pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0038326**
Facility Type	**Non-Municipal**	APS ID	**10674**
Major / Minor	**Minor**	Authorization ID	**1265750**

Applicant and Facility Information

Applicant Name	**Pequea Valley School District**	Facility Name	**Intermediate and High School WWTP**
Applicant Address	166 South New Holland Rd., PO Box 130	Facility Address	4033 East Newport Road, PO Box 287
	Kinzers, PA 17535-0130		Kinzers, PA 17535-0130
Applicant Contact	Gavin Scalyer	Facility Contact	Gavin Scalyer
Applicant Phone	(717) 768-5513	Facility Phone	(717) 768-5513
Client ID	108	Site ID	450344
Ch 94 Load Status	Not Overloaded	Municipality	Leacock Township
Connection Status	No Limitations	County	Lancaster
Date Application Received	March 19, 2019	EPA Waived?	Yes
Date Application Accepted	March 21, 2019	If No, Reason	

Purpose of Application: NPDES Renewal.

Summary of Review

Pequea Valley School District has applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of its National Pollutant Discharge Elimination System (NPDES) permit. The permit was issued on September 19, 2014 and became effective on October 1, 2014, authorizing discharge of treated sewage from the existing wastewater treatment plant (WWTP) located in Leacock Township, Lancaster County into Pequea Creek. The existing permit expiration date was September 30, 2019, and the permit has been administratively extended since that time.

Changes in this renewal: No changes were made to the effluent limitations.

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.

Supplemental information is attached to this fact sheet.

Approve	Deny	Signatures	Date
		Benjamin R. Lockwood / Environmental Engineering Specialist	April 14, 2020
		Daniel W. Martin, P.E. / Environmental Engineer Manager	
		Maria D. Bebenek, P.E. / Program Manager	

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	001	Design Flow (MGD)	.0208
Latitude	40º 1' 9.7"	Longitude	76º 4' 1.4"
Quad Name	New Holland	Quad Code	1837
Wastewater Description:	Sewage Effluent		
Receiving Waters	Pequea Creek	Stream Code	07450
NHD Com ID	57463607	RMI	35.4
Drainage Area	43.1 mi^2	Yield (cfs/mi^2)	0.134
Q_{7-10} Flow (cfs)	5.78	Q_{7-10} Basis	USGS PA StreamStats
Elevation (ft)	363	Slope (ft/ft)	
Watershed No.	7-K	Chapter 93 Class.	WWF, MF
Existing Use	N/A	Existing Use Qualifier	N/A
Exceptions to Use	N/A	Exceptions to Criteria	N/A
Assessment Status	Impaired		
Cause(s) of Impairment	Pathogens, Siltation, Nutrients, Organic Enrichment, Habitat Alterations, Siltation		
Source(s) of Impairment	Source Unknown, Habitat Modification – Other than Hydromodification, Agriculture, Agriculture, Habitat Modification – Other than Hydromodification, Agriculture		
TMDL Status	Final, 04/09/2001	Name	Pequea Creek TMDL
Nearest Downstream Public Water Supply Intake	Chester Water Authority		
PWS Waters	Susquehanna River	Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	48.5

Changes Since Last Permit Issuance: USGS PA StreamStats is showing a drainage area of 43.1 mi^2 and a Q_{7-10} flow of 5.78 cfs.

Other Comments: None

Treatment Facility Summary				
Waste Type	**Degree of Treatment**	**Process Type**	**Disinfection**	**Avg Annual Flow (MGD)**
Sewage	Secondary	Activated Sludge	Hypochlorite	0.0208
Hydraulic Capacity (MGD)	**Organic Capacity (lbs/day)**	**Load Status**	**Biosolids Treatment**	**Biosolids Use/Disposal**
0.0208		Not Overloaded		

Changes Since Last Permit Issuance: None

Other Comments: The WWTP process is as follows: Comminutor – Equalization Tank - Aeration Tank – Settling Tank – Chlorine Contact Tank – Outfall 001 to Pequea Creek.

