pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southeast Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0057657**
Facility Type	**Non-Municipal**	APS ID	**1025915**
Major / Minor	**Minor**	Authorization ID	**1331608**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Kendal Crosslands Communities**	Facility Name	**Kendall Crosslands STP**
Applicant Address	PO Box 100	Facility Address	1109 E Baltimore Pike
	Kennett Square, PA 19348-0100		Kennett Square, PA 19348-2366
Applicant Contact	Joseph Deckman	Facility Contact	Joseph Deckman
Applicant Phone	(610) 388-5018	Facility Phone	(610) 388-5018
Client ID	26611	Site ID	496305
Ch 94 Load Status	Not Overloaded	Municipality	Kennett Township
Connection Status	No Limitations	County	Chester
Date Application Received	October 21, 2020	EPA Waived?	Yes
Date Application Accepted	November 30, 2020	If No, Reason	

Purpose of Application: NPDES permit renewal for stream discharge.

Summary of Review

The PA Department of Environmental Protection (PADEP/Department) received an NPDES permit renewal application for Kendal Crosslands STP (facility) from Kendal Crosslands Community (permittee) on October 21, 2020. The facility is in Upper Kennett Township, Chester County. This is a minor facility with design flow of 0.125 MGD. The treated effluent discharges through Outfall 001 into a culvert to UNT to Bennetts Run, WWF/MF, at RMI 0.83. The existing permit will expire on February 28, 2021. The terms and conditions were automatically extended since the renewal application was 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: Average monthly TRC limit became more stringent.

Sludge use and disposal description and location(s): Hauled off to DELCORA and Pottstown WWTP

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	February 23, 2021
X		Pravin Patel Pravin C. Patel, P.E. / Environmental Engineer Manager	02/24/2021

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.125
Latitude	39º 52' 32"	Longitude	-75º 39' 21"
Quad Name	Unionville	Quad Code	1940
Wastewater Description:	Sewage Effluent		
Receiving Waters	Bennetts Run (WWF, MF)	Stream Code	00050
NHD Com ID	26092142	RMI	0.83
Drainage Area	0.0422 mi^2	Yield (cfs/mi^2)	0.22
Q_{7-10} Flow (cfs)	0.07 (previous PR, Winter only)	Q_{7-10} Basis	
Elevation (ft)	401.15	Slope (ft/ft)	
Watershed No.	3-H	Chapter 93 Class.	WWF, MF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Not Assessed		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	

Background/Ambient Data		Data Source
pH (SU)	7.0	Default per 391-2000-013
Temperature (°C)	25	Default per 391-2000-013 for WWF
Hardness (mg/L)	100	Default
Other:		

Nearest Downstream Public Water Supply Intake		None between discharge and DE border	
PWS Waters		Flow at Intake (cfs)	
PWS RMI		Distance from Outfall (mi)	

Changes Since Last Permit Issuance: None

Other Comments:

Streamflow:

Streamflow data was collected from the nearest downstream USGS stream gage 01481000 located in Brandywine Creek at Chadds Ford, PA. Q_{7-10}, Q_{1-10}, and Q_{30-10} values at this gage are 63.8 cfs, 60.0 cfs, and 76.9 cfs respectively for the reporting years of 1975-2008. The drainage area was found to be 287 mi^2. These values were obtained from the latest USGS streamflow report (1). The drainage area at the discharge point was found to be 0.0422 mi^2 from USGS StreamStats Version 3.0 Flow Statistics Ungaged Site Report on February 22, 2021.

Q_{7-10} runoff rate = 63.8 cfs/287 mi^2 = 0.22 cfs/mi^2
Q_{7-10} = 0.22 cfs/mi^2 * 0.0422 mi^2 = 0.009 cfs
Q_{1-10}/Q_{7-10} = 60 cfs/63.8 cfs = 0.94
Q_{30-10}/Q_{7-10} = 76.9 cfs/63.8 cfs = 1.21

The existing permit has Q_{7-10} value of 0.07 cfs for winter months which will be used for modeling, if needed.

(1) Stuckey, M.H., Roland, M.A., 2011, Selected streamflow statistics for streamgage locations in and near Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2011-1070, 23p, 37p.

PWS Intake:
There is no downstream PWS intake from the discharge point to Delaware border.

Wastewater Characteristics:
A default pH of 7.0 and a default temperature of 20^0C (per 391-2000-013) will be used for modeling, if needed. Default Hardness value of 100 mg/l will be used for modeling, if needed.

