pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northcentral Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0113182**
Facility Type	**Non-Municipal**	APS ID	**1043755**
Major / Minor	**Minor**	Authorization ID	**1362458**

Applicant and Facility Information

Applicant Name	**Nittany Grove Condominium Comm Association**	Facility Name	**Nittany Grove Condominium Comm Association**
Applicant Address	204 Timberwood	Facility Address	Timberwood Trail
	Centre Hall, PA 16828		Boalsburg, PA 16827
Applicant Contact	Thomas Bettle	Facility Contact	Thomas Bettle
Applicant Phone	(814) 355-2021	Facility Phone	(814) 355-2021
Client ID	342082	Site ID	238308
Ch 94 Load Status	Not Overloaded	Municipality	Harris Township
Connection Status	No Limitations	County	Centre
Date Application Received	July 20, 2021	EPA Waived?	Yes
Date Application Accepted	August 9, 2021	If No, Reason	

Purpose of Application: Renewal of an existing NPDES permit for the discharge of treated sewage.

Summary of Review

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		*Jonathan P. Peterman* Jonathan P. Peterman / Project Manager	September 8, 2022
X		*Nicholas W. Hartranft* Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	September 9, 2022

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.0105
Latitude	40º 47' 3.85"	Longitude	-77º 43' 54.16"
Quad Name	Centre Hall	Quad Code	1224
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary to Spring Creek (HQ-CWF, MF)	Stream Code	22966 (Spring Creek)
NHD Com ID	67180188	RMI	0.172 @ UNT 23.5 @ Spring Creek
Drainage Area	0.054 mi^2 @ UNT 1.8 mi^2 @ Spring Creek	Yield (cfs/mi^2)	0.239
Q_{7-10} Flow (cfs)	0 @ UNT 0.14 @ Spring Creek	Q_{7-10} Basis	Gauge No. 01546400
Elevation (ft)	1205	Slope (ft/ft)	0.033 (UNT) 0.00182 (Spring Creek)
Watershed No.	9-C	Chapter 93 Class.	HQ-CWF, MF
Existing Use	N/A	Existing Use Qualifier	N/A
Exceptions to Use	None	Exceptions to Criteria	None
Assessment Status	Impaired		
Cause(s) of Impairment	HABITAT ALTERATIONS, SILTATION		
Source(s) of Impairment	HABITAT MODIFICATION - OTHER THAN HYDROMODIFICATION, HABITAT MODIFICATION - OTHER THAN HYDROMODIFICATION		
TMDL Status		Name	
Nearest Downstream Public Water Supply Intake	PA American Water Company		
PWS Waters	West Branch Susquehanna River	Flow at Intake (cfs)	752
PWS RMI	10.6	Distance from Outfall (mi)	Approx. 100

Changes Since Last Permit Issuance: None.

Other Comments: The discharge is to a road-side ditch that ultimately drains to Spring Creek. The updated Q_{7-10} data was obtained from the updated stream gage information obtained from *Stuckey, M.H., and Roland, M.A., 2011, Selected Streamflow Statistics for Streamgage Locations In and Near Pennsylvania*. A comparative stream analysis was previously conducted using a comparative stream gage based on basin characteristics. The Q_{7-10} calculations indicate that the Q_{7-10} is 23.5 cfs at Spring Creek.

Treatment Facility Summary

Treatment Facility Name: Nittany Grove MHP Sewer System

WQM Permit No.	Issuance Date	Comments
1474401 T-1	7/20/06	Transfer.
1474401	4/30/74	Original construction,
1409402	7/13/16	Expansion of sewer system.

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Extended Aeration	Hypochlorite	0.0105
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.0105	24	Not Overloaded	Aerobic Digestion	

Treatment System Components for Outfall 001:
- One (1) Influent Screen.
- One (1) Equalization Tank.
- Two (2) Aeration Basins.
- One (1) Secondary Clarifier.
- Two (2) Sand Filters.
- One (1) Tablet Chlorine disinfection system with contact tank.
- One (1) Outfall 001.

- One (1) Aerobic digester.

Changes Since Last Permit Issuance: None.
Other Comments: None.

Anti-Backsliding

In accordance with 40 CFR 122.44(l)(1) and (2), this permit does not contain effluent limitations, standards, or conditions that are less stringent than the previous permit.

