pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**New**	Application No.	**PA0255726**
Facility Type	**Municipal**	APS ID	**1018672**
Major / Minor	**Minor**	Authorization ID	**1318525**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Mount Pleasant Township Municipal Authority (MPTMA)**	Facility Name	**MPTMA WWTP**
Applicant Address	P.O. Box 411	Facility Address	Sabo Road
	Hickory, PA 15340		Mount Pleasant, PA 15340
Applicant Contact	Gary Farner	Facility Contact	Same as Applicant
Applicant Phone	(724) 356-7974	Facility Phone	Same as Applicant
Client ID	357116	Site ID	843617
Ch 94 Load Status		Municipality	Mount Pleasant Township
Connection Status		County	Washington
Date Application Received	June 18, 2020	EPA Waived?	Yes
Date Application Accepted	June 26, 2020	If No, Reason	

Purpose of Application: Issuance of a New NPDES Permit for the discharge of treated sewage.

Summary of Review

The applicant is proposing a new NPDES Permit for the discharge of a new sewage treatment plant owned and operated by MPTMA located in Mount Pleasant Township, Washington county.

The treated effluent will discharge into an unnamed tributary to Chartiers Run, which is classified as a Warm Water Fishery (WWF) located in State Watershed No. 20-F.

Two associated WQM permits are under the Department review and will be issued separately from the NPDES Permit. The applicant may seek PENNVEST funding.

WQM Permit No.6320401 is for the proposed sewage treatment plant rated at annual average design flow of 0.175 MGD, peak instantaneous capacity of 0.875 MGD, and organic design capacity of 349.4 lbs./day. The treatment process consists of two SBRs and UV disinfection. The sewage sludge will be treated with aerobic digestion and mechanical dewatering and then be hauled to the Arden Landfill.

WQM No.6320402 is for sewer collections system, includes four pump stations, force mains, gravity sewer lines, eone grinder pumps.

The proposed effluent limitations and monitoring requirements are determined under the effluent discharge rate of 0.175 MGD. The Water Quality Based Effluent Limitations (WQBEL) are compared to the minimum technology-based and BPJ standards for individual sewage permits. The most stringent of those limitations are imposed on the draft NPDES permit as per the SOP-Establishing Effluent Limitations for Individual Sewage Permits. WQM 7.0 modeling results are enclosed.

Approve	Deny	Signatures	Date
X		*Yingmin Xue* Yingmin Xue / Environmental Engineering Specialist	July 10, 2020
X		Donald J. Leone Donald J. Leone, P.E. / Environmental Engineer Manager	September 1, 2020

Summary of Review

The Act 537 Official Plan Update was approved by the Department on July 29, 2016. The plan approves a design capacity of 0.175 MGD for the MPTMA WWTP.

The applicant has complied with Act 14 Notifications via letters dated on August 1, 2018, and no comments were received.

Public Participation

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

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	0.175
Latitude	40º 16' 45"	Longitude	-80º 16' 40"
Quad Name	Midway	Quad Code	1603
Wastewater Description:	Sewage Effluent		

Receiving Waters	UNT to Chartiers Run (WWF)	Stream Code	37052
NHD Com ID	99692734	RMI	1.35
Drainage Area	3.23	Yield (cfs/mi^2)	0.0107
Q_{7-10} Flow (cfs)	0.0348	Q_{7-10} Basis	USGS StreamStats
Elevation (ft)	1125	Slope (ft/ft)	0.003
Watershed No.	20-F	Chapter 93 Class.	WWF
Existing Use		Existing Use Qualifier	
Exceptions to Use		Exceptions to Criteria	
Assessment Status	Impaired		
Cause(s) of Impairment	HABITAT ALTERATIONS, METALS, SILTATION, TOTAL DISSOLVED SOLIDS (TDS), TURBIDITY		
Source(s) of Impairment	ACID MINE DRAINAGE, CONSTRUCTION, HABITAT MODIFICATION - OTHER THAN HYDROMODIFICATION		
TMDL Status	Final, Final	Name	Chartiers Creek,Chartiers Creek Watershed

