pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southeast Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0011070**
Facility Type	**Industrial**	APS ID	**1014934**
Major / Minor	**Minor**	Authorization ID	**1311555**

NPDES PERMIT FACT SHEET INDIVIDUAL INDUSTRIAL WASTE (IW) AND IW STORMWATER

Applicant and Facility Information

Applicant Name	**Knoll, Inc.**	Facility Name	**Knoll East Greenville Facility**
Applicant Address	1235 Water Street	Facility Address	1235 Water Street
	East Greenville, PA 18041		East Greenville, PA 18041
Applicant Contact	Emma Murphy	Facility Contact	Scott Cameron
Applicant Phone	(416) 779-8010	Facility Phone	(215) 679-1667
Client ID	52154	Site ID	455040
SIC Code	2521	Municipality	Upper Hanover Township
SIC Description	Manufacturing - Wood Office Furniture	County	Montgomery
Date Application Received	February 27, 2020	EPA Waived?	Yes
Date Application Accepted	July 9, 2020	If No, Reason	

Purpose of Application: Permit Renewal.

Summary of Review

The PA Department of Environmental Protection (PADEP/Department) received an NPDES permit renewal application for Knoll East Greenville Facility (facility) from Knoll, Inc. (permittee/Knoll) on February 27, 2020. The facility is in Upper Hanover Township, Montgomery County. This is a minor industrial facility with a design flow of 0.04 MGD (rerated to 0.005 MGD). The treated effluent is discharged through Outfall 001 into Perkiomen Creek (TSF, MF). There are several other stormwater outfalls discharging stormwater runoff. The existing permit expired on January 31, 2020. The terms and conditions were administratively extended since the renewal application was not received at least 180 days prior to permit expiration date. Renewal NPDES permit applications under Clean Water program are not covered by PADEP's PDG per 021-2100-001.

This fact sheet is developed in accordance with 40 CFR §124.56

Changes in the permit: Mass loads recalculated for rerated annual flow of 0.005 MGD. IMPs 101, 103, and 301 will be removed after the treatment plant is rerated at lower flow. Mass based WLA for Total Phosphorus is recalculated to reflect the reduction in flow.

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
√		Reza H. Chowdhury, E.I.T. / Project Manager	December 30, 2020
X		Pravin Patel Pravin C. Patel, P.E. / Environmental Engineer Manager	12/31/2020

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.0715
Latitude	40º 25' 2"	Longitude	-75º 31' 23"
Quad Name	East Greenville	Quad Code	1541
Wastewater Description:	Combined effluent from IMPs 101, 201, and stormwater from main parking area		

Receiving Waters	Perkiomen Creek (TSF, MF)	Stream Code	01017
NHD Com ID	25971706	RMI	27.97
Drainage Area	35.2 mi^2	Yield (cfs/mi^2)	0.197
Q_{7-10} Flow (cfs)	6.93	Q_{7-10} Basis	Please see below
Elevation (ft)	316.15	Slope (ft/ft)	
Watershed No.	3-E	Chapter 93 Class.	TSF, MF
Existing Use	**TSF/MF**	Existing Use Qualifier	
Exceptions to Use	None	Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status	**Final, March 10, 2003**	Name	**Green Lane Reservoir**

Background/Ambient Data		Data Source
pH (SU)	7.0	Default per 391-2000-013
Temperature (°F)	20	Default per 391-2000-013 for TSF/CWF
Hardness (mg/L)	100	Default
Other:		

Nearest Downstream Public Water Supply Intake		Aqua PA Main Division	
PWS Waters	Perkiomen Creek	Flow at Intake (cfs)	
PWS RMI	0.91	Distance from Outfall (mi)	27.06

Discharge, Receiving Waters and Water Supply Information

Outfall No.	002	Design Flow (MGD)	0
Latitude	40º 25' 2.19"	Longitude	-75º 31' 23"
Quad Name	East Greenville	Quad Code	1541
Wastewater Description:	Stormwater from fabrication building parking lots and roof drains		

Discharge, Receiving Waters and Water Supply Information

Outfall No.	003	Design Flow (MGD)	0
Latitude	40º 25' 8"	Longitude	-75º 31' 12"
Quad Name	East Greenville	Quad Code	1541
Wastewater Description:	Stormwater from Lubin Building parking lots and roof drains		

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	IMP 101	Design Flow (MGD)	0.0004
Latitude	40º 25' 3"	Longitude	-75º 31' 22"
Quad Name	East Greenville	Quad Code	1541
Wastewater Description:	Emergency discharge from frac building heating boiler blowdown		

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	IMP 201	Design Flow (MGD)	0.005
Latitude	40º 25' 3"	Longitude	-75º 31' 22"
Quad Name	East Greenville	Quad Code	1541
Wastewater Description:	Treated wastewater from STP		

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	IMP 301	Design Flow (MGD)	
Latitude	40º 25' 3"	Longitude	-75º 31' 22"
Quad Name	East Greenville	Quad Code	1541
Wastewater Description:	Non contact cooling water from fabrication building (capped)		

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	IMP 103	Design Flow (MGD)	0.0215
Latitude	40º 24' 23"	Longitude	-75º 31' 19"
Quad Name	East Greenville	Quad Code	1541
Wastewater Description:	Noncontact Cooling Water (NCCW) for Lubin building		

Other Comments:

Streamflow:

Streamflow will be correlated with the nearby USGS Streamgage 01472198 located on Perkiomen Creek at East Greenville, PA at RMI 26.05 mile which is approximately 1.92 miles downstream. $Q_{7\text{-}10}$, $Q_{1\text{-}10}$, and $Q_{30\text{-}10}$ values at this gage were found to be 7.5 cfs, 7.1 cfs, and 9.6 cfs respectively for the reporting period of 1983-2008. The drainage area at this gage is 38 mi^2.

$Q_{7\text{-}10}$ runoff rate = 7.5 cfs/ 38 mi^2 or 0.197 cfs/mi^2
$Q_{7\text{-}10}$ at Outfall 001 = 0.197 cfs/mi^2 * 35.2 mi^2 or 6.93 cfs
$Q_{30\text{-}10}/Q_{7\text{-}10}$ = 9.6 cfs/7.5 cfs or 1.28
$Q_{1\text{-}10}/Q_{7\text{-}10}$ = 7.1 cfs/7.5 cfs or 0.95

PWS Intake:

The nearest downstream public water supply is Aqua PA Main Division on Perkiomen Creek at RMI 0.91. Its approximately 27 miles downstream of Outfall 001.

Wastewater Characteristics:
A median pH of 6.82 from daily DMR during dry months July through September for the year 2020 and a median temperature of 75.38^{0}F (24.1^{0}C) for the same period will be used for modeling, if needed. The application data indicated an average Total Hardness of 146 mg/l out of 3 samples.

