pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0085979**
Facility Type	**Municipal**	APS ID	**475114**
Major / Minor	**Minor**	Authorization ID	**1398515**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Guest Farm Village Sewer Authority**	Facility Name	**Guest Farm Village STP**
Applicant Address	11364 Fort Loudon Road	Facility Address	11334 Punch Bowl Road
	Mercersburg, PA 17236-8503		Mercersburg, PA 17236-9779
Applicant Contact	Michael Rife	Facility Contact	Jon Piper
Applicant Phone	(717) 328-3743	Facility Phone	(717) 328-5769
Client ID	206551	Site ID	661
Ch 94 Load Status	Not Overloaded	Municipality	Montgomery Township
Connection Status		County	Franklin
Date Application Received	June 3, 2022	EPA Waived?	Yes
Date Application Accepted	June 6, 2022	If No, Reason	
Purpose of Application	NPDES Renewal		

Summary of Review

Guest Farm Village Sewer Authority (GFVSA) has applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of the NPDES permit. The permit was last reissued on November 16, 2017 and expired on November 30, 2022. The permit was amended on February 22, 2018 for to correct a typographical error.

Based on the review, it is recommended that the permit be drafted. The original draft permit was sent on September 11, 2023 but it was not sent to US EPA for review/comments. Consequently, the draft permit has once again been prepared.

Sludge use and disposal description and location(s): Sludge is being processed on-site and then transport to another WWTP (McConnellsburg Sewer Authority) or land-applied under PAG 073522.

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		*Jinsu Kim* Jinsu Kim / Environmental Engineering Specialist	01/17/2024
X		Maria D. Bebenek Daniel W. Martin, P.E. / Environmental Engineer Manager	02/02/2024
X		Maria D. Bebenek Maria D. Bebenek, P.E. / Program Manager	02/02/2024

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.0372
Latitude	39º 46' 24"	Longitude	-77º 57' 37.18"
Quad Name		Quad Code	
Wastewater Description:	Sewage Effluent		
Receiving Waters	Unnamed Tributary to Licking Creek (TSF, MF)	Stream Code	59481
NHD Com ID	49482950	RMI	0.57
Drainage Area	0.99	Yield (cfs/mi^2)	
Q_{7-10} Flow (cfs)	0.0158	Q_{7-10} Basis	StreamStats
Elevation (ft)		Slope (ft/ft)	
Watershed No.	13-C	Chapter 93 Class.	TSF, MF
Existing Use	none	Existing Use Qualifier	none
Exceptions to Use	none	Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status	**Approved (May 25, 2021)**	Name	**Licking Creek Sediment TMDL**
Nearest Downstream Public Water Supply Intake	Carlisle Borough WTP		
PWS Waters	Conodoguinet Creek	Flow at Intake (cfs)	
PWS RMI	37.03	Distance from Outfall (mi)	33

Drainage Area
The discharge is to Unnamed Tributary of Licking Creek (59481) at RM 0.57. A drainage area upstream of the discharge point is estimated to be 0.99 sq.mi. according to USGS StreamStats available at https://streamstats.usgs.gov/ss/.

Streamflow
StreamStats produced a Q7-10 flow of 0.0158 cfs at the point of discharge.

Newburg Run
Under 25 Pa Code §93.9z, Licking Creek basin has a designated water use of trout stocking and migratory fishes (TSF, MF). No special protection water is therefore impacted by this discharge. The latest integrated water quality report finalized in 2022 shows that the receiving stream is not impaired; however the main stem, Licking Creek, is impaired for siltation as a result of agricultural activities. A TMDL was approved on May 25, 2021 to address this impairment and a wasteload allocation (WLA) for TSS was assigned to this facility. Further details will be discussed later in this fact sheet.

Public Water Supply Intake
The fact sheet developed during the last permit renewal indicates that the nearest downstream PWS is Carlisle Borough in North Middleton Township at RMI 37.03, about 33 miles downstream of the discharge. The Q_{7-10} at the intake is about 62.47 cfs. The discharge will not impact the intake because of the distance, dilution, and effluent limits.