Compliance History	
Summary of DMRs:	A summary of the past 12-month DMR effluent data is presented on the next page of this fact sheet
Summary of Inspections:	4/18/2016: A routine inspection was conducted by Sheena Ripple, DEP Water Quality Specialist. All treatment units were online and operational. Effluent field readings were collected and were within permit limits. 11/18/2019: A routine inspection was conducted by Tracy Tomtishen, DEP Water Quality Specialist. A walkthrough of the WWTP was performed. The clarifier effluent trough appeared clear. Sodium hypochlorite was dripping upon inspection. Field readings were within permit limits.

Other Comments: There are no open violations associated with this facility.

Compliance History

DMR Data for Outfall 001 (from March 1, 2019 to February 29, 2020)

Parameter	FEB-20	JAN-20	DEC-19	NOV-19	OCT-19	SEP-19	AUG-19	JUL-19	JUN-19	MAY-19	APR-19	MAR-19
Flow (MGD) Average Monthly	0.005650	0.006367	0.005350	0.006548	0.007573	0.006610	0.00572	0.002837	0.003210	0.005710	0.006279	0.007207
Flow (MGD) Daily Maximum	0.00970	0.01070	0.01280	0.01500	0.02680	0.01620	0.01230	0.01080	0.00720	0.0190	0.01580	0.01520
pH (S.U.) Minimum	7.66	7.45	7.57	7.59	7.63	7.70	7.83	7.75	7.82	7.82	7.69	7.16
pH (S.U.) Maximum	8.12	8.41	8.30	8.16	8.23	8.23	8.60	8.50	8.87	8.60	8.60	8.55
DO (mg/L) Minimum	7.5	7.4	7.0	8.0	7.6	8.0	7.5	8.0	7.5	7.4	7.4	8.0
TRC (mg/L) Average Monthly	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.0046	0.0004	< 0.01
TRC (mg/L) Instantaneous Maximum	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.06	0.01	< 0.01
CBOD5 (mg/L) Average Monthly	< 2	< 2	< 2	< 2	< 2	< 2.95	< 2	< 5	3.9	< 3.5	< 6.5	< 2
TSS (mg/L) Average Monthly	10	10.5	8	7	9.5	8	19	6	8	< 4.5	15.5	13.5
Fecal Coliform (CFU/100 ml) Geometric Mean	< 4.5	< 3.2	< 4.5	< 2	< 2	< 2	8.1	< 4	< 2	< 2.4	< 2.4	< 4
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	10	5	10	< 2	< 2	< 2	13	8	< 2	3	3	8
Nitrate-Nitrite (mg/L) Average Monthly	63.7	48.1	51.7	51.3	54.0	33.2	20.6	7.9	24.5	25.3	36.8	42.8
Nitrate-Nitrite (lbs) Total Monthly	109.68	103.67	69.35	69.09	111.86	77.21	45.0	4.88	24.0	50.46	123.91	115.09
Total Nitrogen (mg/L) Average Monthly	64.32	< 48.55	< 52.38	52.22	54.8	33.87	21.86	8.81	25.46	26.43	38.61	44.31
Total Nitrogen (lbs) Total Monthly	110.74	< 104.75	< 70.31	70.32	113.52	78.90	47.71	5.67	24.99	52.76	129.90	119.04
Ammonia (mg/L) Average Monthly	< 0.1	< 0.1	< 0.1	< 0.1	< 0.32	< 0.1	< 0.11	< 0.1	< 0.1	< 0.41	0.41	0.395
TKN (mg/L) Average Monthly	0.62	< 0.5	< 0.68	0.92	0.8	0.72	1.31	0.93	1.01	1.18	1.81	1.51
TKN (lbs) Total Monthly	1.06	< 1.09	< 0.96	1.23	1.64	1.69	2.71	0.80	0.99	2.30	5.97	3.95

Total Phosphorus (mg/L) Average Monthly	8.14	7.52	8.60	9.23	9.13	7.89	6.18	5.55	6.77	5.89	5.98	4.44
Total Phosphorus (lbs) Total Monthly	14.01	16.6	11.15	12.84	18.88	20.39	12.17	4.79	6.53	11.68	20.34	11.29
Total Phosphorus (lbs) Total Annual						126.32						

Existing Effluent Limitations and Monitoring Requirements

The tables below summarize the effluent limits and monitoring requirements implemented in the existing NPDES permit.