Background data:
There is currently no nearby WQN stations from Outfall 001. In absence of site-specific temperature data, a default temperature of 20°C and default pH of 7.0 (per 391-2000-013, CWF) will be used in modeling, if needed. Default stream hardness of 100 mg/l will be used, if needed.

303d Listed Streams:
The receiving stream, Perkiomen Creek, is supporting its designated uses.

Green Lane Reservoir:
On March 10, 2003, a Final Total Maximum Daily Load (TMDL) report on nutrients for Green Lane Reservoir, prepared by TetraTech, Inc. was approved by the Environmental Protection Agency (EPA). The TMDL requires a Total Phosphorus effluent limit of 0.5 mg/l for this discharger. On May 20, 2020, The Department rerated the treatment plant from 40,000 GPD to 5,000 GPD. The mass based WLA for TP will be revised to show this change in the flow. The TMDL will be updated in the future.

Changes Since Last Permit Issuance:

PADEP issued a Part II Water Quality Management permit on May 20, 2020 to authorize rerate of the WWTP's design flow from 40,000 GPD to 5,000 GPD under permit number 4620201. The rerate was necessary to address the non-compliance due to low flow contributing to the treatment plant. The permittee indicated, and the Operations confirmed that IMP 101 and IMP 301 are capped and the wastewater contributing to these IMPs are being pumped and hauled offsite. The majority of the wastewater treated in this facility is generated from onsite sanitary wastewater. Minor waste streams include respirator washing machine residue waste (~8 GPD) and water-based glue process machinery wash water (~250 GPD). The IMP 101, IMP 301, and IMP 103 will be removed from the permit.

Treatment Facility Summary

Treatment Facility Name: Knoll East Greenville Facility

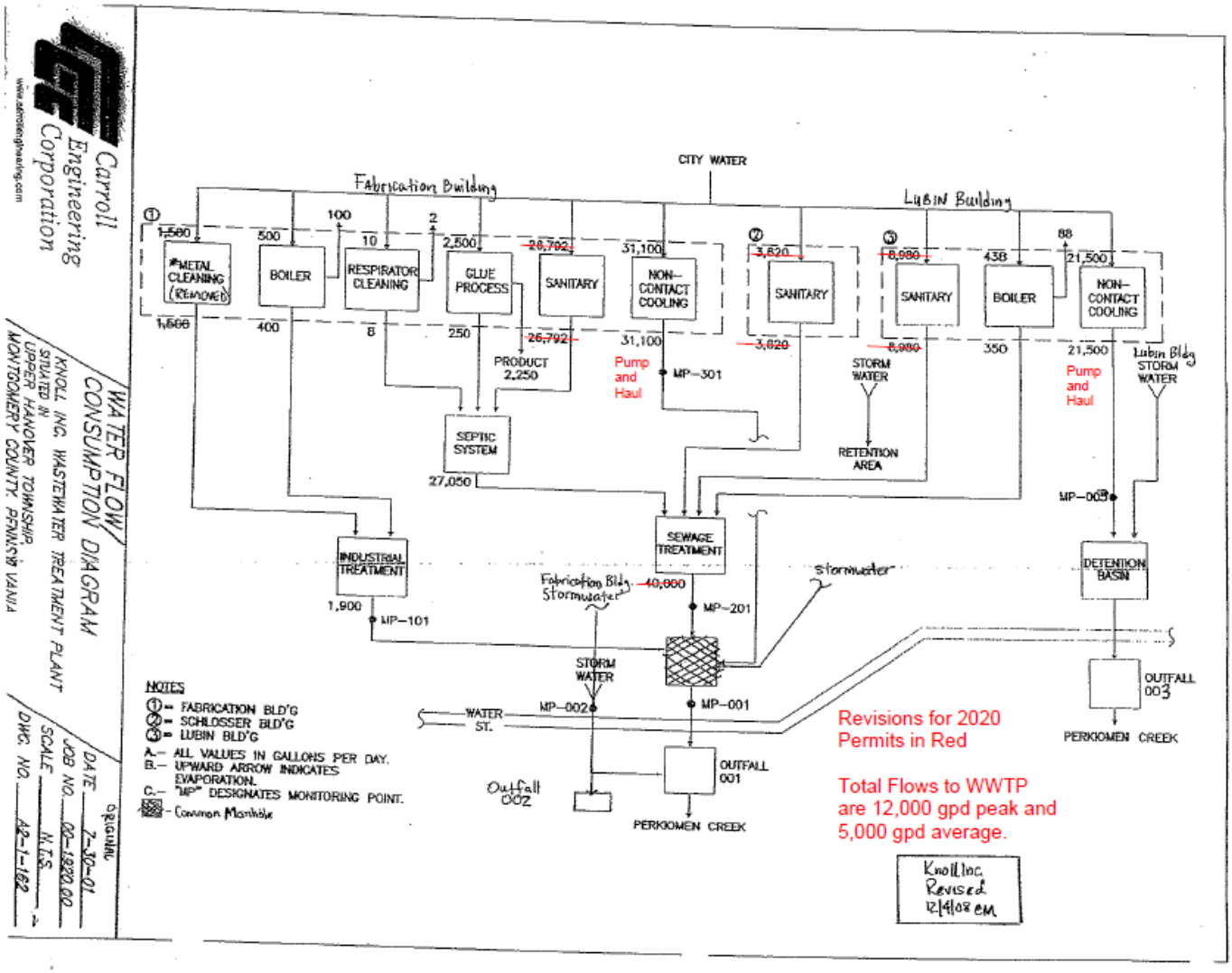
WQM Permit No.	Issuance Date
4620201	5/20/2020

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Industrial			Chlorine	0.005

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.005	10	Not Overloaded	None	Hauled offsite

Treatment Plant Summary

Knoll East Greenville facility produces wooden and metal office furniture. The wastewater generated from this facility consists mostly of sanitary sewage, ~8 GPD from respirator washing machine, and ~250 GPD of glue process machinery wash water. The recent inspection report dated December 23, 2020 indicated capping of IMP 101. 350 GPD of boiler blowdown water is also coming from Lubin Building and contributing to Outfall 001. Outfall 003 is discharging the storm water from Lubin Building area. Outfall 002 discharges stormwater runoff from parking area and roof drains from fabrication building area. Effluent limits for each outfall will be discussed later of this fact sheet.



Process Flow Diagram

To summarize, the WWTP treats 5,000 GPD of sanitary wastewater that respirator cleaning water, glue process water, and 350 GPD of boiler blowdown water from Lubin Building. The facility also discharges stormwater through Outfalls 002 and 003.

