pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southcentral Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0081655**
Facility Type	**Industrial**	APS ID	**710519**
Major / Minor	**Minor**	Authorization ID	**1445716**

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

Applicant and Facility Information

Applicant Name	**Philadelphia Mixing Solutions Ltd**	Facility Name	**Philadelphia Mixing Solutions**
Applicant Address	1221 E Main Street	Facility Address	1221 East Main Street
	Palmyra, PA 17078-9506		Palmyra, PA 17078
Applicant Contact	Justin Loser	Facility Contact	Mark Garrett
Applicant Phone	(717) 832-8871	Facility Phone	(717) 832-8871
Client ID	278225	Site ID	245886
SIC Code	3569	Municipality	Palmyra Borough
SIC Description	Manufacturing - General Industrial Machinery, Nec	County	Lebanon
Date Application Received	June 29, 2023	EPA Waived?	Yes
Date Application Accepted	July 10, 2023	If No, Reason	

Purpose of Application: This is an application for NPDES renewal.

Approve	Deny	Signatures	Date
X		Nicholas Hong, P.E. / Environmental Engineer Nick Hong (via electronic signature)	July 23, 2024
x		Daniel W. Martin, P.E. / Environmental Engineer Manager Maria D. Bebenek for	July 25, 2024
x		Maria D. Bebenek, P.E. / Environmental Program Manager Maria D. Bebenek	July 25, 2024

Summary of Review

The application submitted by the applicant requests a NPDES renewal permit for the Philadelphia Mixing Solutions located at 1221 East Main Street, Palmyra, PA 17078 in Lebanon County, municipality of Palmyra Borough. The existing permit became effective on July 1, 2018 and expired on June 30, 2023. The application for renewal was received by DEP Southcentral Regional Office (SCRO) on June 29, 2023.

The purpose of this Fact Sheet is to present the basis of information used for establishing the proposed NPDES permit effluent limitations. The Fact Sheet includes a description of the facility, a description of the facility's receiving waters, a description of the facility's receiving waters attainment/non-attainment assessment status, and a description of any changes to the proposed monitoring/sampling frequency. Section 6 provides the justification for the proposed NPDES effluent limits derived from technology based effluent limits (TBEL), water quality based effluent limits (WQBEL), total maximum daily loading (TMDL), antidegradation, anti-backsliding, and/or whole effluent toxicity (WET). A brief summary of the outlined descriptions has been included in the Summary of Review section.

The subject facility is a 0.50 MGD treatment facility. The applicant does not anticipate any proposed upgrades to the treatment facility in the next five years. The NPDES application has been processed as an Industrial Wastewater Facility (Minor Facility without ELG) due to the type of wastewater and the design flow rate for the facility. The applicant disclosed the Act 14 requirement to Lebanon County Commissioner Office and Palmyra Township and the notice was received by the parties on June 29, 2023.

Utilizing the DEP's web-based Emap-PA information system, the receiving waters has been determined to be Killinger Creek. The sequence of receiving streams that the Killinger Creek discharges into are Quittapahilla Creek, Trib 09745 To Swatara Creek, Swatara Creek, and the Susquehanna River which eventually drains into the Chesapeake Bay. The subject site is not subject to the Chesapeake Bay implementation requirements. The receiving water has protected water usage for trout stocking fish (TSF) and migratory fishes (MF). No Class A Wild Trout fisheries are impacted by this discharge. The absence of high quality and/or exceptional value surface waters removes the need for an additional evaluation of anti-degradation requirements.

The Killinger Creek is a Category 4a and 5 stream listed in the 2024 Integrated List of All Waters (formerly 303d Listed Streams). This stream is an impaired stream (1) for aquatic life due to nutrients from agriculture and (2) impaired for recreation uses due to pathogens from an unknown source. The receiving waters is subject to a total maximum daily load (TMDL) plan to improve water quality in the subject facility's watershed. The local TMDL is Quittapahilla Creek Watershed TMDL.

The existing permit and proposed permit differ as follows:

- No changes to the monitoring frequency or effluent limits.

Sludge use and disposal description and location(s): The facility did not have any sludge/biosolids disposal in 2023.

The proposed permit will expire five (5) years from the effective date.

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

Any additional information or public review of documents associated with the discharge or facility may be available at PA DEP Southcentral Regional Office (SCRO), 909 Elmerton Avenue, Harrisburg, PA 17110. To make an appointment for file review, contact the SCRO File Review Coordinator at 717.705.4700.

1.0 Applicant

1.1 General Information

This fact sheet summarizes PA Department of Environmental Protection's review for the NPDES renewal for the following subject facility.

Facility Name:	Philadelphia Mixing Solutions, LLC
NPDES Permit #	PA0081655
Physical Address:	1221 East Main Street Palmyra, PA 17078
Mailing Address:	1221 East Main Street Palmyra, PA 17078
Contact:	Justin Loser Site Leader (717) 832-8871 Justin.loser@spxflow.com
Consultant:	Shannon Lonergan Senior Professional Antea Group Shannon.lonergan@anteagroup.us (206) 650-3368

1.2 Permit History

Description of Facility

Philadelphia Mixers designs, builds, and repairs industrial mixing equipment, including aerators, agitators, and static mixers. The facility's operational area includes two main buildings used for operations, a large two-story barn used for additional material storage, a few small ancillary structures, paved parking areas, and vegetated areas along the perimeter of the facility, including two stormwater basins.

The two main operational buildings are the office/warehouse building and the test Lab building. The Test Lab building includes three main rooms:

- Northern Room- used for small-scale research and development (R&D) activities.
- Adjoining Room- Includes a small water tank that is used for product load testing (approximately 5 to 10% of final products assembled at the facility are tested here)
- Southern Room- Includes two larger water tanks for testing floating aeration devices in a full-scale environment. The wastewater from the large test tank (LTT, 750,000-gallons) in the test lab is managed under individual NPDES Permit No. PA0081655.

Non-hazardous wastes stored outside include covered dumpsters for trash and recycling in the open paved area on the south-central side of the main building and a scrap metal shed on the northern side of the warehouse area. The scrap metal shed includes a dumpster for scrap metal as well as space for other larger items awaiting disposal, reuse, or recycling.

The facility include testing floating aeration devices in several water tanks of carrying sizes. Philadelphia Mixers draws in municipal water for the test tanks, and with the exception of the largest all water used

during testing is discharged to sanitary sewer (Borough of Palmyra) over the course of an average of eight hours. If the large tank is completely full it is discharged over two days to remain within the permitted discharge limit of 500,000-gallons per day (GPD).

Permit submittal included the following information.

- NPDES Application
- Flow Diagrams
- Effluent Sample Data

2.0 Treatment Facility Summary

2.1.1 Site location

The physical address for the facility is 1221 East Main Street, Palmyra, PA 17078. A topographical and an aerial photograph of the facility are depicted as Figure 1 and Figure 2.

