Pennsylvania Department of Environmental Protection

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0025810**
Facility Type	**Municipal**	APS ID	**1101180**
Major / Minor	**Minor**	Authorization ID	**1462306**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Shade Central City Joint Authority**	Facility Name	**Shade Central City Joint Authority**
Applicant Address	429 Sunshine Avenue	Facility Address	Sr 0160
	Central City, PA 15926-1134		Central City, PA 15926
Applicant Contact	Randy Kiser	Facility Contact	
Applicant Phone		Facility Phone	(814) 754-4195
Client ID	1685	Site ID	247645
Ch 94 Load Status	Not Overloaded	Municipality	Shade Township
Connection Status		County	Somerset
Date Application Received	November 16, 2023	EPA Waived?	Yes
Date Application Accepted	November 20, 2023	If No, Reason	

Purpose of Application: Renewal of Sewage NPDES Major Permit.

Summary of Review

The Shade Central City Joint Authority has applied for renewal of the Shade Central City Joint Authority STP.

Sewage to the plant is treated by grit chambers and comminutors, two aerated lagoons in series, and chlorination.

The Act 14 Notification was provided in the September 1st, 2023 letters to Shade Township and Somerset County.

Water quality models have recommended several new limits for this authorization. The section on Development of Effluent Limitations contains additional details.

Sludge use and disposal description and location

Sludge blanket in the lagoons is monitored and hauled to municipal STP as required to maintain effluent quality.

Chapter 94 Status

The most recent Chapter 94 Report shows no existing or projected overloads within the next 5 years. This projection was made for both Organic and Hydraulic loading to the plant.

Issuance of the draft permit is recommended.

Approve	Deny	Signatures	Date
x		John Price Jack Price / Environmental Engineering Specialist	July 1, 2025
x		Mahbuba Iasmin Mahbuba Iasmin, Ph.D., P.E. / Environmental Engineering Manager	July 7, 2025

Summary of Review
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.

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.85
Latitude	40º 7' 9.0"	Longitude	-78º 48' 30.0"
Quad Name	Central City	Quad Code	40078A7
Wastewater Description:	Sewage Effluent		
Receiving Waters	Dark Shade Creek (CWF)	Stream Code	45330
NHD Com ID	123716615	RMI	2.34
Drainage Area	18.2	Yield (cfs/mi^2)	0.0714
Q_{7-10} Flow (cfs)	1.30	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	2144.86	Slope (ft/ft)	0.001
Watershed No.	18-E	Chapter 93 Class.	CWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	METALS, PH, SILTATION		
Source(s) of Impairment	ACID MINE DRAINAGE, SITE CLEARANCE (LAND DEVELOPMENT OR REDEVELOPMENT)		
TMDL Status	Final	Name	Kiskiminetas-Conemaugh River Watersheds TMDL

Background/Ambient Data		Data Source
pH (SU)		
Temperature (°F)		
Hardness (mg/L)		
Other:		

Nearest Downstream Public Water Supply Intake	Buffalo Twp Mun Auth Freeport (PWSID 5030019) 1.25 MGD		
PWS Waters	Allegheny River	Flow at Intake (cfs)	2,390
PWS RMI	29.54	Distance from Outfall (mi)	59.7 Linear Miles

Changes Since Last Permit Issuance:

New WQM 7.0 and TRC_Calc models were run for the discharge in this authorization. The models returned recommendations for more stringent Total Residual Chlorine, Total Iron, summer CBOD5, and summer and winter Ammonia-Nitrogen.

Treatment Facility Summary

Treatment Facility Name: Shade Central City Joint Authority STP

WQM Permit No.	Issuance Date
5671403	05/20/1971
5671403 A-1	09/21/1989
5671403 A-2	12/28/2000
568402 A-3	11/18/2013

Facility Description: The Shade Central City JA STP is a four-cell aerated lagoon system. The two lagoons in the system are split into a total of four cells by baffles in each lagoon. The plant consists of influent grit chamber and comminutor with mechanical bar screen for maintenance, followed by treatment in Lagoon #1, followed by Lagoon #2, followed by chlorine disinfection. Disinfected effluent then outfalls to Dark Shade Creek.

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Primary	Septic Tank	Gas Chlorine	0.85

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.85	640	Not Overloaded	Belt Filter Press	Hauled to other STP. See Below.

This facility is an aerated lagoon and does not regularly waste sludge. In lieu of regular wasting of sludge, Part C.II. Conditions in the permit contains instructions to remove sludge at 20% of lagoon volume, at 18 inches of depth, or when accumulation of sludge causes or contributes to effluent violations. Sludge is typically wasted from this facility every 10-15 years. The next sludge removal process is being budgeted and is anticipated to conclude by 2028.

Compliance History

DMR Data for Outfall 001 (from April 1, 2024 to March 31, 2025)

Parameter	MAR-25	FEB-25	JAN-25	DEC-24	NOV-24	OCT-24	SEP-24	AUG-24	JUL-24	JUN-24	MAY-24	APR-24
Flow (MGD) Average Monthly	0.350	0.778	0.335	0.547	0.380	0.192	0.225	0.286	0.143	0.166	0.420	0.895
Flow (MGD) Daily Maximum	0.887	2.068	1.894	2.078	1.334	0.425	0.781	1.880	0.343	0.314	1.450	3.515
pH (S.U.) Instantaneous Minimum	6.82	6.82	6.83	6.88	6.84	6.84	6.83	6.74	6.66	6.64	6.73	6.84
pH (S.U.) Instantaneous Maximum	7.28	7.24	7.22	7.29	7.27	7.21	6.96	6.98	6.91	7.04	7.10	7.27
DO (mg/L) Instantaneous Minimum	8.4	9.7	9.5	9.5	8.3	6.9	6.3	6.4	6.8	6.0	6.2	7.1
TRC (mg/L) Average Monthly	0.29	0.23	0.32	0.32	0.25	0.25	0.28	0.25	0.26	0.29	0.26	0.25
TRC (mg/L) Instantaneous Maximum	0.59	0.59	0.72	0.66	0.55	0.52	0.75	0.44	0.38	0.44	0.69	0.73
CBOD5 (lbs/day) Average Monthly	< 6.0	< 25.0	< 7.5	< 17.0	< 41.0	< 6.0	< 3.0	< 3.0	< 2.0	< 3.0	< 4.0	< 10.0
CBOD5 (lbs/day) Weekly Average	8.0	49.0	14.0	54.0	155.0	< 8.0	< 4.0	4.0	< 4.0	3.0	< 6.0	25.0
CBOD5 (mg/L) Average Monthly	< 3.0	< 3.5	< 4.5	< 4.0	< 8.0	< 5.0	< 2.0	< 3.0	< 1.5	< 2.0	< 1.5	< 2.0
CBOD5 (mg/L) Weekly Average	4.0	5.0	12.0	9.0	22.0	8.0	2.0	4.0	< 1.5	3.0	< 1.5	2.0
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	< 106	212	107	120	68.0	84.0	175	36	53	52	45	117
BOD5 (lbs/day) Raw Sewage Influent Weekly Average	147	507	146	162	126.0	126	550	58	97	91	72	264
BOD5 (mg/L) Raw Sewage Influent Average Monthly	< 43.5	42.0	49.0	28.0	52.0	53.0	121	30	38	42	17	23
BOD5 (mg/L) Raw Sewage Influent Weekly Average	80.0	104	58.0	42.0	99.0	106	386	47	58	77	21	46

