

Application Type Renewal
Facility Type Municipal
Major / Minor Major

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Application No. PA0024902
APS ID 276292
Authorization ID 1400965

Applicant and Facility Information

Applicant Name <u>Upper Allen Township</u>	Facility Name <u>Upper Allen Township Grantham WWTP</u>
Applicant Address <u>100 Gettysburg Pike</u> <u>Mechanicsburg, PA 17055-5604</u>	Facility Address <u>400 Creekside Drive</u> <u>Mechanicsburg, PA 17055</u>
Applicant Contact <u>Scott Fraser</u>	Facility Contact _____
Applicant Phone <u>(717) 766-0756</u>	Facility Phone <u>(717) 697-9548</u>
Client ID <u>77320</u>	Site ID <u>251387</u>
Ch 94 Load Status <u>Not Overloaded</u>	Municipality <u>Upper Allen Township</u>
Connection Status <u>No Limitations</u>	County <u>Cumberland</u>
Date Application Received <u>June 27, 2022</u>	EPA Waived? <u>No</u>
Date Application Accepted <u>June 30, 2022</u>	If No, Reason <u>Major Facility, Significant CB Discharge</u>
Purpose of Application <u>NPDES Renewal.</u>	

Summary of Review

Upper Allen Township (UAT) has applied to the Pennsylvania Department of Environmental Protection (DEP) for reissuance of the NPDES permit. The permit was last reissued on December 28, 2017 and expired on December 31, 2022.

Based on the review, it is recommended that the permit be drafted.

Sludge use and disposal description and location(s): Sludge is treated onsite then either land applied under PAG083592 or sent to a landfill (Blue Ridge Landfill)

Public Participation

DEP will publish notice of the receipt of the NPDES permit application and a tentative decision to issue the individual NPDES permit in the *Pennsylvania Bulletin* in accordance with 25 Pa. Code § 92a.82. Upon publication in the *Pennsylvania Bulletin*, DEP will accept written comments from interested persons for a 30-day period (which may be extended for one additional 15-day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

Approve	Deny	Signatures	Date
X		<i>Jinsu Kim</i> Jinsu Kim / Environmental Engineering Specialist	August 11, 2023
X		Maria D. Bebenek for Daniel W. Martin, P.E. / Environmental Engineer Manager	September 11, 2023
X		Maria D. Bebenek Maria D. Bebenek, P.E. / Program Manager	September 11, 2023

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	1.1
Latitude	40° 9' 15.02"	Longitude	-76° 59' 3.75"
Quad Name	Lemoyne	Quad Code	1730
Wastewater Description:	Treated Sewage		
Receiving Waters	Yellow Breeches Creek	Stream Code	10121
NHD Com ID	56407005	RMI	19.14
Drainage Area	162 sq.mi.	Yield (cfs/mi ²)	0.318
Q ₇₋₁₀ Flow (cfs)	51.516	Q ₇₋₁₀ Basis	USGS gage no. 01571500
Elevation (ft)	410	Slope (ft/ft)	
Watershed No.	7-E	Chapter 93 Class.	CWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment			
Source(s) of Impairment			
TMDL Status		Name	
Nearest Downstream Public Water Supply Intake	United Water Company		
PWS Waters	Yellow Breeches Creek	Flow at Intake (cfs)	N/A
PWS RMI	7.42	Distance from Outfall (mi)	11.717

Drainage Area

The discharge is to Yellow Breeches Creek at RMI 19.14. A drainage area upstream of the point of discharge is determined to be 162 sq.mi according to USGS PA StreamStats available at <https://streamstats.usgs.gov/ss/>.

Stream Flow

USGS gauging station no. 01571500 on Yellow Breeches Creek, located 3.1 miles above mouth also measures the hatchery flow and springs at Huntsdale (PA0037141) which results in a greater yield rate in the basin than actually exists. The monthly hatchery discharge is estimated to be 12.384 MGD during low-flow periods of the year and the gauge flow should be adjusted by subtracting the hatchery discharge as follows:

$$\begin{aligned}
 \text{Gauge flow} &= 86.8 - 12.384(1.547) = 67.64 \text{ cfs} \\
 \text{Q7-10 runoff rate} &= (67.64) / 213 = 0.318 \text{ cfs/sq.mi.} \\
 \text{Q30-10:Q7-10} &= 94.0/86.8 = 1.08:1 \quad / \quad \text{Q1-10:Q7-10} = 81.6/86.8 = 0.94:1 \\
 \text{Q7-10} &= 162(0.318) = 51.516 \text{ cfs}
 \end{aligned}$$

Yellow Breeches Creek

Under 25 Pa Code §93.9o, Yellow Breeches Creek (main stem, LR21012 to Mouth) is designated as cold water & migratory fishes. It is not classified as a Class A Trout stream; therefore no Class A Wild Trout Fishery is impacted by this discharge. DEP's 2014 PA Integrated Water Quality Monitoring and Assessment report indicates that Yellow Breeches Creek including a number of unnamed tributaries are currently impaired at further downstream of the point of discharge. The discharge is currently located in a stream segment listed as attaining uses.

Public Water Supply Intake

The nearest downstream public water supply intake is the United Water Company, located on the Yellow Breeches Creek, approximately 11 miles from the point of discharge. Considering distance, nature and dilution, the discharge is not expected to significantly impact this intake.

Treatment Facility Summary				
Treatment Facility Name: Upper Allen Township Grantham WWTP				
WQM Permit No.	Issuance Date	WQM Permit No.	Issuance Date	
2197407	09/08/1997	2190401	12/13/2011	
2101412	02/07/2002	WQG02210803	10/06/2008	
2102406	08/29/2002	WQG02210805	10/06/2008	
2110407	10/26/2010	WQG02210802	05/01/2008	
2190407 A-3	4/12/2023			
Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Sequencing Batch Reactor	Gas Chlorine	1.10
Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
1.37	2018	Not Overloaded	Aerobic Digesters/ Belt Filter Press	Land applied/landfill

The Upper Allen Township Grantham wastewater treatment plant located at 400 Creekside Drive Mechanicsburg PA 17055 serves the Township only with a population of 8,000 and all sewer system is 100% separated. With having both annual average design flow and hydraulic design capacity as 1.10 MGD, 25 Pa Code §92a.26(b) recognizes this facility as a major facility with design flow greater than 1 MGD but less than 5 MGD. The treatment process, according to the application, is as follows:

Screening → Influent Pump Station → Sequencing Batch Reactors (2) → Chlorine Contact Tanks (2) → Outfall 001 to Yellow Breeches Creek.

Chlorine gas is used for disinfection. Alum and polymer products are used for phosphorous removal and sludge conditioning, respectively. Solids processes consist of aerobic digestion, dewatering via belt filter press. Solids generated from this facility will be either land applied for hauled off to a local landfill (DEP Biosolids Beneficial User Permit no. 08-3592).

There are no industrial users connected to the sewer system; therefore, the facility is not required to develop and implement a pretreatment program administered by US EPA.

Compliance History	
Summary of DMRs:	A summary of past 12-month DMR is presented on the next page.
Summary of Inspections:	<p>04/12/2023: Brandon Bettinger conducted a routine inspection. No issues were found during the inspection.</p> <p>04/05/2023: Brandon Bettinger conducted an incident inspection following a discharge of raw sewage to the ground and a nearby UNT of Yellow Breeches Creek as a result of a force main break.</p> <p>01/28/2022: Brandon Bettinger conducted a routine inspection. No issues were found during the inspection.</p> <p>03/17/2021: Michael Benham, conducted a follow up inspection as a result of a PPC plan violation noted during the last routine inspection. No issues were found during the inspection.</p>
Other Comments	There is currently no open violation associated with this facility or permittee. A number of permit violations have been reported since the last reissuance. These violations are summarized on page

Compliance History

DMR Data for Outfall 001 (from July 1, 2022 to June 30, 2023)

Parameter	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22
Flow (MGD) Average Monthly	0.568	0.627	0.657	0.635	0.637	0.644	0.632	0.589	0.593	0.614	0.580	0.572
Flow (MGD) Daily Maximum	0.697	1.109	1.275	0.791	0.734	0.743	1.073	0.678	0.709	0.795	0.669	0.657
pH (S.U.) Daily Minimum	6.77	6.78	6.72	6.6	6.52	6.63	6.61	6.68	6.92	6.92	6.98	6.83
pH (S.U.) Daily Maximum	7.18	7.16	7.18	7.04	6.98	7.03	7.08	7.21	7.27	7.41	7.52	7.38
DO (mg/L) Daily Minimum	6.15	6.52	6.96	6.83	6.42	6.61	6.58	6.49	6.67	6.39	6.2	6.21
TRC (mg/L) Average Monthly	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2
TRC (mg/L) Instantaneous Maximum	0.23	0.24	0.23	0.26	0.24	0.22	0.27	0.19	0.15	0.32	0.26	0.23
CBOD5 (lbs/day) Average Monthly	19	25	19	3.0	19	16	18	15	< 14	15	< 17	< 15
CBOD5 (lbs/day) Weekly Average	20	34	23	23	23	17	21	20	16	19	21	21
CBOD5 (mg/L) Average Monthly	4.0	5.0	4.0	3.0	3.0	3.0	3.0	3.0	< 3.0	3.0	< 3.0	< 3.0
CBOD5 (mg/L) Weekly Average	4.0	7.0	5.0	5.0	4.0	3.0	4.0	4.0	3.0	4.0	4.0	4.0
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	817	701	885	672	880	924	762	861	649	997	1095	1216
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	1356	1421	1376	1272	1493	1382	1170	1799	1020	1837	1233	1655
BOD5 (mg/L) Raw Sewage Influent Average Monthly	170	131	170	130	158	168	143	176	131	180	223	243
TSS (lbs/day) Average Monthly	5.0	6.0	6.0	5.0	9.0	6.0	6.0	9.0	5.0	7.0	6.0	7.0
TSS (lbs/day) Raw Sewage Influent Average Monthly	1192	1095	1268	1325	1459	1626	1557	1425	1415	1503	1190	1254

NPDES Permit Fact Sheet
Upper Allen STP

NPDES Permit No. PA0024902

Parameter	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22
TSS (lbs/day) Raw Sewage Influent Daily Maximum	1531	1555	1790	1903	1749	2227	2472	1949	2407	2268	1518	1720
TSS (lbs/day) Weekly Average	8.0	13.0	7.0	7.0	10	7.0	8.0	11	6.0	9.0	7.0	10
TSS (mg/L) Average Monthly	1.0	1.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0	3.0	1.0	1.0
TSS (mg/L) Raw Sewage Influent Average Monthly	248	203	241	254	267	293	295	279	279	269	238	252
TSS (mg/L) Weekly Average	2.0	3.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0	2.0	2.0	4.0
Fecal Coliform (No./100 ml) Geometric Mean	22	< 6.0	31	23	45	24	< 14	92	152	27	22	16
Fecal Coliform (No./100 ml) Instantaneous Maximum	340	16	60	225	312	150	100	220	1664	290	68	84
Nitrate-Nitrite (mg/L) Average Monthly	2.15	1.89	1.86	2.38	3.82	3.87	4.05	3.7	4.99	3.11	2.06	1.56
Nitrate-Nitrite (lbs) Total Monthly	311	320	288	383	582	668	656	558	780	501	316	240
Total Nitrogen (mg/L) Average Monthly	3.65	< 3.22	3.87	4.19	5.42	5.5	5.56	5.53	6.7	4.75	3.67	< 2.92
Total Nitrogen (lbs) Effluent Net Total Monthly	528	< 539	600	677	828	948	903	830	1046	766	563	< 451
Total Nitrogen (lbs) Total Monthly	528	< 539	600	677	828	948	903	830	1046	766	563	< 451
Total Nitrogen (lbs) Effluent Net Total Annual										< 8788		
Total Nitrogen (lbs) Total Annual										< 8788		
Ammonia (lbs/day) Average Monthly	1.0	2.0	2.0	4.0	< 2.0	< 2.0	< 1.0	< 3.0	< 2.0	< 1	< 0.7	< 0.5
Ammonia (mg/L) Average Monthly	0.214	0.375	0.42	0.701	< 0.365	< 0.372	< 0.188	< 0.588	< 0.371	< 0.221	< 0.143	< 0.101
Ammonia (lbs) Total Monthly	31	61	65	114	< 56	< 66	< 31	< 85	< 58	< 35	< 22	< 16
Ammonia (lbs) Total Annual										< 603		

NPDES Permit Fact Sheet
Upper Allen STP

NPDES Permit No. PA0024902

Parameter	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23	DEC-22	NOV-22	OCT-22	SEP-22	AUG-22	JUL-22
TKN (mg/L)												
Average Monthly	1.5	< 1.3	2.0	1.8	1.6	1.6	1.5	1.8	1.7	1.6	1.6	< 1.4
TKN (lbs)												
Total Monthly	217	< 219	313	293	246	280	247	272	267	266	246	< 211
Total Phosphorus (lbs/day)												
Average Monthly	4.0	6.0	4.0	3.0	3.0	3.0	3.0	7.0	7.0	9.0	7.0	3.0
Total Phosphorus (mg/L)												
Average Monthly	0.93	1.1	0.75	0.59	0.48	0.49	0.67	1.34	1.32	1.7	1.39	0.69
Total Phosphorus (lbs) Effluent Net												
Total Monthly	134	180	116	95	72	84	108	202	207	268	210	107
Total Phosphorus (lbs) Total Monthly	134	180	116	95	72	84	108	202	207	268	210	107
Total Phosphorus (lbs) Effluent Net												
Total Annual										1783		
Total Phosphorus (lbs) Total Annual										1783		

Existing Effluent Limits and Monitoring Requirements

The table below summarizes effluent limitations and monitoring requirements specified in the current NPDES permit renewal.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) ⁽¹⁾		Concentrations (mg/L)				Minimum ⁽²⁾ Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Daily Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	9.0	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5 May 1 - Oct 31	183	275 Wkly Avg	XXX	20.0	30.0 Wkly Avg	40	2/week	24-Hr Composite
CBOD5 Nov 1 - Apr 30	229	367 Wkly Avg	XXX	25.0	40.0 Wkly Avg	50	2/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Suspended Solids	275	413 Wkly Avg	XXX	30.0	45.0 Wkly Avg	60	2/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/week	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/week	Grab
Ammonia-Nitrogen	Report	XXX	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Phosphorus	18.3	XXX	XXX	2.0	XXX	4.0	2/week	24-Hr Composite

Parameter	Effluent Limitations					Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)			Minimum Measurement Frequency	Required Sample Type
	Monthly	Annual	Minimum	Monthly Average	Maximum		
Ammonia---N	Report	Report	XXX	Report	XXX	1/week	24-hr comp
Kjeldahl---N	Report	XXX	XXX	Report	XXX	1/week	24-hr comp
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	1/week	24-hr comp
Total Nitrogen	Report	Report	XXX	Report	XXX	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	2/week	24-hr comp
Net Total Nitrogen	Report	20091	XXX	XXX	XXX	1/month	Calculation
Net Total Phosphorus	Report	2,679	XXX	XXX	XXX	1/month	Calculation

Development of Effluent Limitations and Monitoring Requirements

Outfall No. 001
Latitude 40° 9' 16.00"
Wastewater Description: Sewage Effluent

Design Flow (MGD) 1.1
Longitude -76° 59' 6.00"

Technology-Based Limitations

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

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

Water Quality-Based Limitations

CBOD₅, NH₃-N and Dissolved Oxygen (DO)

WQM 7.0 version 1.0b is a water quality model designed to assist DEP to determine appropriate permit requirements for CBOD₅, NH₃-N and DO. DEP's technical guidance no. 391-2000-007 describes the technical methods contained in the model for conducting wasteload allocation analyses and for determining recommended limits for point source discharges. DEP recently updated this model (ver. 1.1) to include new ammonia criteria that has been approved by US EPA as part of the 2017 Triennial Review. As shown on the table below, there is a number of point source discharges located on the Yellow Breeches Creek. A multiple discharge analysis was therefore conducted to evaluate the cumulative impact of these discharges:

Facility Name	NPDES Permit no.	RMI	Discharge Flow, MGD
Huntsdale Fish Hatchery	PA0037141	40.75	12.34
SMTMA WWTP	PA0044113	26.9	1.5
Williams Grove MHP	PA0081795	21.65	0.03
Upper Allen WWTP	PA0024902	19.14	1.1

For the multiple discharge analysis, the information currently available to DEP was used. Discharge pH and temperature values reported on the application will be used in the model. The Water Quality Network station no. 212 is situated at the mouth of Yellow Breeches Creek approximately 20 miles downstream of the outfall. This station routinely collects chemical/biological data of the stream. As recommended by DEP's technical guidance no. 391-2000-006, median pH (8.0 SU) and temperature (20.5 °C) values obtained from this WQN station will be used in modeling. All other discharges such as small flow sewage and water treatment plant wastewater were purposely excluded from the analysis considering the volume and nature of discharge. These stream reaches were properly chosen as the model accommodates the DO sag curve low point and beginning of recovery. The model output indicates that new WQBELs for ammonia are needed for Upper Allen WWTP. This is presumably as a result of newly updated version that includes new ammonia criteria. A review of past DMR data shows that the facility will have no issue meeting these WQBELs. Therefore, these limits will be imposed in the permit in accordance with 40 CFR § 122.44(d)(1)(i).

