pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northeast Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0020206**
Facility Type	**Municipal**	APS ID	**599520**
Major / Minor	**Minor**	Authorization ID	**1172215**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Bath Borough Municipal Authority Northampton County**	Facility Name	**Bath Borough Authority WWTP**
Applicant Address	P O Box 87 160 Mill Street	Facility Address	160 Mill Street
	Bath, PA 18014		Bath, PA 18014
Applicant Contact	David Stack	Facility Contact	Phillip Shunk
Applicant Phone	(610) 837-0652	Facility Phone	(610) 837-0652
Client ID	44473	Site ID	445416
Ch 94 Load Status	Not Overloaded	Municipality	Bath Borough
Connection Status	-	County	Northampton
Date Application Received	March 3, 2017	EPA Waived?	Yes
Date Application Accepted	April 4, 2017	If No, Reason	-

Purpose of Application: RENEWAL OF EXISTINGN NPDES PERMIT.

Summary of Review

This is an NPDES Permit Renewal Application for a 0.51 MGD POTW discharging to Monocacy Creek (HQ-CWF). The ADF flows were 0.313 MGD in 2016, 0.320 MGD in 2015, and 0.325 MGD in 2014. The highest monthly average flow was 0.521 in February 2016. In 2011, their average daily flow was 0.431 MGD per previous NPDES renewal Fact Sheet. The 2018 Chapter 94 Report indicated an average 0.47 MGD ADF (2018) and 0.383 MGD ADF (2017).

- Facility is in the process of substantially upgrading plant (mostly new units/equipment adjacent to old plant area).
- 9/13/2017 Docket D-1988-051 CP-3 included additional limits/requirements (post-WWTP replacement)
- **The 12/3/2018 Amended Consent Order & Agreement milestones include:**
  - **Soliciting WWTP bids by 2/28/2019**
  - **Obtaining WWTP financing by 7/31/2019**
  - **Completion of construction of WQM Permit No. 3818403 (replacement WWTP) by 10/31/2020. NOTE: The existing NPDES permit triggers new limits/monitoring upon "Date construction of new WWTP is complete" and "Start date of new WWTP".**

Part C Special Conditions: Changes bolded:

- Part C.I.A, B, C: Existing standard conditions (Stormwater prohibition; Necessary Property Rights; Residuals Management)
- Part C.I.D: **Updated** Chlorine Minimization Condition for facility going to UV disinfection.
- **Part C.I.E: New Dry Stream Condition (effluent-dominated stream)**
- **Part C.I.F: New High Flow Management Plant (HFMP) due to 2018-2019 hydraulic overload.**
- Part C.I.G: Existing Changes in Discharge/Stream Condition
- Part C.I.H: Existing notification of WWTP upgrade completion condition
- **Part C.II: New standard Solids Management conditions with additional sludge drying bed language.**

Approve	Deny	Signatures	Date
X		James D. Berger, P.E. / Environmental Engineer	June 19, 2019
X		Amy M. Bellanca, P.E. / Environmental Engineer Manager	

Summary of Review
• **Part C.III: New WQBELs for Toxics (copper) condition due to new copper permit limit.**

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)	0.51 (0.7889 CFS)
Latitude	40º 43' 24.64"	Longitude	-75º 23' 39.82"
Quad Name	Catasauqua	Quad Code	1342 (6.22.4)
Wastewater Description:	Sewage Effluent		
Receiving Waters	Monocacy Creek (HQ-CWF)	Stream Code	3384
NHD Com ID	26293699	RMI	13.2 (per DRBC Docket)
Drainage Area	7.64 square miles	Yield (cfs/mi^2)	**0.1**
Q_{7-10} Flow (cfs)	**0.764 CFS**	Q_{7-10} Basis	**See below**
Elevation (ft)	410 Feet (NPDES Permit Application GIF)	Slope (ft/ft)	-
Watershed No.	2-C	Chapter 93 Class.	HQ-CWF
Existing Use	**-**	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Impaired (aquatic life and recreational)		
Cause(s) of Impairment	HABITAT ALTERATIONS, SILTATION, SILTATION; Pathogens (source unknown)		
Source(s) of Impairment	AGRICULTURE, AGRICULTURE, URBAN RUNOFF/STORM SEWERS		
TMDL Status	**-**	Name	**-**

Background/Ambient Data: None available		Data Source: None available
pH (SU)	-	-
Temperature (°F)	-	-
Hardness (mg/L)	-	-
Other:	-	-

Nearest Downstream Public Water Supply Intake		North Penn Water Authority	
PWS Waters	Delaware River	Flow at Intake (cfs)	-
PWS RMI	-	Distance from Outfall (mi)	~50 miles per DRBC Docket