Compliance History

DMR Data for Outfall 001 (from June 1, 2019 to May 31, 2020)

Parameter	MAY-20	APR-20	MAR-20	FEB-20	JAN-20	DEC-19	NOV-19	OCT-19	SEP-19	AUG-19	JUL-19	JUN-19
Flow (MGD) Average Monthly	0.0026	0.0035	0.004	0.0044	0.0047	0.0035	0.0037	0.004	0.0029	0.0032	0.0035	0.0034
Flow (MGD) Daily Maximum	0.0093	0.0096	0.0106	0.0093	0.0047	0.0079	0.0085	0.0099	0.0061	0.0059	0.0122	0.0069
pH (S.U.) Instantaneous Minimum	4.2	6.8	6.3	3.6	6.7	5.6	4.3	6.1	5.6	6.0	6.1	5.9
pH (S.U.) Instantaneous Maximum	8.6	8.6	8.6	7.9	8.6	8.4	8.1	8.4	7.8	7.6	7.6	8.4
Temperature (ºF) Instantaneous Maximum	67	57	57	53	56	56	55	75	76	79	81	75
TSS (lbs/day) Average Monthly	< 0.1	0.3	< 0.4	< 0.3	< 0.2	0.2	0.4	< 0.2	0.3	0.3	< 0.3	< 0.2
TSS (lbs/day) Daily Maximum	< 0.2	0.3	< 0.4	< 0.3	0.2	0.2	0.5	< 0.2	0.4	0.3	0.6	0.2
TSS (mg/L) Average Monthly	< 7	5	< 4	< 4	< 4	< 4	8	< 5	7	7	< 8	< 5
TSS (mg/L) Daily Maximum	9	5	< 4	< 4	4	4	10	6	10	9	13	6
Total Dissolved Solids (mg/L) Average Monthly	730	799	1160	880	1215	905	1090	831	893	723	629	607
Total Dissolved Solids (mg/L) Daily Maximum	1370	1250	1160	1070	1270	1100	1130	959	926	738	688	703
Total Phosphorus (lbs/day) Average Monthly	0.007	0.09	0.03	0.02	0.03	0.02	0.1	0.07	0.2	0.2	0.1	0.3
Total Phosphorus (mg/L) Average Monthly	0.9	1.3	0.4	0.3	0.6	0.6	1.5	1.8	4.9	4.5	2.4	3.4

DMR Data for Outfall 002 (from June 1, 2019 to May 31, 2020)

Parameter	MAY-20	APR-20	MAR-20	FEB-20	JAN-20	DEC-19	NOV-19	OCT-19	SEP-19	AUG-19	JUL-19	JUN-19
pH (S.U.) Daily Maximum						6.77						
CBOD5 (mg/L) Daily Maximum						< 2.0						
COD (mg/L) Daily Maximum						< 5.00						
TSS (mg/L) Daily Maximum						6.8						
Oil and Grease (mg/L) Daily Maximum						< 5.0						
TKN (mg/L) Daily Maximum						< 0.50						
Total Phosphorus (mg/L) Daily Maximum						< 0.12						
Dissolved Iron (mg/L) Daily Maximum						< 0.100						

DMR Data for Outfall 003 (from June 1, 2019 to May 31, 2020)

Parameter	MAY-20	APR-20	MAR-20	FEB-20	JAN-20	DEC-19	NOV-19	OCT-19	SEP-19	AUG-19	JUL-19	JUN-19
pH (S.U.) Daily Maximum						6.71						
CBOD5 (mg/L) Daily Maximum						< 2.0						
COD (mg/L) Daily Maximum						6.45						
TSS (mg/L) Daily Maximum						< 4.0						
Oil and Grease (mg/L) Daily Maximum						< 5.2						
TKN (mg/L) Daily Maximum						< 0.50						
Total Phosphorus (mg/L) Daily Maximum						< 0.10						
Dissolved Iron (mg/L) Daily Maximum						< 0.100						

DMR Data for Outfall 201 (from June 1, 2019 to May 31, 2020)

Parameter	MAY-20	APR-20	MAR-20	FEB-20	JAN-20	DEC-19	NOV-19	OCT-19	SEP-19	AUG-19	JUL-19	JUN-19
Flow (GPD) Average Monthly	0.0026	0.0035	0.004	0.0044	0.0047	0.0035	0.0037	0.004	0.0029	0.0032	0.0035	0.0034
pH (S.U.) Instantaneous Minimum	3.9	5.9	6.1	3.3	6.5	5.4	4.2	6.1	6.6	6.6	6.1	6.0
pH (S.U.) Instantaneous Maximum	7.6	7.7	7.1	7.5	7.1	7.4	6.8	7.7	7.6	7.6	6.9	6.9
TRC (mg/L) Average Monthly	0.3	< 0.2	0.3	0.5	0.3	0.4	0.5	0.3	0.3	0.1	0.2	0.1
TRC (mg/L) Instantaneous Maximum	0.6	0.6	0.7	1.0	1.1	2.0	1.3	1.2	1.2	0.5	1.0	0.2
CBOD5 (lbs/day) Average Monthly	0.2	< 0.1	< 0.2	1.2	< 0.1	< 0.08	< 0.08	< 0.1	< 0.1	0.6	< 0.07	< 0.1
CBOD5 (lbs/day) Daily Maximum	0.3	< 0.1	< 0.2	2.1	< 0.1	< 0.08	< 0.08	< 0.1	0.1	0.6	< 0.07	< 0.1
CBOD5 (mg/L) Average Monthly	6	< 2	< 2	18	2	< 2	< 2	< 2	< 2	9	< 2	< 2
CBOD5 (mg/L) Daily Maximum	7	< 2	< 2	33	2	< 2	< 2	< 2	2	16	< 2	< 2
TSS (lbs/day) Average Monthly	0.7	< 0.3	0.4	< 0.5	< 0.2	< 0.2	0.5	< 0.2	< 0.6	1.8	< 0.3	0.4
TSS (lbs/day) Daily Maximum	1.3	0.6	0.4	0.8	< 0.2	< 0.2	0.8	< 0.2	1.1	1.8	0.3	0.4
TSS (mg/L) Average Monthly	15	< 6	4	< 8	< 4	< 4	12	< 4	< 13	27	< 7	9
TSS (mg/L) Daily Maximum	24	12	4	13	4	< 4	19	< 4	21	48	10	9
Fecal Coliform (CFU/100 ml) Geometric Mean	100	10	< 1	< 1	< 1	< 1	< 1	41	78	89	38	23
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	144	54	< 1	< 1	< 1	< 1	< 1	1700	84	176	9400	276
Ammonia (lbs/day) Average Monthly	< 0.07	< 0.005	< 0.009	< 0.007	< 0.005	< 0.04	< 0.03	0.1	0.3	0.3	0.4	0.1
Ammonia (mg/L) Average Monthly	< 1.3	< 0.1	< 0.1	< 0.1	< 0.1	< 0.9	< 0.8	2.3	5.4	9.3	6.6	1.2