Chesapeake Bay Requirements

Since this facility's hydraulic design capacity is 0.0105 MGD, the permittee previously monitored and reported TN and TP concentrations over the last permit term. In accordance with the Phase II WIP Chesapeake Bay Strategy for Phase V facilities (0.002 MGD to 0.2 MGD), yearly monitoring requirements for nutrients is not required if this monitoring has been conducted and documented in the previous fact sheet. The previous the monitoring results are as follows:

DUE DATE	DMR RECEIVED DATE	PARAMETER	LOAD UNITS	LOADING	CONCENTRATION VALUE	CONC LIMIT	CONC 3 SBC
01/28/2018	10/22/2017	Total Nitrogen	lbs/day	< 26.8	< 26.8	Monitor and Report	Daily Maximum
01/28/2019	11/26/2018	Total Nitrogen	lbs/day	< 0.42	< 9.31	Monitor and Report	Daily Maximum
01/28/2020	12/09/2019	Total Nitrogen	lbs/day	0.41	49.4	Monitor and Report	Daily Maximum
01/28/2021	01/07/2021	Total Nitrogen	lbs/day	2.07	51.1	Monitor and Report	Daily Maximum
01/28/2022	07/09/2021	Total Nitrogen	lbs/day	0.718	19.94	Monitor and Report	Daily Maximum
01/28/2018	10/22/2017	Total Phosphorus	lbs/day	5.89	5.89	Monitor and Report	Daily Maximum
01/28/2019	11/26/2018	Total Phosphorus	lbs/day	0.09	2.06	Monitor and Report	Daily Maximum
01/28/2020	12/09/2019	Total Phosphorus	lbs/day	0.06	7.93	Monitor and Report	Daily Maximum
01/28/2021	01/07/2021	Total Phosphorus	lbs/day	0.18	4.40	Monitor and Report	Daily Maximum
01/28/2022	07/09/2021	Total Phosphorus	lbs/day	0.17	4.80	Monitor and Report	Daily Maximum

Existing Effluent Limitations and Monitoring Requirements

Existing Limits – Outfall 001

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	1/week	Weir
pH (S.U.)	XXX	XXX	6.0	XXX	9.0	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	Report	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	XXX	XXX	XXX	10.0	XXX	20	2/month	Grab
Total Suspended Solids	XXX	XXX	XXX	10.0	XXX	20	2/month	Grab
Fecal Coliform (CFU/100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Fecal Coliform (CFU/100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Total Nitrogen	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/year	Grab
Ammonia-Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/month	Grab
Total Phosphorus	XXX	Report Daily Max	XXX	XXX	Report Daily Max	XXX	1/year	Grab

*The existing effluent limits for Outfall 001 were based on a design flow of 0.105 MGD.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.0105
Latitude 40º 47' 3.85" **Longitude** -77º 43' 54.16"
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)

Water Quality-Based Limitations

To establish whether or not water-quality based effluent limitations (WQBELs) are required, the Department models in-stream conditions. In order to determine limitations for CBOD5, ammonia-N and dissolved oxygen, the Department utilizes the WQM 7.0 v1.0b model and in order to determine limitations for toxics, the Department utilizes the Toxics Management Spreadsheet. This spreadsheet was not utilized for this review.

WQM 7.0 for Windows, Version 1.0b, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen
The previous model was run using the latest information on Q7-10 stream flow, background water quality, average annual design flow, and other discharge characteristics. There were no changes to the facility or watershed since the previous review. The existing technology-based effluent limit for $CBOD_5$ (10 mg/l) and NH3-N (25 mg/l) were used as inputs for the modeling. The DO minimum daily average criterion from §93.7 (5.0 mg/L for CWF) was used for the in-stream objective for the model. The summary of the output is as follows:

Parameter	Effluent Limit		
	30 Day Average	Maximum	Minimum
CBOD5	10	N/A	N/A
Ammonia-N	25	50	N/A
Dissolved Oxygen	N/A	N/A	3

The model does not recommend water-quality based effluent limitations with regards to CBOD5, ammonia-nitrogen, and dissolved oxygen.

Best Professional Judgment (BPJ) Limitations

See the Dissolved Oxygen section below.

Additional Considerations

None

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 the abovementioned 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) and/or BPJ.

