pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northcentral Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0028738**
Facility Type	**Municipal**	APS ID	**1034694**
Major / Minor	**Minor**	Authorization ID	**1347191**

Applicant and Facility Information

Applicant Name	**Ralpho Township Municipal Authority**	Facility Name	**Ralpho Township Municipal Authority Wastewater Treatment Plant**
Applicant Address	206 S Market Street Suite 1 Elysburg, PA 17824-9782	Facility Address	827 Bottle Drive Elysburg, PA 17824
Applicant Contact	Theodore Yeager	Facility Contact	Todd Mace
Applicant Phone	(570) 672-9792	Facility Phone	(570) 274-1755
Client ID	25371	Site ID	248937
Ch 94 Load Status	Existing Hydraulic Overload	Municipality	Shamokin Township
Connection Status	Dept. Imposed Connection Prohibitions	County	Northumberland

Date Application Received March 23, 2021 EPA Waived? No Date Application Accepted April 5, 2021 If No, Reason Significant CB Discharge

Purpose of Application Renewal of an existing NPDES permit for the discharge of treated sewage.

Public Participation

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

Approve	Deny	Signatures	Date
X		*Derek S. Garner* Derek S. Garner / Project Manager	June 24, 2021
X		*Nicholas W. Hartranft* Nicholas W. Hartranft, P.E. / Environmental Engineer Manager	June 28, 2021

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.819
Latitude	40º 52' 11.68"	Longitude	-76º 35' 14.78"
Quad Name	Shamokin	Quad Code	1233
Wastewater Description:	Sewage Effluent		

Receiving Waters	Shamokin Creek	Stream Code	18489
NHD Com ID	54960999	RMI	14.53
Drainage Area (mi^2)	74	Yield (cfs/mi^2)	0.5
Q_{7-10} Flow (cfs)	37	Q_{7-10} Basis	Streamgage No. 01554500
Elevation (ft)	538	Slope (ft/ft)	n/a
Watershed No.	6-B	Chapter 93 Class.	WWF
Existing Use	n/a	Existing Use Qualifier	n/a
Exceptions to Use	n/a	Exceptions to Criteria	n/a
Assessment Status	Impaired		
Cause(s) of Impairment	Metals		
Source(s) of Impairment	Abandoned Mine Drainage		
TMDL Status	Final, 04/09/2001	Name	Shamokin Creek Watershed

Nearest Downstream Public Water Supply Intake	United Water Pennsylvania		
PWS Waters	Susquehanna River	Flow at Intake (cfs)	2,360
PWS RMI	77	Distance from Outfall (mi)	61

Treatment Facility Summary

The Ralpho Township Municipal Authority Wastewater Treatment Plant operates under WQM Permit No. 4917401, issued May 15, 2017. The facility has an annual average design flow and hydraulic capacity of 0.819 MGD and an organic capacity of 1,487 lbs/day.

Treatment at the facility starts with one grit chamber and one mechanical and manual bar screen. After grit removal and screening, wastewater is conveyed to a wet well where it is then pumped to one of three sequencing batch reactors (SBRs). The supernatant from the SBRs is then disinfected using gas chlorine in the facility's one chlorine contact tank. After disinfection, the wastewater is dechlorinated. The final effluent is then conveyed through an aeration channel before being discharged via Outfall 001.

Settled sludge from the SBR tanks is pumped to one of two aerobic sludge digesters. The sludge is dewatered using a centrifuge and hauled to the Lycoming County Landfill.

Compliance History

The following effluent violations occurred during the existing permit's term:

Noncompliance Date	Noncompliance Type	Noncompliance Category	Parameter	Sample Value	Violation Condition	Permit Value	Units	SBC
8/30/2017	Violation of permit condition	Concentration 3 Effluent Violation	Fecal Coliform	2419	>	1000	CFU/100 ml	Instantaneous Maximum
12/28/2017	Violation of permit condition	Concentration 2 Effluent Violation	Total Residual Chlorine (TRC)	0.57	>	0.5	mg/L	Average Monthly
6/28/2018	Violation of permit condition	Concentration 3 Effluent Violation	Fecal Coliform	2419	>	1000	CFU/100 ml	Instantaneous Maximum
7/30/2018	Violation of permit condition	Concentration 3 Effluent Violation	Fecal Coliform	2419.6	>	1000	CFU/100 ml	Instantaneous Maximum
8/28/2018	Violation of permit condition	Concentration 3 Effluent Violation	Fecal Coliform	1046	>	1000	CFU/100 ml	Instantaneous Maximum
8/28/2018	Violation of permit condition	Load 2 Effluent Violation	Total Suspended Solids	317	>	305	lbs/day	Weekly Average
10/29/2018	Violation of permit condition	Concentration 3 Effluent Violation	Carbonaceous Biochemical Oxygen Demand (CBOD5)	41.6	>	40	mg/L	Weekly Average
10/29/2018	Violation of permit condition	Load 2 Effluent Violation	Carbonaceous Biochemical Oxygen Demand (CBOD5)	516	>	270	lbs/day	Weekly Average
10/29/2018	Violation of permit condition	Load 2 Effluent Violation	Total Suspended Solids	317	>	305	lbs/day	Weekly Average
2/19/2019	Violation of permit condition	Concentration 2 Effluent Violation	Total Residual Chlorine (TRC)	0.6	>	0.5	mg/L	Average Monthly
7/18/2019	Violation of permit condition	Concentration 3 Effluent Violation	Fecal Coliform	2419.6	>	1000	CFU/100 ml	Instantaneous Maximum
8/28/2019	Violation of permit condition	Concentration 3 Effluent Violation	Fecal Coliform	2419.6	>	1000	CFU/100 ml	Instantaneous Maximum
6/23/2020	Violation of permit condition	Concentration 3 Effluent Violation	Fecal Coliform	1553.1	>	1000	CFU/100 ml	Instantaneous Maximum
7/23/2020	Violation of permit condition	Concentration 3 Effluent Violation	Total Residual Chlorine (TRC)	3.16	>	1.6	mg/L	Instantaneous Maximum
9/27/2020	Violation of permit condition	Concentration 3 Effluent Violation	Total Residual Chlorine (TRC)	3.93	>	1.6	mg/L	Instantaneous Maximum