Changes Since Last Permit Issuance:

- **This is a Natural Trout Reproduction stream (headwaters downstream to mouth) subject to the Chapter 93.7 DO criteria (effective 2013). Assorted stormwater outfalls in area now covered by MS4 Permit.**
- **New WWTP being constructed (different treatment technology) which might have different discharge quality within same permit limits.**

Other Comments:

- **Effluent-Dominated Stream**:
  - This is an effluent-dominated stream at the default statewide 0.1 CFS/square miles LFY (~>1:1). The facility would dominate ~4:1 at the PAStreamstats-estimated Q7-10 low flow.
  - **Recommend DEP Biologist evaluate impact of facility on stream during new NPDES Permit Term (after new WWTP replacement has been discharging for a year or so)**.
- **Impairment Causes**: Both Monocacy Creek (upstream of Outfall and Bath urban area) and Trib 03410 To Monocacy Creek (confluence upstream of Outfall and Bath urban areas) support aquatic life but are impaired due to pathogens of unknown origin. Other cause(s) can be contribute to impairments cumulatively or synergystically.
  - Copper and TDS: New permit limits will address potential impairment.

- Aluminum, Zinc, and Chlorides: Monitoring will address potential impairment.
- Siltation: STPs are not expected to be a source of siltation. TSS and TDS limits will also address any potential contribution to siltation impairment.
- Pathogens: A properly operating STP will be treating the effluent to prevent negative impact on the receiving stream.
- Urban stormwater impacts: Stormwater is prohibited in the POTW collection system.
    - Bath Borough has separate MS4 NPDES Permit ID# PAI132215 which will help address urban stormwater impacts over time.
    - Bath HMA Plant FKA Eastern Industries, Inc. (NPDES PAS702203) stormwater outfalls in same area. Separate permitting will address any stormwater impacts from that source.

Q7-10 Low Flow: The current permit limits are supported at the 0.1 CFS/square mile statewide default (used in 2002 PENTOSXD water quality modeling) used due to lack of better site-specific data.

- Original Permitting: Original water quality modeling relied upon the obsolete (no longer recommended for use by USGS) PA Bulletin No. 12 Gage Station No. 01452500 (1.875 CFS from 7.5 mile drainage area, i.e. LFY of 0.25 CFS/square mile).
- PAStreamstats Limitations: USGS PAStreamstats is of uncertain accuracy at this stream location.
    - Outfall Location: Streamstats estimated an 0.203 CFS Q7-10 low flow with a 7.64 square mile drainage area, equating to a 0.0265 CFS/square mile LFY, but Streamstats warned of unknown error due to "depth-to-rock" being outside the regression equation range.
    - Downstream Location without Warning of Unknown Error: PAStreamstats was used to determine the Q7-10 low flow at a downstream location on Monocacy Creek to determine an overall watershed LFY of 0.0432 CFS/square mile. USGS topography indicates a mining disturbed area downstream of the Outfall and quarries upstream, impacting PAStreamstats accuracy at the downstream location. Streamstats accuracy is impacted when there is stream "regulation" due to mining impacts (can increase or decrease low flows).
- DRBC Docket: The DRBC Docket estimated Monocacy Creek Q7-10 low flow at 0.12 MGD (0.2 CFS), i.e. ~0.25% of the Bath Borough STP flow of 0.51 MGD. At 7.5 square mile drainage area, the DRBC estimate would equate to an LFY of 0.0266 CFS/square miles. The Department contacted the DRBC to clarify how the Q7-10 low flow was calculated. DRBC indicated they used PAStreamstats in the previous DRBC Dockets for this site. NOTE: The DRBC also indicated it does not use Q7-10 in their SPW No Measurable Change (NMC) to Existing Water Quality (EWQ) analyses to derive effluent limits for the plant upgrade – DRBC uses harmonic mean flow and mean or median in-stream water quality data. Therefore, the Q7-10 value listed in the docket is not critical to the DRBC evaluation.

Treatment Facility Summary

Treatment Facility Name: Bath Borough Authority

WQM Permit No.	Issuance Date	Scope
4899407	4/7/2000	Expansion to 0.51 MGD capacity, with facility design including: comminutor/bar screen; flume; wet well with 3 pumps; four aeration tanks; three final settling tanks; chlorine contact tank; dechlorination tank; two aerobic digestion tanks; one belt filter press; and sludge drying beds. A flow equalization tank was converted into an aeration tank. The Design Engineer Report indicated plant expansion would allow an increase in organic loading from 850 lbs/day to 1,040 lbs/day.
4802408	2/28/2003	Conversion of plant over to conventional sludge activated process (shorter aeration retention time allowing for treatment of greater organic loadings to processed during 24-hour operating day), with increase in organic loading to 1,700 lbs/day (in theory).
4811404	8/9/2013	BESST Treatment Units (earlier replacement treatment plant design being superseded by 2018 WQM treatment plant design)
4818403	9/20/2018	New Treatment System including: New headworks and control building; mechanical screen; vortex grit removal system; new influent submersible pump station; conversion of existing treatment basin into equalization tank with triplex submersible pumping station; two new ICEAS SBR tanks with two new precast concrete aerobic digesters; UV disinfection (replacing chlorination system); new rotary press dewatering system. Sized for 3.0 MGD peak instantaneous flow.

