pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0026158**
Facility Type	**Municipal**	APS ID	**826984**
Major / Minor	**Major**	Authorization ID	**1272265**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Mon Valley Sewage Authority**	Facility Name	**Mon Valley Sewage Authority**
Applicant Address	20 S Washington Street	Facility Address	20 S Washington Street
	Donora, PA 15033-1394		Donora, PA 15033-1394
Applicant Contact	Sean Gaskill	Facility Contact	Same as Applicant
Applicant Phone	(724) 379-4141	Facility Phone	Same as Applicant
Client ID	45119	Site ID	269750
Ch 94 Load Status	Not Overloaded	Municipality	Carroll Township
Connection Status	No Limitations	County	Washington
Date Application Received	May 6, 2019	EPA Waived?	No
Date Application Accepted	May 7, 2019	If No, Reason	Major Facility
Purpose of Application	Application for renewal of an existing NPDES Permit for the discharge of treated sewage effluent with combined sewer overflows (CSOs).		

Summary of Review

The permittee has applied for a renewal of NPDES Permit No. PA0026158. NPDES Permit No. PA0026158 was previously issued by the PA Department of Environmental Protection (DEP) on October 24, 2014 and expired on October 31, 2019. The application was submitted in a timely manner, so the permit was granted an administrative extension.

Sewage from this facility is treated by contact stabilization and chlorine disinfection before discharging through Outfall 001 to the Monongahela River (ID 37185).

The receiving stream, Monongahela River, is classified as a WWF and is located in State Watershed No. 20-F.

Mon Valley Sewer Authority (MVSA) is currently enrolled in and will continue to use eDMR.

Sewage sludge produced at this facility aerobically digested, thickened, and dewatered with a belt press before being land applied at Lone Maple Farm and Rhoads Farm under General Permit No. PAG086114. Alternately, biosolids may also be thickened and dewatered with a belt press and disposed of in a landfill.

The applicant has complied with Act 14 Notifications with documents sent May 1, 2019 to Carroll Township and Washington County.

In accordance with Part C.I.E. of the 2014 permit, MVSA has written and follows a High Flow Management Plan. The purpose of the plan is to contain a process for treating the maximum amount of flow to the plant while protecting the treatment plant and the receiving stream. Managing flow involves maximizing flow to the treatment plant, which is able to handle a peak flow of 12 MGD, and installation of a 3 MG equalization tank. Interceptors are cleaned and televised every five

Approve	Deny	Signatures	Date
X		Stephanie Conrad / Environmental Engineer	December 12, 2024
X		Mahbuba Iasmin, Ph.D., P.E. / Environmental Engineering Manager	December 24, 2024

Summary of Review

years. Much work has been completed to date to eliminate CSOs, increase storage capacity in the conveyance system, and increasing pumping capacity in the pump stations. The treatment plant is protected by an emergency bypass.

CSO Outfalls 002, 005, 013, 015, 018, 019, and 022 will no longer be permitted. They were disconnected from the sewer system as part of work approved by WQM Permit Number 6505401.

CSO Outfall 006 will no longer be permitted. It has already been disconnected and MVSA has applied for an amendment to WQM Permit No. 6515401 to reflect this work.

CSO Outfalls 003, 004, 007, 010, 011, 014, 016, and 017 will again be permitted. These outfalls serve as combined sewer overflows necessitated by storm water entering the sewer system and exceeding the hydraulic capacity of the sewers and/or treatment plant and are permitted to discharge only for this reason. Dry weather discharges from these outfalls are prohibited. Part A.I.B., Identification of Combined Sewer Overflow Discharges, and Part C.II, Combined Sewer Overflows, have been added to the permit.

The Department previously approved the NMC and LTCP Reports. The LTCP, which was dated July 2007, was initially approved by the Department in September 2007. Chapter four of the LTCP was revised in April 2008. The LTCP proposed to comply with the Presumptive Approach Criteria of the EPA CSO Policy with an 85% capture rate for flow that occurs during average design conditions.

In a letter dated March 15, 2019, Mon Valley documented that during Phase II construction, they determined that the reach of the Monongahela River where CSO 007 discharges is a sensitive area. Because of this designation, there is a requirement for 100% of the discharge from CSO 007 to receive primary treatment and the size of the Seneca Street CSO Satellite Treatment Facility was increased from 4 MGD to 44 MGD.

The Department approved an amendment to the LTCP compliance schedule on May 6, 2022 to accommodate extra time needed to complete construction as a result of the discharge to a sensitive area. This change was approved under the authority of 40 CFR 122.44 (l) (2) (i) (B) (1), which allows for backsliding in an NPDES Permit when “Information is available which was not available at the time of permit issuance.” The following LTCP Compliance Schedule will be imposed in Part C. II. C.3. of the permit.

Milestone	Completion Date
Submit Annual CSO Status Report	**March 31 of each year**
Submit CSO DMR	**Within 28 days of the end of a month**
Completion of Phase III Construction	**February 28, 2026**
PCCMP Submission for DEP Approval	**December 31, 2026**
Start of PCCMP Implementation	**Within 90 days of PCCMP Approval**
Completion of PCCMP Implementation	**Within 24 months of Start of PCCMP Implementation**
PCCMP Report Submission	**Within 18 months of Completion of PCCMP Implementation**
Compliance with Presumptive Approach Criteria and 85% Performance Standard	**Within 18 Months of Completion of PCCMP Implementation**

LTCP Implementation of the Phase I Construction Project was completed in December 2013 under WQM Permit No. 6510402 and its 2012 amendment. The work included stream separation, interceptor upgrades, pump station upgrades, construction of an equalization basin and wet weather pump station and modifications at the WWTP.

LTCP Implementation of the Phase II Construction Project was completed in November 2018 under WQM Permit No. 6505401. The work included sewer separation, and construction of a satellite treatment facility.

Summary of Review

The facility is currently in Phase III of Construction, which consists of construction of one- 2MG equalization tank for CSO 010 and 011.

The approved LTCP Task Implementation Schedule requires PCCMP report submission by June 30, 2027.

Since the last permit, monthly *E. coli*, weekly aluminum, and quarterly PFAS monitoring have been added to the permit. Additionally, Part B I.D.4. was added to the permit, which requires the Authority to submit a list to EPA and DEP of industrial users in Effluent Limit Guideline categories expected or suspected of PFAS discharges.

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 40 CFR 122.44 *(l) 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.*

Summary of Whole Effluent Toxicity (WET) Tests

The 2014 permit required Mon Valley to collect discharge samples and perform WET tests to generate chronic survival and reproduction data for *Cladoceran* (water flea) and *Ceriodaphnia dubia,* and chronic survival and growth data for *Pimephales promelas* (fathead minnow). The dilution series for these tests was 100%, 60%, 30%, 2%, and 1%. The Target Instream Waste Concentration (TIWC) used to analyze the results was 2%.

Mon Valley passed all of its four most recent WET tests conducted August 2019, July 2020, July 2021, and June 2022.

The Target Instream Waste Concentration (TIWC) in this permit will again be 2% and the dilution series 100%, 60%, 30%, 2%, and 1%.

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)	4.96
Latitude	40º 9' 45.86"	Longitude	-79º 52' 19.31"
Quad Name	Donora	Quad Code	1707
Wastewater Description:	Sewage Effluent		

Receiving Waters	Monongahela River (WWF)	Stream Code	37185
NHD Com ID	99409584	RMI	38.25
Drainage Area	5220	Yield (cfs/mi^2)	0.105
Q_{7-10} Flow (cfs)	550	Q_{7-10} Basis	US Army Corp of Engineers
Elevation (ft)	726.9	Slope (ft/ft)	
Watershed No.	19-C	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Polychlorinated Biphenyls (PCBs)		
Source(s) of Impairment	Source Unknown		
TMDL Status	Final	Name	Monongahela River TMDL

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

Nearest Downstream Public Water Supply Intake	West Penn Power		
PWS Waters	Monongahela River	Flow at Intake (MGD)	0.45
PWS RMI	47.51	Distance from Outfall (mi)	9.26

Changes Since Last Permit Issuance: None

Other Comments: None

Discharge, Receiving Waters and Water Supply Information			
Outfall No.	007	Design Flow (MGD)	44
Latitude	40º 9' 43"	Longitude	-79º 52' 34"
Quad Name	Donora	Quad Code	1707
Wastewater Description:	Sewage Effluent		
Receiving Waters	Monongahela River (WWF)	Stream Code	37185
NHD Com ID	99409584	RMI	38.04
Drainage Area	5220	Yield (cfs/mi^2)	0.105
Q_{7-10} Flow (cfs)	550	Q_{7-10} Basis	US Army Corp of Engineers
Elevation (ft)	726.9	Slope (ft/ft)	
Watershed No.	19-C	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	Polychlorinated Biphenyls (Pcbs)		
Source(s) of Impairment	Source Unknown		
TMDL Status	Final	Name	Monongahela River TMDL

Other Comments: Q_{7-10} flow between RMI 23.8 and 41.5 is maintained by USGS as 550 cfs. CSO Outfalls 001 and 007 both fall within this range and therefore have the same Q_{7-10} flow for Monongahela River.

Treatment Facility Summary

Treatment Facility Name: Mon Valley Sewer Authority STP

WQM Permit No.	Issuance Date	Summary
467S032	1968	Permit issued to MVSA approving construction of a sewage treatment plant and Donora Pump Station.
467S032 A-1	December 2, 1993	Permit issued to MVSA approving construction of a winter biosolids storage system including: • One 80'x105'x5' pre-cast concrete storage bin • 620 LF of 4" drain pipe • 420 LF of 4" force main • One 13' deep 4' manhole with submersible pump
467S032 A-2	October 18, 1994	Permit Issued to MVSA approving replacing the existing vacuum filter press with a belt filter press consisting of: • One 2.2 meter belt filter press • 2-225 gpm rotary lobe pumps • Dry polymer feed unit. • Liquid polymer metering pump • Mixing tank • Biosolids storage tank
467S032 A-3	January 28, 1998	Permit issued to MVSA approving relocation of the Monessan force main about 20' upstream on the Monongahela.
467S032 A-4	July 15, 2019	Permit issued by PADEP to MVSA approving improvements to the Donora Pump Station including: • Removal of the existing comminutor • Installation of a Duperon FlexRake Model FPFS-M Mechanical Bar Screen • Installation of an influent channel weir • Installation of a manual bar screen • Installation of a Duperon washer compacter
467S032 A-4	July 2, 2020	Permit issued to Mon Valley SA approving improvements to the aeration system including: • Reconfiguration of the existing aeration manifolds in the aerobic digester tanks to accommodate new mixers and installation of a new purge sump assembly on each aerobic digester tank manifold • Installation of new mixers in the four existing aerobic digester tanks • Installation of variable frequency drives (VFDs) on the existing aeration blowers • Replacement of the existing check valves on each of the aeration blowers • Installation of a new Motor Control Center (MCC) to replace the existing unit and modifications to the blower room to accommodate new equipment • Installation of dissolved oxygen (DO) probes in each of the four aerobic digester tanks • Installation of airflow meters and control valves on each air supply line for the aerobic digester and contact/stabilization tanks

		• Installation of a third-party control system for automatic adjustment of aeration flowrates based on measured dissolved oxygen (DO) concentrations
467S032 A-5	September 7, 2023	Permit issued to Mon Valley from PADEP documenting CSO work that had been previously completed but not permitted. It documented: • Isolation of the diversion structure for CSO 006 • Installation of 20LF 6" PVC separate gravity sewer line

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Tertiary	Contact Stabilization W/Solids Removal	Gas Chlorine	4.96

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
4.96	6,220	Not Overloaded	Aerobic Digestion	Land Application and Landfill

Comments: None

Operations Compliance Check Summary Report

Facility: Mon Valley Sewer Authority STP

NPDES Permit No.: PA0026158

Compliance Review Period: 7/1/18-7/18/23

Inspection Summary:

INSPECTED DATE	INSP TYPE	AGENCY	INSPECTION RESULT DESC	INSPECTION COMMENT
04/03/2023	Combined Sewer Overflow-Non-Sampling	PA Dept of Environmental Protection	No Violations Noted	
10/27/2022	Administrative/File Review	PA Dept of Environmental Protection	No Violations Noted	An administrative review from 10/31/2022 to 10/27/2022 revealed no effluent violations. There was one CSO discharge on 7/26/2022 at CSO Outfall 016.
10/27/2022	Compliance Evaluation	PA Dept of Environmental Protection	Violation(s) Noted	
11/16/2021	Compliance Evaluation	PA Dept of Environmental Protection	No Violations Noted	
11/16/2021	Administrative/File Review	PA Dept of Environmental Protection	No Violations Noted	An administrative review from 9/1/20 to 11/16/21 revealed no effluent violations which has been notated in the 11/16/21 CEI report.
02/18/2021	Chapter 94 Inspection	PA Dept of Environmental Protection	No Violations Noted	The plant was not hydraulically or organically overloaded for the operating year 2020.
02/11/2021	Compliance Evaluation	PA Dept of Environmental Protection	Viol(s) Noted & Immediately Corrected	
02/11/2021	Compliance Evaluation	PA Dept of Environmental Protection	No Violations Noted	DMRs review 2/10/19 - 2/11/21 showed 2 effluent violations TRC 1.67 > 1.5 on 2/29/20, DO 2.44 < 4.0 notated on 9.17.20 CEI. Unauthorized discharge on 3/1/20 notated on 2.11.21 CEI
02/10/2021	Administrative/File Review	PA Dept of Environmental Protection	No Violations Noted	No effluent violations from 2-11-19 20 2-10-21.
09/01/2020	Compliance Evaluation	PA Dept of Environmental Protection	Viol(s) Noted & Immediately Corrected	
09/01/2020	Combined Sewer Overflow-Non-Sampling	PA Dept of Environmental Protection	No Violations Noted	
07/23/2019	Compliance Evaluation	PA Dept of Environmental Protection	Viol(s) Noted & Immediately Corrected	

Violation Summary:

VIOLATION DATE	VIOLATION TYPE	VIOLATION TYPE DESC	RESOLVED DATE
02/11/2021	92A.61(C)	NPDES - Failure to monitor pollutants as required by the NPDES permit	03/30/2021
09/01/2020	92A.44	NPDES - Violation of effluent limits in Part A of permit	10/01/2020
07/23/2019	92A.44	NPDES - Violation of effluent limits in Part A of permit	08/31/2019

Open Violations by Client ID:

No open violations for Client ID 45119

Enforcement Summary:

No enforcements executed during review period, though violations were noted during inspections.

Effluent Violation Summary:

MON_PD_END	PARAMETER	SAMPLE	PERMIT	UNIT	STAT_BASE_CODE
7/31/2021	Total Residual Chlorine (TRC)	1.85	1.5	mg/L	Instantaneous Maximum
6/30/2021	Total Residual Chlorine (TRC)	1.56	1.5	mg/L	Instantaneous Maximum
2/29/2020	Total Residual Chlorine (TRC)	1.67	1.5	mg/L	Instantaneous Maximum
10/31/2019	Dissolved Oxygen	2.44	4	mg/L	Minimum
11/30/2018	Dissolved Oxygen	1.03	4	mg/L	Minimum

Compliance Status: Facility is currently in compliance with no enforcements pending.

Completed by: Amanda Schmidt

Completed date: 7/18/23

Compliance History

DMR Data for Outfall 001 (from November 1, 2023 to October 31, 2024)

Parameter	OCT-24	SEP-24	AUG-24	JUL-24	JUN-24	MAY-24	APR-24	MAR-24	FEB-24	JAN-24	DEC-23	NOV-23
Flow (MGD) Average Monthly	1.51	1.837	1.982	2.181	2.244	3.00	5.422	3.945	3.983	4.024	2.519	2.134
Flow (MGD) Daily Maximum	2.416	4.186	2.563	5.553	4.681	93.01	12.944	11.476	8.007	12.001	5.172	7.426
pH (S.U.) Minimum	6.59	6.62	6.09	6.22	6.32	6.38	6.1	6.7	6.6	6.7	6.4	6.5
pH (S.U.) Maximum	7.21	7.6	7.33	7.2	7.52	7.57	7.5	7.8	7.4	7.5	7.3	7.7
DO (mg/L) Minimum	5.93	5.42	6.03	5.42	6.32	7.45	7.33	8.25	7.62	8.19	7.69	7.02
TRC (mg/L) Average Monthly	< 0.3	0.38	0.35	0.39	0.32	0.32	0.3	0.31	0.23	0.29	0.24	0.22
TRC (mg/L) Instantaneous Maximum	1.38	1.37	1.31	1.08	1.23	0.61	1.09	0.98	0.57	0.89	1.12	0.59
$CBOD_5$ (lbs/day) Average Monthly	49	< 42	< 51	< 76	58	< 69	< 278	< 119	< 82	< 122	62	54
$CBOD_5$ (lbs/day) Weekly Average	1.599	45	< 69	120	64	< 75	919	160	189	204	100	140
$CBOD_5$ (mg/L) Average Monthly	< 4	< 3	< 3	< 3	< 3	< 3	< 4	< 4	< 3	< 4	3	3
$CBOD_5$ (mg/L) Weekly Average	5	3	3	< 5	< 3	3	9	4	4	5	5	3
BOD_5 (lbs/day) Raw Sewage Influent Average Monthly	3299	3726	2591	2926	2185	3147	2052	3427	3972	4131	2431	4010
BOD_5 (lbs/day) Raw Sewage Influent Weekly Average	4624	5521	3689	8197	3043	7085	3887	12165	5342	16704	4225	19385
BOD_5 (mg/L) Raw Sewage Influent Average Monthly	251	268	159	137	115	145	54	91	198	135	140	156
BOD_5 (mg/L) Raw Sewage Influent Weekly Average	384	400	188	297	164	325	108	205	332	410	196	313

TSS (lbs/day) Average Monthly	< 61	58	< 72	< 109	< 67	160	20	< 218	123	279	94	99
TSS (lbs/day) Raw Sewage Influent Average Monthly	4381	5948	5303	5845	5404	6026	6443	8203	8910	5850	3436	6116
TSS (lbs/day) Raw Sewage Influent Weekly Average	7088	10924	8487	15051	8135	20161	10684	29670	21686	16704	7003	24463
TSS (lbs/day) Weekly Average	97	84	< 114	177	< 79	211	51	329	184	548	164	140
TSS (mg/L) Average Monthly	< 5	4	< 4	< 5	< 4	7	1435	< 7	6	8	5	6
TSS (mg/L) Raw Sewage Influent Average Monthly	329	434	329	256	286	275	186	221	461	153	192	262
TSS (mg/L) Raw Sewage Influent Weekly Average	465	850	640	520	450	1020	525	500	1210	410	320	435
TSS (mg/L) Weekly Average	6	6	< 6	7	< 4	11	5233	10	8	11	8	9
Fecal Coliform (CFU/100 ml) Geometric Mean	28	128	< 20	50	57	9	49	62	122	86	311	46
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	920.8	509.9	160.5	245.8	285.1	33.6	2419.6	2419.5	1046.2	437.1	2419.6	686.7
Total Nitrogen (mg/L) Daily Maximum		9.561			8.4606			7.071			213	
Ammonia (lbs/day) Average Monthly	5	< 5	< 2	< 11	9	< 13	30	< 8	< 26	9	14	5
Ammonia (lbs/day) Weekly Average	8	13	< 5	24	15	40	46	24	57	26	49	11
Ammonia (mg/L) Average Monthly	0.407	< 0.3602	< 0.1409	< 0.4553	0.4493	< 0.6419	0.9401	< 0.2288	< 1.0517	< 0.2265	0.6224	0.2406
Ammonia (mg/L) Weekly Average	0.6757	0.8714	0.2636	0.6442	0.7429	2.071	1.8912	0.615	2.4809	0.6146	2.1589	0.4629
Total Phosphorus (mg/L) Daily Maximum		0.215			0.225			0.23			9	

Compliance History

Effluent Violations for Outfall 001, from: December 1, 2023 To: October 31, 2024

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
TSS	04/30/24	Avg Mo	1435	mg/L	30	mg/L
TSS	04/30/24	Avg Mo	1435	mg/L	30	mg/L
TSS	04/30/24	Wkly Avg	5233	mg/L	45	mg/L
TSS	04/30/24	Wkly Avg	5233	mg/L	45	mg/L

Other Comments: None

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 4.96
Latitude 40º 9' 48.00" **Longitude** -79º 52' 19.00"
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
Flow (MGD)	Report	Average Monthly	-	92a.27, 92a.61
$CBOD_5$	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)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)
Ammonia-Nitrogen	25	Average Monthly	-	BPJ
Dissolved Oxygen	4.0	Min	-	BPJ
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Total Nitrogen	Report	Average Monthly	-	92a.61
Total Phosphorus	Report	Average Monthly	-	92a.61
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)

Water Quality-Based Limitations (WQBELs)

Pursuant to EPA's approval of Pennsylvania's 2017 Triennial Review of Water Quality Standards and corresponding regulatory changes published in the *Pennsylvania Bulletin* on July 11, 2020, new water quality criteria for ammonia-nitrogen apply to waters of the commonwealth. Therefore, WQBELs for Outfall 001 are re-evaluated even though there have been no changes to the STP.

WQM 7.0 Water Quality Modeling

DEP's WQM 7.0 version 1.1 model is a Microsoft Access Program used for sewage dischargers to determine whether TBELs are sufficient to meet in-stream water quality criteria for ammonia-nitrogen, carbonaceous biochemical oxygen demand ($CBOD_5$), and dissolved oxygen (DO). To accomplish this, the model simultaneously stimulates mixing and degradation of ammonia-nitrogen and mixing and consumption of DO through $CBOD_5$ and ammonia-nitrogen degradation. WQM 7.0 determines the highest pollutant loadings that the stream can assimilate while still meeting water quality criteria under design conditions. More information regarding the model can be found in the Department's "*Technical Reference Guide (TRG) WQM 7.0 for Windows Wasteload Allocation Program for Dissolved Oxygen and Ammonia Nitrogen Version 1.0"* [Doc. No. 391-2000-007]

The model is a two-step process. The discharge is first modeled for the summer period (May through October) because warm temperatures are more likely to result in critical loading conditions. Reduced DO levels likely also play a role in ammonia-toxicity and solubility of DO decreases at increased water temperature. If summer modeling determines that WQBELs are appropriate for the summer period., then modeling is completed for the winter period (November through April). This is in accordance with DEP's *"Implementation Guidance of Section 93.7 Ammonia Criteria"* [Doc. No. 391-2000-013] (Ammonia Guidance).

River Mile Index (RMI) was measured in eMAP PA as the distance from the facility's outfall to the mouth of the Ohio River. Elevation was read by applying a topomap in eMAP PA. Discharge point and downstream drainage areas were generated by the USGS Stream Stats. Q_{7-10} flow is regulated in the vicinity of the outfall at 550 cfs by the US Army Corps of Engineers. In the absence of site-specific data, discharge temperature, stream temperature, and stream pH were assumed to be 20, 25, and 7 in accordance with the Ammonia Guidance. Stream width was measured in Google Earth to be 610 ft and depth was assumed to be 10 ft.

WQM 7.0 modeling inputs are documented in the table below:

Discharge Characteristics		Basin/Stream Characteristics	
Parameter	**Value**	**Parameter**	**Value**
River Mile Index (RMI)	38.25	Drainage Area (Attachment A)	5220
Discharge Flow (MGD)	4.96	$Q_{7-10\ (cfs)}$	548.1
Discharge Temp (^oC)	20	Low-flow yield (cfs/mi^2)	0.105
Ammonia-Nitrogen (mg/L)	25	Elevation (ft)	726.90
$CBOD_5$ (mg/L)	25	Stream Width (ft)	610
Dissolved Oxygen (mg/L)	4.0	Stream Depth (ft)	10
		Stream Temp (^oC)	25
		Stream pH (s.u.)	7

The discharge was modeled using WQM 7.0 to evaluate the $CBOD_5$, ammonia-nitrogen, and DO parameters. Modeling confirmed that technology based effluent limitations are appropriate for $CBOD_5$, ammonia-nitrogen, and DO. WQM 7.0 output files are included in Attachment B.

In accordance with Section 1.A. Note 4 of the Department's SOP *Establishing Effluent Limitations for Individual Sewage Permits* [SOP no. BCW-PMT-033 Version 1.9], for existing permits where WQM modeling results for summer indicate that an average monthly limit of 25 mg/L is acceptable, a year-round monitoring requirement will be imposed for ammonia-nitrogen as a minimum. Year-round monitoring is imposed at a sampling frequency of 2/week in accordance with Table 6.3, Self-Monitoring Requirements for Sewage Dischargers, from the Department's *Technical Guidance for Development and Specification of Effluent Limitations* [Doc No. 362-0400-001]. This monitoring requirement is not changing from the previous permit. The highest Ammonia-Nitrogen average monthly result for the last year was 4.6 mg/L, which is significantly less than the technology based effluent limitation of 25 mg/L.