The above violations report indicates chronic exceedances of fecal coliform and total residual chlorine limits. A dechlorination system was installed in September 2020 that should allow the permittee to properly balance the chlorine residual while still maintaining an effective fecal kill.

Three load violations are identified during the existing permit's term: two for TSS and one for CBOD5. The most recently reviewed Chapter 94 Report, dated 2019, indicates that the facility is currently hydraulically overloaded. A corrective action plan ("CAP"), dated June 2020, was submitted to DEP. The CAP, which was generally acceptable per a July 14, 2020 DEP response, includes provisions for ongoing monitoring and repairs of the collection system. Future loading violations should be less frequent moving forward as the permittee makes improvements to the collection system.

The facility was most recently inspected by DEP on February 17, 2021. All required treatment units were operational and no negative impacts to the receiving stream were noted.

There are no open violations associated with the permittee.

Based on the above compliance review, it appears that the permittee is actively working towards eliminating the chronic effluent exceedances. Accordingly, the facility's compliance history should not impact the development of effluent limits or monitoring frequencies.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.819
Latitude 40º 52' 11.90" **Longitude** -76º 35' 14.40"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

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

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

Water Quality-Based Limitations

DEP models in-stream conditions to determine if WQBELs are appropriate. Models were created using WQM 7.0 v1.1 for CBOD5, ammonia-N and dissolved oxygen and Toxics Management Spreadsheet v1.2 ("TMS") for toxics.

The water quality model WQM is used to determine the WQBELs for dissolved oxygen, CBOD5 and ammonia-n based on a multiple-discharge analysis, if applicable. The model assumes complete and instantaneous mixing with the receiving surface water. The reach chosen to model the in-stream characteristics is appropriate as a recovery in dissolved oxygen levels is demonstrated. The modeling output is as follows:

Parameter	Discharge Conc. (mg/l)	Effluent Limitations		
		30 Day Average (mg/l)	Maximum (mg/l)	Minimum (mg/l)
CBOD5	25	25	--	--
NH3-N	25	25	50	--
Dissolved Oxygen	3	--	--	3

The input concentration for CBOD5 is the current average monthly technology-based concentration limitation in the existing permit. The ammonia-n and dissolved oxygen input concentrations of 25 and 3 mg/l, respectively, are typical concentrations contained within treated effluent. Based on the model output, no WQBELs are recommended for CBOD5, ammonia-n and dissolved oxygen.

Unlike WQM, TMS is a single discharge model that does not assume instantaneous mixing with the receiving surface water upon discharge, but instead, assigns a partial mixing factor based upon surface water and discharge characteristics. The existing permit contains monthly monitoring requirements for total copper and total lead, based on sample results provided with the application, and annual monitoring requirements for TMDL-related parameters, total aluminum, total iron, and total manganese. The maximum concentrations from the total copper and total lead monthly sample results were input into TMS. Based on the submitted concentration results, TMS does not recommend any further monitoring requirements or effluent limits. Accordingly, total copper and total lead have been removed from the permit.

The maximum concentrations from the total aluminum, total iron, and total manganese annual sample results were also input into TMS. Based on the submitted concentration results, TMS does not recommend any further monitoring requirements or effluent limits. However, since monitoring for these parameters was established to verify that the discharge is not contributing to the impairment of Shamokin Creek, the results must be compared to Chapter 93 criteria, as a pollutant discharged under criteria is generally not considered to contribute to an impairment. Based on the results, the concentrations of total aluminum and total iron do not approach Chapter 93 criteria; however, total manganese had one result exceed the criterion (3.09 mg/l discharge vs. 1.0 mg/l criterion). Since only one TMDL-related parameter exceeded criteria only one time in the last five years, DEP is recommending removing the monitoring requirements from the permit. The permittee will still be required to sample for the TMDL-related parameters per the requirements of each subsequent renewal application.

TRC limitations were evaluated using the TRC_CALC spreadsheet. The spreadsheet indicates the proposed BAT effluent limitations are protective of the receiving surface water.

Best Professional Judgment (BPJ) Limitations

DEP recommends continued monitoring for dissolved oxygen to help characterize the wastewater and any impacts on Shamokin Creek.

DEP also recommends continued influent monitoring for BOD5 and TSS to help with Chapter 94 reporting requirements.

An annual reporting requirement for E. Coli is proposed per the 2017 Triennial Review of Water Quality Standards, published in the PA Bulletin on July 11, 2020.

Chesapeake Bay Tributary Strategy

Per Phase 3 of Pennsylvania's Chesapeake Bay Watershed Implementation Plan ("WIP"), the Ralpho Township Municipal Authority Wastewater Treatment Plant is designated as Phase 2 facility, assigned cap loads of 13,132 lbs/yr total nitrogen and 1,751 lbs/yr total phosphorus.