Treatment Facility Summary				
Treatment Facility Name: Guest Farm Village WWTP				
WQM Permit No.	**Issuance Date**			
2894405	03/06/2020			
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Tertiary	Extended Aeration With Solids Removal	Hypochlorite	0.0372
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.0372	75	Not Overloaded	Aerobic Digestion	Other WWTP/Land Applied

GFVSA utilizes an extended aeration activated sludge treatment process including an equalization tank, aeration tanks, chlorination, post aeration tank, a tertiary filter. A sludge digestor is available for sludge processing. This is technically owned by Montgomery Township serving only residential units located in Montgomery Township. Therefore, this is a POTW.

Compliance History	
Summary of DMRs:	A summary of past 12-month DMR data is available on the next page.
Summary of Inspections:	04/26/2021: Brandon Bettinger conducted a routine inspection during the plant upgrade. No issues were noted at the time of inspection.
Other Comments:	A number of effluent violations have been reported (see page 6). There is no open violation associated with this facility.

Effluent Data

DMR Data for Outfall 001 (from December 1, 2022 to November 30, 2023)

Parameter	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22
Flow (MGD) Average Monthly	0.004417	0.00514	0.004667	0.0044	0.007277	0.0059	0.0061	0.0079	0.0078	0.0105	0.0080	0.0078
Flow (MGD) Daily Maximum	0.032000	0.002730	0.013100	0.0095	0.0268	0.0140	0.0146	0.0313	0.0354	0.0244	0.0165	0.0359
pH (S.U.) Daily Minimum	8.2	8.3	8.3	7.7	7.7	7.5	7.3	7.3	7.5	7.8	7.9	8.0
pH (S.U.) Instantaneous Maximum	8.8	8.8	8.9	8.8	8.8	8.1	7.8	7.7	8.1	8.2	8.7	8.6
DO (mg/L) Daily Minimum	9.5	8.6	7.7	7.9	8.1	8.8	8.6	9.5	10.0	10.9	10.4	11.3
TRC (mg/L) Average Monthly	0.10	0.10	0.09	0.11	0.10	0.08	0.09	0.07	0.10	0.11	0.11	0.12
TRC (mg/L) Instantaneous Maximum	0.42	0.43	0.43	0.46	0.39	0.34	0.021	0.25	0.25	0.25	0.49	0.59
CBOD5 (lbs/day) Average Monthly	0.12	0.12	0.11	3.00	0.21	0.11	0.14	0.17	0.32	0.10	0.32	0.40
CBOD5 (lbs/day) Weekly Average	0.16	0.16	0.013	3.00	0.031	0.12	0.19	0.2	0.34	0.14	0.33	0.68
CBOD5 (mg/L) Average Monthly	5.88	5.39	3.00	0.09	3.00	3.15	3.0	4.45	5.60	4.28	5.95	10.5
CBOD5 (mg/L) Weekly Average	6.70	5.58	3.00	0.11	3.00	3.29	3.0	5.89	6.35	5.56	8.89	18.00
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	5	6	10	11	14	13	14	10	7	8	12	6
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	5	9	12	14	17	18	21	11	9	8	12	6
BOD5 (mg/L) Raw Sewage Influent Average Monthly	224	249	265	366	239	379	276	243	128	352	197	149
TSS (lbs/day) Average Monthly	0.15	0.07	0.17	0.11	0.42	0.10	0.11	0.17	0.31	0.16	0.67	0.33
TSS (lbs/day) Raw Sewage Influent Average Monthly	3	8	7	7	16	9	9	4	3	4	7	5

