pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northeast Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0041742**
Facility Type	**Municipal**	APS ID	**595638**
Major / Minor	**Major**	Authorization ID	**1459893**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Nazareth Borough Municipal Authority Northampton County (NBMA)**	Facility Name	**Nazareth Borough WWTP**
Applicant Address	PO Box A, 872 Tatamy Road Nazareth, PA 18064-0450	Facility Address	872 Tatamy Road Nazareth, PA 18064-2562
Applicant Contact	Dean Minnich	Facility Contact	Dean Minnich (with alternate site contact identified as William Brown (HRG) at 484-460-7050)
Applicant Phone	(610) 759-0727	Facility Phone	(610) 759-0727
Client ID	34470	Site ID	260823
Ch 94 Load Status	Not Overloaded	Municipality	Lower Nazareth Township
Connection Status	No Limitations	County	Northampton
Date Application Received	October 16, 2023	EPA Waived?	No
Date Application Accepted	November 10, 2023	If No, Reason	Major Facility

Purpose of Application: RENEWAL OF EXISTING NPDES PERMIT.

Summary of Review

This is a NPDES permit renewal for a 1.6 MGD Nazareth Borough Municipal Authority (NBMA) POTW discharging to Shoeneck Creek (WWF) a.k.a. Schoeneck Creek (both spellings in use in different sources). This is a discharge to a (~0.13 mile) dry stream reach of Shoeneck Creek before Point of First Use by aquatic life (POFU) at the confluence with the downstream UNT No. 4628 (known locally as Nazareth Creek) which has relatively high Q7-10 low flows due to quarry discharges. Upstream dry conditions tied to sinkholes and possibly quarry pumping impacts/hydromodification.

- Application Documents:
  - Original Hard copy application (received10/16/2023)
  - On-Base# 129395 (revised application)
  - Public Upload# 238357 (Response to Tech Def Letter and supplemental information)
- Flows:
  - AADF Flows: 1.227 MGD (2022), 1.183 MGD (2021), and 1.108 MGD (2020).
  - Highest flows (2022): Highest monthly average flow of 1.897 MGD (March) and peak instantaneous flow of 6.759 MGD.
  - The 5/10/2017 DEP Preliminary Effluent Limits (PEL) Letter provided outdated PELs for an expansion to 2.1 MGD, but expansion was not requested in the Renewal Application.
- Service Area: The POTW services Palmer Township (proposed development adjacent to Treatment Plant and west of Route 33 per Chapter 94 Report), Upper & Lower Nazareth Townships, Bushkill Townships, and Nazareth Borough.
- Permittee: Permittee is Municipal Authority (EIN# 23-6267058). Different EIN number from Borough itself.

Approve	Deny	Signatures	Date
X		James D. Berger (signed) James D. Berger, P.E. / Environmental Engineer	9/27/2024
X		Amy M. Bellanca (signed) Amy M. Bellanca, P.E. / Acting Engineer Manager	10-7-24

Summary of Review

- DRBC Docket: The DRBC's Docket No. D-2002-038 CP-3 imposed TN (72.1 lbs/day) and TP (41.4 lbs/day) mass limits.
- IW Stormwater Controls: IW Stormwater permitting requirements pertain to all Major STPs (≥1.0 MGD NPDES permit basis flow) with their industrial activity/material handling areas. In practical terms, the NPDES Permit Part C Stormwater conditions (site PPC Plan, stormwater BMPs, etc.) apply even if there is no available point of concentrated flow to sample stormwater (i.e. sheet flow/infiltration areas). Application information: All storm water catch basins are piped to the influent headworks, then treated through the process. The remainder of the stormwater sheets across the grassy areas of the plant. There is one stormwater retention pond for the stormwater runoff from the Administration Building, and one located in the plant as required by the Northampton County Conservation District". In terms of stormwater drainage areas, the NPDES Application form was not updated to address the following stormwater drainage areas:
    - Existing IW Outfall No. 001: The revised Site Plan Drawing shows that stormwater around the sludge storage/maintenance/garage building is directed into the WWTP for treatment, and ultimately discharged via Outfall No. 001. As this is the area of potential stormwater contamination (spill, leaks, releases from biosolids drying, storage, and handling), this is allowable. Process Flow Diagram shows the stormwater is piped into the process (after influent sampling/flow measurement) and shows the Outfall No. 001 effluent monitoring point at Chlorine Contact Tanks. The Outfall is sampled at the Chlorine Contact Tanks in Lower Nazareth, but the actual stream discharge point is in Palmer Township.
    - New Stormwater Drainage Area/Outfall No. 002: The active STP area was indicated to sheet flow to the stream. A point in the middle of the SBR tanks has been used to create a sheet flow drainage area (in the absence of a concentrated point of discharge for stormwater monitoring).
    - New Stormwater Drainage Area/Outfall No. 003: The Application identified an existing stormwater retention pond with associated rock filters on the southern part of the site, which would discharge to the UNT. Center at 40.732085 & -75.28588. It is located on a site access road away from the POTW Treatment Units (but adjacent to a "smoke house"). Some sheet flow drainage from the treatment unit area flows to this control. This area would have been the older STP area that was replaced by the adjacent SBR STP Plant.
    - New Stormwater Drainage Area/Outfall No. 004: The Application identified an existing stormwater retention pond (a.k.a. Rain Garden #1) near Admin Building at the northwest corner of property, adjacent to the site gate & along access road (used by biosolids-containing vehicles). It appears to receive offsite run-on. Reportedly, it does not discharge and does not receive stormwater from the industrial activity/material handling areas. Might receive a release along access road. In practical terms, it must presume to overflow during a sufficiently severe storm event as a stormwater detention pond. Center point at 40.734085 & -75.284809.

