza, P.E. / Environmental Engineer	December 17, 2019
		Daniel W. Martin, P.E. / Environmental Engineer Manager	
		Maria D. Bebenek, P.E., Program Manager	

Summary of Review

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.

1.2 Changes to the existing Permit

- Monitoring for Total nitrogen, Nitrate-Nitrite, and TKN has been increased to semiannual to collect adequate data for the Chesapeake Bay Program.

1.3 Existing Permit Limits and Monitoring Requirements

DISCHARGE LIMITATIONS							MONITORING REQUIREMENTS	
Discharge Parameter	Mass Units (lbs/day)		Concentrations (mg/l)				Monitoring Frequency	Sample Type
	Average Monthly	Maximum Daily	Inst. Minimum	Average Monthly	Maximum Daily	Inst. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.12	XXX	0.38	1/day	Grab
CBOD5	XXX	XXX	XXX	10	XXX	20	2/month	8-Hr Composite
Total Suspended Solids	XXX	XXX	XXX	10	XXX	20	2/month	8-Hr Composite
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	Grab
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/month	Grab
Total Phosphorus	XXX	XXX	XXX	2.0	XXX	4.0	2/month	8-Hr Composite
Fecal Coliform (5/1 to 9/30)	XXX	XXX	XXX	200	XXX	XXX	2/month	Grab
Fecal Coliform (10/1 to 4/30)	XXX	XXX	XXX	2000	XXX	XXX	2/month	Grab
Ammonia-Nitrogen May 1 - Oct 31	XXX	XXX	XXX	3.0	XXX	6.0	2/month	8-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	XXX	XXX	XXX	9.0	XXX	18	2/month	8-Hr Composite
Total Kjeldahl Nitrogen	XXX	XXX	XXX	Report AnnI Avg	XXX	XXX	1/year	8-Hr Composite
Nitrate-Nitrite as N	XXX	XXX	XXX	Report AnnI Avg	XXX	XXX	1/year	8-Hr Composite
Total Nitrogen	XXX	XXX	XXX	Report AnnI Avg	XXX	XXX	1/year	Calculation

1.4 Discharge, Receiving Waters and Water Supply Information			
Outfall No.	<u>001</u>	Design Flow (MGD)	<u>.04</u>
Latitude	<u>40° 16' 15.11"</u>	Longitude	<u>-76° 31' 28.42"</u>
Quad Name	<u>Palmyra</u>	Quad Code	<u></u>
Wastewater Description: <u>Sewage Effluent</u>			
Receiving Waters	<u>Unnamed Tributary to Gingrich Run (TSF)</u>	Stream Code	<u>09713</u>
NHD Com ID	<u>56400717</u>	RMI	<u>0.25</u>
Drainage Area	<u></u>	Yield (cfs/mi ²)	<u>0.1</u>
Q ₇₋₁₀ Flow (cfs)	<u></u>	Q ₇₋₁₀ Basis	<u>USGS Gage Station</u>
Elevation (ft)	<u></u>	Slope (ft/ft)	<u></u>
Watershed No.	<u>7-D</u>	Chapter 93 Class.	<u>TSF</u>
Existing Use	<u></u>	Existing Use Qualifier	<u></u>
Exceptions to Use	<u></u>	Exceptions to Criteria	<u></u>
Assessment Status	<u>Impaired</u>		
Cause(s) of Impairment	<u>Flow Alterations, Siltation, Pathogens</u>		
Source(s) of Impairment	<u>Agriculture, Source Unknown</u>		
TMDL Status	<u>Final, 04/09/2001</u>	Name	<u>Quittapahilla Creek Watershed</u>
Background/Ambient Data		Data Source	
pH (SU)	<u></u>		<u></u>
Temperature (°F)	<u></u>		<u></u>
Hardness (mg/L)	<u></u>		<u></u>
Other:	<u></u>		<u></u>
Nearest Downstream Public Water Supply Intake	<u>PA American Water</u>		
PWS Waters	<u>Swatara Creek</u>	Flow at Intake (cfs)	<u></u>
PWS RMI	<u></u>	Distance from Outfall (mi)	<u>18</u>

Changes Since Last Permit Issuance: None

1.4.1 Water Supply Intake

The nearest water supply intake is 18 miles downstream at South Hanover Township, Dauphin County on the Susquehanna River by PA American Water. No impact is expected from this discharge.