Parameter	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22
TSS (lbs/day) Raw Sewage Influent Daily Maximum	5	15	8	10	21	12	10	5	3	4	7	5
TSS (lbs/day) Weekly Average	0.20	0.11	0.19	0.11	0.74	0.14	0.18	0.17	0.45	0.16	0.97	0.50
TSS (mg/L) Average Monthly	7.20	3.00	5.00	3.80	5.00	2.80	2.20	4.20	5.0	7.20	9.80	8.40
TSS (mg/L) Raw Sewage Influent Average Monthly	164	267	210	269	257	242	258	102	55	198	138	122
TSS (mg/L) Weekly Average	8.40	3.60	5.60	4.40	7.20	4.00	2.80	4.80	6.4	8.00	10.40	13.20
Fecal Coliform (No./100 ml) Geometric Mean	13	4	5	2	109	19	49	7	15	40	20	15
Fecal Coliform (No./100 ml) Instantaneous Maximum	13	8	11	4	161	41	128	23	72	54	93	236
Nitrate-Nitrite (mg/L) Average Monthly	15.72	6.39	2.89	2.40	2.40	2.40	2.78	10.92	28.4	31.25	26.85	26.63
Nitrate-Nitrite (lbs) Total Monthly	9.51	4.26	3.32	2.07	5.01	2.55	4.07	13.24	52.97	20.64	53.77	33.41
Total Nitrogen (mg/L) Average Monthly	16.22	9.70	4.64	4.92	4.19	4.68	3.74	11.5	28.9	32.00	27.6	27.21
Total Nitrogen (lbs) Total Monthly	9.82	7.12	5.24	4.07	8.94	4.98	5.43	13.92	53.84	21.13	55.11	34.12
Total Nitrogen (lbs) Total Annual			7.958									
Ammonia (lbs/day) Average Monthly	0.01	0.0018	0.009	0.0011	0.023	0.007	0.006	0.004	0.01	0.002	0.039	0.008
Ammonia (mg/L) Average Monthly	0.53	0.86	0.27	0.41	0.34	0.20	0.14	0.1	0.17	0.10	0.40	0.21
Ammonia (lbs) Total Monthly	0.30	0.56	0.29	0.32	0.68	0.21	0.18	0.12	0.29	0.07	1.17	0.24
Ammonia (lbs) Total Annual			0.243									
TKN (mg/L) Average Monthly	0.50	3.31	1.75	0.07	1.79	2.28	0.96	0.58	0.50	0.02	0.75	0.58
TKN (lbs) Total Monthly	0.031	2.86	1.92	2.00	3.93	2.42	1.36	0.68	0.88	0.49	1.34	0.70
Total Phosphorus (mg/L) Average Quarterly			5.70			5.03			4.05			3.98

Parameter	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22
Total Phosphorus (lbs) Total Annual			2.56									

Compliance History

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
TRC	08/31/22	Avg Mo	0.22	mg/L	.18	mg/L
TRC	11/30/22	Avg Mo	0.19	mg/L	.18	mg/L
CBOD5	12/31/22	Avg Mo	10.5	mg/L	10.0	mg/L
CBOD5	12/31/22	Wkly Avg	18.00	mg/L	15.0	mg/L
CBOD5	11/30/22	Wkly Avg	16.50	mg/L	15.0	mg/L
Nitrate-Nitrite	05/31/21	Avg Mo	26.31	mg/L	10	mg/L
Nitrate-Nitrite	06/30/21	Avg Mo	25.83	mg/L	10	mg/L
Nitrate-Nitrite	07/31/21	Avg Mo	18.56	mg/L	10	mg/L
Nitrate-Nitrite	08/30/21	Avg Mo	18.09	mg/L	10	mg/L
Nitrate-Nitrite	10/31/21	Avg Mo	24.8	mg/L	10	mg/L
Nitrate-Nitrite	10/31/22	Avg Mo	10.87	mg/L	10	mg/L
TSS	05/31/21	Avg Mo	10.4	mg/L	10	mg/L
TSS	10/31/21	Avg Mo	10.4	mg/L	10	mg/L
TSS	11/30/21	Avg Mo	11.4	mg/L	10	mg/L
TSS	11/30/21	Wk Avg	15.6	mg/L	15	mg/L
TSS	02/29/22	Wk Avg	26	mg/L	15	mg/L
Fecal Coliform	08/30/21	Geo Mean	530	CFU/100 mL	200	CFU/100 mL
Fecal Coliform	08/30/21	Inst. Max	2420	CFU/100 mL	1000	CFU/100 mL
Dissolved Oxygen	12/31/21	Daily Min	0.2	mg/L	5	mg/L
Dissolved Oxygen	02/29/22	Daily Min	1.7	mg/L	5	mg/L
Dissolved Oxygen	03/31/22	Daily Min	1.7	mg/L	5	mg/L
Ammonia-Nitrogen	04/30/22	Avg Mo	18.21	mg/L	5.1	mg/L
	5/31/2022					