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

Nearest Downstream Public Water Supply Intake		West View Water Authority	
PWS Waters	Ohio River	Flow at Intake (cfs)	62.0
PWS RMI		Distance from Outfall (mi)	40.50

Changes Since Last Permit Issuance: N/A

Other Comments: The discharge is to Chartiers Creek, which has a Final TMDL and is impaired by PCB and Chlordane. And Chartiers Creek is part of the Chartiers Creek Watershed that has a Final TMDL and is impaired by metals. This sewage discharge is not expected to contribute to the stream impairment for which abandoned mine drainage is a source of such impairment. No WLAs have been developed for this sewage discharge, and they are not expected to contribute to the stream impairment for these pollutants. The proposed permit requires monitoring of these metals. 1/year monitoring frequency is imposed for the parameters of Total Iron, Total Manganese and Total Aluminum for plants rated within 0.002 and 0.499 MGD.

Treatment Facility Summary

Treatment Facility Name: Mt Pleasant Municipal Authority WWTP

WQM Permit No.	Issuance Date
6320401	
6320402	

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary with Ammonia Reduction	SBRs	UV	0.175

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.175	349.4		Aerobic digestion and Mechanical dewatering	Hauled to Arden Landfill

Changes Since Last Permit Issuance: N/A

Other Comments: This is a New NPDES Permit, and the facility has not been constructed. WQM Permit No.6320401 for sewage treatment facility and No.6320402 for sewer collections system have been submitted to the Department for review and will be issued separately from this NPDES Permit.

Limits are based on a Design Flow of 0.175 MGD, which is the Annual Average Design Flow of the WWTP. The Hydraulic Design Capacity is 0.175 MGD for the WWTP, and this number will be used to prepare the Annual Municipal Wasteload Management Report to help determine whether a “hydraulic overload” situation exists, as defined in Title 25 Pa. Code Chapter 94. The Organic Capacity is based upon the Annual Average Design Flow of 349.4 MGD and will control growth in the system.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.175
Latitude 40º 16' 45.00" **Longitude** -80º 16' 40.00"
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

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

Parameter	Limit (mg/l)	SBC	Model
Ammonia Nitrogen (May 1 to Oct 31)	1.5	Average Monthly	WQM 7.0 Version 1.0
Ammonia Nitrogen (May 1 to Oct 31)	3.0	IMAX	WQM 7.0 Version 1.0
Ammonia Nitrogen (Nov 1 - Apr 30)	3.5	Average Monthly	WQM 7.0 Version 1.0
Ammonia Nitrogen (Nov 1 - Apr 30)	7.0	IMAX	WQM 7.0 Version 1.0
Dissolved Oxygen	5.0	Minimum	WQM 7.0 Version 1.0

Comments: The proposed discharge was evaluated using WQM 7.0 for the $CBOD_5$, Ammonia-Nitrogen and Dissolved Oxygen parameters. The modeling results show technology-based effluent limitations for $CBOD_5$ are appropriate. The modeling results also confirm that Ammonia-Nitrogen and Dissolved Oxygen limitations are necessary to meet in-stream water quality criterion. Total Suspended Solids, pH, Fecal Coliform, are not evaluated using WQM 7.0.

Best Professional Judgment (BPJ) Limitations

Comments: N/A

Anti-Backsliding

N/A

Additional Considerations:

Monitoring frequencies for the proposed effluent limits are based upon Table 6-3 Self-Monitoring Requirements for Sewage Dischargers of the DEP's Technical Guidance for the Development and Specification of Effluent Limitations.

For STPs with Ultraviolet (UV) disinfection, routine monitoring of UV transmittance, UV dosage, or UV intensity at the same monitoring frequency used for TRC should be contained in the permit as per the SOP-Establishing Effluent Limitations for Individual Sewage Permits.

Nutrient monitoring is required to establish the nutrient load from the wastewater treatment facility and the impacts that load may have on the quality of the receiving stream(s). Sewage discharges with a design flow greater than 2,000 gpd require monitoring, at a minimum, for Total Nitrogen and Total Phosphorus in new and reissued permits. A 1/year monitoring and report requirement for Total Nitrogen and Total Phosphorus has been added to the permit as per Chapter 92.a.61.