2.0 Treatment Facility Summary				
Treatment Facility Name: Thousand Trails Inc.				
WQM Permit No.		Issuance Date		
Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary With Ammonia Reduction	Extended Aeration	Hypochlorite	0.04
Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.04		Not Overloaded		

Changes Since Last Permit Issuance: None

2.1 Treatment Facility

Treatment units are:

- 3 aerated EQ tanks with pump to pump flow to aeration tank
- 1 aeration
- 1 clarifier
- 2 mixed media filters with clear/mud well
- Chlorine Contact Tank with liquid chlorination
- De-chlorination
- 1 Sludge holding tank

2.2 Chemicals

- Soda ash for pH adjustments
- Sodium Hypochlorite for disinfection
- Sodium bisulfate for de-chlorination
- Aluminum Sulfate added for phosphorus removal

3.0 Compliance History

3.1 DMR Data for Outfall 001 (from November 1, 2018 to October 31, 2019)

Parameter	OCT-19	SEP-19	AUG-19	JUL-19	JUN-19	MAY-19	APR-19	MAR-19	FEB-19	JAN-19	DEC-18	NOV-18
Flow (MGD) Average Monthly	0.005	0.0084	0.0113	0.014	0.0124	0.0103	0.0049	0.0023	0.0015	0.0017	0.0015	0.003
Flow (MGD) Daily Maximum	0.0115	0.0127	0.0183	0.0198	0.0177	0.0198	0.0117	0.0061	0.0042	0.0098	0.006	0.0097
pH (S.U.) Minimum	7.3	7.3	7.3	7.4	7.4	7.4	7.5	7.5	7.5	7.5	7.5	7.6
pH (S.U.) Maximum	7.7	7.8	7.6	7.9	7.9	7.8	7.8	7.8	8.1	7.9	7.9	7.9
DO (mg/L) Minimum	8.4	7.9	7.4	7.1	7.7	7.3	9.1	10.9	11.5	10.3	10.2	10.2
TRC (mg/L) Average Monthly	< 0.02	< 0.02	< 0.02	< 0.03	< 0.02	< 0.04	< 0.04	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
TRC (mg/L) Instantaneous Maximum	0.12	0.05	0.05	0.13	0.05	0.23	0.15	0.08	0.05	0.07	0.08	0.06
CBOD5 (mg/L) Average Monthly	< 2.0	< 2.0	< 2.3	< 2.5	< 2.0	< 2.6	< 2.3	2.3	< 3.5	< 2.3	< 2	< 3
TSS (mg/L) Average Monthly	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	8.0	10.5	< 5.0	< 5.0	< 5	< 5
Fecal Coliform (CFU/100 ml) Geometric Mean	22	< 5	11	9	< 1	< 1	< 1	< 2	< 1	< 1	< 3	< 1
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	80	21	13	18	2	2	< 1	5	< 1	< 1	10	< 1
Nitrate-Nitrite (mg/L) Annual Average											< 77.5	
Total Nitrogen (mg/L) Annual Average											< 78.5	
Ammonia (mg/L) Average Monthly	0.4	0.3	0.4	0.2	0.2	< 0.1	0.8	< 0.1	< 0.1	0.3	< 0.1	< 0.1
TKN (mg/L) Annual Average											< 1	
Total Phosphorus (mg/L) Average Monthly	1.6	0.8	1.1	1.1	1.0	0.3	0.5	1.1	0.4	0.5	1.1	0.8

3.2 Effluent Violations for Outfall 001, from: December 1, 2018 To: October 31, 2019

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
TSS	03/31/19	Avg Mo	10.5	mg/L	10	mg/L

3.3 Compliance History

Summary of DMRs:

Discharge Monitoring Reports (DMRs) review for the facility for the last 12 months of operation presented on the table above in section 3.1 indicate permit limits have been met most of the time. One permit limit violation noted on DMRs during the period reviewed as shown on the table above in section 3.2. The violation appears to have been addressed.

Summary of Inspections:

The facility was inspected 6 times during the past permit cycle. Inspection reports review for the facility during the period indicate permit limits have been met satisfactorily. The reports recommended skimmer repairs in the clarifier, sludge hauling record retention on-site for 5 years and development of emergency response plan. Fecal Coliform violation noted during plant inspection on 9/3/2019. Over all the facility has good compliance record.