Outfall 001

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Total Monthly	Daily Maximum	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report Avg Mo	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	XXX	XXX	XXX	25	XXX	50	2/month	8-Hr Composite
TSS	XXX	XXX	XXX	30	XXX	60	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	1,000	2/month	Grab
Nitrate-Nitrite (lbs/mo)	Report	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Nitrogen (lbs/mo)	Report	XXX	XXX	Report	XXX	XXX	1/month	Calculation
Ammonia-N	XXX	XXX	XXX	Report	XXX	Report	2/month	8-Hr Composite
TKN (lbs/mo)	Report	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Phosphorus (lbs/mo)	Report	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Phosphorus (lbs/year)	XXX	633 Total Annual	XXX	XXX	XXX	XXX	1/year	Calculation

Compliance Sampling Location: Outfall 001

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .0208
Latitude 40º 1' 9.7" **Longitude** 76º 4' 1.4"
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

Pursuant to 40 CFR § 122.44(d)(1)(i), more stringent requirements should be considered when pollutants are discharged at the levels which have the reasonable potential to cause or contribute to excursions above water quality standards.

WQM 7.0 ver. 1.0b is a water quality model designed to assist DEP in determining appropriate water quality based effluent limits (WQBELs) for carbonaceous biochemical oxygen demand ($CBOD_5$), ammonia (NH_3-N), and dissolved oxygen (D.O.). The model simulates two basic processes: In the NH_3-N module, the model simulates the mixing and degradation of NH_3-N in the stream and compares calculated instream NH_3-N concentrations to NH_3-N water quality criteria. In the D.O. module, the model simulates the mixing and consumption of D.O. in the stream due to the degradation of $CBOD_5$ and NH_3-N and compares calculated instream D.O. concentrations to D.O. water quality criteria. The model then determines the highest pollutant loadings that the stream can assimilate while still meeting water quality criteria under design conditions. DEP's Technical Guidance No. 391-2000-007 provides the technical methods contained in WQM 7.0 for determining wasteload allocations and for determining recommended NPDES effluent limits for point source discharges.

The model was utilized for this permit application. The flow data used to run the model was acquired from USGS PA StreamStats and is included in an attachment. Default stream pH and temperature inputs were used for this model run. The model output indicated a $CBOD_5$ average monthly limit of 25 mg/l, an NH_3-N average monthly limit of 25 mg/l, and a D.O. minimum limit of 5.0 mg/l were protective of water quality. The $CBOD_5$ limit is the same as the existing limit, which will remain in the permit. Per DEP's SOP No. BCW-PMT-033, for existing discharges, if WQM modeling results indicate that an average monthly limit of 25 mg/l is acceptable, a year-round monitoring requirement for ammonia-nitrogen should be established at a minimum, which is consistent with the existing permit limits.

There are no industrial/commercial users contributing industrial wastewater to the system and Pequea Valley School District does not currently have an EPA-approved pretreatment program. Accordingly, evaluating reasonable potential of toxic pollutants is not necessary as effluent levels of toxic pollutants are expected to be insignificant.

Best Professional Judgement (BPJ) Limitations

Dissolved Oxygen

A minimum D.O. limit of 5.0 mg/L is a D.O. water quality criterion found in 25 Pa. Code § 93.7(a). This limit is included in the existing NPDES permit. This limit will remain in the permit to ensure that the facility continues to achieve compliance with DEP water quality standards.