Background data:
The nearest downstream WQN stations from Outfall 001 is WQN105. Stream data were collected from WQN station for parameters pH, Total Hardness, and Temperature. The median pH, Total Hardness, and Temperature for the months July-September between years 1999-2019 is 7.4 S.U., 108 mg/l, and 22.4°C, respectively. These values will be used in the modeling, if needed.

Christina River Basin TMDL:
The facility is located within Christina River Basin TMDL. The Christina River Basin Total Maximum Daily Load (TMDL) for Nutrients and Dissolved Oxygen for Low-Flow Conditions was issued by the Environmental Protections Agency (EPA) on January 19, 2001 and subsequently revised on October 2002 and April 2006. Furthermore, DEP prepared, and EPA acknowledged an Alternative Reduction Scenario for the Christina River Basin for Low Flow TMDL dated June 27, 2012 to reassigned some of the allocations within the dischargers by keeping the total load to the basin the same. The Christina River Basin also has an approved High-Flow TMDL for Bacteria and Sediment (dated September 2006) for Fecal Coliform, enterococci, and TSS, flows and loads for nutrients and CBOD5. The high flow TMDL allocations were not adjusted at the time when low flow TMDL under an "Alternative Reduction Scenario" was developed. Since the Christina River Low-Flow TMDL is the driver for the Christina River High-Flow TDML especially for nutrients, it is assumed that compliance with the low flow TMDL satisfies the compliance of the high flow TMDL.

The facility doesn't have an approved WLA in the TMDL.

Antidegradation (93.4):
The effluent limits for this discharge have been developed to ensure that existing in-stream water uses and the level of water quality necessary to protect the existing uses are maintained and protected. The receiving streams are designated as Warm Water Fishes (WWF) and Migratory Fishes (MF.) No High-Quality stream or Exceptional Value water is impacted by this discharge; therefore, no Antidegradation Analysis is performed for the discharge.

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

Treatment Facility Summary

Treatment Facility Name: Kendal Crosslands STP

WQM Permit No.	Issuance Date
1599417 A-1	12/14/2018
1599417	02/10/2000

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Tertiary	Aerated Lagoon With Solids Removal	Hypochlorite	0.125

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.125	260	Not Overloaded	Drying	Other WWTP

Changes Since Last Permit Issuance: None

Other Comments:

Treatment Plant Description

Kendall Crosslands STP is a minor STP with a design flow of 0.125 MGD that discharges treated sewage to an UNT to Bennetts Run, which is a tributary to Brandywine Creek. This facility normally uses lagoon treatment and spray irrigation (under WQM permit number 1599417). The stream discharge is a secondary or emergency disposal method of treated wastewater where land application is the primary method of disposal.

As stated in the application, raw sewage enters the plant, flowing through a comminutor/manual bar screen. It then enters a single basin SBR system, flows to a polishing pond, and is then pumped to a flocculation tank. Prior to the flocculation tank, alum is added for phosphorus removal. Following the flocculation tank, the wastewater flows through a cloth disk filter to a storage lagoon, then a chlorine contact tank. It then goes through dechlorination before being discharged through one of two discharge options: stream discharge to Outfall 001 or by spray discharge.

Most recent inspection report (January 7, 2020) indicates the treatment process consists of a comminutor, SBR, floc tanks, Aqua Disk-Filter, Storage lagoon, and polishing pond.

The contributors to the facility are as follows:

Municipalities served	Flow contribution (%)	Type of Sewer System	
		Separate (%)	Combined (%)
Kennett Township (Kendal at Longwood)	47	100	0
Pennsbury Township (Crosslands and Cartmel)	53	100	0

The following chemicals are used for wastewater treatment purpose:

Chemical name	Purpose	Maximum use rate	Units
Sodium Hypochlorite	Disinfection	15-50	Gpd
Aluminum Sulfate	Flocculation	10	Gpd
Sodium Bisulfate	Dechlorination	2.5	gpd

The facility has a short-term plan to upgrade existing Reed Bed drain lines and plant new Common Phragmites Reed Rootstock.

Biosolids Management:
Sludge hauled off site either to DELCORA WWTP or Pottstown WWTP.

Summary of Inspection:
01/07/2020: RTPT conducted. No violation noted.

03/06/2018: RTPT conducted. No violation noted.