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
Fecal Coliform	5/31/2022	IMAX	1414	No./100 ml	1000	No./100 ml
Fecal Coliform	6/30/2022	Geo Mean	335	No./100 ml	200	No./100 ml
TRC	6/30/2022	Avg Mon	0.28	mg/L	0.18	mg/L
TRC	6/30/2022	IMAX	0.62	mg/L	0.61	mg/L
TRC	8/31/2022	Avg Mon	0.22	mg/L	0.18	mg/L
Nitrate-Nitrite as N	10/31/2022	Avg Mon	10.87	mg/L	10	mg/L
CBOD5	11/30/2022	Wkly Avg	16.5	mg/L	15	mg/L
CBOD5	12/31/2022	Avg Mon	10.5	mg/L	10	mg/L
CBOD5	12/31/2022	Wkly Avg	18	mg/L	15	mg/L
TSS	8/31/2023	Avg Mon	3.8	lbs/day	3	lbs/day

Existing Effluent Limits and Monitoring Requirements

Tables below summarize effluent limits and monitoring requirements specified in the existing permit.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	3.0	4.5	XXX	10.0	15.0	20	2/month	8-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Residual Chlorine (TRC) Interim	XXX	XXX	XXX	0.4	XXX	1.2	1/day	Grab
Total Residual Chlorine (TRC) Final	XXX	XXX	XXX	0.18	XXX	0.61	1/day	Grab
Total Suspended Solids	3.0	4.5	XXX	10.0	15.0	20	2/month	8-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	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
Nitrate-Nitrite as N Nov 1- Apr 30	XXX	XXX	XXX	Report	XXX	XXX	1/quarter (3)	8-Hr Composite
Nitrate-Nitrite as N May 1- Oct 31	XXX	XXX	XXX	10	XXX	20	2/month	8-Hr Composite
Total Nitrogen Nov 1- Apr 30	XXX	XXX	XXX	Report	XXX	XXX	1/quarter (3)	8-Hr Composite
Total Nitrogen May 1- Oct 31	XXX	XXX	XXX	Report	XXX	XXX	1/month	Calculation
Ammonia-Nitrogen Nov 1 - Apr 30	1.5	XXX	XXX	5.1	XXX	10	2/month	8-Hr Composite

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Ammonia-Nitrogen May 1 - Oct 31	0.5	XXX	XXX	1.7	XXX	3.4	2/month	8-Hr Composite
Total Kjeldahl Nitrogen Nov 1- Apr 30	XXX	XXX	XXX	Report	XXX	XXX	1/quarter (3)	8-Hr Composite
Total Kjeldahl Nitrogen May 1- Oct 31	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Ammonia--N	Report	Report	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Kjeldahl--N	Report	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/month	Calculation
Total Phosphorus		Report	XXX	Report	XXX	XXX	1/quarter	8-Hr Composite

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .0372
Latitude 39º 46' 24.00" **Longitude** -77º 57' 37.00"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	IMAX	-	92a.47(a)(4)
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geo Mean	-	92a.47(a)(5)
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	IMAX	-	92a.47(a)(5)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Water Quality-Based Limitations

CBOD5, NH3-N and Dissolved Oxygen (DO)
WQM 7.0 version 1.0b is a water quality model designed to assist DEP to determine appropriate permit requirements for CBOD5, NH3-N and DO. DEP's technical guidance no. 391-2000-007 describes the technical methods contained in the model for conducting wasteload allocation analyses and for determining recommended limits for point source discharges. DEP recently updated this model (ver. 1.1) to include new ammonia criteria that has been approved by US EPA as part of the 2017 Triennial Review. The model was utilized, and the model output indicated that all existing requirements are still appropriate. Therefore, no changes are recommended.

Toxics
DEP's NPDES permit application for minor sewages (less than 1.0 MGD) does requires samples of heavy metals including Total Copper, Total Lead, and Total Zinc when the facility receives industrial or commercial contributions. The application shows no sample results. Therefore, no toxic pollutants are determined to be pollutants of concern for this facility.

Total Residual Chlorine
TRC_Calc Spreadsheet is utilized to determine if existing limits are still appropriate.

Best Professional Judgment (BPJ) Limitations

Dissolved Oxygen
A minimum of 5.0 mg/L for DO is an existing effluent limit and will remain unchanged in the draft permit as recommended by DEP's SOP. This requirement has also been assigned to other major sewage facilities in the region. 5.0 mg/L is taken directly from 25 Pa. Code § 93.7(a) and it is also determined to be appropriate according to water quality modeling.