TSS (lbs/day) Average Monthly	< 9.0	< 23.0	7.25	< 9.0	15.0	8.0	7.0	4.0	< 5.0	< 5.0	< 6.0	< 11.0
TSS (lbs/day) Raw Sewage Influent Average Monthly	101	152	104	127	114.0	86.0	78	68	112	87	114	394
TSS (lbs/day) Raw Sewage Influent Weekly Average	128	197	168	192	225.0	121	96	102	269	110	156	1407
TSS (lbs/day) Weekly Average	20.0	43.0	10.0	16.0	49.0	21.0	10.0	6.0	13.0	8.0	< 8.0	< 25.0
TSS (mg/L) Average Monthly	< 4.3	< 3.5	3.5	< 2.0	6.0	5.0	5.0	4.0	< 3.0	< 5.0	< 2.0	< 2.0
TSS (mg/L) Raw Sewage Influent Average Monthly	38	30.0	47.0	26.0	58.0	52.0	55	59	72	69	44	44
TSS (mg/L) Raw Sewage Influent Weekly Average	42	44.0	67.0	36.0	67.0	68.0	80	99	99	80	55	52
TSS (mg/L) Weekly Average	11.0	6.0	5.0	2.0	9.0	8.0	6.0	5.0	5.0	8.0	< 2.0	2.0
Fecal Coliform (No./100 ml) Geometric Mean	< 1.0	< 3.0	< 2.0	< 16.0	< 3.0	< 1.5	< 1.0	< 1.0	< 2.0	< 2.0	< 1.0	< 2.0
Fecal Coliform (No./100 ml) Instantaneous Maximum	1.0	38.4	12.1	> 2420	86.0	7.4	1.0	< 1.0	9.0	16.0	1.0	11.0
Total Nitrogen (mg/L) Daily Maximum	6.96			7.00			6.84			9.52		
Ammonia-Nitrogen (mg/L) Daily Maximum	4.48			1.98			1.94			4.94		
Total Phosphorus (mg/L) Daily Maximum	0.60			0.90			1.22			0.76		
Total Aluminum (mg/L) Daily Maximum	< 0.10			< 0.10			< 0.10			< 0.10		
Total Iron (mg/L) Daily Maximum	0.98			0.24			0.20			0.34		
Total Manganese (mg/L) Daily Maximum	0.38			0.13			0.09			0.15		

Compliance History

Operations Compliance Check Summary Report

Facility: Shade Central City JA STP

NPDES Permit No.: PA0025810

Compliance Review Period: 05/01/2020-05/01/2025

Inspection Summary:

INSP ID	INSPECTED DATE	INSP TYPE	INSPECTION RESULT DESC	INSPECTOR
3176322	04/05/2021	Administrative/File Review	No Violations Noted	MILSOP, LISA
3176325	04/05/2021	Compliance Evaluation	No Violations Noted	MILSOP, LISA
3176323	04/05/2021	Administrative/File Review	No Violations Noted	MILSOP, LISA
3907429	01/24/2025	Administrative/File Review	No Violations Noted	MILSOP, LISA
3907453	01/27/2025	Compliance Evaluation	No Violations Noted	MILSOP, LISA

Violation Summary:

No eFACTS violations within the compliance review period.

Open Violations by Client ID:

No open violations for Client ID.

Enforcement Summary:

No WMS Enforcement Actions within the compliance review period.

DMR Violation Summary:

MONITORING END DATE	OUTFALL	PARAMETER	SBC	LIMIT	SAMPLE	UNIT OF MEASURE
Fecal Coliform	12/31/24	IMAX	> 2420	No./100 ml	10000	No./100 ml

Compliance Status:

Facility does not currently have any open violations or pending enforcements. A final compliance status will be determined at permit issuance.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.85
Latitude 40º 7' 9.00" **Longitude** -78º 48' 30.00"
Wastewater Description: Sewage Effluent

Technology-Based Limitations (TBELs)

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

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

Comments: The discharge was evaluated using WQM 7.0 for $CBOD_5$, Ammonia-Nitrogen, and Dissolved Oxygen. The discharge was evaluated using TRC_Calc for Total Residual Chlorine.

The WQM 7.0 Model determined that TBELs would be sufficiently protective during the cold months. For Summer $CBOD_5$, Ammonia-Nitrogen, DO, and TRC, WQBELs apply.

Water Quality-Based Limitations (WQBELs)

The following limitations were determined through water quality modeling (output files attached):

Parameter	Limit (mg/l)	SBC	Model
Dissolved Oxygen	4.0 (min)	Average Monthly	WQM 7.0 Version 1.1
$CBOD_5$ (Warm Period)	10.38	Average Monthly	WQM 7.0 Version 1.1
$CBOD_5$ (Cold Period)	25.0	Average Monthly	WQM 7.0 Version 1.1
Ammonia-Nitrogen (Warm Period)	3.11	Average Monthly	WQM 7.0 Version 1.1
Ammonia-Nitrogen (Cold Period)	15.05	Average Monthly	WQM 7.0 Version 1.1
Total Residual Chlorine	0.153	Average Monthly	TRC_Calc
Total Aluminum	Report	Average Monthly	Toxics Management Spreadsheet 1.4
Total Iron	2.98	Average Monthly	Toxics Management Spreadsheet 1.4
Total Manganese	Report	Average Monthly	Toxics Management Spreadsheet 1.4
Total Copper	Report	Average Monthly	Toxics Management Spreadsheet 1.4

Comments:

The WQM 7.0 report can be found in Attachment 2.

Analyses for WQBELs were performed using the Q7-10 flow. The flow was obtained via USGS StreamStats. The USGS StreamStats Report is located in Attachment 1.

WQBELs for Toxic Parameters were determined in a Reasonable Potential (RP) analysis. The RP Analysis is described in detail in the Reasonable Potential Analysis section.

eDMR Data and Renewal Testing indicate that the permittee will be able to immediately comply with the new more stringent Ammonia-Nitrogen limits, and Total Iron limits, however the permittee will not be able to immediately comply reliably with new TRC limits. A schedule of compliance is included for the permittee to reach full compliance with final effluent limitations. Per Section IV.G.3 of the SOP for Individual NPDES Sewage Applications, the permittee will be given two years to reach compliance with final effluent limitations. This period of two years includes time to plan and execute modifications to treatment facilities, operations, or other measures.

Reasonable Potential Analysis

The SOP for Sewage Effluent Limits (DEP Document No. BCW-PMT-033, Revised February 5, 2024), Section II.F. and the SOP for Toxic Pollutants (DEP Document No. BCW-PMT-037) instruct the permit manager to evaluate the reasonable potential for toxic pollutants to cause an excursion above water quality standards based on the available data. The permit application submitted to DEP contained effluent testing data for the facility and there is quarterly monitoring for Total Iron, Total Aluminum, and Total Manganese. Where more than ten samples were available, a ToxConc spreadsheet was used to determine a long-term average. A toxics Reasonable Potential (RP) Analysis was performed in TMS based on the effluent testing submitted in the renewal application and follow up information submitted in the pre-draft survey.

In the initial permit application, the effluent sampling for Total Lead and Total Copper were conducted using Quantitation Limits (QLs) less sensitive than the Target QL (TQL) and did not return a detection under the QL used. The QL used was therefore input as the max concentration in the RP analysis. The RP analysis returned limits for Total Copper and Total Lead. A pre-draft survey was issued to provide the applicant an opportunity to analyze the effluent at the TQL. An RP analysis with effluent sampled at the recommended sensitivity returned non-detect for lead and monitor-only for copper.

The monitoring requirement may be revisited if the record of effluent data demonstrates the concentration of these parameters is no longer within this range without treatment. Proposed relaxation of monitoring requirements must fall under the backsliding exceptions under Section 402(o) of the Clean Water Act.

Pre-draft testing, ToxConc spreadsheets, and the TMS Report can be found in Attachment 3.

Anti-Backsliding

Section 402(o) of the Clean Water Act (CWA), enacted in the Water Quality Act of 1987, establishes anti-backsliding rules governing two situations. The first situation occurs when a permittee seeks to revise a Technology-Based effluent limitation based on BPJ to reflect a subsequently promulgated effluent guideline which is less stringent. The second situation addressed by Section 402(o) arises when a permittee seeks relaxation of an effluent limitation which is based upon a State treatment standard of water quality standard.

Previous limits can be used pursuant to EPA's anti-backsliding regulation. Reissued permits. (1) Except as provided in paragraph (l)(2) of this section when a permit is renewed or reissued. Interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit (unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification or revocation and reissuance under §122.62). (2) In the case of effluent limitations established on the basis of Section 402(a)(1)(B) of the CWA, a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under section 304(b) subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.

(40 CFR 122.44 (l)(2) Establishing limitations, standards, and other permit conditions., 40 CFR Ch. I (7-1-21 Edition))

No permits limits have been made less stringent in the renewal draft permit.

Chlorine Disinfection

Disinfection at this facility is provided by gaseous chlorine. Per the SOP for effluent limitations and the recommendations from the TRC_Calc Model, a monthly limit of 0.153 mg/L and an instantaneous maximum of 0.502 mg/L is established. The TRC_Calc Report may be found in Attachment 4.