Total Residual Chlorine

The attached computer printout utilizes the equations and calculations as presented in the Department's May 1, 2003 Implementation Guidance for Total Residual Chlorine (TRC) (ID No. 391-2000-015) for developing chlorine limitations. The Guidance references Chapter 92, Section 92.2d (3) which establishes a standard BAT limit of 0.5 mg/l unless a facility-specific BAT has been developed. The attached printout indicates that a water quality limit of 0.5 mg/l would be needed to prevent toxicity concerns. It is recommended that a TRC limit of 0.5 mg/l monthly average and 1.6 mg/l instantaneous maximum be applied this permit cycle, the same as the existing limit.

Additional Considerations

Chesapeake Bay Total Maximum Daily Load (TMDL)

DEP developed a strategy to comply with the EPA and Chesapeake Bay Foundation requirements by reducing point source loadings of Total Nitrogen (TN) and Total Phosphorus (TP). This strategy can be located in the *Pennsylvania Chesapeake Watershed Implementation Plan* (WIP), dated January 11, 2011. Subsequently, an update to the WIP was published as the Phase 2 WIP. As part of the Phase 2 WIP, a *Phase 2 Watershed Implementation Plan Wastewater Supplement* (Phase 2 Supplement) was developed, providing an update on TMDL implementation for point sources and DEP's current implementation strategy for wastewater. A new update to the WIP was published as the Phase 3 WIP in August 2019. As part of the Phase 3 WIP, a *Phase 3 Watershed Implementation Plan Wastewater Supplement* (Phase 3 Supplement) was developed, and was most recently revised on December 17, 2019, and is the basis for the development of any Chesapeake Bay related permit parameters. Sewage discharges have been prioritized based on their design flow to the Bay. The highest priority (Phases 1, 2, and 3) dischargers will receive annual Cap Loads based on their design flow on August 29, 2005 and concentrations of 6 mg/l TN and 0.8 mg/l TP. These limits may be achieved through a combination of treatment technology, credits, or offsets. For Phase 4 and 5 facilities, Cap Loads are not currently being implemented for renewed or amended permits for facilities that do not increase design flow.

This facility is considered a Phase 5 non-significant discharger with a design flow less than 0.2 MGD but greater than 0.002 MGD. According to DEP's latest-revised Phase 3 Supplement, issuance of permits with monitoring and reporting for TN and TP is recommended for any Phase 5 non-significant sewage facilities (i.e., facilities with average annual design flows on August 29, 2005 less than 0.2 MGD but greater than 0.002 MGD). Furthermore, DEP's SOP No. BCW-PMT-033 states that in general, at a minimum, monitoring for TN and TP should be included in new and reissued permits for sewage discharges with design flows > 2,000 gpd. Therefore, TN and TP monitoring will be included in the renewed permit, which is consistent with the existing permit.

Pequea Creek TMDL

A TMDL exists for Pequea Creek for phosphorus and sediment. The TMDL was completed and approved on April 9, 2001 and was revised in 2006. The TMDL established a TP mass loading of 633 lbs/year for this facility. This limit will remain in the permit.

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.

303d Listed Streams

The discharge is located on a stream segment that is designated on the 303(d) list as impaired. There is a recreational impairment for pathogens due to an unknown source. There is an aquatic life impairment for habitat modification – other

than hydromodification due to siltation and habitat alterations; agriculture due to nutrients, organic enrichment, and siltation. The permit contains monitoring requirements for nutrients and will not contribute to the other impairments.

Class A Wild Trout Fisheries

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

Anti-Backsliding

Pursuant to 40 CFR § 122.44(l)(1), all proposed permit requirements addressed in this fact sheet are at least as stringent as the requirements implemented in the existing NPDES permit unless any exceptions addressed by DEP in this fact sheet.