Anti-Backsliding

Monitoring requirements for total copper, total lead, total aluminum, total iron, and total manganese have been removed from the permit. Per 40 CFR § 122.44(l)(2)(i)(B)(1), a permit made be less stringent when information is available which was not available at the time of the previous permit issuance. In this case, continued monitoring for the metals has provided more data points that were not previously available.

Existing Effluent Limitations and Monitoring Requirements

The existing limitations and monitoring requirements are as follows:

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report	XXX	XXX	XXX	XXX	Continuous	Measured
pH (S.U.)	XXX	XXX	6.0	XXX	9.0 Max	XXX	1/day	Grab
Dissolved Oxygen	XXX	XXX	Report	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	170	270 Wkly Avg	XXX	25.0	40.0	50	1/week	8-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Total Suspended Solids	200	305 Wkly Avg	XXX	30.0	45.0	60	1/week	8-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Ammonia-Nitrogen	Report	XXX	XXX	Report	XXX	XXX	2/week	8-Hr Composite
Aluminum, Total	Report Annl Avg	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	8-Hr Composite
Copper, Total	Report	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite
Iron, Total	Report Annl Avg	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	8-Hr Composite
Lead, Total	Report	XXX	XXX	Report	XXX	XXX	1/month	8-Hr Composite
Manganese, Total	Report Annl Avg	XXX	XXX	Report Annl Avg	XXX	XXX	1/year	8-Hr Composite

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Ammonia--N	Report	Report	XXX	Report	XXX	XXX	2/week	8-Hr Composite
Kjeldahl--N	Report	XXX	XXX	Report	XXX	XXX	2/week	8-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	2/week	8-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	2/week	8-Hr Composite
Net Total Nitrogen	Report	13132	XXX	XXX	XXX	XXX	1/month	Calculation
Net Total Phosphorus	Report	1751	XXX	XXX	XXX	XXX	1/month	Calculation

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)		Concentrations (mg/L)				Minimum 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	Measured
pH (S.U.)	XXX	XXX	6.0 Inst Min	XXX	XXX	9.0	1/day	Grab
Dissolved Oxygen	XXX	XXX	Report Inst Min	XXX	XXX	XXX	1/day	Grab
Total Residual Chlorine (TRC)	XXX	XXX	XXX	0.5	XXX	1.6	1/day	Grab
Carbonaceous Biochemical Oxygen Demand (CBOD5)	170	270	XXX	25.0	40.0	50	1/week	8-Hr Composite
Biochemical Oxygen Demand (BOD5) Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
Total Suspended Solids	200	305	XXX	30.0	45.0	60	1/week	8-Hr Composite
Total Suspended Solids Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/year	Grab
Ammonia-Nitrogen	Report	XXX	XXX	Report	XXX	XXX	2/week	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	Report	XXX	XXX	2/week	8-Hr Composite

Compliance Sampling Location: Outfall 001

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

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day)		Concentrations (mg/L)				Minimum Measurement Frequency	Required Sample Type
	Monthly	Annual	Monthly	Monthly Average	Maximum	Instant. Maximum		
Ammonia--N	Report	Report	XXX	Report	XXX	XXX	2/week	8-Hr Composite
Kjeldahl--N	Report	XXX	XXX	Report	XXX	XXX	2/week	8-Hr Composite
Nitrate-Nitrite as N	Report	XXX	XXX	Report	XXX	XXX	2/week	8-Hr Composite
Total Nitrogen	Report	Report	XXX	Report	XXX	XXX	1/month	Calculation
Total Phosphorus	Report	Report	XXX	Report	XXX	XXX	2/week	8-Hr Composite
Net Total Nitrogen	XXX	13132	XXX	XXX	XXX	XXX	1/year	Calculation
Net Total Phosphorus	XXX	1751	XXX	XXX	XXX	XXX	1/year	Calculation

Compliance Sampling Location: Outfall 001

ATTACHMENTS

DMR_RECEIVED_DATE	PARAMETER	LOAD_UNITS	LOAD_1_VALUE	LOAD_1_LIMIT	LOAD_1_SBC	CONC_UNITS	CONC_2_VALUE	CONC_2_LIMIT	CONC_2_SBC	SAMPLE_FREQUENCY	SAMPLE_TYPE
1/26/2018	Aluminum, Total	lbs/day	0.453	Monitor and Report	Annual Average	mg/L	< 0.100	Monitor and Report	Annual Average	1/year	24-Hr Composite
1/28/2019	Aluminum, Total	lbs/day	< 0.70	Monitor and Report	Annual Average	mg/L	< 0.1	Monitor and Report	Annual Average	1/year	8-Hr Composite
3/22/2019	Aluminum, Total	lbs/day	< 0.5	Monitor and Report	Annual Average	mg/L	< 0.1	Monitor and Report	Annual Average	1/year	24-Hr Composite
12/1/2020	Aluminum, Total	lbs/day	< 0.9	Monitor and Report	Annual Average	mg/L	< 0.1	Monitor and Report	Annual Average	1/year	24-Hr Composite