03/10/2016: RTPT conducted. SBR had a heavy mat of solids on the surface. It was recommended that measures should be taken to control surface scum and prevent it from carrying over during the decant cycle.

08/26/2015: RTNC conducted. No violation noted. There were some erosion channels within the wooded area. They did not originate exclusively near the spray heads and appeared to have been caused by rain events and not a result of land application.

Compliance History

DMR Data for Outfall 002 (from January 1, 2020 to December 31, 2020)

Parameter	DEC-20	NOV-20	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20	FEB-20	JAN-20
pH (S.U.) Instantaneous Minimum	7.6	7.4	6.8	6.8	6.6	6.8	6.8	8.5	7.7	7.5	8.0	7.4
pH (S.U.) Instantaneous Maximum	7.6	7.4	6.8	6.9	6.6	6.8	6.8	8.5	7.7	7.5	8.4	8.5
CBOD5 (mg/L) Average Monthly	< 2.0	< 2.0	19.8	4.3	4.5	3.3	8.6	3.2	< 2.0	9.0	5.3	< 2.0
TSS (mg/L) Average Monthly	5.0	< 5.0	11.0	< 5.0	9.0	< 5.0	18.0	16.0	21.0	10.0	17.0	17.0
Fecal Coliform (No./100 ml) Geometric Mean	< 1	< 1	< 1	< 1	1	< 1	< 2	< 1	< 1	< 1	< 1	< 1

DMR Data for Outfall 1599417 (from January 1, 2020 to December 31, 2020)

Parameter	DEC-20	NOV-20	OCT-20	SEP-20	AUG-20	JUL-20	JUN-20	MAY-20	APR-20	MAR-20	FEB-20	JAN-20
Flow (GPD) Influent Average Monthly	69516	72706	71635	68000	65376	61714	66067	61677	65730	69194	62031	58332

Existing Effluent Limitations and Monitoring Requirements

The table below summarizes effluent limitations and monitoring requirements specified in the existing final NPDES permit that was in effect between March 1, 2016 to February 28, 2021.

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	XXX	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	6.0	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.1	XXX	0.2	1/day	Grab
CBOD5	21	XXX	XXX	20	XXX	40	1/week	24-Hr Composite
Total Suspended Solids	21	XXX	XXX	20	XXX	40	1/week	24-Hr Composite
Fecal Coliform (No./100 ml)	XXX	XXX	XXX	200	XXX	1,000	1/week	Grab
Ammonia-Nitrogen May 1 - Oct 31	2.1	XXX	XXX	2.0	XXX	4.0	1/week	24-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	6.3	XXX	XXX	6.0	XXX	12.0	1/week	24-Hr Composite
Total Phosphorus	2.1	XXX	XXX	2.0	XXX	4.0	1/week	24-Hr Composite
Total Copper	0.013	0.025	XXX	0.012	0.024	0.03	1/month	24-Hr Composite
Total Zinc	0.08	0.17	XXX	0.08	0.16	0.2	1/month	24-Hr Composite

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.125
Latitude 39º 52' 32.00" **Longitude** -75º 39' 21.00"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

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

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

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 $Q_{7\text{-}10}$ and historic background water quality levels of the river. The following data were used in the attached computer model of the stream:

- Discharge pH 7.0 (Default per 391-2000-013)
- Discharge Temperature 20°C (Default per 391-2000-013)
- Discharge Hardness 100 mg/l (Default)
- Stream pH 7.4 (WQN_105, median July-Sep, 1999-2019)
- Stream Temperature 22.4°C (WQN_105, median July-Sep, 1999-2019)
- Stream Hardness 108 mg/l (WQN_105, median July-Sep, 1999-2019)

The following nodes were considered in modeling:

Node 1: Outfall 001 at UNT to Bennetts Run (00050)
Elevation: 401.15 ft (USGS National Map viewer, 02/22/2021)
Drainage Area: 0.0422 mi^2 (StreamStat Version 3.0, 02/22/2021)
River Mile Index: 0.83 (PA DEP eMapPA)
Low Flow Yield: 0.22 cfs/mi^2
Discharge Flow: 0.125 MGD

Node 2: At confluence with Bennetts Run (00047)
Elevation: 245.12 ft (USGS National Map viewer, 02/22/2021)

Drainage Area:	0.51 mi^2 (StreamStat Version 3.0, 02/22/2021)
River Mile Index:	0.0 (PA DEP eMapPA)
Low Flow Yield:	0.22 cfs/mi^2
Discharge Flow:	0.0 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 2.0 mg/l as monthly average and 4.0 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 calculated to be 2.1 lbs./day. The existing winter season limits of 6.0 mg/l as average monthly and 12.0 mg/l as IMAX limit will be carried over in this renewal. Winter average monthly mass limit was calculated as 6.3 lbs./day. All these values are the same as existing permit and will be carried over.