Toxics Management Spreadsheet Water Quality Modeling Program and Procedure for Evaluating Reasonable Potential

DEP's Toxics Management Spreadsheet Version 1.3 (TMS) is a Microsoft Excel ® spreadsheet that facilitates the evaluation of a single discharger by performing the calculations necessary to complete a Reasonable Potential Analysis and determine WQBELs for discharges of toxic and nonconventional pollutants.

The TMS evaluates each pollutant by computing a Wasteload Allocation for each applicable criterion, determining the most stringent governing WQBEL, and comparing that governing WQBEL to the input discharge concentration to determine whether permit requirements should apply. That decision is made using the following reasonable potential thresholds as documented in the Department's SOP *Establishing Water Quality-Based Limitations (WQBELs) and Permit Conditions for Toxic Pollutants in NPDES Permits for Existing Dischargers* [SOP no. BCW-PMT-037]:

- Establish limits in the permit where the maximum reported effluent concentration or calculated average monthly effluent concentration exceeds 50% of the WQBEL. Use the average monthly, maximum daily, and instantaneous maximum (IMAX) limits for the permit as recommended by the TMS.

- For non-conservative pollutants, establish monitoring requirements where the maximum reported effluent concentration or calculated average monthly effluent concentration is between 25%- 50% of the WQBEL.

- For conservative pollutants, establish monitoring requirements where the maximum reported effluent concentration or calculated average monthly concentration is between 10 – 50 % of the WQBEL.

TMS requires input data including stream code, RMI, elevation, drainage area, low flow yield, discharge hardness and pH, and stream hardness and pH. The same discharge and basin characteristic values are used as for the WQM 7.0. Discharge pH and hardness are taken from the effluent sample results reported in the application. In the absence of site-specific data, stream pH and hardness defaults to 7.0 s.u. and 100 mg/L In accordance with DEP's *DEP Toxics Management Spreadsheet (TMS) Instructions.* When known, additional information may be filled in to further define the model. In this case, a velocity rate of 0.09 was taken from the WQM 7.0 model output. Additionally, acute and chronic mix factors were calculated for the WET Test to be 0.102 and 0.708.

A Reasonable Potential Analysis was conducted using TMS. No additional limits were determined through water quality modeling; however, the modeling results recommend monitoring requirements for Aluminum. The output files from the TMS spreadsheet are provided in Attachment C.

Total Residual Chlorine

Total Residual Chlorine was re-modeled with the TRC Spreadsheet and it was confirmed that technology based effluent limits are appropriate for Total Residual Chlorine. TRC Spreadsheet output files are provided in Attachment D.

Best Professional Judgment (BPJ) Limitations

In accordance with Section 1.A. Note 6 of the Department's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 Version 1.9] and 25 Pa. Code §93, a dissolved oxygen minimum of 4.0 mg/L will be imposed based on BPJ in order to ensure adequate operation and maintenance.

Per- and Polyfluoroalkyl Substances (PFAS)

In February 2024, DEP implemented a new PFAS monitoring initiative consistent with EPA's memorandum that provides guidance for addressing PFAS in treated effluent discharges permitted under the NPDES program. PFAS are a family of synthetic, organic chemicals containing a chain of strong carbon-fluorine bonds. PFAS are generally highly stable and water- and oil-resistant and are useful in a variety of consumer products and industrial processes. PFAS are resistant to biodegradation, photooxidation, direct photolysis, and hydrolysis. Because PFAS do not readily degrade by natural processes, it accumulates over time. According to the United States Department of Health and Human Services' Agency for Toxic Substances and Disease Registry (ATSDR). The environmental persistence and mobility of PFAS combined with decades of widespread use have resulted in surface water, groundwater, drinking water, rainwater, soil, sediment, ice caps, outdoor and indoor air, plants, animal tissue, and human blood serum across the globe. ATSDR also reports that exposure to certain PFAS can lead to adverse human health impacts. Due to their durability, toxicity, persistence, and pervasiveness, PFAS have emerged as a potentially significant pollutant of concern for sewage treatment plants.

In accordance with Section II.G, of DEP's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [BCQ-PMT-033] and under the authority of 25 Pa. Code § 92.a.61, DEP is imposing monitoring for a subset of common/well-studied PFAS to help understand the extend of PFAS contamination throughout the Commonwealth and the extent to which point source discharges under the NPDES program contribute. These PFAS include Perfluorooctanoic Acid (PFOA), Perfluoroctanesulfonic Acid (PFOS), Perfluorobutanesulfonic acid (PFBS), and Hexafluoropropylene Oxide Dimer Acid (HFPO-DA).

Mon Valley Sewer Authority submitted their NPDES Permit renewal application prior to August 5, 2024 and were therefore not required to sample for PFOA, PFOS, PFBS, and HFPO-DA as part of the renewal sampling. MVSA STP has one categorical user, Tech Met, Inc, which is subject to EPA's effluent limit guidance for metal finishing found in 40 CFR Part 433. The EPA believes that industrial waste generators that fall under the metal finishing category may be a source of PFAS. Therefore, quarterly monitoring will be required for PFOA, PFOS, PFBS. And HFPO-DA. In accordance with Section II.G.3. of DEP's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [BCQ-PMT-033], a footnote has been added to the permit stating "The permittee may discontinue monitoring for PFOA, PFOS, HFPO-DA, and PFBS if the results in four consecutive monitoring periods indicate non-detect results at or below Quantitation Limits of 4.0 ng/L for PFOA, 3.7 ng/L for PFOS, 3.5 ng/L for PFBS, and 6.4 ng/L for HFPO-DA. When monitoring is discontinued, permittees must enter a No Discharge Indicator (NODI) Code of "GG" on DMRs.

Additional Considerations

In accordance with Section 1.A. of the Department's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 Version 1.9], pursuant to EPA's approval of Pennsylvania's 2017 Triennial Review of Water Quality Standards and corresponding regulatory changes published in the *Pennsylvania Bulletin* on July 11, 2020, and under the authority of 25 Pa. Code § 93.7(a) and § 92.a.61, sewage discharges will include monitoring for *E. coli*. For new and reissued permits, a monitoring frequency of 1/month will be imposed for facilities with a design flow of >= 1 MGD.

In accordance with Section IV.F.2 of the Department's SOP for *Clean Water Program Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 Version 1.9], and under the authority of 25 Pa. Code § 92a.61(b), nutrient monitoring for total nitrogen and total phosphorus will be imposed. The intent of this monitoring is to establish the nutrient load of the wastewater and evaluate the impact that load may have on the quality of the receiving stream. The SOP states that a monitoring frequency shall be imposed equivalent to that imposed or conventional pollutants if the facility discharges to a nutrient impaired stream or a lesser frequency if the receiving stream is not nutrient-impaired. The receiving stream, the Monongahela River, is not impaired for nutrients, therefore a monitoring frequency of 1/quarter will again be imposed. Since 2016, total nitrogen results have ranged from 0.1 to 10.122 mg/L. During the same time frame, total phosphorus results ranged from 0.02 to 0.412 mg/L.

In accordance with Section IV.F.2 of the Department's SOP for *New and Reissuance Sewage Individual NPDES Permit Applications* [SOP No. BCW-PMT-002 Version 2.0] for POTWs with design flows greater than 2,000 GPD, influent BOD_5 and TSS monitoring must be established in the permit at a frequency and sample type equivalent to that imposed for the effluent parameters.

Monitoring frequency for the proposed effluent limits are based on Table 6-3. Self-Monitoring Requirements for Sewage Discharges, from the Department's *Technical Guidance for the Development and Specification of Effluent Limitations* [Doc No.362-0400-001]. Please note that no monitoring frequencies have changed since the last permit cycle.

Mass Loading

Section 1.A of the Department's SOP, *Establishing Effluent Limitations for the Individual Sewage Permits* [SOP No. BCW-PMT-033 Version 1.9] and table 5.3 of the Department's *Technical Guidance for the Development and Specifications of Effluent Limitations* [Doc No. 362-0400-001] establish mass loading limits for Public Owned Treatment Works (POTWs) for $CBOD_5$, TSS, and ammonia-nitrogen. Average monthly and average weekly limits will be assigned $CBOD_5$ and TSS. Only a monitor and report average monthly requirement will be imposed for ammonia-nitrogen, however because it does not have a numeric limit. Mass loading limits are calculated according to the following equation:

$$mass\ loading\ limit\ \left(\frac{lbs}{day}\right) = average\ annual\ flow\ (MGD) * concentration\ limit\ \left(\frac{mg}{L}\right) * 8.34\ (conversion\ factor)$$

The following mass loading limits are being imposed:

Parameter	Average Monthly (lbs/day)	Weekly Average (lbs/day)
TSS (mg/L)	916	1374
$CBOD_5$ (mg/L)	763	1160
Ammonia-Nitrogen	Report	---

Industrial Users

Mon Valley Sewer Authority STP accepts effluent from three industrial users. The Elliot group repairs heavy rotating equipment and discharges water produced by steam cleaning as well as cooling water. Metheson Tri-Gas is a manufacturer of medical grade nitrous oxide and discharges process water and cooling water. Tech Met, Inc is a metal finishing plant. They are categorical user who is subject to 40 CFR Part 433. This facility is less than 5.0 MGD and the accepted industrial effluent is not anticipated to contribute to effluent limitations, therefore a pre-treatment program is not required for this facility.

Outfall No.	007	**Design Flow (MGD)**	44
Latitude	40º 9' 43.00"	**Longitude**	-79º 52' 34.00"
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
Flow (MGD)	Report	Average Monthly		92a.27, 92a.61
$CBOD_5$	Report	Average Monthly		92a.61
Total Suspended Solids	Report	Average Monthly		92a.61
Total Residual Chlorine	0.5	Average Monthly		92a.48(b)(2)
Ammonia-Nitrogen	Report	Average Monthly		92a.61
pH	6.0 – 9.0 S.U.	Min – Max		95.2(1)
Total Nitrogen	Report	Average Monthly		92a.61
Total Phosphorus	Report	Average Monthly		92a.61
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)

Best Professional Judgement (BPJ)

The Seneca Street CSO Satellite Treatment Plant is intended to provide primary settling and disinfection for the captured combined sewer flows that are not going to be directed to the main treatment plant. In order to comply with 85% capture for treatment under the Presumption Approach of EPA's *Combined Sewer Overflow (CSO) Control Policy* [FRL-4732-7] (*CSO Policy*), Section II.C.4.a.ii of the *CSO Policy* outlines that the effluent must meet a minimum of:

- Primary clarification (Removal of floatables and settleable solids may be achieved by any combination of treatment technologies or methods that are shown to be equivalent to primary clarification.);
- Solids and floatables disposal; and
- Disinfection of effluent, if necessary, to meet WQS, protect designated uses and protect human health, including removal of harmful disinfection chemical residuals, where necessary.

In consideration of the *CSO Policy* requirements and in an effort to provide DEP with a metric to verify proper operation and maintenance of the treatment system, minimum percent removal requirements will be imposed for $CBOD_5$ and TSS.

Section 62.21 of DEP's *Domestic Wastewater Facilities Manual* [Doc. No. 362-0300-001] documents that "A BOD removal of 30 percent to 35 percent will indicate efficient primary treatment. Similarly, page 396 of the fourth edition of *Wastewater Engineering Treatment and Reuse* by Metcalf and Eddy states "Efficiently designed and operated sedimentation tanks should remove … 25 to 40 percent of BOD". Based on these references, a best professional judgment minimum percent removal limit of 35% is being imposed at Outfall 007. Percent removal must be calculated using influent and effluent monitoring results, and therefore, influent and effluent $CBOD_5$ monitoring is also being imposed at Outfall 007.

Page 396 of the fourth edition of *Wastewater Engineering Treatment and Reuse* by Metcalf and Eddy states "Efficiently designed and operated sedimentation tanks should remove 50 to 70 percent of suspended solids." Based on this reference, a best professional judgement minimum percent removal limit of 60% is being imposed at Outfall 007. Percent removal must be calculated using influent and effluent monitoring results, and therefore, influent and effluent TSS monitoring is also being imposed at Outfall 007.