Proposed Effluent Limitations and Monitoring Requirements

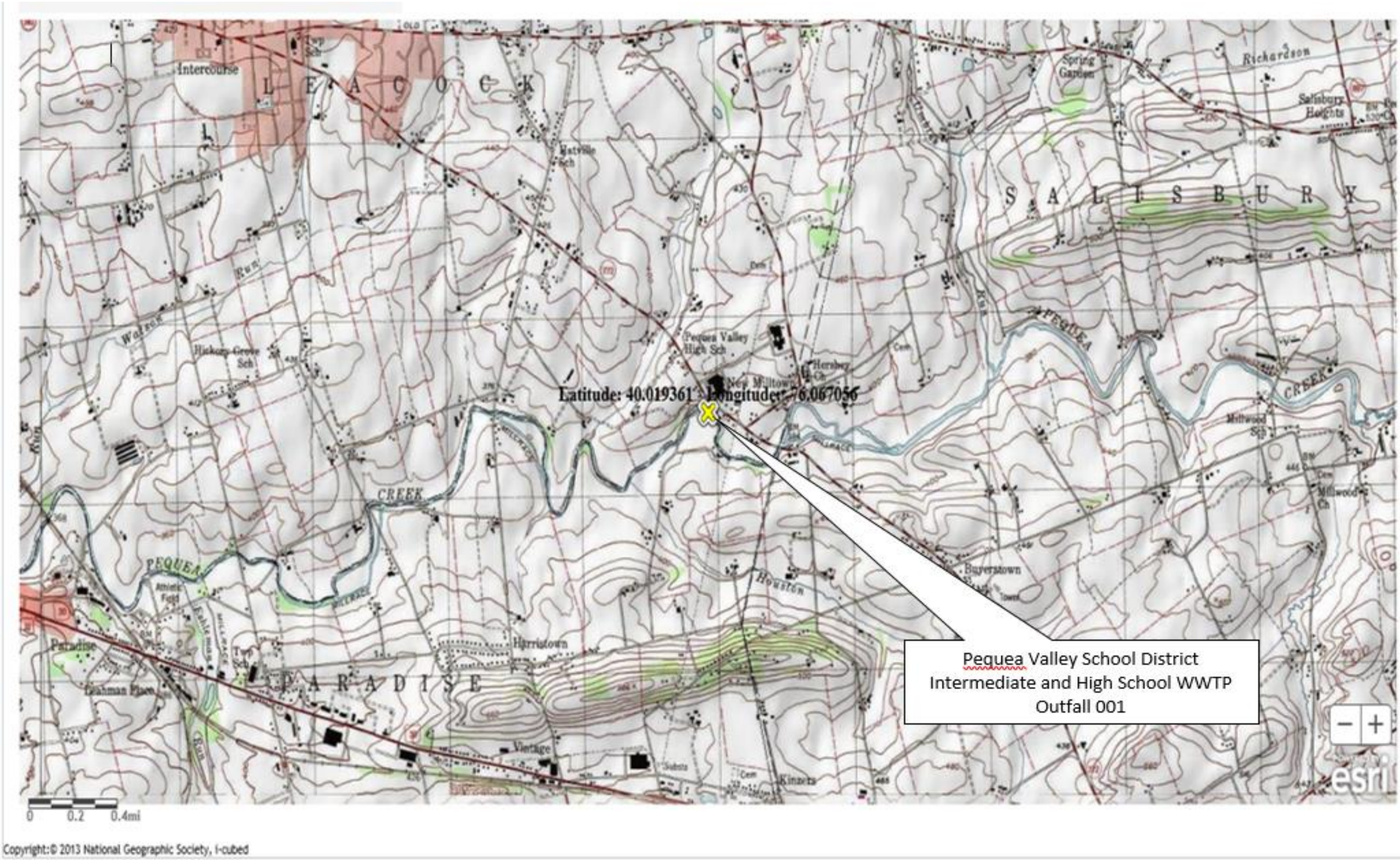
The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). 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)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Total Annual	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 Inst Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5	XXX	XXX	XXX	25	XXX	50	2/month	8-Hr Composite
TSS	XXX	XXX	XXX	30	XXX	60	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	1,000	2/month	Grab
Ammonia-N	XXX	XXX	XXX	Report	XXX	Report	2/month	8-Hr Composite
TKN (lbs/mo)	Report Total Mo	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Nitrate-Nitrite (lbs/mo)	Report Total Mo	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Nitrogen (lbs/mo)	Report Total Mo	XXX	XXX	Report	XXX	XXX	1/month	Calculation
Total Phosphorus (lbs/mo)	Report Total Mo	XXX	XXX	Report	XXX	XXX	2/month	8-Hr Composite
Total Phosphorus (lbs/year)	XXX	633	XXX	XXX	XXX	XXX	1/year	Calculation