4.0 Development of Effluent Limitations

Outfall No.	<u>001</u>	Design Flow (MGD)	<u>.04</u>
Latitude	<u>40° 16' 15.07"</u>	Longitude	<u>-76° 31' 27.65"</u>
Wastewater Description:	<u>Sewage Effluent</u>		

4.1 Basis for Effluent Limitations

In general, the Clean Water Act(AWA) requires that the effluent limits for a particular pollutant be the more stringent of either technology-based limits or water quality-based limits. Technology-based limits are set according to the level of treatment that is achievable using available technology. A water quality-based effluent limit is designed to ensure that the water quality standards applicable to a waterbody are being met and may be more stringent than technology-based effluent limits.

4.1.1 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	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 Technology-based limits for TSS and CBOD₅ recommended on the above table are not applicable to this discharge. Effluent limits in the permit are based on the August 18, 1997 Implementation Guidance for Evaluating Wastewater Discharges to Drainage Ditches and Swales (ID # 391-2000-014). The guidance requires a minimum treatment of 10 mg/l CBOD₅ and Suspended Solids and the use of filters for treatment.

4.2 Water Quality-Based Limitations

4.2.1 Streamflows:

Streamflows for the water quality analysis were determined by correlating with the yield of USGS gauging station No 01573000 on Swatara Creek. The Q₇₋₁₀ and drainage area at the gage is 20.2ft³/s and 309 mi² respectively. The resulting streamflows are as follows:

- $Q_{7-10} = (20.2\text{ft}^3/\text{s}) / 309 \text{ mi}^2 = 0.1\text{ft}^3/\text{s}/ \text{mi}^2$
- $Q_{30-10} / Q_{7-10} = 1.41$
- $Q_{1-10} / Q_{7-10} = 0.81$

The drainage area at POFU= 0.45 mi²

The Q₇₋₁₀ at POFU = 0.45 mi² x .10 ft³/s/mi² = 0.045 ft³/s.

4.2.2 NH₃N Calculations

The NH₃-N calculations will be based on Chapter 93 regulations and the Division of Water Management’s November 1997 NH₃-N Implementation Guideline The following background information will be used to determine the instream NH₃-N criteria used in the attached computer model of the stream.

- Discharge pH = 7.3 (DMR median July- Sept)

- Discharge Temperature = 25 ° C (default)
- Stream pH = 7.0 (default)
- Stream Temperature = 20 ° C (default)
- Background NH₃-N = 0.0 (default)
- Annual Average Flow = 0.04MGD

4.2.3 CBOD₅ & NH₃-N

The existing limits in the permit were based on the Department's dry stream guidance. The previous factsheet document that dry stream effluent limits were recommended due to a "losing" stream condition downstream. The attached result of WQM 7.0 stream model (attachment B) indicates that a limit of 25 mg/l is adequate to protect water quality of the stream, however, due to anti-backsliding restrictions the existing limit of 10mg/l will be continued in the permit. The attached result of the WQM 7.0 stream model also indicates that a limit of 3.0 mg/l NH₃ as a monthly average is necessary to protect the aquatic life from toxicity effects at the point of first used during summer months. Winter months limits are 3 times the summer months limit. These limits are consistent with the existing limits in the permit and the permittee has been complying with the limitations in the permit.

4.2.4 Dissolved Oxygen

The existing permit contains a limit of 5 mg/l for Dissolved Oxygen (DO). DEP's Technical Guidance for the Development and Specification of Effluent Limitations (362-0400-001, 10/97) suggests that either the adopted minimum stream D.O. criteria for the receiving stream or the effluent level determined through water quality modeling be used for the limit. Since the WQM 7.0 model was run using a minimum D.O. of 5.0 mg/l, this limit will be continued in the renewed permit with a daily monitoring requirement per DEP guidance.