Compliance History

Effluent Violations for Outfall 001, from: July 1, 2019 To: May 31, 2020

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
pH	09/30/19	Inst Min	5.6	S.U.	6.0	S.U.
pH	05/31/20	Inst Min	4.2	S.U.	6.0	S.U.
pH	02/29/20	Inst Min	3.6	S.U.	6.0	S.U.
pH	11/30/19	Inst Min	4.3	S.U.	6.0	S.U.
pH	12/31/19	Inst Min	5.6	S.U.	6.0	S.U.
Total Dissolved Solids	01/31/20	Avg Mo	1215	mg/L	1000	mg/L
Total Dissolved Solids	11/30/19	Avg Mo	1090	mg/L	1000	mg/L
Total Dissolved Solids	03/31/20	Avg Mo	1160	mg/L	1000	mg/L
Total Dissolved Solids	03/31/20	Avg Mo	1160	mg/L	1000	mg/L
Total Phosphorus	04/30/20	Avg Mo	1.3	mg/L	0.5	mg/L
Total Phosphorus	11/30/19	Avg Mo	1.5	mg/L	0.5	mg/L
Total Phosphorus	08/31/19	Avg Mo	4.5	mg/L	0.5	mg/L
Total Phosphorus	05/31/20	Avg Mo	0.9	mg/L	0.5	mg/L
Total Phosphorus	12/31/19	Avg Mo	0.6	mg/L	0.5	mg/L
Total Phosphorus	07/31/19	Avg Mo	2.4	mg/L	0.5	mg/L
Total Phosphorus	10/31/19	Avg Mo	1.8	mg/L	0.5	mg/L
Total Phosphorus	09/30/19	Avg Mo	4.9	mg/L	0.5	mg/L
Total Phosphorus	01/31/20	Avg Mo	0.6	mg/L	0.5	mg/L

Effluent Violations for Outfall 201, from: July 1, 2019 To: May 31, 2020

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
pH	05/31/20	Inst Min	3.9	S.U.	6.0	S.U.
pH	12/31/19	Inst Min	5.4	S.U.	6.0	S.U.
pH	04/30/20	Inst Min	5.9	S.U.	6.0	S.U.
pH	11/30/19	Inst Min	4.2	S.U.	6.0	S.U.
pH	02/29/20	Inst Min	3.3	S.U.	6.0	S.U.
TRC	12/31/19	IMAX	2.0	mg/L	1.3	mg/L
TSS	08/31/19	Daily Max	48	mg/L	45	mg/L
Fecal Coliform	07/31/19	IMAX	9400	CFU/100 ml	1000	CFU/100 ml
Fecal Coliform	10/31/19	IMAX	1700	CFU/100 ml	1000	CFU/100 ml

Other Comments: Due to several effluent violations, a CO&A was entered into on January 30, 2020 (amended on October 5, 2020) which required permittee to take appropriate action to meet the effluent limits. It is expected that after the modifications are made, the facility will be able to meet the effluent limitations.

Summary of Inspections:

12/23/2020: CEI conducted. No effluent violation noted. Condition of all outfall locations seemed to be normal.

05/11/2020: FUI conducted. No violation noted. The collection system and the WWTP were operating normally. This FUI will serve to correct the 12/18/2019 unpermitted discharge violation.

12/18/2019: INCDT conducted due to release from a wastewater force main to a grassy area. The release occurred when one of the facility wastewater pump stations at the Lubin building activated and pressurized the pipe. Wastewater was discharged to the ground, ran onto the adjacent asphalt lot, and into a drain that discharges to an adjacent grassy area. The leak was repaired, and a vac truck had been brought on site to clean up standing water in the catch basin and on the grass.

11/07/2019: CEI conducted. Late NPDES permit renewal application was not submitted on time and this was marked as a violation.

08/13/2019: RTPT conducted. No violation was noted during the inspection.

01/23/2019: RTPT conducted. No effluent violation noted.

11/27/2018: CEI conducted. No effluent violation noted. It was recommended that the facility should confirm that the outfall 001 sampler aliquot volume is at least 100 ml.

5/15/2018: RTPT conducted. No violation noted.

03/16/2018: FUI conducted, secondary containment provided for the chemical storage area, correcting the violation cited during 1/11/2018 inspection. No violation noted during the inspection.

1/11/2018: CEI conducted. Violation noted due to lack of chemical secondary containment. An NOV was issued on 1/18/2018 that cited the non-compliance.

12/13/2016: CEI conducted. No violation observed.

Existing Limits effective between February 1, 2015 to January 31, 2020

For Outfall 001

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Instant. Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Calculation
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Temperature (ºF)	XXX	XXX	XXX	XXX	XXX	110	1/week	I-S
Total Suspended Solids	18	36	XXX	30	60	75	2/month	24-Hr Composite
Total Dissolved Solids	XXX	XXX	XXX	1,000	2,000	2500	2/month	24-Hr Composite
Total Phosphorus	0.3	XXX	XXX	0.5	XXX	1.2	2/month	24-Hr Composite

For IMP 101:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly		Instant. Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (GPD)	Report	XXX	XXX	XXX	XXX	XXX	1/discharge	Metered
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/discharge	Grab
Total Copper	XXX	XXX	XXX	Report	Report	XXX	1/discharge	24-Hr Composite
Total Zinc	XXX	XXX	XXX	Report	Report	XXX	1/discharge	24-Hr Composite

For IMP 201:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Instant. Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (GPD)	Report	XXX	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.5	XXX	1.3	1/day	Grab
CBOD5	8.0	13.0	XXX	25	40	50	2/month	24-Hr Composite
Total Suspended Solids	10.0	15.0	XXX	30	45	60	2/month	24-Hr Composite
Fecal Coliform (CFU/100 ml)	XXX	XXX	XXX	200 Geo Mean	XXX	1,000	2/month	Grab
Ammonia-Nitrogen May 1 - Oct 31	3.3	XXX	XXX	10.0	XXX	20.0	2/month	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	6.7	XXX	XXX	20.0	XXX	40.0	2/month	24-Hr Composite

For IMP 301:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly		Instant. Minimum	Average Monthly		Instant. Maximum		
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/week	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.5	XXX	1.3	1/week	Grab
Temperature (ºF)	XXX	XXX	XXX	XXX	XXX	110	1/week	I-S