This new chlorine limit is more stringent than the limit in the existing permit. The eDMR records do not indicate that the permittee can immediately comply with the new limit. A schedule of compliance will therefore be included with the permit.

(*Section I.A, Note 3, SOP for Clean Water Program, Establishing Effluent Limitations for Individual Sewage Permits, Final November 9, 2012, Revised March 24, 2021, Version 1.9* and *25 PA Code 92a.61(b)*.)

Mass Loadings

Mass loading limits are applicable for publicly owned treatment works. Current policy requires average monthly mass loading limits be established for $CBOD_5$, TSS, and NH_3-N and average weekly mass loading limits be established for $CBOD_5$ and TSS.

Average monthly mass loading limits (lbs./day) are based on the formula: design flow (MGD) x concentration limit (mg/L) x conversion factor (8.34).

(*Section IV, SOP for Clean Water Program, Establishing Effluent Limitations for Individual Sewage Permits, Final November 9, 2012, Revised March 24, 2021, Version 1.9*)

Kiskiminetas-Conemaugh River Watershed TMDL

A TMDL for the Kiskiminetas-Conemaugh River Watershed – of which Dark Shade Creek is a part – was completed on January 29, 2010 for the control of acid mine drainage pollutants: aluminum, iron, manganese, sediment, and pH. In accordance with 40 CFR § 122.44(d)(1)(vii)(B), when developing WQBELs, the permitting authority shall ensure that effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with the assumptions and requirements of any available wasteload allocation (WLA) for the discharge prepared by the State and approved by the EPA pursuant to 40 CFR § 130.7. The Shade Central City Joint Authority STP was not assigned wasteload allocations for aluminum, iron and manganese by the Kiskiminetas-Conemaugh River Watershed TMDL (Appendix G) and is listed as a Negligible Discharge Facility (Appendix C).

Under 25 PA Code § 92a.61(b), effluent concentrations of these pollutants will be reported at least once per year. For Total Iron, effluent data for Total Iron has indicated that effluent limitations are required. A monitoring frequency of 1/week has been established. Please see the WQBELs section for additional information.

For Total Aluminum and Total Manganese, the quarterly monitoring frequency will continue into the next permit cycle to determine if there is reasonable potential at renewal.

Additional Considerations

Sewage discharges will include monitoring, at a minimum, for *E. Coli*, in new and reissued permits, with a monitoring frequency of 1/quarter for design flows ≥0.05 and <1 MGD.

(*Note 12 SOP-Establishing Effluent Limitations for Individual Sewage Permits Final November 9, 2012, Revised February 5, 2024, Version 2.0.* and *25 PA Code 92a.61(b).)*

For POTWs with design flows greater than 2,000 GPD, influent BOD5 and TSS monitoring must be established in the permit, and the monitoring should be consistent with the same frequency and sample type as is used for other effluent parameters. BOD5 and TSS influent loads will once again be reported for monthly average and daily maximum values in lbs/day and monthly average concentrations in mg/L.

(Section *IV.E.8. SOP – New and Reissuance Individual Sewage NPDES Permits Final November 9, 2012, Revised February 3, 2022, Version 2.0.)*

Monitoring frequencies are generally determined using Table 6-3 of the Permit Writer's Manual, however there are exceptions to this guidance. For new parameters introduced into renewed permits, in which the application manager desires for the permittee to collect data to verify reasonable potential for the subsequent permit application review, the application manager may select any reasonable monitoring frequency that is greater than or equal to once per year.

A monitoring frequency of 1/quarter has been selected for these parameters.

(Section *IV.E.5. SOP – New and Reissuance Individual Sewage NPDES Permits Final November 9, 2012, Revised February 3, 2022, Version 2.0.)*

Nutrient monitoring is required by the SOP for Effluent Limitations for Individual Sewage Permits. Monitoring is included to establish the nutrient load from the wastewater treatment facility and the impacts that load may have on the quality of the receiving stream(s). The receiving stream is not listed as impaired for nutrients, therefore at the discretion of the application manager, a monitoring frequency less than the equivalent of conventional pollutants in Table 6-3 of the Permit Writer's Manual has been selected.

(*Section I.A, Note 7 & 8, SOP for Clean Water Program, Establishing Effluent Limitations for Individual Sewage Permits, Final November 9, 2012, Revised March 24, 2021, Version 1.9* and *25 PA Code 92a.61(b)*.)

Rounding-Off Mathematical Values. Section 5 C.2. of the Permit Writers Manual contains general guidelines for rounding conventional and toxic pollutants, with instructions to round down to the nearest decimal place indicated.

General Magnitude	Conventional Pollutants	Toxic Pollutants
<0.01	to nearest 0.001	to nearest 0.001
0.01 - 0.1	to nearest 0.01	to nearest 0.01
0.1 - 1.0	to nearest 0.1	to nearest 0.01
1.0 - 10.0	to nearest 0.5	to nearest 0.01
10.0 - 60.0	to nearest 1.0	to nearest 0.01
60.0 or greater	to nearest 5.0	to nearest 0.10

(Department Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits, Updated June 28, 2023 (Document No. 362-0400-001))

Section 2.C of the Permit Writers Manual contains the procedure for converting average monthly effluent limitations to average weekly, maximum daily, and instantaneous maximum effluent limitations. The average monthly limit is multiplied according to the following chart:

Discharge Solution	Parameters	Average Weekly	Maximum Daily	Instantaneous Maximum Multiplier
Sewage	All	1.5		2.0
Industrial	All		2.0	2.5*

(Department Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits, Updated June 28, 2023 (Document No. 362-0400-001))

Table 5-3: Methods of Expressing Effluent Limits for Sewage Discharges

Discharge Situation	Mass Loadings (lbs/day)			Concentrations (mg/L)				
	Average Monthly	Average Weekly[3]	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily	Instant Maximum[4]	Limit On Flow[6]
A. POTW DISCHARGES:								
1. Technology Based concentration limits	x	x[3]		x	x[3]		x	Yes
2. Water Quality Based limits	x	x[3]		x	x[3]		x	Yes
3. Water Quality Based limits (Toxics)	x		x	x		x		
B. NON-POTW DISCHARGES:								
1. Technology Based concentration limits	x[5]			x			x	Yes
2. Water Quality based limits	x[5]			x			x	Yes

1. This table is for all pollutants, conventional, non-conventional, toxic and all other pollutants that may be regulated by the permit. (Also refer to the toxics management strategy when specifying toxic WQBELs.)

2. X indicates need for an effluent limitation.

3. Only CBOD and TSS limitation.

4. Only include Instantaneous maximum limitations on the DMR forms if grab a sample is specified in the permit, otherwise do not include instantaneous maximum limitations on the DMR.

   Also, the permit page could include the following language for when composite samples are required "Instantaneous maximum limitations are imposed to allow for a grab sample to be collected by the appropriate regulatory agency to determine compliance. The permittee does not have to monitor for the instantaneous maximum limitations, however, if grab samples are collected by the permittee, the results must be reported."

5. This is for all sewage permits with design flow greater than 100,000 gpd since 25 Pa. Code § 94.13 requires flow monitoring.

6. The maximum monthly average flow limitation is the permitted flow that is to be placed in the NPDES permit. Generally, the annual average flow (AAF) is to be used for water quality modeling and to be used to determine the allowable mass loading in NPDES permits (i.e., AAF x 8.34 x mg/l = #/day) (Refer to the Domestic Wastewater Facilities Manual).

(Department Technical Guidance for the Development and Specification of Effluent Limitations and Other Permit Conditions in NPDES Permits, Updated June 28, 2023 (Document No. 362-0400-001))

Monitoring frequency for the proposed effluent limits are based upon Table 6-3, Self-Monitoring Requirements for Sewage Dischargers.