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Activated Sludge (pre-upgrade); ICEAS Sequencing Batch Reactors (after upgrade)	Gas Chlorination/SO2 dechlorination (pre-upgrade); Ultraviolet (after upgrade)	0.51

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
0.51	1063*	Not Overloaded	Sludge drying beds, Belt filter press Dewatering pre-upgrade; Aerobic digestion and dewatering after upgrade	Landfill

*After upgrade. As noted above, the last expansion assumed facility could handle 1,700 lbs/day based on theoretical estimates assuming a 400 mg/l BOD influent.

Changes Since Last Permit Issuance:

- **2018 Chapter 94 Report indicates major WWTP upgrades to be completed in 2020 (i.e. new STP headworks, new control building, two (2) SBRs, and SCADA System) sized for 0.51 MGD ADF, peak flow of 1.04 MGD, and maximum instantaneous peak flow of 3.0 MGD. Also, upgrades to Jacksonville Pump Station, Route 512 Pump Station, and Red Cliff Pump Stations to allow for WWTP SCADA monitoring. NPDES Permit Application indicated expected 96% BOD5/TSS removal and 88% TN/TP removal. Existing**

plant was described as conventional activated sludge plant in NPDES Permit Application. 2018 WQM Module 1 indicated 1.28 MGD max daily capacity.

Other Comments:

BOD/TSS Loadings and Minimum Monthly Average Reduction Requirements:

Constituent	Influent Average (Application)	85% Reduction Goal in effluent	EDMR data compliant with 85% goal?
BOD5	248 mg/l (105 samples)*	37.2 mg/l BOD (equivalent to 31 mg/l CBOD5 effluent at 1:1.2 effluent ratio)	Yes (CBOD5 average effluent at 3 mg/l)
TSS	200.6 mg/l (105 samples)**	30.09 mg/l	Yes (TSS average effluent at 4.66 mg/l)

***BOD5 influent concentrations were as low as 15 mg/l and high as 1060 mg/l. CBOD5 Monitoring and Reporting will be required in this NPDES Permit term.**
****TSS influent concentrations were as low as 56 mg/l and as high as 462 mg/l. Monitoring and Reporting will be required in this NPDES Permit Term.**

2018 Chapter 94 Report Information:

General Information Section: The NPDES Permit dates are incorrect, as the permit has not been renewed, only administratively extended until permit action.

No existing or projected overload in 2018 (Form Items 1, 2, 9):

- **Organic Design Capacity: The Report is incorrect about the future organic design capacity (claimed to remain at 1700 lbs BOD5/day).**
  - **Existing Chapter 94-identified organic design capacity (1700 lbs BOD5/day) will become obsolete upon new WWTP upgrade (1063 lbs BOD5/day) in progress.**
  - **Substantial increase in organic loading from September to December 2018, with one month at 1,041 lbs BOD5/day. This would indicate either measurement problems or new/increased customer loadings. 4/11/2018 Calibration Report for the influent flow meter predates the increased influent organic loadings (i.e. flow-proportional monitoring flow meter might require re-calibration).**
- **Hydraulic Design Capacity:**
  - **EDMR indicates three consecutive months greater than the design capacity (November 2018 – January 2019). This meets the definition of hydraulic overload (Chapter 94).**
  - **2018 had 4 nonconsecutive months (February, August, November, December) with monthly average flows greater than the 0.51 MGD hydraulic design capacity. Maximum 3-month average was 0.535 MGD. One month in 2016 was also above 0.51 MGD monthly average flow. WQM Permit Application indicates facility received 3.0 MGD peak instantaneous wet weather flows.**

Map showing all sewer extensions (Item 4): Item 4 map (Attachment C) did not identify any newly constructed collection area, and did not define pump station collection areas. Unclear if something could have been constructed in 2018 to result in higher organic loadings in the latter part of the year. NOTE: 2018 Inspection Report indicated Borough owned its own camera system, and Jett Cutting truck, and had rehabilitated 15-16 manholes by the 10/18/2018 Inspection date.