DMR_RECEIVED_DATE	PARAMETER	LOAD_UNITS	LOAD_1_VALUE	LOAD_1_LIMIT	LOAD_1_SBC	CONC_UNITS	CONC_2_VALUE	CONC_2_LIMIT	CONC_2_SBC	SAMPLE_FREQUENCY	SAMPLE_TYPE
11/30/2016	Copper, Total	lbs/day	0.05	Monitor and Report	Average Monthly	mg/L	0.016	Monitor and Report	Average Monthly	1/week	24-Hr Composite
12/28/2016	Copper, Total	lbs/day	0.05	Monitor and Report	Average Monthly	mg/L	0.0118	Monitor and Report	Average Monthly	1/week	24-Hr Composite
1/23/2017	Copper, Total	lbs/day	< 1.0	Monitor and Report	Average Monthly	mg/L	0.26	Monitor and Report	Average Monthly	1/week	24-Hr Composite
2/27/2017	Copper, Total	lbs/day	0.08	Monitor and Report	Average Monthly	mg/L	0.0107	Monitor and Report	Average Monthly	1/week	24-Hr Composite
3/28/2017	Copper, Total	lbs/day	< 0.09	Monitor and Report	Average Monthly	mg/L	< 0.0155	Monitor and Report	Average Monthly	1/week	24-Hr Composite
4/26/2017	Copper, Total	lbs/day	< 0.2	Monitor and Report	Average Monthly	mg/L	< 0.0313	Monitor and Report	Average Monthly	1/month	24-Hr Composite
5/25/2017	Copper, Total	lbs/day	< 0.08	Monitor and Report	Average Monthly	mg/L	0.0113	Monitor and Report	Average Monthly	1/week	24-Hr Composite
6/15/2017	Copper, Total	lbs/day	< 0.50	Monitor and Report	Average Monthly	mg/L	< 0.075	Monitor and Report	Average Monthly	1/week	24-Hr Composite
7/27/2017	Copper, Total	lbs/day	< 0.09	Monitor and Report	Average Monthly	mg/L	< 0.0171	Monitor and Report	Average Monthly	1/week	24-Hr Composite
8/30/2017	Copper, Total	lbs/day	< 0.10	Monitor and Report	Average Monthly	mg/L	< 0.0139	Monitor and Report	Average Monthly	1/week	24-Hr Composite
9/18/2017	Copper, Total	lbs/day	< 0.10	Monitor and Report	Average Monthly	mg/L	0.0276	Monitor and Report	Average Monthly	1/month	24-Hr Composite
10/27/2017	Copper, Total	lbs/day	< 0.05	Monitor and Report	Average Monthly	mg/L	< 0.0176	Monitor and Report	Average Monthly	1/month	24-Hr Composite
11/28/2017	Copper, Total	lbs/day	< 0.08	Monitor and Report	Average Monthly	mg/L	< 0.0213	Monitor and Report	Average Monthly	1/week	24-Hr Composite
12/28/2017	Copper, Total	lbs/day	< 0.10	Monitor and Report	Average Monthly	mg/L	< 0.0316	Monitor and Report	Average Monthly	1/week	24-Hr Composite
1/26/2018	Copper, Total	lbs/day	< 0.10	Monitor and Report	Average Monthly	mg/L	< 0.0365	Monitor and Report	Average Monthly	1/month	24-Hr Composite
2/28/2018	Copper, Total	lbs/day	0.2	Monitor and Report	Average Monthly	mg/L	0.0467	Monitor and Report	Average Monthly	1/month	24-Hr Composite
3/23/2018	Copper, Total	lbs/day	0.2	Monitor and Report	Average Monthly	mg/L	0.029	Monitor and Report	Average Monthly	1/month	24-Hr Composite
4/25/2018	Copper, Total	lbs/day	< 0.10	Monitor and Report	Average Monthly	mg/L	< 0.0137	Monitor and Report	Average Monthly	1/month	24-Hr Composite
5/18/2018	Copper, Total	lbs/day	0.4	Monitor and Report	Average Monthly	mg/L	0.0345	Monitor and Report	Average Monthly	1/month	24-Hr Composite
6/28/2018	Copper, Total	lbs/day	< 0.10	Monitor and Report	Average Monthly	mg/L	< 0.0198	Monitor and Report	Average Monthly	3/month	24-Hr Composite
7/30/2018	Copper, Total	lbs/day	0.05	Monitor and Report	Average Monthly	mg/L	0.0129	Monitor and Report	Average Monthly	1/month	24-Hr Composite
8/28/2018	Copper, Total	lbs/day	< 0.04	Monitor and Report	Average Monthly	mg/L	< 0.0080	Monitor and Report	Average Monthly	2/month	24-Hr Composite
9/28/2018	Copper, Total	lbs/day	< 0.09	Monitor and Report	Average Monthly	mg/L	< 0.01	Monitor and Report	Average Monthly	1/month	24-Hr Composite
10/29/2018	Copper, Total	lbs/day	0.08	Monitor and Report	Average Monthly	mg/L	< 0.01	Monitor and Report	Average Monthly	1/month	24-Hr Composite
11/28/2018	Copper, Total	lbs/day	0.1	Monitor and Report	Average Monthly	mg/L	0.0159	Monitor and Report	Average Monthly	1/month	24-Hr Composite
12/28/2018	Copper, Total	lbs/day	0.7	Monitor and Report	Average Monthly	mg/L	0.0475	Monitor and Report	Average Monthly	1/month	24-Hr Composite
1/28/2019	Copper, Total	lbs/day	< 0.07	Monitor and Report	Average Monthly	mg/L	< 0.01	Monitor and Report	Average Monthly	1/month	8-Hr Composite