Table 6-3 – Self-Monitoring Requirements for SEWAGE Discharges

Plant Design Flow (MGD)	Flow Monitoring	C-BOD_5 or BOD_5	Suspended Solids	pH	Fecal Coliform	Chlorine Residual	NH_3-N	Phosphorus	DO	Toxics
Single Residence (Individual Permit)	2/year by estimate	2/year*	2/year*	1/month*	2/year*	1/month*	2/year*	2/year*	2/year*	N/A
.0005 to .002	weekly, using average pump rate or weir (a)	1/month*	1/month*	daily*	1/month*	daily*	1/month*	1/month*	daily*	N/A
.002 to .01	weekly, using average pump rate or weir (a)	2/month*	2/month*	daily*	2/month*	daily*	2/month*	2/month*	daily*	N/A
0.01 to 0.1	weekly, using average pump rate or weir (a)	2/month*	2/month*	daily*	2/month*	daily*	2/month*	2/month*	Daily*	1/week*
0.1 to 1.0	**meter**	**1/week****	**1/week****	**daily***	**1/week***	**daily***	**1/week****	**1/week****	**daily***	**1/week******
1.0 to 5.0	meter	2/week***	2/week***	daily*	2/week*	daily*	2/week***	2/week***	daily*	1/week****
5.0 to 25.0	meter	daily***	daily***	daily*	daily*	1/shift*	daily***	daily***	daily*	1/week****
over 25.0	meter	daily***	daily***	1/shift*	daily*	1/shift*	1/shift***	1/shift***	1/shift*	1/week****

* Grab sample-these should be most representative of the effluent and are to be taken at a time when the normal daily maximum flow would reach the sampling point.

** 8-hour composite sample.

*** 24-hour composite sample.

**** Same sample type as for Industrial Process Wastewater (See Table 6-4).

	Parameter Statistical Basis	Proposed Change	Previous Permit	New Permit	Reason for Change
Ammonia-Nitrogen	Summer Ammonia Nitrogen (mg/L) Average Monthly	More stringent (lower effluent limitation).	Report	3.11	WQM 7.0 Report
	Summer Ammonia Nitrogen (mg/L) Weekly Average	Statistical Basis Added	-	4.66	2.C Permit Writer's Manual
	Summer Ammonia Nitrogen (mg/L) Instantaneous Maximum	Statistical Basis Added	-	6.22	WQM 7.0 Report
	Summer Ammonia Nitrogen (lbs/day) Average Monthly	Mass Loading/Stat Basis Added	-	21.0	BCW-PMT-002 IV.B
	Summer Ammonia Nitrogen (lbs/day) Weekly Average	Statistical Basis Added	-	31.0	BPJ
	Winter Ammonia Nitrogen (mg/L) Average Monthly	More stringent (lower effluent limitation).	Report	15.05	WQM 7.0 Report
	Winter Ammonia Nitrogen (mg/L) Weekly Average	Statistical Basis Added	-	22.57	2.C Permit Writer's Manual
	Winter Ammonia Nitrogen (mg/L) Instantaneous Maximum	Statistical Basis Added	-	30.1	WQM 7.0 Report
	Winter Ammonia Nitrogen (lbs/day) Average Monthly	Mass Loading/Stat Basis Added	-	105.0	BCW-PMT-002 IV.B
	Winter Ammonia Nitrogen (lbs/day) Weekly Average	Statistical Basis Added	-	155.0	BPJ
$CBOD_5$	Summer $CBOD_5$ (mg/L) Average Monthly	More stringent (lower effluent limitation).	25.0	10.0	WQM 7.0 Report
	Summer $CBOD_5$ (mg/L) Average Monthly	More stringent (lower effluent limitation).	37.5	15.0	2.C Permit Writer's Manual
	Summer $CBOD_5$ (mg/L) Instantaneous Maximum	More stringent (lower effluent limitation).	50.0	20.0	2.C Permit Writer's Manual
	Summer $CBOD_5$ (lbs/day) Average Monthly	More stringent (lower effluent limitation).	177.0	70.0	BCW-PMT-002 IV.B
	Summer $CBOD_5$ (lbs/day) Weekly Average	More stringent (lower effluent limitation).	266.0	105.0	BCW-PMT-002 IV.B
	Winter $CBOD_5$ (lbs/day) Average Monthly	Round according to Department Guidance	177.0	175.0	5 C.2. Permit Writers Manual
	Winter $CBOD_5$ (lbs/day) Weekly Average	Round according to Department Guidance	266.0	265.0	5 C.2. Permit Writers Manual
TRC	TRC (mg/L) Average Monthly	More stringent (lower effluent limitation).	0.5	0.153	TRC_Calc Report.
	TRC (mg/L) Instantaneous Maximum	More stringent (lower effluent limitation).	1.6	0.502	TRC_Calc Report
Total Iron	Total Iron (mg/L) Average Monthly	More stringent (lower effluent limitation).	Report	2.98	TMS Report
	Total Iron (mg/L) Weekly Average	Statistical Basis Added	-	5.50	TMS Report
	Total Iron (mg/L) Instantaneous Maximum	Statistical Basis Added	-	7.45	TMS Report
	Total Iron Monitoring Frequency	Monitoring Frequency Increased	Quarterly	Weekly	Table 6-3
	E. Coli (No./100 mL) Daily Max	New Monitoring.	-	Report	BCW-PMT-033 Table I.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: 24 Months After Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
TRC	XXX	XXX	XXX	0.153	XXX	0.502	1/day	Grab

Compliance Sampling Location: Outfall 001

Proposed Effluent Limitations and Monitoring Requirements

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

Outfall 001, Effective Period: Permit Effective Date through 24 Months after Permit Effective Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Maximum	Instant. Maximum		
TRC	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab

Compliance Sampling Location: Outfall 001

Proposed Effluent Limitations and Monitoring Requirements

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

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Continuous	Recorded
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	4.0 Inst Min	XXX	XXX	XXX	1/day	Grab
CBOD5 Nov 1 - Apr 30	175.0	265.0	XXX	25.0	37.5	50.0	1/week	8-Hr Composite
CBOD5 May 1 - Oct 31	70.0	105.0	XXX	10.0	15.0	20.0	1/week	8-Hr Composite
BOD5 Raw Sewage Influent	Report	Report	XXX	Report	Report	XXX	1/week	8-Hr Composite
TSS	210.0	315.0	XXX	30.0	45.0	60.0	1/week	8-Hr Composite
TSS Raw Sewage Influent	Report	Report	XXX	Report	Report	XXX	1/week	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	8-Hr Composite
Ammonia-Nitrogen Nov 1 - Apr 30	105.0	155.0	XXX	15.05	22.57	30.1	1/week	8-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	21.0	31.0	XXX	3.11	4.66	6.22	1/week	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	8-Hr Composite

Outfall 001, Continued (from Permit Effective Date through Permit Expiration Date)

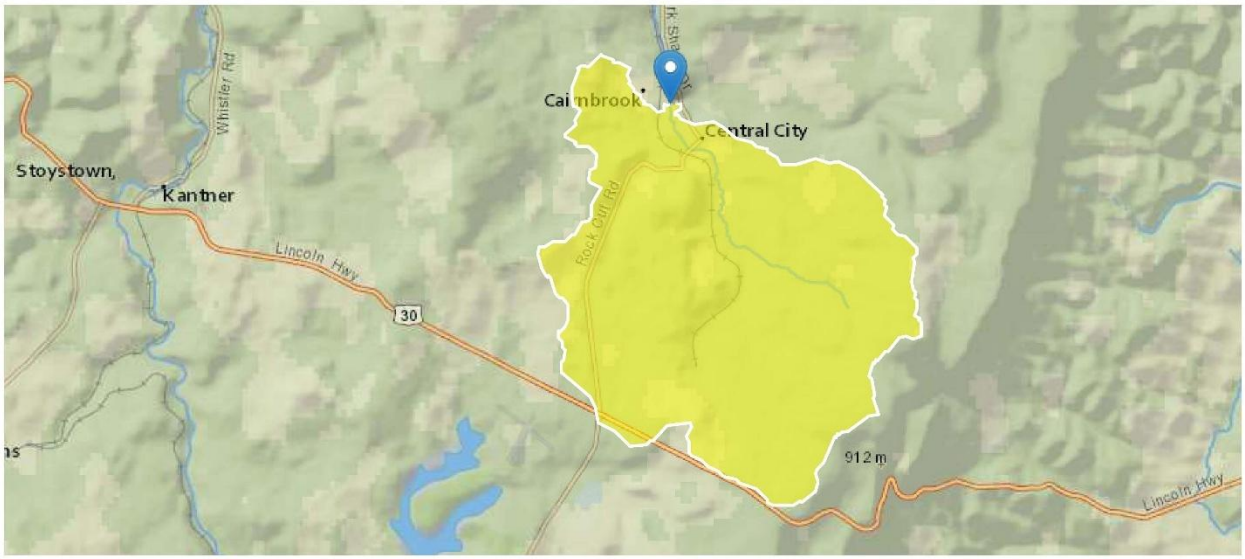
Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Total Aluminum	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	8-Hr Composite
Total Copper	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	8-Hr Composite
Total Iron	XXX	XXX	XXX	2.98	5.50	7.45	1/week	8-Hr Composite
Total Manganese	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	8-Hr Composite