Sewer Maintenance/I&I Work Identified (Form Item 6): They flushed 18,000 LF in 2018, but no physical or video inspections. The Authority hires independent firms to do video inspections for selected areas. No correction actions mentioned. No bypassing or overflows per Chapter 94 Report. They check the pump stations 3/week.

Four (4) Pump Stations (Form Item 7): Capacities not identified in the Chapter 94 Report.

- **Red Cliff PS serves Patriot Hills and Penn Dixie Manor subdivisions.**
- **Jacksonville PS serves Village of Jacksonville with WQM Permit No. 4805403 transferred to the Authority on 5/17/2013.**
- **Route 512 Pump Station serves the Arcadia East Industrial Park with WQM Permit No. 4801403 transferred to the Authority on 5/17/2013.**
- **Greenbriar PS serves Greenbriar Village and pumps to the Route 512 Industrial Park.**

Industrial Wastewater (Form Item 8): No industrial waste is currently be received at the STP. They included copies of the Bath Borough ordinances Nos. 240 and 241 with the Report. NOTE: The 1/18/2018 Alternatives Analysis Report indicates there is an industrial park (East Allen Township) that discharges to this facility. No tributary municipality report was included to verify that there are no industrial dischargers at present.

Solids Management Inventory (Form Item 10): No sewage sludge information included in Report. Existing NPDES Permit Part B.I.C.4.c included the following requirement: "A "Solids Management Inventory" including the following information for the preceding year, at a minimum: average annual flow (MGD), average influent BOD5 (mg/l), average effluent CBOD5 (mg/l), total volume of sludge wasted (gallons), average solids concentration of return or waste sludge flow (mg/l), and total sludge or biosolids generated (wet or dry tons)." Underlining added for missing information.

Compliance History

DMR Data for Outfall 001 (from May 1, 2018 to April 30, 2019)

Parameter	APR-19	MAR-19	FEB-19	JAN-19	DEC-18	NOV-18	OCT-18	SEP-18	AUG-18	JUL-18	JUN-18	MAY-18
Flow (MGD) Average Monthly	0.469	0.480	0.445	**0.521**	**0.536**	**0.632**	0.436	0.452	**0.580**	0.416	0.335	0.463
Flow (MGD) Daily Maximum	1.019	0.821	0.676	1.221	0.983	1.173	0.840	0.893	1.719	0.750	0.401	0.957
pH (S.U.) Minimum	7.0	7.1	7.1	7.1	7.1	7.0	7.1	7.0	7.1	7.0	7.0	7.0
pH (S.U.) Maximum	7.5	7.2	7.3	7.3	7.3	7.4	7.4	7.3	7.3	7.2	7.3	7.6
DO (mg/L) Minimum	7.1	7.2	7.3	7.0	7.0	7.1	7.0	7.1	7.1	7.0	7.2	7.1
TRC (mg/L) Average Monthly	0.39	0.39	0.26	0.26	0.32	0.29	0.25	0.28	0.26	0.25	0.34	0.27
TRC (mg/L) Instantaneous Maximum	0.76	0.72	0.60	0.38	0.64	0.56	0.57	0.42	0.53	0.78	0.77	0.42
CBOD5 (lbs/day) Average Monthly	10.32	10.57	10.90	11.91	10.23	15.02	10.95	10.35	14.14	14.4	9.21	11.4
CBOD5 (lbs/day) Weekly Average	11.80	11.98	11.90	16.48	11.90	16.48	18.03	15.78	23.9	18.84	10.03	15.9
CBOD5 (mg/L) Average Monthly	**3.0**	**3**	**3.0**	**3.0**	**2.75**	**3**	**3.28**	**2.75**	**3**	**3.64**	**3**	**2.8**
CBOD5 (mg/L) Weekly Average	3.0	3	3.0	3.0	3.0	3	4.44	0.30	3	5.57	3	3.0
TSS (lbs/day) Average Monthly	17.03	17.63	18.17	17.96	13.48	25.04	13.54	12.62	13.56	10.87	7.84	14.85
TSS (lbs/day) Weekly Average	19.68	19.97	19.84	21.98	15.87	27.4	16.97	18.09	27.34	16.45	8.69	37.5
TSS (mg/L) Average Monthly	5.0	5.0	5.0	4.6	3.6	5.0	4.32	3.54	2.75	2.79	2.55	3.07
TSS (mg/L) Weekly Average	5.0	5.0	5.0	0.50	4.0	5.0	5.0	5.0	3.4	3.33	2.60	4.7
Total Dissolved Solids (lbs/day) Average Quarterly		2750			3176			2262			820	