$CBOD_5$:
The WQM 7.0 model suggests a monthly average $CBOD_5$ limit of 20 mg/l. The IMAX value is 40 mg/l. The average monthly mass loading is calculated as 21 lbs/day. These values are the same as existing permit and will be carried over.

Dissolved Oxygen (DO):
The existing permit has a minimum DO of 6.0 mg/l. WQM 7.0 output file supports the existing limit and will be carried over.

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.

The existing permit has Total Copper average monthly, daily max, and imax limit of 0.012 mg/l, 0.024 mg/l, and 0.03 mg/l, respectively. Average monthly and daily max mass limits are 0.013 lbs./day and 0.025 lbs./day, respectively. Total Zinc has an average monthly, daily max, and imax limit of 0.08 mg/l, 0.16 mg/l, and 0.2 mg/l, respectively. The average monthly and daily max mass loads are 0.08 lbs./day and 0.17 lbs./day, respectively. The maximum concentration reported in the application for Total Copper and Total Zinc are 0.003 mg/l and 0.016 mg/l. These values are utilized in the TMS to conduct a Reasonable Potential (RP) Analysis. The output from model shows no RP were demonstrated for both parameters. Therefore, the existing limits will be carried over since none of the exception in federal Anti-degradation policy were met.

Additional Considerations

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. The facility has year-round geo-mean limit of 200/100 ml and IMAX of 1000/100 ml. These limits will be carried over in this renewal.

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 20 mg/L average monthly and 40 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 limits are calculated to be 21 lbs./day, which will be carried over in this renewal.

Total Phosphorus: The existing permit has average monthly and IMAX limit of 2.0 mg/l and 4.0 mg/l. The average monthly mass limit is 2.1 lbs./day. Existing limits will be carried over in this renewal.

Total Residual Chlorine (TRC):
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 0.06 mg/l would be needed to prevent toxicity concerns at the discharge point for Outfall 001. The Instantaneous Maximum (IMAX) limit is 0.2 mg/l. The existing permit has AML limit of 0.1 mg/l and IMAX limit of 0.2 mg/l. The Average monthly limit is more stringent compared to existing limit. The facility uses Sodium Bisulfate for dechlorination. It is believed that the facility has technology in place to meet more stringent average monthly limit. Therefore, it is recommended that the average monthly limit of 0.06 will be placed in this renewal.

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

Best Professional Judgement (BPJ):

Monitoring Frequency and Sample Types:
Otherwise specified above, the monitoring frequency and sample type of compliance monitoring for existing parameters are recommended by DEP's SOP and Permit Writers Manual and/or on a case-by-case basis using best professional judgment (BPJ).

Anti-Backsliding

The proposed limits are at least as stringent as are in existing permit, unless otherwise stated; therefore, anti-backsliding is not applicable.

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
Flow (MGD)	Report	XXX	XXX	XXX	XXX	XXX	Continuous	Metered
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	6.0 Inst Min	XXX	XXX	XXX	1/day	Grab
TRC	XXX	XXX	XXX	0.06	XXX	0.2	1/day	Grab
CBOD5	21	XXX	XXX	20	XXX	40	1/week	24-Hr Composite
TSS	21	XXX	XXX	20	XXX	40	1/week	24-Hr Composite
Fecal Coliform (No./100 ml)	XXX	XXX	XXX	200	XXX	1000	1/week	Grab
Ammonia Nov 1 - Apr 30	6.3	XXX	XXX	6.0	XXX	12	1/week	24-Hr Composite
Ammonia May 1 - Oct 31	2.1	XXX	XXX	2.0	XXX	4	1/week	24-Hr Composite
Total Phosphorus	2.1	XXX	XXX	2.0	XXX	4	1/week	24-Hr Composite
Total Copper	0.013	0.025 Daily Max	XXX	0.012	0.024 Daily Max	0.03	1/month	24-Hr Composite
Total Zinc	0.08	0.17 Daily Max	XXX	0.08	0.16 Daily Max	0.2	1/month	24-Hr Composite