Compliance Sampling Location: Outfall 001

Attachment 1
Stream Characteristics Report

StreamStats Report-Upstream

Region ID: PA
Workspace ID: PA20240927170936979000
Clicked Point (Latitude, Longitude): 40.11730, -78.81051
Time: 2024-09-27 13:10:01 -0400



PA0025810 Outlet Elevation: 2144.86

Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	18.2	square miles
ELEV	Mean Basin Elevation	2523	feet
OUTLETXA83	X coordinate of the outlet, in NAD_1983_Albers,meters	-69091.9435	meters
OUTLETYA83	Y coordinate of the outlet, in NAD_1983_Albers, meters	124351.1784	meters
PRECIP	Mean Annual Precipitation	43	inches

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 3]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	18.2	square miles	2.33	1720
ELEV	Mean Basin Elevation	2523	feet	898	2700
PRECIP	Mean Annual Precipitation	43	inches	38.7	47.9

Low-Flow Statistics Flow Report [Low Flow Region 3]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	2.8	ft^3/s	43	43
30 Day 2 Year Low Flow	3.81	ft^3/s	38	38
7 Day 10 Year Low Flow	1.31	ft^3/s	54	54
30 Day 10 Year Low Flow	1.67	ft^3/s	49	49
90 Day 10 Year Low Flow	2.42	ft^3/s	41	41

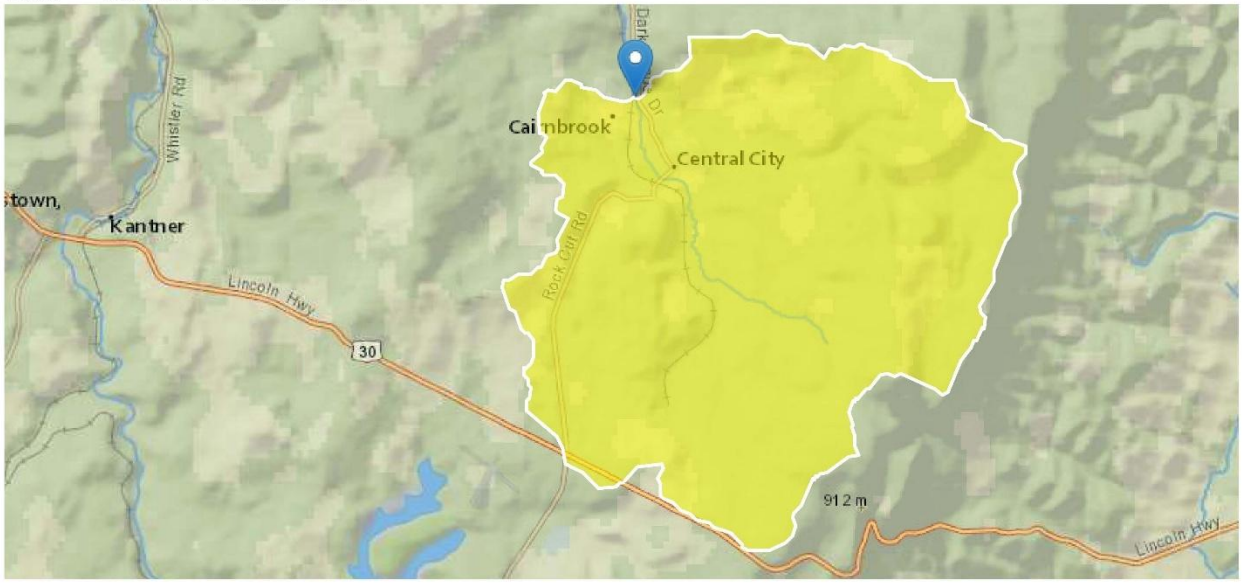
Low-Flow Statistics Citations

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

Application Version: 4.24.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

StreamStats Report-Downstream

Region ID: PA
Workspace ID: PA20240927172208637000
Clicked Point (Latitude, Longitude): 40.12339, -78.81163
Time: 2024-09-27 13:22:34 -0400



PA0025810 Outlet Elevation: 2142.48'

Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	28.7	square miles
ELEV	Mean Basin Elevation	2526	feet
OUTLETXA83	X coordinate of the outlet, in NAD_1983_Albers,meters	-69186.0696	meters
OUTLETYA83	Y coordinate of the outlet, in NAD_1983_Albers, meters	125024.9988	meters
PRECIP	Mean Annual Precipitation	43	inches

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 3]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	28.7	square miles	2.33	1720

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
ELEV	Mean Basin Elevation	2526	feet	898	2700
PRECIP	Mean Annual Precipitation	43	inches	38.7	47.9

Low-Flow Statistics Flow Report [Low Flow Region 3]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct, RMSE: Root Mean Squared Error, PseudoR^2: Pseudo R Squared (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	4.47	ft^3/s	43	43
30 Day 2 Year Low Flow	6.02	ft^3/s	38	38
7 Day 10 Year Low Flow	2.14	ft^3/s	54	54
30 Day 10 Year Low Flow	2.7	ft^3/s	49	49
90 Day 10 Year Low Flow	3.9	ft^3/s	41	41

Low-Flow Statistics Citations

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

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Application Version: 4.24.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

Attachment 2
WQM Model-Warm Seasons

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
18E	45330	DARK SHADE CREEK	**12.340**	2144.86	18.20	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.071	0.00	0.00	0.000	0.000	10.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Shade STP	PA0025810	0.0000	0.8500	0.0000	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	9.17	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
18E	45330	DARK SHADE CREEK	**11.960**	2142.48	18.21	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.071	0.00	0.00	0.000	0.000	10.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

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

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	9.17	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
18E	45330	DARK SHADE CREEK	**11.000**	2137.71	18.22	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.071	0.00	0.00	0.000	0.000	10.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

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

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	9.17	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
18E	45330	DARK SHADE CREEK	**10.500**	2135.05	18.23	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.071	0.00	0.00	0.000	0.000	10.0	0.00	0.00	20.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

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

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	9.17	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Modeling Specifications

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

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
18E	45330	DARK SHADE CREEK

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
12.340	1.30	0.00	1.30	1.3149	0.00119	1.245	12.45	10	0.17	0.138	20.00	7.00
11.960	1.30	0.00	1.30	1.3149	0.00094	1.257	12.57	10	0.17	0.355	20.00	7.00
11.000	1.30	0.00	1.30	1.3149	0.00101	1.254	12.54	10	0.17	0.184	20.00	7.00
Q1-10 Flow												
12.340	0.83	0.00	0.83	1.3149	0.00119	NA	NA	NA	0.15	0.154	20.00	7.00
11.960	0.83	0.00	0.83	1.3149	0.00094	NA	NA	NA	0.15	0.396	20.00	7.00
11.000	0.83	0.00	0.83	1.3149	0.00101	NA	NA	NA	0.15	0.205	20.00	7.00
Q30-10 Flow												
12.340	1.77	0.00	1.77	1.3149	0.00119	NA	NA	NA	0.18	0.126	20.00	7.00
11.960	1.77	0.00	1.77	1.3149	0.00094	NA	NA	NA	0.18	0.323	20.00	7.00
11.000	1.77	0.00	1.77	1.3149	0.00101	NA	NA	NA	0.18	0.167	20.00	7.00

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
18E	45330	DARK SHADE 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
12.340	Shade STP	9.67	15.79	9.67	15.79	0	0
11.960		NA	NA	9.67	NA	NA	NA
11.000		NA	NA	9.67	NA	NA	NA

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
12.340	Shade STP	1.92	4.49	1.92	4.49	0	0
11.960		NA	NA	1.92	NA	NA	NA
11.000		NA	NA	1.92	NA	NA	NA

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
12.34	Shade STP	10.38	10.38	3.11	3.11	4	4	0	0
11.96		NA	NA	NA	NA	NA	NA	NA	NA
11.00		NA	NA	NA	NA	NA	NA	NA	NA