Communications Log:

10/16/2023: Hard copy application submittal
10/30/2023: DEP Initial Incompleteness letter
10/31/2023: NBMA (Minnich) E-mail acknowledging receipt of DEP Incompleteness letter
11/2/2023: Application Due Date
11/10/2023: **On-Base No. 129395** (partial revised Application received) along with NBMA (Minnich) E-mail courtesy notification.
3/8/2024: Technical Deficiency Letter issued.
3/20/2024: NBMA (Brown) E-mail request for extension to 6/6/2024 for response to Tech Def Letter.
3/20/2024: NBMA (Brown) E-mail asking for clarification on analytical requirements.
3/20/2024: DEP (Berger) E-mail granting extension to 6/6/2024 per request.
3/20/2024: DEP (Berger) E-mail providing feedback on analytical requirements (referencing Major Sewage NPDES Application Instructions, Part A.III template language, and TMS available on DEP webpage.
6/6/2024: **Public Upload# 238357** (Response to Tech Def Letter and supplemental information)

Sludge use and disposal description and location(s):

- 2022: 160.5 dry tons disposed in 2022 (land application by third party (Synagro)) at farms in Northampton county (McEwan Farm' Miller Farm, and NBMA Farm). The 2022 Chapter 94 Report also indicated land application at Klein Farms.

Summary of Review

- 2023: 81 dry tons were land applied by Synagro (Spring) and 93 dry tons were land applied by Synagro (Autumn) in farms located in Lower Mount Bethel Township, Northampton County per 2023 Chapter 94 Report.

Special Conditions:

Part A.I: Quarterly PFAS testing due to facility receipt of IW wastewater from EPA-identified known or suspected PFAS sources per DEP PFAS policy (Chapter 92a.61). Added Footnote language: The permittee may discontinue monitoring for PFOA, PFOS, HFPO-DA, and PFBS if the results in four (4) consecutive monitoring periods indicate non-detect results at or below DEP Quantitation Limits of 4.0 ng/l for PFOA, 3.7 ng/l PFOS, 3.5 ng/l for PFBS, and 6.4 ng/l for HFPO-DA. When monitoring is discontinued, permittees must enter a No Discharge Indicator (NODI) of "GG" on DMRs.

Part C Special Conditions: Changes bolded.

- Omitted Conditions: Previous C.I.D condition omitted as redundant to Part A.I Additional Requirement language.
- Part C.I.A, B, C: Existing standard conditions (Stormwater prohibition; Necessary property rights; Residuals management)
- **Part C.I.D: New Chlorine Minimization Condition**
- **Part C.I.E: New SBR discharge condition due to batch nature of discharges (with additional consideration of potential stream restoration at the Outfall No. 001 location).**
- **Part C.I.F: New Dry Stream condition with requirement to notify Department in event of any known sinkhole remediation project along upstream portion of Shoeneck Creek. In practical terms, the facility is discharging to a dry reach of Schoeneck Creek (which has aquatic life and perennial flow upstream of the upstream sinkholes).** The dry reach is due to sinkholes (with potential contributing causes being local quarry pumping), but streams are expected to recover long-term in Pennsylvania.
    - The existing point of first use is the (downstream) UNT# 4628 (a.k.a. Nazareth) confluence at present.
    - The potential future point of first use (by aquatic life) would be at the Outfall No. 001 location in event of potential stream restoration by sinkhole remediation. In event of future sinkhole remediation, the stream could be restored, with aquatic life recolonizing the former dry reach at the Outfall No. 001 location. In that event, the Department permit limits would have to be substantially revised to prevent negative impacts on the aquatic life in the restored perennial stream. The current POFU (UNT confluence) location has substantially greater Q7-10 low flows/dilution due to quarry pumping during low flow conditions (that the Outfall No. 001 location would not experience). As noted by the application, there are two quarries that discharge directly to the UNT during stream low flow condition (in order to operate), with the UNT confluence downstream of Outfall No. 001 (plus a third quarry in the area):
        - New Enterprise Stone and Lime Co. Inc. discharges to the UNT.
        - Lehigh Cement Co. discharges to the UNT.
        - A third Hercules Quarry discharges instead to the Little Bushkill Creek (no flow is returned to Shoeneck Creek). The application indicates the permittee believes that Hercules quarry pumping might be contributing to dry stream conditions in Shoeneck Creek.
    - Potential new WQBELs would be determined by the Department in event the POFU location moves to the Outfall No. 001 location (based on then available information in term of stream flow at Outfall No. 001 and permittee-chosen options which include redirecting the discharge directly to the UNT)**.**
- **Part C.I.G: Modified existing special condition:** "For the purpose of determining compliance with Part A, Additional Requirements, paragraph 1.d **during dry stream conditions**, DEP will compare conditions in the receiving water upstream of the discharge to conditions in the receiving water approximately 100 feet downstream of the **UNT confluence (Point of First Use by aquatic life)** to determine if there is an observable change in the receiving water". This language has been clarified due to dry stream discharge with dry conditions found upstream of Outfall No. 001 during much of the year. If the stream is restored (upstream of Outfall No. 001), this site-specific language will be deleted from future NPDES Permits renewals.
- Part C.II: Existing Solids Management Conditions
- **Part C.III**: **New WQBELs for Toxic Pollutants due to Reasonable Potential Analysis.** See Effluent Limits Section for the ten WQBELs.
- Part C.IV: **Updated** WET Test conditions **(updated dilution series)**.
- **Part C.V: New WQBELs below QLs for compliance reporting purposes.** (Relief from permit limits might require more sensitive analysis to demonstrate absence or to calculate the Long Term Average Monthly Effluent Concentration)

Summary of Review

- **Part C.VI: New IW Stormwater Conditions.** The application indicates that there are no points of concentrated stormwater flow onsite, but that information was incorrect (at least one monitorable outfall). The facility is subject to IW Stormwater permit requirements (PPC Plan, Stormwater BMPs) as a Major STP, even if it was all sheet flow. The condition has been modified to require submittal of Annual IW Stormwater Inspection form via EDMR and with benchmark requirements (TSS and COD).