4.2.5 Chesapeake Bay Strategy

The Department formulated a strategy in April 2007, to comply with the EPA and Chesapeake Bay Foundation requirements to reduce point source loadings of Total Nitrogen (TN) and Total Phosphorus (TP) to the Bay. In the Strategy, sewage dischargers have been prioritized by Central Office based on their delivered TN loadings to the Bay. The highest priority (Phases 1, 2, and 3) dischargers will receive annual loading caps based on their design flow on August 29, 2005 and concentrations of 6 mg/l TN and 0.8 mg/l TP. Phase 4 (0.2 -0.4mgd) and Phase 5(below 0.2mdg) will be required to monitor and report TN and TP during permit renewal at a monitoring frequency following Table 6-3 of DEP's Technical Guidance for Development and Specification of effluent Limitations (No. 362-0400-001). Any facility in Phases 4 and 5 that undergoes expansion is subjected to cap load right away.

EPA published the Chesapeake Bay Total Maximum Daily Load (TMDL) in December of 2010. Despite extensive restoration efforts during the past 25 years, the TMDL was prompted by insufficient progress and continued poor water quality in the Chesapeake Bay and its tidal tributaries.

In order to address the TMDL, Pennsylvania developed in addition to the Bay Strategy, a Chesapeake Watershed Implementation Plan (WIP) Phase 1 in January 2011 and Phase 2 in March 2012. In accordance with the Phase 2 WIP and its supplement, re-issuing permits for significant dischargers follow the same phased approach formulated in the original Bay strategy, whilst Phase 4 and Phase 5 will be required to monitor and report TN and TP during permit renewal. This facility is, classified as a phase 5, and has been monitoring Nitrate-Nitrite as N, Total Kjeldahl Nitrogen, Total Nitrogen annually and will be required to continue monitoring Nitrate-Nitrite as N, Total Kjeldahl Nitrogen, Total Nitrogen semi-annually during this permit cycle collect adequate data. There is limit on Total Phosphorus in the permit, no monitoring is required.

4.2.6 Phosphorus:

The average monthly limit of 2mg/l phosphorus in the existing permit was based on the requirement to control phosphorus loading to Lower Susquehanna River Basin. That requirement has been superseded by the development of Chesapeake Bay TMDL in 2010, however due to anti-backsliding restrictions the limit will remain in the permit.

4.2.7 Total Suspended Solids(TSS):

There is no water quality criterion for TSS. The existing average monthly limit of 10mg/l for TSS based on dry stream guidance will remain in the permit due to the stream being intermittent and become a “losing” stream downstream at times.

4.2.8 Total Residual Chlorine:

The attached TRC results presented in attachment C utilizes the equations and calculations presented in the Department's 2003 Implementation Guidance for Residual Chlorine (TRC) (ID # 391-2000-015) for developing chlorine limitations. The result indicates that a water quality limit rounded to 2 decimal places of 0.12 mg/l monthly average and 0.38 mg/l IMAX would be needed to prevent toxicity concerns. This is consistent with the existing permit, and the facility has been meeting this 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 Special Permit Conditions

The permit will contain 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. Dry stream discharge condition,
6. Chlorine minimization

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 Biosolids Management

Sludge is hold up in sludge holding tank and hauled out by a licensed hauler periodically to Manheim.

5.4 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. No High-Quality Waters are impacted by this discharge. No Exceptional Value Waters are impacted by this discharge.

5.5 Class A Wild Trout Fisheries

No Class A Wild Trout Fisheries are impacted by this discharge.

5.6 303d Listed Streams:

The discharge is located on stream segment listed as impaired for recreational use due to pathogens source unknown, and for aquatic life due to siltation and flow alteration from agricultural activities. The discharge is

located on stream segment within the Quittapahilla Creek Watershed with a TMDL finalized in 2001. This discharge does not contribute significantly to the impairment to warrant any further action at this time.

5.7 Basis for Effluent and Surface Water Monitoring

Section 308 of the CWA and federal regulation 40 CFR 122.44(i) require monitoring in permits to determine compliance with effluent limitations. Monitoring may also be required to gather effluent and surface water data to determine if additional effluent limitations are required and/or to monitor effluent impacts on receiving water quality. The permittee is responsible for conducting the monitoring and for reporting results on Discharge Monitoring Reports (DMRs).

5.8 Effluent Monitoring

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. Permittees have the option of taking more frequent samples than are required under the permit. These samples can be used for averaging if they are conducted using EPA-approved test methods (generally found in 40 CFR 136) and if the Method Detection Limits are less than the effluent limits. The sampling location must be after the last treatment unit and prior to discharge to the receiving water. If no discharge occurs during the reporting period, "no discharge" shall be reported on the DMR.