Proposed Limits - 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	1/week	Weir
pH (S.U.)	XXX	XXX	6.0	XXX	9.0	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	Report	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	XXX	XXX	XXX	10.0	XXX	20	2/month	Grab
Total Suspended Solids	XXX	XXX	XXX	10.0	XXX	20	2/month	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/month	Grab
Ammonia-Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	2/month	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	Report	XXX	XXX	1/month	Grab

*The proposed effluent limits for Outfall 001 were based on a design flow of 0.105 MGD.

Effluent Limit Determination for Outfall 001

General Information

All effluent limits were then rounded down in accordance with the rounding rules established in the *Technical Guidance for the Development and Specification of Effluent Limitations (362-0400-001)*, Chapter 5 - Specifying Effluent Limitations in NPDES Permits. The existing monitoring frequencies and sample types for these parameters generally correspond with the *Technical Guidance for the Development and Specification of Effluent Limitations* (362-0400-001) Table 6-3 and will remain.

Flow

Reporting of the average monthly flow and daily maximums is consistent with monitoring requirements for other treatment plants and will remain.

Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)
The results of the WQM 7.0 model showed that the previously applied advanced treatment requirements of the Department's Dry Streams guidance (Document No. 391-2000-014, 4/12/08) of 10 mg/l for $CBOD_5$ were protective of water quality and will remain.

Total Suspended Solids (TSS)
The previously applied advanced treatment requirements of the Department's Dry Streams guidance (Document No. 391-2000-014, 4/12/08) of 10 mg/l for TSS will remain as well.

pH
CFR Title 40 §133.102(c) and 25 PA Code §95.2(1) provide the basis of effluent limitations for pH.

Fecal Coliforms
The existing fecal coliform limits with I-max limits were previously updated from the previous Chapter 92 code to correspond with what is specified in the updated 25 PA Code § 92a.47 (a)(4)&(5). The existing effluent limits will remain.

Ammonia-Nitrogen (NH3-N)
The results of the WQM 7.0 model show that the existing monitoring requirement for ammonia-nitrogen is appropriate and will remain.

Dissolved Oxygen (DO)
25 PA Code §93.7 provides specific water quality criteria for DO and monitoring for this parameter will ensure that the facility is not creating or contributing to an in-stream excursion below these water quality standards. Additionally, the *Technical Guidance for the Development and Specification of Effluent Limitations* (362-0400-001) lists DO under the self-monitoring requirements for sewage discharges and monitoring of DO is consistent with other discharges of this size and type.

E. Coli
25 PA Code § 92a.61 provide the basis of monitoring requirements for E. Coli. Monthly monitoring will be required going forward.

Total Residual Chlorine (TRC)
The attached TRC model indicates that the existing effluent limits of 0.5 mg/L (Average Monthly) and 1.6 mg/L (Instantaneous Maximum) are protective of water quality and will remain.

Compliance History

Summary of Inspections -The last inspection of the facilities was conducted by the Department on 5/4/21 which reveals the facility was operating normally, but effluent violations had occurred in the previous year.
WMS Query Summary - A WMS Query was run at *Reports - Violations & Enforcements – Open Violations for Client Report* to determine whether there are any unresolved violations associated with the client that will affect issuance of the permit (per CSL Section 609). This query revealed that there were no unresolved violations.
DMRs Summary -Upon review of the DMR's, the facility generally appears to be operating within the given concentration limits. However, minor exceedances were noted over the last permit term for CBOD and TSS.

Compliance History

DMR Data for Outfall 001 (from April 1, 2021 to March 31, 2022)