Additional Considerations

In accordance with Section 1.A. of the Department's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033], pursuant to EPA's approval of Pennsylvania's 2017 Triennial Review of Water Quality Standards and corresponding regulatory changes published in the *PA Bulletin* on July 11, 2020, and under the authority of 25 Pa. Code §92.a61, sewage discharges will include monitoring for *E. coli* for new and reissued permits. A monitoring frequency of 1/month when discharging will be imposed for facilities with a design flow of ≥ 1 MGD.

In accordance with Section IV.F.2 of the Department's SOP for *Clean Water Program Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 Version 1.9], and under the authority of 25 Pa. Code § 92a.61(b), nutrient monitoring for total nitrogen and total phosphorus will be imposed. The intent of this monitoring is to establish the nutrient load of the wastewater and evaluate the impact that load may have on the quality of the receiving stream. The SOP states that a monitoring frequency shall be imposed equivalent to that imposed or conventional pollutants if the facility discharges to a nutrient impaired stream or a lesser frequency if the receiving stream is not nutrient-impaired. The receiving stream, the Monongahela River, is not impaired for nutrients, therefore a monitoring frequency of 1/quarter will be imposed.

In accordance with Section IV.F.2 of the Department's SOP for *New and Reissuance Sewage Individual NPDES Permit Applications* [SOP No. BCW-PMT-002 Version 2.0] for POTWs with design flows greater than 2,000 GPD, influent BOD_5 and TSS monitoring must be established in the permit at a frequency and sample type equivalent to that imposed for the effluent parameters.

Monitoring frequency for the proposed effluent limitations are typically based on Table 6-3. Self-Monitoring Requirements for Sewage Discharges, from the Department's *Technical Guidance for the Development and Specification of Effluent Limitations* [Doc No.362-0400-001]. The Seneca Street CSO discharges to a sensitive area and has a design flow rate of 44 MGD. Based on Table 6.3, a sampling frequency of daily when discharging will be imposed.

Total Residual Chlorine

DEP's Total Residual Chlorine (TRC) Spreadsheet is a Microsoft Excel® Program used to evaluate WQBELs for TRC using a mass balance. In accordance with the Department's SOP for *Establishing Effluent Limitations for Individual Sewage Permits* [SOP No. BCW-PMT-033 Version 1.9], default values of 0.3 mg/L and 0 mg/L for in-stream and discharge chlorine demand were used. Additionally, a discharge flow of 44 MGD and a $Q_{7\text{-}10}$ of 548.1 were used. TRC modeling verified that a technology based effluent limit of 0.5 is adequate.

Whole Effluent Toxicity (WET)

The 2014 permit required Mon Valley to collect discharge samples and perform WET tests to generate chronic survival and reproduction data for *cladoceran* (water flea) and *Ceriodaphnia dubia* and chronic survival and growth data for *Pimephales promelas* (fathead minnow). The dilution series for these tests was 100%, 60%, 30%, 2%, and 1%. The Target Instream Waste Concentration (TIWC) used to analyze the results was 2.

Mon Valley SA passed all four of its last four annual WET tests conducted August 2019, July 2020, July 2021, and June 2022. WET test evaluation results are provided in Attachment E.

Complete mix time is calculated as a function of discharge flow rate and receiving stream characteristics ($Q_{7\text{-}10}$ flow, velocity, width, depth, and slope). Stream characteristics are the same as those used for WQM and TMS models.

Complete mixing time was calculated to be 1179 min. Because the complete mix time is greater than 720 minutes, therefore Chronic Partial Mix Factor is calculated using the following equation:

$$PMF_c = \left(\frac{720}{Complete\ mix\ time}\right)^{0.5}$$

The Chronic Partial Mix Factor was calculated to be 78.14%

Chronic Instream Waste Concentration (IWC_c) is calculated as a function of discharge flow, stream flow, and PMF_c according to the following equation:

$$IWC_c = (\frac{Q_d * 1.547}{Q_{7-10} * PMF_c}) + (Q_d * 1.547)$$

IWC_c was calculated to be 36.69%. Chronic Tests will again be imposed in the permit.

Target Chronic Instream Waste Concentration is calculated as a function of IWCa using the following equation:

$$TIWC_c = \frac{IWC_c}{1}$$

$TIWC_c$ was calculated to be 2%.

The dilution series as determined using Attachment D of the Department's SOP for *Whole Effluent Toxicity (WET)* [SOP No. BPNPSM-PMT-031]. Based on a $TIWC_c$, of 2%, the dilution series imposed in this permit will again be 100%, 60%, 30%, 2%, and 1%.

Monongahela River Total Maximum Daily Load

A Total Maximum Daily Load (TMDL) for PCBs and chlordane in the Monongahela River was finalized on March 1, 1999. This TMDL applies to RMI 420 to 530. 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, a numeric water quality criterion, or both, are consistent with the assumptions and requirements of any available waste load allocation (WLA) for the discharge prepared by the State and approved by EPA pursuant to 40 CFR § 130.7. The TMDL document states that the production and use of PCBs were banned in the US in July 1979 and the use of chlordane has been banned in the US since April 1988. There are therefore no new point sources for either of these pollutants. Known, existing point sources of PCBs and/or chlordane have obtained NPDES permits with WQBELs for those pollutants. PCBs and chlordane in the Monongahela River are expected to be present primarily in the sediment due to historic use and improper disposal practices. Natural attenuation is expected to reduce PCB and chlordane contamination in the Monongahela River over time. Pennsylvania is monitoring the concentrations of PCBs and chlordane in white bass and carp tissue. Mon Valley Sewer Authority is not being assigned limits or monitoring due to the Monongahela River TMDL.

Proposed Effluent Limitations and Monitoring Requirements

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

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	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
Dissolved Oxygen	XXX	XXX	4.0 Inst Min	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
$CBOD_5$	1030	1570	XXX	25	38	50	2/week	24-Hr Composite
BOD_5 Raw Sewage Influent	Report	Report	XXX	Report	Report	XXX	2/week	24-Hr Composite
Total Suspended Solids	1240	1860	XXX	30	45	60	2/week	24-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report	XXX	Report	Report	XXX	2/week	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/week	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/month	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	24-Hr Composite
Ammonia-Nitrogen	Report	Report	XXX	Report	Report	XXX	2/week	24-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 Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	24-Hr Composite
Total Aluminum	Report	Report Daily Max	XXX	Report	Report Daily Max	XXX	1/week	24-Hr Composite
PFOA (ng/L)	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	Grab
PFOS (ng/L)	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	Grab
PFBS (ng/L)	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
HFPO-DA (ng/L)	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	Grab

Compliance Sampling Location: Outfall 001

Other Comments: None

Proposed Effluent Limitations and Monitoring Requirements

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

Outfall 007, Effective Period: Permit Effective Date through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2)	Required
	Average Monthly	Average Weekly	Instantaneous Minimum	Average Monthly	Weekly Average	Instant. Maximum	Measurement Frequency	Sample Type
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	Daily when Discharging	Metered
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	Daily when Discharging	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.5	XXX	1.6	Daily when Discharging	Grab
$CBOD_5$	XXX	XXX	XXX	Report	XXX	Report	Daily when Discharging	Grab
$CBOD_5$ Raw Sewage Influent	XXX	XXX	XXX	Report	XXX	Report	Daily when Discharging	Grab
$CBOD_5$ % Removal (%)	XXX	XXX	35.00	XXX	XXX	XXX	Daily when Discharging	Grab
Total Suspended Solids Raw Sewage Influent	XXX	XXX	XXX	Report	XXX	Report	Daily when Discharging	Grab
Total Suspended Solids	XXX	XXX	XXX	Report	Report	XXX	Daily when Discharging	Grab
Total Suspended Solids % Removal (%)	XXX	XXX	60	XXX	XXX	XXX	Daily when Discharging	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	Daily when Discharging	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	Daily when Discharging	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	Monthly When Discharging	Grab
Total Nitrogen	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab
Ammonia-Nitrogen	XXX	XXX	XXX	Report	XXX	Report	Daily when Discharging	Grab

Outfall 007 , 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	Average Weekly	Instantaneous Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Total Phosphorus	XXX	XXX	XXX	XXX	XXX	Report	1/quarter	Grab

Compliance Sampling Location: Outfall 007

Other Comments:

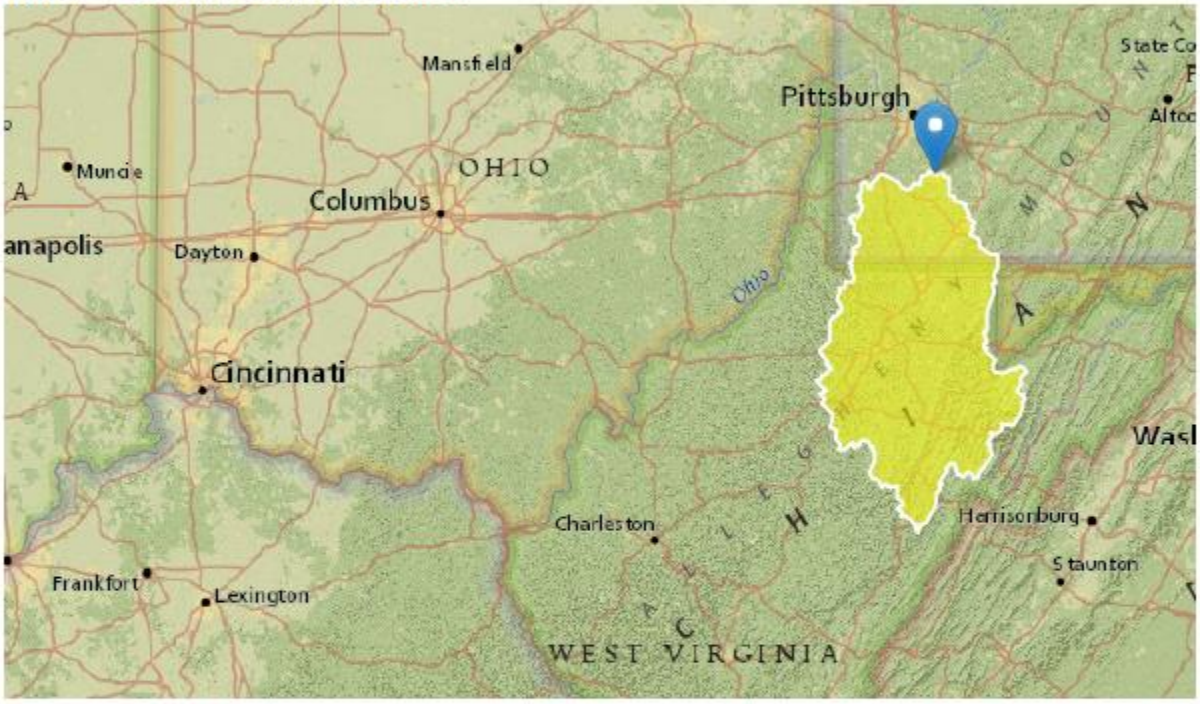
ATTACHMENT A

USGS Stream Stats Output

Discharge Point

StreamStats Report

Region ID: PA
Workspace ID: PA20211130152726866000
Clicked Point (Latitude, Longitude): 40.16141, -79.86792
Time: 2021-11-30 10:27:54 -0500



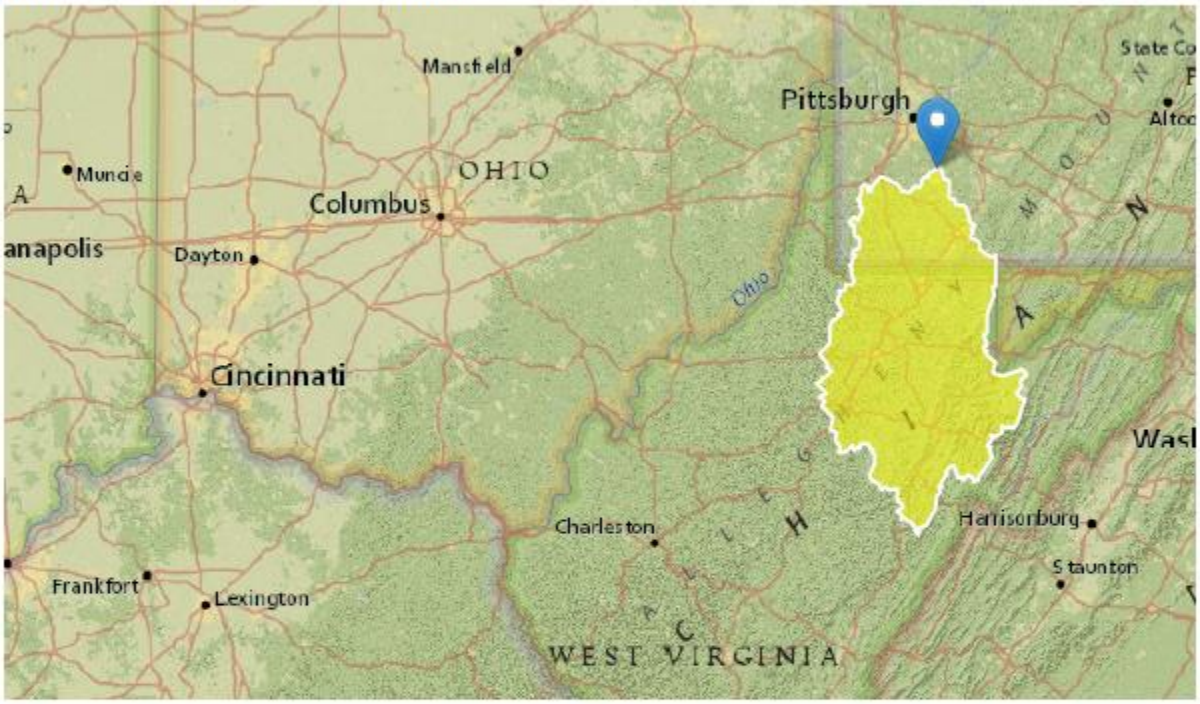
Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	5220	square miles
ELEV	Mean Basin Elevation	1841	feet