Total Dissolved Solids (mg/L) Average Quarterly		**0.852**			782			817			820	
Fecal Coliform (CFU/100 ml) Geometric Mean	2.43	3	2	1	> 1	2.2	1	2	1	1	1	1.14
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	35	52	2	1	> 1	52.8	1	2	1	1	1	2
Total Nitrogen (lbs/day) Average Monthly								76.14	70.54	81.82	21.9	23.1
Total Nitrogen (mg/L) Average Monthly								27.5	22.2	21.1	21.9	23.1
Ammonia (lbs/day) Average Monthly	4.29	4.09	1.08	0.91	0.69	1.49	0.97	0.745	4.35	1.99	3.27	2.17
Ammonia (lbs/day) Weekly Average	8.12	9.53	1.19	1.15	1.1	1.64	1.20	1.38	9.96	3.12	8.34	3.99
Ammonia (mg/L) Average Monthly	1.35	1.17	0.30	0.24	0.186	0.30	0.29	0.22	0.81	0.50	1.37	0.50
Ammonia (mg/L) Weekly Average	2.69	2.71	0.30	0.30	0.30	0.30	0.30	0.50	1.31	0.52	3.05	0.50
Nitrate (lbs/day) Average Monthly								78.63	70.54	76.01	20.3	21.6
Nitrate (mg/L) Average Monthly								28.4	22.2	19.6	20.3	21.6
Total Phosphorus (lbs/day) Average Monthly	1.76	1.59	2.00	1.60	2.63	6.95	1.92	2.14	2.85	2.01	1.84	2.73
Total Phosphorus (mg/L) Average Monthly	0.45	0.39	0.539	0.37	0.59	1.32	0.53	0.57	0.59	0.58	0.66	0.70

Compliance History

Inspection History:

CLIENT	INSP PROGRAM	INSP ID	INSPECTED DATE	INSP TYPE	INSPECTION RESULT DESC	INSPECTOR ID	# OF VIOLATIONS
BATH BORO MUNI AUTH NORTHAMPTON CNTY	WPCNP	2788975	09/06/2018	Compliance Evaluation	No Violations Noted	00733079	0
BATH BORO MUNI AUTH NORTHAMPTON CNTY	WPCNP	2706969	09/12/2017	Administrative/File Review	Violation(s) Noted	00733079	2
BATH BORO MUNI AUTH NORTHAMPTON CNTY	WPCNP	2358340	07/08/2014	Compliance Evaluation	No Violations Noted	00613405	0
BATH BORO MUNI AUTH NORTHAMPTON CNTY	WPCNP	2247869	12/06/2013	Administrative/File Review	Violation(s) Noted	00628030	1
BATH BORO MUNI AUTH NORTHAMPTON CNTY	WPCNP	2227171	02/21/2013	Compliance Evaluation	No Violations Noted	00628030	0
BATH BORO MUNI AUTH NORTHAMPTON CNTY	WPCNP	2145379	10/10/2012	Administrative/File Review	Violation(s) Noted	00628030	1
BATH BORO MUNI AUTH NORTHAMPTON CNTY	WPCNP	2145350	10/09/2012	Administrative/File Review	Violation(s) Noted	00511586	1
BATH BORO MUNI AUTH NORTHAMPTON CNTY	WPCNP	2117847	08/28/2012	Routine/Complete Inspection	No Violations Noted	00628030	0
BATH BORO MUNI AUTH NORTHAMPTON CNTY	WPCNP	2117815	05/07/2012	Compliance Evaluation	No Violations Noted	00628030	0
BATH BORO MUNI AUTH NORTHAMPTON CNTY	WPCNP	2036683	01/25/2012	Administrative/File Review	Violation(s) Noted	00517135	1

Other Comments:

The NPDES Permit renewal application was late, and the Permit was not administratively extended by regulation. 3/6/2017 NPDES Application Incompleteness letter was issued. Existing NPDES Permit expired on 8/31/2017.

Application referenced the 1/3/2012 CO&A. This CO&A was amended on 12/3/2018 with new milestones for WWTP replacement.
9/12/2017 NOV included Ammonia-N violations. There was a subsequent 2018 fecal coliform violation.

2018 Chapter 94 Reports omitted required Solids Management Inventory information. Other informational deficiencies noted (per Treatment Plant section).

EDMR indicated hydraulic overload (November 2018 – January 2019).

Open Violations per Client: No open violations per 6/17/2019 WMS Query:

Permit: PA0020206
Client ID: 44473
Client: All

Open Violations: 0

No data was found using the criteria entered. Please revise your choices and try again.