Compliance Sampling Location: At Outfall 001

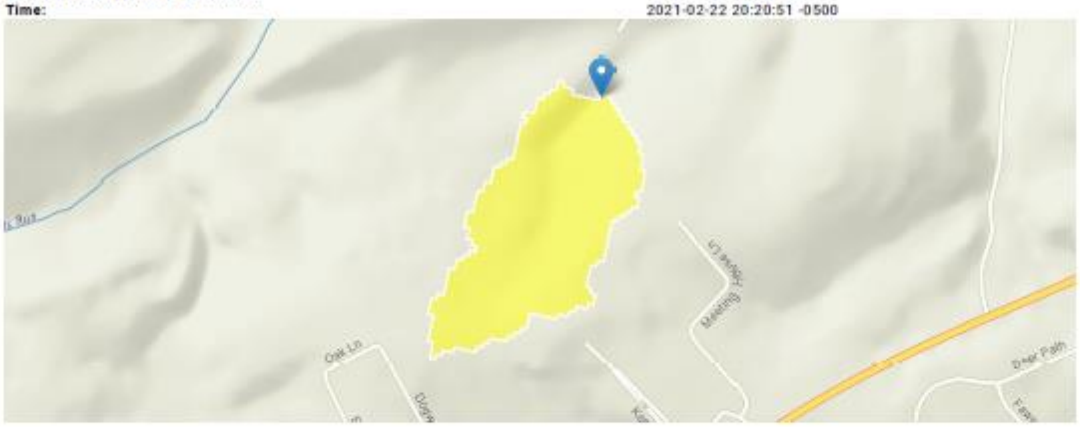
Other Comments: None

Tools and References Used to Develop Permit	
☒	WQM for Windows Model (see Attachment)
☒	Toxics Management Spreadsheet (see Attachment)
☒	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical Guidance for the Development and Specification of Effluent Limitations, 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:

Permit No. PA0057657

PA0057657 at Outfall 001

Region ID:	PA
Workspace ID:	PA20210223012035827000
Clicked Point (Latitude, Longitude):	39.87615, -75.65166
Time:	2021-02-22 20:20:51 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.0422	square miles
BSLOPD	Mean basin slope measured in degrees	4.4925	degrees
ROCKDEP	Depth to rock	5	feet
URBAN	Percentage of basin with urban development	54.3956	percent

Low-Flow Statistics Parameters[Low Flow Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.0422	square miles	4.78	1150
BSLOPD	Mean Basin Slope degrees	4.4925	degrees	1.7	6.4
ROCKDEP	Depth to Rock	5	feet	4.13	5.21
URBAN	Percent Urban	54.3956	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]

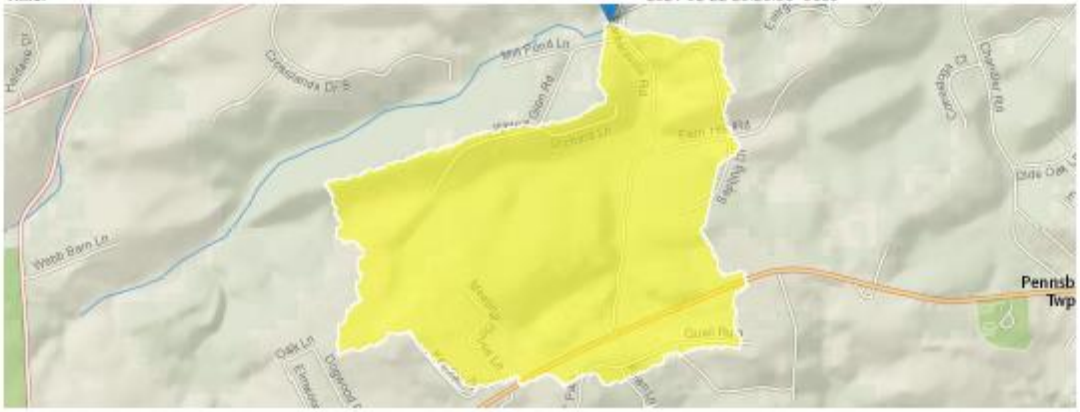
Statistic	Value	Unit
7 Day 2 Year Low Flow	0.0228	ft^3/s
30 Day 2 Year Low Flow	0.0299	ft^3/s
7 Day 10 Year Low Flow	0.0107	ft^3/s
30 Day 10 Year Low Flow	0.0148	ft^3/s
90 Day 10 Year Low Flow	0.0233	ft^3/s