Compliance Sampling Location: Outfall 001

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☐	PENTOXSD for Windows Model (see Attachment)
☒	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Toxics Screening Analysis 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:


Intercourse
L E A C O C K
Spring Garden
Richardson
Salisbury Heights
S A L I S B U R Y
Warren Run
Hickory Grove Sch
Pequea Valley High Sch
New Milltown
Hershey Ch
Latitude: 40.019361 Longitude: 76.067056
PEQUEA CREEK
CREEK
Millwood Sch
Millwood Ch
PEQUEA
Buyerstown
Houston Run
Harristown
Paradise
P A R A D I S E
Vintage
Kinzers
Pequea Valley School District
Intermediate and High School WWTP
Outfall 001
0 0.2 0.4mi
esri
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Intermediate and High School WWTP

PA0038326 Outfall 001

Region ID: PA
Workspace ID: PA20200325133843338000
Clicked Point (Latitude, Longitude): 40.01930, -76.06717
Time: 2020-03-25 09:39:02 -0400

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	43.1	square miles
BSLOPD	Mean basin slope measured in degrees	3.6	degrees
ROCKDEP	Depth to rock	5.4	feet

Parameter Code	Parameter Description	Value	Unit
URBAN	Percentage of basin with urban development	2	percent

Low-Flow Statistics Parameters[Low Flow Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	43.1	square miles	4.78	1150
BSLOPD	Mean Basin Slope degrees	3.6	degrees	1.7	6.4
ROCKDEP	Depth to Rock	5.4	feet	4.13	5.21
URBAN	Percent Urban	2	percent	0	89

Low-Flow Statistics Disclaimers[Low Flow Region 1]

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 1]

Statistic	Value	Unit
7 Day 2 Year Low Flow	11.2	ft^3/s
30 Day 2 Year Low Flow	14.1	ft^3/s
7 Day 10 Year Low Flow	5.78	ft^3/s
30 Day 10 Year Low Flow	7.26	ft^3/s
90 Day 10 Year Low Flow	11.3	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/)

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Application Version: 4.3.11

Intermediate and High School WWTP

PA0038326 Downstream Pt.

Region ID: PA
Workspace ID: PA20200325134137186000
Clicked Point (Latitude, Longitude): 40.01771, -76.07738
Time: 2020-03-25 09:41:57 -0400

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	46.6	square miles
BSLOPD	Mean basin slope measured in degrees	3.6	degrees
ROCKDEP	Depth to rock	5.4	feet

Parameter Code	Parameter Description	Value	Unit
URBAN	Percentage of basin with urban development	2	percent

Low-Flow Statistics Parameters[Low Flow Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	46.6	square miles	4.78	1150
BSLOPD	Mean Basin Slope degrees	3.6	degrees	1.7	6.4
ROCKDEP	Depth to Rock	5.4	feet	4.13	5.21
URBAN	Percent Urban	2	percent	0	89

Low-Flow Statistics Disclaimers[Low Flow Region 1]

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 1]

Statistic	Value	Unit
7 Day 2 Year Low Flow	12.1	ft^3/s
30 Day 2 Year Low Flow	15.2	ft^3/s
7 Day 10 Year Low Flow	6.28	ft^3/s
30 Day 10 Year Low Flow	7.87	ft^3/s
90 Day 10 Year Low Flow	12.3	ft^3/s