For Outfall 002:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly		Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
CBOD5	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Chemical Oxygen Demand	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Kjeldahl Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Dissolved Iron	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab

For Outfall 003:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly		Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
CBOD5	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Chemical Oxygen Demand	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Kjeldahl Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Dissolved Iron	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab

For IMP 103:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly		Instant. Minimum	Average Monthly		Instant. Maximum		
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	Daily when Discharging	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.5	XXX	1.3	Daily when Discharging	Grab
Temperature (ºF)	XXX	XXX	XXX	XXX	XXX	110	Daily when Discharging	I-S

Development of effluent limitations

Outfall 001:

Historically, Outfall 001 received comingled industrial wastewater, sanitary wastewater, noncontact cooling water, and stormwater. The industrial wastewater (metal cleaning) is disconnected and 31,100 GPD of NCCW is now being pumped and hauled. The Sanitary wastewater contribution was reduced from 40,000 GPD to 5,000 GPD which is the only discharge through Outfall 001 excluding stormwater. Outfall 001 may be considered as stormwater only outfall, since the sanitary wastewater is sampled and monitored at IMP 201. Therefore, the effluent quality is somewhat similar to Outfall 002 (stormwater from parking lots and roof drains) and below parameters will be placed in this renewal for Outfall 001:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly		Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
CBOD5	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Chemical Oxygen Demand	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Kjeldahl Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Phosphorus	0.02	XXX	XXX	0.5	XXX	1.2	2/month	24-Hr Composite
Dissolved Iron	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab

Outfall 002:

Outfall 002 is a stormwater only outfall that collects stormwater from parking lots and roof drains of Fabrication Building. The existing permit has the following parameters which will be carried over in this renewal:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly		Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
CBOD5	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Chemical Oxygen Demand	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Kjeldahl Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Dissolved Iron	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab

Outfall 003:
Historically Outfall 003 received approximately 21,500 GPD of NCCW from Lubin Building and stormwater runoff from Lubin Building that were collected in detention basin and discharged through Outfall 003. There was an internal monitoring point for NCCW, IMP 003, prior to the detention basin. Since the NCCW is now being pumped and hauled, the detention basin receives stormwater only. The effluent quality is now similar to Outfall 001 and 002. The following effluent monitoring requirements will be placed in this renewal:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly		Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
CBOD5	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Chemical Oxygen Demand	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Kjeldahl Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Dissolved Iron	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab

IMP 101:
IMP 101 received wastewater from former Industrial Wastewater Treatment facility. Since the IWTP is removed and IMP 101 is capped, the effluent monitoring requirements related to this monitoring point will be removed.

IMP 103:
IMP 103 received NCCW from Lubin Building in emergency only during closed-loop system breakdown. This NCCW is now being pumped and hauled off site. Therefore, IMP 103 will be removed from monitoring requirement.

IMP 301:
Historically IMP 301 received NCCW of about 31,100 GPD that discharged into a common pit prior to discharging through Outfall 001. This monitoring point is capped and the NCCW is now being pumped and hauled. Therefore, the monitoring requirements for this IMP will be removed.

IMP 201:
Treated sewage is monitored at IMP 201 prior to being comingled with stormwater and discharged through Outfall 001. The sewage treatment plant is designed to treat an average flow of 40,000 GPD and rerated to 5,000 GPD. Since the flow is decreased significantly, the WQM modeling will be required.

A. **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	200 / 100 ml	Geo Mean	DRBC	92a.47(a)(5)
Fecal Coliform	1,000 / 100 ml	IMAX	DRBC	92a.47(a)(5)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)
Total Dissolved Solids*	1000	Average Monthly	DRBC	-

* TDS is monitored at Outfall 001
Comments: These standards apply, subject to Water Quality Analysis and BPJ where applicable.

Water Quality-Based Limitations

WQM 7.0:

WQM 7.0 version 1.0b is a water quality model designed to assist DEP to determine appropriate effluent limits for $CBOD_5$, NH_3-N and DO. 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_3N and compares calculated instream D.O. concentrations to D.O. water quality criteria. The model was utilized for this permit renewal by using adjusted Q_{7-10} and historic background water quality levels of the receiving stream. The following data were used in the attached computer model of the stream:

• Discharge pH	6.42	(median Jul-Sep, 2020, DMR data)
• Discharge Temperature	24.1°C	(median Jul-Sep, 2020, DMR data)
• Discharge Hardness	146 mg/l	(Application data)
• Stream pH	7.0	(Default per 391-2000-013)
• Stream Temperature	20°C	(Default per 391-2000-013, CWF)
• Stream Hardness	100 mg/l	(Default data)

The following nodes were considered in modeling:

Node 1: Outfall 001 at Perkiomen Creek (01017)

Elevation:	316.15 ft (USGS National Map viewer, 12/30/2020)
Drainage Area:	35.2 mi^2 (StreamStat Version 3.0, 11/17/2020)
River Mile Index:	27.97 (PA DEP eMapPA)
Low Flow Yield:	0.197 cfs/mi^2
Discharge Flow:	0.005 MGD

Node 2: Confluence with Molasses Creek (01466)

Elevation:	285.1 ft (USGS National Map viewer, 12/30/2020)
Drainage Area:	40.4 mi^2 (StreamStat Version 3.0, 11/17/2020)
River Mile Index:	25.14 (PA DEP eMapPA)
Low Flow Yield:	0.197 cfs/mi^2
Discharge Flow:	0 MGD

Ammonia (NH_3-N), Carbonaceous Biochemical Oxygen Demand (CBOD5), & Dissolved Oxygen (DO):

WQM 7.0 version 1.0b is a water quality model designed to assist DEP to determine appropriate effluent limits for $CBOD_5$, NH_3-N and DO. 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_3N and compares calculated instream D.O. concentrations to D.O. water quality criteria. The model was utilized for this permit renewal by using Q_{7-10} and current background water quality levels of the stream.

NH_3-N:

WQM 7.0 suggested NH_3-N limit of 10.0 mg/l as monthly average and 20.0 mg/l as IMAX limit during summer to protect water quality standards. These values are the same as existing permitted limits. Recent DMR data show that the plant is meeting the permit limits. The average monthly mass loading is recalculated to be 0.417 lbs./day. The existing winter season limits of 20.0 mg/l as average monthly and 40.0 mg/l as IMAX limit will be carried over in this renewal. Winter average monthly mass limit was recalculated as 0.834 lbs./day. It should be noted the mass limits were recalculated using rerated design flow of 0.005 MGD.