Total Residual Chlorine

Since chlorine is used for disinfection, Total Residual Chlorine (TRC) effluent levels must be regulated. The existing permit contains the BAT TBEL of 0.5 mg/L derived from 25 Pa Code §92a.48(b)(2). DEP's TRC_CALC worksheet is utilized to determine if this existing limit is still appropriate. The worksheet indicated that existing limits of 0.5 mg/L (average monthly) and 1.6 mg/L (IMAX) are still protective of water quality. Therefore, no change is recommended.

Toxics

Effluent sample results for toxic pollutants reported on the renewal application were entered into DEP's Toxics Management Spreadsheet (TMD) to develop appropriate permit requirements for toxic pollutants of concern. TMS output shows there are no toxic pollutants of concern.

Best Professional Judgment (BPJ) Limitations

Total Phosphorus

For Total Phosphorus (TP), the current NPDES permit requires the permittee to comply with average monthly and instantaneous maximum (IMAX) limits of 2.0 mg/L and 4.0 mg/L, respectively. Historically a TP effluent limit of 2.0 mg/L was established in the permit when DEP generally determines that the facility is expected to contribute 0.25% or more of the total point source phosphorus loading at the point of impact (page 17 of DEP's technical guidance no. 391-2000-018). DEP previously documented that the discharge contributes more than 0.25% and phosphorus controls were therefore needed. These existing limits will still therefore remain unchanged in the permit to protect the local watershed.

Dissolved Oxygen

A minimum of 5.0 mg/L for DO is an existing effluent limit derived directly from state water quality criteria found in 25 Pa Code §93.7(a). This effluent limit will remain unchanged in the permit to ensure that the facility continues to achieve compliance with water quality standards. This approach is recommended by DEP's SOP no. BPNPSM-PMT-033 and therefore has been applied to other sewage facilities throughout the state.

Additional Considerations

Flow Monitoring

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

Influent BOD & TSS Monitoring

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

E. Coli Monitoring Requirement

DEP's SOP no. BCW-PMT-033 recommends a routine monitoring for E. Coli in all new and reissued sewage permits. As a result, a monthly monitoring requirement for E. Coli will be included in the permit given the facility's design flow is greater than 1.0 MGD.

Total Dissolved Solids (TDS)

TDS and its associated solids including Bromide, Chloride, and Sulfate have become statewide pollutants of concern. The requirement to monitor these pollutants must be considered under the criteria specified in 25 Pa. Code § 95.10 and the following January 23, 2014 DEP Central Office Directive:

For point source discharges and upon issuance or reissuance of an individual NPDES permit:

-Where the concentration of TDS in the discharge exceeds 1,000 mg/L, or the net TDS load from a discharge exceeds 20,000 lbs/day, and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for TDS, sulfate, chloride, and bromide. Discharges of 0.1 MGD or less should monitor and report for TDS, sulfate, chloride, and bromide if the concentration of TDS in the discharge exceeds 5,000 mg/L.

- Where the concentration of bromide in a discharge exceeds 1 mg/L and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for bromide. Discharges of 0.1 MGD or less should monitor and report for bromide if the concentration of bromide in the discharge exceeds 10 mg/L.

-Where the concentration of 1,4-dioxane (CAS 123-91-1) in a discharge exceeds 10 µg/L and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for 1,4-dioxane. Discharges of 0.1 MGD or less should monitor and report for 1,4-dioxane if the concentration of 1,4-dioxane in the discharge exceeds 100 µg/L.

UAT reported the maximum effluent TDS concentration of 682 mg/L, Bromide of 1.3 mg/L and 1,4-dioxane of <3.0 µg/L. Based on this, a routine monitoring of bromide is recommended.

Chesapeake Bay TMDL

In August 2019, DEP finalized Phase 3 Chesapeake Bay Watershed Implementation Plan to provide the plans in place by 2025 to further achieve the nutrient and sediment reduction targets that would ultimately meet U.S EPA's expectations for the Chesapeake Bay TMDL. The Chesapeake Bay TMDL identifies the necessary pollution reductions from major sources of nitrogen, phosphorus and sediment across the Bay jurisdictions and sets pollution limits necessary to meet water quality standards. The Phase 3 WIP is an update to the Pennsylvania's Chesapeake Bay TMDL Strategy (2004), the Chesapeake WIP Phase I (2011) and Phase 2 WIP (2012). The more details on the TMDL are available at www.dep.pa.gov.

A Supplement to the Phase 3 WIP which was last updated on December 17, 2019 provides an update on Chesapeake Bay TMDL implementation activities for point sources and DEP's current implementation strategy for wastewater. According to this document, Upper Allen Township is a phase 3 significant discharger located within the Chesapeake Bay watershed. The following Cap Loads (annual net nutrient mass effluent limitations) specified in the current Supplement to the Phase 3 WIP will be included in the draft permit:

NPDES Permit No.	Phase	Facility	Latest Permit Issuance Date	Permit Expiration Date	Cap Load Compliance Start Date	TN Cap Load (lbs/yr)	TN Offsets Included in Cap Load (lbs/yr)	TP Cap Load (lbs/yr)	TN Delivery Ratio	TP Delivery Ratio
PA0024902	3	Upper Allen Township	8/6/2020	10/31/2022	10/1/2012	20,091	-	2,679	0.682	0.410

These cap loads were calculated based on the design flow of 1.10 MGD with TN concentration of 6.0 mg/L and TP concentration of 0.8 mg/L. A list of 116 retired on-lot systems connected to the collection system was submitted and accepted by DEP which resulted approved offsets of 2,900 lbs/yr (116*25 lbs TN/year/offset). Additional language will be provided in the draft permit indicating the offsets may be applied throughout the compliance year or during the truing period.

Stormwater Requirements

Stormwater discharges from any POTWs (SIC Code 4952) described in 40 CFR § 122.26(b)(14)(ix) require coverage under an NPDES permit. There is currently one (1) stormwater outfall collecting stormwater drained from the property.

Outfall no.	Coordinates	Drainage Area (ft ²)	Receiving Water
S01	Lat: 40°09'18" Long: -76°59'7.4"	11,569	Yellow Breeches Creek

In general, DEP's standard Part C stormwater requirements and site-specific best management practices (BMPs) are included in the permit for those POTWs. The following standard BMPs for POTWs will be included in Part C of the draft permit:

1. Manage sludge in accordance with all applicable permit requirements.
2. Store chemicals in secure areas on impervious surfaces away from storm drains.
3. For new facilities and upgrades, design wastewater treatment facilities to avoid, to the maximum extent practicable, stormwater commingling with sanitary wastewater, sewage sludge, and biosolids.
4. Efficiently use pesticides for weed control; where practicable, use the least toxic herbicide that will achieve pest management objectives. Do not apply during windy conditions.
5. Do not wash parts or equipment over impervious surfaces that wash into storm drains.

6. Implement infiltration techniques, including infiltration basins, trenches, dry wells, porous pavement, etc., wherever practicable.

Monitoring Frequency and Sample Type

Unless otherwise specified throughout this fact sheet, monitoring frequencies and sample types are derived from the "NPDES Permit Writer's Manual" (362-0400-001) and/or BPJ.

Mass Loading Limitations

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

Antidegradation Requirements

All effluent limitations and monitoring requirements have been developed to ensure that existing instream water uses and the level of water quality necessary to protect the existing uses are maintained and protected.

Class A Wild Trout Fishery

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

Whole Effluent Toxicity (WET)

For Outfall 001, ☐ **Acute** ☒ **Chronic** WET Testing was completed:

- ☒ For the permit renewal application (4 tests).
☐ Quarterly throughout the permit term.
☐ Quarterly throughout the permit term and a TIE/TRE was conducted.
☐ Other:

The dilution series used for the tests was: 100%, 60%, 30%, 3%, and 1%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 3%.

Summary of Four Most Recent Test Results

(NOTE – Enter results into one table, depending on which data analysis method was used).

TST Data Analysis

(NOTE – In lieu of recording information below, the application manager may attach the DEP WET Analysis Spreadsheet).

Test Date	Ceriodaphnia Results (Pass/Fail)		Pimephales Results (Pass/Fail)	
	Survival	Reproduction	Survival	Growth
July 2018	Pass	Pass	Pass	Pass
July 2019	Pass	Pass	Pass	Pass
August 2020	Pass	Pass	Pass	Pass
June 2021	Pass	Pass	Pass	Pass

* A “passing” result is that in which the replicate data for the TIWC is not statistically significant from the control condition. This is exhibited when the calculated *t* value (“T-Test Result”) is greater than the critical *t* value. A “failing” result is exhibited when the calculated *t* value (“T-Test Result”) is less than the critical *t* value.

Is there reasonable potential for an excursion above water quality standards based on the results of these tests? (NOTE – In general, reasonable potential is determined anytime there is at least one test failure in the previous four tests).

☐ YES ☒ NO

Comments: DEP's Whole Effluent Toxicity Analysis Spreadsheet

Evaluation of Test Type, IWC and Dilution Series for Renewed Permit

Acute Partial Mix Factor (PMFa): **0.426**

Chronic Partial Mix Factor (PMFc): **1**

1. Determine IWC – Acute (IWCa):

$$(Q_d \times 1.547) / ((Q_{7-10} \times \text{PMFa}) + (Q_d \times 1.547))$$

$$[(1.1 \text{ MGD} \times 1.547) / ((51.516 \text{ cfs} \times 0.426) + (1.1 \text{ MGD} \times 1.547))] \times 100 = \mathbf{7.16\%}$$

Is IWCa < 1%? ☐ YES ☒ NO **(YES - Acute Tests Required OR NO - Chronic Tests Required)**

Type of Test for Permit Renewal: Chronic

2b. Determine Target IWCC (If Chronic Tests Required)

$$(Q_d \times 1.547) / (Q_{7-10} \times \text{PMFc}) + (Q_d \times 1.547)$$

$$[(1.1 \text{ MGD} \times 1.547) / ((51.516 \text{ cfs} \times 1) + (1.1 \text{ MGD} \times 1.547))] \times 100 = \mathbf{3\%}$$

3. Determine Dilution Series

(NOTE – check Attachment C of WET SOP for dilution series based on TIWCa or TIWCc, whichever applies).

Dilution Series = 100%, 60%, 30%, 3%, and 1%.

WET Limits

Has reasonable potential been determined? ☐ YES ☒ NO

Will WET limits be established in the permit? ☐ YES ☒ NO

If WET limits will be established, identify the species and the limit values for the permit (TU).

N/A

If WET limits will not be established, but reasonable potential was determined, indicate the rationale for not establishing WET limits:

N/A

Proposed Effluent Limitations and Monitoring Requirements

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

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) ⁽¹⁾		Concentrations (mg/L)				Minimum ⁽²⁾ Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Daily Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	9.0	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
CBOD5 May 1 - Oct 31	183	275 Wkly Avg	XXX	20.0	30.0 Wkly Avg	40	2/week	24-Hr Composite
CBOD5 Nov 1 - Apr 30	229	367 Wkly Avg	XXX	25.0	40.0 Wkly Avg	50	2/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Total Suspended Solids	275	413 Wkly Avg	XXX	30.0	45.0 Wkly Avg	60	2/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	2/week	24-Hr Composite
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/week	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/week	Grab
Ammonia-Nitrogen May – Sep 30	201	XXX	XXX	22	XXX	XXX	2/week	24-Hr Composite
Ammonia-Nitrogen Oct 1 - Apr 30	Report	XXX	XXX	XXX	XXX	XXX	2/week	24-Hr Composite
Total Phosphorus	18.3	XXX	XXX	2.0	XXX	4.0	2/week	24-Hr Composite
Bromide	Report	XXX	XXX	Report	XXX	XXX	2/month	24-Hr Composite

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, to comply with Pennsylvania's Chesapeake Bay Tributary Strategy.