Mass loading limits are applicable for publicly owned treatment works (POTWs). Current policy requires average monthly mass loading limits be established for CBOD5, TSS, and NH_3-N and average weekly mass loading limits be established for CBOD5 and TSS. Average monthly mass loading limits (lbs/day) are based on the formula: design flow (MGD) x concentration limit (mg/L) x conversion factor (8.34).

For POTWs with design flows greater than 2,000 GPD, influent BOD_5 and TSS monitoring must be established in the permit, and the monitoring should be consistent with the same frequency and sample type as is used for other effluent parameters.

Total Dissolved Solids (TDS) and its Major Constituents

Total Dissolved Solids (TDS) and its major constituents, including sulfate, chloride, and bromide, have emerged as pollutants of concern in several major watersheds in the Commonwealth. The conservative nature of these solids allows them to accumulate in surface waters, and they may remain a concern even if the immediate downstream public water supply is not directly impacted. Bromide has been linked to the formation of disinfection byproducts at increased levels in public water systems. In addition, as a consequence of actions associated with Triennial Review 13, the Environmental Quality Board has directed DEP to collect additional data related to sulfate, chloride, and 1,4-dioxane. Furthermore, in an August 2013 letter from Jon Capacasa of the Region III Water Protection Program to DEP (attached), EPA has expressed concern related to bromide and the importance of monitoring all point sources for bromide when it may be present.

Based on these concerns and under the authority of §92a.61, DEP has determined it should implement increased monitoring in NPDES permits for these parameters: TDS, sulfate, chloride, bromide, and 1,4-dioxane.

Increased monitoring in NPDES permits will only occur when the following conditions are met:

- Where the concentration of TDS in the discharge exceeds 1,000 mg/L, or the net TDS load from a discharge exceeds 20,000 lbs/day, and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for TDS, sulfate, chloride, and bromide. Discharges of 0.1 MGD or less should monitor and report for TDS, sulfate, chloride, and bromide if the concentration of TDS in the discharge exceeds 5,000 mg/L.
- Where the concentration of bromide in a discharge exceeds 1 mg/L and the discharge flow exceeds 0.1 MGD, Part A of the permit should include monitor and report for bromide. Discharges of 0.1 MGD or less should monitor and report for bromide if the concentration of bromide in the discharge exceeds 10 mg/L.

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

Monitoring is not required for TDS, sulfate, chloride, bromide & 1,4-dioxane. These parameters will be evaluated during the next permit renewal and imposed if necessary.

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	Instantaneous Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	1/week	Metered
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
CBOD5	36.0	58.0	XXX	25.0	40.0	50	1/week	8-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	1/week	8-Hr Composite
TSS	43.0	65.0	XXX	30.0	45.0	60	1/week	8-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	1/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	1/week	Grab
UV Transmittance (%)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Measured
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	8-Hr Composite
Ammonia Nov 1 - Apr 30	5.0	XXX	XXX	3.5	XXX	7.0	1/week	8-Hr Composite
Ammonia May 1 - Oct 31	2.0	XXX	XXX	1.5	XXX	3.0	1/week	8-Hr Composite
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/year	8-Hr Composite

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

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

Compliance Sampling Location: Outfall 001

Other Comments: Effluent limitations are based on a design flow of 0.175 MGD.

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

October 2, 2015

Mr. Kevin D. Hoffman
KLH Engineers, Inc.
5173 Campbells Run Road
Pittsburgh PA 15205

Re: Preliminary Effluent Limits with intended Flow 0.175 MGD
Mt. Pleasant Township MA WWTP
Mt. Pleasant Township, Washington County

Dear Mr. Hoffman:

In response to your letter, dated August 18, 2015, we have developed preliminary effluent limits for a discharge of 0.175 MGD of treated wastewater to Westland Run, a tributary to Chartiers Run. Any changes in the size or location of the discharge will require a reevaluation. The Preliminary Effluent Limits are provided below:

Parameter	Concentration (mg/l)		
	Monthly Average	Weekly Average	Instantaneous Maximum
CBOD5	25		25
Total Suspended Solids	30		60
Ammonia-Nitrogen (May 1- October 31)	1.58		3.16
Ammonia-Nitrogen (November 1- April 30)	3.65		7.3
Fecal Coliform (5-1 to 9-30)	200 Geo Mean		1,000
Fecal Coliform (10-1 to 4-30)	2,000 Geo Mean		10,000
Dissolved Oxygen	Minimum of 5.0 at all times		
Total Residual Chlorine	0.03		0.1
Total Nitrogen	Report		
Total Phosphorous	Report		
Total Iron	Report		
Total Aluminum	Report		
Total Manganese	Report		
CBOD Raw Sewage Influent	Report		
TSS Raw sewage Influent	Report		
pH	Within the range of 6 to 9 standard units at all times		

Total Nitrogen, Total Phosphorous, Total Aluminum, Total Iron, Total Manganese, CBOD Raw Sewage Influent, and TSS Raw Sewage Influent have to be monitored and reported. If UV disinfection is not used, Total Residual Chlorine (TRC) limits will be applicable. If UV Disinfection is used, TRC limits will not be applicable, but routine monitoring of UV transmittance (mjoules/cm^2) will be applicable.

To meet the requirements of the Sewage Facilities Act, the proposed facility must be included in the municipality's Official Sewage Plan that is approved by DEP. For private projects, this may be done through the submission of sewage planning module components that are adopted by the municipality as a revision to the Official Plan. If you have not already done so, please initiate the sewage planning process by contacting Emily Shade at (724)769-1055.

When the municipality has a DEP-approved Official Plan that addresses this project, permit applications may be submitted. An NPDES permit application must be filed with DEP at least 180 days before you propose to commence the discharge of treated wastewater. A Water Quality Management (WQM) permit must be obtained from DEP prior to starting construction of the proposed facilities. Permit applications can be obtained by contacting this office or by visiting DEP's website at www.elibrary.dep.state.pa.us.

Issuance of these limits does not represent approval for a discharge to the waters of the Commonwealth. This information is provided as an aid in evaluating alternative wastewater disposal methods. Please review these results. If you should have any questions, please feel free to contact Harris Mahmud at 412-442-4201.

Sincerely,

Donald J. Leone, P.E.
Environmental Engineering Manager
Clean Water Program

cc: Regional File

Warm Weather

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
20F	37052	Trib 37052 to Chartiers Run	1.350	1125.00	3.23	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.011	0.00	0.03	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 (°C)	Disc pH
Mt. Pleasant Tw	PA0000000	0.1750	0.1750	0.1750	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

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
20F	37052	Trib 37052 to Chartiers Run	1.050	1120.00	3.46	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	0.011	0.00	0.04	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 (°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
20F	37052	Trib 37052 to Chartiers Run

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												
1.350	0.03	0.00	0.03	.2707	0.00316	.426	8.91	20.91	0.08	0.228	25.00	7.00
Q1-10 Flow												
1.350	0.02	0.00	0.02	.2707	0.00316	NA	NA	NA	0.08	0.233	25.00	7.00
Q30-10 Flow												
1.350	0.05	0.00	0.05	.2707	0.00316	NA	NA	NA	0.08	0.223	25.00	7.00

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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	85.00%	Use Balanced Technology	☐
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
20F	37052	Trib 37052 to Chartiers Run

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
1.350	Mt. Pleasant Tw	6.76	7.32	6.76	7.32	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
1.350	Mt. Pleasant Tw	1.34	1.58	1.34	1.58	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)		
1.35	Mt. Pleasant Tw	25	25	1.58	1.58	5	5	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20F	37052	Trib 37052 to Chartiers Run

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.350	0.175	25.000	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
8.911	0.426	20.906	0.080
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
22.38	1.481	1.40	1.029
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.369	19.419	Owens	5
Reach Travel Time (days)			
0.228			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.023	21.45	1.36	5.20
0.046	20.56	1.33	5.14
0.068	19.70	1.30	5.15
0.091	18.88	1.27	5.20
0.114	18.10	1.24	5.28
0.137	17.35	1.21	5.37
0.160	16.62	1.18	5.47
0.182	15.93	1.16	5.57
0.205	15.27	1.13	5.67
0.228	14.64	1.10	5.77