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** .51
Latitude 40º 43' 21.95" **Longitude** -75º 23' 43.14"
Wastewater Description: Sewage Effluent

Permit limits and/or monitoring: Changes bolded

Parameter	Limit (mg/l unless otherwise specified)	SBC	Model/Basis
CBOD5 May 1 – Oct 31	85**.0** Lbs/d 128**.0** Lbs/d 20**.0** 30**.0** 40**.0**	Monthly Average Weekly Average Monthly Average Weekly Average IMAX	Existing Technology limit (Chapter 92a.47) supported by water quality modeling. **Application data indicated 3 mg/l was both the maximum and average CBOD5 concentration (106 samples).**
CBOD5 Nov 1 – April 30	106**.0** Lbs/d 170**.0** Lbs/d 25**.0** 40**.0** 50**.0**	Monthly Average Weekly Average Monthly Average Weekly Average IMAX	Existing WQBEL supported by water quality modeling.
CBOD5 **Minimum Monthly Reduction**	**85%**	**Monthly Average**	**Existing Permit, regulatory, and DRBC requirement. Reporting now required.**
TSS (Year-round) Pre-WWTP Replacement	127**.0** Lbs/d 191**.0** Lbs/d 30**.0** 45**.0** 60**.0**	Monthly Average Weekly Average Monthly Average Weekly Average IMAX	Existing Technology limit (Chapter 92a.47). Application data indicated a maximum 13 mg/l concentration and 4.66 mg/l average (106 samples).
TSS After WWTP Replacement May 1 – September 30	78**.0** Lbs/d 191**.0** Lbs/d 30**.0** 45**.0** 60**.0**	Monthly Average Weekly Average Monthly Average Weekly Average IMAX	Existing DRBC mass limit requirement for after WWTP replacement.
TSS After WWTP Replacement Oct 1 – April 30	127**.0** Lbs/d 191**.0** Lbs/d 30**.0** 45**.0** 60**.0**	Monthly Average Weekly Average Monthly Average Weekly Average IMAX	Existing Technology limit.
TSS **Minimum Monthly Reduction**	**85%**	**Monthly Average**	**Existing Permit and regulatory requirement. Reporting now required.**
pH	6.0 – 9.0 SU	**Inst.** Min - IMAX	Existing Technology limit (Chapter 92a.47). Application indicates pH ranged from 7.0 to 7.3 SU.
Dissolved Oxygen (DO)	6.0	**Inst.** Minimum	Existing WQBEL supported by water quality modeling. Application indicates minimum of 7.0 mg/l DO.
Fecal Coliform	200/100 ml 1,000/100 ml	Geo Mean IMAX	Existing year-round WQBEL (Chapter 92a.47). Application data indicates <47/100 ml max and 2.34/100 ml average (55 samples).
Total Residual Chlorine **Pre-WWTP Replacement**	0.7**0** 2.3**0**	Monthly Average IMAX	**Facility is converting to UV Disinfection.** New TRC Limits will come into effect after

			WWTP upgrade. Application indicates <1.0 mg/l max and 0.45 mg/l average (734 samples). Facility has SO2 dechlorination.
Total Residual Chlorine After WWTP Replacement	**0.21 0.49**	**Monthly Average IMAX**	**Facility is converting to UV Disinfection. New TRC Limits will come into effect after WWTP upgrade. Monitoring per Part C.I.D Chlorine Minimization Condition.**
Ammonia-Nitrogen Pre-WWTP Replacement (May 1 - Oct 31)	12.8 Lbs/d 18.1 Lbs/d 3.0 4.5 6.0	Monthly Average Weekly Average Monthly Average Weekly Average IMAX	Existing WQBEL supported by water quality modeling. **Application data indicated 11.0 mg/l maximum and average of 3.26 mg/l average (107 samples).**
Ammonia-Nitrogen Pre-WWTP and Post-WWTP Replacement (Nov 1 - Apr 30)	38.0 Lbs/d 57.0 Lbs/d 9.0 13.5 18.0	Monthly Average Weekly Average Monthly Average Weekly Average IMAX	See above.
Ammonia-Nitrogen After WWTP Replacement (May 1 – Sept 30)	7.98 Lbs/d 19.1 Lbs/d 3.0 4.5 6.0	Monthly Average Weekly Average Monthly Average Weekly Max IMAX	Existing DRBC mass limit for after WWTP replacement.
Ammonia-Nitrogen After WWTP Replacement (Oct 1 - Oct 31)	12.8 Lbs/d 38.0 Lbs/d 3.0 4.5 6.0	Monthly Average Weekly Average Monthly Average Weekly Max IMAX	Existing DRBC mass limit after WWTP replacement
Total Phosphorus	8.5 Lbs/d 2.0 **Report** 4.0	Monthly Average Monthly Average **Daily Max** IMAX	Existing WQBEL. Application indicated 6.87 mg/l max and average of 0.908 mg/l (99 samples).
Total Nitrogen (Nitrate-N + Nitrite-N + TKN measured in same sample) Pre-WWTP Replacement May 1 – September 30	Report Lbs/d Report **Report** Report	Monthly Average Monthly Average **Daily Max** IMAX	Existing Monitoring Requirement. **Application indicated 19.55 mg/l max and average of 19.69 average (11 samples). Cause of discrepancy is unknown.** TKN was 3.7 mg/l max and 3.05 mg/l average (3 samples). Nitrate-Nitrite as N was 15.95 mg/l max and 15.34 mg/l average (3 samples).
Total Nitrogen (Nitrate-N + Nitrite-N + TKN measured in same sample) After WWTP Replacement May 1 – September 30	51.24 Lbs/d Report **Report** Report	Monthly Average Monthly Average **Daily Max** IMAX	Existing DRBC mass limit
Total Nitrogen (Nitrate-N + Nitrite-N + TKN measured in same sample) After WWTP Replacement Oct 1 – April 30	**Report Lbs/d Report Report Report**	**Monthly Average Monthly Average Daily Max IMAX**	**New winter monitoring requirement (Chapter 92a.61)**
Nitrate as N Pre-WWTP Replacement May 1 – September 30	Report Lbs/d Report **Report** Report	Monthly Average Monthly Average **Daily Max** IMAX	Existing Monitoring Requirement. Application did not identify Nitrate-N component of Nitrate-Nitrite as N (15.95 mg/l max and 15.34 mg/l average).
Nitrate as N After WWTP Replacement May 1 – September 30	30.82 Lbs/d Report **Report** Report	Monthly Average Monthly Average **Daily Max** IMAX	Existing DRBC mass limit