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

Parameter	Effluent Limitations					Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)			Minimum Measurement Frequency	Required Sample Type
	Monthly	Annual	Minimum	Monthly Average	Maximum		
Ammonia---N	Report	Report	XXX	Report	XXX	2/week	24-Hr Composite
Kjeldahl---N	Report	XXX	XXX	Report	XXX	2/week	24-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	2/week	24-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	2/week	24-Hr Composite
Net Total Nitrogen	XXX	20091	XXX	XXX	XXX	1/month	Calculation
Net Total Phosphorus	XXX	2679	XXX	XXX	XXX	1/month	Calculation

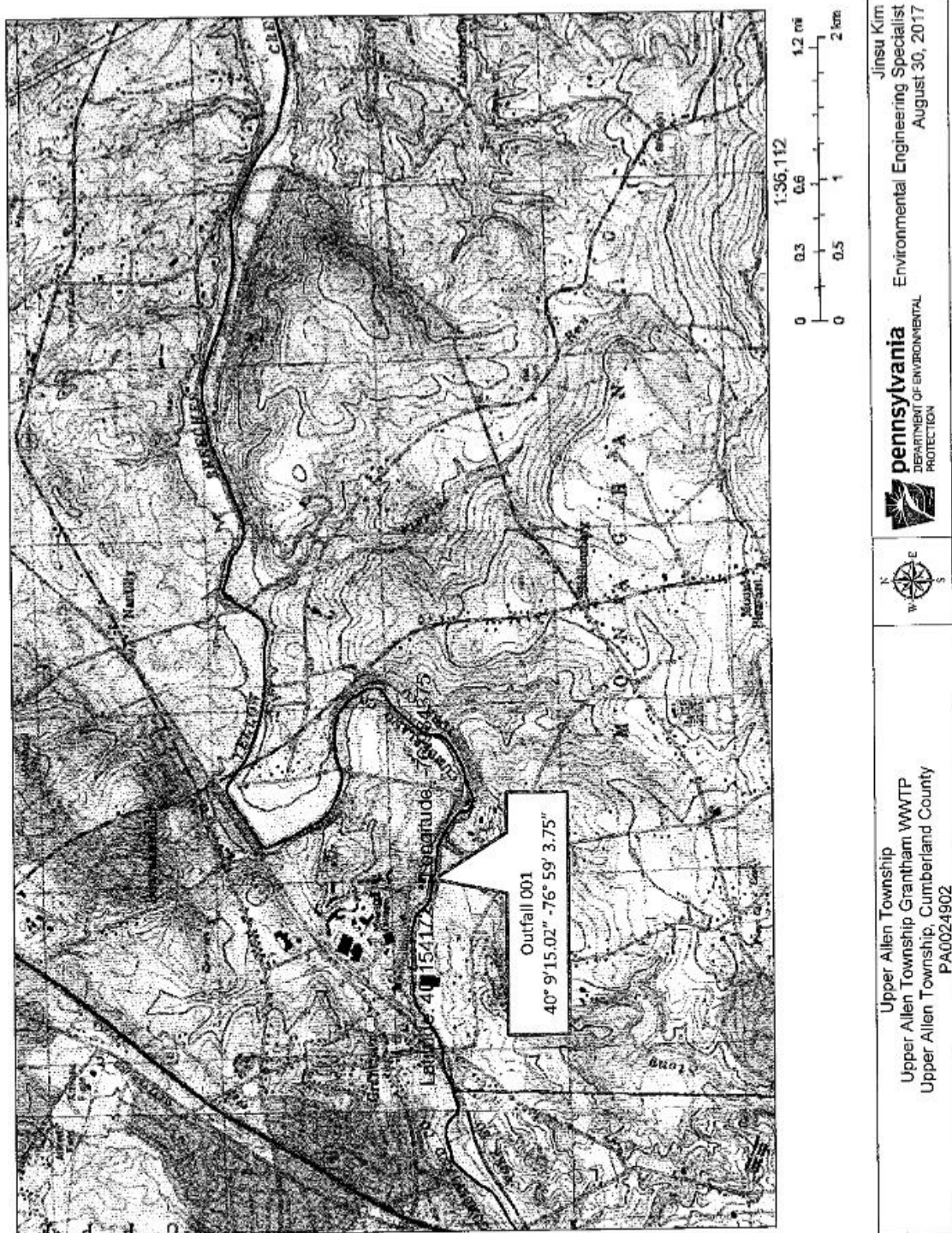
The permittee is authorized to use 2900 lbs/year as Total Nitrogen (TN) Offsets toward compliance with the Annual Net TN mass load limitations (Cap Loads), in accordance with Part C of this permit. These Offsets may be applied throughout the Compliance Year or during the Truing Period. The application of offsets must be reported to DEP as described in Part C. The Offsets are authorized for the following pollutant load reduction activities:

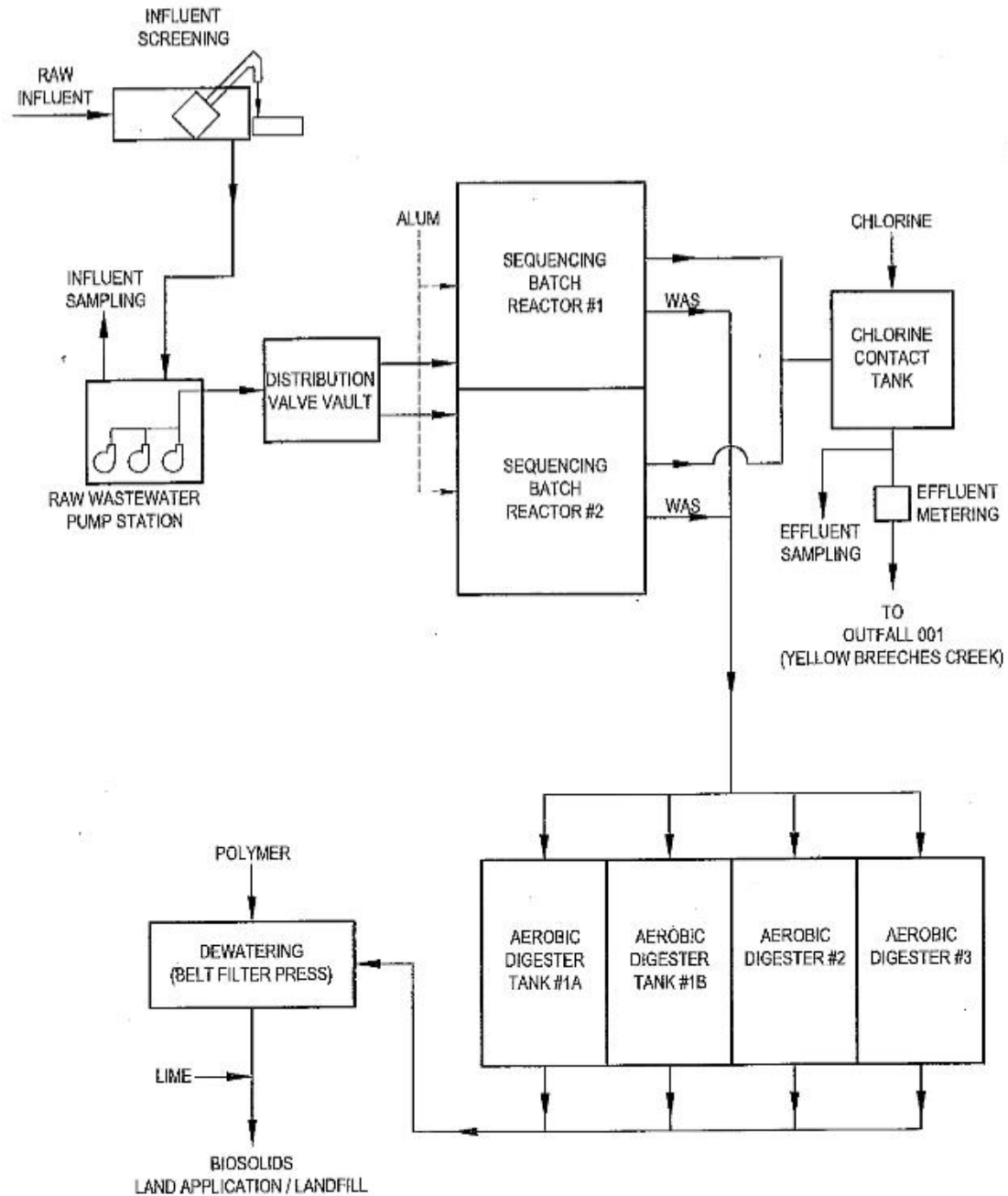
- Connection of 116 on-lot sewage disposal systems to the public sewer system after January 1, 2003, in which 25 lbs/year of TN offsets are granted per connection.

Tools and References Used to Develop Permit	
<input type="checkbox"/>	WQM for Windows Model (see Attachment)
<input type="checkbox"/>	Toxics Management Spreadsheet (see Attachment)
<input type="checkbox"/>	TRC Model Spreadsheet (see Attachment)
<input type="checkbox"/>	Temperature Model Spreadsheet (see Attachment)
<input type="checkbox"/>	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
<input type="checkbox"/>	Technical Guidance for the Development and Specification of Effluent Limitations, 386-0400-001, 10/97.
<input type="checkbox"/>	Policy for Permitting Surface Water Diversions, 386-2000-019, 3/98.
<input type="checkbox"/>	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 386-2000-018, 11/96.
<input type="checkbox"/>	Technology-Based Control Requirements for Water Treatment Plant Wastes, 386-2183-001, 10/97.
<input type="checkbox"/>	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 386-2183-002, 12/97.
<input type="checkbox"/>	Pennsylvania CSO Policy, 386-2000-002, 9/08.
<input type="checkbox"/>	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
<input type="checkbox"/>	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 386-2000-008, 4/97.
<input type="checkbox"/>	Determining Water Quality-Based Effluent Limits, 386-2000-004, 12/97.
<input type="checkbox"/>	Implementation Guidance Design Conditions, 386-2000-007, 9/97.
<input type="checkbox"/>	Technical Reference Guide (TRG) WQM 7.0 for Windows, Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen, Version 1.0, 386-2000-016, 6/2004.
<input type="checkbox"/>	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 386-2000-012, 10/1997.
<input type="checkbox"/>	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 386-2000-009, 3/99.
<input type="checkbox"/>	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 386-2000-015, 5/2004.
<input type="checkbox"/>	Implementation Guidance for Section 93.7 Ammonia Criteria, 386-2000-022, 11/97.
<input type="checkbox"/>	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 386-2000-013, 4/2008.
<input type="checkbox"/>	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 386-2000-011, 11/1994.
<input type="checkbox"/>	Implementation Guidance for Temperature Criteria, 386-2000-001, 4/09.
<input type="checkbox"/>	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 386-2000-021, 10/97.
<input type="checkbox"/>	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 386-2000-020, 10/97.
<input type="checkbox"/>	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 386-2000-005, 3/99.
<input type="checkbox"/>	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 386-2000-010, 3/1999.
<input type="checkbox"/>	Design Stream Flows, 386-2000-003, 9/98.
<input type="checkbox"/>	Field Data Collection and Evaluation Protocol for Deriving Daily and Hourly Discharge Coefficients of Variation (CV) and Other Discharge Characteristics, 386-2000-006, 10/98.
<input type="checkbox"/>	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 386-3200-001, 6/97.
<input type="checkbox"/>	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
<input type="checkbox"/>	SOP:
<input type="checkbox"/>	Other:

Attachments

Maps/StreamStats





UPPER ALLEN TOWNSHIP
NPDES PERMIT RENEWAL
GRANTHAM WWTP
PROCESS SCHEMATIC

Job Number: 111-08323
Revision: A
Date: APRIL 2016
Figure 01

3240 North Monrovia Road, Norristown PA 19380 USA T 1-215-641-0600 F 1-215-641-0601 C hannah@ghd.com W www.ghd.com

Printed: 12 April 2016 - 11:00 AM

Customer: 1001411001/2015/0002/Permit Renewal/GRANTHAM WWTP/Process Schematic

StreamStats Flow Statistics Report

Page 1 of 2

StreamStats Version 3.0

Flow Statistics Ungaged Site Report

Date: Wed Apr 20, 2016 1:25:57 PM GMT-4
Study Area: Pennsylvania
NAD 1983 Latitude: 40.1052 (40 06 19)
NAD 1983 Longitude: -77.2975 (-77 17 51)
Drainage Area: 40.5 mi²
2001 NLCD Impervious: 1.0 percent

1st Node
Huntsdale
Fish Hatchery

Low Flow Basin Characteristics			
100% Low Flow Region 2 (40.5 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	40.5	4.93	1280
Mean Annual Precipitation (inches)	40.0	35	50.4
Stream Density (miles per square mile)	1.08	0.51	3.1
Depth to Rock (feet)	5.4	3.32	5.65
Percent Carbonate (percent)	32.0	0	99

Mean/Base-flow Basin Characteristics			
100% Statewide Mean and Base Flow (40.5 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	40.5	2.26	1720
Mean Basin Elevation (feet)	1030.0	130	2700
Mean Annual Precipitation (inches)	40.0	33.1	50.4
Percent Carbonate (percent)	32.0	0	99
Percent Forest (percent)	62.0	5.1	100
Percent Urban (percent)	1.0	0	89

Peak Flow Basin Characteristics			
100% Peak Flow Region 3 (40.5 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	40.5	1.44	1610
Mean Basin Elevation (feet)	1030.0	457	2150
Percent Carbonate (percent)	32.0	0	99
Percent Urban (percent)	1.0	0	64
Percent Storage (percent)	1.0	0	22.6

Low Flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
M7D2Y	14.3	ft ³ /s	38			

http://streamstatsags.cr.usgs.gov/v3_beta/FTreport.htm?rcode=PA&workspaceID=PA2016... 4/20/2016

StreamStats Flow Statistics Report

Page 2 of 2

M30D2Y	16.2	ft ³ /s	33			
M7D10Y	10.3	ft ³ /s	51			
M30D10Y	11.3	ft ³ /s	46			
M90D10Y	13.6	ft ³ /s	36			

<http://pubs.usgs.gov/sir/2006/5130/> (<http://pubs.usgs.gov/sir/2006/5130/>)
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.

Mean/Base-flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
QA	54.3	ft ³ /s	12			
QAH	70.1	ft ³ /s	38			
BF10YR	24.7	ft ³ /s	21			
BF25YR	21.7	ft ³ /s	21			
BF50YR	20	ft ³ /s	23			

<http://pubs.usgs.gov/sir/2006/5130/> (<http://pubs.usgs.gov/sir/2006/5130/>)
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.

Peak Flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
PK2	926	ft ³ /s	31	3		
PK5	1590	ft ³ /s	28	5		
PK10	2120	ft ³ /s	28	7		
PK50	3520	ft ³ /s	31	11		
PK100	4200	ft ³ /s	36	11		
PK500	6100	ft ³ /s	43	11		

<http://pubs.usgs.gov/sir/2008/5102/> (<http://pubs.usgs.gov/sir/2008/5102/>)
Roland, M.A., and Stuckey, M.H., 2008. Regression equations for estimating flood flows at selected recurrence intervals for ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2008-5102, 57p.

Accessibility FOIA Privacy Policies and Notices
U.S. Department of the Interior | U.S. Geological Survey
URL: http://streamstats.cr.usgs.gov/v3_beta/FReport.htm
Page Contact Information: StreamStats Help
Page Last Modified: 11/24/2015 15:32:58 (Web1)

StreamStats Status News



StreamStats Flow Statistics Report

Page 1 of 2

StreamStats Version 3.0

Flow Statistics Ungaged Site Report

Date: Wed Apr 20, 2016 1:28:18 PM GMT-4
Study Area: Pennsylvania
NAD 1983 Latitude: 40.145 (-40 08 42)
NAD 1983 Longitude: -77.1775 (-77 10 39)
Drainage Area: 111 mi²
2001 NLCD Impervious: 1.0 percent

2nd Node
① Confluence
with Mountain Creek

Low Flow Basin Characteristics			
100% Low Flow Region 2 (111 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	111	4.93	1280
Mean Annual Precipitation (inches)	41.0	35	50.4
Stream Density (miles per square mile)	1.13	0.51	3.1
Depth to Rock (feet)	5.3	3.32	5.65
Percent Carbonate (percent)	30.0	0	99

Mean/Base-flow Basin Characteristics			
100% Statewide Mean and Base Flow (111 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	111	2.26	1720
Mean Basin Elevation (feet)	1010.3	130	2700
Mean Annual Precipitation (inches)	41.0	33.1	50.4
Percent Carbonate (percent)	30.0	0	99
Percent Forest (percent)	69.0	5.1	100
Percent Urban (percent)	1.0	0	89

Peak Flow Basin Characteristics			
100% Peak Flow Region 3 (111 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	111	1.44	1610
Mean Basin Elevation (feet)	1010.3	457	2150
Percent Carbonate (percent)	30.0	0	99
Percent Urban (percent)	1.0	0	64
Percent Storage (percent)	2.0	0	22.6

Low Flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
M7D2Y	43.3	ft ³ /s	38			

http://streamstatsags.cr.usgs.gov/v3_beta/FtReport.htm?rcode=PA&workspaceID=PA2016... 4/20/2016

StreamStats Flow Statistics Report

Page 2 of 2

M30D2Y	48.6	ft ³ /s	33			
M7D10Y	32	ft ³ /s	51			
M30D10Y	35	ft ³ /s	46			
M90D10Y	41.2	ft ³ /s	36			

<http://pubs.usgs.gov/sir/2006/5130/> (<http://pubs.usgs.gov/sir/2006/5130/>)

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.