$CBOD_5$:

The WQM 7.0 model suggests a monthly average $CBOD_5$ limit of 25 mg/l, daily maximum limit of 40 mg/l, and IMAX of 50 mg/l, which are the same as existing limits. The mass based limit is recalculated to be 1.04 lbs./day as average monthly and 1.668 lbs./day.

Other Requirements:

Total Residual Chlorine:
The attached computer printout utilizes the equation and calculations as presented in the Department's 2003 Implementation Guidance for Total Residual Chlorine (TRC) (ID#391-2000-015) for developing chlorine limitations. The attached printout indicates that a water quality limit of 0.5 mg/l would be needed to prevent toxicity concerns at the discharge point for Outfall 001. The Instantaneous Maximum (IMAX) limit is 1.6 mg/l. The existing permit has AML limit of 0.5 mg/l and IMAX limit of 1.3 mg/l. The existing IMAX limit will be carried over.

Fecal Coliform: The recent coliform guidance in 25 Pa. code § 92a.47.(a) requires a technology limit of 200/100 ml as a geometric mean and an instantaneous maximum not greater than 1,000/100ml. These limits are the same as existing limits and will be carried over.

pH:
The TBEL for pH is above 6.0 and below 9.0 S.U. (40 CFR §133.102(c) and Pa Code 25 § 95.2(1)) which are existing limits and will be carried over.

Total Suspended Solids (TSS):
There is no water quality criterion for TSS. The existing limits of 30 mg/L average monthly, 45 mg/l average weekly, and 60 mg/L instantaneous maximum will remain in the permit based on the minimum level of effluent quality attainable by secondary treatment, 25 Pa. Code § 92a.47 and 40CFR 133.102(b). The mass based average monthly and weekly average limits are recalculated to be 1.251 lbs./day and 1.88 lbs./day respectively.

Total Phosphorus:
The WLA in Green Lane Reservoir TMDL for TP is 0.5 mg/l as average monthly. The mass load allocated to this facility was 0.3 lbs./day for a flow of 71,940 GPD. Since the facility is rerated to 5,000 GPD, the mass based WLA needs to be recalculated. Using a flow of 0.005 MGD, the calculated mass loading is 0.02 lbs./day. This new load will be applied to this facility.

Flow Monitoring
Flow monitoring will remain in the permit and is required by 40 CFR § 122.44(i)(1)(ii).

Toxics:
Based on the monitoring data (maximum concentrations) reported on the application, PADEP utilizes Toxics Management Spreadsheet (TMS) to (1) evaluate reasonable potential for toxic pollutants to cause or contribute to an excursion above the water quality standards and (2) develop WQBELs for those such toxic pollutants (i.e., 40 CFR § 122.44(d)(1)(i)). It is noteworthy that some of these pollutants that may be reported as "non-detect", but still exceeded the criteria, were determined to be candidates for modeling because the method detection levels used to analyze those pollutants were higher than target QLs and/or the most stringent Chapter 93 criteria. The model then recommended the appropriate action for the Pollutants of Concerns based on the following logic:

1. In general, establish limits in the draft permit where the effluent concentration determined in B.1 or B.2 equals or exceeds 50% of the WQBEL (i.e., RP is demonstrated). Use the average monthly, maximum daily and instantaneous maximum (IMAX) limits for the permit as recommended by the TMS (or, if appropriate, use a multiplier of 2 times the average monthly limit for the maximum daily limit and 2.5 times the average monthly limit for IMAX).

2. For non-conservative pollutants, in general, establish monitoring requirements where the effluent concentration determined in B.1 or B.2 is between 25% - 50% of the WQBEL.

3. For conservative pollutants, in general, establish monitoring requirements where the effluent concentration determined in B.1 or B.2 is between 10% - 50% of the WQBEL.

NOTE 4 – If the effluent concentration determined in B.1 or B.2 is "non-detect" at or below the target quantitation limit (TQL) for the pollutant as specified in the TMS and permit application, the pollutant may be eliminated as a candidate for WQBELs or monitoring requirements unless 1) a more sensitive analytical method is available for the pollutant under 40 CFR Part 136 where the quantitation limit for the method is less than the applicable water quality criterion and 2) a detection at the more sensitive method may lead to a determination that an effluent limitation is necessary, considering available dilution at design conditions.

NOTE 5 – If the effluent concentration determined in B.1 or B.2 is a detection below the TQL but above or equal to the applicable water quality criterion, WQBELs or monitoring may be established for the pollutant.

4. Application managers may, on a site- and pollutant-specific basis, deviate from these guidelines where there is specific rationale that is documented in the fact sheet.

TMS Output sheet indicates there is no toxicity concern from this facility at Outfall 001.

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 End of Interim Period 1.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Calculation
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
Temperature (deg F) (ºF)	XXX	XXX	XXX	XXX	XXX	110	1/week	I-S
Total Suspended Solids	18	36	XXX	30	60	75	2/month	24-Hr Composite
Total Dissolved Solids	XXX	XXX	XXX	1000	2000	2500	2/month	24-Hr Composite
Total Phosphorus	0.3	XXX	XXX	0.5	XXX	1.2	2/month	24-Hr Composite

Compliance Sampling Location: At Outfall 001

Other Comments: 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 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: End of Interim Period 1 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	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Chemical Oxygen Demand (COD)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Kjeldahl Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Phosphorus	0.02	XXX	XXX	0.5	XXX	1.2	2/month	24-Hr Composite
Iron, Dissolved	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab

Compliance Sampling Location: At Outfall 001

Other Comments: 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 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 002, Effective Period: Permit Effective Date through End of Interim Period 1.

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	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Chemical Oxygen Demand (COD)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Kjeldahl Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Iron, Dissolved	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab

Compliance Sampling Location: At Outfall 002

Other Comments: 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 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 002, Effective Period: End of Interim Period 1 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	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Chemical Oxygen Demand (COD)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Kjeldahl Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Iron, Dissolved	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab

Compliance Sampling Location: At Outfall 002

Other Comments: 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 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 003, Effective Period: Permit Effective Date through End of Interim Period 1.

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	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Chemical Oxygen Demand (COD)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Kjeldahl Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Iron, Dissolved	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab

Compliance Sampling Location: At Outfall 003

Other Comments: 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 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 003, Effective Period: End of Interim Period 1 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	Daily Maximum	Instant. Maximum		
pH (S.U.)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Chemical Oxygen Demand (COD)	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Kjeldahl Nitrogen	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Total Phosphorus	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab
Iron, Dissolved	XXX	XXX	XXX	XXX	Report	XXX	1/year	Grab

Compliance Sampling Location: At Outfall 003

Other Comments: 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 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 101, Effective Period: Permit Effective Date through End of Interim Period 1.

