pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northeast Regional Office
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Application Type	**Renewal**	Application No.	**PA0021199**
Facility Type	**Municipal**	APS ID	**599239**
Major / Minor	**Minor**	Authorization ID	**1337476**

Applicant and Facility Information

Applicant Name	**Borough of Beaver Meadows Municipal Authority**	Facility Name	**Borough of Beaver Meadows STP**
Applicant Address	100 East Broad Street	Facility Address	Plane Street (Off Route 93)
	Beaver Meadows, PA 18216		Beaver Meadows, PA 18216-0247
Applicant Contact	Anthony Rusnock, Council President	Facility Contact	Emory Toth, Operator
Applicant Phone	(570) 455-7841	Facility Phone	(570) 436-4770
Client ID	36813	Site ID	249759
Ch 94 Load Status	Not Overloaded	Municipality	Beaver Meadows Borough
Connection Status	No Limitations	County	Carbon
Date Application Received	December 22, 2020	EPA Waived?	Yes
Date Application Accepted	January 19, 2021	If No, Reason	-
Purpose of Application	Renewal of NPDES permit for discharge of treated sewage.		

Summary of Review

The applicant is requesting the renewal of an NPDES permit to discharge up to 0.18 MGD of treated sewage into Beaver Creek, a Cold-Water Fishery, Migratory Fish (CWF, MF) receiving stream in State Water Plan Basin 2-B (Middle Lehigh River). As per the Department's current existing use list, the receiving stream does not have an existing use classification that is more protective than its designated use. This stream segment is designated as a naturally reproducing trout stream as per PA Fish & Boat Commission. This discharge is not expected to affect public water supplies.

Limitations for pH, $CBOD_5$, Dissolved Oxygen (DO), Total Suspended Solids (TSS), and Fecal Coliform are technology-based and carried over from the previous permit.

The previous permit had a monitoring/reporting requirement for Ammonia-Nitrogen at a frequency of 2/month. WQM 7.0 recommended stricter summertime limitations for Ammonia-Nitrogen (7.8 mg/L monthly average, 15.7 mg/L IMAX). These limitations will come into effect four (4) years after the permit effective date. The summertime technology-based limitations of 25 mg/L and 50 mg/L IMAX will be in effect for the first four (4) years of the permit. Monitoring/reporting for Ammonia-Nitrogen is required from November-April and will begin at the permit effective date. A 1/week sampling frequency is being applied to remain consistent with recommended frequencies

The Total Residual Chlorine (TRC) Calculation Spreadsheet recommends stricter limitations than the previous permit. The permittee will be required to meet the new water quality-based limits for TRC starting four (4) years after the effective date of the permit. TRC limitations from the previously issued permit are in effect for the first year after the permit effective date, followed by the technology-based limits of 0.5 mg/L average monthly and 1.6 mg/L IMAX for TRC being in effect for the next three (3) years of the permit.

The 2/month monitoring and reporting for Total Nitrogen, Total Phosphorous, Total Kjeldahl Nitrogen, and Nitrate-Nitrite as N has been maintained in this permit.

Approve	Deny	Signatures	Date
X		Allison Seyfried (signed) Allison Seyfried / Environmental Engineering Specialist	January 18, 2022
X		Amy M. Bellanca (signed) Amy M. Bellanca, P.E. / Environmental Engineer Manager	1-18-22

Summary of Review

Per current Standard Operating Procedures for Publicly Owned Treatment Plants, raw sewage influent TSS monitoring/ reporting shall be added to the permit. A monitoring frequency of 1/week has been applied.

Sewage discharges now require monitoring and reporting for E. Coli. A monitoring frequency of 1/month for design flows >= 1 MGD, 1/quarter for design flows >= 0.05 and < 1 MGD, 1/year for design flows of 0.002 – 0.05 MGD will be utilized.

24-hour composite sampling is now required for every pollutant except pH, DO, Fecal Coliform, TRC, and E. Coli.