Down Stream of Discharge

StreamStats Report

Region ID: PA
Workspace ID: PA20211208184651748000
Clicked Point (Latitude, Longitude): 40.19458, -79.86069
Time: 2021-12-08 13:47:18 -0500



Basin Characteristics

Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	5230	square miles
ELEV	Mean Basin Elevation	1840	feet

ATTACHMENT B

WQM 7.0 Modeling Results

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
19A	37185	MONONGAHELA RIVER	38.250	726.90	5220.00	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	0.105	0.00	0.00	0.000	0.000	0.0	610.00	10.00	25.00	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
MVSA	PA0026158	0.0000	4.9600	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	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

Input Data WQM 7.0

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19A	37185	MONONGAHELA RIVER	35.000	726.00	5230.00	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	0.105	0.00	0.00	0.000	0.000	0.0	610.00	10.00	25.00	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	8.24	0.00	0.00
NH3-N	25.00	0.00	0.00	0.70

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
19A	37185	MONONGAHELA RIVER

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												
38.250	548.10	0.00	548.10	7.6731	0.00005	10	610	61	0.09	2.180	24.93	7.00
Q1-10 Flow												
38.250	350.78	0.00	350.78	7.6731	0.00005	NA	NA	NA	0.06	3.380	24.89	7.00
Q30-10 Flow												
38.250	745.42	0.00	745.42	7.6731	0.00005	NA	NA	NA	0.12	1.609	24.95	7.00

WQM 7.0 Modeling Specifications

Parameters	Both	Use Inputted Q1-10 and Q30-10 Flows	☑
WLA Method	EMPR	Use Inputted W/D Ratio	☐
Q1-10/Q7-10 Ratio	0.64	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 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
19A	37185	MONONGAHELA RIVER

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
38.250	MVSA	11.17	50	11.17	50	0	0

NH3-N Chronic Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
38.250	MVSA	1.37	25	1.37	25	0	0

Dissolved Oxygen Allocations

RMI	Discharge Name	CBOD5		NH3-N		Dissolved Oxygen		Critical Reach	Percent Reduction
		Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)	Baseline (mg/L)	Multiple (mg/L)		
38.25	MVSA	25	25	25	25	4	4	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19A	37185	MONONGAHELA RIVER

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
38.250	4.960	24.931	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
610.000	10.000	61.000	0.091
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.32	0.054	0.35	1.023
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.184	0.138	O'Connor	5
Reach Travel Time (days)			
2.180			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.218	2.28	0.28	7.55
0.436	2.25	0.22	7.55
0.654	2.22	0.18	7.33
0.872	2.18	0.14	7.15
1.090	2.15	0.11	7.01
1.308	2.12	0.09	6.91
1.526	2.09	0.07	6.82
1.744	2.06	0.06	6.76
1.962	2.03	0.05	6.71
2.180	2.00	0.04	6.67

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
19A	37185	MONONGAHELA RIVER

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)
38.250	MVSA	PA0026158	0.000	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			4

ATTACHMENT C

TMS Spreadsheet Modeling Results

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Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Mon Valley SA** NPDES Permit No.: **PA0026158** Outfall No.: **001**

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

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
4.96	81	7	0.113	0.781				

					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		534									
	Chloride (PWS)	mg/L		147									
	Bromide	mg/L		0.023									
	Sulfate (PWS)	mg/L		190									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L		664									
	Total Antimony	µg/L	<	0.35									
	Total Arsenic	µg/L		0.249									
	Total Barium	µg/L		43.3									
	Total Beryllium	µg/L	<	0.4									
	Total Boron	µg/L		107									
	Total Cadmium	µg/L	<	0.123									
	Total Chromium (III)	µg/L	<	0.718									
	Hexavalent Chromium	µg/L	<	0.01									
	Total Cobalt	µg/L		17.3									
	Total Copper	µg/L		7.03									
	Free Cyanide	µg/L		1									
	Total Cyanide	µg/L	<	10									
	Dissolved Iron	µg/L		141									
	Total Iron	µg/L		235									
	Total Lead	µg/L		1.57									
	Total Manganese	µg/L		465									
	Total Mercury	µg/L		0.2									
	Total Nickel	µg/L		40.8									
	Total Phenols (Phenolics) (PWS)	µg/L	<	2									
	Total Selenium	µg/L	<	1.67									
	Total Silver	µg/L	<	1.37									
	Total Thallium	µg/L		0.155									
	Total Zinc	µg/L		63.6									
	Total Molybdenum	µg/L		2.51									
	Acrolein	µg/L	<	1.56									
	Acrylamide	µg/L	<										
	Acrylonitrile	µg/L	<	0.53									
	Benzene	µg/L	<	0.48									
	Bromoform	µg/L	<	0.36									

Group 3	Carbon Tetrachloride	µg/L	<	0.51										
	Chlorobenzene	µg/L	<	0.2										
	Chlorodibromomethane	µg/L	<	0.45										
	Chloroethane	µg/L	<	0.46										
	2-Chloroethyl Vinyl Ether	µg/L	<	4.85										
	Chloroform	µg/L		1.18										
	Dichlorobromomethane	µg/L	<	0.35										
	1,1-Dichloroethane	µg/L	<	0.5										
	1,2-Dichloroethane	µg/L	<	0.46										
	1,1-Dichloroethylene	µg/L	<	0.33										
	1,2-Dichloropropane	µg/L	<	0.52										
	1,3-Dichloropropylene	µg/L	<	0.29										
	1,4-Dioxane	µg/L	<	10										
	Ethylbenzene	µg/L	<	0.3										
	Methyl Bromide	µg/L	<	0.48										
	Methyl Chloride	µg/L	<	0.32										
	Methylene Chloride	µg/L	<	0.44										
	1,1,2,2-Tetrachloroethane	µg/L	<	0.44										
	Tetrachloroethylene	µg/L	<	0.38										
	Toluene	µg/L	<	0.37										
	1,2-trans-Dichloroethylene	µg/L	<	0.43										
	1,1,1-Trichloroethane	µg/L		11.7										
	1,1,2-Trichloroethane	µg/L	<	0.21										
	Trichloroethylene	µg/L	<	0.52										
	Vinyl Chloride	µg/L	<	0.42										
Group 4	2-Chlorophenol	µg/L	<	0.135										
	2,4-Dichlorophenol	µg/L	<	0.26										
	2,4-Dimethylphenol	µg/L	<	0.27										
	4,6-Dinitro-o-Cresol	µg/L	<	0.936										
	2,4-Dinitrophenol	µg/L	<	0.894										
	2-Nitrophenol	µg/L	<	0.26										
	4-Nitrophenol	µg/L	<	0.198										
	p-Chloro-m-Cresol	µg/L	<	0.416										
	Pentachlorophenol	µg/L	<	1.01										
	Phenol	µg/L	<	0.26										
	2,4,6-Trichlorophenol	µg/L		0.76										
Group 5	Acenaphthene	µg/L	<	0.27										
	Acenaphthylene	µg/L	<	0.229										
	Anthracene	µg/L	<	0.135										
	Benzidine	µg/L	<	0.364										
	Benzo(a)Anthracene	µg/L	<	0.218										
	Benzo(a)Pyrene	µg/L	<	0.208										
	3,4-Benzofluoranthene	µg/L	<	0.187										
	Benzo(ghi)Perylene	µg/L	<	0.218										
	Benzo(k)Fluoranthene	µg/L	<	0.198										
	Bis(2-Chloroethoxy)Methane	µg/L	<	0.156										
	Bis(2-Chloroethyl)Ether	µg/L	<	0.26										
	Bis(2-Chloroisopropyl)Ether	µg/L	<	0.354										
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	0.666										
	4-Bromophenyl Phenyl Ether	µg/L	<	0.198										
	Butyl Benzyl Phthalate	µg/L	<	0.229										
	2-Chloronaphthalene	µg/L	<	0.291										
	4-Chlorophenyl Phenyl Ether	µg/L	<	0.302										
	Chrysene	µg/L	<	0.354										
	Dibenzo(a,h)Anthrancene	µg/L	<	0.27										
	1,2-Dichlorobenzene	µg/L	<	0.333										
	1,3-Dichlorobenzene	µg/L	<	0.177										
	1,4-Dichlorobenzene	µg/L	<	0.156										
	3,3-Dichlorobenzidine	µg/L	<	0.135										
	Diethyl Phthalate	µg/L	<	0.281										
	Dimethyl Phthalate	µg/L	<	0.239										
	Di-n-Butyl Phthalate	µg/L		1.37										
	2,4-Dinitrotoluene	µg/L	<	0.801										

	2,6-Dinitrotoluene	µg/L	<	0.135										
	Di-n-Octyl Phthalate	µg/L	<	0.281										
	1,2-Diphenylhydrazine	µg/L	<	0.208										
	Fluoranthene	µg/L	<	0.187										
	Fluorene	µg/L	<	0.26										
	Hexachlorobenzene	µg/L	<	0.26										
	Hexachlorobutadiene	µg/L	<	0.281										
	Hexachlorocyclopentadiene	µg/L	<	0.229										
	Hexachloroethane	µg/L	<	0.27										
	Indeno(1,2,3-cd)Pyrene	µg/L	<	0.26										
	Isophorone	µg/L	<	0.239										
	Naphthalene	µg/L	<	0.26										
	Nitrobenzene	µg/L	<	0.27										
	n-Nitrosodimethylamine	µg/L	<	0.461										
	n-Nitrosodi-n-Propylamine	µg/L	<	0.322										
	n-Nitrosodiphenylamine	µg/L	<	0.281										
	Phenanthrene	µg/L	<	0.218										
	Pyrene	µg/L	<	0.166										
	1,2,4-Trichlorobenzene	µg/L	<	0.177										
Group 6	Aldrin	µg/L	<	0.007										
	alpha-BHC	µg/L	<	0.0122										
	beta-BHC	µg/L	<	0.0226										
	gamma-BHC	µg/L	<	0.0054										
	delta BHC	µg/L	<	0.0121										
	Chlordane	µg/L	<	0.25										
	4,4-DDT	µg/L	<	0.0066										
	4,4-DDE	µg/L	<	0.0098										
	4,4-DDD	µg/L	<	0.0066										
	Dieldrin	µg/L	<	0.0072										
	alpha-Endosulfan	µg/L	<	0.0336										
	beta-Endosulfan	µg/L	<	0.0034										
	Endosulfan Sulfate	µg/L	<	0.0074										
	Endrin	µg/L	<	0.0124										
	Endrin Aldehyde	µg/L	<	0.026										
	Heptachlor	µg/L	<	0.0111										
	Heptachlor Epoxide	µg/L	<	0.0053										
	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	<	0.417										
	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 1.3, March 2021

Stream / Surface Water Information

Mon Valley SA, NPDES Permit No. PA0026158, Outfall 001

Instructions | Discharge | *Stream*

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

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

Location	Stream Code*	RMI*	Elevation (ft)*	DA (mi²)*	Slope (ft/ft)	PWS Withdrawal (MGD)	Apply Fish Criteria*
Point of Discharge	037185	38.25	726.9	5220	0.000177		Yes
End of Reach 1	037185	0.001	718.7	7380	0.000177		Yes