Figure 1: Topographical map of the subject facility

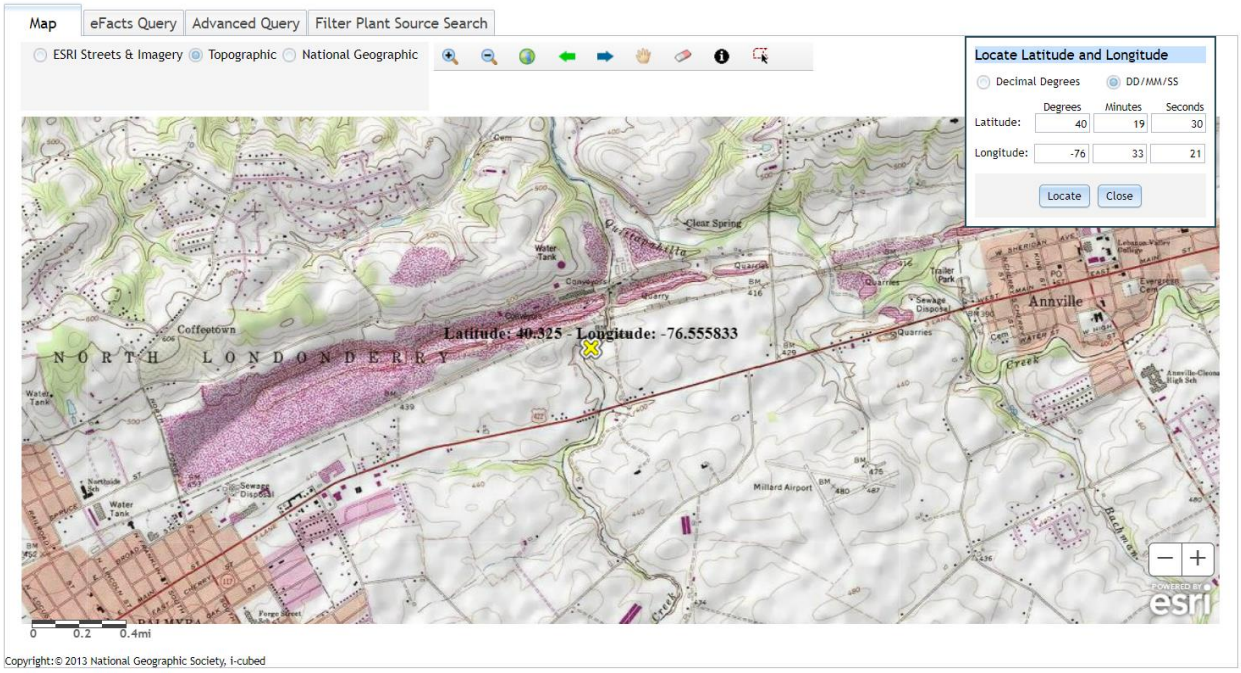
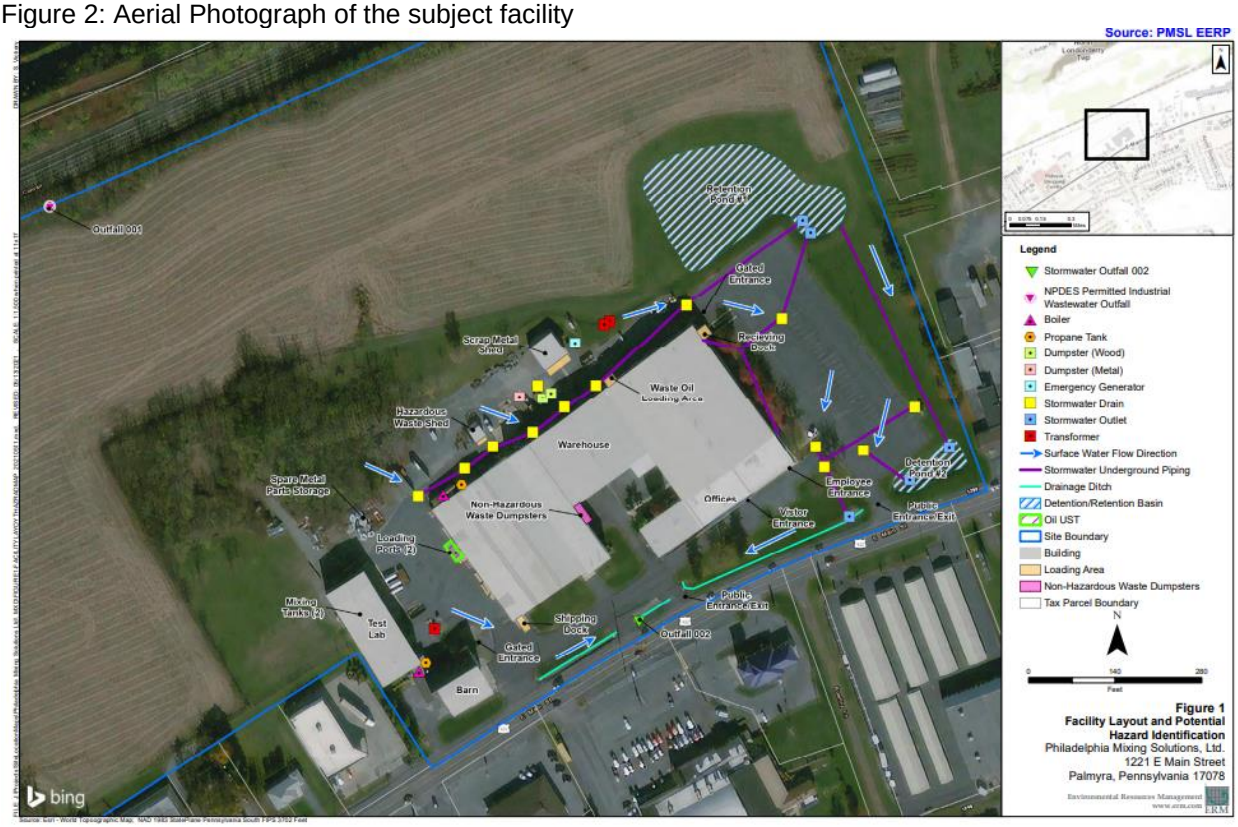


Figure 2: Aerial Photograph of the subject facility



2.1.2 Sources of Wastewater/Stormwater

The source of water is municipal city water.

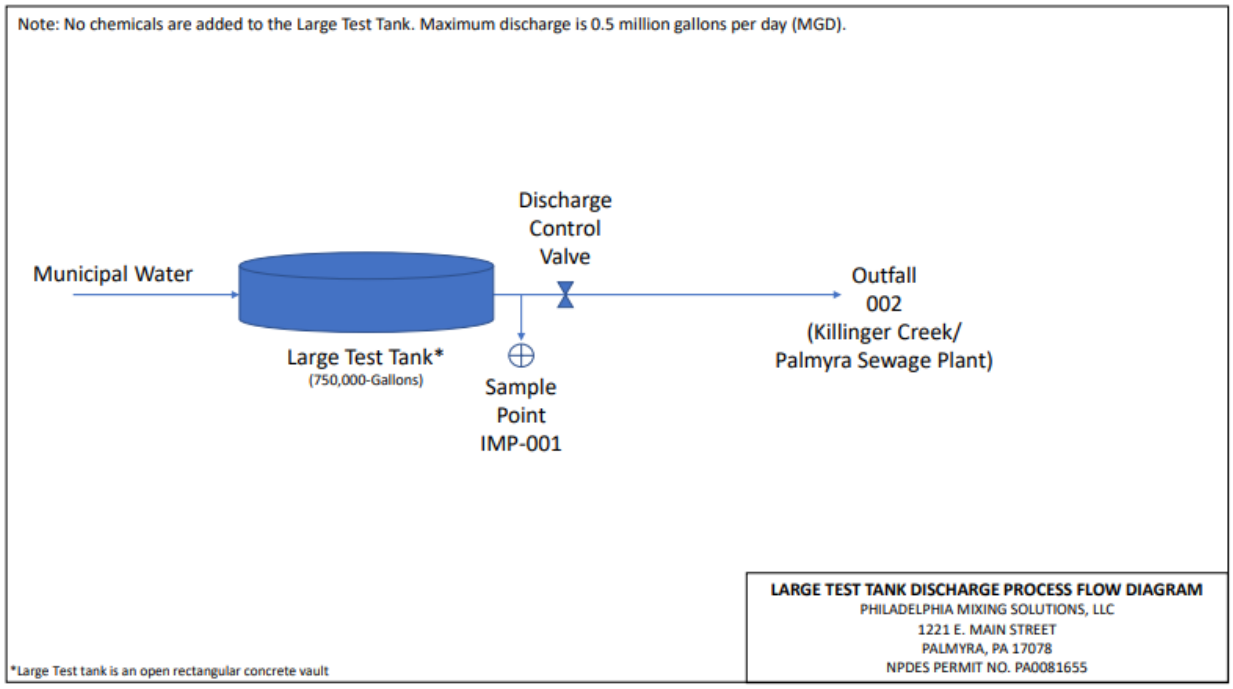
2.2 Description of Wastewater Treatment Process

The subject facility is a 0.50 MGD design flow facility. The facility generates wastewater from a large test tank (LTT, 750,000-gallons).

The facility is being evaluated for flow, pH, TDS, total cobalt, total sodium, total sulfate, chloride, and bromide. For Outfall 001, the facility is also monitored for stormwater parameters.

The existing permits limits for the facility is summarized in Section 2.4.

A process flow diagram for the facility is depicted.



2.3 Facility Outfall Information

The facility has the following outfall information for wastewater.

Outfall No.	001	**Design Flow (MGD)**	.5
Latitude	40º 19' 30.00"	**Longitude**	-76º 33' 21.00"
Wastewater Description:	Intermittent Discharge		

Outfall No.	002	**Design Flow (MGD)**	0
Latitude	40º 19' 1.00"	**Longitude**	-76º 34' 38.00"
Wastewater Description:	Stormwater		

The subject facility outfall is within the vicinity of another sewage/wastewater outfall. The upstream outfall is North Londonderry Township (PA0261262) which is about 0.36 miles from the subject facility.