Total Phosphorus
DEP's SOP no. BPNPSM-PMT-033 recommends monitoring requirements for Total Phosphorus all sewage facilities. Therefore, the existing monitoring requirement will remain unchanged in the permit.

Additional Considerations

Flow Monitoring
The requirement to monitor the volume of effluent will remain in the draft permit per 40 CFR § 122.44(i)(1)(ii).

Influent BOD & TSS Monitoring
As a result of negotiation with EPA, the existing influent monitoring reporting requirement for TSS and BOD5 will be maintained in the draft permit. This requirement has been consistently assigned to all municipal wastewater treatment facilities.

Local Watershed TMDL
A TMDL was approved on May 25, 2021 to address the siltation impairments identified within the Licking Creek watershed which includes the receiving stream. The TMDL lists the following annual average TSS WLA for this facility:

Sediment WLA: 1,095 lbs/yr TSS

This is a newly developed WLA for this facility (i.e., new TMDL developed after the last renewal was issued). According to the TMDL, this annual load is calculated based on the existing effluent limit of 3 lbs/day average monthly TSS limits (3*365 = 1095 lbs/yr). Past DMR since December 2019 shows the average monthly of 0.36 lbs/day (average), 3.93 lbs/day (maximum), 0.03 lbs/day (minimum), 0.185 lbs/day (median), 0.727 lbs/day (90^{th} percentile). This would equate to the annual average (*365) of 131 lbs/yr (average), 1,434 lbs/yr (maximum), 109 lbs/yr (minimum), 67.5 lbs/yr (median), 365 lbs/yr (90^{th} percentile). Given this data, the facility would be able to meet the new WLA without any compliance schedule. Also, the TMDL includes the daily maximum TSS WLA of 19 lbs/day. However, this daily maximum number is less stringent than the existing weekly average limit of 4.5 lbs/day. As a result, the only annual average TSS WLA will be included in the permit.

Chesapeake Bay TMDL
DEP's Phase III Watershed Implementation Plan (WIP) categorizes this facility as a phase 5 non-significant sewage facility that has a design flow less than 0.2 MGD but greater than 0.002 MGD. The WIP recommends monitoring of nutrients. Therefore, no change is recommended.

E. Coli Monitoring
DEP's SOP No. BCW-PMT-033 recommends under 25 Pa Code §92a.61 a routine monitoring for E. Coli in all new and reissued permits. Since the facility has now the annual average design flow of 0.0372 MGD, a quarterly monitoring will be included in the permit.

Monitoring Frequency and Sample Type
Existing monitoring frequency for nutrients will be changed from 1/quarter to 1/month given that very small data would be obtained if quarterly sampling is assigned to seasonal parameters (i.e., Nov-Apr would produce only 1 or 2 sample results in a year). Also, no further reporting requirements are necessary annual nutrient loading. All other existing monitoring frequencies and sample types will remain unchanged in the permit.

Mass Loading Limitations
All effluent mass loading limits will be based on the formula: design flow x concentration limit x conversion factor of 8.34.

Antidegradation Requirements
All effluent limitations and monitoring requirements 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.

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (386-0400-001), SOPs and/or BPJ.

Outfall 001, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0 Daily Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0 Daily Min	XXX	XXX	XXX	1/day	Grab
CBOD5	3.0	4.5	XXX	10.0	15.0	20	2/month	8-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	8-Hr Composite
TSS	3.0	4.5	XXX	10.0	15.0	20	2/month	8-Hr Composite
TSS	XXX	1095 Annual Average	XXX	XXX	XXX	XXX	1/year	Calculation
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.18	XXX	0.61	1/day	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
Nitrate-Nitrite Nov 1 - Apr 30	XXX	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite
Nitrate-Nitrite May 1 - Oct 31	XXX	XXX	XXX	10	XXX	20	2/month	8-Hr Composite
Total Nitrogen	XXX	XXX	XXX	Report	XXX	XXX	1/month	Calculation

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) [1]		Concentrations (mg/L)				Minimum [2] Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Ammonia Nov 1 - Apr 30	1.5	XXX	XXX	5.1	XXX	10	2/month	8-Hr Composite
Ammonia May 1 - Oct 31	0.5	XXX	XXX	1.7	XXX	3.4	2/month	8-Hr Composite
TKN May 1 - Oct 31	XXX	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
TKN Nov 1 - Apr 30	XXX	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite