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
18E	45330	DARK SHADE CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
12.340	0.850	20.000	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
12.449	1.245	10.000	0.169
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
6.21	0.519	1.57	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.570	1.901	Tsivoglou	5
Reach Travel Time (days)			
0.138			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.014	6.17	1.55	6.50
0.028	6.13	1.54	6.44
0.041	6.08	1.52	6.38
0.055	6.04	1.51	6.32
0.069	6.00	1.49	6.27
0.083	5.95	1.48	6.21
0.096	5.91	1.46	6.16
0.110	5.87	1.45	6.11
0.124	5.83	1.44	6.07
0.138	5.78	1.42	6.02

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
11.960	0.850	20.000	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
12.571	1.257	10.000	0.165
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
5.78	0.505	1.42	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.025	1.480	Tsivoglou	5
Reach Travel Time (days)			
0.355			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.035	5.68	1.39	5.88
0.071	5.58	1.35	5.75
0.106	5.48	1.32	5.63
0.142	5.38	1.29	5.52
0.177	5.29	1.26	5.43
0.213	5.19	1.22	5.35
0.248	5.10	1.19	5.27
0.284	5.01	1.17	5.21
0.319	4.92	1.14	5.15
0.355	4.84	1.11	5.11

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
18E	45330	DARK SHADE CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
11.000	0.850	20.000	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
12.537	1.254	10.000	0.166
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
4.83	0.489	1.11	0.700
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.107	1.593	Tsivoglou	5
Reach Travel Time (days)			
0.184			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.018	4.79	1.09	5.10
0.037	4.75	1.08	5.09
0.055	4.71	1.07	5.08
0.073	4.66	1.05	5.07
0.092	4.62	1.04	5.07
0.110	4.58	1.03	5.07
0.129	4.54	1.01	5.07
0.147	4.50	1.00	5.07
0.165	4.46	0.99	5.07
0.184	4.42	0.98	5.07

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
18E	45330	DARK SHADE 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)
12.340	Shade STP	PA0025810	0.000	CBOD5	10.38		
				NH3-N	3.11	6.22	
				Dissolved Oxygen			4

Attachment 2
WQM Model-Cool Seasons

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
18E	45330	DARK SHADE CREEK	**12.340**	2144.86	18.20	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.143	0.00	0.00	0.000	0.000	10.0	0.00	0.00	5.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Shade STP	PA0025810	0.0000	0.8500	0.0000	0.000	15.00	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	4.00	12.80	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
18E	45330	DARK SHADE CREEK	**11.960**	2142.48	18.21	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.143	0.00	0.00	0.000	0.000	10.0	0.00	0.00	5.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

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

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	12.80	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
18E	45330	DARK SHADE CREEK	**11.000**	2137.71	18.22	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.143	0.00	0.00	0.000	0.000	10.0	0.00	0.00	5.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

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

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	12.80	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
18E	45330	DARK SHADE CREEK	**10.500**	2135.05	18.23	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.143	0.00	0.00	0.000	0.000	10.0	0.00	0.00	5.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

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

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	12.80	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
18E	45330	DARK SHADE CREEK	**10.000**	2130.20	18.24	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.143	0.00	0.00	0.000	0.000	10.0	0.00	0.00	5.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

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

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	12.80	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Modeling Specifications

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

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
18E	45330	DARK SHADE CREEK

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (°C)	Analysis pH
Q7-10 Flow												
12.340	2.60	0.00	2.60	1.3149	0.00119	1.361	13.61	10	0.21	0.110	8.36	7.00
11.960	2.60	0.00	2.60	1.3149	0.00094	1.374	13.74	10	0.21	0.283	8.36	7.00
11.000	2.60	0.00	2.60	1.3149	0.00101	1.37	13.7	10	0.21	0.146	8.36	7.00
10.500	2.60	0.00	2.60	1.3149	0.00184	1.337	13.37	10	0.22	0.139	8.36	7.00
Q1-10 Flow												
12.340	1.66	0.00	1.66	1.3149	0.00119	NA	NA	NA	0.18	0.128	9.42	7.00
11.960	1.66	0.00	1.66	1.3149	0.00094	NA	NA	NA	0.18	0.330	9.41	7.00
11.000	1.67	0.00	1.67	1.3149	0.00101	NA	NA	NA	0.18	0.171	9.41	7.00
10.500	1.67	0.00	1.67	1.3149	0.00184	NA	NA	NA	0.19	0.162	9.41	7.00
Q30-10 Flow												
12.340	3.53	0.00	3.53	1.3149	0.00119	NA	NA	NA	0.24	0.097	7.71	7.00
11.960	3.54	0.00	3.54	1.3149	0.00094	NA	NA	NA	0.23	0.251	7.71	7.00
11.000	3.54	0.00	3.54	1.3149	0.00101	NA	NA	NA	0.24	0.130	7.71	7.00
10.500	3.54	0.00	3.54	1.3149	0.00184	NA	NA	NA	0.25	0.124	7.71	7.00

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
18E	45330	DARK SHADE 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
12.340	Shade STP	20.59	46.63	20.59	46.63	0	0
11.960		NA	NA	20.59	NA	NA	NA
11.000		NA	NA	20.59	NA	NA	NA
10.500		NA	NA	20.59	NA	NA	NA

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
12.340	Shade STP	4.08	15.05	4.08	15.05	0	0
11.960		NA	NA	4.08	NA	NA	NA
11.000		NA	NA	4.08	NA	NA	NA
10.500		NA	NA	4.08	NA	NA	NA

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
12.34	Shade STP	25	25	15.05	15.05	4	4	0	0
11.96		NA	NA	NA	NA	NA	NA	NA	NA
11.00		NA	NA	NA	NA	NA	NA	NA	NA
10.50		NA	NA	NA	NA	NA	NA	NA	NA

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
18E	45330	DARK SHADE CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
12.340	0.850	8.360	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
13.605	1.361	10.000	0.211
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
9.73	1.286	5.06	0.286
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
9.843	1.808	Tsivoglou	5
Reach Travel Time (days)			
0.110			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.011	9.65	5.04	9.69
0.022	9.57	5.02	9.54
0.033	9.49	5.01	9.39
0.044	9.41	4.99	9.25
0.055	9.33	4.98	9.11
0.066	9.26	4.96	8.98
0.077	9.18	4.95	8.85
0.088	9.10	4.93	8.72
0.099	9.03	4.92	8.60
0.110	8.95	4.90	8.48

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
11.960	0.850	8.358	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
13.738	1.374	10.000	0.207
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
8.95	1.252	4.90	0.286
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.483	1.407	Tsivoglou	5
Reach Travel Time (days)			
0.283			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.028	8.77	4.86	8.16
0.057	8.59	4.82	7.86
0.085	8.41	4.78	7.58
0.113	8.24	4.74	7.31
0.141	8.07	4.70	7.06
0.170	7.90	4.67	6.83
0.198	7.74	4.63	6.61
0.226	7.58	4.59	6.41
0.255	7.43	4.55	6.22
0.283	7.27	4.52	6.05

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
18E	45330	DARK SHADE CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
11.000	0.850	8.357	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
13.702	1.370	10.000	0.209
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
7.27	1.211	4.52	0.286
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.052	1.515	Tsivoglou	5
Reach Travel Time (days)			
0.146			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.015	7.20	4.50	5.98
0.029	7.12	4.48	5.91
0.044	7.05	4.46	5.84
0.059	6.98	4.44	5.78
0.073	6.90	4.42	5.72
0.088	6.83	4.40	5.66
0.103	6.76	4.39	5.61
0.117	6.69	4.37	5.55
0.132	6.62	4.35	5.50
0.146	6.55	4.33	5.46

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
10.500	0.850	8.356	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
13.366	1.337	10.000	0.219
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
6.55	1.181	4.33	0.286
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.459	2.905	Tsivoglou	5
Reach Travel Time (days)			
0.139			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.014	6.49	4.31	5.54
0.028	6.43	4.30	5.61
0.042	6.37	4.28	5.69
0.056	6.31	4.26	5.76
0.070	6.24	4.24	5.83
0.084	6.18	4.23	5.90
0.098	6.13	4.21	5.97
0.111	6.07	4.19	6.04
0.125	6.01	4.18	6.10
0.139	5.95	4.16	6.16

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
18E	45330	DARK SHADE 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)
12.340	Shade STP	PA0025810	0.000	CBOD5	25		
				NH3-N	15.05	30.1	
				Dissolved Oxygen			4

Attachment 3
Pre-Draft Survey, ToxConc Report, and TMS Report

Pennsylvania
Department of
Environmental Protection

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
PRE-DRAFT PERMIT SURVEY FOR TOXIC POLLUTANTS

Permittee Name: **Shade Central City Joint Authority** Permit No.: **PA0025810**

Pollutant(s) identified by DEP that may require WQBELs: Copper, Iron, Lead, Manganese

Is the permittee aware of the source(s) of the pollutant(s)? ☐ Yes ☒ No ☐ Suspected

If Yes or Suspected, describe the known or suspected source(s) of pollutant(s) in the effluent.