Mean/Base-flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
QA	159	ft ³ /s	12			
QAH	65.4	ft ³ /s	38			
BF10YR	75.1	ft ³ /s	21			
BF25YR	66.5	ft ³ /s	21			
BF50YR	61.6	ft ³ /s	23			

<http://pubs.usgs.gov/sir/2006/5130/> (<http://pubs.usgs.gov/sir/2006/5130/>)

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.

Peak Flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
PK2	2070	ft ³ /s	31	3		
PK5	3390	ft ³ /s	28	5		
PK10	4440	ft ³ /s	28	7		
PK50	7070	ft ³ /s	31	11		
PK100	8340	ft ³ /s	36	11		
PK500	11800	ft ³ /s	43	11		

<http://pubs.usgs.gov/sir/2008/5102/> (<http://pubs.usgs.gov/sir/2008/5102/>)

Roland, M.A., and Stuckey, M.H., 2008, Regression equations for estimating flood flows at selected recurrence intervals for ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2008-5102, 57p.

Accessibility FOIA Privacy Policies and Notices
U.S. Department of the Interior | U.S. Geological Survey
URL: http://streamstats.cr.usgs.gov/v3_beta/FTreport.htm
Page Contact Information: StreamStats Help
Page Last Modified: 11/24/2015 15:32:58 (Web)

StreamStats Status News



StreamStats Flow Statistics Report

Page 1 of 2

StreamStats Version 3.0

Flow Statistics Ungaged Site Report

(a) Math of
Mountain Creek

Date: Wed Apr 20, 2016 1:35:32 PM GMT-4
Study Area: Pennsylvania
NAD 1983 Latitude: 40.1447 (40 08 41)
NAD 1983 Longitude: -77.1775 (-77 10 39)
Drainage Area: 47.7 mi²
2001 NLCD Impervious: 1.0 percent

Low Flow Basin Characteristics			
100% Low Flow Region 2 (47.7 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	47.7	4.93	1280
Mean Annual Precipitation (inches)	41.0	35	50.4
Stream Density (miles per square mile)	1.19	0.51	3.1
Depth to Rock (feet)	5.1	3.32	5.65
Percent Carbonate (percent)	16.0	0	99

Mean/Base-flow Basin Characteristics			
100% Statewide Mean and Base Flow (47.7 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	47.7	2.26	1720
Mean Basin Elevation (feet)	1100.1	130	2700
Mean Annual Precipitation (inches)	41.0	33.1	50.4
Percent Carbonate (percent)	16.0	0	99
Percent Forest (percent)	84.0	5.1	100
Percent Urban (percent)	2.0	0	89

Peak Flow Basin Characteristics			
100% Peak Flow Region 3 (47.7 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	47.7	1.44	1610
Mean Basin Elevation (feet)	1100.1	457	2150
Percent Carbonate (percent)	16.0	0	99
Percent Urban (percent)	2.0	0	64
Percent Storage (percent)	2.0	0	22.6

Low Flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
M7D2Y	12.9	ft ³ /s	38			

http://streamstatsags.cr.usgs.gov/v3_beta/FTRreport.htm?rcode=PA&workspaceID=PA2016... 4/20/2016

StreamStats Flow Statistics Report

Page 2 of 2

M30D2Y	15.4	ft3/s	33			
M7D10Y	8.26	ft3/s	51			
M30D10Y	9.64	ft3/s	46			
M90D10Y	12.6	ft3/s	36			

<http://pubs.usgs.gov/sir/2006/5130/> (<http://pubs.usgs.gov/sir/2006/5130/>)
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.

Mean/Base-flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
QA	71.4	ft3/s	12			
QAH	22.5	ft3/s	38			
BF10YR	32.8	ft3/s	21			
BF25YR	29.2	ft3/s	21			
BF50YR	27.2	ft3/s	23			

<http://pubs.usgs.gov/sir/2006/5130/> (<http://pubs.usgs.gov/sir/2006/5130/>)
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.

Peak Flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
PK2	1240	ft3/s	31	3		
PK5	2030	ft3/s	28	5		
PK10	2650	ft3/s	28	7		
PK50	4170	ft3/s	31	11		
PK100	4900	ft3/s	36	11		
PK500	6860	ft3/s	43	11		

<http://pubs.usgs.gov/sir/2008/5102/> (<http://pubs.usgs.gov/sir/2008/5102/>)
Roland, M.A., and Stuckey, M.H., 2008. Regression equations for estimating flood flows at selected recurrence intervals for ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2008-5102, 57p.

Accessibility FOIA Privacy Policies and Notices
U.S. Department of the Interior | U.S. Geological Survey
URL: http://streamstats.cr.usgs.gov/v3_beta/FTreport.htm
Page Contact Information: StreamStats Help
Page Last Modified: 11/24/2015 15:32:58 (Web1)

Streamstats Status News



http://streamstats.cr.usgs.gov/v3_beta/FTreport.htm?rcode=PA&workspaceID=PA2016... 4/20/2016

StreamStats Flow Statistics Report

Page 1 of 2

StreamStats Version 3.0

Flow Statistics Ungaged Site Report

3rd Node
SMTMA WWTP

Date: Wed Apr 20, 2016 1:41:24 PM GMT-4
Study Area: Pennsylvania
NAD 1983 Latitude: 40.1491 (40 08 57)
NAD 1983 Longitude: -77.0933 (-77 05 36)
Drainage Area: 135 mi²
2001 NLCD Impervious: 1.0 percent

Low Flow Basin Characteristics			
100% Low Flow Region 2 (135 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	135	4.93	1280
Mean Annual Precipitation (inches)	40.0	35	50.4
Stream Density (miles per square mile)	1.10	0.51	3.1
Depth to Rock (feet)	5.3	3.32	5.65
Percent Carbonate (percent)	34.0	0	99

Mean/Base-flow Basin Characteristics			
100% Statewide Mean and Base Flow (135 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	135	2.26	1720
Mean Basin Elevation (feet)	951.4	130	2700
Mean Annual Precipitation (inches)	40.0	33.1	50.4
Percent Carbonate (percent)	34.0	0	99
Percent Forest (percent)	66.0	5.1	100
Percent Urban (percent)	2.0	0	89

Peak Flow Basin Characteristics			
100% Peak Flow Region 3 (135 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	135	1.44	1610
Mean Basin Elevation (feet)	951.4	457	2150
Percent Carbonate (percent)	34.0	0	99
Percent Urban (percent)	2.0	0	64
Percent Storage (percent)	2.0	0	22.6

Low Flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
M7D2Y	52.4	ft ³ /s	38			

http://streamstatsags.cr.usgs.gov/v3_beta/FI/report.htm?rcode=PA&workspaceID=PA2016... 4/20/2016

StreamStats Flow Statistics Report

Page 2 of 2

M30D2Y	58.4	ft3/s	33			
M7D10Y	39.5	ft3/s	51			
M30D10Y	43	ft3/s	46			
M90D10Y	50.2	ft3/s	36			

<http://pubs.usgs.gov/sir/2006/5130/> (<http://pubs.usgs.gov/sir/2006/5130/>)

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.

Mean/Base-flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
QA	183	ft3/s	12			
QAH	77.8	ft3/s	38			
BF10YR	86.6	ft3/s	21			
BF25YR	76.5	ft3/s	21			
BF50YR	70.7	ft3/s	23			

<http://pubs.usgs.gov/sir/2006/5130/> (<http://pubs.usgs.gov/sir/2006/5130/>)

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.

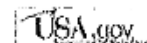
Peak Flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
PK2	2350	ft3/s	31	3		
PK5	3870	ft3/s	28	5		
PK10	5080	ft3/s	28	7		
PK50	8150	ft3/s	31	11		
PK100	9630	ft3/s	36	11		
PK500	13700	ft3/s	43	11		

<http://pubs.usgs.gov/sir/2008/5102/> (<http://pubs.usgs.gov/sir/2008/5102/>)

Roland, M.A., and Stuckey, M.H., 2008. Regression equations for estimating flood flows at selected recurrence intervals for ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2008-5102, 57p.

Accessibility FOIA Privacy Policies and Notices
U.S. Department of the Interior | U.S. Geological Survey
URL: http://streamstatsags.cr.usgs.gov/v3_beta/FTreport.htm
Page Contact Information: StreamStats Help
Page Last Modified: 11/24/2015 15:32:58 (Web1)

StreamStats Status News



StreamStats Flow Statistics Report

Page 1 of 2

StreamStats Version 3.0

Flow Statistics Ungaged Site Report

4th Node

Williams Grove STP

Date: Wed Apr 20, 2016 1:44:45 PM GMT-4
Study Area: Pennsylvania
NAD 1983 Latitude: 40.1479 (40 08 52)
NAD 1983 Longitude: -77.0285 (-77 01 43)
Drainage Area: 155 mi²
2001 NLCD Impervious: 2.0 percent

Low Flow Basin Characteristics			
100% Low Flow Region 2 (155 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	155	4.93	1280
Mean Annual Precipitation (inches)	40.0	35	50.4
Stream Density (miles per square mile)	1.11	0.51	3.1
Depth to Rock (feet)	5.3	3.32	5.65
Percent Carbonate (percent)	36.0	0	99

Mean/Base-flow Basin Characteristics			
100% Statewide Mean and Base Flow (155 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	155	2.26	1720
Mean Basin Elevation (feet)	917.4	130	2700
Mean Annual Precipitation (inches)	40.0	33.1	50.4
Percent Carbonate (percent)	36.0	0	99
Percent Forest (percent)	63.0	5.1	100
Percent Urban (percent)	2.0	0	89

Peak Flow Basin Characteristics			
100% Peak Flow Region 3 (155 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	155	1.44	1610
Mean Basin Elevation (feet)	917.4	457	2150
Percent Carbonate (percent)	36.0	0	99
Percent Urban (percent)	2.0	0	64
Percent Storage (percent)	2.0	0	22.6

Low Flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
M7D2Y	61.8	ft ³ /s	38			

http://streamstatsags.cr.usgs.gov/v3_hcta/FTreport.htm?rcode=PA&workspaceID=PA2016... 4/20/2016

StreamStats Flow Statistics Report

Page 2 of 2

M30D2Y	68.5	ft ³ /s	33			
M7D10Y	47.2	ft ³ /s	51			
M30D10Y	51.1	ft ³ /s	46			
M90D10Y	59	ft ³ /s	36			

<http://pubs.usgs.gov/sir/2006/5130/> (<http://pubs.usgs.gov/sir/2006/5130/>)

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.

Mean/Base-flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
QA	208	ft ³ /s	12			
QAH	91.7	ft ³ /s	38			
BF10YR	98.4	ft ³ /s	21			
BF25YR	86.8	ft ³ /s	21			
BF50YR	80.1	ft ³ /s	23			

<http://pubs.usgs.gov/sir/2006/5130/> (<http://pubs.usgs.gov/sir/2006/5130/>)

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.

Peak Flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
PK2	2600	ft ³ /s	31	3		
PK5	4290	ft ³ /s	28	5		
PK10	5640	ft ³ /s	28	7		
PK50	9060	ft ³ /s	31	11		
PK100	10700	ft ³ /s	36	11		
PK500	15200	ft ³ /s	43	11		

<http://pubs.usgs.gov/sir/2008/5102/> (<http://pubs.usgs.gov/sir/2008/5102/>)

Roland, M.A., and Stuckey, M.H., 2008. Regression equations for estimating flood flows at selected recurrence intervals for ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2008-5102, 57p.

Accessibility FOIA Privacy Policies and Notices
U.S. Department of the Interior | U.S. Geological Survey
URL: http://streamstatsags.cr.usgs.gov/v3_beta/FTreport.htm
Page Contact Information: StreamStats Help
Page Last Modified: 11/24/2015 15:32:58 (Web1)

Streamstats Status News



StreamStats Flow Statistics Report

Page 1 of 2

~~StreamStats Version 3.0~~

Flow Statistics Ungaged Site Report

5th Node.

④ Upper Allen STP

Date: Wed Apr 20, 2016 1:48:11 PM GMT-4
Study Area: Pennsylvania
NAD 1983 Latitude: 40.1544 (40 09 16)
NAD 1983 Longitude: -76.9854 (-76 59 08)
Drainage Area: 162 mi²
2001 NLCD Impervious: 2.0 percent

Low Flow Basin Characteristics			
100% Low Flow Region 2 (162 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	162	4.93	1280
Mean Annual Precipitation (inches)	40.0	35	50.4
Stream Density (miles per square mile)	1.10	0.51	3.1
Depth to Rock (feet)	5.3	3.32	5.65
Percent Carbonate (percent)	37.0	0	99

Mean/Base-flow Basin Characteristics			
100% Statewide Mean and Base Flow (162 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	162	2.26	1720
Mean Basin Elevation (feet)	898.8	130	2700
Mean Annual Precipitation (inches)	40.0	33.1	50.4
Percent Carbonate (percent)	37.0	0	99
Percent Forest (percent)	61.0	5.1	100
Percent Urban (percent)	2.0	0	89

Peak Flow Basin Characteristics			
100% Peak Flow Region 3 (162 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	162	1.44	1610
Mean Basin Elevation (feet)	898.8	457	2150
Percent Carbonate (percent)	37.0	0	99
Percent Urban (percent)	2.0	0	64
Percent Storage (percent)	2.0	0	22.6

Low Flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
M7D2Y	66.1	ft ³ /s	38			

http://streamstatsags.er.usgs.gov/v3_beta/FTreport.htm?rcode=PA&workspaceID=PA2016... 4/20/2016

StreamStats Flow Statistics Report

Page 2 of 2

M30D2Y	73	ft ³ /s	33			
M7D10Y	50.7	ft ³ /s	51			
M30D10Y	54.8	ft ³ /s	46			
M90D10Y	63	ft ³ /s	36			

<http://pubs.usgs.gov/sir/2006/5130/> (<http://pubs.usgs.gov/sir/2006/5130/>)
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.

Mean/Base-flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
QA	216	ft ³ /s	12			
QAH	96.6	ft ³ /s	38			
BF10YR	102	ft ³ /s	21			
BF25YR	89.7	ft ³ /s	21			
BF50YR	82.8	ft ³ /s	23			

<http://pubs.usgs.gov/sir/2006/5130/> (<http://pubs.usgs.gov/sir/2006/5130/>)
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.