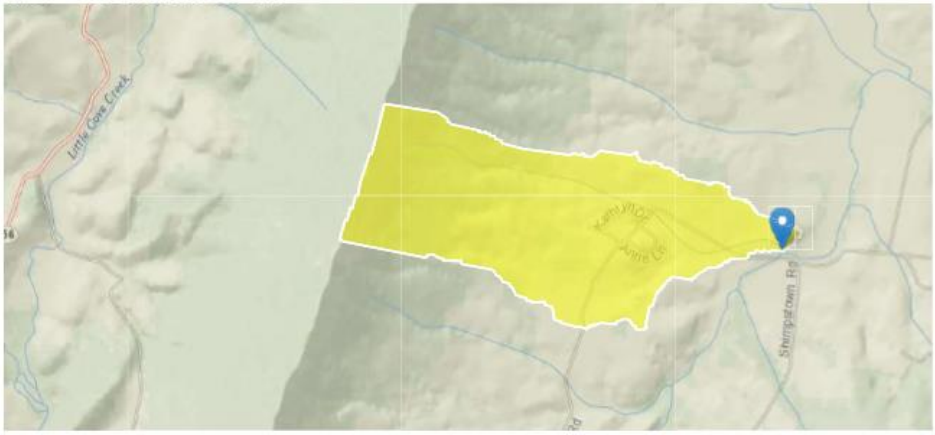
Tools and References Used to Develop Permit	
☐	WQM for Windows Model (see Attachment)
☐	Toxics Management Spreadsheet (see Attachment)
☐	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical 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:
☐	Other:

Attachments

StreamStats

StreamStats Report

Region ID: PA
Workspace ID: PA20230809133046284000
Clicked Point (Latitude, Longitude): 39.77144, -77.95040
Time: 2023-08-09 09:31:06 -0400



Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	4.45	percent
DRNAREA	Area that drains to a point on a stream	0.99	square miles
PRECIP	Mean Annual Precipitation	41	inches
ROCKDEP	Depth to rock	4.5	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	3.82	miles per square mile

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.99	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	41	inches	35	50.4

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
STRDEN	Stream Density	3.82	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	4.5	feet	3.32	5.65
CARBON	Percent Carbonate	4.45	percent	0	99

Low-Flow Statistics Disclaimers [Low Flow Region 2]

One or more of the parameters is outside the suggested range. Estimates were extrapolated with unknown errors.

Low-Flow Statistics Flow Report [Low Flow Region 2]

Statistic	Value	Unit
7 Day 2 Year Low Flow	0.0421	ft^3/s
30 Day 2 Year Low Flow	0.062	ft^3/s
7 Day 10 Year Low Flow	0.0158	ft^3/s
30 Day 10 Year Low Flow	0.023	ft^3/s
90 Day 10 Year Low Flow	0.0388	ft^3/s

Low-Flow Statistics Citations

Stuckey, M.H.,2006, Low-flow, base-flow, and mean-flow regression equations for Pennsylvania streams: U.S. Geological Survey Scientific Investigations Report 2006-5130, 84 p. (http://pubs.usgs.gov/sir/2006/5130/)

Application Version: 4.16.1
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

WQM 7.0 (summer)

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
13C	59481	Trib 59481 to Licking Creek	**0.570**	602.00	0.99	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	0.100	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
GuestFarm	PA0085979	0.0372	0.0372	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	10.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	1.70	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
13C	59481	Trib 59481 to Licking Creek	**0.000**	600.00	8.97	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	0.100	0.00	0.00	0.000	0.000	0.0	0.00	0.00	25.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	0.00	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 D.O.Simulation

SWP Basin	Stream Code	Stream Name
13C	59481	Trib 59481 to Licking Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.570	0.037	23.162	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
6.103	0.407	15.002	0.063
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
4.94	0.961	0.62	0.893
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.051	19.379	Owens	5
Reach Travel Time (days)			
0.553			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.055	4.65	0.59	7.75
0.111	4.37	0.57	7.78
0.166	4.11	0.54	7.78
0.221	3.87	0.51	7.78
0.276	3.64	0.49	7.78
0.332	3.42	0.46	7.78
0.387	3.22	0.44	7.78
0.442	3.02	0.42	7.78
0.497	2.84	0.40	7.78
0.553	2.67	0.38	7.78