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

Location	RMI	LFY (cfs/mi²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	38.25	0.105				610	10	0.09				100	7		
End of Reach 1	0.001	0.105													

Q_h

Location	RMI	LFY (cfs/mi²)	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness	pH	Hardness	pH
Point of Discharge	38.25														
End of Reach 1	0.001														

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Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Mon Valley SA, NPDES Permit No. PA0026158, Outfall 001

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

☐ ***Hydrodynamics***

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 15 PMF: 0.113 Analysis Hardness (mg/l): 97.906 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	6,804	
Total Antimony	0	0		0	1,100	1,100	9,979	
Total Arsenic	0	0		0	340	340	3,084	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	190,506	
Total Boron	0	0		0	8,100	8,100	73,481	
Total Cadmium	0	0		0	1.973	2.09	18.9	Chem Translator of 0.945 applied
Total Chromium (III)	0	0		0	559.971	1,772	16,076	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	148	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	862	
Total Copper	0	0		0	13.174	13.7	124	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	22	22.0	200	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	63.110	79.5	721	Chem Translator of 0.794 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	14.9	Chem Translator of 0.85 applied
Total Nickel	0	0		0	459.926	461	4,181	Chem Translator of 0.998 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	Chem Translator of 0.922 applied
Total Silver	0	0		0	3.102	3.65	33.1	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	590	
Total Zinc	0	0		0	115.098	118	1,068	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	27.2	

Acrylonitrile	0	0		0	650	650	5,897	
Benzene	0	0		0	640	640	5,806	
Bromoform	0	0		0	1,800	1,800	16,329	
Carbon Tetrachloride	0	0		0	2,800	2,800	25,401	
Chlorobenzene	0	0		0	1,200	1,200	10,886	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	163,291	
Chloroform	0	0		0	1,900	1,900	17,236	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	136,076	
1,1-Dichloroethylene	0	0		0	7,500	7,500	68,038	
1,2-Dichloropropane	0	0		0	11,000	11,000	99,789	
1,3-Dichloropropylene	0	0		0	310	310	2,812	
Ethylbenzene	0	0		0	2,900	2,900	26,308	
Methyl Bromide	0	0		0	550	550	4,989	
Methyl Chloride	0	0		0	28,000	28,000	254,008	
Methylene Chloride	0	0		0	12,000	12,000	108,861	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	9,072	
Tetrachloroethylene	0	0		0	700	700	6,350	
Toluene	0	0		0	1,700	1,700	15,422	
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	61,688	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	27,215	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	30,844	
Trichloroethylene	0	0		0	2,300	2,300	20,865	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	5,080	
2,4-Dichlorophenol	0	0		0	1,700	1,700	15,422	
2,4-Dimethylphenol	0	0		0	660	660	5,987	
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	726	
2,4-Dinitrophenol	0	0		0	660	660	5,987	
2-Nitrophenol	0	0		0	8,000	8,000	72,574	
4-Nitrophenol	0	0		0	2,300	2,300	20,865	
p-Chloro-m-Cresol	0	0		0	160	160	1,451	
Pentachlorophenol	0	0		0	8.723	8.72	79.1	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	4,173	
Acenaphthene	0	0		0	83	83.0	753	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	2,722	
Benzo(a)Anthracene	0	0		0	0.5	0.5	4.54	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	30,000	30,000	272,152	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	40,823	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	2,449	
Butyl Benzyl Phthalate	0	0		0	140	140	1,270	

2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	820	820	7,439	
1,3-Dichlorobenzene	0	0		0	350	350	3,175	
1,4-Dichlorobenzene	0	0		0	730	730	6,622	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	36,287	
Dimethyl Phthalate	0	0		0	2,500	2,500	22,679	
Di-n-Butyl Phthalate	0	0		0	110	110	998	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	14,515	
2,6-Dinitrotoluene	0	0		0	990	990	8,981	
1,2-Diphenylhydrazine	0	0		0	15	15.0	136	
Fluoranthene	0	0		0	200	200	1,814	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	10	10.0	90.7	
Hexachlorocyclopentadiene	0	0		0	5	5.0	45.4	
Hexachloroethane	0	0		0	60	60.0	544	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	90,717	
Naphthalene	0	0		0	140	140	1,270	
Nitrobenzene	0	0		0	4,000	4,000	36,287	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	154,219	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	2,722	
Phenanthrene	0	0		0	5	5.0	45.4	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	1,179	
Aldrin	0	0		0	3	3.0	27.2	
alpha-BHC	0	0		0	N/A	N/A	N/A	
beta-BHC	0	0		0	N/A	N/A	N/A	
gamma-BHC	0	0		0	0.95	0.95	8.62	
Chlordane	0	0		0	2.4	2.4	21.8	
4,4-DDT	0	0		0	1.1	1.1	9.98	
4,4-DDE	0	0		0	1.1	1.1	9.98	
4,4-DDD	0	0		0	1.1	1.1	9.98	
Dieldrin	0	0		0	0.24	0.24	2.18	
alpha-Endosulfan	0	0		0	0.22	0.22	2.0	
beta-Endosulfan	0	0		0	0.22	0.22	2.0	
Endosulfan Sulfate	0	0		0	N/A	N/A	N/A	
Endrin	0	0		0	0.086	0.086	0.78	
Endrin Aldehyde	0	0		0	N/A	N/A	N/A	
Heptachlor	0	0		0	0.52	0.52	4.72	
Heptachlor Epoxide	0	0		0	0.5	0.5	4.54	
Toxaphene	0	0		0	0.73	0.73	6.62	

☑ *CFC* CCT (min): 720 PMF: 0.781 Analysis Hardness (mg/l): 99.665 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	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	12,493	
Total Arsenic	0	0		0	150	150	8,518	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	232,830	
Total Boron	0	0		0	1,600	1,600	90,860	
Total Cadmium	0	0		0	0.245	0.27	15.3	Chem Translator of 0.909 applied
Total Chromium (III)	0	0		0	73.911	85.9	4,881	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	590	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	1,079	
Total Copper	0	0		0	8.930	9.3	528	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	5.2	5.2	295	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	108,647	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	2.507	3.17	180	Chem Translator of 0.791 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	51.4	Chem Translator of 0.85 applied
Total Nickel	0	0		0	51.859	52.0	2,954	Chem Translator of 0.997 applied
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	4.600	4.99	283	Chem Translator of 0.922 applied
Total Silver	0	0		0	N/A	N/A	N/A	Chem Translator of 1 applied
Total Thallium	0	0		0	13	13.0	738	
Total Zinc	0	0		0	117.804	119	6,785	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	170	
Acrylonitrile	0	0		0	130	130	7,382	
Benzene	0	0		0	130	130	7,382	
Bromoform	0	0		0	370	370	21,011	
Carbon Tetrachloride	0	0		0	560	560	31,801	
Chlorobenzene	0	0		0	240	240	13,629	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	198,757	
Chloroform	0	0		0	390	390	22,147	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	176,042	
1,1-Dichloroethylene	0	0		0	1,500	1,500	85,182	
1,2-Dichloropropane	0	0		0	2,200	2,200	124,933	
1,3-Dichloropropylene	0	0		0	61	61.0	3,464	
Ethylbenzene	0	0		0	580	580	32,937	
Methyl Bromide	0	0		0	110	110	6,247	
Methyl Chloride	0	0		0	5,500	5,500	312,333	

Methylene Chloride	0	0		0	2,400	2,400	136,291	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	11,925	
Tetrachloroethylene	0	0		0	140	140	7,950	
Toluene	0	0		0	330	330	18,740	
1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	79,503	
1,1,1-Trichloroethane	0	0		0	610	610	34,641	
1,1,2-Trichloroethane	0	0		0	680	680	38,616	
Trichloroethylene	0	0		0	450	450	25,554	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	6,247	
2,4-Dichlorophenol	0	0		0	340	340	19,308	
2,4-Dimethylphenol	0	0		0	130	130	7,382	
4,6-Dinitro-o-Cresol	0	0		0	16	16.0	909	
2,4-Dinitrophenol	0	0		0	130	130	7,382	
2-Nitrophenol	0	0		0	1,600	1,600	90,860	
4-Nitrophenol	0	0		0	470	470	26,690	
p-Chloro-m-Cresol	0	0		0	500	500	28,394	
Pentachlorophenol	0	0		0	6.693	6.69	380	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	5,168	
Acenaphthene	0	0		0	17	17.0	965	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	3,350	
Benzo(a)Anthracene	0	0		0	0.1	0.1	5.68	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	6,000	6,000	340,726	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	51,677	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	3,067	
Butyl Benzyl Phthalate	0	0		0	35	35.0	1,988	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	160	160	9,086	
1,3-Dichlorobenzene	0	0		0	69	69.0	3,918	
1,4-Dichlorobenzene	0	0		0	150	150	8,518	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	45,430	
Dimethyl Phthalate	0	0		0	500	500	28,394	
Di-n-Butyl Phthalate	0	0		0	21	21.0	1,193	
2,4-Dinitrotoluene	0	0		0	320	320	18,172	
2,6-Dinitrotoluene	0	0		0	200	200	11,358	
1,2-Diphenylhydrazine	0	0		0	3	3.0	170	

Fluoranthene	0	0		0	40	40.0	2,272	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	2	2.0	114	
Hexachlorocyclopentadiene	0	0		0	1	1.0	56.8	
Hexachloroethane	0	0		0	12	12.0	681	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	119,254	
Naphthalene	0	0		0	43	43.0	2,442	
Nitrobenzene	0	0		0	810	810	45,998	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	193,078	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	3,350	
Phenanthrene	0	0		0	1	1.0	56.8	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	1,476	
Aldrin	0	0		0	0.1	0.1	5.68	
alpha-BHC	0	0		0	N/A	N/A	N/A	
beta-BHC	0	0		0	N/A	N/A	N/A	
gamma-BHC	0	0		0	N/A	N/A	N/A	
Chlordane	0	0		0	0.0043	0.004	0.24	
4,4-DDT	0	0		0	0.001	0.001	0.057	
4,4-DDE	0	0		0	0.001	0.001	0.057	
4,4-DDD	0	0		0	0.001	0.001	0.057	
Dieldrin	0	0		0	0.056	0.056	3.18	
alpha-Endosulfan	0	0		0	0.056	0.056	3.18	
beta-Endosulfan	0	0		0	0.056	0.056	3.18	
Endosulfan Sulfate	0	0		0	N/A	N/A	N/A	
Endrin	0	0		0	0.036	0.036	2.04	
Endrin Aldehyde	0	0		0	N/A	N/A	N/A	
Heptachlor	0	0		0	0.0038	0.004	0.22	
Heptachlor Epoxide	0	0		0	0.0038	0.004	0.22	
Toxaphene	0	0		0	0.0002	0.0002	0.011	

☑ ***THH*** CCT (min): 720 PMF: 0.781 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 Antimony	0	0		0	5.6	5.6	318	
Total Arsenic	0	0		0	10	10.0	568	
Total Barium	0	0		0	2,400	2,400	136,369	

Total Boron	0	0		0	3,100	3,100	176,143	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Free Cyanide	0	0		0	4	4.0	227	
Dissolved Iron	0	0		0	300	300	17,046	
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	56,820	
Total Mercury	0	0		0	0.050	0.05	2.84	
Total Nickel	0	0		0	610	610	34,660	
Total Phenols (Phenolics) (PWS)	0	0		0	5	5.0	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	0.24	0.24	13.6	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	170	
Acrylonitrile	0	0		0	N/A	N/A	N/A	
Benzene	0	0		0	N/A	N/A	N/A	
Bromoform	0	0		0	N/A	N/A	N/A	
Carbon Tetrachloride	0	0		0	N/A	N/A	N/A	
Chlorobenzene	0	0		0	100	100.0	5,682	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	324	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	N/A	N/A	N/A	
1,1-Dichloroethylene	0	0		0	33	33.0	1,875	
1,2-Dichloropropane	0	0		0	N/A	N/A	N/A	
1,3-Dichloropropylene	0	0		0	N/A	N/A	N/A	
Ethylbenzene	0	0		0	68	68.0	3,864	
Methyl Bromide	0	0		0	100	100.0	5,682	
Methyl Chloride	0	0		0	N/A	N/A	N/A	
Methylene Chloride	0	0		0	N/A	N/A	N/A	
1,1,2,2-Tetrachloroethane	0	0		0	N/A	N/A	N/A	
Tetrachloroethylene	0	0		0	N/A	N/A	N/A	
Toluene	0	0		0	57	57.0	3,239	
1,2-trans-Dichloroethylene	0	0		0	100	100.0	5,682	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	568,202	
1,1,2-Trichloroethane	0	0		0	N/A	N/A	N/A	
Trichloroethylene	0	0		0	N/A	N/A	N/A	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	30	30.0	1,705	