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” (362-0400-001), 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	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.12	XXX	0.38	1/day	Grab
CBOD5	XXX	XXX	XXX	10	XXX	20	2/month	8-Hr Composite
TSS	XXX	XXX	XXX	10	XXX	20	2/month	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2,000 Geo Mean	XXX	10,000	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Nitrate-Nitrite	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/6 months	8-Hr Composite
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/6 months	Calculation
Ammonia Nov 1 - Apr 30	XXX	XXX	XXX	9.0	XXX	18	2/month	8-Hr Composite
Ammonia May 1 - Oct 31	XXX	XXX	XXX	3.0	XXX	6	2/month	8-Hr Composite
TKN	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/6 months	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	2.0	XXX	4	2/month	8-Hr Composite

Compliance Sampling Location: Outfall 001

Tools and References Used to Develop Permit	
<input checked="" type="checkbox"/>	WQM for Windows Model (see Attachment B)
<input type="checkbox"/>	PENTOXSD for Windows Model (see Attachment [redacted])
<input checked="" type="checkbox"/>	TRC Model Spreadsheet (see Attachment C)
<input type="checkbox"/>	Temperature Model Spreadsheet (see Attachment [redacted])
<input type="checkbox"/>	Toxics Screening Analysis Spreadsheet (see Attachment [redacted])
<input type="checkbox"/>	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
<input checked="" type="checkbox"/>	Technical Guidance for the Development and Specification of Effluent Limitations, 362-0400-001, 10/97.
<input type="checkbox"/>	Policy for Permitting Surface Water Diversions, 362-2000-003, 3/98.
<input checked="" type="checkbox"/>	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 362-2000-008, 11/96.
<input type="checkbox"/>	Technology-Based Control Requirements for Water Treatment Plant Wastes, 362-2183-003, 10/97.
<input type="checkbox"/>	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 362-2183-004, 12/97.
<input type="checkbox"/>	Pennsylvania CSO Policy, 385-2000-011, 9/08.
<input type="checkbox"/>	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
<input type="checkbox"/>	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 391-2000-002, 4/97.
<input checked="" type="checkbox"/>	Determining Water Quality-Based Effluent Limits, 391-2000-003, 12/97.
<input type="checkbox"/>	Implementation Guidance Design Conditions, 391-2000-006, 9/97.
<input type="checkbox"/>	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 391-2000-007, 6/2004.
<input type="checkbox"/>	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 391-2000-008, 10/1997.
<input type="checkbox"/>	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 391-2000-010, 3/99.
<input type="checkbox"/>	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 391-2000-011, 5/2004.
<input type="checkbox"/>	Implementation Guidance for Section 93.7 Ammonia Criteria, 391-2000-013, 11/97.
<input type="checkbox"/>	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 391-2000-014, 4/2008.
<input checked="" type="checkbox"/>	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 391-2000-015, 11/1994.
<input type="checkbox"/>	Implementation Guidance for Temperature Criteria, 391-2000-017, 4/09.
<input type="checkbox"/>	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 391-2000-018, 10/97.
<input type="checkbox"/>	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, 391-2000-019, 10/97.
<input type="checkbox"/>	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 391-2000-021, 3/99.
<input type="checkbox"/>	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, 391-2000-022, 3/1999.
<input type="checkbox"/>	Design Stream Flows, 391-2000-023, 9/98.
<input type="checkbox"/>	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 391-2000-024, 10/98.
<input type="checkbox"/>	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 391-3200-013, 6/97.
<input checked="" type="checkbox"/>	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
<input checked="" type="checkbox"/>	SOP: Establishment of effluent limitation for individual sewage permit
<input type="checkbox"/>	Other: [redacted]

Attachments

A. Topographical Map



B. WQM Model Results

WQM 7.0 Effluent Limits

<u>SWP Basin</u>		<u>Stream Code</u>		<u>Stream Name</u>			
07D		9713		Trib 09713 to Gingrich 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)
0.250	Thousand Trails	PA0081841	0.040	CBOD5	25		
				NH3-N	3.02	6.04	
				Dissolved Oxygen			5

Permit No. PA0081841

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
07D	9713 Trib	09713 to Gingrich Run	0.250	523.40	0.45	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	Tributary pH	Stream Temp	Stream pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.100	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
Thousand Trails	PA0081841	0.0400	0.0400	0.0400	0.000	25.00	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	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