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 (IW) 002 (SW) 004 (SW, not being monitored)	Design Flow (MGD)	1.6 (001) 0 (002, 004)
Latitude	40º 43' 58.12" (001) 40º 43' 57.25" (002) 40º 44' 0.8304" (004)	Longitude	-75º 16' 59.15" (001) -75º 16' 59.65" (002) -75º 16' 58.422" (002)
Quad Name	Nazareth	Quad Code	1343 (6.22.1)
Wastewater Description:	001: Sewage Effluent 002, 003, and 004: Stormwater only		

Receiving Waters	Shoeneck Creek (WWF)	Stream Code	4626
NHD Com ID	26046362	RMI	3.2 (DRBC Docket); ~3.62 by E-maps measurement
Drainage Area	2.58 square Miles at Outfall No. 001; 5.98 at UNT Confluence POFU	Yield (cfs/mi^2)	0.156 (at POFU)
Q_{7-10} Flow (cfs)	0.932 at POFU	Q_{7-10} Basis	See below
Elevation (ft)	~348.5 (Outfall) 340 (POFU)	Slope (ft/ft)	-
Watershed No.	1-F	Chapter 93 Class.	WWF
Existing Use	-	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Impaired		
Cause(s) of Impairment	FLOW REGIME MODIFICATION, SILTATION; Pathogens (unknown source); Mercury (atmospheric deposition)		
Source(s) of Impairment	AGRICULTURE, URBAN RUNOFF/STORM SEWERS (see also below)		
TMDL Status	-	Name	-

Background/Ambient Data		Data Source
pH (SU)	7.5 (lab)	Sample ID: 2047399 Sequence Number: 1 (located where Shoeneck Creek makes abrupt turn southward) Date Collected: 6/1/2016 11:00:00 AM. 10/27/2003 DEP Biologist Cause and Effect Survey Station 1 was at 8.12 SU.
Temperature (°C)	13.78	-
Hardness (mg/L)	194	No sample determination. 10/27/2003 DEP Biologist Cause and Effect Survey Station 1 (upstream of Outfall 001 and downstream of above sample). **The application submitted a 283 mg/l Nazareth Creek (Trib POFU) Total Hardness value for stream receiving quarry discharges.**
Zinc, T (ug/l)	51.000	10/27/2003 DEP Biologist Cause and Effect Survey Station 1 was at 192.0 ug/l.
Manganese, T (ug/l)	476.000	10/27/2003 DEP Biologist Cause and Effect Survey Station 1 was at <10.00 ug/l.
Lead, T (ug/l)	3.02	10/27/2003 DEP Biologist Cause and Effect Survey Station 1 was at <1.00 ug/l
Copper, T (ug/l)	16.000	10/27/2003 DEP Biologist Cause and Effect Survey Station 1 was at <10.0 ug/l.

Nearest Downstream Public Water Supply Intake — North Penn Water Authority (per DRBC Docket)

PWS Waters	Delaware River	Flow at Intake (cfs)	-
PWS RMI	-	Distance from Outfall (mi)	~35 miles

Changes Since Last Permit Issuance:

- Natural Trout Reproduction Stream designation (headwaters downstream to mouth).
- 3/29/2024 DEP Biologist (Tim Daley) Point of First Use (by aquatic life) POFU Memo. The POFU remains at downstream UNT No. 4628 (known locally as Nazareth Creek per permittee) confluence. Biologist noted that the upstream section of receiving stream appear to have had multiple sinkholes and stream was possibly historically redirected (flow modification) to present route from historic route, due to cement quarries.

Nazareth WWTP POFU.pdf

Other Comments:

- **General Area History**: The original 1982 WPC Report assumed a 0.4 CFS flow for a 0.9 square mil drainage area. Subsequent WPCs noted dry stream conditions at the Outfall location (location modified slightly when SBR plant installed). A 1994 Report (excerpt found in microfiche files) indicated the POTW discharge was the sole source of stream flow during dry weather periods. The 12/16/1998 DEP Biologist (Kupsky) report identified the POFU at the downstream UNT location (which was noted to have permanent flow augmentation from upstream active quarries. The general area is carbonate geology with existing/historic local cement plant quarrying activities and sinkhole problems in stream itself (including one 0.75 – 1 acre-sized sinkhole noted in the stream channel upstream of Outfall No. 001 back in 2003). Area streams are impaired for Aquatic Life due to flow modification and siltation (urban runoff/storm sewers and agriculture). Some of the area has been redeveloped for warehouses, etc. Shoeneck a.k.a. Schoeneck Creek flows into Bushkill Creek (HQ-CWF) and then into the Delaware River.
    - Shoeneck Creek (a.k.a. Schoeneck Creek): Shoeneck Creek is a Warm Water Fishery (higher Temperature and pH than typical cold water fishery). The headwater are in built-up portions of Upper NazaretTownship (with Bushkill Township & Nazareth Borough & Upper Nazareth Township MS4 stormwater outfalls). Historical sampling has had high total hardness values. Shoeneck Creek makes a sharp turn just before a historic Hercules Cement quarry mining-impacted area per the topography, indicating likely rerouting of surface water southward, but with DEP Biologist indicating groundwater flowing in other direction (eastward toward Bushkill Creek).
        - Upstream of the POTW: Upstream of POTW discharge, there is aquatic life. Biologists have noted sinkholes impacting the stream over the years. There is an upstream Hercules Sed Pond Monitoring Point (ID# 74441) that was sampled circa 2003.
        - At POTW: Dry stream conditions per multiple DEP Biologist memos over the decades. There is little stream flow unless there is a precipitation event during dry weather seasons. The POTW discharge largely becomes the stream during those conditions.
        - Downstream of POTW: The POFU is at the confluence with UNT No. 04629 (~0.13 miles downstream). (i.e. POTW discharge is effluent-dominating whenever there is little stormwater flows).
    - UNT Trib No. 04628 to Shoeneck Creek (WWF, Impaired by Pathogens, Impaired by flow modification/Siltation, Impaired by atmospheric mercury deposition): The confluence is the existing Point of First Use (POFU) by aquatic life. The UNT receives cement plant discharges but is a perennial UNT to Shoeneck Creek (in addition to the POTW contribution). For example, the 10/27/2003 DEP (Sherril R. Wills, Biologist) Cause and Effect Survey indicated dry stream conditions and large upstream sinkhole. Shoeneck Creek was noted to be dry during visit, with whole channel looking like it had been redug and very straight from STP Outfall to downstream UNT (POFU used in previous NPDES permit water quality modeling). The UNT was noted to have high total hardness (346 mg/l CaCO3).
- **Low Flow Value**: This is an unusual situation. Shoeneck Creek is a perennial stream upstream of the POTW, but upstream area has been subject to hydromodification (historic and ongoing cement plant mining activities/pumping plus apparent stream rerouting) and sinkholes to the point that it has been and continues to be a dry stream at the POTW Outfall (with POFU previously determined at downstream UNT confluence about 0.13

miles downstream of Outfall No. 001). DEP Biologist indicates that the groundwater flow direction also differs from the dry reach flow direction (losing stream scenario), likely from historic stream rerouting.