Pollutant sampling results submitted with the permit application were entered into the Toxic Management Spreadsheet (TMS). The highest reported Total Copper concentration was 0.0178 mg/L, the highest Total Zinc concentration was 0.0647 mg/L, and the highest Total Lead concentration was 0.00118 mg/L. The TMS recommended limits for Total Copper and monitoring/reporting for Total Zinc and Total Lead. The permittee was given the opportunity to conduct a minimum of 10 additional effluent samples for these parameters so that an average concentration could be used for modeling instead of the maximum concentration. The Pre-Draft Permit Survey for Toxic Pollutants (Survey) was completed and returned by the permittee's consultant via email on January 27, 2021. The Survey indicated that the permittee would not be conducting the additional sampling.

Total Copper limitations and monitoring/reporting for Total Zinc and Total Lead were added to the permit. The Total Copper limits will come into effect four (4) years after the permit effective date. Monitoring/reporting for Total Copper will be in effect for the first four (4) years. The monitoring/reporting for Total Zinc and Total Lead will be in effect at the permit effective date. The Part C. III. condition regarding Toxics Reduction Evaluations (TREs) is added to the permit and applies to the Total Copper limitations. The permittee will have the option to accept the implementation of the limitations or to perform site-specific studies to verify or refine the WQBELs.

A final Total Maximum Daily Load (TMDL) exists for Black Creek, Hazle Creek, Wetzle Creek, & Quakake Creek. The TMDL addresses pH and metals (iron, manganese, and aluminum) associated with acid mine drainage (AMD). There are no approved Waste Load Allocation (WLA) for this facility. Since this is a sewage discharge with no industrial contributors, no appreciable quantities of these metals are expected to be present in the effluent.

Monitoring frequencies for all parameters with limitations have been updated to the recommended frequencies found in Table 6-3 of DEP's Technical Guidance for the Development and Specification of Effluent Limitations (Document No. 362-0400-001).

There are no representative stream gages in the vicinity of the outfall. Therefore, the default Low Flow Yield (LFY) of 0.1 cfs/mi^2 was used to model the discharge. For modeling inputs, RMI values were obtained using the "PA Historic Streams" feature of eMapPA, drainage areas were delineated using USGS's StreamStats Interactive Map, and elevations were obtained using the elevation profile feature of StreamStats.

There are currently no open violations for this client that warrant withholding issuance of this permit.

A Water Management System Inspection query indicated that on June 8, 2021 a Compliance Evaluation was performed.

Sludge use and disposal description and location(s): The permittee's consultant has indicated that sludge has never been hauled from the lagoons.

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)	0.180
Latitude	40º 55' 47.31"	Longitude	-75º 54' 3.82"
Quad Name	Hazleton	Quad Code	1138
Wastewater Description:	Sewage Effluent		
Receiving Waters	Beaver Creek (CWF)	Stream Code	4155
NHD Com ID	132813269	RMI	3.21
Drainage Area	7.03 mi^2	Yield (cfs/mi^2)	0.1
Q_{7-10} Flow (cfs)	0.703	Q_{7-10} Basis	State-wide default
Elevation (ft)	1,542	Slope (ft/ft)	-
Watershed No.	2-B	Chapter 93 Class.	CWF
Existing Use	-	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Attaining Use(s)		
Cause(s) of Impairment	Metals		
Source(s) of Impairment	Acid Mine Drainage		
TMDL Status	Final	Name	Black and Hazle Creek
Nearest Downstream Public Water Supply Intake	Lehighton Water Authority		
PWS Waters	Lehigh River	Flow at Intake (cfs)	-
PWS RMI	44.3	Distance from Outfall (mi)	~ 21.8

Treatment Facility Summary

Treatment Facility Name: Borough of Beaver Meadows STP

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Aerated Lagoon	Chlorination	0.107 (2017-2019)

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.180	-	Not Overloaded	Settled	-

Compliance History

DMR Data for Outfall 001 (from December 1, 2020 to November 30, 2021)