Parameter	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21	APR-21
Flow (MGD) Average Monthly	0.00540	0.01221	0.00475	0.00472	0.00544	0.00729	0.00686	0.00463	0.00432	0.00453	0.00460	0.00747
Flow (MGD) Daily Maximum	0.00864	0.05832	0.00864	0.00810	0.01350	0.02430	0.02106	0.01080	0.00702	0.01188	0.00756	0.01242
pH (S.U.) Instantaneous Minimum	6.57	6.84	6.70	6.67	6.50	6.50	6.39	6.40	6.46	6.72	6.43	6.59
pH (S.U.) Instantaneous Maximum	7.30	7.34	7.32	7.00	7.18	6.88	6.99	6.78	7.04	6.97	7.08	7.04
DO (mg/L) Instantaneous Minimum	3.08	4.44	4.15	3.5	3.33	2.26	1.74	11.86	1.44	1.21	1.10	1.05
TRC (mg/L) Average Monthly	0.34	0.39	0.38	0.36	0.48	0.50	0.38	0.45	0.18	0.17	0.27	0.21
TRC (mg/L) Instantaneous Maximum	0.73	0.99	1.45	1.11	1.20	1.45	1.17	1.21	0.98	0.55	0.72	0.48
CBOD5 (mg/L) Average Monthly	28.85	22.15	11.72	9.5	3.00	3.00	3.56	3.00	5.21	6.7	14.3	17.35
CBOD5 (mg/L) Instantaneous Maximum	40.8	23.2	17.9	10.1	3.00	3.00	4.12	3.00	5.23	10.4	24.9	20.3
TSS (mg/L) Average Monthly	7.9	12.8	7.0	8.2	7.8	4.40	4.40	2.30	15.0	16.2	15.8	30.75
TSS (mg/L) Instantaneous Maximum	8.8	14.8	7.6	8.80	12.0	4.80	4.80	3.60	15.2	19.6	16.5	43.5
Fecal Coliform (No./100 ml) Geometric Mean	1.76	1	1	2.5	1	1	1	1	1	6.07	1	1
Fecal Coliform (No./100 ml) Instantaneous Maximum	3.1	1	1	6.2	1	1	1	1	1	36.8	1	1

Total Nitrogen (lbs/day) Daily Maximum				0.718								
Total Nitrogen (mg/L) Daily Maximum				19.94								
Ammonia (mg/L) Average Monthly	26.68	29.11	24.21	22.03	2.265	16.1	7.149	4.488	23.18	8.01	32.74	4.892
Total Phosphorus (lbs/day) Daily Maximum				0.17								
Total Phosphorus (mg/L) Daily Maximum				4.80								

Compliance History

Effluent Violations for Outfall 001, from: May 1, 2021 To: March 31, 2022

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
CBOD5	02/28/22	Avg Mo	22.15	mg/L	10.0	mg/L
CBOD5	03/31/22	Avg Mo	28.85	mg/L	10.0	mg/L
CBOD5	01/31/22	Avg Mo	11.72	mg/L	10.0	mg/L
CBOD5	05/31/21	Avg Mo	14.3	mg/L	10.0	mg/L
CBOD5	05/31/21	IMAX	24.9	mg/L	20.0	mg/L
CBOD5	02/28/22	IMAX	23.2	mg/L	20.0	mg/L
CBOD5	03/31/22	IMAX	40.8	mg/L	20.0	mg/L
TSS	07/31/21	Avg Mo	15.0	mg/L	10.0	mg/L
TSS	02/28/22	Avg Mo	12.8	mg/L	10.0	mg/L
TSS	07/31/21	Avg Mo	15.0	mg/L	10.0	mg/L
TSS	06/30/21	Avg Mo	16.2	mg/L	10.0	mg/L

TSS	05/31/21	Avg Mo	15.8	mg/L	10.0	mg/L

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

APPENDIX A

Q^{7-10} ANALYSIS

USGS
science for a changing world

Prepared in cooperation with the Pennsylvania Department of Environmental Protection

Selected Streamflow Statistics for Streamgage Locations in and near Pennsylvania

Open-File Report 2011–1070

U.S. Department of the Interior
U.S. Geological Survey

Table 1. List of U.S. Geological Survey streamgage locations in and near Pennsylvania with updated streamflow statistics.—Continued

[Latitude and Longitude in decimal degrees; mi², square miles]