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
13C	59481	Trib 59481 to Licking 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												
0.570	0.10	0.00	0.10	.0575	0.00086	.407	6.1	15	0.06	0.553	23.16	7.00
Q1-10 Flow												
0.570	0.06	0.00	0.06	.0575	0.00086	NA	NA	NA	0.05	0.639	22.62	7.00
Q30-10 Flow												
0.570	0.13	0.00	0.13	.0575	0.00086	NA	NA	NA	0.07	0.493	23.50	7.00

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
13C	59481	Trib 59481 to Licking 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
0.570	GuestFarm	13.49	3.4	13.49	3.4	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
0.570	GuestFarm	1.51	1.7	1.51	1.7	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)		
0.57	GuestFarm	10	10	1.7	1.7	5	5	0	0

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
13C	59481	Trib 59481 to Licking 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)
0.570	GuestFarm	PA0085979	0.037	CBOD5	10		
				NH3-N	1.7	3.4	
				Dissolved Oxygen			5

WQM 7.0 (winter)

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
13C	59481	Trib 59481 to Licking Creek	**0.570**	602.00	0.99	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	0.100	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
GuestFarm	PA0085979	0.0372	0.0372	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	10.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	5.10	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
13C	59481	Trib 59481 to Licking Creek	**0.000**	600.00	8.97	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	0.100	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	0.00	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 D.O.Simulation

SWP Basin	Stream Code	Stream Name
13C	59481	Trib 59481 to Licking Creek

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.570	0.037	20.000	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
6.103	0.407	15.002	0.063
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
4.94	0.983	1.87	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.051	17.979	Owens	5
Reach Travel Time (days)			
0.553			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.055	4.68	1.80	7.93
0.111	4.43	1.74	8.24
0.166	4.20	1.67	8.24
0.221	3.98	1.61	8.24
0.276	3.77	1.55	8.24
0.332	3.57	1.49	8.24
0.387	3.38	1.43	8.24
0.442	3.20	1.38	8.24
0.497	3.03	1.32	8.24
0.553	2.87	1.27	8.24

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
13C	59481	Trib 59481 to Licking 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												
0.570	0.10	0.00	0.10	.0575	0.00086	.407	6.1	15	0.06	0.553	20.00	7.00
Q1-10 Flow												
0.570	0.06	0.00	0.06	.0575	0.00086	NA	NA	NA	0.05	0.639	20.00	7.00
Q30-10 Flow												
0.570	0.13	0.00	0.13	.0575	0.00086	NA	NA	NA	0.07	0.493	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	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
13C	59481	Trib 59481 to Licking 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
0.570	GuestFarm	16.76	10.2	16.76	10.2	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
0.570	GuestFarm	1.89	5.1	1.89	5.1	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)		
0.57	GuestFarm	10	10	5.1	5.1	5	5	0	0

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
13C	59481	Trib 59481 to Licking 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)
0.570	GuestFarm	PA0085979	0.037	CBOD5	10		
				NH3-N	5.1	10.2	
				Dissolved Oxygen			5

TRC_CALC

TRC_CALC

1A	B	C	D	E	F	G
2	**TRC EVALUATION**					
3	Input appropriate values in B4:B8 and E4:E7					
4	0.099	= Q stream (cfs)		0.5	= CV Daily	
5	0.0372	= 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	0.18	= 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 = 0.568		1.3.2.iii	WLA cfc = 0.546
12	PENTOXSD TRG	5.1a	LTAMULT afc = 0.373		5.1c	LTAMULT cfc = 0.581
13	PENTOXSD TRG	5.1b	LTA_afc= 0.212		5.1d	LTA_cfc = 0.317
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) = 0.180		BAT/BPJ	
18			INST MAX LIMIT (mg/l) = 0.589			

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)

Thus, before calculating the load allocations, the margins of safety and wasteload allocations must be defined.