2,4-Dichlorophenol	0	0		0	10	10.0	568	
2,4-Dimethylphenol	0	0		0	100	100.0	5,682	
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	114	
2,4-Dinitrophenol	0	0		0	10	10.0	568	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	N/A	N/A	N/A	
Phenol	0	0		0	4,000	4,000	227,281	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	3,977	
Anthracene	0	0		0	300	300	17,046	
Benzidine	0	0		0	N/A	N/A	N/A	
Benzo(a)Anthracene	0	0		0	N/A	N/A	N/A	
Benzo(a)Pyrene	0	0		0	N/A	N/A	N/A	
3,4-Benzofluoranthene	0	0		0	N/A	N/A	N/A	
Benzo(k)Fluoranthene	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroethyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Chloroisopropyl)Ether	0	0		0	200	200	11,364	
Bis(2-Ethylhexyl)Phthalate	0	0		0	N/A	N/A	N/A	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	0.1	0.1	5.68	
2-Chloronaphthalene	0	0		0	800	800	45,456	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	1,000	1,000	56,820	
1,3-Dichlorobenzene	0	0		0	7	7.0	398	
1,4-Dichlorobenzene	0	0		0	300	300	17,046	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	34,092	
Dimethyl Phthalate	0	0		0	2,000	2,000	113,640	
Di-n-Butyl Phthalate	0	0		0	20	20.0	1,136	
2,4-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
2,6-Dinitrotoluene	0	0		0	N/A	N/A	N/A	
1,2-Diphenylhydrazine	0	0		0	N/A	N/A	N/A	
Fluoranthene	0	0		0	20	20.0	1,136	
Fluorene	0	0		0	50	50.0	2,841	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	N/A	N/A	N/A	
Hexachlorocyclopentadiene	0	0		0	4	4.0	227	
Hexachloroethane	0	0		0	N/A	N/A	N/A	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	34	34.0	1,932	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	568	

n-Nitrosodimethylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	N/A	N/A	N/A	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	20	20.0	1,136	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	3.98	
Aldrin	0	0		0	N/A	N/A	N/A	
alpha-BHC	0	0		0	N/A	N/A	N/A	
beta-BHC	0	0		0	N/A	N/A	N/A	
gamma-BHC	0	0		0	4.2	4.2	239	
Chlordane	0	0		0	N/A	N/A	N/A	
4,4-DDT	0	0		0	N/A	N/A	N/A	
4,4-DDE	0	0		0	N/A	N/A	N/A	
4,4-DDD	0	0		0	N/A	N/A	N/A	
Dieldrin	0	0		0	N/A	N/A	N/A	
alpha-Endosulfan	0	0		0	20	20.0	1,136	
beta-Endosulfan	0	0		0	20	20.0	1,136	
Endosulfan Sulfate	0	0		0	20	20.0	1,136	
Endrin	0	0		0	0.03	0.03	1.7	
Endrin Aldehyde	0	0		0	1	1.0	56.8	
Heptachlor	0	0		0	N/A	N/A	N/A	
Heptachlor Epoxide	0	0		0	N/A	N/A	N/A	
Toxaphene	0	0		0	N/A	N/A	N/A	

☑ *CRL* CCT (min): ###### 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 Antimony	0	0		0	N/A	N/A	N/A	
Total Arsenic	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	N/A	N/A	N/A	
Total Boron	0	0		0	N/A	N/A	N/A	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Free Cyanide	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	

Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	0.06	0.06	14.4	
Benzene	0	0		0	0.58	0.58	140	
Bromoform	0	0		0	7	7.0	1,685	
Carbon Tetrachloride	0	0		0	0.4	0.4	96.3	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	0.8	0.8	193	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	N/A	N/A	N/A	
Dichlorobromomethane	0	0		0	0.95	0.95	229	
1,2-Dichloroethane	0	0		0	9.9	9.9	2,384	
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	0.9	0.9	217	
1,3-Dichloropropylene	0	0		0	0.27	0.27	65.0	
Ethylbenzene	0	0		0	N/A	N/A	N/A	
Methyl Bromide	0	0		0	N/A	N/A	N/A	
Methyl Chloride	0	0		0	N/A	N/A	N/A	
Methylene Chloride	0	0		0	20	20.0	4,815	
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	48.2	
Tetrachloroethylene	0	0		0	10	10.0	2,408	
Toluene	0	0		0	N/A	N/A	N/A	
1,2-trans-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,1,1-Trichloroethane	0	0		0	N/A	N/A	N/A	
1,1,2-Trichloroethane	0	0		0	0.55	0.55	132	
Trichloroethylene	0	0		0	0.6	0.6	144	
Vinyl Chloride	0	0		0	0.02	0.02	4.82	
2-Chlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dichlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dimethylphenol	0	0		0	N/A	N/A	N/A	
4,6-Dinitro-o-Cresol	0	0		0	N/A	N/A	N/A	
2,4-Dinitrophenol	0	0		0	N/A	N/A	N/A	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	0.030	0.03	7.22	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	361	

Acenaphthene	0	0		0	N/A	N/A	N/A	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	0.0001	0.0001	0.024	
Benzo(a)Anthracene	0	0		0	0.001	0.001	0.24	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.024	
3,4-Benzofluoranthene	0	0		0	0.001	0.001	0.24	
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	2.41	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	7.22	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	77.0	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	N/A	N/A	N/A	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	0.12	0.12	28.9	
Dibenzo(a,h)Anthrancene	0	0		0	0.0001	0.0001	0.024	
1,2-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,3-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,4-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
3,3-Dichlorobenzidine	0	0		0	0.05	0.05	12.0	
Diethyl Phthalate	0	0		0	N/A	N/A	N/A	
Dimethyl Phthalate	0	0		0	N/A	N/A	N/A	
Di-n-Butyl Phthalate	0	0		0	N/A	N/A	N/A	
2,4-Dinitrotoluene	0	0		0	0.05	0.05	12.0	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	12.0	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	7.22	
Fluoranthene	0	0		0	N/A	N/A	N/A	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	0.00008	0.00008	0.019	
Hexachlorobutadiene	0	0		0	0.01	0.01	2.41	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	24.1	
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	0.24	
Isophorone	0	0		0	N/A	N/A	N/A	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	N/A	N/A	N/A	
n-Nitrosodimethylamine	0	0		0	0.0007	0.0007	0.17	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	1.2	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	795	
Phenanthrene	0	0		0	N/A	N/A	N/A	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	N/A	N/A	N/A	
Aldrin	0	0		0	0.0000008	8.00E-07	0.0002	
alpha-BHC	0	0		0	0.0004	0.0004	0.096	
beta-BHC	0	0		0	0.008	0.008	1.93	
gamma-BHC	0	0		0	N/A	N/A	N/A	

Chlordane	0	0		0	0.0003	0.0003	0.072	
4,4-DDT	0	0		0	0.00003	0.00003	0.007	
4,4-DDE	0	0		0	0.00002	0.00002	0.005	
4,4-DDD	0	0		0	0.0001	0.0001	0.024	
Dieldrin	0	0		0	0.000001	0.000001	0.0002	
alpha-Endosulfan	0	0		0	N/A	N/A	N/A	
beta-Endosulfan	0	0		0	N/A	N/A	N/A	
Endosulfan Sulfate	0	0		0	N/A	N/A	N/A	
Endrin	0	0		0	N/A	N/A	N/A	
Endrin Aldehyde	0	0		0	N/A	N/A	N/A	
Heptachlor	0	0		0	0.000006	0.000006	0.001	
Heptachlor Epoxide	0	0		0	0.00003	0.00003	0.007	
Toxaphene	0	0		0	0.0007	0.0007	0.17	

☑ ***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 Aluminum	Report	Report	Report	Report	Report	µg/L	4,361	AFC	Discharge Conc > 10% WQBEL (no RP)

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

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

Pollutants	Governing WQBEL	Units	Comments
Total Dissolved Solids (PWS)	N/A	N/A	PWS Not Applicable
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 Antimony	N/A	N/A	Discharge Conc < TQL
Total Arsenic	568	µg/L	Discharge Conc ≤ 10% WQBEL
Total Barium	122,107	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Boron	47,098	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cadmium	12.1	µg/L	Discharge Conc < TQL
Total Chromium (III)	4,881	µg/L	Discharge Conc < TQL
Hexavalent Chromium	94.7	µg/L	Discharge Conc < TQL
Total Cobalt	552	µg/L	Discharge Conc ≤ 10% WQBEL
Total Copper	79.8	µg/L	Discharge Conc ≤ 10% WQBEL
Free Cyanide	128	µg/L	Discharge Conc ≤ 25% WQBEL
Total Cyanide	N/A	N/A	No WQS

Dissolved Iron	17,046	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	108,647	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	180	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	56,820	µg/L	Discharge Conc ≤ 10% WQBEL
Total Mercury	2.84	µg/L	Discharge Conc ≤ 10% WQBEL
Total Nickel	2,680	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	Discharge Conc < TQL
Total Selenium	283	µg/L	Discharge Conc < TQL
Total Silver	21.2	µg/L	Discharge Conc ≤ 10% WQBEL
Total Thallium	13.6	µg/L	Discharge Conc ≤ 10% WQBEL
Total Zinc	684	µg/L	Discharge Conc ≤ 10% WQBEL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	17.4	µg/L	Discharge Conc < TQL
Acrylonitrile	14.4	µg/L	Discharge Conc < TQL
Benzene	140	µg/L	Discharge Conc < TQL
Bromoform	1,685	µg/L	Discharge Conc < TQL
Carbon Tetrachloride	96.3	µg/L	Discharge Conc ≤ 25% WQBEL
Chlorobenzene	5,682	µg/L	Discharge Conc < TQL
Chlorodibromomethane	193	µg/L	Discharge Conc < TQL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	104,663	µg/L	Discharge Conc < TQL
Chloroform	324	µg/L	Discharge Conc ≤ 25% WQBEL
Dichlorobromomethane	229	µg/L	Discharge Conc < TQL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	2,384	µg/L	Discharge Conc < TQL
1,1-Dichloroethylene	1,875	µg/L	Discharge Conc < TQL
1,2-Dichloropropane	217	µg/L	Discharge Conc ≤ 25% WQBEL
1,3-Dichloropropylene	65.0	µg/L	Discharge Conc < TQL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	3,864	µg/L	Discharge Conc < TQL
Methyl Bromide	3,198	µg/L	Discharge Conc < TQL
Methyl Chloride	162,809	µg/L	Discharge Conc < TQL
Methylene Chloride	4,815	µg/L	Discharge Conc < TQL
1,1,2,2-Tetrachloroethane	48.2	µg/L	Discharge Conc < TQL
Tetrachloroethylene	2,408	µg/L	Discharge Conc < TQL
Toluene	3,239	µg/L	Discharge Conc < TQL
1,2-trans-Dichloroethylene	5,682	µg/L	Discharge Conc < TQL
1,1,1-Trichloroethane	17,444	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,2-Trichloroethane	132	µg/L	Discharge Conc < TQL
Trichloroethylene	144	µg/L	Discharge Conc ≤ 25% WQBEL
Vinyl Chloride	4.82	µg/L	Discharge Conc < TQL
2-Chlorophenol	1,705	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	568	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	3,838	µg/L	Discharge Conc < TQL
4,6-Dinitro-o-Cresol	114	µg/L	Discharge Conc < TQL