2/22/2019	Copper, Total	lbs/day	0.7	Monitor and Report	Average Monthly	mg/L	0.0622	Monitor and Report	Average Monthly	1/month	8-Hr Composite
3/22/2019	Copper, Total	lbs/day	0.2	Monitor and Report	Average Monthly	mg/L	0.0435	Monitor and Report	Average Monthly	1/month	24-Hr Composite
4/25/2019	Copper, Total	lbs/day	0.2	Monitor and Report	Average Monthly	mg/L	0.041	Monitor and Report	Average Monthly	1/month	24-Hr Composite
5/22/2019	Copper, Total	lbs/day	0.06	Monitor and Report	Average Monthly	mg/L	0.0119	Monitor and Report	Average Monthly	1/month	24-Hr Composite
6/26/2019	Copper, Total	lbs/day	0.1	Monitor and Report	Average Monthly	mg/L	0.0187	Monitor and Report	Average Monthly	1/month	24-Hr Composite
7/25/2019	Copper, Total	lbs/day	< 0.09	Monitor and Report	Average Monthly	mg/L	< 0.01	Monitor and Report	Average Monthly	1/month	24-Hr Composite
8/28/2019	Copper, Total	lbs/day	0.8	Monitor and Report	Average Monthly	mg/L	0.0745	Monitor and Report	Average Monthly	1/month	24-Hr Composite
9/27/2019	Copper, Total	lbs/day	< 0.2	Monitor and Report	Average Monthly	mg/L	< 0.01	Monitor and Report	Average Monthly	1/month	8-Hr Composite
10/28/2019	Copper, Total	lbs/day	< 0.05	Monitor and Report	Average Monthly	mg/L	< 0.01	Monitor and Report	Average Monthly	1/month	8-Hr Composite
11/25/2019	Copper, Total	lbs/day	< 0.03	Monitor and Report	Average Monthly	mg/L	< 0.01	Monitor and Report	Average Monthly	1/month	24-Hr Composite
12/27/2019	Copper, Total	lbs/day	0.4	Monitor and Report	Average Monthly	mg/L	0.0718	Monitor and Report	Average Monthly	1/month	24-Hr Composite
1/28/2020	Copper, Total	lbs/day	< 0.07	Monitor and Report	Average Monthly	mg/L	< 0.01	Monitor and Report	Average Monthly	1/month	8-Hr Composite
2/27/2020	Copper, Total	lbs/day	< 0.06	Monitor and Report	Average Monthly	mg/L	< 0.06	Monitor and Report	Average Monthly	1/month	24-Hr Composite
3/28/2020	Copper, Total	lbs/day	< 0.09	Monitor and Report	Average Monthly	mg/L	< 0.01	Monitor and Report	Average Monthly	1/month	24-Hr Composite
4/23/2020	Copper, Total	lbs/day	< 0.07	Monitor and Report	Average Monthly	mg/L	< 0.01	Monitor and Report	Average Monthly	1/month	24-Hr Composite
5/28/2020	Copper, Total	lbs/day	< 0.09	Monitor and Report	Average Monthly	mg/L	< 0.01	Monitor and Report	Average Monthly	1/month	24-Hr Composite
6/26/2020	Copper, Total	lbs/day	< 0.08	Monitor and Report	Average Monthly	mg/L	< 0.01	Monitor and Report	Average Monthly	1/month	24-Hr Composite
7/27/2020	Copper, Total	lbs/day	< 0.06	Monitor and Report	Average Monthly	mg/L	< 0.01	Monitor and Report	Average Monthly	1/month	24-Hr Composite
8/26/2020	Copper, Total	lbs/day	< 0.05	Monitor and Report	Average Monthly	mg/L	< 0.01	Monitor and Report	Average Monthly	1/month	24-Hr Composite
9/28/2020	Copper, Total	lbs/day	< 0.05	Monitor and Report	Average Monthly	mg/L	< 0.01	Monitor and Report	Average Monthly	1/month	24-Hr Composite
10/27/2020	Copper, Total	lbs/day	< 0.04	Monitor and Report	Average Monthly	mg/L	< 0.01	Monitor and Report	Average Monthly	1/month	24-Hr Composite
11/25/2020	Copper, Total	lbs/day	< 0.03	Monitor and Report	Average Monthly	mg/L	< 0.01	Monitor and Report	Average Monthly	1/month	24-Hr Composite
12/23/2020	Copper, Total	lbs/day	< 0.04	Monitor and Report	Average Monthly	mg/L	< 0.01	Monitor and Report	Average Monthly	1/month	24-Hr Composite
1/27/2021	Copper, Total	lbs/day	< 0.05	Monitor and Report	Average Monthly	mg/L	< 0.01	Monitor and Report	Average Monthly	1/month	24-Hr Composite
2/26/2021	Copper, Total	lbs/day	0.09	Monitor and Report	Average Monthly	mg/L	0.01	Monitor and Report	Average Monthly	1/month	24-Hr Composite
3/18/2021	Copper, Total	lbs/day	< 0.04	Monitor and Report	Average Monthly	mg/L	< 0.01	Monitor and Report	Average Monthly	1/month	24-Hr Composite
4/27/2021	Copper, Total	lbs/day	< 0.1	Monitor and Report	Average Monthly	mg/L	< 0.01	Monitor and Report	Average Monthly	1/month	24-Hr Composite
5/27/2021	Copper, Total	lbs/day	< 65	Monitor and Report	Average Monthly	mg/L	< 12.5	Monitor and Report	Average Monthly	1/month	24-Hr Composite