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
20F	37052	Trib 37052 to Chartiers Run

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)
1.350	Mt. Pleasant Tw	PA0000000	0.175	CBOD5	25		
				NH3-N	1.58	3.16	
				Dissolved Oxygen			5

Cold Weather

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
20F	37052	Trib 37052 to Chartiers Run	1.350	1125.00	3.23	0.00000	0.00	☑

Stream Data

Design Cond.	LFY (cfsm)	Trib Flow (cfs)	Stream Flow (cfs)	Rch Trav Time (days)	Rch Velocity (fps)	WD Ratio	Rch Width (ft)	Rch Depth (ft)	Tributary Temp (°C)	Tributary pH	Stream Temp (°C)	Stream pH
Q7-10	0.011	0.00	0.03	0.000	0.000	0.0	0.00	0.00	5.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
Mt. Pleasant Tw	PA0000000	0.1750	0.1750	0.1750	0.000	15.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	10.18	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
20F	37052	Trib 37052 to Chartiers Run	1.050	1120.00	3.46	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	0.011	0.00	0.04	0.000	0.000	0.0	0.00	0.00	5.00	7.00	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

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

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	3.00	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
20F	37052	Trib 37052 to Chartiers Run

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												
1.350	0.03	0.00	0.03	.2707	0.00316	.426	8.91	20.91	0.08	0.228	13.86	7.00
Q1-10 Flow												
1.350	0.02	0.00	0.02	.2707	0.00316	NA	NA	NA	0.08	0.233	14.24	7.00
Q30-10 Flow												
1.350	0.05	0.00	0.05	.2707	0.00316	NA	NA	NA	0.08	0.223	13.51	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	85.00%	Use Balanced Technology	☐
D.O. Goal	5		

WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
20F	37052	Trib 37052 to Chartiers Run

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
1.350	Mt. Pleasant Tw	14.84	16.07	14.84	16.07	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
1.350	Mt. Pleasant Tw	3.11	3.65	3.11	3.65	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)		
1.35	Mt. Pleasant Tw	25	25	3.65	3.65	5	5	0	0

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
20F	37052	Trib 37052 to Chartiers Run

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
1.350	0.175	13.861	7.000
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
8.911	0.426	20.906	0.080
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
22.38	1.483	3.24	0.436
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.590	19.419	Owens	5
Reach Travel Time (days)			
0.228			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.023	21.82	3.21	6.49
0.046	21.27	3.17	7.09
0.068	20.73	3.14	7.49
0.091	20.21	3.11	7.76
0.114	19.70	3.08	7.96
0.137	19.21	3.05	8.10
0.160	18.72	3.02	8.21
0.182	18.25	2.99	8.29
0.205	17.79	2.96	8.36
0.228	17.34	2.93	8.42

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
20F	37052	Trib 37052 to Chartiers Run

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)
1.350	Mt. Pleasant Tw	PA0000000	0.175	CBOD5	25		
				NH3-N	3.65	7.3	
				Dissolved Oxygen			5

TRC Modelling

1A	B	C	D	E	F	G
2	**TRC EVALUATION**			**Placid Manor Mobile Home STP**		
3	Input appropriate values in B4:B8 and E4:E7			**Preliminary Effluent TRC**		
4	0.0348	= Q stream (cfs)		0.5	= CV Daily	
5	0.175	= 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		= Chlorine Demand of Discharge		15	= AFC_Criteria Compliance Time (min)	
9	0.5	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)	
		= % Factor of Safety (FOS)			=Decay Coefficient (K)	
10	Source	Reference	AFC Calculations		Reference	CFC Calculations
11	TRC	1.3.2.iii	WLA afc = 0.060		1.3.2.iii	WLA cfc = 0.051
12	PENTOXSD TRG	5.1a	LTAMULT afc = 0.373		5.1c	LTAMULT cfc = 0.581
13	PENTOXSD TRG	5.1b	LTA_afc= 0.022		5.1d	LTA_cfc = 0.030
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) = 0.028		AFC	
18			INST MAX LIMIT (mg/l) = 0.090			
	Imposed TRC Limits: AVG MONTHLY 0.03 mg/l; INST MAX 0.1 mg/l					