Peak Flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
PK2	2680	ft ³ /s	31	3		
PK5	4430	ft ³ /s	28	5		
PK10	5830	ft ³ /s	28	7		
PK50	9380	ft ³ /s	31	11		
PK100	11100	ft ³ /s	36	11		
PK500	15800	ft ³ /s	43	11		

<http://pubs.usgs.gov/sir/2008/5102/> (<http://pubs.usgs.gov/sir/2008/5102/>)
Roland, M.A., and Stuckey, M.H., 2008. Regression equations for estimating flood flows at selected recurrence intervals for ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2008-5102, 57p.

Accessibility FOIA Privacy Policies and Notices
U.S. Department of the Interior | U.S. Geological Survey
URL: http://streamstatsags.cr.usgs.gov/v3_beta/FTreport.htm
Page Contact Information: StreamStats Help
Page Last Modified: 11/24/2015 15:32:58 (Web1)

StreamStats Status News



StreamStats Flow Statistics Report

Page 1 of 2

StreamStats Version 3.0

Flow Statistics Ungaged Site Report

6th Node

Confluence with

Stony Run (63124)

Date: Wed Apr 20, 2016 1:50:58 PM GMT-4
Study Area: Pennsylvania
NAD 1983 Latitude: 40.1536 (40 09 13)
NAD 1983 Longitude: -76.9811 (-76 58 52)
Drainage Area: 175 mi²
2001 NLCD Impervious: 2.0 percent

Low Flow Basin Characteristics			
100% Low Flow Region 2 (175 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	175	4.93	1280
Mean Annual Precipitation (inches)	40.0	35	50.4
Stream Density (miles per square mile)	1.16	0.51	3.1
Depth to Rock (feet)	5.3	3.32	5.65
Percent Carbonate (percent)	34.0	0	99

Mean/Base-flow Basin Characteristics			
100% Statewide Mean and Base Flow (175 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	175	2.26	1720
Mean Basin Elevation (feet)	880.0	130	2700
Mean Annual Precipitation (inches)	40.0	33.1	50.4
Percent Carbonate (percent)	34.0	0	99
Percent Forest (percent)	60.0	5.1	100
Percent Urban (percent)	2.0	0	89

Peak Flow Basin Characteristics			
100% Peak Flow Region 3 (175 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	175	1.44	1610
Mean Basin Elevation (feet)	880.0	457	2150
Percent Carbonate (percent)	34.0	0	99
Percent Urban (percent)	2.0	0	64
Percent Storage (percent)	2.0	0	22.6

Low Flow Statistics					
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval
					Min Max
M7D2Y	66.4	ft ³ /s	38		

http://streamstatsags.cr.usgs.gov/v3_beta/FTRreport.html?rcode=PA&workspaceID=PA2016... 4/20/2016

StreamStats Flow Statistics Report

Page 2 of 2

M30D2Y	73.9	ft ³ /s	33			
M7D10Y	50.6	ft ³ /s	51			
M30D10Y	54.9	ft ³ /s	46			
M90D10Y	63.7	ft ³ /s	36			

<http://pubs.usgs.gov/sir/2006/5130/> (<http://pubs.usgs.gov/sir/2006/5130/>)

Sturkey, 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.

Mean/Base-flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
QA	232	ft ³ /s	12			
QAH	99.4	ft ³ /s	38			
BF10YR	107	ft ³ /s	21			
BF25YR	94	ft ³ /s	21			
BF50YR	86.7	ft ³ /s	23			

<http://pubs.usgs.gov/sir/2006/5130/> (<http://pubs.usgs.gov/sir/2006/5130/>)

Sturkey, 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.

Peak Flow Statistics						
Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
PK2	3010	ft ³ /s	31	3		
PK5	4950	ft ³ /s	28	5		
PK10	6500	ft ³ /s	28	7		
PK50	10400	ft ³ /s	31	11		
PK100	12300	ft ³ /s	36	11		
PK500	17500	ft ³ /s	43	11		

<http://pubs.usgs.gov/sir/2008/5102/> (<http://pubs.usgs.gov/sir/2008/5102/>)

Roland, M.A., and Stuckey, M.H., 2008. Regression equations for estimating flood flows at selected recurrence intervals for ungaged streams in Pennsylvania: U.S. Geological Survey Scientific Investigations Report 2008-5102, 57p.

Accessibility FOIA Privacy Policies and Notices
U.S. Department of the Interior | U.S. Geological Survey
URL: http://streamstats.cr.usgs.gov/v3_beta/FTreport.htm
Page Contact Information: StreamStats Help
Page Last Modified: 11/24/2015 15:32:58 (Web)

StreamStats Status News



WQM 7.0 ver. 1.1

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
07E	10121	YELLOW BREECHES CREEK	40.750	598.00	40.50	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	pH	Stream Temp	pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.318	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.50	8.00	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
PFBC 001	PA0037141	12.3400	12.3400	12.3400	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	5.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	1.00	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
07E	10121	YELLOW BREECHES CREEK	39.750	578.00	43.00	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	pH	Stream Temp	pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.313	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.50	7.78	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	0.00	7.00

Parameter Data

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

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
07E	10121	YELLOW BREECHES CREEK	32.630	501.00	111.00	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	pH	Stream Temp	pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.318	8.26	0.00	0.000	0.000	0.0	0.00	0.00	20.50	8.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	0.00	7.00

Parameter Data

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

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
07E	10121	YELLOW BREECHES CREEK	26.900	454.00	135.00	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	pH	Stream Temp	pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.318	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.50	8.00	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
South Middleton	PA0044113	1.5000	1.5000	1.5000	0.000	20.00	7.70

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	15.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	8.00	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
07E	10121	YELLOW BREECHES CREEK	21.650	415.00	155.00	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	pH	Stream Temp	pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.318	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.50	8.00	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
Williams Grove	PA0081795	0.0300	0.0300	0.0300	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	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

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
07E	10121	YELLOW BREECHES CREEK	19.140	410.00	162.00	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	pH	Stream Temp	pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.318	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.50	8.00	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
Upper Allen	PA0024902	1.1000	1.1000	1.1000	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	5.00	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
07E	10121	YELLOW BREECHES CREEK	18.940	398.00	175.00	0.00000	0.00	<input checked="" type="checkbox"/>

Stream Data

Design Cond.	LFY	Trib Flow	Stream Flow	Rch Trav Time	Rch Velocity	WD Ratio	Rch Width	Rch Depth	Tributary Temp	pH	Stream Temp	pH
	(cfsm)	(cfs)	(cfs)	(days)	(fps)		(ft)	(ft)	(°C)		(°C)	
Q7-10	0.318	0.00	0.00	0.000	0.000	0.0	0.00	0.00	20.50	8.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	0.00	7.00

Parameter Data

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

WQM 7.0 D.O. Simulation

SWP Basin	Stream Code	Stream Name			
07E	10121	YELLOW BREECHES CREEK			
RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)		Analysis pH	
40.750	12.340	20.201		7.196	
Reach Width (ft)	Reach Depth (ft)	Reach WDRatio		Reach Velocity (fps)	
61.778	0.825	74.914		0.628	
Reach CBOD5 (mg/L)	Reach Kc (1/days)	Reach NH3-N (mg/L)		Reach Kn (1/days)	
3.79	1.162	0.60		0.711	
Reach DO (mg/L)	Reach Kr (1/days)	Kr Equation		Reach DO Goal (mg/L)	
6.306	10.026	Tsivoglou		5	
Reach Travel Time (days)	Subreach Results				
0.097	TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)	
	0.010	3.75	0.59	6.49	
	0.019	3.71	0.59	6.66	
	0.029	3.66	0.58	6.81	
	0.039	3.62	0.58	6.95	
	0.049	3.58	0.58	7.07	
	0.058	3.54	0.57	7.19	
	0.068	3.50	0.57	7.29	
	0.078	3.46	0.56	7.39	
	0.088	3.42	0.56	7.48	
	0.097	3.38	0.56	7.56	
RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)		Analysis pH	
39.750	12.340	20.209		7.203	
Reach Width (ft)	Reach Depth (ft)	Reach WDRatio		Reach Velocity (fps)	
65.244	0.834	78.210		0.602	
Reach CBOD5 (mg/L)	Reach Kc (1/days)	Reach NH3-N (mg/L)		Reach Kn (1/days)	
3.35	0.706	0.54		0.711	
Reach DO (mg/L)	Reach Kr (1/days)	Kr Equation		Reach DO Goal (mg/L)	
7.575	5.778	Tsivoglou		5	
Reach Travel Time (days)	Subreach Results				
0.723	TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)	
	0.072	3.18	0.52	7.80	
	0.145	3.02	0.49	7.96	
	0.217	2.87	0.47	8.08	
	0.289	2.73	0.44	8.17	
	0.362	2.59	0.42	8.21	
	0.434	2.46	0.40	8.21	
	0.506	2.33	0.38	8.21	
	0.578	2.22	0.36	8.21	
	0.651	2.11	0.34	8.21	
	0.723	2.00	0.33	8.21	

WQM 7.0 D.O. Simulation

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>			
07E	10121	YELLOW BREECHES CREEK			
RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)		Analysis pH	
32.630	12.340	20.267		7.284	
Reach Width (ft)	Reach Depth (ft)	Reach WDRatio		Reach Velocity (fps)	
84.881	0.892	95.114		0.541	
Reach CBOD5 (mg/L)	Reach Kc (1/days)	Reach NH3-N (mg/L)		Reach Kn (1/days)	
2.00	0.000	0.26		0.715	
Reach DO (mg/L)	Reach Kr (1/days)	Kr Equation		Reach DO Goal (mg/L)	
8.217	3.948	Tsivoglou		5	
Reach Travel Time (days)	Subreach Results				
0.647	TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)	
	0.065	2.00	0.25	8.20	
	0.129	2.00	0.24	8.20	
	0.194	2.00	0.23	8.20	
	0.259	2.00	0.22	8.20	
	0.323	2.00	0.21	8.20	
	0.388	2.00	0.20	8.20	
	0.453	2.00	0.19	8.20	
	0.517	2.00	0.18	8.20	
	0.582	2.00	0.17	8.20	
	0.647	2.00	0.16	8.20	
RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)		Analysis pH	
26.900	13.840	20.290		7.354	
Reach Width (ft)	Reach Depth (ft)	Reach WDRatio		Reach Velocity (fps)	
95.467	0.919	103.884		0.581	
Reach CBOD5 (mg/L)	Reach Kc (1/days)	Reach NH3-N (mg/L)		Reach Kn (1/days)	
2.59	0.290	0.50		0.716	
Reach DO (mg/L)	Reach Kr (1/days)	Kr Equation		Reach DO Goal (mg/L)	
8.062	3.839	Tsivoglou		5	
Reach Travel Time (days)	Subreach Results				
0.552	TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)	
	0.055	2.55	0.48	8.13	
	0.110	2.51	0.46	8.18	
	0.166	2.47	0.44	8.20	
	0.221	2.43	0.42	8.20	
	0.276	2.39	0.41	8.20	
	0.331	2.35	0.39	8.20	
	0.387	2.31	0.38	8.20	
	0.442	2.28	0.36	8.20	
	0.497	2.24	0.35	8.20	
	0.552	2.20	0.33	8.20	

WQM 7.0 D.O. Simulation

SWP Basin	Stream Code	Stream Name			
07E	10121	YELLOW BREECHES CREEK			
RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)		Analysis pH	
21.650	13.870	20.313		7.392	
Reach Width (ft)	Reach Depth (ft)	Reach WDRatio		Reach Velocity (fps)	
109.127	0.974	112.055		0.540	
Reach CBOD5 (mg/L)	Reach Kc (1/days)	Reach NH3-N (mg/L)		Reach Kn (1/days)	
2.20	0.160	0.32		0.717	
Reach DO (mg/L)	Reach Kr (1/days)	Kr Equation		Reach DO Goal (mg/L)	
8.201	0.957	Tsivoglou		5	
Reach Travel Time (days)	Subreach Results				
0.284	TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)	
	0.028	2.19	0.31	8.18	
	0.057	2.18	0.30	8.16	
	0.085	2.17	0.30	8.15	
	0.114	2.16	0.29	8.13	
	0.142	2.15	0.29	8.11	
	0.170	2.14	0.28	8.10	
	0.199	2.13	0.27	8.09	
	0.227	2.12	0.27	8.08	
	0.256	2.11	0.26	8.06	
	0.284	2.10	0.26	8.05	

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)		Analysis pH	
19.140	14.970	20.311		7.387	
Reach Width (ft)	Reach Depth (ft)	Reach WDRatio		Reach Velocity (fps)	
84.889	0.981	88.526		0.736	
Reach CBOD5 (mg/L)	Reach Kc (1/days)	Reach NH3-N (mg/L)		Reach Kn (1/days)	
2.59	0.416	0.88		0.717	
Reach DO (mg/L)	Reach Kr (1/days)	Kr Equation		Reach DO Goal (mg/L)	
7.976	39.303	Tsivoglou		5	
Reach Travel Time (days)	Subreach Results				
0.017	TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)	
	0.002	2.59	0.88	8.04	
	0.003	2.59	0.88	8.10	
	0.005	2.59	0.88	8.16	
	0.007	2.59	0.87	8.20	
	0.008	2.58	0.87	8.20	
	0.010	2.58	0.87	8.20	
	0.012	2.58	0.87	8.20	
	0.013	2.58	0.87	8.20	
	0.015	2.58	0.87	8.20	
	0.017	2.58	0.87	8.20	

WQM 7.0 Hydrodynamic Outputs

<u>SWP Basin</u>		<u>Stream Code</u>		<u>Stream Name</u>								
07E		10121		YELLOW BREECHES CREEK								
RMI	Stream Flow	PWS With	Net Stream Flow	Disc Analysis Flow	Reach Slope	Depth	Width	W/D Ratio	Velocity	Reach Trav Time	Analysis Temp	Analysis pH
	(cfs)	(cfs)	(cfs)	(cfs)	(ft/ft)	(ft)	(ft)		(fps)	(days)	(°C)	
Q7-10 Flow												
40.750	12.88	0.00	12.88	19.09	0.00341	.825	81.78	74.91	0.63	0.097	20.20	7.20
39.750	13.66	0.00	13.66	19.09	0.00205	.834	85.24	78.21	0.60	0.723	20.21	7.20
32.630	21.92	0.00	21.92	19.09	0.00155	.892	84.88	95.11	0.54	0.647	20.27	7.28
26.900	29.55	0.00	29.55	21.4105	0.00141	.919	95.47	103.88	0.58	0.552	20.29	7.35
21.650	35.91	0.00	35.91	21.4569	0.00038	.974	109.13	112.06	0.54	0.284	20.31	7.39
19.140	38.14	0.00	38.14	23.1586	0.01136	.981	84.89	86.53	0.74	0.017	20.31	7.39
Q1-10 Flow												
40.750	12.11	0.00	12.11	19.09	0.00341	NA	NA	NA	0.62	0.099	20.19	7.19
39.750	12.84	0.00	12.84	19.09	0.00205	NA	NA	NA	0.59	0.733	20.20	7.19
32.630	20.61	0.00	20.61	19.09	0.00155	NA	NA	NA	0.53	0.659	20.26	7.27
26.900	27.78	0.00	27.78	21.4105	0.00141	NA	NA	NA	0.57	0.563	20.28	7.34
21.650	33.76	0.00	33.76	21.4569	0.00038	NA	NA	NA	0.53	0.290	20.31	7.38
19.140	35.85	0.00	35.85	23.1586	0.01136	NA	NA	NA	0.72	0.017	20.30	7.37
Q30-10 Flow												
40.750	13.91	0.00	13.91	19.09	0.00341	NA	NA	NA	0.64	0.096	20.21	7.21
39.750	14.75	0.00	14.75	19.09	0.00205	NA	NA	NA	0.61	0.710	20.22	7.22
32.630	23.68	0.00	23.68	19.09	0.00155	NA	NA	NA	0.55	0.632	20.28	7.30
26.900	31.92	0.00	31.92	21.4105	0.00141	NA	NA	NA	0.60	0.538	20.30	7.37
21.650	38.79	0.00	38.79	21.4569	0.00038	NA	NA	NA	0.55	0.276	20.32	7.41
19.140	41.19	0.00	41.19	23.1586	0.01136	NA	NA	NA	0.76	0.016	20.32	7.40