Low-Flow Statistics Citations

Permit No. PA0057657

StreamStats at Node 2

Region ID:	PA
Workspace ID:	PA20210223012252626000
Clicked Point (Latitude, Longitude):	39.88275, -75.64368
Time:	2021-02-22 20:23:08 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	0.51	square miles
CARBON	Percentage of area of carbonate rock	0	percent
BSLOPD	Mean basin slope measured in degrees	5.2435	degrees
ROCKDEP	Depth to rock	5	feet
URBAN	Percentage of basin with urban development	26.5827	percent

Low-Flow Statistics Parameters[Low Flow Region 1]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	0.51	square miles	4.78	1150
BSLOPD	Mean Basin Slope degrees	5.2435	degrees	1.7	6.4
ROCKDEP	Depth to Rock	5	feet	4.13	5.21
URBAN	Percent Urban	26.5827	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	0.23	ft^3/s
30 Day 2 Year Low Flow	0.286	ft^3/s
7 Day 10 Year Low Flow	0.115	ft^3/s
30 Day 10 Year Low Flow	0.149	ft^3/s
90 Day 10 Year Low Flow	0.214	ft^3/s

Low-Flow Statistics Citations

https://streamstats.usgs.gov/ss/ 2/22/2021

Permit No. PA0057657

TRC_CALC

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

0.07	= Q stream (cfs)	0.5	= CV Daily
0.125	= 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 =	0.134	1.3.2.iii	WLA cfc =	0.124
PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc =	0.581
PENTOXSD TRG	5.1b	LTA_afc=	0.050	5.1d	LTA_cfc =	0.072

Source		Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML MULT =	1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) =	0.062	AFC
		INST MAX LIMIT (mg/l) =	0.202	

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)

Permit No. PA0057657

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
03H	50	Trib 00050 to Bennetts Run	0.830	401.15	0.04	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	0.220	0.00	0.00	0.000	0.000	0.0	0.00	0.00	22.40	7.40	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
Kendall STP	PA0057657	0.1250	0.1250	0.1250	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	20.00	2.00	0.00	1.50
Dissolved Oxygen	6.00	8.24	0.00	0.00
NH3-N	2.00	0.00	0.00	0.70

Permit No. PA0057657

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
03H	50	Trib 00050 to Bennetts Run	0.000	245.12	0.51	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	0.220	0.00	0.00	0.000	0.000	0.0	0.00	0.00	22.40	7.40	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	25.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Permit No. PA0057657

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
03H	50	Trib 00050 to Bennetts Run

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
0.830	0.01	0.00	0.01	.1934	0.03560	.481	2.07	4.31	0.20	0.250	20.11	7.01
Q1-10 Flow												
0.830	0.01	0.00	0.01	.1934	0.03560	NA	NA	NA	0.20	0.250	20.10	7.01
Q30-10 Flow												
0.830	0.01	0.00	0.01	.1934	0.03560	NA	NA	NA	0.20	0.249	20.13	7.01

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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	0.94	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.21	Temperature Adjust Kr	☑
D.O. Saturation	90.00%	Use Balanced Technology	☑
D.O. Goal	6		

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WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
03H	50	Trib 00050 to Bennetts Run

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
0.830	Kendall STP	9.53	4	9.53	4	0	0

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
0.830	Kendall STP	1.88	1.99	1.88	1.99	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
0.83	Kendall STP	20	20	1.99	1.99	6	6	0	0

Permit No. PA0057657

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
03H	50	Trib 00050 to Bennetts Run

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
0.830	0.125	20.110	7.012
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
2.075	0.481	4.311	0.203
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
19.18	1.491	1.90	0.706
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.103	28.915	Owens	6
Reach Travel Time (days)			
0.250			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.025	18.47	1.87	6.81
0.050	17.79	1.84	7.18
0.075	17.14	1.80	7.39
0.100	16.51	1.77	7.51
0.125	15.90	1.74	7.60
0.150	15.32	1.71	7.67
0.175	14.75	1.68	7.73
0.200	14.21	1.65	7.78
0.225	13.69	1.62	7.83
0.250	13.18	1.59	7.88

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WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
03H	50	Trib 00050 to Bennetts Run

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
0.830	Kendall STP	PA0057657	0.125	CBOD5	20		
				NH3-N	1.99	3.98	
				Dissolved Oxygen			6