DMR_RECEIVED_DATE	PARAMETER	LOAD_UNITS	LOAD_1_VALUE	LOAD_1_LIMIT	LOAD_1_SBC	CONC_UNITS	CONC_2_VALUE	CONC_2_LIMIT	CONC_2_SBC	SAMPLE_FREQUENCY	SAMPLE_TYPE
1/26/2018	Iron, Total	lbs/day	0.429	Monitor and Report	Annual Average	mg/L	0.0945	Monitor and Report	Annual Average	1/year	24-Hr Composite
1/28/2019	Iron, Total	lbs/day	< 2	Monitor and Report	Annual Average	mg/L	< 0.3	Monitor and Report	Annual Average	1/year	8-Hr Composite
3/22/2019	Iron, Total	lbs/day	< 2	Monitor and Report	Annual Average	mg/L	< 0.3	Monitor and Report	Annual Average	1/year	24-Hr Composite
12/1/2020	Iron, Total	lbs/day	< 2	Monitor and Report	Annual Average	mg/L	< 0.2	Monitor and Report	Annual Average	1/year	24-Hr Composite

DMR_RECEIVED_DATE	PARAMETER	LOAD_UNITS	LOAD_1_VALUE	LOAD_1_LIMIT	LOAD_1_SBC	CONC_UNITS	CONC_2_VALUE	CONC_2_LIMIT	CONC_2_SBC	SAMPLE_FREQUENCY	SAMPLE_TYPE
1/26/2018	Manganese, Total	lbs/day	< 2.268	Monitor and Report	Annual Average	mg/L	0.5	Monitor and Report	Annual Average	1/year	24-Hr Composite
1/28/2019	Manganese, Total	lbs/day	0.3	Monitor and Report	Annual Average	mg/L	0.0422	Monitor and Report	Annual Average	1/year	8-Hr Composite
3/22/2019	Manganese, Total	lbs/day	16	Monitor and Report	Annual Average	mg/L	3.09	Monitor and Report	Annual Average	1/year	24-Hr Composite
12/1/2020	Manganese, Total	lbs/day	0.3	Monitor and Report	Annual Average	mg/L	0.0327	Monitor and Report	Annual Average	1/year	24-Hr Composite

DMR_RECEIVED_DATE	PARAMETER	LOAD_UNITS	LOAD_1_VALUE	LOAD_1_LIMIT	LOAD_1_SBC	CONC_UNITS	CONC_2_VALUE	CONC_2_LIMIT	CONC_2_SBC	SAMPLE_FREQUENCY
11/30/2016	Lead, Total	lbs/day	0.02	Monitor and Report	Average Monthly	mg/L	0.008	Monitor and Report	Average Monthly	1/week
12/28/2016	Lead, Total	lbs/day	0.03	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/week
1/23/2017	Lead, Total	lbs/day	< 0.8	Monitor and Report	Average Monthly	mg/L	< 0.206	Monitor and Report	Average Monthly	1/week
2/27/2017	Lead, Total	lbs/day	0.06	Monitor and Report	Average Monthly	mg/L	0.008	Monitor and Report	Average Monthly	1/week
3/28/2017	Lead, Total	lbs/day	< 0.04	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
4/26/2017	Lead, Total	lbs/day	< 0.08	Monitor and Report	Average Monthly	mg/L	< 0.0080	Monitor and Report	Average Monthly	1/month
5/25/2017	Lead, Total	lbs/day	< 0.06	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/week
6/15/2017	Lead, Total	lbs/day	< 0.04	Monitor and Report	Average Monthly	mg/L	0.008	Monitor and Report	Average Monthly	1/week
7/27/2017	Lead, Total	lbs/day	< 0.04	Monitor and Report	Average Monthly	mg/L	0.008	Monitor and Report	Average Monthly	1/week
8/30/2017	Lead, Total	lbs/day	< 0.07	Monitor and Report	Average Monthly	mg/L	< 0.0080	Monitor and Report	Average Monthly	1/week
9/18/2017	Lead, Total	lbs/day	< 0.04	Monitor and Report	Average Monthly	mg/L	0.008	Monitor and Report	Average Monthly	1/month
10/27/2017	Lead, Total	lbs/day	< 0.03	Monitor and Report	Average Monthly	mg/L	0.008	Monitor and Report	Average Monthly	1/week
11/28/2017	Lead, Total	lbs/day	< 0.03	Monitor and Report	Average Monthly	mg/L	< 0.0080	Monitor and Report	Average Monthly	1/week
12/28/2017	Lead, Total	lbs/day	0.03	Monitor and Report	Average Monthly	mg/L	< 0.0080	Monitor and Report	Average Monthly	1/week
1/26/2018	Lead, Total	lbs/day	< 0.04	Monitor and Report	Average Monthly	mg/L	< 0.0080	Monitor and Report	Average Monthly	1/month
2/28/2018	Lead, Total	lbs/day	< 0.03	Monitor and Report	Average Monthly	mg/L	< 0.0080	Monitor and Report	Average Monthly	1/month
3/23/2018	Lead, Total	lbs/day	< 0.06	Monitor and Report	Average Monthly	mg/L	0.008	Monitor and Report	Average Monthly	1/month
4/25/2018	Lead, Total	lbs/day	< 0.06	Monitor and Report	Average Monthly	mg/L	< 0.0080	Monitor and Report	Average Monthly	1/month
5/18/2018	Lead, Total	lbs/day	< 0.01	Monitor and Report	Average Monthly	mg/L	< 0.0080	Monitor and Report	Average Monthly	1/month
6/28/2018	Lead, Total	lbs/day	< 0.07	Monitor and Report	Average Monthly	mg/L	< 0.0080	Monitor and Report	Average Monthly	3/month
7/30/2018	Lead, Total	lbs/day	0.03	Monitor and Report	Average Monthly	mg/L	0.008	Monitor and Report	Average Monthly	1/month
8/28/2018	Lead, Total	lbs/day	< 0.016	Monitor and Report	Average Monthly	mg/L	< 0.07	Monitor and Report	Average Monthly	2/month
9/28/2018	Lead, Total	lbs/day	< 0.07	Monitor and Report	Average Monthly	mg/L	< 0.0080	Monitor and Report	Average Monthly	1/month
10/29/2018	Lead, Total	lbs/day	0.03	Monitor and Report	Average Monthly	mg/L	0.004	Monitor and Report	Average Monthly	1/month
11/28/2018	Lead, Total	lbs/day	< 0.03	Monitor and Report	Average Monthly	mg/L	< 0.0040	Monitor and Report	Average Monthly	1/month
12/28/2018	Lead, Total	lbs/day	0.2	Monitor and Report	Average Monthly	mg/L	0.0122	Monitor and Report	Average Monthly	1/month
1/28/2019	Lead, Total	lbs/day	< 0.06	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
2/22/2019	Lead, Total	lbs/day	0.1	Monitor and Report	Average Monthly	mg/L	0.00945	Monitor and Report	Average Monthly	1/month
3/22/2019	Lead, Total	lbs/day	< 0.04	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
4/25/2019	Lead, Total	lbs/day	< 0.05	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
5/22/2019	Lead, Total	lbs/day	< 0.04	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
6/26/2019	Lead, Total	lbs/day	< 0.05	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
7/25/2019	Lead, Total	lbs/day	< 0.07	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
8/28/2019	Lead, Total	lbs/day	0.09	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
9/27/2019	Lead, Total	lbs/day	< 0.2	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
10/28/2019	Lead, Total	lbs/day	< 0.04	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
11/25/2019	Lead, Total	lbs/day	< 0.03	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
12/27/2019	Lead, Total	lbs/day	< 0.05	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
1/28/2020	Lead, Total	lbs/day	< 0.06	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
2/27/2020	Lead, Total	lbs/day	< 0.05	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
3/28/2020	Lead, Total	lbs/day	< 0.07	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
4/23/2020	Lead, Total	lbs/day	< 0.06	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
5/28/2020	Lead, Total	lbs/day	< 0.07	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
6/26/2020	Lead, Total	lbs/day	< 0.07	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
7/27/2020	Lead, Total	lbs/day	< 0.05	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
8/26/2020	Lead, Total	lbs/day	< 0.04	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
9/28/2020	Lead, Total	lbs/day	< 0.04	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
10/27/2020	Lead, Total	lbs/day	< 0.03	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
11/25/2020	Lead, Total	lbs/day	< 0.03	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
12/23/2020	Lead, Total	lbs/day	< 0.03	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
1/27/2021	Lead, Total	lbs/day	< 0.04	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
2/26/2021	Lead, Total	lbs/day	FF	Monitor and Report	Average Monthly	mg/L	FF	Monitor and Report	Average Monthly	
3/18/2021	Lead, Total	lbs/day	0.07	Monitor and Report	Average Monthly	mg/L	0.008	Monitor and Report	Average Monthly	1/month
3/18/2021	Lead, Total	lbs/day	< 0.03	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
4/27/2021	Lead, Total	lbs/day	< 0.1	Monitor and Report	Average Monthly	mg/L	< 0.008	Monitor and Report	Average Monthly	1/month
5/27/2021	Lead, Total	lbs/day	< 3	Monitor and Report	Average Monthly	mg/L	< 0.5	Monitor and Report	Average Monthly	1/month