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Application Version: 4.3.11

Permit No. PA0038326

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
07K	7450	PEQUEA CREEK	35.400	362.00	43.10	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	5.78	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
Pequea Valley	PA0038326	0.0208	0.0208	0.0208	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

Permit No. PA0038326

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
07K	7450	PEQUEA CREEK	34.600	360.00	46.60	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	6.28	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

Permit No. PA0038326

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
07K	7450	PEQUEA 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												
35.400	5.78	0.00	5.78	.0322	0.00047	.732	39.25	53.62	0.20	0.242	20.03	7.00
Q1-10 Flow												
35.400	3.70	0.00	3.70	.0322	0.00047	NA	NA	NA	0.16	0.310	20.04	7.00
Q30-10 Flow												
35.400	7.86	0.00	7.86	.0322	0.00047	NA	NA	NA	0.24	0.204	20.02	7.00

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WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.36	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	5		

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WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
07K	7450	PEQUEA 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
35.400	Pequea Valley	9.64	50	9.64	50	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
35.400	Pequea Valley	1.91	25	1.91	25	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)		
35.40	Pequea Valley	25	25	25	25	5	5	0	0

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WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
07K	7450	PEQUEA CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
35.400	0.021	20.028	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
39.253	0.732	53.616	0.202
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.13	0.083	0.14	0.701
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.225	0.911	Tsivoglou	5
Reach Travel Time (days)			
0.242			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.024	2.12	0.14	8.23
0.048	2.12	0.13	8.23
0.073	2.11	0.13	8.24
0.097	2.11	0.13	8.24
0.121	2.11	0.13	8.24
0.145	2.10	0.13	8.24
0.169	2.10	0.12	8.24
0.193	2.09	0.12	8.24
0.218	2.09	0.12	8.24
0.242	2.09	0.12	8.24