Parameter	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21	APR-21	MAR-21	FEB-21	JAN-21	DEC-20
Flow (MGD) Average Monthly	0.074	0.062	0.122	0.088	0.045	0.042	0.082	0.069	0.136	0.076	0.091	0.103
Flow (MGD) Daily Maximum	0.190	0.181	0.277	0.278	0.087	0.073	0.208	0.131	0.224	0.235	0.209	0.303
pH (S.U.) Minimum	6.52	6.5	6.43	6.61	6.74	6.85	6.7	6.80	6.62	6.28	6.47	6.63
pH (S.U.) Maximum	7.30	7.03	7.23	7.08	7.25	7.41	7.14	7.37	7.33	6.91	6.80	7.01
DO (mg/L) Minimum	6.48	6.31	5.14	5.43	5.42	5.57	5.29	5.78	5.78	5.69	6.40	5.52
TRC (mg/L) Average Monthly	0.53	0.38	0.34	0.44	0.49	0.74	0.46	0.66	0.43	0.43	0.67	0.79
TRC (mg/L) Instantaneous Max	1.49	0.72	0.71	0.99	1.65	1.60	0.74	1.48	1.24	1.13	1.28	1.76
CBOD5 (lbs/day) Average Monthly	4.8	3.3	6.6	4.5	3.1	4.1	5.6	5.4	15.8	10.5	8.00	5.5
CBOD5 (lbs/day) Weekly Average	5.6	4.5	10.3	9.1	6.4	8.7	8.0	6.6	31.1	15.1	10.55	9.3
CBOD5 (mg/L) Average Monthly	7.70	6.41	6.5	6.1	8.3	11.6	8.2	9.3	13.9	16.6	10.53	6.4
CBOD5 (mg/L) Weekly Average	8.83	7.1	8.37	6.39	12.0	18.3	9.96	13.9	22.5	19.7	16.1	7.88
TSS (lbs/day) Average Monthly	5.3	3.0	6.0	4.9	4.1	3.5	3.8	6.5	14.1	8.9	9.33	10.1
TSS (lbs/day) Weekly Average	7.8	4.3	10.1	9.6	12.0	6.8	6.2	8.7	19.7	11.1	12.42	17.8
TSS (mg/L) Average Monthly	8.6	5.8	5.9	6.65	10.8	10.1	5.6	11.3	12.4	14.0	12.3	11.7
TSS (mg/L) Weekly Average	9.8	7.0	8.5	11.6	22.5	18.5	6.8	14.4	20.4	14.5	13.5	15.0
Fecal Coliform (CFU/100 ml) Geometric Mean	1.0	1.0	1.0	1.0	1.0	1.0	1	1.0	1.0	1.0	1.0	1.0
Nitrate-Nitrite (mg/L) Average Monthly	2.7	3.1	1.2	0.99	1.39	1.3	0.84	1.1	0.7	0.6	0.63	0.65
Total Nitrogen (mg/L) Average Monthly	9.3	8.5	7.1	10.8	7.39	13.6	13.9	12.2	11.9	22.1	13.2	15.7
Ammonia (mg/L) Average Monthly	3.5	8.5	3.5	5.2	2.5	8.9	10.1	8.3	9.9	16.0	9.3	10.3
TKN (mg/L) Average Monthly	6.6	5.4	5.9	9.8	6.0	12.3	12.7	11.1	11.0	21.5	12.6	15.0
Total Phosphorus (mg/L) Avg Monthly	2.1	1.8	1.7	4.2	2.9	2.4	2.2	1.9	1.6	2.5	1.9	2.3

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 0.180
Latitude 40º 55' 48.75" **Longitude** -75º 54' 4.42"
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
$CBOD_5$	25.0	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40.0	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
	50.0	IMAX	-	-
Total Suspended Solids	30.0	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45.0	Average Weekly	133.102(b)(2)	92a.47(a)(2)
	60.0	IMAX	-	-
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)
Dissolved Oxygen	5.0	Minimum	-	BPJ
E. Coli (No./100 ml)	Report	IMAX	-	92a.61