Input Data WQM 7.0

Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
18489	SHAMOKIN CREEK	**14.530**	538.00	74.00	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 (ºC)	Tributary pH	Stream Temp (ºC)	Stream pH
Q7-10	0.500	0.00	0.00	0.000	0.000	0.0	0.00	0.00	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 (ºC)	Disc pH
MART	PA0028738	0.8190	0.8190	0.8190	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

Input Data WQM 7.0

Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
18489	SHAMOKIN CREEK	**14.480**	527.00	80.90	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 (ºC)	Tributary pH	Stream Temp (ºC)	Stream pH
Q7-10	0.500	0.00	0.00	0.000	0.000	0.0	0.00	0.00	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 (ºC)	Disc pH
		0.0000	0.0000	0.0000	0.000	0.00	7.00

Parameter Data

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

WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
06B	18489	SHAMOKIN CREEK

RMI	Stream Flow (cfs)	PWS With (cfs)	Net Stream Flow (cfs)	Disc Analysis Flow (cfs)	Reach Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Reach Trav Time (days)	Analysis Temp (ºC)	Analysis pH
Q7-10 Flow												
14.530	37.00	0.00	37.00	1.267	0.04167	1.127	45.39	40.27	0.75	0.004	25.00	7.00
Q1-10 Flow												
14.530	25.16	0.00	25.16	1.267	0.04167	NA	NA	NA	0.61	0.005	25.00	7.00
Q30-10 Flow												
14.530	66.60	0.00	66.60	1.267	0.04167	NA	NA	NA	1.03	0.003	25.00	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	0.68	Use Inputted Reach Travel Times	☐
Q30-10/Q7-10 Ratio	1.8	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
06B	18489	SHAMOKIN CREEK

NH3-N Acute Allocations

RMI	Discharge Name	Baseline Criterion (mg/L)	Baseline WLA (mg/L)	Multiple Criterion (mg/L)	Multiple WLA (mg/L)	Critical Reach	Percent Reduction
14.530	MART	11.07	50	11.07	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
14.530	MART	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)		
14.53	MART	25	25	25	25	3	3	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
06B	18489	SHAMOKIN CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (ºC)	Analysis pH
14.530	0.819	25.000	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
45.386	1.127	40.274	0.748
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
2.76	0.448	0.83	1.029
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
8.069	163.716	Tsivoglou	5
Reach Travel Time (days)			
0.004			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.000	2.76	0.83	7.54
0.001	2.76	0.83	7.54
0.001	2.76	0.83	7.54
0.002	2.76	0.83	7.54
0.002	2.76	0.83	7.54
0.002	2.76	0.83	7.54
0.003	2.76	0.83	7.54
0.003	2.76	0.82	7.54
0.004	2.76	0.82	7.54
0.004	2.76	0.82	7.54