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	<input checked="" type="checkbox"/>
WLA Method	EMPR	Use Inputted W/D Ratio	<input type="checkbox"/>
Q1-10/Q7-10 Ratio	0.94	Use Inputted Reach Travel Times	<input type="checkbox"/>
Q30-10/Q7-10 Ratio	1.08	Temperature Adjust Kr	<input checked="" type="checkbox"/>
D.O. Saturation	90.00%	Use Balanced Technology	<input checked="" type="checkbox"/>
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

<u>SWP Basin</u>	<u>Stream Code</u>	<u>Stream Name</u>
07E	10121	YELLOW BREECHES 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
40.750	PFBC 001	13.7	2	13.7	2	0	0
39.750		NA	NA	13.58	NA	NA	NA
32.630		NA	NA	12.33	NA	NA	NA
26.900	South Middleton	4.04	16	11.27	16	0	0
21.650	Williams Grove	3.83	50	10.69	50	0	0
19.140	Upper Allen	4.98	50	10.78	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
40.750	PFBC 001	1.69	1	1.69	1	0	0
39.750		NA	NA	1.68	NA	NA	NA
32.630		NA	NA	1.59	NA	NA	NA
26.900	South Middleton	.79	8	1.52	8	0	0
21.650	Williams Grove	.76	25	1.47	25	0	0
19.140	Upper Allen	.91	22.92	1.48	22.92	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	<u>CBOD5</u>		<u>NH3-N</u>		<u>Dissolved Oxygen</u>		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
40.75	PFBC 001	5	5	1	1	5	5	0	0
39.75		NA	NA	NA	NA	NA	NA	NA	NA
32.63		NA	NA	NA	NA	NA	NA	NA	NA
26.90	South Middleton	15	15	8	8	5	5	0	0
21.65	Williams Grove	25	25	25	25	5	5	0	0
19.14	Upper Allen	20	20	22.92	22.92	5	5	0	0

WQM 7.0 Effluent Limits

<u>SWP Basin</u>		<u>Stream Code</u>		<u>Stream Name</u>			
07E		10121		YELLOW BREECHES 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)
40.750	PFBC 001	PA0037141	12.340	CBOD5	5		
				NH3-N	1	2	
				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)
26.900	South Middleton	PA0044113	1.500	CBOD5	15		
				NH3-N	8	16	
				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)
21.650	Williams Grove	PA0081795	0.030	CBOD5	25		
				NH3-N	25	50	
				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)
19.140	Upper Allen	PA0024902	1.100	CBOD5	20		
				NH3-N	22.92	45.84	
				Dissolved Oxygen			5

TRC_CALC

TRC_CALC

1A	B	C	D	E	F	G
2	TRC EVALUATION					
3	Input appropriate values in B4:B8 and E4:E7					
4	51.516	= Q stream (cfs)		0.5	= CV Daily	
5	1.1	= Q discharge (MGD)		0.5	= CV Hourly	
6	30	= no. samples		1	= AFC_Partial Mix Factor	
7	0.3	= Chlorine Demand of Stream		1	= CFC_Partial Mix Factor	
8	0	= Chlorine Demand of Discharge		15	= AFC_Criteria Compliance Time (min)	
9	0.5	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)	
	0	= % Factor of Safety (FOS)			=Decay Coefficient (K)	
10	Source	Reference	AFC Calculations	Reference	CFC Calculations	
11	TRC	1.3.2.iii	WLA afc = 9.676	1.3.2.iii	WLA cfc = 9.426	
12	PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581	
13	PENTOXSD TRG	5.1b	LTA_afc= 3.606	5.1d	LTA_cfc = 5.480	
14						
15	Source	Effluent Limit Calculations				
16	PENTOXSD TRG	5.1f	AML MULT = 1.231			
17	PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500	BAT/BPJ		
18			INST MAX LIMIT (mg/l) = 1.635			
	WLA afc	$(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))... \\ ...+ Xd + (AFC_Yc*Qs*Xd/Qd)]*(1-FOS/100)$				
	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	$(.011/e(-k*CFC_tc)) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))... \\ ...+ Xd + (CFC_Yc*Qs*Xd/Qd)]*(1-FOS/100)$				
	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)				

TMS

Toxics Management Spreadsheet
Version 1.4, May 2023

Discharge Information

Instructions Discharge Stream

Facility: Upper Allen STP NPDES Permit No.: PA0024902 Outfall No.: 001

Evaluation Type: Major Sewage / Industrial Waste Wastewater Description: Sewage

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
1.1	320	7						

Discharge Pollutant			Units	Max Discharge Conc	0 if left blank		0.5 if left blank		0 if left blank		1 if left blank		
					Trib Conc	Stream Conc	Daily CV	Hourly CV	Strea m CV	Fate Coeff	FOS	Criteri a Mod	Chem Trans
Group 1	Total Dissolved Solids (PWS)	mg/L		682									
	Chloride (PWS)	mg/L		234									
	Bromide	mg/L		1.3									
	Sulfate (PWS)	mg/L		74.5									
	Fluoride (PWS)	mg/L											
	Total Aluminum	µg/L		55									
	Total Antimony	µg/L		1.7									
	Total Arsenic	µg/L		0.6									
	Total Barium	µg/L		26									
	Total Beryllium	µg/L	<	0.5									
Group 2	Total Boron	µg/L		180									
	Total Cadmium	µg/L	<	0.2									
	Total Chromium (III)	µg/L		0.37									
	Hexavalent Chromium	µg/L		0.083									
	Total Cobalt	µg/L	<	0.83									
	Total Copper	µg/L		5.8									
	Free Cyanide	µg/L		11									
	Total Cyanide	µg/L		11									
	Dissolved Iron	µg/L	<	20									
	Total Iron	µg/L		20									
	Total Lead	µg/L	<	1									
	Total Manganese	µg/L		14									
	Total Mercury	µg/L		0.0146									
	Total Nickel	µg/L		1.8									
	Total Phenols (Phenolics) (PWS)	µg/L		13									
	Total Selenium	µg/L	<	2									
	Total Silver	µg/L	<	0.33									
	Total Thallium	µg/L		0.5									
	Total Zinc	µg/L		58									
	Total Molybdenum	µg/L		3.4									
	Acrolein	µg/L	<	1.3									
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<	0.5									
	Benzene	µg/L	<	0.5									
	Bromoform	µg/L	<	0.5									
Carbon Tetrachloride	µg/L	<	0.23										

Group 3	Chlorobenzene	µg/L	<	0.5																
	Chlorodibromomethane	µg/L		1.1																
	Chloroethane	µg/L	<	0.47																
	2-Chloroethyl Vinyl Ether	µg/L	<	5																
	Chloroform	µg/L		7.8																
	Dichlorobromomethane	µg/L		4.5																
	1,1-Dichloroethane	µg/L	<	0.5																
	1,2-Dichloroethane	µg/L	<	0.5																
	1,1-Dichloroethylene	µg/L	<	0.5																
	1,2-Dichloropropane	µg/L	<	0.5																
	1,3-Dichloropropylene	µg/L	<	0.47																
	1,4-Dioxane	µg/L	<	3																
	Ethylbenzene	µg/L	<	0.5																
	Methyl Bromide	µg/L	<	0.42																
	Methyl Chloride	µg/L	<	0.33																
	Methylene Chloride	µg/L	<	0.14																
	1,1,2,2-Tetrachloroethane	µg/L	<	0.5																
	Tetrachloroethylene	µg/L	<	0.5																
	Toluene	µg/L	<	0.5																
	1,2-trans-Dichloroethylene	µg/L	<	0.5																
	1,1,1-Trichloroethane	µg/L	<	0.5																
	1,1,2-Trichloroethane	µg/L	<	0.5																
	Trichloroethylene	µg/L	<	0.5																
	Vinyl Chloride	µg/L	<	0.5																
Group 4	2-Chlorophenol	µg/L	<	3																
	2,4-Dichlorophenol	µg/L	<	3																
	2,4-Dimethylphenol	µg/L	<	3																
	4,6-Dinitro-o-Cresol	µg/L	<	6																
	2,4-Dinitrophenol	µg/L	<	6																
	2-Nitrophenol	µg/L	<	3																
	4-Nitrophenol	µg/L	<	3																
	p-Chloro-m-Cresol	µg/L	<	3																
	Pentachlorophenol	µg/L	<	6																
	Phenol	µg/L	<	8																
	2,4,6-Trichlorophenol	µg/L	<	3																
	Acenaphthene	µg/L	<	1.5																
Group 5	Acenaphthylene	µg/L	<	1.5																
	Anthracene	µg/L	<	1.5																
	Benzidine	µg/L	<	4																
	Benzo(a)Anthracene	µg/L	<	1.5																
	Benzo(a)Pyrene	µg/L	<	1.5																
	3,4-Benzofluoranthene	µg/L	<	1.5																
	Benzo(ghi)Perylene	µg/L	<	1.5																
	Benzo(k)Fluoranthene	µg/L	<	1.5																
	Bis(2-Chloroethoxy)Methane	µg/L	<	3																
	Bis(2-Chloroethyl)Ether	µg/L	<	3																
	Bis(2-Chloroisopropyl)Ether	µg/L	<	3																
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	3																
	4-Bromophenyl Phenyl Ether	µg/L	<	3																
	Butyl Benzyl Phthalate	µg/L	<	3																
	2-Chloronaphthalene	µg/L	<	3																
	4-Chlorophenyl Phenyl Ether	µg/L	<	3																
	Chrysene	µg/L	<	1.5																
	Dibenzo(a,h)Anthracene	µg/L	<	1.5																
	1,2-Dichlorobenzene	µg/L	<	0.37																
	1,3-Dichlorobenzene	µg/L	<	0.43																
	1,4-Dichlorobenzene	µg/L	<	0.43																
	3,3-Dichlorobenzidine	µg/L	<	3																
	Diethyl Phthalate	µg/L	<	3																
	Dimethyl Phthalate	µg/L	<	3																
	Di-n-Butyl Phthalate	µg/L		0.77																
	2,4-Dinitrotoluene	µg/L	<	3																
	2,6-Dinitrotoluene	µg/L	<	3																
	Di-n-Octyl Phthalate	µg/L	<	3																

Page 3



Toxics Management Spreadsheet
Version 1.4, May 2023

Stream / Surface Water Information

Upper Allen STP, NPDES Permit No. PA0024902, Outfall 001

Instructions Discharge Stream

Receiving Surface Water Name: Yellow Breeches Creek

No. Reaches to Model: 1

☒ Statewide Criteria
☐ Great Lakes Criteria
☐ ORSANCO Criteria

Location	Stream Code	RMI	Elevation (ft)	DA (mi ²)	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria
Point of Discharge	010121	19.14	410	162			Yes
End of Reach 1	010121	18.94	398	175			Yes

Q₇₋₁₀

Location	RMI	LFY (cfs/mi ²)	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	19.14	0.318										94.3	8		
End of Reach 1	18.94	0.318													

Q_h

Location	RMI	LFY (cfs/mi ²)	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	19.14														
End of Reach 1	18.94														



Toxics Management Spreadsheet
Version 1.4, May 2023

Model Results

Upper Allen STP, NPDES Permit No. PA0024902, Outfall 001

Instructions

Results

RETURN TO INPUTS

SAVE AS PDF

PRINT

All

Inputs

Results

Limits

Hydrodynamics

Wasteload Allocations

AFC

CCT (min): 15

PMF: 0.426

Analysis Hardness (mg/l): 110.54

Analysis pH: 7.78

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	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	10,425	
Total Antimony	0	0		0	1,100	1,100	15,290	
Total Arsenic	0	0		0	340	340	4,726	
Total Barium	0	0		0	21,000	21,000	291,909	
Total Boron	0	0		0	8,100	8,100	112,594	
Total Cadmium	0	0		0	2,220	2,36	32.8	
Total Chromium (III)	0	0		0	618,482	1,957	27,206	Chem Translator of 0.94 applied
Hexavalent Chromium	0	0		0	16	16.3	226	Chem Translator of 0.316 applied
Total Cobalt	0	0		0	95	95.0	1,321	Chem Translator of 0.982 applied
Total Copper	0	0		0	14,769	15.4	214	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	22	22.0	306	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	72,012	92.8	1,289	Chem Translator of 0.776 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1,400	1.65	22.9	Chem Translator of 0.85 applied
Total Nickel	0	0		0	509,650	511	7,099	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	3,822	4.5	62.5	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	904	
Total Zinc	0	0		0	127,561	130	1,813	
Acrolein	0	0		0	3	3.0	41.7	Chem Translator of 0.978 applied
Acrylonitrile	0	0		0	650	650	9,035	
Benzene	0	0		0	640,111/2023	640	8,896	

Bromoform	0	0	0	0	0	1,800	1,800	25,021	
Carbon Tetrachloride	0	0	0	0	0	2,800	2,800	38,921	
Chlorobenzene	0	0	0	0	0	1,200	1,200	16,681	
Chlorodibromomethane	0	0	0	0	0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0	0	0	0	18,000	18,000	250,208	
Chloroform	0	0	0	0	0	1,900	1,900	26,411	
Dichlorobromomethane	0	0	0	0	0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0	0	0	0	15,000	15,000	208,507	
1,1-Dichloroethylene	0	0	0	0	0	7,500	7,500	104,253	
1,2-Dichloropropane	0	0	0	0	0	11,000	11,000	152,805	
1,3-Dichloropropylene	0	0	0	0	0	310	310	4,309	
Ethylbenzene	0	0	0	0	0	2,900	2,900	40,311	
Methyl Bromide	0	0	0	0	0	550	550	7,645	
Methyl Chloride	0	0	0	0	0	28,000	28,000	389,212	
Methylene Chloride	0	0	0	0	0	12,000	12,000	166,805	
1,1,2,2-Tetrachloroethane	0	0	0	0	0	1,000	1,000	13,900	
Tetrachloroethylene	0	0	0	0	0	700	700	9,730	
Toluene	0	0	0	0	0	1,700	1,700	23,631	
1,2-trans-Dichloroethylene	0	0	0	0	0	6,800	6,800	94,523	
1,1,1-Trichloroethane	0	0	0	0	0	3,000	3,000	41,701	
1,1,2-Trichloroethane	0	0	0	0	0	3,400	3,400	47,262	
Trichloroethylene	0	0	0	0	0	2,300	2,300	31,971	
Vinyl Chloride	0	0	0	0	0	N/A	N/A	N/A	
2-Chlorophenol	0	0	0	0	0	560	560	7,784	
2,4-Dichlorophenol	0	0	0	0	0	1,700	1,700	23,631	
2,4-Dimethylphenol	0	0	0	0	0	660	660	9,174	
4,6-Dinitro-o-Cresol	0	0	0	0	0	80	80.0	1,112	
2,4-Dinitrophenol	0	0	0	0	0	660	660	9,174	
2-Nitrophenol	0	0	0	0	0	8,000	8,000	111,204	
4-Nitrophenol	0	0	0	0	0	2,300	2,300	31,971	
p-Chloro-m-Cresol	0	0	0	0	0	160	160	2,224	
Pentachlorophenol	0	0	0	0	0	19,165	19.2	266	
Phenol	0	0	0	0	0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0	0	0	0	460	460	6,394	
Acenaphthene	0	0	0	0	0	83	83.0	1,154	
Anthracene	0	0	0	0	0	N/A	N/A	N/A	
Benzidine	0	0	0	0	0	300	300	4,170	
Benzo(a)Anthracene	0	0	0	0	0	0.5	0.5	6.95	
Benzo(a)Pyrene	0	0	0	0	0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0	0	0	0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0	0	0	0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0	0	0	0	30,000	30,000	417,013	
Bis(2-Chloroisopropyl)Ether	0	0	0	0	0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0	0	0	0	4,500	4,500	62,552	
4-Bromophenyl Phenyl Ether	0	0	0	0	0	270	270	3,753	
Butyl Benzyl Phthalate	0	0	0	0	0	140	140	1,946	
2-Chloronaphthalene	0	0	0	0	0	N/A	N/A	N/A	
Chrysene	0	0	0	0	0	N/A	N/A	N/A	
Dibenz(a,h)Anthracene	0	0	0	0	0	N/A	N/A	N/A	