2.3.1 Operational Considerations- Chemical Additives

Chemical additives are chemical products introduced into a waste stream that is used for cleaning, disinfecting, or maintenance and which may be detected in effluent discharged to waters of the Commonwealth. Chemicals excluded are those used for neutralization of waste streams, the production of goods, and treatment of wastewater.

The subject facility utilizes the following chemicals as part of their treatment process.

- **The facility did not report any chemicals/additive usages on the NPDES application.**

2.4 Existing NPDES Permits Limits

The existing NPDES permit limits are summarized in the table.

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. A. For Outfall 001 , **Latitude** 40° 19' 30.00" , **Longitude** 76° 33' 21.00" , **River Mile Index** 0.75 , **Stream Code** 09705

Receiving Waters: Killinger Creek (TSF)

Type of Effluent: Intermittent Discharge

1. The permittee is authorized to discharge during the period from **July 1, 2018** through **June 30, 2023**.
2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements and Footnotes).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	1/discharge	Estimate
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/discharge	Grab
Total Dissolved Solids	XXX	XXX	XXX	XXX	Report	XXX	1/discharge	Grab
Cobalt, Total	XXX	XXX	XXX	XXX	Report	XXX	1/discharge	Grab
Sodium, Total	XXX	XXX	XXX	XXX	Report	XXX	1/discharge	Grab
Sulfate, Total	XXX	XXX	XXX	XXX	Report	XXX	1/discharge	Grab
Chloride	XXX	XXX	XXX	XXX	Report	XXX	1/discharge	Grab
Bromide	XXX	XXX	XXX	XXX	Report	XXX	1/discharge	Grab

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

at Outfall 001

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. B. For Outfall 002 , **Latitude** 40° 19' 1.00" , **Longitude** 76° 34' 38.00" , **River Mile Index** 0.7000 , **Stream Code** 09706

Receiving Waters: Unnamed Tributary to Killinger Creek (TSF, MF)

Type of Effluent: Stormwater

1. The permittee is authorized to discharge during the period from **July 1, 2018** through **June 30, 2023**.
2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements and Footnotes).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Aluminum, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Copper, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Iron, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Lead, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

at Outfall 002

3.0 Facility NPDES Compliance History

3.1 Summary of Inspections

A summary of the most recent inspections during the existing permit review cycle is as follows.

The DEP inspector noted the following during the inspection.

02/02/2021:

- The facility was advised when the next discharge occurs, please provide photos from the on-set of the discharge from the pipe at outfall 001 to Killinger Creek.

9/10/2021:

- The last reported discharge from the facility occurred in September 2020. Discharges originate for the test tanks used to test mixing equipment. The facility was advised to provide notification prior to the next discharge so arrangements may be made for an on-site inspection. If an inspection is not conducted by the DEP during the next discharge, please provide photos from the outfall as the discharge first reaches Killinger Creek. The facility was advised to contact with Pennsy Supply Millard Quarry to notify them that your discharge pipe is on their property and to ensure that the facility has access to the outfall.

3.2 Summary of DMR Data

A review of approximately 1-year of DMR data shows that the monthly average flow data for the facility below the design capacity of the treatment system. The maximum average flow data for the DMR reviewed was 0.5 MGD in December 2023. The design capacity of the treatment system is 0.5 MGD.

The off-site laboratory used for the analysis of the parameters was ALS Environmental located at 301 Fulling Mill Road, Middletown, PA 17057.

DMR Data for Outfall 001 (from April 1, 2023 to March 31, 2024)

Parameter	MAR-24	FEB-24	JAN-24	DEC-23	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23
Flow (MGD) Average Monthly	0.325	0.48		0.5							0.3	
Flow (MGD) Daily Maximum	0.325	0.48		0.5							0.3	
pH (S.U.) Instantaneous Minimum	7.15	7.73		7.7							7.23	
pH (S.U.) Instantaneous Maximum	7.15	7.73		7.7							7.23	
Total Dissolved Solids (mg/L) Daily Maximum	1320	164		198							0.66	
Total Cobalt (mg/L) Daily Maximum	0.38	0.0077		0.0079							0.016	
Total Sodium (mg/L) Daily Maximum	400	25.6		27.9							19.6	
Sulfate (mg/L) Daily Maximum	868	19.2		22.1							18.5	
Chloride (mg/L) Daily Maximum	39.4	43.7		42.7							36.1	
Bromide (mg/L) Daily Maximum	0.01	1.1		0.0001							0.001	

DMR Data for Outfall 002 (from April 1, 2023 to March 31, 2024)

Parameter	MAR-24	FEB-24	JAN-24	DEC-23	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23
TSS (mg/L) Daily Maximum				0.001						7		
Oil and Grease (mg/L) Daily Maximum				1.5						0.01		
Total Aluminum (mg/L) Daily Maximum				0.027						0.04		
Total Copper (mg/L) Daily Maximum				0.012						0.022		

Total Iron (mg/L) Daily Maximum				0.055						0.057		
Total Lead (mg/L) Daily Maximum				0.00033						0.0004		

3.3 Non-Compliance

3.3.1 Non-Compliance- NPDES Effluent

A summary of the non-compliance to the permit limits for the existing permit cycle is as follows.

From the DMR data beginning in July 1, 2018 to July 22, 2024, the facility had observed effluent non-compliances.

DEP computer files indicate that the facility had tardy DMR submissions. The occurrences ranged from July 2019 to April 2024.

3.3.2 Non-Compliance- Enforcement Actions

A summary of the non-compliance enforcement actions for the current permit cycle is as follows:

Beginning in July 1, 2018 to July 22, 2024, the following were observed enforcement actions.

Summary of Enforcement Actions
Beginning July 1, 2018 and ending June 14, 2024

ENF ID	ENF TYPE	ENF TYPE DESC	ENF CREATION DATE	EXECUTED DATE	INITIATED DATE	VIOLATIONS	# OF VIOLATIONS	ENF FINAL STATUS	ENF CLOSED DATE
414131	NOV	Notice of Violation	03/17/2023	03/28/2023	03/01/2023	92A.75(A)	1	Administrative Close Out	06/29/2023

3.4 Summary of Biosolids Disposal

A summary of the biosolids disposed of from the facility is as follows.

The facility did not have any sludge/biosolids disposal in 2023.

3.5 Open Violations

No open violations existed as of July 2024.

4.0 Receiving Waters and Water Supply Information Detail Summary

4.1 Receiving Waters

The receiving waters has been determined to be Killinger Creek. The sequence of receiving streams that the Killinger Creek discharges into are Quittapahilla Creek, Trib 09745 To Swatara Creek, Swatara Creek, and the Susquehanna River which eventually drains into the Chesapeake Bay.

4.2 Public Water Supply (PWS) Intake

The closest PWS to the subject facility is Suez Water (PWS ID #7220015) located approximately 17 miles downstream of the subject facility on the Swatara Creek. Based upon the distance and the flow rate of the facility, the PWS should not be impacted.

4.3 Class A Wild Trout Streams

Class A Wild Trout Streams are waters that support a population of naturally produced trout of sufficient size and abundance to support long-term and rewarding sport fishery. DEP classifies these waters as high-quality coldwater fisheries.

The information obtained from EMAP suggests that no Class A Wild Trout Fishery will be impacted by this discharge.

4.4 2024 Integrated List of All Waters (303d Listed Streams)

Section 303(d) of the Clean Water Act requires States to list all impaired surface waters not supporting uses even after appropriate and required water pollution control technologies have been applied. The 303(d) list includes the reason for impairment which may be one or more point sources (i.e. industrial or sewage discharges) or non-point sources (i.e. abandoned mine lands or agricultural runoff and the pollutant causing the impairment such as metals, pH, mercury or siltation).

States or the U.S. Environmental Protection Agency (EPA) must determine the conditions that would return the water to a condition that meets water quality standards. As a follow-up to listing, the state or EPA must develop a Total Maximum Daily Load (TMDL) for each waterbody on the list. A TMDL identifies allowable pollutant loads to a waterbody from both point and non-point sources that will prevent a violation of water quality standards. A TMDL also includes a margin of safety to ensure protection of the water.

The water quality status of Pennsylvania's waters uses a five-part categorization (lists) of waters per their attainment use status. The categories represent varying levels of attainment, ranging from Category 1, where all designated water uses are met to Category 5 where impairment by pollutants requires a TMDL for water quality protection.

The receiving waters is listed in the 2024 Pennsylvania Integrated Water Quality Monitoring and Assessment Report as a Category 4a and 5 waterbody. This stream is an impaired stream (1) for aquatic life due to nutrients from agriculture and (2) impaired for recreation uses due to pathogens from an unknown source. The designated use has been classified as protected waters for trout stocking fishes (TSF) and migratory fishes (MF).