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.2, February 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Kendall Crosslands STP** NPDES Permit No.: **PA0057657** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Treated effluent**

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.125	100	7						

	Discharge Pollutant	Units	Max Discharge Conc		0 if left blank: Trib Conc	0 if left blank: Stream Conc	0.5 if left blank: Daily CV	0.5 if left blank: Hourly CV	0 if left blank: Stream CV	0 if left blank: Fate Coeff	0 if left blank: FOS	1 if left blank: Criteria Mod	1 if left blank: Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		316									
	Chloride (PWS)	mg/L											
	Bromide	mg/L											
	Sulfate (PWS)	mg/L											
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L											
	Total Antimony	µg/L											
	Total Arsenic	µg/L											
	Total Barium	µg/L											
	Total Beryllium	µg/L											
	Total Boron	µg/L											
	Total Cadmium	µg/L											
	Total Chromium (III)	µg/L											
	Hexavalent Chromium	µg/L											
	Total Cobalt	µg/L											
	Total Copper	µg/L		3									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L											
	Total Lead	µg/L											
	Total Manganese	µg/L											
	Total Mercury	µg/L											
	Total Nickel	µg/L											
	Total Phenols (Phenolics) (PWS)	µg/L											
	Total Selenium	µg/L											
	Total Silver	µg/L											
	Total Thallium	µg/L											
	Total Zinc	µg/L		16									
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

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Group 3	Carbon Tetrachloride	µg/L	<										
	Chlorobenzene	µg/L											
	Chlorodibromomethane	µg/L	<										
	Chloroethane	µg/L	<										
	2-Chloroethyl Vinyl Ether	µg/L	<										
	Chloroform	µg/L	<										
	Dichlorobromomethane	µg/L	<										
	1,1-Dichloroethane	µg/L	<										
	1,2-Dichloroethane	µg/L	<										
	1,1-Dichloroethylene	µg/L	<										
	1,2-Dichloropropane	µg/L	<										
	1,3-Dichloropropylene	µg/L	<										
	1,4-Dioxane	µg/L	<										
	Ethylbenzene	µg/L	<										
	Methyl Bromide	µg/L	<										
	Methyl Chloride	µg/L	<										
	Methylene Chloride	µg/L	<										
	1,1,2,2-Tetrachloroethane	µg/L	<										
	Tetrachloroethylene	µg/L	<										
	Toluene	µg/L	<										
	1,2-trans-Dichloroethylene	µg/L	<										
	1,1,1-Trichloroethane	µg/L	<										
	1,1,2-Trichloroethane	µg/L	<										
	Trichloroethylene	µg/L	<										
	Vinyl Chloride	µg/L	<										
Group 4	2-Chlorophenol	µg/L	<										
	2,4-Dichlorophenol	µg/L	<										
	2,4-Dimethylphenol	µg/L	<										
	4,6-Dinitro-o-Cresol	µg/L	<										
	2,4-Dinitrophenol	µg/L	<										
	2-Nitrophenol	µg/L	<										
	4-Nitrophenol	µg/L	<										
	p-Chloro-m-Cresol	µg/L	<										
	Pentachlorophenol	µg/L	<										
	Phenol	µg/L	<										
	2,4,6-Trichlorophenol	µg/L	<										
Group 5	Acenaphthene	µg/L	<										
	Acenaphthylene	µg/L	<										
	Anthracene	µg/L	<										
	Benzidine	µg/L	<										
	Benzo(a)Anthracene	µg/L	<										
	Benzo(a)Pyrene	µg/L	<										
	3,4-Benzofluoranthene	µg/L	<										
	Benzo(ghi)Perylene	µg/L	<										
	Benzo(k)Fluoranthene	µg/L	<										
	Bis(2-Chloroethoxy)Methane	µg/L	<										
	Bis(2-Chloroethyl)Ether	µg/L	<										
	Bis(2-Chloroisopropyl)Ether	µg/L	<										
	Bis(2-Ethylhexyl)Phthalate	µg/L	<										
	4-Bromophenyl Phenyl Ether	µg/L	<										
	Butyl Benzyl Phthalate	µg/L	<										
	2-Chloronaphthalene	µg/L	<										
	4-Chlorophenyl Phenyl Ether	µg/L	<										
	Chrysene	µg/L	<										
	Dibenzo(a,h)Anthrancene	µg/L	<										
	1,2-Dichlorobenzene	µg/L	<										
	1,3-Dichlorobenzene	µg/L	<										
	1,4-Dichlorobenzene	µg/L	<										
	3,3-Dichlorobenzidine	µg/L	<										
	Diethyl Phthalate	µg/L	<										
	Dimethyl Phthalate	µg/L	<										
	Di-n-Butyl Phthalate	µg/L	<										
	2,4-Dinitrotoluene	µg/L	<										