- The DRBC Docket assumed a 0.17 MGD (0.26 CFS) Q7-10 low flow for Schoeneck Creek at the WWTP discharge (001), equivalent to the 0.1 CFS/square mile DEP statewide LFY default. In reality, there might not be any dry weather flow due to loss of upstream flow to sinkhole and undefined quarry pumping impacts.
- USGS PA Streamstats estimated 0.258 CFS for a 2.58 square mile drainage area at the dry Outfall No. 001 (below regression equation range), which is at the 0.1 CFS/square mile DEP Statewide LFY default. If the stream ever is restored, this would be the likely best Q7-10 low flow value.
- Previous POFU modeling assumptions are dubious. There is no existing stream gage on Shoeneck or Bushkill Creeks. Previous modeling assumed USGS Gage 01452500 (Monocacy Creek at Bethlehem) was a comparable stream for use to calculate an LFY, but that is dubious due to site-specific conditions. 0.297 CFS/square mile was assumed in previous renewal Fact Sheet (2018 modeling) but for a 6.39 square mile drainage area. 0.250 CFS/square mile assumed in 2013 modeling but for 6.43 square mile drainage area. 2017 PEL Letter (2.1 MGD) Modeling in the past used 0.250 CFS/square miles for a 6.38 square mile drainage area.
- **Recalculated LFY/Q7-10 Low Flow: Calculated an adjusted 0.156 CFS/square mile LFY for conservatism (to exclude lost stream flows). Additional site-specific information such as (current) watershed quarry pumping/discharge rates and geological information would be needed to justify a higher Q7-10 low flow and/or LFY value at this time.**
  - USGS PA Streamstats estimated 1.63 CFS Q7-10 low flow for a 5.98 square mile drainage area at the Shenandoah Creek Confluence with UNT (equivalent to LFY of 0.2752 LFY). USGS PA Streamstats uses all available watershed gage data but is impacted here by site-specific conditions and lack of existing local gages for updated stream flow data. The LFY is consistent with historic quarry pumping discharges being a significant source of stream flow in the watershed during low flow conditions. However, it assumes here a contribution from the dry reach drainage area that is not present during dry conditions.
    - The UNT drainage area contribution was estimated 3.38 square miles by PA Streamstats, which is the actively contributing stream flow area (but below the regression equation range, preventing use of the calculated UNT Q7-10 low flow value).
    - The dry reach Shoeneck Creek drainage area is 2.6 square miles by subtraction (~43% of area).
  - Used the LFY method (POFU location) to derive the overall watershed LFY (0.2753) for Shoeneck Creek watershed at the closest point to the POTW (in the absence of scientific site-specific data).
    - UNT Flow: 0.93 CFS at Q7-10 low flow for 3.38 square mile contributing drainage area is the available stream flow in Shenandoah Creek at POFU.
    - Adjusted LFY: Dividing 0.93 CFS by 5.98 square mile drainage area, the adjusted LFY is 0.1555, rounded up to 0.156 CFS/square mile.

- Causes for Impairment:
  - Aquatic Life: URBAN RUNOFF/STORM SEWERS - SILTATION; AGRICULTURE - SILTATION; URBAN RUNOFF/STORM SEWERS - FLOW REGIME MODIFICATION:
    - This facility is not expected to be a contributing source if TSS permit limits are met. No construction is presently proposed.
    - Nazareth Borough has MS4 NPDES Permit No. PAG132261, Nazareth Township has MS4 NPDES Permit No. PAI132234, and Bushkill Township has MS4 NPDES Permit No. PAI132219 which will help to address any urban stormwater contributions to stream impairment.
    - There are some IW Stormwater discharges upstream, but they are not expected to contribute to stream impairment if they comply with the PAG-03 IW Stormwater NPDES permitting requirements.
  - Fish Consumption: ATMOSPHERIC DEPOSITION – MERCURY: This facility is not expected to be a source of atmospheric mercury.
  - Recreational: Pathogens – source unknown (2015). In practical terms, dry stream conditions means little dilution for the treated sewage discharge or any wildlife contributions or any other discharges. The area was previously more agricultural, so follow-up may be needed in next NPDES Permit term to verify the POTW is not a contributing source.

Discharge, Receiving Waters and Water Supply Information

Outfall No.	003	Design Flow (MGD)	0
Latitude	40º 43' 52.47"	Longitude	-75º 17' 8.30"
Quad Name	Nazareth	Quad Code	1343 (6.22.1)
Wastewater Description:	Stormwater		
Receiving Waters	Unnamed Tributary to Shoeneck Creek (WWF, MF) known locally as Nazareth Creek	Stream Code	4628
NHD Com ID	26046360	RMI	0.1100
Drainage Area	~3.38 square miles	Yield (cfs/mi^2)	-
Q_{7-10} Flow (cfs)	See above	Q_{7-10} Basis	See 001 section above.
Elevation (ft)	~340 at confluence	Slope (ft/ft)	-
Watershed No.	1-F	Chapter 93 Class.	WWF, MF
Existing Use	-	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Impaired		
Cause(s) of Impairment	FLOW REGIME MODIFICATION, SILTATION, Pathogens (unknown source); Fish consumption (atmospheric deposition)		
Source(s) of Impairment	AGRICULTURE, URBAN RUNOFF/STORM SEWERS, URBAN RUNOFF/STORM SEWERS		
TMDL Status	-	Name	-

Background/Ambient Data		Data Source
pH (SU)	7.83	2003 DEP Biologist (Sherril Leap) Cause & Effect Survey Station 3 (UNT) sampling.
Temperature (°C)	14.60	See above.
Hardness (mg/L)	283	Application information.
Iron, Total (ug/l):	242.0	2003 DEP Biologist (Sherril Leap) Cause & Effect Survey Station 3 sampling.
Zinc, Total (ug/l)	268.0	See above. No assimilative capacity. Similar results for Shoeneck Creek sampling points.
Manganese, Total (ug/l)	15.0	See above.