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)

StreamStats Version 3 Beta

Basin Characteristics Ungaged Site Report

RMI 1.35

Date: Thurs Oct 1, 2015 9:10:43 AM GMT-4
NAD 1983 Latitude: 40.2791 (40 16 45)
NAD 1983 Longitude: -80.2775 (-80 16 39)

Label	Value	Units	Definition
DRNAREA	3.23	square miles	Area that drains to a point on a stream
STRMTOT	7.12	miles	Total length of mapped streams in basin
ELEV	1193	feet	Mean Basin Elevation

upstream RMI 1.05
down " " 1.35
Basin 20 F

StreamStats Version 3 Beta

Flow Statistics Ungaged Site Report

Date: Thurs Oct 1, 2015 9:06:39 AM GMT-4
Site Location: Pennsylvania
NAD 1983 Latitude: 40.2791 (40 16 45)
NAD 1983 Longitude: -80.2775 (-80 16 39)
Drainage Area: 3.23 mi2

Low Flow Basin Characteristics			
100% Low Flow Region 4 (3.23 mi2)			
Parameter	**Value**	**Regression Equation Valid Range**	
		Min	**Max**
Drainage Area (square miles)	3.23	2.26	1400
Mean Basin Elevation (feet)	1193.0	1050	2580

Mean/Base-flow Basin Characteristics			
100% Statewide Mean and Base Flow (3.23 mi2)			
Parameter	**Value**	**Regression Equation Valid Range**	
		Min	**Max**
Drainage Area (square miles)	3.23	2.26	1720
Mean Basin Elevation (feet)	1193.0	130	2700
Mean Annual Precipitation (inches)	39.0	33.1	50.4
Percent Carbonate (percent)	0.0	0	99
Percent Forest (percent)	43.0	5.1	100
Percent Urban (percent)	2.0	0	89

Peak Flow Basin Characteristics			
100% Peak Flow Region 3 (3.23 mi2)			
Parameter	**Value**	**Regression Equation Valid Range**	
		Min	**Max**
Drainage Area (square miles)	3.23	1.44	1610
Mean Basin Elevation (feet)	1193.0	457	2150
Percent Carbonate (percent)	0.0	0	99

Percent Urban (percent)	2.0	0	64
Percent Storage (percent)	0.0	0	22.6

Low Flow Statistics

Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
M7D2Y	0.11	ft3/s	43			
M30D2Y	0.19	ft3/s	38			
M7D10Y	0.0348	ft3/s	66			
M30D10Y	0.0681	ft3/s	54			
M90D10Y	0.13	ft3/s	41			

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

Mean/Base-flow Statistics

Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
QA	3.94	ft3/s	12			
QAH	0.6	ft3/s	38			
BF10YR	1.21	ft3/s	21			
BF25YR	1.05	ft3/s	21			
BF50YR	0.95	ft3/s	23			

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

Peak Flow Statistics

Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
PK2	201	ft3/s	31	3		
PK5	352	ft3/s	28	5		
PK10	473	ft3/s	28	7		
PK50	789	ft3/s	31	11		
PK100	944	ft3/s	36	11		
PK500	1370	ft3/s	43	11		

StreamStats Version 3 Beta

Basin Characteristics Ungaged Site Report

RMI 1.05

Date: Thurs Oct 1, 2015 9:04:09 AM GMT-4
NAD 1983 Latitude: 40.2748 (40 16 29)
NAD 1983 Longitude: -80.2729 (-80 16 23)

Label	Value	Units	Definition
DRNAREA	3.46	square miles	Area that drains to a point on a stream
STRMTOT	7.51	miles	Total length of mapped streams in basin
ELEV	1189.2	feet	Mean Basin Elevation