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 (GPD)	Report	XXX	XXX	XXX	XXX	XXX	1/discharge	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/discharge	Grab
Copper, Total	XXX	XXX	XXX	Report	Report Daily Max	XXX	1/discharge	24-Hr Composite
Zinc, Total	XXX	XXX	XXX	Report	Report Daily Max	XXX	1/discharge	24-Hr Composite

Compliance Sampling Location: At IMP 101

Other Comments: 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 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 103, Effective Period: Permit Effective Date through End of Interim Period 1.

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		
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	Daily when Discharging	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.3	Daily when Discharging	Grab
Temperature (deg F) (ºF)	XXX	XXX	XXX	XXX	XXX	110	Daily when Discharging	I-S

Compliance Sampling Location: At IMP 103

Other Comments: 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 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 201, Effective Period: Permit Effective Date through End of Interim Period 1.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (GPD)	Report	XXX	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.3	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	8.0	13.0	XXX	25	40	50	2/month	24-Hr Composite
Total Suspended Solids	10.0	15.0	XXX	30	45	60	2/month	24-Hr Composite
Fecal Coliform (No./100 ml)	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Ammonia-Nitrogen Nov 1 - Apr 30	6.7	XXX	XXX	20.0	XXX	40	2/month	24-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	3.3	XXX	XXX	10.0	XXX	20	2/month	24-Hr Composite

Compliance Sampling Location: At IMP 201

Other Comments: 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 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 201, Effective Period: End of Interim Period 1 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	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (GPD)	Report	XXX	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.3	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	1.04	1.668	XXX	25.0	40.0	50	2/month	24-Hr Composite
Total Suspended Solids	1.251	1.88	XXX	30.0	45.0	60	2/month	24-Hr Composite
Fecal Coliform (No./100 ml)	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/month	Grab
Ammonia-Nitrogen Nov 1 - Apr 30	0.834	XXX	XXX	20.0	XXX	40	2/month	24-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	0.417	XXX	XXX	10.0	XXX	20	2/month	24-Hr Composite

Compliance Sampling Location: At IMP 201

Other Comments: 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 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 301, Effective Period: Permit Effective Date through End of Interim Period 1.

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		
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/week	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.3	1/week	Grab
Temperature (deg F) (ºF)	XXX	XXX	XXX	XXX	XXX	110	1/week	I-S

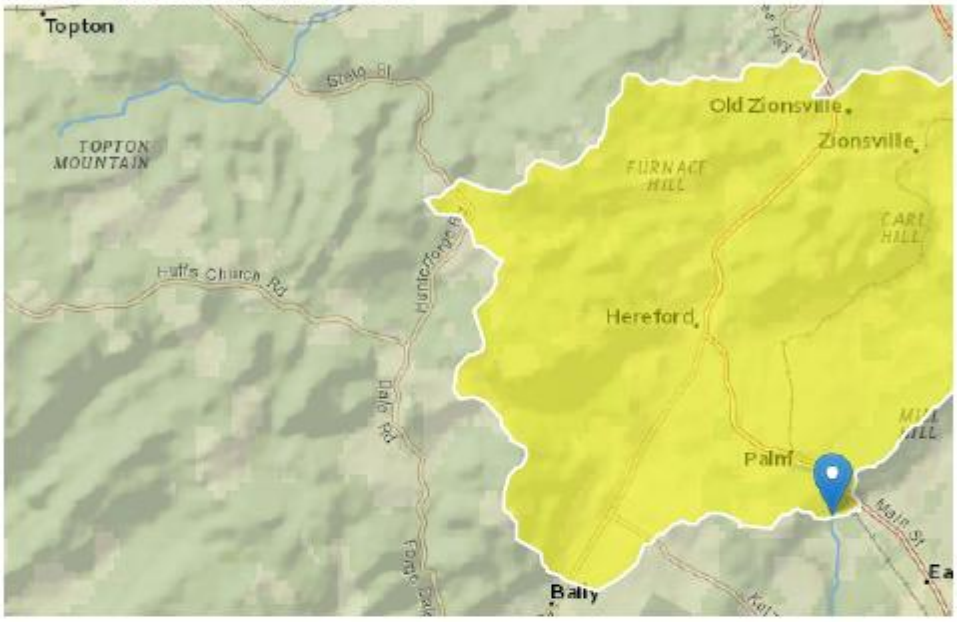
Compliance Sampling Location: At IMP 301

Other Comments: None

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☒	TMS (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:

PA0011070 at Outfall 001

Region ID: PA
Workspace ID: PA20201117211942786000
Clicked Point (Latitude, Longitude): 40.41722, -75.52403
Time: 2020-11-17 16:19:59 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	35.2	square miles
BSLOPD	Mean basin slope measured in degrees	5.3524	degrees
ROCKDEP	Depth to rock	4.9	feet
URBAN	Percentage of basin with urban development	2.028	percent

Low-Flow Statistics Parameters[100 Percent (35.1 square miles) Low Flow Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	35.2	square miles	4.78	1150
BSLOPD	Mean Basin Slope degrees	5.3524	degrees	1.7	6.4
ROCKDEP	Depth to Rock	4.9	feet	4.13	5.21
URBAN	Percent Urban	2.028	percent	0	89

Low-Flow Statistics Flow Report[100 Percent (35.1 square miles) Low Flow Region 1]

PII: Prediction Interval-Lower, Plu: Prediction Interval-Upper, SEp: Standard Error of Prediction, SE: Standard Error (other -- see report)

Statistic	Value	Unit	SE	SEp
7 Day 2 Year Low Flow	9.99	ft^3/s	46	46
30 Day 2 Year Low Flow	12.2	ft^3/s	38	38
7 Day 10 Year Low Flow	5.36	ft^3/s	51	51
30 Day 10 Year Low Flow	6.59	ft^3/s	46	46
90 Day 10 Year Low Flow	9.13	ft^3/s	41	41

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/)

USGS Data Disclaimer: Unless otherwise stated, all data, metadata and related materials are considered to satisfy the quality standards relative to the purpose for which the data were collected. Although these data and associated metadata have been reviewed for accuracy and completeness and approved for release by the U.S. Geological Survey (USGS), no warranty expressed or implied is made regarding the display or utility of the data for other purposes, nor on all computer systems, nor shall the act of distribution constitute any such warranty.