Nearest Downstream Public Water Supply Intake		North Penn Water Authority (per DRBC Docket)	
PWS Waters	Delaware River	Flow at Intake (cfs)	-
PWS RMI	-	Distance from Outfall (mi)	~35 miles

Changes Since Last Permit Issuance: Existing POTW IW Stormwater outfall being added to NPDES Permit.

Other Comments: The main branch of Shoeneck Creek is dry during dry weather, with the UNT being the POFU and the source of stream flow during dry weather (i.e. background at POFU). The UNT receives several quarry discharges.

Treatment Facility Summary

Treatment Facility Name: Nazareth Borough Municipal Authority WWTP

WQM Permit No.	Issuance Date	Scope
4809403-A1	6/21/2023	The installation of a new Ultraviolet (UV) Light Disinfection System at the existing wastewater treatment plant. Associated manholes, piping, and UV Building (along with relocation of some existing pipes). Per IRR: Chlorination will no longer be used as the primary disinfection method at the WWTP once the UV system is installed and operating. Chlorine will only be used in emergency situations where the UV system has catastrophically failed. The physical chlorine contact tank will remain and all proposed work associated with this permit occurs after the chlorine tank. This UV system can deliver a design dose of >30 mJ/cm^2 at a flow rate of 12 MGD with a 65% UV Transmittance (UVT).
4809403	3/9/2010	Upgrade existing WWTP including construction of two (2) additional intermittent Cycle Extended Aeration System (ICEAS) basins, installation of a centrifuge dewatering system to replace the existing belt filter press, a new plant generator, and associated mechanical/electrical equipment upgrades (per subsequent amendment IRR).
4803403	11/25/2003	Re-rate from 1.3 MGD to 1.6 MGD – no construction involved
4894402	12/19/1994	Sewage Treatment Plant rerating from 1.10 MGD to 1.30 MGD, with no construction change. STP description included influent screen, aerated grit chambers, influent pumps, splitter box, SBRs, chlorine contact tanks, post-aeration flume, aerobic digesters, a belt filter press, and a generator.
4887432	6/15/1988	STP rerate to 1.1 MGD with two (2) SBRs replacing old Trickling Filter, two (2) chlorine contact tanks, sludge centrifuging deleted (sludge to be hauled offsite). The IRR noted that a “new effluent headwall” would be moved north along Shoeneck Creek from its current location. Special Condition II states: “When channel changes occur, the stream bed shall not exceed the original width and if a greater cross sectional area is required, an elevated flood plain must be put to use”.
4887414	4/5/1988	STP for replacement of Trickling Filter with SBR and to expand to 1.5 MGD (from pervious 0.7 MGD). Preliminary treatment building included bar screen, aerated grit chamber and wastewater pumping. UV disinfection system proposed. Sludge will be dewatered by belt filter press. A new operational building (Admin building) constructed. IRR noted that this was the first SBR facility in PA.
4885402	9/5/1985	Covered Sludge Drying Beds and removal of previous two sludge lagoons and unpermitted sludge polishing ponds. IRR noted that this project included relocation of portion of Shoeneck Creek adjacent to the old sludge lagoons.
Other	-	There is a large assortment of NBMA WQM permits for pump stations, sewers and sewer extensions. Some permits were originally issued to the “Nazareth Sewer Company” (as listed in a 7/20/1972 document) prior to the NBMA.

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Sequencing Batch Reactor	UV*	1.6

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
1.6	4003	Not Overloaded	Combination**	Land Application

*Application indicated sodium hypochlorite would be used for emergency disinfection if needed.
**Four aerobic digesters in series. Centrifuge dewatering system. Class B biosolids are used for agricultural utilization with Class B pathogen reduction and vector attraction reduction.

Changes Since Last Permit Issuance: UV system under construction.

Other Comments:

- Treatment Plant includes four (4) ICEAS SBRs operated in series with non-continuous discharge to Outfall No. 001 (2895 GPM or ~4.17 MGD decant rate). Application indicates the initial SBR is used to aerate, settle and decanting, with solids transferred to the three other SBRs for aeration, settling and decanting. Mean cell resident time was estimated to range from 30 to 90 days. The facility upgraded to SBRs in 1990 per 2023 Chapter 94 Report.
- Phosphorus chemical removal in addition to biological nutrient removal (TN by anoxic cycles and TP by both biological/chemical treatment).
- Solids are dewatered by centrifuge with goal of a Class B biosolid (Non-Exceptional) under PAG082205. Pathogen/vector reduction required prior to agricultural usage. All dewatered biosolids are stored in a covered area.
- No hauled-in wastes
- Headworks upgrade planned in next five (5) years (with Inspection Report indicating it would include a new grit removal system and storage towers for the Process Masters Mastercat 4239 phosphorus removal chemical).

Minimum Monthly Average reduction: The 2022 and 2023 Chapter 94 Reports indicates 99% reduction of CBOD5 and TSS.

2022 & 2023 NBMA Chapter 94 Report: The Report (prepared by HRG Inc.) did not include the DEP Form or DEP spreadsheet.

- No existing or projected overloading (1.6 MGD hydraulic design capacity; 4003 lbs BOD5/day organic design capacity):
  - 2022 Report:
    - AADF: 1.227 MGD
    - 3-month Max daily Flow: 1.519 MGD (April – June)
    - Average Daily Organic Load: 2,252 lbs BOD5/day
    - Report indicated: “In the past, the volume of the chlorine contact tanks was the limiting individual unit process when establishing the hydraulic design capacity of the WWTP”.
    - Projected Growth: 312 total new connections projected over next 5 years. There is a table breakdown of EDUs per area for the projected development.
      - They assume 200 GPD/EDU.
      - They assume 0.40 lb/EDU (DWFM default is 0.17 lb/day per capita).
  - 2023 Report:
    - AADF: 1.180 MGD
    - 3-month Max daily Flow: 1.317 MGD (December 2022 – February 2023)
    - Average Daily Organic Load: 2,516 lbs BOD5/day
    - Max Month Organic Load: 2,980 lb BOD5/day
    - Projection: They indicated a total of 285 EDUs in the next 5 years, ~5% increase in loadings. They included a projected development table that indicated when and where the new connections were expected.
  - Renewal Application Information: Application indicated a total of 12,797 persons, equating to 1.28 MGD dry weather flow (at DWFM Default of 100 GPCD) and 2,176 lbs BOD5/day (at DWFM default of 0.17 lb BOD5/day/capita).
    - At a typical 2.5 persons per EDU, the service area would have 5119 EDUs based on population, discounting the small IW contributions (estimated at 1% of daily flows in application).