Model Results

8/11/2023

Page 6

1,2-Dichlorobenzene	0	0	0	0	820	820	11,398	
1,3-Dichlorobenzene	0	0	0	0	350	350	4,865	
1,4-Dichlorobenzene	0	0	0	0	730	730	10,147	
3,3-Dichlorobenzidine	0	0	0	0	N/A	N/A	N/A	
Diethyl Phthalate	0	0	0	0	4,000	4,000	55,602	
Dimethyl Phthalate	0	0	0	0	2,500	2,500	34,751	
Di-n-Butyl Phthalate	0	0	0	0	110	110	1,529	
2,4-Dinitrotoluene	0	0	0	0	1,600	1,600	22,241	
2,6-Dinitrotoluene	0	0	0	0	990	990	13,761	
1,2-Diphenylhydrazine	0	0	0	0	15	15.0	209	
Fluoranthene	0	0	0	0	200	200	2,780	
Fluorene	0	0	0	0	N/A	N/A	N/A	
Hexachlorobenzene	0	0	0	0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0	0	0	10	10.0	139	
Hexachlorocyclopentadiene	0	0	0	0	5	5.0	69.5	
Hexachloroethane	0	0	0	0	60	60.0	834	
Indeno(1,2,3-cd)Pyrene	0	0	0	0	N/A	N/A	N/A	
Isophorone	0	0	0	0	10,000	10,000	139,004	
Naphthalene	0	0	0	0	140	140	1,946	
Nitrobenzene	0	0	0	0	4,000	4,000	55,602	
n-Nitrosodimethylamine	0	0	0	0	17,000	17,000	236,308	
n-Nitrosodi-n-Propylamine	0	0	0	0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0	0	0	300	300	4,170	
Phenanthrene	0	0	0	0	5	5.0	69.5	
Pyrene	0	0	0	0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0	0	0	130	130	1,807	

CFC CCT (min): 82.604 PMF: 1 Analysis Hardness (mg/l): 101.52 Analysis pH: 7.89

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	0	N/A	N/A	N/A	
Chloride (PWS)	0	0	0	0	N/A	N/A	N/A	
Sulfate (PWS)	0	0	0	0	N/A	N/A	N/A	
Total Aluminum	0	0	0	0	N/A	N/A	N/A	
Total Antimony	0	0	0	0	220	220	6,880	
Total Arsenic	0	0	0	0	150	150	4,691	Chem Translator of 1 applied
Total Barium	0	0	0	0	4,100	4,100	128,220	
Total Boron	0	0	0	0	1,600	1,600	50,037	
Total Cadmium	0	0	0	0	0.249	0.27	8.56	Chem Translator of 0.908 applied
Total Chromium (III)	0	0	0	0	75.034	87.2	2,729	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0	0	0	10	10.4	325	Chem Translator of 0.962 applied
Total Cobalt	0	0	0	0	19	19.0	594	
Total Copper	0	0	0	0	9.072	9.45	296	Chem Translator of 0.96 applied
Free Cyanide	0	0	0	0	5.2	5.2	163	
Dissolved Iron	0	0	0	0	N/A	N/A	N/A	
Total Iron	0	0	0	0	1,500	1,500	46,910	WQC = 30 day average; PMF = 1
Total Lead	0	0	0	0	2.558	3.24	101	Chem Translator of 0.789 applied

Model Results

8/11/2023

Page 7

Total Manganese	0	0	0	0	N/A	N/A	N/A	Chem Translator of 0.85 applied
Total Mercury	0	0	0	0	0.770	0.91	28.3	Chem Translator of 0.997 applied
Total Nickel	0	0	0	0	52.673	52.8	1,652	
Total Phenols (Phenolics) (PWS)	0	0	0	0	N/A	N/A	N/A	
Total Selenium	0	0	0	0	4.600	4.99	156	Chem Translator of 0.922 applied
Total Silver	0	0	0	0	N/A	N/A	N/A	Chem Translator of 1 applied
Total Thallium	0	0	0	0	13	13.0	407	
Total Zinc	0	0	0	0	119.656	121	3,795	Chem Translator of 0.988 applied
Acrolein	0	0	0	0	3	3.0	93.8	
Acrylonitrile	0	0	0	0	130	130	4,066	
Benzene	0	0	0	0	130	130	4,066	
Bromoform	0	0	0	0	370	370	11,571	
Carbon Tetrachloride	0	0	0	0	560	560	17,513	
Chlorobenzene	0	0	0	0	240	240	7,506	
Chlorobromomethane	0	0	0	0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0	0	0	3,500	3,500	109,456	
Chloroform	0	0	0	0	380	380	12,197	
Dichlorobromomethane	0	0	0	0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0	0	0	3,100	3,100	96,947	
1,1-Dichloroethylene	0	0	0	0	1,500	1,500	46,910	
1,2-Dichloropropane	0	0	0	0	2,200	2,200	68,801	
1,3-Dichloropropylene	0	0	0	0	61	61.0	1,908	
Ethylbenzene	0	0	0	0	580	580	18,138	
Methyl Bromide	0	0	0	0	110	110	3,440	
Methyl Chloride	0	0	0	0	5,500	5,500	172,003	
Methylene Chloride	0	0	0	0	2,400	2,400	75,056	
1,1,2,2-Tetrachloroethane	0	0	0	0	210	210	6,567	
Tetrachloroethylene	0	0	0	0	140	140	4,378	
Toluene	0	0	0	0	330	330	10,320	
1,2-trans-Dichloroethylene	0	0	0	0	1,400	1,400	43,783	
1,1,1-Trichloroethane	0	0	0	0	610	610	19,077	
1,1,2-Trichloroethane	0	0	0	0	680	680	21,266	
Trichloroethylene	0	0	0	0	450	450	14,073	
Vinyl Chloride	0	0	0	0	N/A	N/A	N/A	
2-Chlorophenol	0	0	0	0	110	110	3,440	
2,4-Dichlorophenol	0	0	0	0	340	340	10,633	
2,4-Dimethylphenol	0	0	0	0	130	130	4,066	
4,6-Dinitro-o-Cresol	0	0	0	0	16	16.0	500	
2,4-Dinitrophenol	0	0	0	0	130	130	4,066	
2-Nitrophenol	0	0	0	0	1,600	1,600	50,037	
4-Nitrophenol	0	0	0	0	470	470	14,698	
p-Chloro-m-Cresol	0	0	0	0	500	500	15,637	
Pentachlorophenol	0	0	0	0	14,704	14.7	460	
Phenol	0	0	0	0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0	0	0	91	91.0	2,846	
Acenaphthene	0	0	0	0	17	17.0	532	
Anthracene	0	0	0	0	N/A	N/A	N/A	

Benzidine	0	0	0	0	59	59.0	1,845	
Benzo(a)Anthracene	0	0	0	0	0.1	0.1	3.13	
Benzo(a)Pyrene	0	0	0	0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0	0	0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0	0	0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0	0	0	6,000	6,000	187,640	
Bis(2-Chloroisopropyl)Ether	0	0	0	0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0	0	0	910	910	28,459	
4-Bromophenyl Phenyl Ether	0	0	0	0	54	54.0	1,689	
Butyl Benzyl Phthalate	0	0	0	0	35	35.0	1,095	
2-Chloronaphthalene	0	0	0	0	N/A	N/A	N/A	
Chrysene	0	0	0	0	N/A	N/A	N/A	
Dibenzo(a,h)Anthracene	0	0	0	0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0	0	0	160	160	5,004	
1,3-Dichlorobenzene	0	0	0	0	69	69.0	2,158	
1,4-Dichlorobenzene	0	0	0	0	150	150	4,691	
3,3-Dichlorobenzidine	0	0	0	0	N/A	N/A	N/A	
Diethyl Phthalate	0	0	0	0	800	800	25,019	
Dimethyl Phthalate	0	0	0	0	500	500	15,637	
Di-n-Butyl Phthalate	0	0	0	0	21	21.0	657	
2,4-Dinitrotoluene	0	0	0	0	320	320	10,007	
2,6-Dinitrotoluene	0	0	0	0	200	200	6,255	
1,2-Diphenylhydrazine	0	0	0	0	3	3.0	93.8	
Fluoranthene	0	0	0	0	40	40.0	1,251	
Fluorene	0	0	0	0	N/A	N/A	N/A	
Hexachlorobenzene	0	0	0	0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0	0	0	2	2.0	62.5	
Hexachlorocyclopentadiene	0	0	0	0	1	1.0	31.3	
Hexachloroethane	0	0	0	0	12	12.0	375	
Indeno(1,2,3-cd)Pyrene	0	0	0	0	N/A	N/A	N/A	
Isophorone	0	0	0	0	2,100	2,100	65,674	
Naphthalene	0	0	0	0	43	43.0	1,345	
Nitrobenzene	0	0	0	0	810	810	25,331	
n-Nitrosodimethylamine	0	0	0	0	3,400	3,400	106,329	
n-Nitrosodi-n-Propylamine	0	0	0	0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0	0	0	59	59.0	1,845	
Phenanthrene	0	0	0	0	1	1.0	31.3	
Pyrene	0	0	0	0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0	0	0	26	26.0	813	

☒ THH CCT (min): 82.604 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	0	500,000	500,000	N/A	
Chloride (PWS)	0	0	0	0	250,000	250,000	N/A	
Sulfate (PWS)	0	0	0	0	250,000	250,000	N/A	

Total Aluminum	0	0	0	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A
Total Antimony	0	0	0	0	0	0	5.6	5.6	175			
Total Arsenic	0	0	0	0	0	0	10	10.0	313			
Total Barium	0	0	0	0	0	0	2,400	2,400	75,056			
Total Boron	0	0	0	0	0	0	3,100	3,100	96,947			
Total Cadmium	0	0	0	0	0	0	N/A	N/A	N/A			
Total Chromium (III)	0	0	0	0	0	0	N/A	N/A	N/A			
Hexavalent Chromium	0	0	0	0	0	0	N/A	N/A	N/A			
Total Cobalt	0	0	0	0	0	0	N/A	N/A	N/A			
Total Copper	0	0	0	0	0	0	N/A	N/A	N/A			
Free Cyanide	0	0	0	0	0	0	4	4.0	125			
Dissolved Iron	0	0	0	0	0	0	300	300	9,382			
Total Iron	0	0	0	0	0	0	N/A	N/A	N/A			
Total Lead	0	0	0	0	0	0	N/A	N/A	N/A			
Total Manganese	0	0	0	0	0	0	1,000	1,000	31,273			
Total Mercury	0	0	0	0	0	0	0.050	0.05	1.56			
Total Nickel	0	0	0	0	0	0	810	810	19,077			
Total Phenols (Phenolics) (PWS)	0	0	0	0	0	0	5	5.0	N/A			
Total Selenium	0	0	0	0	0	0	N/A	N/A	N/A			
Total Silver	0	0	0	0	0	0	N/A	N/A	N/A			
Total Thallium	0	0	0	0	0	0	0.24	0.24	7.51			
Total Zinc	0	0	0	0	0	0	N/A	N/A	N/A			
Acrolein	0	0	0	0	0	0	3	3.0	93.8			
Acrylonitrile	0	0	0	0	0	0	N/A	N/A	N/A			
Benzene	0	0	0	0	0	0	N/A	N/A	N/A			
Bromoform	0	0	0	0	0	0	N/A	N/A	N/A			
Carbon Tetrachloride	0	0	0	0	0	0	N/A	N/A	N/A			
Chlorobenzene	0	0	0	0	0	0	100	100.0	3,127			
Chlorodibromomethane	0	0	0	0	0	0	N/A	N/A	N/A			
2-Chloroethyl Vinyl Ether	0	0	0	0	0	0	N/A	N/A	N/A			
Chloroform	0	0	0	0	0	0	5.7	5.7	178			
Dichlorobromomethane	0	0	0	0	0	0	N/A	N/A	N/A			
1,2-Dichloroethane	0	0	0	0	0	0	N/A	N/A	N/A			
1,1-Dichloroethylene	0	0	0	0	0	0	33	33.0	1,032			
1,2-Dichloropropane	0	0	0	0	0	0	N/A	N/A	N/A			
1,3-Dichloropropylene	0	0	0	0	0	0	N/A	N/A	N/A			
Ethylbenzene	0	0	0	0	0	0	68	68.0	2,127			
Methyl Bromide	0	0	0	0	0	0	100	100.0	3,127			
Methyl Chloride	0	0	0	0	0	0	N/A	N/A	N/A			
Methylene Chloride	0	0	0	0	0	0	N/A	N/A	N/A			
1,1,2,2-Tetrachloroethane	0	0	0	0	0	0	N/A	N/A	N/A			
Tetrachloroethylene	0	0	0	0	0	0	N/A	N/A	N/A			
Toluene	0	0	0	0	0	0	57	57.0	1,783			
1,2-trans-Dichloroethylene	0	0	0	0	0	0	100	100.0	3,127			
1,1,1-Trichloroethane	0	0	0	0	0	0	10,000	10,000	312,733			
1,1,2-Trichloroethane	0	0	0	0	0	0	N/A	N/A	N/A			
Trichloroethylene	0	0	0	0	0	0	N/A	N/A	N/A			

Page 11

CRL	CCT (min): 32.632	PMF: 1	Analysis Hardness (mg/l): N/A	Analysis pH: N/A
------------	-------------------	--------	-------------------------------	------------------

Model Results	0	0	0	9.98/11/2023.9	1,365	Page 12
---------------	---	---	---	----------------	-------	---------