Streamgage number	Streamgage name	Latitude	Longitude	Drainage area (mi²)	Regulated[1]
01541303	West Branch Susquehanna River at Hyde, Pa.	41.005	-78.457	474	Y
01541308	Bradley Run near Ashville, Pa.	40.509	-78.584	6.77	N
01541500	Clearfield Creek at Dimeling, Pa.	40.972	-78.406	371	Y
01542000	Moshannon Creek at Osceola Mills, Pa.	40.850	-78.268	68.8	N
01542500	WB Susquehanna River at Karthaus, Pa.	41.118	-78.109	1,462	Y
01542810	Waldy Run near Emporium, Pa.	41.579	-78.293	5.24	N
01543000	Driftwood Branch Sinnemahoning Creek at Sterling Run, Pa.	41.413	-78.197	272	N
01543500	Sinnemahoning Creek at Sinnemahoning, Pa.	41.317	-78.103	685	N
01544000	First Fork Sinnemahoning Creek near Sinnemahoning, Pa.	41.402	-78.024	245	Y
01544500	Kettle Creek at Cross Fork, Pa.	41.476	-77.826	136	N
01545000	Kettle Creek near Westport, Pa.	41.320	-77.874	233	Y
01545500	West Branch Susquehanna River at Renovo, Pa.	41.325	-77.751	2,975	Y
01545600	Young Womans Creek near Renovo, Pa.	41.390	-77.691	46.2	N
01546000	North Bald Eagle Creek at Milesburg, Pa.	40.942	-77.794	119	N
01546400	Spring Creek at Houserville, Pa.	40.834	-77.828	58.5	N
01546500	Spring Creek near Axemann, Pa.	40.890	-77.794	87.2	N
01547100	Spring Creek at Milesburg, Pa.	40.932	-77.786	142	N
01547200	Bald Eagle Creek below Spring Creek at Milesburg, Pa.	40.943	-77.786	265	N
01547500	Bald Eagle Creek at Blanchard, Pa.	41.052	-77.604	339	Y
01547700	Marsh Creek at Blanchard, Pa.	41.060	-77.606	44.1	N
01547800	South Fork Beech Creek near Snow Shoe, Pa.	41.024	-77.904	12.2	N
01547950	Beech Creek at Monument, Pa.	41.112	-77.702	152	N
01548005	Bald Eagle Creek near Beech Creek Station, Pa.	41.081	-77.549	562	Y
01548500	Pine Creek at Cedar Run, Pa.	41.522	-77.447	604	N
01549000	Pine Creek near Waterville, Pa.	41.313	-77.379	750	N
01549500	Blockhouse Creek near English Center, Pa.	41.474	-77.231	37.7	N
01549700	Pine Creek below Little Pine Creek near Waterville, Pa.	41.274	-77.324	944	Y
01550000	Lycoming Creek near Trout Run, Pa.	41.418	-77.033	173	N
01551500	WB Susquehanna River at Williamsport, Pa.	41.236	-76.997	5,682	Y
01552000	Loyalsock Creek at Loyalsockville, Pa.	41.325	-76.912	435	N
01552500	Muncy Creek near Sonestown, Pa.	41.357	-76.535	23.8	N
01553130	Sand Spring Run near White Deer, Pa.	41.059	-77.077	4.93	N
01553500	West Branch Susquehanna River at Lewisburg, Pa.	40.968	-76.876	6,847	Y
01553700	Chillisquaque Creek at Washingtonville, Pa.	41.062	-76.680	51.3	N
01554000	Susquehanna River at Sunbury, Pa.	40.835	-76.827	18,300	Y
01554500	Shamokin Creek near Shamokin, Pa.	40.810	-76.584	54.2	N
01555000	Penns Creek at Penns Creek, Pa.	40.867	-77.048	301	N
01555500	East Mahantango Creek near Dalmatia, Pa.	40.611	-76.912	162	N
01556000	Frankstown Branch Juniata River at Williamsburg, Pa.	40.463	-78.200	291	N
01557500	Bald Eagle Creek at Tyrone, Pa.	40.684	-78.234	44.1	N
01558000	Little Juniata River at Spruce Creek, Pa.	40.613	-78.141	220	N
01559000	Juniata River at Huntingdon, Pa.	40.485	-78.019	816	LF
01559500	Standing Stone Creek near Huntingdon, Pa.	40.524	-77.971	128	N
01559700	Sulphur Springs Creek near Manns Choice, Pa.	39.978	-78.619	5.28	N
01560000	Dunning Creek at Belden, Pa.	40.072	-78.493	172	N

Table 2. Selected low-flow statistics for streamgage locations in and near Pennsylvania.—Continued

[ft³/s; cubic feet per second; —, statistic not computed; <, less than]