4.5 Low Flow Stream Conditions

Water quality modeling estimates are based upon conservative data inputs. The data are typically estimated using either a stream gauge or through USGS web based StreamStats program. The NPDES effluent limits are based upon the combined flows from both the stream and the facility discharge.

A conservative approach to estimate the impact of the facility discharge using values which minimize the total combined volume of the stream and the facility discharge. The volumetric flow rate for the stream is based upon the seven-day, 10-year low flow (Q710) which is the lowest estimated flow rate of the stream during a 7 consecutive day period that occurs once in 10 -year time period. The facility discharge is based upon a known design capacity of the subject facility.

For WQM modeling, default values for pH and stream water temperature data were used. The pH was 7.0 and the temperature was 20 C.

The hardness of the stream was estimated by collecting a sample upstream of the facility. The sampling result was 256 mg/l $CaCO_3$.

The low flow yield and the Q710 for the subject facility was estimated using StreamStats.

The low flow yield is 0.318 $ft^3/s/mi^2$ and the Q710 is 4.45 ft^3/s.

4.6.1 Summary of Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	.5
Latitude	40º 19' 29.95"	Longitude	-76º 33' 20.96"
Quad Name		Quad Code	
Wastewater Description:	Intermittent Discharge		

Receiving Waters	Killinger Creek (TSF)	Stream Code	9705
NHD Com ID	56399247	RMI	0.75
Drainage Area	14	Yield (cfs/mi^2)	0.317
Q_{7-10} Flow (cfs)	4.45	Q_{7-10} Basis	StreamStats
Elevation (ft)	376	Slope (ft/ft)	
Watershed No.	7-D	Chapter 93 Class.	TSF, MF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	NUTRIENTS, PATHOGENS,		
Source(s) of Impairment	AGRICULTURE, SOURCE UNKNOWN		
TMDL Status	Final	Name	Quittapahilla Creek Watershed

Background/Ambient Data		Data Source
pH (SU)	7	Default
Temperature (°C)	20	Default
Hardness (mg/L)	256	NPDES application
Other:		

Nearest Downstream Public Water Supply Intake		Suez Water	
PWS Waters	Swatara Creek	Flow at Intake (cfs)	
PWS RMI	10.4	Distance from Outfall (mi)	17

4.6.2 Summary of Discharge, Receiving Waters and Water Supply Information

Outfall No.	002	Design Flow (MGD)	0
Latitude	40º 19' 2.20"	Longitude	-76º 34' 15.91"
Quad Name		Quad Code	
Wastewater Description:	Stormwater		
Receiving Waters	Unnamed Tributary to Killinger Creek (TSF, MF)	Stream Code	9706
NHD Com ID	56399371	RMI	0.7000
Drainage Area		Yield (cfs/mi^2)	
Q_{7-10} Flow (cfs)		Q_{7-10} Basis	
Elevation (ft)		Slope (ft/ft)	
Watershed No.	7-D	Chapter 93 Class.	TSF, MF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	FLOW REGIME MODIFICATION, PATHOGENS, SILTATION		
Source(s) of Impairment	AGRICULTURE, AGRICULTURE, SOURCE UNKNOWN		
TMDL Status	Final	Name	Quittapahilla Creek Watershed

5.0: Overview of Presiding Water Quality Standards

5.1 General

There are at least six (6) different policies which determines the effluent performance limits for the NPDES permit. The policies are technology based effluent limits (TBEL), water quality based effluent limits (WQBEL), antidegradation, total maximum daily loading (TMDL), anti-backsliding, and whole effluent toxicity (WET) The effluent performance limitations enforced are the selected permit limits that is most protective to the designated use of the receiving waters. An overview of each of the policies that are applicable to the subject facility has been presented in Section 6.

5.2.1 Technology-Based Limitations

TBEL treatment requirements under section 301(b) of the Act represent the minimum level of control that must be imposed in a permit issued under section 402 of the Act (40 CFR 125.3).

5.3 Water Quality-Based Limitations

WQBEL are based on the need to attain or maintain the water quality criteria and to assure protection of designated and existing uses (PA Code 25, Chapter 92a.2). The subject facility that is typically enforced is the more stringent limit of either the TBEL or the WQBEL.

Determination of WQBEL is calculated by spreadsheet analysis or by a computer modeling program developed by DEP. DEP permit engineers utilize the following computing programs for WQBEL permit limitations: (1) MS Excel worksheet for Total Residual Chorine (TRC); (2) WQM 7.0 for Windows Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen Version 1.1 (WQM Model) and (3) Toxics using DEP Toxics Management Spreadsheet for Toxics pollutants.

The modeling point nodes utilized for this facility are summarized below.

General Data 1	***(Modeling Point #1)***	***(Modeling Point #2)***	***Units***
Stream Code	9705	9705	
River Mile Index	0.75	0	miles
Elevation	376	364	feet
Latitude	40.325	40.335191	
Longitude	-76.555833	-76.556026	
Drainage Area	14	71.4	sq miles
Low Flow Yield	0.318	0.318	cfs/sq mile

5.3.1 Water Quality Modeling 7.0

The WQM Model is a computer model that is used to determine NPDES discharge effluent limitations for Carbonaceous BOD (CBOD5), Ammonia Nitrogen (NH3-N), and Dissolved Oxygen (DO) for single and multiple point source discharges scenarios. WQM Model is a complete-mix model which means that the discharge flow and the stream flow are assumed to instantly and completely mixed at the discharge node.

WQM recommends effluent limits for DO, CBOD5, and NH_3-N in mg/l for the discharge(s) in the simulation.

Four types of limits may be recommended. The limits are

(a) a *minimum concentration for DO in the discharge as 30-day average;*
(b) a 30-day average concentration for CBOD5 in the discharge;
(c) a 30-day average concentration for the NH_3-N in the discharge;
(d) *24-hour average concentration for NH_3-N in the discharge*.

The WQM Model requires several input values for calculating output values. The source of data originates from either EMAP, the National Map, or Stream Stats. Data for stream gauge information, if any, was abstracted from USGS Low-Flow, Base-Flow, and Mean-Flow Regression Equations for Pennsylvania Streams authored by Marla H. Stuckey (Scientific Investigations Report 2006-5130).

The applicable WQM Effluent Limit Type are discussed in Section 6 under the corresponding parameter which is either DO, CBOD, or ammonia-nitrogen.

5.3.2 Toxics Modeling

The Toxics Management Spreadsheet model is a computer model that is used to determine effluent limitations for toxics (and other substances) for single discharge wasteload allocations. This computer model uses a mass-balance water quality analysis that includes consideration for mixing, first-order decay, and other factors used to determine recommended water quality-based effluent limits. Toxics Management Spreadsheet does not assume that all discharges completely mix with the stream. The point of compliance with water quality criteria are established using criteria compliance times (CCTs). The available CCTs are either acute fish criterion (AFC), chronic fish criterion (CFC), or human health criteria (THH & CRL).

Acute Fish Criterion (AFC) measures the criteria compliance time as either the maximum criteria compliance time (i.e.15 minutes travel time downstream of the current discharge) or the complete mix time whichever comes first. AFC is evaluated at Q710 conditions.

Chronic Fish Criterion (CFC) measures the criteria compliance time as either the maximum criteria compliance time (i.e. 12 hours travel time downstream of the current discharge) or the complete mix time whichever comes first. CFC is evaluated at Q710 conditions.

Threshold Human Health (THH) measures the criteria compliance time as either the maximum criteria compliance time (i.e. 12 hours travel time downstream of the current discharge) or the estimated travel time downstream to the nearest potable water supply intake whichever comes first. THH is evaluated at Q710 conditions.

Cancer Risk Level (CRL) measures the criteria compliance time as either the maximum criteria compliance time (i.e. 12 hours travel time downstream of the current discharge) or the complete mix time whichever comes first. CRL is evaluated at Qh (harmonic mean or normal flow) conditions.

The Toxics Model requires several input values for calculating output values. The source of data originates from either EMAP, the National Map, or Stream Stats. Data for stream gauge information, if any, was abstracted from USGS Low-Flow, Base-Flow, and Mean-Flow Regression Equations for Pennsylvania Streams authored by Marla H. Stuckey (Scientific Investigations Report 2006-5130).