Water Quality-Based Limitations

The following limitations were determined through water quality modeling:

Parameter	Limit (mg/l)	SBC	Model
Total Residual Chlorine	0.37	Average Monthly	TRC Calculation Spreadsheet
	1.2	IMAX	
Ammonia-Nitrogen May 1 - Oct 31	7.8	Average Monthly	WQM 7.0
	15.7	IMAX	
Ammonia-Nitrogen Nov 1 - Apr 30	Report	Average Monthly	
$CBOD_5$ Raw Sewage Influent	Report	Average Monthly	Requirement for Publicly Owned Treatment Plants
Total Suspended Solids Raw Sewage Influent	Report	Average Monthly	
Total Lead	Report	Average Monthly	Toxic Modeling Spreadsheet (TMS)
Total Zinc	Report	Average Monthly	
Total Copper	0.032	Average Monthly	
	0.049	Daily Max	
	0.079	IMAX	
Total Phosphorus	Report	Average Monthly	Previous Permit
Nitrate-Nitrite as N	Report	Average Monthly	
Total Nitrogen	Report	Average Monthly	
Total Kjeldahl Nitrogen	Report	Average Monthly	

Anti-Backsliding

No limitations were made less stringent.

Modeling with State-Wide default LFY:

$$\frac{0.1\ ft^3/sec}{mi^2} \times 7.03\ mi^2 = \frac{\mathbf{0.703\ ft^3}}{\mathbf{sec}}$$

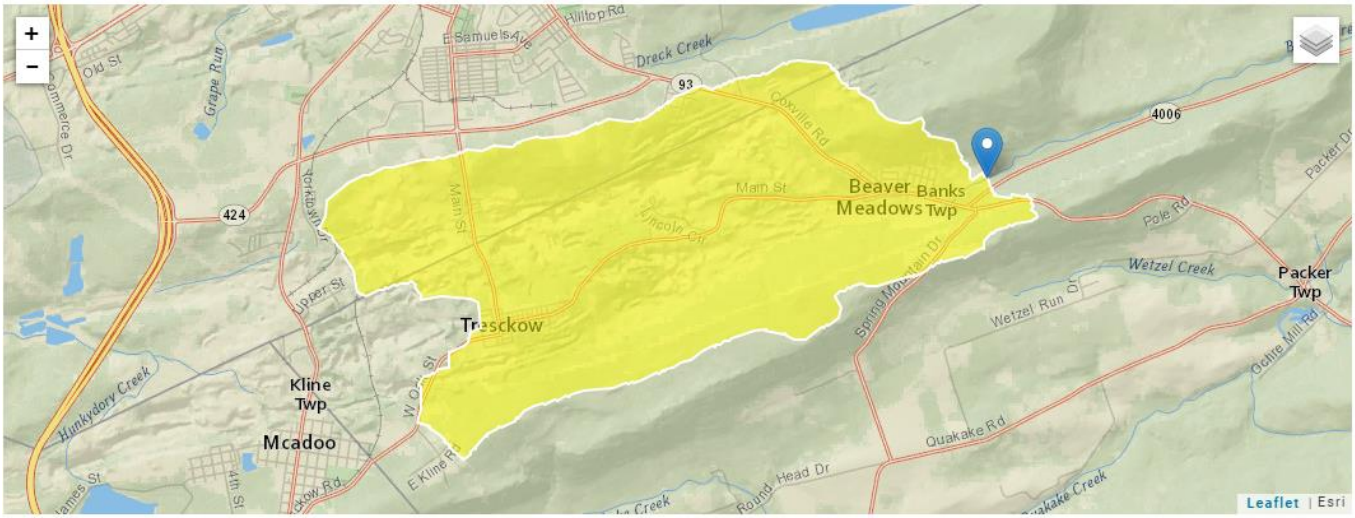
Modeling Using StreamStats:

At Outfall 001 to Beaver Creek:

RMI	Elevation (ft)	Drainage Area (mi²)	$Q_{7\text{-}10}$ Flow (cfs)
3.21	1,542	7.03	3.43