Streamgage number	Period of record used in analysis[1]	Number of years used in analysis	1-day, 10-year (ft³/s)	7-day, 10-year (ft³/s)	7-day, 2-year (ft³/s)	30-day, 10-year (ft³/s)	30-day, 2-year (ft³/s)	90-day, 10-year (ft³/s)
01546000	1912–1934	17	1.8	2.2	6.8	3.7	12.1	11.2
01546400	1986–2008	23	13.5	14.0	19.6	15.4	22.3	18.7
01546500	1942–2008	67	26.8	29.0	41.3	31.2	44.2	33.7
01547100	1969–2008	40	102	105	128	111	133	117
01547200	1957–2008	52	99.4	101	132	106	142	115
01547500	[2]1971–2008	38	28.2	109	151	131	172	153
01547500	[3]1956–1969	14	90.0	94.9	123	98.1	131	105
01547700	1957–2008	52	.5	.6	2.7	1.1	3.9	2.2
01547800	1971–1981	11	1.6	1.8	2.4	2.1	2.9	3.5
01547950	1970–2008	39	12.1	13.6	28.2	17.3	36.4	23.8
01548005	[2]1971–2000	25	142	151	206	178	241	223
01548005	[3]1912–1969	58	105	114	147	125	165	140
01548500	1920–2008	89	21.2	24.2	50.1	33.6	68.6	49.3
01549000	1910–1920	11	26.0	32.9	78.0	46.4	106	89.8
01549500	1942–2008	67	.6	.8	2.5	1.4	3.9	2.6
01549700	1959–2008	50	33.3	37.2	83.8	51.2	117	78.4
01550000	1915–2008	94	6.6	7.6	16.8	11.2	24.6	18.6
01551500	[2]1963–2008	46	520	578	1,020	678	1,330	919
01551500	[3]1901–1961	61	400	439	742	523	943	752
01552000	1927–2008	80	20.5	22.2	49.5	29.2	69.8	49.6
01552500	1942–2008	67	.9	1.2	3.1	1.7	4.4	3.3
01553130	1969–1981	13	1.0	1.1	1.5	1.3	1.8	1.7
01553500	[2]1968–2008	41	760	838	1,440	1,000	1,850	1,470
01553500	[3]1941–1966	26	562	619	880	690	1,090	881
01553700	1981–2008	28	9.1	10.9	15.0	12.6	17.1	15.2
01554000	[2]1981–2008	28	1,830	1,990	3,270	2,320	4,210	3,160
01554000	[3]1939–1979	41	1,560	1,630	2,870	1,880	3,620	2,570
01554500	1941–1993	53	16.2	22.0	31.2	25.9	35.7	31.4
01555000	1931–2008	78	33.5	37.6	58.8	43.4	69.6	54.6
01555500	1931–2008	78	4.9	6.5	18.0	9.4	24.3	16.6
01556000	1918–2008	91	43.3	47.8	66.0	55.1	75.0	63.7
01557500	1946–2008	63	2.8	3.2	6.3	4.2	8.1	5.8
01558000	1940–2008	69	56.3	59.0	79.8	65.7	86.2	73.7
01559000	1943–2008	66	104	177	249	198	279	227
01559500	1931–1958	28	9.3	10.5	15.0	12.4	17.8	15.8
01559700	1963–1978	16	.1	.1	.2	.1	.3	.2
01560000	1941–2008	68	8.5	9.4	15.6	12.0	20.2	16.2
01561000	1932–1958	27	.4	.5	1.6	.8	2.5	1.7
01562000	1913–2008	96	64.1	67.1	106	77.4	122	94.5
01562500	1931–1957	27	1.1	1.6	3.8	2.3	5.4	3.7
01563200	[2]1974–2008	35	—	—	—	112	266	129
01563200	[3]1948–1972	25	10.3	28.2	86.1	64.5	113	95.5
01563500	[2]1974–2008	35	384	415	519	441	580	493
01563500	[3]1939–1972	34	153	242	343	278	399	333
01564500	1940–2008	69	3.6	4.2	10.0	6.2	14.4	10.6