Has the permittee completed any studies in the past to control or treat the pollutant(s)? ☐ Yes ☒ No

If Yes, describe prior studies and results:

Does the permittee believe it can achieve the proposed WQBELs now? ☒ Yes ☐ No ☐ Uncertain

If No, describe the activities, upgrades or process changes that would be necessary to achieve the WQBELs, if known.

Estimated date by which the permittee could achieve the proposed WQBELs: _____ ☐ Uncertain

Will the permittee conduct additional sampling for the pollutant(s) to supplement the application? ☒ Yes ☐ No

Check the appropriate box(es) below to indicate site-specific data that have been collected by the permittee in the past. If any of these data have not been submitted to DEP, please attach to this survey.

☐	Discharge pollutant concentration coefficient(s) of variability	Year(s) Studied:
☐	Discharge and background Total Hardness concentrations (metals)	Year(s) Studied:
☐	Background / ambient pollutant concentrations	Year(s) Studied:
☐	Chemical translator(s) (metals)	Year(s) Studied:
☐	Slope and width of receiving waters	Year(s) Studied:
☐	Velocity of receiving waters at design conditions	Year(s) Studied:
☐	Acute and/or chronic partial mix factors (mixing at design conditions)	Year(s) Studied:
☐	Volatilization rates (highly volatile organics)	Year(s) Studied:
☐	Site-specific criteria (e.g., Water Effect Ratio or related study)	Year(s) Studied:

Please submit this survey to the DEP regional office that is reviewing the permit application within 30 days of receipt.

Laboratory Results

Geochemical Testing

Date: *11-Dec-24*

CLIENT:	SHADE CENTRAL CITY JOINT AUTH	**Client Sample ID:**	Effluent
Lab Order:	G2412200		
Project:		**Sampled By:**	SCCJA
Lab ID:	G2412200-001	**Collection Date:**	12/3/2024 3:00:00 PM
Matrix:	WASTE WATER	**Received Date:**	12/4/2024 11:54:33 AM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC METALS		Analyst: **RLR**				**EPA 200.2 REV 2.8**	**EPA 200.8 REV 5.4**
Copper	0.003	0.001		mg/L	1	12/05/24 11:10 AM	12/06/24 10:41 AM
Lead	< 0.001	0.001		mg/L	1	12/05/24 11:10 AM	12/06/24 10:41 AM
Manganese	0.147	0.005		mg/L	5	12/05/24 11:10 AM	12/09/24 9:18 AM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *16-Dec-24*

CLIENT:	SHADE CENTRAL CITY JOINT AUTH	**Client Sample ID:**	Effluent
Lab Order:	G2412589		
Project:		**Sampled By:**	SCCJA
Lab ID:	G2412589-001	**Collection Date:**	12/10/2024 3:00:00 PM
Matrix:	WASTE WATER	**Received Date:**	12/11/2024 10:10:57 AM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC METALS		Analyst: **RLR**				**EPA 200.2 REV 2.8**	**EPA 200.8 REV 5.4**
Copper	2.9	1.0		µg/L	1	12/12/24 9:30 AM	12/13/24 8:23 AM
Lead	< 1.0	1.0		µg/L	1	12/12/24 9:30 AM	12/13/24 8:23 AM
Manganese	154	5.0		µg/L	5	12/12/24 9:30 AM	12/13/24 9:45 AM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *26-Dec-24*

CLIENT:	SHADE CENTRAL CITY JOINT AUTH	**Client Sample ID:**	Effluent
Lab Order:	G2412A68		
Project:		**Sampled By:**	SCCJA
Lab ID:	G2412A68-001	**Collection Date:**	12/17/2024 3:00:00 PM
Matrix:	WASTE WATER	**Received Date:**	12/18/2024 1:07:53 PM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC METALS		Analyst: **RLR**				**EPA 200.2 REV 2.8**	**EPA 200.8 REV 5.4**
Copper	3.0	1.0		µg/L	1	12/19/24 9:20 AM	12/20/24 10:18 AM
Lead	< 1.0	1.0		µg/L	1	12/19/24 9:20 AM	12/23/24 8:30 AM
Manganese	220	10		µg/L	10	12/19/24 9:20 AM	12/23/24 10:13 AM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Laboratory Results

Geochemical Testing

Date: *31-Dec-24*

CLIENT:	SHADE CENTRAL CITY JOINT AUTH	**Client Sample ID:**	Effluent
Lab Order:	G2412C82		
Project:		**Sampled By:**	SCCJA
Lab ID:	G2412C82-001	**Collection Date:**	12/22/2024 3:00:00 PM
Matrix:	WASTE WATER	**Received Date:**	12/23/2024 10:04:59 AM

Analyses	Result	QL	Q	Units	DF	Date Prepared	Date Analyzed
INORGANIC METALS		Analyst: **RLR**				**EPA 200.2 REV 2.8**	**EPA 200.8 REV 5.4**
Copper	3.0	1.0		µg/L	1	12/26/24 10:30 AM	12/30/24 10:24 AM
Lead	< 1.0	1.0		µg/L	1	12/26/24 10:30 AM	12/30/24 9:30 AM
Manganese	263	5.0		µg/L	5	12/26/24 10:30 AM	12/30/24 11:04 AM

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Facility:	Shade Central City Joint Authority WWTP
NPDES #:	PA0025810
Outfall No:	001
n (Samples/Month):	4
Reviewer/Permit Engineer:	

Parameter Name	Total Aluminum	Total Iron	Total Manganese									
Units	µg/L	µg/L	µg/L									
Detection Limit	100	10	5									
Sample Date	*When entering values below the detection limit, enter "ND" or use the < notation (eg. <0.02)*											
12/31/2016	<100	240	60									
3/31/2017	<100	810	370									
6/30/2017	<100	410	180									
9/30/2017	<100	80	100									
12/31/2017	<100	370	100									
3/31/2018	<100	1340	430									
6/30/2018	<100	590	190									
9/30/2018	<100	340	60									
12/31/2018	<100	490	150									
3/31/2019	<100	920	360									
6/30/2019	<100	540	240									
9/30/2019	<100	70	20									
12/31/2019	<100	90	20									
3/31/2020	<100	970	460									
6/30/2020	<100	1360	370									
9/30/2020	<100	70	10									
12/31/2020	<100	90	30									
3/31/2021	<100	970	730									
6/30/2021	<100	480	90									
9/30/2021	<100	190	50									
12/31/2021	<100	210	60									
3/31/2022	<100	1020	320									
6/30/2022	<100	800	200									
9/30/2022	<100	50	20									
12/31/2022	<100	490	200									
3/31/2023	<100	910	440									
6/30/2023	<100	660	240									
9/30/2023	<100	90	40									
12/31/2023	<100	240	90									
3/31/2024	<100	870	310									
Renewal			320									
Additonal Test 1			147									
Additonal Test 1			154									
Additonal Test 1			220									
Additonal Test 1			263									