StreamStats Version 3 Beta

Flow Statistics Ungaged Site Report

Date: Thurs Oct 1, 2015 9:04:35 AM GMT-4
Site Location: Pennsylvania
NAD 1983 Latitude: 40.2748 (40 16 29)
NAD 1983 Longitude: -80.2729 (-80 16 23)
Drainage Area: 3.46 mi2

Low Flow Basin Characteristics			
100% Low Flow Region 4 (3.46 mi2)			
Parameter	**Value**	**Regression Equation Valid Range**	
		Min	**Max**
Drainage Area (square miles)	3.46	2.26	1400
Mean Basin Elevation (feet)	1189.2	1050	2580

Mean/Base-flow Basin Characteristics			
100% Statewide Mean and Base Flow (3.46 mi2)			
Parameter	**Value**	**Regression Equation Valid Range**	
		Min	**Max**
Drainage Area (square miles)	3.46	2.26	1720
Mean Basin Elevation (feet)	1189.2	130	2700
Mean Annual Precipitation (inches)	39.0	33.1	50.4
Percent Carbonate (percent)	0.0	0	99
Percent Forest (percent)	45.0	5.1	100
Percent Urban (percent)	4.0	0	89

Peak Flow Basin Characteristics			
100% Peak Flow Region 3 (3.46 mi2)			
Parameter	**Value**	**Regression Equation Valid Range**	
		Min	**Max**
Drainage Area (square miles)	3.46	1.44	1610
Mean Basin Elevation (feet)	1189.2	457	2150
Percent Carbonate (percent)	0.0	0	99

Percent Urban (percent)	4.0	0	64
Percent Storage (percent)	0.0	0	22.6

Low Flow Statistics

Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
M7D2Y	0.11	ft3/s	43			
M30D2Y	0.21	ft3/s	38			
M7D10Y	0.0378	ft3/s	66			
M30D10Y	0.0736	ft3/s	54			
M90D10Y	0.14	ft3/s	41			

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

Mean/Base-flow Statistics

Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
QA	4.28	ft3/s	12			
QAH	0.67	ft3/s	38			
BF10YR	1.34	ft3/s	21			
BF25YR	1.16	ft3/s	21			
BF50YR	1.06	ft3/s	23			

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

Peak Flow Statistics

Statistic	Value	Unit	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
					Min	Max
PK2	213	ft3/s	31	3		
PK5	372	ft3/s	28	5		
PK10	501	ft3/s	28	7		
PK50	833	ft3/s	31	11		
PK100	996	ft3/s	36	11		
PK500	1440	ft3/s	43	11		

elev 1125
StreamStats Version 3 Beta - Pennsylvania
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PA Map Layers
Zoom To

StreamStats Version 3 Beta - Pennsylvania
StreamStats
Delineation Results
PA Map Layers

Notes for WQM 7.0

① In the model, never use binoculars, instead use enter to keep inputting data.

② – 1st point, use upstream
– 2nd " , use downstream
– RMI decreases from upstream to down stream
– elevation decreases
– D.A. increases
– stream flow increases

③ – Warm weather,
– temp for both stream & discharge 25° F
– temp for cold weather stream is 5° F
discharge 15° F
– D.O. is 3 for warm
5 for cold
– keep other default numbers same.

stream code [illegible]

sewage discharge flow = 0.175 mgd = 0.27 ft^3/s

(1)
DA = 3.23 sq. mi
elev = 1125 feet
Q_{7-10} = 0.0348 ft^3/s
yield = $\frac{0.0348}{3.23}$ = 0.0107 $\frac{cfs}{sq.mi}$.

Distance 1584 feet

(2)
DA = 3.46 sq. mi
elev = 1120 feet
Q_{7-10} = 0.0378 ft^3/s
yield = $\frac{0.0378}{3.46}$ = 0.0109 $\frac{cfs}{sq.mi}$.

slope = 0.003 ft/ft

Dilution Ratio = $\frac{0.0378}{0.27}$ = 0.14 ~~$\frac{cfs}{cfs}$~~

(1) RMI 1.05
(2) RMI 1.35

Chartiers Run
37043
RMI ~~3.507~~ 4.312 (hoffman (a kit ussinus cam)
WWF 20F
(1.75 miles from outfall)