Permit No. PA0081841

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
07D	9713	Trib 09713 to Gingrich Run	0.010	515.20	0.90	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	Tributary pH	Stream Temp	Stream pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.100	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	5.00	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

<u>SWP Basin</u>		<u>Stream Code</u>				<u>Stream Name</u>						
07D		9713				Trib 09713 to Gingrich 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												
0.250	0.04	0.00	0.04	.0619	0.00647	.361	4.04	11.19	0.07	0.201	22.89	7.15
Q1-10 Flow												
0.250	0.04	0.00	0.04	.0619	0.00647	NA	NA	NA	0.07	0.210	23.15	7.16
Q30-10 Flow												
0.250	0.06	0.00	0.06	.0619	0.00647	NA	NA	NA	0.08	0.183	22.47	7.12

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WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	<input checked="" type="checkbox"/>
WLA Method	EMPR	Use Inputted W/D Ratio	<input type="checkbox"/>
Q1-10/Q7-10 Ratio	0.81	Use Inputted Reach Travel Times	<input type="checkbox"/>
Q30-10/Q7-10 Ratio	1.41	Temperature Adjust Kr	<input checked="" type="checkbox"/>
D.O. Saturation	90.00%	Use Balanced Technology	<input checked="" type="checkbox"/>
D.O. Goal	5		

Permit No. PA0081841

WQM 7.0 Wasteload Allocations

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>
07D	9713	Trib 09713 to Gingrich 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
0.250	Thousand Trails	6.79	10.79	6.79	10.79	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
0.250	Thousand Trails	1.49	3.02	1.49	3.02	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	<u>CBOD5</u>		<u>NH3-N</u>		<u>Dissolved Oxygen</u>		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
0.25	Thousand Trails	25	25	3.02	3.02	5	5	0	0

Permit No. PA0081841

WQM 7.0 D.O. Simulation

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>		
07D	9713	Trib 09713 to Gingrich Run		
<u>RMI</u>	<u>Total Discharge Flow (mgd)</u>	<u>Analysis Temperature (°C)</u>		<u>Analysis pH</u>
0.250	0.040	22.895		7.148
<u>Reach Width (ft)</u>	<u>Reach Depth (ft)</u>	<u>Reach WDRatio</u>		<u>Reach Velocity (fps)</u>
4.043	0.361	11.188		0.073
<u>Reach CBOD5 (mg/L)</u>	<u>Reach Kc (1/days)</u>	<u>Reach NH3-N (mg/L)</u>		<u>Reach Kn (1/days)</u>
15.32	1.403	1.75		0.875
<u>Reach DO (mg/L)</u>	<u>Reach Kr (1/days)</u>	<u>Kr Equation</u>		<u>Reach DO Goal (mg/L)</u>
6.365	26.486	Owens		5
<u>Reach Travel Time (days)</u>				
0.201				
	<u>Subreach Results</u>			
	<u>TravTime</u>	<u>CBOD5</u>	<u>NH3-N</u>	<u>D.O.</u>
	(days)	(mg/L)	(mg/L)	(mg/L)
	0.020	14.83	1.72	6.65
	0.040	14.36	1.69	6.84
	0.060	13.91	1.66	6.97
	0.080	13.47	1.63	7.06
	0.100	13.04	1.60	7.14
	0.120	12.63	1.58	7.20
	0.140	12.23	1.55	7.25
	0.160	11.85	1.52	7.30
	0.180	11.47	1.50	7.34
	0.201	11.11	1.47	7.38

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C. TRC Calculation Results

Copy of TRC_CALC1

TRC EVALUATION				
Input appropriate values in A3:A9 and D3:D9				
0.045	= 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
TRC	1.3.2.iii	WLA_afc = 0.251		1.3.2.iii
PENTOXSD TRG	5.1a	LTAMULT_afc = 0.373		5.1c
PENTOXSD TRG	5.1b	LTA_afc = 0.094		5.1d
		WLA_cfc = 0.237		
		LTAMULT_cfc = 0.581		
		LTA_cfc = 0.138		
Source	Effluent Limit Calculations			
PENTOXSD TRG	5.1f	AML_MULT = 1.231		
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.115		AFC
		INST MAX LIMIT (mg/l) = 0.376		
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	$1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)$			