Nitrate as N After WWTP Replacement Oct 1 – April 30	**Report Lbs/d Report Report Report**	**Monthly Average Monthly Average Daily Max IMAX**	**New winter monitoring requirement (Chapter 92a.61)**
Nitrite as N	**Report Lbs/d Report Report Report**	**Monthly Average Monthly Average Daily Max IMAX**	**Required to calculate TN. Application did not identify Nitrite-N component of Nitrate-Nitrite as N (15.95 mg/l max and 15.34 mg/l average).**
Total Dissolved Solids (TDS) Pre-WWTP Replacement	Report Lbs/d Report **Report** Report	Monthly Average Monthly Average **Daily Max** IMAX	Existing Monitoring Requirement (changed from quarterly monitoring to monthly monitoring due to EDMR requirements). Application indicated 690 mg/l max and 707 mg/l average (3 samples).
Total Dissolved Solids (TDS) After WWTP Replacement	4,253 Lbs/d 1000.0 **2000.0** **2500.0**	Monthly Average Monthly Average **Daily Max** **IMAX**	Existing DRBC limit with multipliers for daily max and IMAX limits. **Monthly monitoring required due to monthly average DRBC limit. New limits based on standard multipliers in absence of PWS.**
Copper (3- years monitoring and new limits effective on 4th year)	**Report Lbs/d 12.4 ug/l 19.3 ug/l 19.3 ug/l**	**Monthly Average Monthly Average Daily Max IMAX**	**New permit limits (AFC), effective in three years, per Reasonable Potential Analysis and Antidegradation considerations. Monitoring in interim. Application data was 0.0124 mg/l max (3 samples)**
Lead	Not needed	-	No limits or monitoring requirements per Reasonable Potential Analysis. Application data was <0.001 mg/l (3 samples)
Zinc	**Report Lbs/d Report Report**	**Monthly Average Monthly Average Daily Max**	**New monitoring requirements per Reasonable Potential Analysis. Application data was 0.060 mg/l max (3 samples)**
Aluminum	**Report Lbs/d Report Report**	**Semi-annual Average Semi-annual Average Daily Max**	**New monitoring requirement due to use of aluminum-based phosphorus treatment chemicals due to antidegradation considerations and Chapter 92a.61**
Chlorides	**Report Lbs/d Report Report**	**Semi-annual Average Semi-annual Average Daily Max**	**New monitoring requirement due to Reasonable Potential Analysis flagging, antidegradation considerations and Chapter 92a.61.**
Sulfates and Bromides	Not needed	-	No Reasonable Potential

Comments:

- Updated to include significant digits, address EDMR requirements for grab sampling, and daily max reporting (when weekly reporting is not required).
- **Due to unexplained 2018 Chapter 94 Report organic loading increase, general antidegradation considerations (effluent-dominated stream), changes in plant performance expected due to technology changes, variable influent loadings, and the ongoing WWTP replacement project, this permit requires 24-hour composite sampling (not 8-hour) for both influent and effluent sampling.**
- **New Internal Monitoring Point No. 101 (Raw Sewage Influent) monitoring point at headworks being added in this permit cycle for reporting influent loadings and calculation of minimum monthly average reduction (CBOD5 and TSS).**

Reasonable Potential Analysis: See Toxic Screening Spreadsheet and PENTOXSD modeling.