        - The Chapter 94 Reports did not estimate the total existing EDUs but estimated that the projected 285 EDUs would be a 5% increase, i.e. total EDUs in the 5700 EDU range.

- O&M:
    - WWTP: No significant construction in 2022. NPDES application indicates UV system installation planned in June/July 2024. Annual maintenance on equipment includes inspection and/or servicing of all ICEAS and holding tank blowers, mixers, decanter drives, waste pumps, influent screen, grit removal equipment, centrifuge and generators.
    - Collection System:
        - The collection system is comprised of separate systems and consists of approximately 56 miles of sanitary sewers ranging in size from 8 inches to 18 inches. It includes a number of interceptors.
        - In 2022 NBMA commenced a 3-year, $8M sewer main and lateral lining program within the older sections of Nazareth Borough and Upper Nazareth Township. When completed, nearly 37,000 lf of sewer main and 800 laterals will have lined or replaced. In 2022, 6,297 feet of sanitary main in the oldest section of the collection system which consisted primarily of clay (terra cotta) pipe. Additionally,1,122 feet of sanitary laterals (103 laterals) were lined and 35 laterals were completely replaced. This multi-year sewer rehabilitation program is expected to significantly reduce I&I.
        - 2022: As part of routine maintenance on the collection system in 2022, approximately 1,200 feet (0.86 miles) of sewer laterals and main were cleaned/jetted which was accompanied with 1,000 L.F. of televising. Ten (10) manhole frames and covers were replaced. Duke's Root Control treated approximately 1.45 miles (7,633 feet) of sewer main for root control. Several sinkholes along Schoeneck Creek Interceptor were repaired. No copy of applicable ordinance found.
        - 2023: In 2023, 14,600 feet of sanitary main was lined. Additionally, more than 500 laterals were lined or completely replaced. As part of routine maintenance on the collection system in 2023, approximately 1 mile feet of sewer laterals and main were cleaned/jetted.. Ten (10) manhole frames and covers were replaced. Duke's Root Control treated approximately 1.5 miles of sewer main for root control.
        - No mention of SSOs or other capacity issues in the collection system, but SSO were noted in DEP Inspection Report.
        - Shoeneck Creek is impaired by pathogens of unknown origin. Therefore, there is some potential for collection system leakage and/or wildcat sewers in the NBMA service area.

- IW:
    - Two Categorical Users identified (with Authority IU permits): In 2023, the average industrial flow was less than 1% of the average daily flow.
        - Prime Conduit (formerly Lamson & Sessions) which manufactures PVC conduit and fittings. Wastewater includes domestic wastewater and contact cooling water (CCW).
        - Airlite Plastics (formerly S&L Plastics) manufactures plastic components. Wastewater includes NCCW, CCW, and domestic wastewater. The permittee does not believe pretreatment needed here based on its industrial waste survey and pre-connection CCW/NCCW sampling.
    - NPDES Part B.I.C.4.b (total volume of discharge and estimated concentration of each pollutant): Concentration data not found for the categorical users. Authority states it has done some analysis of the discharges. The commercial establishments are subject to an inspection and sampling program (no details given).
    - No IU permits or applicable ordinance included with the Reports.
- Sewage Sludge Management Inventory:
    - The 2022 Chapter 94 Report NPDES Permit Part C.II.C inventory did not have the DEP Ops Spreadsheet (incorporating the referenced EPA methodology). They provided some calculations and indicated land application at Klein Farms (11.08 dry tons) and other farms (65.63 dry tons in Spring; 83.79 dry tons in Fall) in Lower Mt. Bethel Township.
    - The 2023 Chapter 94 Report included the DEP Sludge Generation Calculation (which incorporates the Part C.II.C-specified EPA methodology). The annual amount was within 15% of the calculated value.
- Sewer Extensions:
    - In 2022, houses continue to be constructed in the Heritage Village Campus of Moravian Hall Square - Phase 5 & 6. Phase 7 of Trio Farms was completed in 2022. No mention of other planned/proposed extensions in narrative. Map of collection system provided which showed "Proposed Phase 5 & 6 The Heritage Village Campus of Moravian Square" and "Proposed TRIO Farms Phase 7 (completed 2022)".
    - In 2023, several warehouses were being constructed. No residential housing developments under construction.

- Pump Stations: No estimated or measured pump stations flows found.
    - West End Pump Station: Two 500 GPM pumps
    - Nazareth Crossing Pump Stations: Two 80 GPM pumps
    - Trio Farms Pump Station South: Two 600 GPM pumps
    - Trio Farms Pump Station North: Two 105 GPM pumps. **NOTE**: The pump station has not yet been dedicated to the Authority nor has the Authority began operation of the pump station per the 2023 Chapter 94 Report.
- Calibration Report: They calibrated the influent flow meter which measure WWTP flows in both the 2022 and 2023 Reports. The calibration reports did not state the range of flows that the meter was calibrated for.

Compliance History

DMR Data for Outfall 001 (from January 1, 2023 to December 31, 2023)