Page 13

Recommended WQBELs & Monitoring Requirements

4

☐ **Other Pollutants without Limits or Monitoring**

Middel Results

Total Boron	50.037	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cadmium	8.56	µg/L	Discharge Conc < TQL
Total Chromium (III)	2,729	µg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	145	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cobalt	584	µg/L	Discharge Conc < TQL
Total Copper	137	µg/L	Discharge Conc ≤ 10% WQBEL
Free Cyanide	125	µg/L	Discharge Conc ≤ 25% WQBEL
Total Cyanide	N/A	N/A	No WQS
Dissolved Iron	9,382	µg/L	Discharge Conc < TQL
Total Iron	46,910	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	101	µg/L	Discharge Conc < TQL
Total Manganese	31,273	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	1.56	µg/L	Discharge Conc ≤ 10% WQBEL
Total Nickel	1,652	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	PWS Not Applicable
Total Selenium	156	µg/L	Discharge Conc < TQL
Total Silver	40.1	µg/L	Discharge Conc < TQL
Total Thallium	7.51	µg/L	Discharge Conc ≤ 10% WQBEL
Total Zinc	1,162	µg/L	Discharge Conc ≤ 10% WQBEL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	26.7	µg/L	Discharge Conc < TQL
Acrylonitrile	8.27	µg/L	Discharge Conc < TQL
Benzene	80.0	µg/L	Discharge Conc < TQL
Bromoform	965	µg/L	Discharge Conc < TQL
Carbon Tetrachloride	55.2	µg/L	Discharge Conc < TQL
Chlorobenzene	3,127	µg/L	Discharge Conc < TQL
Chlorodibromomethane	110	µg/L	Discharge Conc ≤ 25% WQBEL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	109,456	µg/L	Discharge Conc < TQL
Chloroform	178	µg/L	Discharge Conc ≤ 25% WQBEL
Dichlorobromomethane	131	µg/L	Discharge Conc ≤ 25% WQBEL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	1,365	µg/L	Discharge Conc < TQL
1,1-Dichloroethylene	1,032	µg/L	Discharge Conc < TQL
1,2-Dichloropropane	124	µg/L	Discharge Conc < TQL
1,3-Dichloropropylene	37.2	µg/L	Discharge Conc < TQL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	2,127	µg/L	Discharge Conc < TQL
Methyl Bromide	3,127	µg/L	Discharge Conc < TQL
Methyl Chloride	172,003	µg/L	Discharge Conc < TQL
Methylene Chloride	2,758	µg/L	Discharge Conc < TQL
1,1,2,2-Tetrachloroethane	27.6	µg/L	Discharge Conc < TQL
Tetrachloroethylene	1,379	µg/L	Discharge Conc < TQL
Toluene	1,783	µg/L	Discharge Conc < TQL
1,2-trans-Dichloroethylene	3,127	µg/L	Discharge Conc < TQL
1,1,1-Trichloroethane	19,077	µg/L	Discharge Conc < TQL
1,1,1,2-Trichloroethane	75.6	µg/L	Discharge Conc < TQL

Model Results 8/13/2023

Trichloroethylene	82.7	µg/L	Discharge Conc < TQL
Vinyl Chloride	2.76	µg/L	Discharge Conc < TQL
2-Chlorophenol	938	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	313	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	3,127	µg/L	Discharge Conc < TQL
4,6-Dinitro-o-Cresol	82.5	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	313	µg/L	Discharge Conc < TQL
2-Nitrophenol	50,037	µg/L	Discharge Conc < TQL
4-Nitrophenol	14,898	µg/L	Discharge Conc < TQL
p-Chloro-m-Cresol	1,426	µg/L	Discharge Conc < TQL
Pentachlorophenol	4.14	µg/L	Discharge Conc < TQL
Phenol	125,093	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	207	µg/L	Discharge Conc < TQL
Acenaphthene	532	µg/L	Discharge Conc < TQL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	9,382	µg/L	Discharge Conc < TQL
Benzo(a)anthracene	0.014	µg/L	Discharge Conc < TQL
Benzo(a)pyrene	0.14	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	0.14	µg/L	Discharge Conc < TQL
Benzo(g,h,i)perylene	N/A	N/A	No WQS
Benzo(k)fluoranthene	1.38	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	4.14	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	6,255	µg/L	Discharge Conc < TQL
Bis(2-Ethylhexyl)Phthalate	44.1	µg/L	Discharge Conc < TQL
4-Bromophenyl Phenyl Ether	1,889	µg/L	Discharge Conc < TQL
Butyl Benzyl Phthalate	3.13	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	25,019	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	16.5	µg/L	Discharge Conc < TQL
Dibenzo(a,h)anthracene	0.014	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	5,004	µg/L	Discharge Conc < TQL
1,3-Dichlorobenzene	219	µg/L	Discharge Conc < TQL
1,4-Dichlorobenzene	4,691	µg/L	Discharge Conc < TQL
3,3-Dichlorobenzidine	6.89	µg/L	Discharge Conc < TQL
Diethyl Phthalate	18,764	µg/L	Discharge Conc < TQL
Dimethyl Phthalate	15,637	µg/L	Discharge Conc < TQL
Di-n-Butyl Phthalate	625	µg/L	Discharge Conc ≤ 25% WQBEL
2,4-Dinitrotoluene	6.89	µg/L	Discharge Conc < TQL
2,6-Dinitrotoluene	6.89	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	4.14	µg/L	Discharge Conc < TQL
Fluoranthene	625	µg/L	Discharge Conc < TQL
Fluorene	1,564	µg/L	Discharge Conc < TQL
Hexachlorobenzene	0.011	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	1.36	µg/L	Discharge Conc < TQL

Model Results 8/13/2023

Hexachlorocyclopentadiene	31.3	µg/L	Discharge Conc < TQL
Hexachloroethane	13.8	µg/L	Discharge Conc < TQL
Indeno(1,2,3-cd)Pyrene	0.14	µg/L	Discharge Conc < TQL
Isophorone	1.063	µg/L	Discharge Conc < TQL
Naphthalene	1.247	µg/L	Discharge Conc < TQL
Nitrobenzene	313	µg/L	Discharge Conc < TQL
n-Nitrosodimethylamine	0.097	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	0.89	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	455	µg/L	Discharge Conc < TQL
Phenanthrene	31.3	µg/L	Discharge Conc < TQL
Pyrene	625	µg/L	Discharge Conc < TQL
1,2,4-Trichlorobenzene	2.19	µg/L	Discharge Conc < TQL

WET Analysis Spreadsheet

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet					
Type of Test	Chronic		Facility Name	Upper Allen STP	
Species Tested	Ceriodaphnia		Permit No.	PA0024902	
Endpoint	Survival				
TIWC (decimal)	0.03				
No. Per Replicate	1				
TST b value	0.75				
TST alpha value	0.2				

Test Completion Date			Test Completion Date		
7/1/2019			8/3/2020		
Replicate No.	Control	TIWC	Replicate No.	Control	TIWC
1	1	1	1	1	1
2	1	1	2	1	1
3	1	1	3	1	1
4	1	1	4	1	1
5	1	1	5	1	1
6	1	1	6	1	1
7	1	1	7	1	1
8	1	1	8	1	1
9	1	1	9	1	1
10	1	1	10	1	1
11			11		
12			12		
13			13		
14			14		
15			15		

Mean	1.000	1.000	Mean	1.000	1.000
Std Dev.	0.000	0.000	Std Dev.	0.000	0.000
# Replicates	10	10	# Replicates	10	10

T-Test Result			T-Test Result		
Deg. of Freedom			Deg. of Freedom		
Critical T Value			Critical T Value		
Pass or Fail	PASS		Pass or Fail	PASS	

Test Completion Date			Test Completion Date		
6/28/2021			7/4/2018		
Replicate No.	Control	TIWC	Replicate No.	Control	TIWC
1	1	1	1	1	1
2	1	1	2	1	1
3	1	1	3	1	0
4	1	1	4	1	1
5	1	1	5	1	1
6	1	1	6	1	1
7	1	1	7	1	1
8	1	1	8	1	1
9	1	1	9	1	1
10	1	1	10	1	1
11			11		
12			12		
13			13		
14			14		
15			15		

Mean	1.000	1.000	Mean	1.000	0.900
Std Dev.	0.000	0.000	Std Dev.	0.000	0.316
# Replicates	10	10	# Replicates	10	10

T-Test Result			T-Test Result	1.5000	
Deg. of Freedom			Deg. of Freedom	9	
Critical T Value			Critical T Value	0.8834	
Pass or Fail	PASS		Pass or Fail	PASS	

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet					
Type of Test	Chronic		Facility Name	Upper Allen STP	
Species Tested	Ceriodaphnia		Permit No.	PA0024902	
Endpoint	Reproduction				
TIWC (decimal)	0.03				
No. Per Replicate	1				
TST b value	0.75				
TST alpha value	0.2				

Test Completion Date 7/1/2019			Test Completion Date 8/3/2020		
Replicate No.	Control	TIWC	Replicate No.	Control	TIWC
1	33	38	1	27	23
2	33	35	2	25	6
3	33	33	3	25	29
4	31	27	4	29	23
5	32	39	5	27	20
6	30	32	6	12	26
7	39	29	7	34	27
8	36	32	8	27	31
9	30	32	9	34	33
10	32	37	10	31	36
11			11		
12			12		
13			13		
14			14		
15			15		

Mean	32.900	33.400	Mean	27.100	25.400
Std Dev.	2.787	3.884	Std Dev.	6.244	8.396
# Replicates	10	10	# Replicates	10	10
T-Test Result	6.2902		T-Test Result	1.6694	
Deg. of Freedom	15		Deg. of Freedom	15	
Critical T Value	0.8862		Critical T Value	0.8862	
Pass or Fail	PASS		Pass or Fail	PASS	

Test Completion Date 8/28/2021			Test Completion Date 7/4/2018		
Replicate No.	Control	TIWC	Replicate No.	Control	TIWC
1	44	44	1	31	34
2	27	44	2	37	35
3	41	42	3	32	30
4	37	37	4	36	29
5	43	35	5	34	36
6	50	46	6	37	31
7	40	42	7	31	32
8	45	41	8	41	36
9	47	39	9	35	34
10	44	45	10	33	30
11			11		
12			12		
13			13		
14			14		
15			15		

Mean	41.800	41.500	Mean	34.700	32.700
Std Dev.	6.339	3.567	Std Dev.	3.164	2.627
# Replicates	10	10	# Replicates	10	10
T-Test Result	5.4006		T-Test Result	5.9629	
Deg. of Freedom	17		Deg. of Freedom	17	
Critical T Value	0.8833		Critical T Value	0.8833	
Pass or Fail	PASS		Pass or Fail	PASS	

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet					
Type of Test	Chronic		Facility Name	Upper Allen STP	
Species Tested	Pimephales		Permit No.	PA0024902	
Endpoint	Survival				
TIWC (decimal)	0.03				
No. Per Replicate	10				
TST b value	0.75				
TST alpha value	0.25				

Test Completion Date			Test Completion Date		
Replicate	7/2/2019		Replicate	8/4/2020	
No.	Control	TIWC	No.	Control	TIWC
1	10	9	1	10	10
2	7	9	2	10	9
3	9	10	3	8	10
4	10	10	4	10	10
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		
11			11		
12			12		
13			13		
14			14		
15			15		

Mean	9.000	9.500	Mean	9.500	9.750
Std Dev.	1.414	0.577	Std Dev.	1.000	0.500
# Replicates	4	4	# Replicates	4	4
T-Test Result	4.3231		T-Test Result	5.2627	
Deg. of Freedom	5		Deg. of Freedom	5	
Critical T Value	0.7267		Critical T Value	0.7267	
Pass or Fail	PASS		Pass or Fail	PASS	

Test Completion Date			Test Completion Date		
Replicate	8/29/2021		Replicate	7/5/2018	
No.	Control	TIWC	No.	Control	TIWC
1	9	10	1	10	8
2	10	10	2	9	9
3	10	10	3	8	9
4	10	10	4	9	9
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		
11			11		
12			12		
13			13		
14			14		
15			15		

Mean	9.750	10.000	Mean	9.000	8.750
Std Dev.	0.500	0.000	Std Dev.	0.816	0.500
# Replicates	4	4	# Replicates	4	4
T-Test Result	12.5523		T-Test Result	4.6505	
Deg. of Freedom	3		Deg. of Freedom	5	
Critical T Value	0.7649		Critical T Value	0.7267	
Pass or Fail	PASS		Pass or Fail	PASS	

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet					
Type of Test	Chronic		Facility Name		
Species Tested	Pimephales		Upper Allen STP		
Endpoint	Growth				
TIWC (decimal)	0.03				
No. Per Replicate	10		Permit No.		
TST b value	0.75		PA0024902		
TST alpha value	0.25				
<hr/>					
Test Completion Date			Test Completion Date		
Replicate	7/2/2019		Replicate	8/4/2020	
No.	Control	TIWC	No.	Control	TIWC
1	0.559	0.519	1	0.56	0.519
2	0.373	0.572	2	0.506	0.382
3	0.533	0.595	3	0.403	0.564
4	0.507	0.547	4	0.536	0.583
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		
11			11		
12			12		
13			13		
14			14		
15			15		
Mean	0.493	0.558	Mean	0.501	0.512
Std Dev.	0.083	0.033	Std Dev.	0.069	0.091
# Replicates	4	4	# Replicates	4	4
T-Test Result	5.3734		T-Test Result	2.6042	
Deg. of Freedom	5		Deg. of Freedom	5	
Critical T Value	0.7267		Critical T Value	0.7267	
Pass or Fail	PASS		Pass or Fail	PASS	
<hr/>					
Test Completion Date			Test Completion Date		
Replicate	8/29/2021		Replicate	7/5/2018	
No.	Control	TIWC	No.	Control	TIWC
1	0.579	0.623	1	0.79	0.652
2	0.569	0.644	2	0.775	0.781
3	0.638	0.669	3	0.783	0.834
4	0.648	0.726	4	0.534	0.798
5			5		
6			6		
7			7		
8			8		
9			9		
10			10		
11			11		
12			12		
13			13		
14			14		
15			15		
Mean	0.609	0.666	Mean	0.721	0.766
Std Dev.	0.040	0.045	Std Dev.	0.124	0.079
# Replicates	4	4	# Replicates	4	4
T-Test Result	7.7778		T-Test Result	3.6878	
Deg. of Freedom	5		Deg. of Freedom	5	
Critical T Value	0.7267		Critical T Value	0.7267	
Pass or Fail	PASS		Pass or Fail	PASS	

WET Summary and Evaluation

Facility Name	Upper Allen STP
Permit No.	PA0024902
Design Flow (MGD)	1.1
Q ₇₋₁₀ Flow (cfs)	51.516
PMF _a	0.426
PMF _c	1

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Ceriodaphnia	Survival	7/1/19	8/3/20	6/28/21	7/4/18
		PASS	PASS	PASS	PASS

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Ceriodaphnia	Reproduction	7/1/19	8/3/20	6/28/21	7/4/18
		PASS	PASS	PASS	PASS

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Pimephales	Survival	7/2/19	8/4/20	6/29/21	7/5/18
		PASS	PASS	PASS	PASS

Species	Endpoint	Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Pimephales	Growth	7/2/19	8/4/20	6/29/21	7/5/18
		PASS	PASS	PASS	PASS

Reasonable Potential? NO

Permit Recommendations

Test Type Chronic
TIWC 3 % Effluent
Dilution Series 1, 3, 30, 60, 100 % Effluent
Permit Limit None
Permit Limit Species