TRC_CALC

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

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

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 285.820	1.3.2.iii	WLA cfc = 278.644
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 106.503	5.1d	LTA_cfc = 161.991

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500	BAT/BPJ
		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)

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
03E	1017	PERKIOMEN CREEK	27.970	316.50	35.20	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	0.970	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
Knoll E. Grnvl	PA0011070	0.0050	0.0050	0.0050	0.000	24.00	6.42

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	10.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
03E	1017	PERKIOMEN CREEK	27.820	313.30	36.30	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	0.197	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	20.00	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
E Grnvl WFP	PA0050644	0.1000	0.1000	0.1000	0.000	20.00	7.60

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

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
03E	1017	PERKIOMEN CREEK	25.140	285.10	40.40	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	0.197	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.00	7.00	20.00	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 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
03E	1017	PERKIOMEN 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												
27.970	34.14	0.00	34.14	.0077	0.00404	.826	60.72	73.52	0.68	0.013	20.00	7.00
27.820	34.36	0.00	34.36	.1624	0.00199	.834	64.46	77.26	0.64	0.255	20.00	7.00
Q1-10 Flow												
27.970	32.44	0.00	32.44	.0077	0.00404	NA	NA	NA	0.66	0.014	20.00	7.00
27.820	32.64	0.00	32.64	.1624	0.00199	NA	NA	NA	0.62	0.263	20.00	7.00
Q30-10 Flow												
27.970	43.70	0.00	43.70	.0077	0.00404	NA	NA	NA	0.78	0.012	20.00	7.00
27.820	43.98	0.00	43.98	.1624	0.00199	NA	NA	NA	0.74	0.222	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	0.95	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.28	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
03E	1017	PERKIOMEN 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
27.970	Knoll E. Gmvl	9.67	20	9.67	20	0	0
27.820	E Gmvl WFP	9.66	50	9.66	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
27.970	Knoll E. Gmvl	1.92	10	1.92	10	0	0
27.820	E Gmvl WFP	1.92	25	1.92	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)		
27.97	Knoll E. Gmvl	25	25	10	10	5	5	0	0
27.82	E Gmvl WFP	25	25	25	25	3	3	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
03E	1017	PERKIOMEN CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
27.970	0.005	20.001	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
60.717	0.826	73.522	0.681
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.01	0.004	0.00	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.242	12.837	Tsivoglou	5
Reach Travel Time (days)			
0.013			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.001	2.01	0.00	8.24
0.003	2.01	0.00	8.24
0.004	2.01	0.00	8.24
0.005	2.01	0.00	8.24
0.007	2.01	0.00	8.24
0.008	2.01	0.00	8.24
0.009	2.01	0.00	8.24
0.011	2.01	0.00	8.24
0.012	2.01	0.00	8.24
0.013	2.01	0.00	8.24

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
27.820	0.105	20.001	7.001
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
64.464	0.834	77.258	0.642
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.11	0.070	0.11	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.219	5.967	Tsivoglou	5
Reach Travel Time (days)			
0.255			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.026	2.10	0.11	8.24
0.051	2.10	0.11	8.24
0.077	2.10	0.11	8.24
0.102	2.09	0.11	8.24
0.128	2.09	0.10	8.24
0.153	2.09	0.10	8.24
0.179	2.08	0.10	8.24
0.204	2.08	0.10	8.24
0.230	2.07	0.10	8.24
0.255	2.07	0.10	8.24

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
03E	1017	PERKIOMEN 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)
27.970	Knoll E. Grnvl	PA0011070	0.005	CBOD5	25		
				NH3-N	10	20	
				Dissolved Oxygen			5

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)
27.820	E Grnvl WFP	PA0050644	0.100	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			3

Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	N/A	N/A	N/A	
Total Boron	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	
Methyl Chloride	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	1.2	1.2	6,264	
Butyl Benzyl Phthalate	0	0		0	N/A	N/A	N/A	
Di-n-Butyl Phthalate	0	0		0	N/A	N/A	N/A	

☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

Pollutants	*Mass Limits* AML (lbs/day)	MDL (lbs/day)	*Concentration Limits* AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments

☑ ***Other Pollutants without Limits or Monitoring***

The following pollutants do not require effluent limits or monitoring based on water quality because reasonable potential to exceed water quality criteria was not determined and the discharge concentration was less than thresholds for monitoring, or the pollutant was not detected and a sufficiently sensitive analytical method was used (e.g., <= Target QL).

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	N/A	N/A	PWS Not Applicable
Chloride (PWS)	N/A	N/A	PWS Not Applicable
Sulfate (PWS)	N/A	N/A	PWS Not Applicable
Total Aluminum	198,685	µg/L	Discharge Conc ≤ 10% WQBEL
Total Barium	2,153,991	µg/L	Discharge Conc ≤ 10% WQBEL
Total Boron	1,435,994	µg/L	Discharge Conc ≤ 10% WQBEL
Total Copper	3,712	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	269,249	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	1,346,245	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	897,496	µg/L	Discharge Conc ≤ 10% WQBEL
Total Nickel	46,836	µg/L	Discharge Conc ≤ 10% WQBEL
Total Silver	1,004	µg/L	Discharge Conc ≤ 10% WQBEL

Total Maximum Daily Load of Nutrients for Green Lane Reservoir

Table 4-5. Individual Wasteload allocations of total phosphorus for Green Lane Reservoir

Point Source	NPDES permit no.	Design Flow (mgd)	Total Phosphorus concentration (mg/l)	WLA (lbs/day)	WLA (lbs/month)
Main Branch Perkiomen Subwatershed					
Brown Printing	PA0051802	0.0116	0.5	0.048	1.45
East Greenville Filtration	PA0050644	0	0	0	0
Hereford Mobile Home Park	PA0041505	0.125	0.5	0.52	15.63
Knoll, Inc.	PA0011070	0.0279	0.5	0.116	3.49
Mountain Village Mobile Home Park	PA0041491	0.064	0.5	0.27	8
TTT Realty	PA0012891	0.0088	0.5	0.037	1.1
Main Branch Perkiomen subwatershed total					**29.7**
West Branch Perkiomen Subwatershed					
Bally Borough	PA0055123	0.5	0.5	2.08	62.55
Strawberry Family Restaurant	PA0053376	0.0015	0.5	0.006	0.19
Washington Township.	PA0086142	0.25	0.5	1.04	31.27
Woodland Mobile Home Park	PA0055352	0.014	0.5	0.059	1.75
West Branch Perkiomen subwatershed total					**95.8**
Direct Drainage Subwatershed					
Green Hills Mobile Home Park	PA0031887	0.03	0.5	0.13	3.75
Upper Perkiomen School District	PA0050911	0.004	0.5	0.017	0.5
Direct Drainage subwatershed total					**4.25**
Direct Drainage (Urban) Subwatershed					
Edmund Optics	PA0053864	0	0	0	0
Upper Montgomery Joint Authority	PA0020532	2	0.5	8.34	250.2
Direct Drainage (urban) subwatershed					**250.2**