5.3.2.1 Determining if NPDES Permit Will Require Monitoring/Limits in the Proposed Permit for Toxic Pollutants

To determine if Toxics modeling is necessary, DEP has developed a Toxics Management Spreadsheet to identify toxics of concern. Toxic pollutants whose maximum concentrations as reported in the permit application or on DMRs are greater than the most stringent applicable water quality criterion are pollutants of concern. A Reasonable Potential Analysis was utilized to determine (a) if the toxic parameters modeled would require monitoring or (b) if permit limitations would be required for the parameters. The toxics reviewed for reasonable potential were the following pollutants: Bromide, chloride, sulfate, cobalt.

Based upon the SOP- Establishing Water Quality-Based Effluent Limitations (WQBELs) and Permit Conditions for Toxic Pollutants (Revised January 10, 2019), monitoring and/or limits will be established as follows.

(a) When reasonable potential is demonstrated, establish limits where the maximum reported concentration equals or exceeds 50% of the WQBEL.
(b) For non-conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 25% - 50% of the WQBEL.
(c) For conservative pollutants, establish monitoring requirements where the maximum reported concentration is between 10% - 50% of the WQBEL.

Applicable monitoring or permit limits for toxics are summarized in Section 6.

The Toxics Management Spreadsheet output has been included in Attachment B.

5.3.3 Whole Effluent Toxicity (WET)

The facility is not subject to WET.

5.4 Total Maximum Daily Loading (TMDL)

5.4.1 TMDL

The goal of the Clean Water Act (CWA), which governs water pollution, is to ensure that all of the Nation's waters are clean and healthy enough to support aquatic life and recreation. To achieve this goal, the CWA created programs designed to regulate and reduce the amount of pollution entering United States waters. Section 303(d) of the CWA requires states to assess their waterbodies to identify those not meeting water quality standards. If a waterbody is not meeting standards, it is listed as impaired and reported to the U.S. Environmental Protection Agency. The state then develops a plan to clean up the impaired waterbody. This plan includes the development of a Total Maximum Daily Load (TMDL) for the pollutant(s) that were found to be the cause of the water quality violations. A Total Maximum Daily Load (TMDL) calculates the maximum amount of a specific pollutant that a waterbody can receive and still meet water quality standards.

A TMDL for a given pollutant and waterbody is composed of the sum of individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background levels. In addition, the TMDL must include an implicit or explicit margin of safety (MOS) to account for the uncertainty in the relationship between pollutant loads and the quality of the receiving waterbody. The TMDL components are illustrated using the following equation:

$$TMDL = \Sigma WLAs + \Sigma LAs + MOS$$

Pennsylvania has committed to restoring all impaired waters by developing TMDLs and TMDL alternatives for all impaired waterbodies. The TMDL serves as the starting point or planning tool for restoring water quality.

5.4.1.1 Local TMDL

The subject facility does discharge into a local TMDL- Quittapahilla Creek Watershed TMDL.

Quittapahilla Creek is a tributary to Swatara Creek located in Lebanon County, Pennsylvania. The stream travels 16.8 miles from its source in South Lebanon Township to its mouth near Valley Glen. Total Maximum Daily Loads (TMDLs) were developed to address impairments noted in Pennsylvania's 1996 and 1998 303(d) lists and the 2000 305(b) report. The impairments were documented during chemical sampling and biological surveys of the aquatic life present in the watershed. Excessive sediment and nutrient loads resulting from agricultural activities have been identified as one of the primary causes of impairments in the basin. The TMDL developed for sediment applies to the entire Quittapahilla Creek basin. Individual total phosphorus TMDLs were developed for the Bachman Run, Beck Creek, Killinger Creek, and Snitz Creek basins. The TMDLs developed for nutrient impairments focus on the control of total phosphorus, since it is the limiting nutrient. Impairments in the Gingrich Run basin due to suspended solids were addressed through a combination of the sediment TMDL developed for the Quittapahilla Creek watershed and the total phosphorus TMDL developed for the Killinger Creek basin.

The facility is not agricultural activity and is not a contributor to sediment and phosphorus. Thus, the facility is not subject to the TMDL.

5.4.1.2 Chesapeake Bay TMDL Requirement

The Chesapeake Bay Watershed is a large ecosystem that encompasses approximately 64,000 square miles in Maryland, Delaware, Virginia, West Virginia, Pennsylvania, New York and the District of Columbia. An ecosystem is composed of interrelated parts that interact with each other to form a whole. All of the plants and animals in an ecosystem depend on each other in some way. Every living thing needs a healthy ecosystem to survive. Human activities affect the Chesapeake Bay ecosystem by adding pollution, using resources and changing the character of the land.

Most of the Chesapeake Bay and many of its tidal tributaries have been listed as impaired under Section 303(d) of the federal Water Pollution Control Act ("Clean Water Act"), 33 U.S.C. § 1313(d). While the Chesapeake Bay is outside the boundaries of Pennsylvania, more than half of the State lies within the watershed. Two major rivers in Pennsylvania are part of the Chesapeake Bay Watershed. They are (a) the Susquehanna River and (b) the Potomac River. These two rivers total 40 percent of the entire Chesapeake Bay watershed.

The overall management approach needed for reducing nitrogen, phosphorus and sediment are provided in the Bay TMDL document and the Phase I, II, and III WIPs which is described in the Bay TMDL document and Executive Order 13508.

The Bay TMDL is a comprehensive pollution reduction effort in the Chesapeake Bay watershed identifying the necessary pollution reductions of nitrogen, phosphorus and sediment across the seven Bay watershed jurisdictions of Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia and the District of Columbia to meet applicable water quality standards in the Bay and its tidal waters.

The Watershed Implementation Plans (WIPs) provides objectives for how the jurisdictions in partnership with federal and local governments will achieve the Bay TMDL's nutrient and sediment allocations.

Phase 3 WIP provides an update on Chesapeake Bay TMDL implementation activities for point sources and DEP's current implementation strategy for wastewater. The latest revision of the supplement was September 13, 2021.

The Chesapeake Bay TMDL (Appendix Q) categorizes point sources into four sectors:

- Sector A- significant sewage dischargers;
- Sector B- significant industrial waste (IW) dischargers;
- Sector C- non-significant dischargers (both sewage and IW facilities); and
- Sector D- combined sewer overflows (CSOs).

All sectors contain a listing of individual facilities with NPDES permits that were believed to be discharging at the time the TMDL was published (2010). All sectors with the exception of the non-significant dischargers have individual wasteload allocations (WLAs) for TN and TP assigned to specific facilities. Non-significant dischargers have a bulk or aggregate allocation for TN and TP based on the facilities in that sector that were believed to be discharging at that time and their estimated nutrient loads.

Cap Loads will be established in permits as Net Annual TN and TP loads (lbs/yr) that apply during the period of October 1 – September 30. For facilities that have received Cap Loads in any other form, the Cap Loads will be modified accordingly when the permits are renewed.

Offsets have been incorporated into Cap Loads in several permits issued to date. From this point forward, permits will be issued with the WLAs as Cap Loads and will identify Offsets separately to facilitate nutrient trading activities and compliance with the TMDL.

Based upon the supplement the subject facility has been categorized as a Sector C discharger. The supplement defines Sector C as a non-significant dischargers include sewage facilities (Phase 4 facilities: ≥ 0.2 MGD and < 0.4 MGD and Phase 5 facilities: > 0.002 MGD and < 0.2 MGD), small flow/single residence sewage treatment facilities (≤ 0.002 MGD), and non-significant IW facilities, all of which may be covered by statewide General Permits or may have individual NPDES permits.

At this time, there are approximately 850 Phase 4 and 5 sewage facilities, approximately 715 small flow sewage treatment facilities covered by a statewide General Permit, and approximately 300 non-significant IW facilities.

For non-significant IW facilities, monitoring and reporting of TN and TP will be required throughout the permit term in renewed or amended permits anytime the facility has the potential to introduce a net TN or TP increase to the load contained within the intake water used in processing. In general, facilities that discharge groundwater and cooling water with no addition of chemicals containing N or P do not require monitoring. Monitoring for facilities with other discharges will generally conform to the following minimum sampling frequencies, with the permit writer having final discretion:

• Food processing and related discharges, discharges associated with textiles, lumber and paper processing, discharges associated with residual waste management (e.g., landfill leachate, coal ash sluice water) – 1/month.
• Stormwater expected to contain TN or TP, discharges from metal finishing and related processing, discharges associated with chemicals, plastics and allied product manufacturing – 1/quarter.
• Cooling water or other discharges treated with chemical additives containing N and/or P – 1/year.