Parameter	DEC-23	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23
Flow (MGD) Average Monthly	1.808	0.911	0.906	1.007	1.067	1.591	0.977	1.109	1.114	1.165	1.044	1.467
Flow (MGD) Daily Maximum	**5.874**	1.421	1.099	1.487	1.463	**8.267**	2.535	2.681	2.643	1.989	1.295	2.596
pH (S.U.) Instantaneous Minimum	7.1	7.1	7.2	7.2	7.1	7.2	7.1	7.1	7.1	7.0	7.0	7.1
pH (S.U.) Instantaneous Maximum	7.5	7.4	7.4	7.5	7.5	7.5	7.4	7.4	7.3	7.3	7.3	7.3
DO (mg/L) Instantaneous Minimum	7.0	7.3	7.3	7.0	6.8	7.0	7.2	7.4	7.5	7.8	7.9	7.9
TRC (mg/L) Average Monthly	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.3	0.3
TRC (mg/L) Instantaneous Maximum	0.7	0.4	0.5	0.8	0.7	0.7	0.6	0.6	0.7	0.7	0.5	0.6
CBOD5 (lbs/day) Average Monthly	< 36	< 19	< 20	< 24	< 31	< 30	< 21	< 25	< 22	< 23	< 21	< 30
CBOD5 (lbs/day) Weekly Average	< 52	< 23	< 22	35	45	< 42	< 31	< 37	28	< 26	< 26	< 40
CBOD5 (mg/L) Average Monthly	**< 2.4**	**< 2.5**	**< 2.6**	**< 2.8**	**< 3.4**	**< 2.6**	**< 2.6**	**< 2.7**	**< 2.6**	**< 2.5**	**< 2.4**	< 2.5
CBOD5 (mg/L) Weekly Average	**< 2.5**	**< 2.9**	**< 2.9**	**3.8**	**4.1**	**< 2.8**	**3.0**	**3.0**	**3.3**	**< 2.8**	**< 2.4**	< 2.6
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	2897	2515	2292	2388	2530	2387	2389	2604	2321	2359	2526	2980
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	4115	4060	2626	2954	2963	2904	2845	2948	2523	2634	2787	5764
BOD5 (mg/L) Raw Sewage Influent Average Monthly	212	326	307	287	288	207	308	299	280	257	291	249

Parameter	DEC-23	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23
TSS (lbs/day) Average Monthly	47	20	17	16	< 25	16	10	14	15	16	19	45
TSS (lbs/day) Raw Sewage Influent Average Monthly	3439	3013	2610	2636	2796	2532	2495	2642	2401	2381	2893	2967
TSS (lbs/day) Raw Sewage Influent Daily Maximum	6218	4551	2983	3439	4295	3173	3388	3284	2785	2565	3336	4273
TSS (lbs/day) Weekly Average	83	29	26	19	< 42	20	15	24	19	26	31	72
TSS (mg/L) Average Monthly	3.1	2.5	2.2	1.9	< 2.7	1.4	1.3	1.5	1.8	1.8	2.1	3.6
TSS (mg/L) Raw Sewage Influent Average Monthly	243	393	350	315	314	219	314	301	289	259	330	255
TSS (mg/L) Weekly Average	3.8	3.3	3.4	2.0	< 4.0	1.7	1.6	1.9	2.3	2.7	2.9	4.3
Total Dissolved Solids (lbs/day) Average Quarterly	3074.1			2767.7			2928.7			3802.5		
Total Dissolved Solids (mg/L) Average Quarterly	380.0			326.0			347.0			379.0		
Fecal Coliform (CFU/100 ml) Geometric Mean	8	14	26	25	27	12	< 4	9	19	14	10	10
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	13.5	40.4	52.9	56.5	201.4	160.7	12.2	154.1	61.3	33.6	24.9	23.1
Nitrate-Nitrite (lbs/day) Average Monthly	27	23	23	10	25	12	6	18	8	20	31	25
Nitrate-Nitrite (mg/L) Average Monthly	2.9	3.46	2.9	1.3	3.04	1.43	0.97	1.9	0.99	2.35	2.98	2.5
Total Nitrogen (lbs/day) Average Monthly	37	31	34.5	15.7	36.3	22.9	6.4	17.9	16	35	49	35
Total Nitrogen (mg/L) Average Monthly	3.95	4.64	4.26	2.07	4.47	2.7	0.969	1.9	1.89	4.14	4.68	3.48
Ammonia (lbs/day) Average Monthly	4	1.0	1	2.0	< 2	3	2	2	2	2.0	2.0	3.0

Parameter	DEC-23	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23	MAR-23	FEB-23	JAN-23
Ammonia (mg/L) Average Monthly	0.2	0.2	0.1	0.2	< 0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2
TKN (lbs/day) Average Monthly	10	8	11	6.0	12	11	< 5	< 7	8	15	18	10
TKN (mg/L) Average Monthly	1.04	1.18	1.36	0.77	1.43	1.27	< 0.7	< 0.7	0.9	1.8	1.69	0.98
Total Phosphorus (lbs/day) Average Monthly	21.3	26.5	33.0	20.9	25.1	22.9	27.4	26.3	15.8	21.2	20.5	19.3
Total Phosphorus (mg/L) Average Monthly	2.3	3.94	4.08	2.75	3.09	2.7	4.14	2.79	1.87	2.48	1.97	1.92
Total Copper (mg/L) Average Quarterly	0.004			0.004			0.003			0.004		
Free Cyanide (ug/L) Average Monthly	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	5.0	< 5.0	< 5.0	< 5.0	6.0	5.0
Total Zinc (mg/L) Average Monthly	0.09	0.093	0.11	0.10	0.08	0.05	0.13	0.12	0.13	0.12	0.09	0.10
Carbon Tetrachloride (mg/L) Average Quarterly	< 0.0005			< 0.0005			< 0.0005			< 0.0005		
Dichlorobromo-methane (mg/L) Average Quarterly	< 0.0005			0.0008			< 0.0005			0.0008		

DMR Data for Outfall 001 (from September 1, 2022 to August 31, 2023)

Parameter	DEC-22	NOV-22	OCT-22	SEP-22
Flow (MGD) Average Monthly	1.441	1.023	1.375	0.922
Flow (MGD) Daily Maximum	2.273	1.322	**5.935**	1.346
pH (S.U.) Instantaneous Minimum	7.1	7.1	7.1	7.1
pH (S.U.) Instantaneous Maximum	7.4	7.3	7.5	7.5