StreamStats Report

Region ID:	PA
Workspace ID:	PA20210119180218913000
Clicked Point (Latitude, Longitude):	40.92977, -75.90099
Time:	2021-01-19 13:02:39 -0500



Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	7.03	square miles

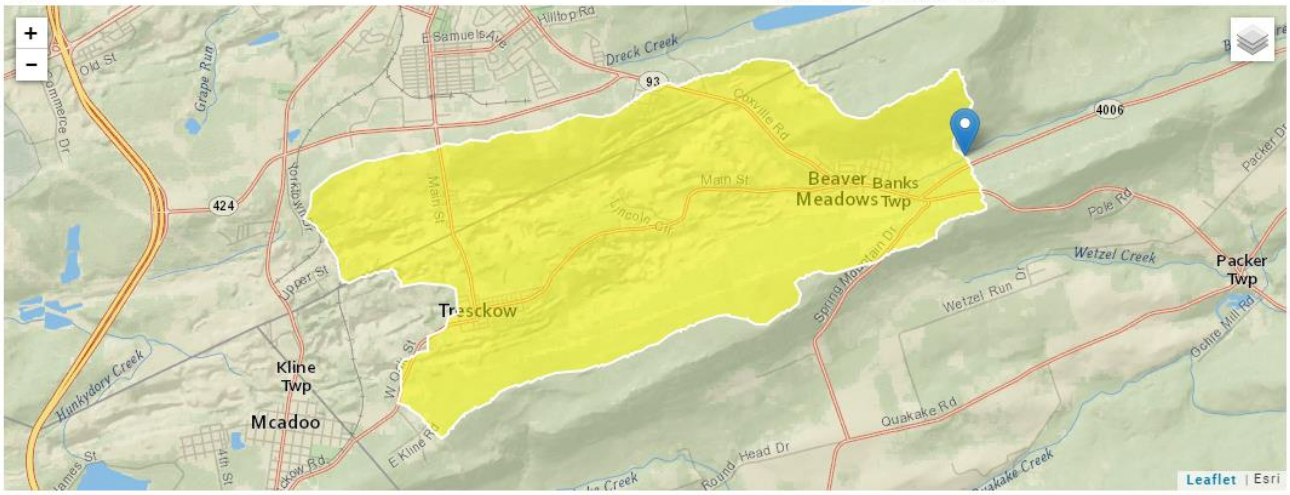
Statistic	Value	Unit
7 Day 2 Year Low Flow	6.36	ft^3/s
30 Day 2 Year Low Flow	7.69	ft^3/s
7 Day 10 Year Low Flow	3.43	ft^3/s

At confluence with Unnamed Tributary to Beaver Creek:

RMI	Elevation (ft)	Drainage Area (mi^2)
2.97	1,541.7	7.36

StreamStats Report

Region ID: PA
Workspace ID: PA20210119182838020000
Clicked Point (Latitude, Longitude): 40.93128, -75.89738
Time: 2021-01-19 13:28:59 -0500



Parameter Code	Parameter Description	Value	Unit
DRNAREA	Area that drains to a point on a stream	7.36	square miles

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
02B	4155	BEAVER 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)
3.210	BeaverMeadows	PA0021199	0.180	CBOD5	25		
				NH3-N	7.83	15.66	
				Dissolved Oxygen			4

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9

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

Source	Reference	AFC Calculations	Reference	CFC Calculations
TRC	1.3.2.iii	WLA afc = 0.824	1.3.2.iii	WLA cfc = 0.796
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.307	5.1d	LTA_cfc = 0.463

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.378	AFC
		INST MAX LIMIT (mg/l) = 1.237	

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)

Recommended WQBELs & Monitoring Requirements from TMS:

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Copper	0.047	0.074	31.6	49.3	79.1	µg/L	31.6	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Lead	Report	Report	Report	Report	Report	µg/L	11.2	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	271	AFC	Discharge Conc > 10% WQBEL (no RP)

TMS-PA0021199-Beaver Meadows.pdf