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
06B	18489	SHAMOKIN CREEK

RMI	Name	Permit Number	Disc Flow (mgd)	Parameter	Effl. Limit 30-day Ave. (mg/L)	Effl. Limit Maximum (mg/L)	Effl. Limit Minimum (mg/L)
14.530	MART	PA0028738	0.819	CBOD5	25		
				NH3-N	25	50	
				Dissolved Oxygen			3

Discharge Information

Instructions | Discharge | Stream

Facility: **Ralpho Township Municipal Authority WWTP** NPDES Permit No.: **PA0028738** Outfall No.: **001**

Evaluation Type: **Custom / Additives** Wastewater Description: **Sewage**

Discharge Characteristics								
Design Flow (MGD)*	Hardness (mg/l)*	pH (SU)*	Partial Mix Factors (PMFs)				Complete Mix Times (min)	
			AFC	CFC	THH	CRL	Q_{7-10}	Q_h
0.819	100	7						

				0 if left blank		*0.5 if left blank*		*0 if left blank*			*1 if left blank*	
Discharge Pollutant	Units	Max Discharge Conc		Trib Conc	Stream Conc	Daily CV	Hourly CV	Stream CV	Fate Coeff	FOS	Criteria Mod	Chem Transl
Total Aluminum	mg/L	<	0.1									
Total Copper	mg/L		0.26									
Total Iron	mg/L		0.3									
Total Manganese	mg/L		3.09									
Total Lead	mg/L		0.0122									

Stream / Surface Water Information

Ralpho Township Municipal Authority WWTP, NPDES Permit No. PA0028738, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: **Shamokin Creek**

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	018489	14.53	538	74			Yes
End of Reach 1	018489	14.48	527	80.9			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	14.53	0.5										100	7		
End of Reach 1	14.48	0.5													

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	14.53														
End of Reach 1	14.48														

Model Results

Ralpho Township Municipal Authority WWTP, NPDES Permit No. PA0028738, Outfall 001

Instructions | Results | RETURN TO INPUTS | SAVE AS PDF | PRINT | (•) All ( ) Inputs ( ) Results ( ) Limits

☑ ***Hydrodynamics***

Q_{7-10}

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
14.53	37		37	1.267	0.042	1.127	45.386	40.274	0.748	0.004	10.809
14.48	40.450		40.45								

Q_h

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
14.53	174.42		174.42	1.267	0.042	2.204	45.386	20.596	1.757	0.002	4.168
14.48	188.554		188.55								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 5.881 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Aluminum	0	0		0	750	750	22,652	
Total Copper	0	0		0	13.439	14.0	423	Chem Translator of 0.96 applied
Total Iron	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	64.581	81.6	2,466	Chem Translator of 0.791 applied

☑ ***CFC*** CCT (min): 10.809 PMF: 1 Analysis Hardness (mg/l): 100 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	8.956	9.33	282	Chem Translator of 0.96 applied
Total Iron	0	0		0	1,500	1,500	45,305	WQC = 30 day average; PMF = 1

Total Manganese	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	2.517	3.18	96.1	Chem Translator of 0.791 applied

☑ ***THH*** CCT (min): 10.809 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 Aluminum	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	1,000	1,000	30,203	
Total Lead	0	0		0	N/A	N/A	N/A	

☑ ***CRL*** CCT (min): 4.168 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 Aluminum	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	

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

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments

☑ ***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 Aluminum	14,519	µg/L	Discharge Conc ≤ 10% WQBEL
Total Copper	271	µg/L	Discharge Conc ≤ 10% WQBEL
Total Iron	45,305	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	30,203	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	96.1	µg/L	Discharge Conc ≤ 10% WQBEL

1A	B	C	D	E	F	G
2	**TRC EVALUATION**					
3	Input appropriate values in B4:B8 and E4:E7					
4	37	= Q stream (cfs)		0.5	= CV Daily	
5	0.819	= Q discharge (MGD)		0.5	= CV Hourly	
6	30	= no. samples		1	= AFC_Partial Mix Factor	
7	0.3	= Chlorine Demand of Stream		1	= CFC_Partial Mix Factor	
8	0	= Chlorine Demand of Discharge		15	= AFC_Criteria Compliance Time (min)	
9	0.5	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)	
	0	= % Factor of Safety (FOS)		0	=Decay Coefficient (K)	
10	Source	Reference	AFC Calculations		Reference	CFC Calculations
11	TRC	1.3.2.iii	WLA afc = 9.335		1.3.2.iii	WLA cfc = 9.093
12	PENTOXSD TRG	5.1a	LTAMULT afc = 0.373		5.1c	LTAMULT cfc = 0.581
13	PENTOXSD TRG	5.1b	LTA_afc= 3.478		5.1d	LTA_cfc = 5.286
14						
15	Source		Effluent Limit Calculations			
16	PENTOXSD TRG	5.1f	AML MULT = 1.231			
17	PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500		BAT/BPJ	
18			INST MAX LIMIT (mg/l) = 1.635			

WLA afc	(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...
	...+ Xd + (AFC_Yc*Qs*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)