Margin of Safety

The margin of safety (MOS) is a portion of pollutant loading that is reserved to account for uncertainties. Reserving a portion of the load as a safety factor requires further load reductions from the ALA to achieve the TMDL. For this analysis, the MOS_{Avg} was explicitly designated as ten-percent of the $TMDL_{Avg}$ based on professional judgment. Thus:

Sediment: 5,123,400 lbs/yr $TMDL_{Avg}$ * 0.1 = 512,340 lbs/yr MOS_{Avg}

Wasteload Allocation

The wasteload allocation (WLA) is the pollutant loading assigned to existing permitted point sources as well as future point sources. Where relevant, wasteload allocations under average annual conditions were assigned as in Table 10. Existing wastewater treatment plants typically received sediment limits based on design flows and existing total suspended solids (TSS) concentration limits per their permits. Note that when compared with estimates of actual sediment loading per the eDMR analysis in Table 4, these WLAs were typically permissive and unlikely to create an additional burden for a facility. This was determined to be appropriate because the existing sediment loading from these point sources was virtually negligible relative to the vastly greater loading estimated for nonpoint sources and forcing load reductions from such facilities would likely be both expensive and ineffective when compared to agricultural BMPs.

In addition, a 1% bulk reserves was included as part of the wasteload allocation to allow for insignificant dischargers, such as small flow (design flow <2,000 gpd) wastewater treatment facilities, and minor increases from point sources as a result of future growth of existing or new sources.

Table 10. Annual Average Wasteload Allocations for Existing NPDES Permitted Discharges in the Licking Creek Subwatershed

		Sediment Load
Permit No.	Facility Name	lb/yr
PAG123849	Herbruck Poultry Ranch, Inc.	Bulk Reserve
PA0085979	Guest Farm Village WWTP	1,095
PAM417009	McCulloh Long Farm Quarry	Bulk Reserve
PA0085278	Deerwood Mtn Estates WWTP	12,024

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PA0087050	Valley Creek Estates	1,142
PAG043919	Tonia Metcalf SFS	Bulk Reserve
PAG043917	Jason Petre SFTF	Bulk Reserve
PA0080608	Camp Tohiglo WWTP	1,096
PA0080501	Montgomery Elem WWTP	Bulk Reserve
PAG043903	Twin Hill Meadows Phase II	Bulk Reserve

Herbruck Poultry Ranch Inc. In Pennsylvania, routine, dry-weather discharges from concentrated animal feeding operations (CAFOs) are not allowed. Wet weather discharges are controlled through best management practices (BMPs), which result in infrequent discharges from production areas and reduced sediment loadings from lands under the control of CAFOs owner or operators, such as croplands where manure is applied. Although not quantified in this table, pollutant loading from CAFOs is accounted for as nonpoint source pollution in the modeling of land uses within the watershed, with the assumption of no additional CAFO-related BMPs.

Guest Farm Village WWTP. The WLA was derived from the permit-based value in Table 4.

McCulloh Long Farm Quarry. Pollutant loading from this facility occurs via stormwater runoff, and thus would be accounted for in nonpoint source modelling of land uses within the watershed. Plus, given the small-scale nature of this operation relative to the overall watershed, the capacity available in the bulk reserves likely far exceeds the pollutant loading from this facility.

Deerwood MTN Estates WWTP. This facility was previously approved for a large expansion to accommodate future residential development. The WLA was derived from the future expansion permit based value in Table 4.

Valley Creek Estates. The WLA derived from the permit-based value in Table 4.

Tonia Metcalf SFS. Given that this is a small flow wastewater treatment facility (<2,000 gpd) the pollutant loading will be covered under the bulk reserve, which has more than enough capacity for this and the other small flow treatment facilities.

Jason Petre SFTF. Given that this is a small flow wastewater treatment facility (<2,000 gpd) the pollutant loading will be covered under the bulk reserve, which has more than enough capacity for this and the other small flow treatment facilities.

Camp Tohiglo WWTP. The WLA was derived from the permit-based value in Table 4.

Montgomery Elementary WWTP. Given that this is a small flow wastewater treatment facility (<2,000 gpd) the pollutant loading will be covered under the bulk reserve, which has more than enough capacity for this and the other small flow treatment facilities.

Twin Hill Meadows Phase II. Given that this is a small flow wastewater treatment facility (<2,000 gpd) the pollutant loading will be covered under the bulk reserve, which has more than enough capacity for this and the other small flow treatment facilities.

Therefore, WLAs were calculated as follows:

5,123,400 lbs/yr $TMDL_{Avg}$ * 0.01 = 51,234 lbs/yr bulk $reserve_{Avg}$ + 15,357 lb/yr permitted loads = 66,591 lbs/yr WLA_{Avg}

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