Non-significant IW facilities that propose expansion or production increases and as a result will discharge at least 75 lbs/day TN or 25 lbs/day TP (on an annual average basis), will be classified as Significant IW dischargers and receive Cap Loads in their permits based on existing performance (existing TN/TP concentrations at current average annual flow).

In general, for new non-significant IW discharges (including existing facilities discharging without a permit), DEP will issue permits containing Cap Loads of "0" and these facilities will be expected to purchase credits and/or apply offsets to achieve compliance.

Since the facility does not generate nitrogen or phosphorus, this facility is not subject to Sector C monitoring requirements.

5.5 Anti-Degradation Requirement

Chapter 93.4a of the PA regulations requires that surface water of the Commonwealth of Pennsylvania may not be degraded below levels that protect the existing uses. The regulations specifically state that *Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected*. Antidegradation requirements are implemented through DEP's guidance manual entitled Water Quality Antidegradation Implementation Guidance (Document #391-0300-02).

The policy requires DEP to protect the existing uses of all surface waters and the existing quality of High Quality (HQ) and Exceptional Value (EV) Waters. Existing uses are protected when DEP makes a final decision on any permit or approval for an activity that may affect a protected use. Existing uses are protected based upon DEP's evaluation of the best available information (which satisfies DEP protocols and Quality Assurance/Quality Control (QA/QC) procedures) that indicates the protected use of the waterbody.

For a new, additional, or increased point source discharge to an HQ or EV water, the person proposing the discharge is required to utilize a nondischarge alternative that is cost-effective and environmentally sound when compared with the cost of the proposed discharge. If a nondischarge alternative is not cost-effective and environmentally sound, the person must use the best available combination of treatment, pollution prevention, and wastewater reuse technologies and assure that any discharge is nondegrading. In the case of HQ waters, DEP may find that after satisfaction of intergovernmental coordination and public participation requirements lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In addition, DEP will assure that cost-effective and reasonable best management practices for nonpoint source control in HQ and EV waters are achieved.

The subject facility's discharge will be to a non-special protection waters and the permit conditions are imposed to protect existing instream water quality and uses. Neither HQ waters or EV waters is impacted by this discharge.

5.6 Anti-Backsliding

Anti-backsliding is a federal regulation which prohibits a permit from being renewed, reissued, or modified containing effluent limitations which are less stringent than the comparable effluent limitations in the previous permit (40 CFR 122.l.1 and 40 CFR 122.l.2). A review of the existing permit limitations with the proposed permit limitations confirm that the facility is consistent with anti-backsliding requirements. The facility has proposed effluent limitations that are as stringent as the existing permit.

6.0 NPDES Parameter Details

The basis for the proposed sampling and their monitoring frequency that will appear in the permit for each individual parameter are itemized in this Section. The final limits are the more stringent of technology based effluent treatment (TBEL) requirements, water quality based (WQBEL) limits, TMDL, antidegradation, anti-degradation, or WET.

The reader will find in this section:

a) a justification of recommended permit monitoring requirements and limitations for each parameter in the proposed NPDES permit;
b) a summary of changes from the existing NPDES permit to the proposed permit; and
c) a summary of the proposed NPDES effluent limits.

6.1 Recommended Monitoring Requirements and Effluent Limitations

6.1.1 Toxics

The facility does not have daily discharges. The facility discharges when testing is in progress for their test tank. The DMR data from 2018 to 2024 was reviewed. The maximum concentrations from the data set were used for Toxics Management Spreadsheet (TMS).

Multiple TMS runs were completed for cobalt. The maximum concentration was 0.45 mg/l. The average concentration from the data set was 0.081 mg/l. TMS shows reasonable potential for cobalt. TMS recommends a maximum daily limit of 0.2 mg/l. Since the average concentration did not exceed the TMS maximum daily limit, monitoring was recommended for the proposed permit.

6.2 Summary of Changes From Existing Permit to Proposed Permit

A summary of how the proposed NPDES permit differs from the existing NPDES permit is summarized as follows.

- No changes to the monitoring frequency or effluent limits.

6.3.1 Summary of Proposed NPDES Effluent Limits

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

The proposed NPDES effluent limitations are summarized in the table below.

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. A. For Outfall 001 , **Latitude** 40º 19' 30.00" , **Longitude** 76º 33' 21.00" , **River Mile Index** 0.75 , **Stream Code** 9705

Receiving Waters: Killinger Creek (TSF)

Type of Effluent: Intermittent Discharge

1. The permittee is authorized to discharge during the period from **Permit Effective Date** through **Permit Expiration Date**.
2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements and Footnotes).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	1/discharge	Estimate
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/discharge	Grab
Total Dissolved Solids	XXX	XXX	XXX	XXX	Report	XXX	1/discharge	Grab
Cobalt, Total	XXX	XXX	XXX	XXX	Report	XXX	1/discharge	Grab
Sodium, Total	XXX	XXX	XXX	XXX	Report	XXX	1/discharge	Grab
Sulfate, Total	XXX	XXX	XXX	XXX	Report	XXX	1/discharge	Grab
Chloride	XXX	XXX	XXX	XXX	Report	XXX	1/discharge	Grab
Bromide	XXX	XXX	XXX	XXX	Report	XXX	1/discharge	Grab

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

at Outfall 001

PART A - EFFLUENT LIMITATIONS, MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

I. B. For Outfall 002 , **Latitude** 40º 19' 1.00" , **Longitude** 76º 34' 38.00" , **River Mile Index** 0.7000 , **Stream Code** 9706

Receiving Waters: Unnamed Tributary to Killinger Creek (TSF, MF)

Type of Effluent: Stormwater

1. The permittee is authorized to discharge during the period from **Permit Effective Date** through **Permit Expiration Date**.
2. Based on the anticipated wastewater characteristics and flows described in the permit application and its supporting documents and/or amendments, the following effluent limitations and monitoring requirements apply (see also Additional Requirements and Footnotes).

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Average Weekly	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Total Suspended Solids	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Oil and Grease	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Aluminum, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Copper, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Iron, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab
Lead, Total	XXX	XXX	XXX	XXX	Report	XXX	1/6 months	Grab

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s):