- **Copper Limit**: New permit limits based on maximum application concentration due to antidegradation considerations.
- **Zinc Monitoring**: New monitoring requirement
- **TDS Limit**: There is no receiving PWS to allow for modeling WQBELs. TDS limits from DRBC (with standard multipliers) will protect receiving stream. Data gathered in this permit term will be used to calculate Long Term Average Monthly Effluent Concentration in next NPDES Permit Renewal.
- **Chlorides Monitoring**: There is no receiving PWS to allow for modeling WQBELs. New Chlorides monitoring will address antidegradation considerations. Data gathered in this permit term will be used to calculate Long Term Average Monthly Effluent Concentration in next NPDES Permit Renewal.
- **Aluminum Monitoring**: The facility has been using aluminum-based chemicals for phosphorus reduction, with new DRBC TP mass limit effective upon WWTP upgrade. Monitoring will be required in this permit term. Data gathered in this permit term will be used to calculate Long Term Average Monthly Effluent Concentration in next NPDES Permit Renewal.

Antidegradation: No new, increased, or additional permit loadings on the stream, therefore no additional degradation is expected. DRBC previously evaluated the discharge in terms of protecting their Special Protection waters, with their limits incorporated into the NPDES Permit.

- **As noted in the Stream section, it is recommended that the DEP Biologist evaluate impact of existing WWTP discharge on the receiving stream due to effluent-domination and Q7-10 flow uncertainties.**
- **New Copper limits incorporate antidegradation considerations.**
- **Additional monitoring (see above) will gather information to allow for calculation of LTAMECs in next NPDES Permit Renewal.**

TOXICS SCREENING ANALYSIS
WATER QUALITY POLLUTANTS OF CONCERN
VERSION 2.6

Facility: Bath Borough Authority WWTP NPDES Permit No.: PA0020206 Outfall: 001
Analysis Hardness (mg/L): 100 Discharge Flow (MGD): 0.51 Analysis pH (SU): 7
Stream Flow, Q_{7-10} (cfs): 0.764

Parameter		Maximum Concentration in Application or DMRs (µg/L)	Most Stringent Criterion (µg/L)	Candidate for PENTOXSD Modeling?	Most Stringent WQBEL (µg/L)	Screening Recommendation
Total Dissolved Solids		732000	500000	Yes		
Chloride		233000	250000	Yes		
Bromide		250	N/A	No		
Sulfate		73200	250000	No		
1,4-Dioxane			N/A			
Total Copper		12.4	9.33	Yes	17.662	Establish Limits
Total Lead	<	1	3.18	No (Value < QL)		
Total Zinc		60	119.8	Yes	151.164	Monitor

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
02C	3384	MONOCACY 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)
13.200	Bath STP	PA0020206	0.510	CBOD5	20		
				NH3-N	3	6	
				Dissolved Oxygen			6

PENTOXSD Analysis Results

Recommended Effluent Limitations

SWP Basin	Stream Code:	Stream Name:
02C	3384	MONOCACY CREEK

RMI	Name	Permit Number	Disc Flow (mgd)
13.20	Bath WWTP	PA0020206	0.5100

Parameter	Effluent Limit (µg/L)	Governing Criterion	Max. Daily Limit (µg/L)	Most Stringent WQBEL (µg/L)	Most Stringent WQBEL Criterion
CHLORIDE (PWS)	233000	INPUT	363517.5	NA	NA
COPPER	12.4	INPUT	19.346	17.662	AFC
TOTAL DISSOLVED SOLIDS (PWS	732000	INPUT	1140000	NA	NA
ZINC	60	INPUT	93.61	151.164	AFC

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9 — Bath B orough WWTP

0.764	= Q stream (cfs)	0.5	= CV Daily
0.51	= Q discharge (MGD)	0.5	= CV Hourly
4	= 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 =	0.328	1.3.2.iii	WLA cfc =	0.312
PENTOXSD TRG	5.1a	LTAMULT afc =	0.373	5.1c	LTAMULT cfc =	0.581
PENTOXSD TRG	5.1b	LTA_afc=	0.122	5.1d	LTA_cfc =	0.181

Source		Effluent Limit Calculations		
PENTOXSD TRG	5.1f	AML MULT =	1.720	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) =	0.210	AFC
		INST MAX LIMIT (mg/l) =	0.492	