2,4-Dinitrophenol	568	µg/L	Discharge Conc < TQL
2-Nitrophenol	46,517	µg/L	Discharge Conc < TQL
4-Nitrophenol	13,374	µg/L	Discharge Conc < TQL
p-Chloro-m-Cresol	930	µg/L	Discharge Conc < TQL
Pentachlorophenol	7.22	µg/L	Discharge Conc < TQL
Phenol	227,281	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	361	µg/L	Discharge Conc ≤ 25% WQBEL
Acenaphthene	483	µg/L	Discharge Conc < TQL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	17,046	µg/L	Discharge Conc < TQL
Benzidine	0.024	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	0.24	µg/L	Discharge Conc < TQL
Benzo(a)Pyrene	0.024	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	0.24	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Benzo(k)Fluoranthene	2.41	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	7.22	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	11,364	µg/L	Discharge Conc < TQL
Bis(2-Ethylhexyl)Phthalate	77.0	µg/L	Discharge Conc < TQL
4-Bromophenyl Phenyl Ether	1,570	µg/L	Discharge Conc < TQL
Butyl Benzyl Phthalate	5.68	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	45,456	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	28.9	µg/L	Discharge Conc < TQL
Dibenzo(a,h)Anthrancene	0.024	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	4,768	µg/L	Discharge Conc < TQL
1,3-Dichlorobenzene	398	µg/L	Discharge Conc < TQL
1,4-Dichlorobenzene	4,245	µg/L	Discharge Conc < TQL
3,3-Dichlorobenzidine	12.0	µg/L	Discharge Conc < TQL
Diethyl Phthalate	23,258	µg/L	Discharge Conc < TQL
Dimethyl Phthalate	14,537	µg/L	Discharge Conc < TQL
Di-n-Butyl Phthalate	640	µg/L	Discharge Conc ≤ 25% WQBEL
2,4-Dinitrotoluene	12.0	µg/L	Discharge Conc < TQL
2,6-Dinitrotoluene	12.0	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	7.22	µg/L	Discharge Conc < TQL
Fluoranthene	1,136	µg/L	Discharge Conc < TQL
Fluorene	2,841	µg/L	Discharge Conc < TQL
Hexachlorobenzene	0.019	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	2.41	µg/L	Discharge Conc < TQL
Hexachlorocyclopentadiene	29.1	µg/L	Discharge Conc < TQL
Hexachloroethane	24.1	µg/L	Discharge Conc < TQL
Indeno(1,2,3-cd)Pyrene	0.24	µg/L	Discharge Conc < TQL
Isophorone	1,932	µg/L	Discharge Conc < TQL

Naphthalene	814	µg/L	Discharge Conc < TQL
Nitrobenzene	568	µg/L	Discharge Conc < TQL
n-Nitrosodimethylamine	0.17	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	1.2	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	795	µg/L	Discharge Conc < TQL
Phenanthrene	29.1	µg/L	Discharge Conc < TQL
Pyrene	1,136	µg/L	Discharge Conc < TQL
1,2,4-Trichlorobenzene	3.98	µg/L	Discharge Conc < TQL
Aldrin	0.0002	µg/L	Discharge Conc < TQL
alpha-BHC	0.096	µg/L	Discharge Conc < TQL
beta-BHC	1.93	µg/L	Discharge Conc < TQL
gamma-BHC	5.52	µg/L	Discharge Conc < TQL
delta BHC	N/A	N/A	No WQS
Chlordane	0.072	µg/L	Discharge Conc < TQL
4,4-DDT	0.007	µg/L	Discharge Conc < TQL
4,4-DDE	0.005	µg/L	Discharge Conc < TQL
4,4-DDD	0.024	µg/L	Discharge Conc < TQL
Dieldrin	0.0002	µg/L	Discharge Conc < TQL
alpha-Endosulfan	1.28	µg/L	Discharge Conc < TQL
beta-Endosulfan	1.28	µg/L	Discharge Conc < TQL
Endosulfan Sulfate	1,136	µg/L	Discharge Conc < TQL
Endrin	0.5	µg/L	Discharge Conc < TQL
Endrin Aldehyde	56.8	µg/L	Discharge Conc < TQL
Heptachlor	0.001	µg/L	Discharge Conc < TQL
Heptachlor Epoxide	0.007	µg/L	Discharge Conc < TQL
Toxaphene	0.011	µg/L	Discharge Conc < TQL

ATTACHMENT D

TRC Modeling Results

Copy of TRC_CALC

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

550	= Q stream (cfs)	0.5	= CV Daily
4.96	= 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 = 22.885	1.3.2.iii	WLA cfc = 22.303
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 8.527	5.1d	LTA_cfc = 12.966

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500	BAT/BPJ
		INST MAX LIMIT (mg/l) = 1.635	

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

ATTACHMENT E

Seneca Street CSO Satellite Treatment TRC Model

TRC_CALC_Seneca Street

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

550	= Q stream (cfs)	0.5	= CV Daily
44	= 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 = 2.597	1.3.2.iii	WLA cfc = 2.524
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.968	5.1d	LTA_cfc = 1.467

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500	BAT/BPJ
		INST MAX LIMIT (mg/l) = 1.635	

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

Page 1

Discharge Point

ATTACHMENT F

WET Test Results

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Reproduction
TIWC (decimal)	0.02
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name: Mon Valley Sewage Authority

Permit No.: PA0026158

Test Completion Date: 8/6/2019

Replicate No.	Control	TIWC
1	28	21
2	28	10
3	32	29
4	18	29
5	7	27
6	34	26
7	34	29
8	27	25
9	37	30
10	33	13
11		
12		
13		
14		
15		
Mean	27.800	23.900
Std Dev.	9.041	7.078
# Replicates	10	10

T-Test Result	0.9840
Deg. of Freedom	17
Critical T Value	0.8633
Pass or Fail	**PASS**

Test Completion Date: 7/13/2020

Replicate No.	Control	TIWC
1	35	21
2	32	25
3	29	30
4	27	32
5	29	29
6	23	26
7	24	31
8	28	19
9	23	28
10	27	29
11		
12		
13		
14		
15		
Mean	27.700	27.000
Std Dev.	3.860	4.269
# Replicates	10	10

T-Test Result	3.8165
Deg. of Freedom	16
Critical T Value	0.8647
Pass or Fail	**PASS**

Test Completion Date: 7/19/2021

Replicate No.	Control	TIWC
1	30	28
2	32	24
3	30	29
4	30	24
5	27	30
6	15	32
7	32	25
8	30	26
9	26	31
10	32	29
11		
12		
13		
14		
15		
Mean	28.400	27.800
Std Dev.	5.125	2.898
# Replicates	10	10

T-Test Result	4.2698
Deg. of Freedom	17
Critical T Value	0.8633
Pass or Fail	**PASS**

Test Completion Date: 6/6/2022

Replicate No.	Control	TIWC
1	26	29
2	29	29
3	27	29
4	25	27
5	25	28
6	27	27
7	26	28
8	25	30
9	23	25
10	25	27
11		
12		
13		
14		
15		
Mean	25.800	27.900
Std Dev.	1.619	1.449
# Replicates	10	10

T-Test Result	14.2997
Deg. of Freedom	17
Critical T Value	0.8633
Pass or Fail	**PASS**

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Survival
TIWC (decimal)	0.02
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name: Mon Valley Sewage Authority

Permit No.: PA0026158

Test Completion Date: 8/6/2019

Replicate No.	Control	TIWC
1	1	1
2	1	0
3	1	1
4	0	1
5	0	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	0
11		
12		
13		
14		
15		
Mean	0.800	0.800
Std Dev.	0.422	0.422
# Replicates	10	10
T-Test Result		
Deg. of Freedom		
Critical T Value		
Pass or Fail	PASS	

Test Completion Date: 7/13/2020

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	10	10
T-Test Result		
Deg. of Freedom		
Critical T Value		
Pass or Fail	PASS	

Test Completion Date: 7/19/2021

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	0	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	0.900	1.000
Std Dev.	0.316	0.000
# Replicates	10	10
T-Test Result		
Deg. of Freedom		
Critical T Value		
Pass or Fail	PASS	

Test Completion Date: 6/6/2022

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	10	10
T-Test Result		
Deg. of Freedom		
Critical T Value		
Pass or Fail	PASS	

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Survival
TIWC (decimal)	0.02
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name: Mon Valley Sewage Authority

Permit No.: PA0026158

Test Completion Date: 8/6/2019

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	0.9	1
4	0.9	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.950	1.000
Std Dev.	0.058	0.000
# Replicates	4	4

T-Test Result	23.5123
Deg. of Freedom	3
Critical T Value	0.7649
Pass or Fail	PASS

Test Completion Date: 7/14/2020

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	4	4

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

Test Completion Date: 7/20/2021

Replicate No.	Control	TIWC
1	1	1
2	0.8	1
3	0.9	1
4	1	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.925	1.000
Std Dev.	0.096	0.000
# Replicates	4	4

T-Test Result	14.3896
Deg. of Freedom	3
Critical T Value	0.7649
Pass or Fail	PASS

Test Completion Date: 6/7/2022

Replicate No.	Control	TIWC
1	0.6	0.9
2	0.9	1
3	0.9	0.8
4	0.8	0.8
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.800	0.875
Std Dev.	0.141	0.096
# Replicates	4	4

T-Test Result	6.5076
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	PASS

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Growth
TIWC (decimal)	0.02
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name
Mon Valley Sewage Authority

Permit No.
PA0026158

Replicate No.	Test Completion Date 8/6/2019 Control	TIWC
1	0.475	0.4245
2	0.435	0.374
3	0.437	0.845
4	0.471	0.469
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.455	0.528
Std Dev.	0.021	0.215
# Replicates	4	4

T-Test Result	1.7387
Deg. of Freedom	3
Critical T Value	0.7649
Pass or Fail	**PASS**

Replicate No.	Test Completion Date 7/14/2020 Control	TIWC
1	0.379	0.353
2	0.377	0.368
3	0.411	0.33
4	0.428	0.38
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.399	0.358
Std Dev.	0.025	0.022
# Replicates	4	4

T-Test Result	4.1124
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	**PASS**

Replicate No.	Test Completion Date 7/20/2021 Control	TIWC
1	0.269	0.313
2	0.254	0.283
3	0.28	0.288
4	0.271	0.27
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.269	0.289
Std Dev.	0.011	0.018
# Replicates	4	4

T-Test Result	8.8261
Deg. of Freedom	4
Critical T Value	0.7407
Pass or Fail	**PASS**

Replicate No.	Test Completion Date 6/7/2022 Control	TIWC
1	0.261	0.389
2	0.371	0.423
3	0.334	0.308
4	0.338	0.383
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.326	0.376
Std Dev.	0.046	0.048
# Replicates	4	4

T-Test Result	4.3988
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	**PASS**

WET Summary and Evaluation

Facility Name	Mon Valley Sewage Authority
Permit No.	PA0026158
Design Flow (MGD)	4.69
Q_{7-10} Flow (cfs)	550
PMF_a	0.102
PMF_c	0.708

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	8/5/19	7/13/20	7/19/21	6/6/22
Ceriodaphnia	Reproduction	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	8/5/19	7/13/20	7/19/21	6/6/22
Ceriodaphnia	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	8/6/19	7/14/20	7/20/21	6/7/22
Pimephales	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	8/6/19	7/14/20	7/20/21	6/7/22
Pimephales	Growth	PASS	PASS	PASS	PASS

Reasonable Potential? NO

Permit Recommendations

Test Type	**Chronic**
TIWC	**2** % Effluent
Dilution Series	**1, 2, 30, 60, 100** % Effluent
Permit Limit	**None**
Permit Limit Species	

Whole Effluent Toxicity (WET)

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

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

The dilution series used for the tests was: 100%, 60%, 30%, 2%, and 1%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 2.

Summary of Four Most Recent Test Results

TST Data Analysis

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

Test Date	*Ceriodaphnia* Results (Pass/Fail)		*Pimephales* Results (Pass/Fail)	
	Survival	Reproduction	Survival	Growth
8/5/2019-8/63/2020	PASS	PASS	PASS	PASS
7/13/2020-7/14/2020	PASS	PASS	PASS	PASS
7/19/2021-7/20/2021	PASS	PASS	PASS	PASS
6/6/2022 – 6/7/22	PASS	PASS	PASS	PASS

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

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

☐ **YES** ☒ **NO**

Comments:

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

Acute Partial Mix Factor (PMFa):**0.113** Chronic Partial Mix Factor (PMFc): **0.781**

1. Determine IWC – Acute (IWCa):

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

[(4.96 MGD x 1.547) / ((550 cfs x 0.113) + (4.96 MGD x 1.547))] x 100 = **36.69%**

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

Type of Test for Permit Renewal: **Chronic**

2a. Determine Target IWCa (If Acute Tests Required)

TIWCa = 36.69/ 0.3 = 12.23**%**

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

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

[(4.96 MGD x 1.547) / ((550 cfs x 0.781) + (436.96 MGD x 1.547))] x 100 = **1.75%**

3. Determine Dilution Series

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

Dilution Series = 100%, 60%, 30%, 2%, and 1%.

Please note that this dilution series is different than what was reported in last permit cycle's fact sheet.

WET Limits

Has reasonable potential been determined? ☐ YES ☒ NO

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

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

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