APPENDIX B

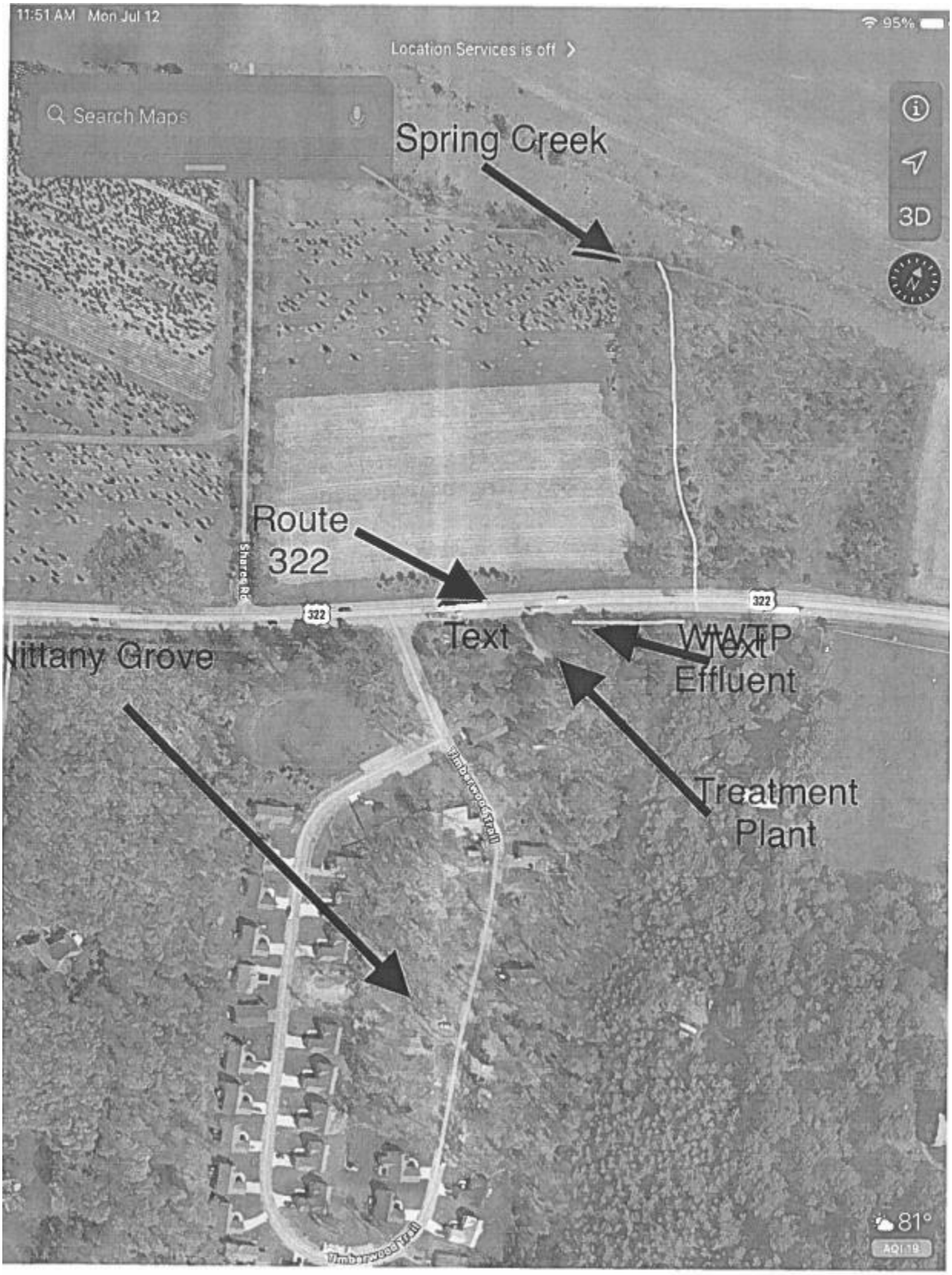
TRC ANALYSIS SPREADSHEET

1A	B	C	D	E	F	G
2	**TRC EVALUATION**			**Nittany Grove MHP PA0113182**		
3	Input appropriate values in B4:B8 and E4:E7					
4	0.172	= Q stream (cfs)		0.5	= CV Daily	
5	0.0105	= 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)		0	=Decay Coefficient (K)	
10	Source	Reference	AFC Calculations		Reference	CFC Calculations
11	TRC	1.3.2.iii	WLA afc = 3.397		1.3.2.iii	WLA cfc = 3.304
12	PENTOXSD TRG	5.1a	LTAMULT afc = 0.373		5.1c	LTAMULT cfc = 0.581
13	PENTOXSD TRG	5.1b	LTA_afc= 1.266		5.1d	LTA_cfc = 1.921
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)

APPENDIX C

FACILITY MAP AND SCHEMATIC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95%
Location Services is off
Search Maps
Spring Creek
3D
Route
322
322
322
Text
WWTP
Text
Effluent
Nittany Grove
Treatment
Plant
Timberwood Trail
Timberwood Trail
81°
AQI 19