	Facility:	Shade Central City Joint Authority WWTP												
	NPDES #:	PA0025810												
	Outfall No:	001												
	n (Samples/Month):	4												
Parameter Name	Total Aluminum	Total Iron	Total Manganese											
Number of Samples	30	30	35											
Samples Nondetected	30	0	0											
LOGNORMAL														
Log MEAN	NA	5.8738928	4.8756493											
Log VAR.		1.0254779	1.1484546											
(LTA) [E(x)]		593.8529984	232.7294476											
Variance [V(x)]		630709.4441766	116630.0441999											
CV (raw)		1.3373212	1.4674181											
CV (n)		0.6686606	0.7337091											
Monthly Avg. (99%, n-day)		2030.1599464	863.5257117											
DELTA-LOGNORMAL														
Delta-Log MEAN	#DIV/0!	NA	NA											
Delta-Log VAR.	#DIV/0!													
(LTA) [E(x)]	#DIV/0!													
Variance [V(x)]	#DIV/0!													
CV (raw)	#DIV/0!													
Delta-Log VAR. (n)	#DIV/0!													
A, Table E-2, TSD	#DIV/0!													
B, Table E-2, TSD	#DIV/0!													
C, Table E-2, TSD	#DIV/0!													
Delta-Log MEAN (n)	#DIV/0!													
phi (Φ)	#DIV/0!													
Z*	#DIV/0!													
Monthly Avg. (99%, n-day)	#DIV/0!													
NORMAL														
MEAN	NA	NA	NA											
VAR.														
(LTA) [E(x)]														
Variance [V(x)]														
CV (raw)														
CV (n)														
Monthly Avg. (99%, n-day)														

[y(i) - μ)]^2	
0.1546486	0.6104371
0.6775618	1.0771403
0.0202391	0.1006841
2.2256648	0.0731590
0.0015690	0.0731590
1.7596873	1.4116669
0.2562685	0.1379192
0.0020203	0.6104371
0.1027283	0.0182212
0.9034138	1.0210187
0.1744535	0.3660124
2.6419173	3.5340881
1.8881046	3.5340881
1.0068180	1.5764740
1.7992122	1.0771403
2.6419173	6.6206595
1.8881046	2.1740085
1.0068180	2.9494463
0.0899360	0.1412554
0.3929644	0.9285757
0.2775028	0.6104371
1.1102101	0.7968627
0.6572651	0.1786483
3.8489332	3.5340881
0.1027283	0.1786483
0.8827575	1.4668248
0.3823530	0.3660124
1.8881046	1.4084227
0.1546486	0.1412554
0.8003098	0.7411884
	0.7968627
	0.0131752
	0.0260188
	0.2683014
	0.4851188

Parameter Name	Total Aluminum	Total Iron	Total Manganese
y(i)			
		5.4806389	4.0943446
		6.6970342	5.9135030
		6.0161572	5.1929569
		4.3820266	4.6051702
		5.9135030	4.6051702
		7.2004249	6.0637852
		6.3801225	5.2470241
		5.8289456	4.0943446
		6.1944054	5.0106353
		6.8243737	5.8861040
		6.2915691	5.4806389
		4.2484952	2.9957323
		4.4998097	2.9957323
		6.8772961	6.1312265
		7.2152400	5.9135030
		4.2484952	2.3025851
		4.4998097	3.4011974
		6.8772961	6.5930445
		6.1737861	4.4998097
		5.2470241	3.9120230
		5.3471075	4.0943446
		6.9275579	5.7683210
		6.6846117	5.2983174
		3.9120230	2.9957323
		6.1944054	5.2983174
		6.8134446	6.0867747
		6.4922398	5.4806389
		4.4998097	3.6888795
		5.4806389	4.4998097
		6.7684932	5.7365723
			5.7683210
			4.9904326
			5.0369526
			5.3936275
			5.5721540

Reviewer/Permit Engineer:

Facility: Shade Central City Joint Authority WWTP
NPDES #: PA0025810
Outfall No: 001
n (Samples/Month): 4

Parameter	Distribution Applied	Coefficient of Variation (daily)	Avg. Monthly
Total Aluminum (µg/L)	Delta-Lognormal	#DIV/0!	#DIV/0!
Total Iron (µg/L)	Lognormal	1.3373212	2030.1599464
Total Manganese (µg/L)	Lognormal	1.4674181	863.5257117

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DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Discharge Information

Instructions | Discharge | Stream

Facility: **Shade Central City JA WWTP** NPDES Permit No.: **PA0025810** Outfall No.: **001**

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

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.85	100	7						

					0 if left blank		*0.5 if left blank*		*0 if left blank*			*1 if left blank*	
	Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Group 1	Total Dissolved Solids (PWS)	mg/L		236									
	Chloride (PWS)	mg/L		42.5									
	Bromide	mg/L	<	0.02									
	Sulfate (PWS)	mg/L		52.4									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L	<	100									
	Total Antimony	µg/L											
	Total Arsenic	µg/L											
	Total Barium	µg/L											
	Total Beryllium	µg/L											
	Total Boron	µg/L											
	Total Cadmium	µg/L											
	Total Chromium (III)	µg/L											
	Hexavalent Chromium	µg/L											
	Total Cobalt	µg/L											
	Total Copper	µg/L		3									
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L		2030			1.33						
	Total Lead	µg/L	<	1									
	Total Manganese	µg/L		863			1.46						
	Total Mercury	µg/L											
	Total Nickel	µg/L											
	Total Phenols (Phenolics) (PWS)	µg/L											
	Total Selenium	µg/L											
	Total Silver	µg/L											
	Total Thallium	µg/L											
	Total Zinc	mg/L	<	0.01									
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

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

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

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Toxics Management Spreadsheet
Version 1.4, May 2023

Stream / Surface Water Information

Shade Central City JA WWTP, NPDES Permit No. PA0025810, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Dark Shade 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	045330	12.34	2144.86	18.2			Yes
End of Reach 1	045330	10	2130.2	18.24			Yes

Q_{7-10}

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	12.34	0.0714										100	7		
End of Reach 1	10	0.0714													

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	12.34														
End of Reach 1	10														

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Toxics Management Spreadsheet
Version 1.4, May 2023

Model Results

Shade Central City JA WWTP, NPDES Permit No. PA0025810, Outfall 001

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

☑ ***Hydrodynamics***

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

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
12.34	1.30		1.30	1.315	0.001	0.619	25.018	40.385	0.169	0.848	12.619
10	1.30		1.302336								

Q_h

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
12.34	9.34		9.34	1.315	0.001	1.15	25.018	21.763	0.371	0.386	15.527
10	9.36		9.36								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 12.619 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

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	1,491	
Total Copper	0	0		0	13.439	14.0	27.8	Chem Translator of 0.96 applied
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	64.581	81.6	162	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	117.180	120	238	Chem Translator of 0.978 applied

☑ ***CFC*** CCT (min): 12.619 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

Pollutants	Stream Conc	Stream	Trib Conc	Fate	WQC	WQ Obj	WLA (µg/L)	Comments

Pollutants	Conc (µg/L)	CV	(µg/L)	Coef	(µg/L)	(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	N/A	N/A	N/A	
Total Copper	0	0		0	8.956	9.33	18.5	Chem Translator of 0.96 applied
Total Iron	0	0		0	1,500	1,500	2,982	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.517	3.18	6.33	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	118.139	120	238	Chem Translator of 0.986 applied

☑ ***THH*** CCT (min): 12.619 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Copper	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	N/A	N/A	N/A	
Total Manganese	0	0		0	1,000	1,000	1,988	
Total Zinc	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 15.527 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

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

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

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML	MDL	AML	MDL	IMAX	Units	Governing	WQBEL	Comments

Pollutants	(lbs/day)	(lbs/day)	AML	MDL	MAX	Units	WQBEL	Basis	Comments
Total Aluminum	Report	Report	Report	Report	Report	µg/L	956	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Copper	Report	Report	Report	Report	Report	µg/L	17.8	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Iron	21.1	39.1	2,982	5,509	7,456	µg/L	2,982	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Manganese	Report	Report	Report	Report	Report	µg/L	1,988	THH	Discharge Conc > 10% WQBEL (no RP)

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

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

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	N/A	N/A	PWS Not Applicable
Chloride (PWS)	N/A	N/A	PWS Not Applicable
Bromide	N/A	N/A	No WQS
Sulfate (PWS)	N/A	N/A	PWS Not Applicable
Total Lead	N/A	N/A	Discharge Conc < TQL
Total Zinc	0.15	mg/L	Discharge Conc ≤ 10% WQBEL

Attachment 4
TRC_Calc Report

TRC_CALC.xls

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

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

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 0.334	1.3.2.iii	WLA cfc = 0.318
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.125	5.1d	LTA_cfc = 0.185

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.153	AFC
		INST MAX LIMIT (mg/l) = 0.502	

WLA afc	**(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...** **...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)**
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	**(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...** **...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)**
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	**1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)**