at Outfall 002

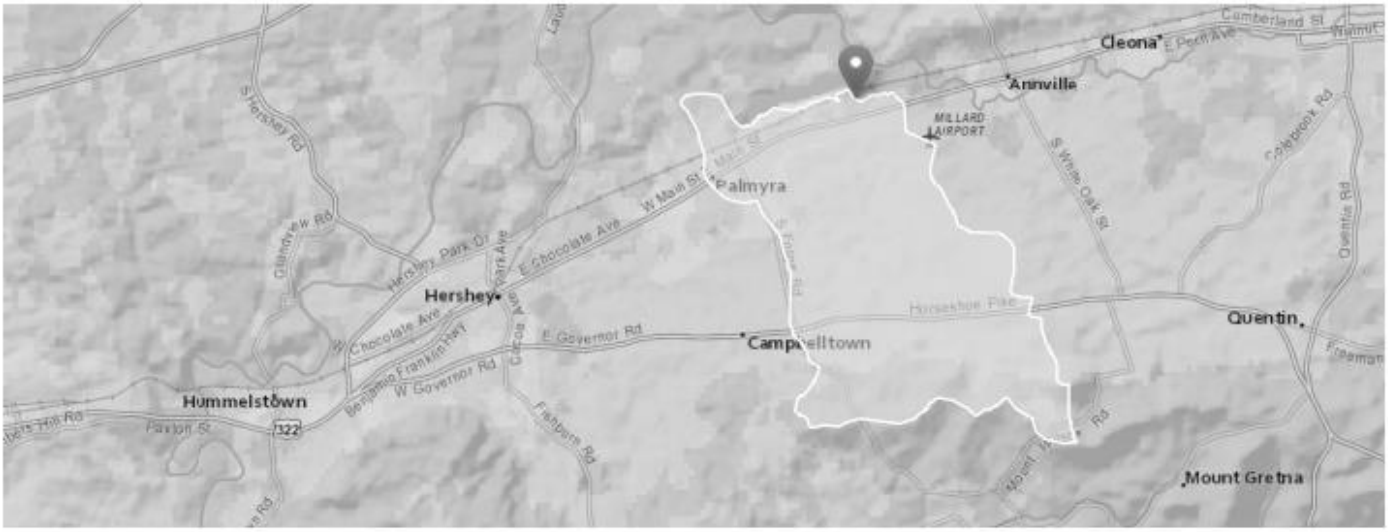
Tools and References Used to Develop Permit	
☐	WQM for Windows Model (see Attachment)
☒	Toxics Management Spreadsheet (see Attachment)
☐	TRC Model Spreadsheet (see Attachment)
☐	Temperature Model Spreadsheet (see Attachment)
☐	Water Quality Toxics Management Strategy, 361-0100-003, 4/06.
☐	Technical Guidance for the Development and Specification of Effluent Limitations, 386-0400-001, 10/97.
☐	Policy for Permitting Surface Water Diversions, 386-2000-019, 3/98.
☐	Policy for Conducting Technical Reviews of Minor NPDES Renewal Applications, 386-2000-018, 11/96.
☐	Technology-Based Control Requirements for Water Treatment Plant Wastes, 386-2183-001, 10/97.
☐	Technical Guidance for Development of NPDES Permit Requirements Steam Electric Industry, 386-2183-002, 12/97.
☐	Pennsylvania CSO Policy, 386-2000-002, 9/08.
☐	Water Quality Antidegradation Implementation Guidance, 391-0300-002, 11/03.
☐	Implementation Guidance Evaluation & Process Thermal Discharge (316(a)) Federal Water Pollution Act, 386-2000-008, 4/97.
☐	Determining Water Quality-Based Effluent Limits, 386-2000-004, 12/97.
☐	Implementation Guidance Design Conditions, 386-2000-007, 9/97.
☐	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.
☐	Interim Method for the Sampling and Analysis of Osmotic Pressure on Streams, Brines, and Industrial Discharges, 386-2000-012, 10/1997.
☐	Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments, 386-2000-009, 3/99.
☐	Technical Reference Guide (TRG) PENTOXSD for Windows, PA Single Discharge Wasteload Allocation Program for Toxics, Version 2.0, 386-2000-015, 5/2004.
☐	Implementation Guidance for Section 93.7 Ammonia Criteria, 386-2000-022, 11/97.
☐	Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers, 386-2000-013, 4/2008.
☐	Implementation Guidance Total Residual Chlorine (TRC) Regulation, 386-2000-011, 11/1994.
☐	Implementation Guidance for Temperature Criteria, 386-2000-001, 4/09.
☐	Implementation Guidance for Section 95.9 Phosphorus Discharges to Free Flowing Streams, 386-2000-021, 10/97.
☐	Implementation Guidance for Application of Section 93.5(e) for Potable Water Supply Protection Total Dissolved Solids, Nitrite-Nitrate, Non-Priority Pollutant Phenolics and Fluorides, 386-2000-020, 10/97.
☐	Field Data Collection and Evaluation Protocol for Determining Stream and Point Source Discharge Design Hardness, 386-2000-005, 3/99.
☐	Implementation Guidance for the Determination and Use of Background/Ambient Water Quality in the Determination of Wasteload Allocations and NPDES Effluent Limitations for Toxic Substances, 386-2000-010, 3/1999.
☐	Design Stream Flows, 386-2000-003, 9/98.
☐	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.
☐	Evaluations of Phosphorus Discharges to Lakes, Ponds and Impoundments, 386-3200-001, 6/97.
☐	Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, 4/07.
☒	SOP: New and Reissuance Industrial Waste and Industrial Stormwater, rev 2/5/2024
☐	Other:

Attachment A

Stream Stats

StreamStats Report

Region ID: PA
Workspace ID: PA20240722171622675000
Clicked Point (Latitude, Longitude): 40.32499, -76.55593
Time: 2024-07-22 13:16:43 -0400



Philadelphia Mixing Solutions PA0081655 Modeling Point #1 July 20224

Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	72.79	percent
DRNAREA	Area that drains to a point on a stream	14	square miles
PRECIP	Mean Annual Precipitation	42	inches
ROCKDEP	Depth to rock	5.3	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	1.32	miles per square mile

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	14	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	42	inches	35	50.4
STRDEN	Stream Density	1.32	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	5.3	feet	3.32	5.65
CARBON	Percent Carbonate	72.79	percent	0	99

Low-Flow Statistics Flow Report [Low Flow Region 2]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	6.31	ft^3/s	38	38
30 Day 2 Year Low Flow	6.89	ft^3/s	33	33
7 Day 10 Year Low Flow	4.45	ft^3/s	51	51
30 Day 10 Year Low Flow	4.77	ft^3/s	46	46
90 Day 10 Year Low Flow	5.16	ft^3/s	36	36

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: 4.21.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

StreamStats Report

Region ID: PA
Workspace ID: PA20240722172010568000
Clicked Point (Latitude, Longitude): 40.33531, -76.55632
Time: 2024-07-22 13:20:33 -0400

Philadelphia Mixing Solutions PA0081655 Modeling Point #2 July 2024

Collapse All

Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
CARBON	Percentage of area of carbonate rock	77	percent
DRNAREA	Area that drains to a point on a stream	71.4	square miles
PRECIP	Mean Annual Precipitation	43	inches
ROCKDEP	Depth to rock	5.3	feet
STRDEN	Stream Density -- total length of streams divided by drainage area	0.9	miles per square mile

Low-Flow Statistics

Low-Flow Statistics Parameters [Low Flow Region 2]

Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit
DRNAREA	Drainage Area	71.4	square miles	4.93	1280
PRECIP	Mean Annual Precipitation	43	inches	35	50.4
STRDEN	Stream Density	0.9	miles per square mile	0.51	3.1
ROCKDEP	Depth to Rock	5.3	feet	3.32	5.65
CARBON	Percent Carbonate	77	percent	0	99

Low-Flow Statistics Flow Report [Low Flow Region 2]

PIL: Lower 90% Prediction Interval, PIU: Upper 90% Prediction Interval, ASEp: Average Standard Error of Prediction, SE: Standard Error, PC: Percent Correct (other -- see report)

Statistic	Value	Unit	SE	ASEp
7 Day 2 Year Low Flow	61.1	ft^3/s	38	38
30 Day 2 Year Low Flow	62.8	ft^3/s	33	33
7 Day 10 Year Low Flow	49.8	ft^3/s	51	51
30 Day 10 Year Low Flow	50.6	ft^3/s	46	46
90 Day 10 Year Low Flow	50.7	ft^3/s	36	36

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: 4.21.0
StreamStats Services Version: 1.2.22
NSS Services Version: 2.2.1

Attachment B
Toxics Screening Analysis

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Discharge Information

Instructions | Discharge | Stream

Facility: **Philadelphia Mixing Solutions** NPDES Permit No.: **PA0081655** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Test tank 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
0.5	256	7.45						

					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		1800									
	Chloride (PWS)	mg/L		60.9									
	Bromide	mg/L		1.1									
	Sulfate (PWS)	mg/L		1200									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L											
	Total Antimony	µg/L											
	Total Arsenic	µg/L											
	Total Barium	µg/L											
	Total Beryllium	µg/L											
	Total Boron	µg/L											
	Total Cadmium	µg/L											
	Total Chromium (III)	µg/L											
	Hexavalent Chromium	µg/L											
	Total Cobalt	mg/L		0.081									
	Total Copper	µg/L											
	Free Cyanide	µg/L											
	Total Cyanide	µg/L											
	Dissolved Iron	µg/L											
	Total Iron	µg/L											
	Total Lead	µg/L											
	Total Manganese	µg/L											
	Total Mercury	µg/L											
	Total Nickel	µg/L											
	Total Phenols (Phenolics) (PWS)	µg/L											
	Total Selenium	µg/L											
	Total Silver	µg/L											
	Total Thallium	µg/L											
	Total Zinc	µg/L											
	Total Molybdenum	µg/L											
	Acrolein	µg/L	<										
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<										
	Benzene	µg/L	<										
	Bromoform	µg/L	<										

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Stream / Surface Water Information

Philadelphia Mixing Solutions, NPDES Permit No. PA0081655, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Killer 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	009705	0.75	376	14			Yes
End of Reach 1	009705	0	364	71.4			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	0.75	0.318										256	7		
End of Reach 1	0	0.318										256	7		

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	0.75														
End of Reach 1	0														

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Toxics Management Spreadsheet
Version 1.4, May 2023

Model Results

Philadelphia Mixing Solutions, NPDES Permit No. PA0081655, Outfall 001

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

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.742 Analysis Hardness (mg/l): 256 Analysis pH: 7.06

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 Cobalt	0	0		0	95	95.0	501	

☑ ***CFC*** CCT (min): 27.273 PMF: 1 Analysis Hardness (mg/l): 256 Analysis pH: 7.04

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 Cobalt	0	0		0	19	19.0	128	

☑ ***THH*** CCT (min): 27.273 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 Cobalt	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 11.688 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 Cobalt	0	0		0	N/A	N/A	N/A	