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	2,6-Dinitrotoluene	µg/L	<											
	Di-n-Octyl Phthalate	µg/L	<											
	1,2-Diphenylhydrazine	µg/L	<											
	Fluoranthene	µg/L	<											
	Fluorene	µg/L	<											
	Hexachlorobenzene	µg/L	<											
	Hexachlorobutadiene	µg/L	<											
	Hexachlorocyclopentadiene	µg/L	<											
	Hexachloroethane	µg/L	<											
	Indeno(1,2,3-cd)Pyrene	µg/L	<											
	Isophorone	µg/L	<											
	Naphthalene	µg/L	<											
	Nitrobenzene	µg/L	<											
	n-Nitrosodimethylamine	µg/L	<											
	n-Nitrosodi-n-Propylamine	µg/L	<											
	n-Nitrosodiphenylamine	µg/L	<											
	Phenanthrene	µg/L	<											
	Pyrene	µg/L	<											
	1,2,4-Trichlorobenzene	µg/L	<											
Group 6	Aldrin	µg/L	<											
	alpha-BHC	µg/L	<											
	beta-BHC	µg/L	<											
	gamma-BHC	µg/L	<											
	delta BHC	µg/L	<											
	Chlordane	µg/L	<											
	4,4-DDT	µg/L	<											
	4,4-DDE	µg/L	<											
	4,4-DDD	µg/L	<											
	Dieldrin	µg/L	<											
	alpha-Endosulfan	µg/L	<											
	beta-Endosulfan	µg/L	<											
	Endosulfan Sulfate	µg/L	<											
	Endrin	µg/L	<											
	Endrin Aldehyde	µg/L	<											
	Heptachlor	µg/L	<											
	Heptachlor Epoxide	µg/L	<											
	PCB-1016	µg/L	<											
	PCB-1221	µg/L	<											
	PCB-1232	µg/L	<											
	PCB-1242	µg/L	<											
	PCB-1248	µg/L	<											
	PCB-1254	µg/L	<											
	PCB-1260	µg/L	<											
	PCBs, Total	µg/L	<											
	Toxaphene	µg/L	<											
	2,3,7,8-TCDD	ng/L	<											
Group 7	Gross Alpha	pCi/L												
	Total Beta	pCi/L	<											
	Radium 226/228	pCi/L	<											
	Total Strontium	µg/L	<											
	Total Uranium	µg/L	<											
	Osmotic Pressure	mOs/kg												

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.2, February 2021

Stream / Surface Water Information

Kendall Crosslands STP, NPDES Permit No. PA0057657, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: _____ No. Reaches to Model: 1

- (●) Statewide Criteria
- ( ) Great Lakes Criteria
- ( ) ORSANCO Criteria

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	000050	0.83	401.15	0.0422			Yes
End of Reach 1	000050	0	245.12	0.51			Yes

$Q_{7\text{-}10}$

Location	RMI	LFY (cfs/mi²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	0.83	0.22										108	7.4		
End of Reach 1	0	0.22													

Q_h

Location	RMI	LFY (cfs/mi²)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	0.83														
End of Reach 1	0														

Permit No. PA0057657

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.2, February 2021

Model Results

Kendall Crosslands STP, NPDES Permit No. PA0057657, Outfall 001

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | ◉ All ○ Inputs ○ Results ○ Limits

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 0.000 PMF: 1 Analysis Hardness (mg/l): 100.37 Analysis pH: 7.01

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	13.486	14.0	14.7	Chem Translator of 0.96 applied
Total Zinc	0	0		0	117.544	120	126	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 0.000 PMF: 1 Analysis Hardness (mg/l): 100.37 Analysis pH: 7.01

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	8.984	9.36	9.81	Chem Translator of 0.96 applied
Total Zinc	0	0		0	118.506	120	126	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): 0.000 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 0.011 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	

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Total Copper	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	

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

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Copper	Report	Report	Report	Report	Report	µg/L	9.81	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	120	AFC	Discharge Conc > 10% WQBEL (no RP)

☑ ***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