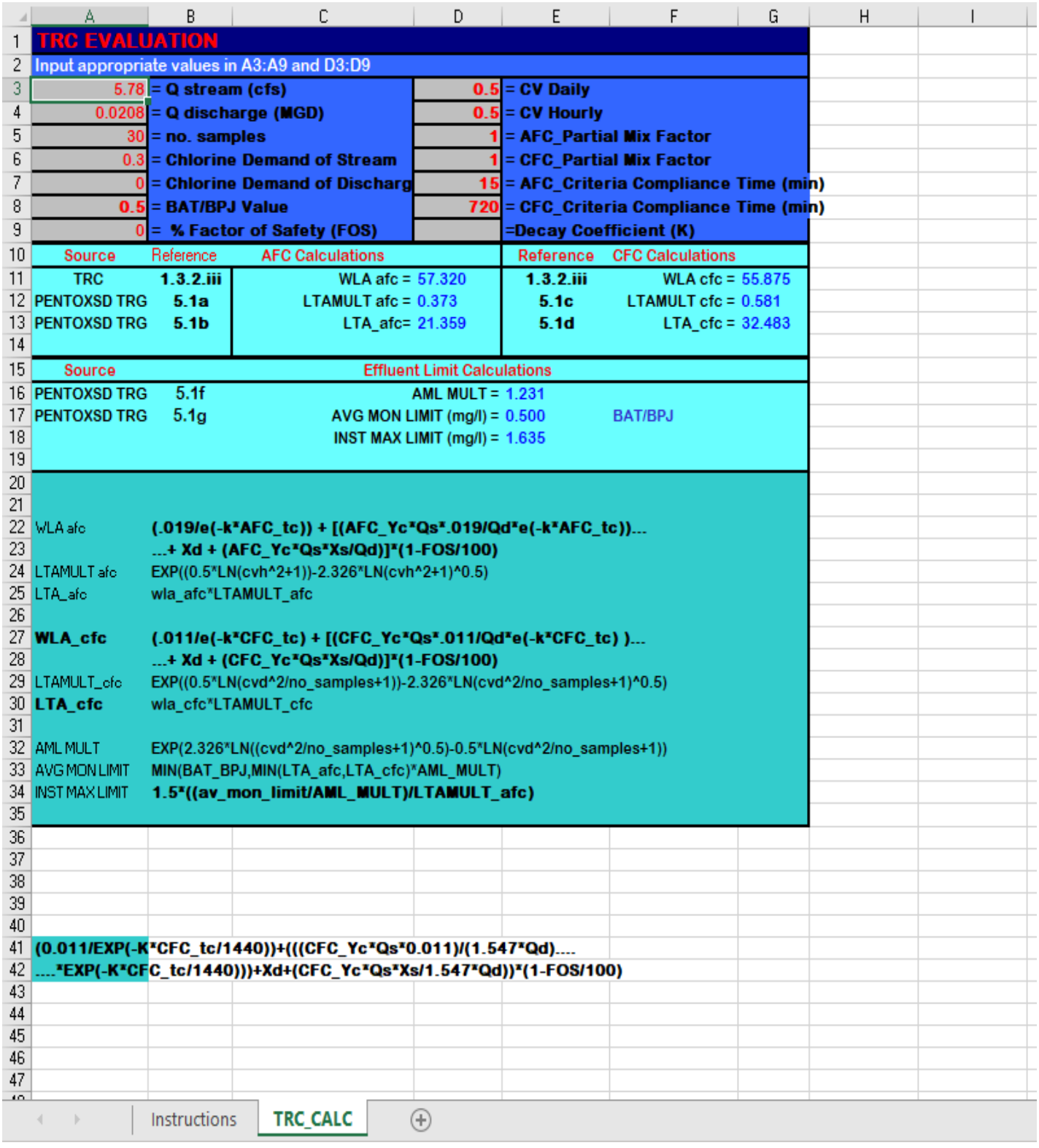
Permit No. PA0038326

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
07K	7450	PEQUEA 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)
35.400	Pequea Valley	PA0038326	0.021	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			5

Permit No. PA0038326



	A	B	C	D	E	F	G	H	I
1	TRC EVALUATION								
2	Input appropriate values in A3:A9 and D3:D9								
3	5.78	= Q stream (cfs)		0.5	= CV Daily				
4	0.0208	= Q discharge (MGD)		0.5	= CV Hourly				
5	30	= no. samples		1	= AFC_Partial Mix Factor				
6	0.3	= Chlorine Demand of Stream		1	= CFC_Partial Mix Factor				
7	0	= Chlorine Demand of Discharg		15	= AFC_Criteria Compliance Time (min)				
8	0.5	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)				
9	0	= % Factor of Safety (FOS)			=Decay Coefficient (K)				
10	Source	Reference	AFC Calculations		Reference	CFC Calculations			
11	TRC	1.3.2.iii	WLA afc = 57.320		1.3.2.iii	WLA cfc = 55.875			
12	PENTOXSD TRG	5.1a	LTAMULT afc = 0.373		5.1c	LTAMULT cfc = 0.581			
13	PENTOXSD TRG	5.1b	LTA_afc= 21.359		5.1d	LTA_cfc = 32.483			
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						
19									
20									
21									
22	WLA afc	(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...							
23		...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)							
24	LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)							
25	LTA_afc	wla_afc*LTAMULT_afc							
26									
27	WLA_cfc	(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...							
28		...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)							
29	LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)							
30	LTA_cfc	wla_cfc*LTAMULT_cfc							
31									
32	AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))							
33	AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)							
34	INST MAX LIMIT	1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)							
35									
36									
37									
38									
39									
40									
41	(0.011/EXP(-K*CFC_tc/1440))+(((CFC_Yc*Qs*0.011)/(1.547*Qd)....								
42	....*EXP(-K*CFC_tc/1440)))+Xd+(CFC_Yc*Qs*Xs/1.547*Qd))*(1-FOS/100)								
43									
44									
45									
46									
47									

Instructions | TRC_CALC