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

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Cobalt	0.54	0.84	0.13	0.2	0.32	mg/L	0.13	CFC	Discharge Conc ≥ 50% WQBEL (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

Monitoring Period Begin Date	Monitoring Period End Date	Parameter Name	Parameter Code	DMR Value	Units	Statistical Base Code
11/01/2018	11/30/2018	Total Dissolved Solids	70295	186	mg/L	Daily Maximum
06/01/2019	06/30/2019	Total Dissolved Solids	70295	152	mg/L	Daily Maximum
09/01/2019	09/30/2019	Total Dissolved Solids	70295	239	mg/L	Daily Maximum
12/01/2019	12/31/2019	Total Dissolved Solids	70295	170	mg/L	Daily Maximum
01/01/2020	01/31/2020	Total Dissolved Solids	70295	192	mg/L	Daily Maximum
09/01/2020	09/30/2020	Total Dissolved Solids	70295	196	mg/L	Daily Maximum
10/01/2021	10/31/2021	Total Dissolved Solids	70295	312	mg/L	Daily Maximum
05/01/2023	05/31/2023	Total Dissolved Solids	70295	0.66	mg/L	Daily Maximum
12/01/2023	12/31/2023	Total Dissolved Solids	70295	198	mg/L	Daily Maximum
02/01/2024	02/29/2024	Total Dissolved Solids	70295	164	mg/L	Daily Maximum
03/01/2024	03/31/2024	Total Dissolved Solids	70295	1320	mg/L	Daily Maximum
04/01/2024	04/30/2024	Total Dissolved Solids	70295	1800	mg/L	Daily Maximum
			Max	1800	mg/l	

Monitoring Period Begin Date	Monitoring Period End Date	Parameter Name	Parameter Code	DMR Value		Units	Statistical Base Code
11/01/2018	11/30/2018	Cobalt, Total	1037	<	0.001	mg/L	Daily Maximum
06/01/2019	06/30/2019	Cobalt, Total	1037		0.037	mg/L	Daily Maximum
09/01/2019	09/30/2019	Cobalt, Total	1037		0.034	mg/L	Daily Maximum
12/01/2019	12/31/2019	Cobalt, Total	1037		0.016	mg/L	Daily Maximum
01/01/2020	01/31/2020	Cobalt, Total	1037		0.006	mg/L	Daily Maximum
09/01/2020	09/30/2020	Cobalt, Total	1037		0.007	mg/L	Daily Maximum
10/01/2021	10/31/2021	Cobalt, Total	1037		0.0085	mg/L	Daily Maximum
05/01/2023	05/31/2023	Cobalt, Total	1037		0.016	mg/L	Daily Maximum
12/01/2023	12/31/2023	Cobalt, Total	1037		0.0079	mg/L	Daily Maximum
02/01/2024	02/29/2024	Cobalt, Total	1037		0.0077	mg/L	Daily Maximum
03/01/2024	03/31/2024	Cobalt, Total	1037		0.38	mg/L	Daily Maximum
04/01/2024	04/30/2024	Cobalt, Total	1037		0.45	mg/L	Daily Maximum
				Max	0.45	mg/l	
				Average	0.081	mg/l	

Monitoring Period Begin Date	Monitoring Period End Date	Parameter Name	Parameter Code	DMR Value	Units	Statistical Base Code
11/01/2018	11/30/2018	Sodium, Total	929	22	mg/L	Daily Maximum
06/01/2019	06/30/2019	Sodium, Total	929	22.9	mg/L	Daily Maximum
09/01/2019	09/30/2019	Sodium, Total	929	28.5	mg/L	Daily Maximum
12/01/2019	12/31/2019	Sodium, Total	929	30.8	mg/L	Daily Maximum
01/01/2020	01/31/2020	Sodium, Total	929	22.7	mg/L	Daily Maximum
09/01/2020	09/30/2020	Sodium, Total	929	20.7	mg/L	Daily Maximum
10/01/2021	10/31/2021	Sodium, Total	929	27	mg/L	Daily Maximum
05/01/2023	05/31/2023	Sodium, Total	929	19.6	mg/L	Daily Maximum
12/01/2023	12/31/2023	Sodium, Total	929	27.9	mg/L	Daily Maximum
02/01/2024	02/29/2024	Sodium, Total	929	25.6	mg/L	Daily Maximum
03/01/2024	03/31/2024	Sodium, Total	929	400	mg/L	Daily Maximum
04/01/2024	04/30/2024	Sodium, Total	929	512	mg/L	Daily Maximum
			Max	512	mg/l	

Monitoring Period Begin Date	Monitoring Period End Date	Parameter Name	Parameter Code	DMR Value	Units	Statistical Base Code
11/01/2018	11/30/2018	Chloride	940	36.6	mg/L	Daily Maximum
06/01/2019	06/30/2019	Chloride	940	50.4	mg/L	Daily Maximum
09/01/2019	09/30/2019	Chloride	940	57.5	mg/L	Daily Maximum
12/01/2019	12/31/2019	Chloride	940	58.7	mg/L	Daily Maximum
01/01/2020	01/31/2020	Chloride	940	52.2	mg/L	Daily Maximum
09/01/2020	09/30/2020	Chloride	940	35.7	mg/L	Daily Maximum
10/01/2021	10/31/2021	Chloride	940	60.9	mg/L	Daily Maximum
05/01/2023	05/31/2023	Chloride	940	36.1	mg/L	Daily Maximum
12/01/2023	12/31/2023	Chloride	940	42.7	mg/L	Daily Maximum
02/01/2024	02/29/2024	Chloride	940	43.7	mg/L	Daily Maximum
03/01/2024	03/31/2024	Chloride	940	39.4	mg/L	Daily Maximum
04/01/2024	04/30/2024	Chloride	940	38.5	mg/L	Daily Maximum
			Max	60.9	mg/l	

Monitoring Period Begin Date	Monitoring Period End Date	Parameter Name	Parameter Code	DMR Value	Units	Statistical Base Code
11/01/2018	11/30/2018	Sulfate, Total	945	17.8	mg/L	Daily Maximum
06/01/2019	06/30/2019	Sulfate, Total	945	17.1	mg/L	Daily Maximum
09/01/2019	09/30/2019	Sulfate, Total	945	30	mg/L	Daily Maximum
12/01/2019	12/31/2019	Sulfate, Total	945	29.6	mg/L	Daily Maximum
01/01/2020	01/31/2020	Sulfate, Total	945	23.3	mg/L	Daily Maximum
09/01/2020	09/30/2020	Sulfate, Total	945	21.3	mg/L	Daily Maximum
10/01/2021	10/31/2021	Sulfate, Total	945	29.2	mg/L	Daily Maximum
05/01/2023	05/31/2023	Sulfate, Total	945	18.5	mg/L	Daily Maximum
12/01/2023	12/31/2023	Sulfate, Total	945	22.1	mg/L	Daily Maximum
02/01/2024	02/29/2024	Sulfate, Total	945	19.2	mg/L	Daily Maximum
03/01/2024	03/31/2024	Sulfate, Total	945	868	mg/L	Daily Maximum
04/01/2024	04/30/2024	Sulfate, Total	945	1200	mg/L	Daily Maximum
			Max	1200	mg/l	

Monitoring Period Begin Date	Monitoring Period End Date	Parameter Name	Parameter Code	DMR Value		Units	Statistical Base Code
11/01/2018	11/30/2018	Bromide	71870		0.3	mg/L	Daily Maximum
06/01/2019	06/30/2019	Bromide	71870		0.3	mg/L	Daily Maximum
09/01/2019	09/30/2019	Bromide	71870	<	0.005	mg/L	Daily Maximum
12/01/2019	12/31/2019	Bromide	71870	<	0.01	mg/L	Daily Maximum
01/01/2020	01/31/2020	Bromide	71870	<	0.001	mg/L	Daily Maximum
09/01/2020	09/30/2020	Bromide	71870	<	0.01	mg/L	Daily Maximum
10/01/2021	10/31/2021	Bromide	71870	<	0.01	mg/L	Daily Maximum
05/01/2023	05/31/2023	Bromide	71870		0.001	mg/L	Daily Maximum
12/01/2023	12/31/2023	Bromide	71870		0.0001	mg/L	Daily Maximum
02/01/2024	02/29/2024	Bromide	71870		1.1	mg/L	Daily Maximum
03/01/2024	03/31/2024	Bromide	71870		0.01	mg/L	Daily Maximum
04/01/2024	04/30/2024	Bromide	71870		0.0001	mg/L	Daily Maximum
				Max	1.1	mg/l	