Parameter	DEC-22	NOV-22	OCT-22	SEP-22
DO (mg/L) Instantaneous Minimum	7.8	7.2	7.0	7.0
TRC (mg/L) Average Monthly	0.3	0.3	0.4	0.4
TRC (mg/L) Instantaneous Maximum	0.5	0.4	0.7	0.5
CBOD5 (lbs/day) Average Monthly	< 34	< 22	< 34	< 37
CBOD5 (lbs/day) Weekly Average	58	< 26	68	83
CBOD5 (mg/L) Average Monthly	< 2.7	< 2.5	< 3.0	< 4.2
CBOD5 (mg/L) Weekly Average	3.2	2.9	4.6	8.1
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	2424	2036	2357	2044
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	3444	2237	2928	2484
BOD5 (mg/L) Raw Sewage Influent Average Monthly	205	234	233	254
TSS (lbs/day) Average Monthly	55	25	41	23
TSS (lbs/day) Raw Sewage Influent Average Monthly	2565	2583	2609	2313
TSS (lbs/day) Raw Sewage Influent Daily Maximum	3958	3395	3991	2893
TSS (lbs/day) Weekly Average	85	37	86	26
TSS (mg/L) Average Monthly	4.4	2.8	3.4	2.8

Parameter	DEC-22	NOV-22	OCT-22	SEP-22
TSS (mg/L) Raw Sewage Influent Average Monthly	216	295	254	287
TSS (mg/L) Weekly Average	4.7	3.4	5.5	3.4
Total Dissolved Solids (lbs/day) Average Quarterly	3296.8			3047.4
Total Dissolved Solids (mg/L) Average Quarterly	391.0			350.0
Fecal Coliform (CFU/100 ml) Geometric Mean	21	21	33.0	41
Fecal Coliform (CFU/100 ml) Instantaneous Maximum	29.2	76.2	150.0	290.9
Nitrate-Nitrite (lbs/day) Average Monthly	42	27	45	30
Nitrate-Nitrite (mg/L) Average Monthly	4.27	3.09	5.39	3.38
Total Nitrogen (lbs/day) Average Monthly	51	35	65.8	30.1
Total Nitrogen (mg/L) Average Monthly	5.25	4.02	7.8	3.38
Ammonia (lbs/day) Average Monthly	3	1.0	2	2
Ammonia (mg/L) Average Monthly	0.2	0.1	0.2	0.2
TKN (lbs/day) Average Monthly	10	8.0	20	< 6
TKN (mg/L) Average Monthly	0.98	0.93	2.4	< 0.7
Total Phosphorus (lbs/day) Average Monthly	14.2	23.3	26.3	26.5
Total Phosphorus (mg/L) Average Monthly	1.46	2.7	3.12	2.98

Parameter	DEC-22	NOV-22	OCT-22	SEP-22
Total Copper (mg/L) Average Quarterly	0.006			0.007
Free Cyanide (ug/L) Average Monthly	< 5.0	< 5.0	< 5.0	5.0
Total Zinc (mg/L) Average Monthly	0.09	0.10	0.10	0.05
Carbon Tetrachloride (mg/L) Average Quarterly	< 0.0005			< 0.0005
Dichlorobromo-methane (mg/L) Average Quarterly	0.0011			0.0009

Compliance History

Inspection History:

FACILITY NAME	INSP PROGRAM	INSP ID	INSPECTED DATE	INSP TYPE	INSPECTION RESULT DESC	# OF VIOLATIONS
NAZARETH BORO MUNI AUTH WWTP	WPCNP	3519634	07/19/2023	Complaint Inspection	No Violations Noted	0
NAZARETH BORO MUNI AUTH WWTP	WPCNP	2975817	03/07/2023	Compliance Evaluation	No Violations Noted	0
NAZARETH BORO MUNI AUTH WWTP	WPCNP	3285020	11/22/2021	Compliance Evaluation	No Violations Noted	0
NAZARETH BORO MUNI AUTH WWTP	WPCNP	3029558	05/07/2020	Administrative/File Review	No Violations Noted	0
NAZARETH BORO MUNI AUTH WWTP	WPCNP	3596276	12/17/2019	Compliance Evaluation	No Violations Noted	0

Comments:

- SSOs:
  - The 7/19/2023 Inspection noted SSO noncompliance.
  - The 3/9/2023 Inspection Report followed an official odor complaint, and noted:

- 4/7-8/2022: 4.1” of rain in a 14-hour period caused SSOs at manholes N1J, N5J, N6J, and N7J along Jandy Blvd in Lower Nazareth Township. 10/13/2022: Heavy rains in a short period of time caused SSOs at manholes N1J, N5J, N6J, and N7J along Jandy Blvd in Lower Nazareth Township

  - SSOs in POTW Sewer System per application:
    - St. Elmo Street and Tatamy Road: One-time overflow during tropical storm. Application noted ongoing 3-year sewer lining project which was expected to reduce I&I.
    - Jandy Boulevard: Overflows during major precipitation events (Tropical storms/localized flooding).
  - Corrective Actions:
    - 6/21/2023 WQM Permit No. 4823401 (Jandy Boulevard Sewer Relocation Project) noted the proposed design will help prevent sewer overflows occurring due to hydraulic restrictions caused by current manholes configurations. Application anticipated construction in Spring 2024.
    - Application noted ongoing 3-year sewer lining project which was expected to reduce I&I.

- Compliance History: No open violations per 9/26/2024 WMS query (open violations by client number).

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 1.6
Latitude 40º 43' 58.00" **Longitude** -75º 16' 59.00"
Wastewater Description: Sewage Effluent

Permit Limits and/or Monitoring: Changes bolded.

Parameter	Limit (mg/l unless otherwise specified)	SBC	Model/Basis
CBOD5 **Raw Sewage Influent**	**Report Lbs/d** **Report Lbs/d** **Report** **Report**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max**	**DRBC Docket D-2002-038 CP-4 reporting requirement (Chapter 92a.12). Sampling to be paired with effluent CBOD5 sampling.** BOD5 Application data: 389 mg/l max and 264 mg/l LTA (104 samples).
BOD5 Raw Sewage Influent	Report Lbs/d Report Lbs/d Report **Report**	Monthly Average Daily Max Monthly Average **Daily Max**	Existing BOD5 M&R requirement retained due to Chapter 94 Reporting requirement. BOD5 Application data: 389 mg/l max and 264 mg/l LTA (104 samples).
TSS Raw Sewage Influent	Report Lbs/d Report Lbs/d Report **Report**	Monthly Average Daily Max Monthly Average **Daily Max**	Existing M&R Requirement. **Daily max concentration reporting added.** Application data: 440 mg/l max and 283 mg/l LTA (104 samples).
CBOD5 Minimum Monthly Average Reduction	**85%**	**Minimum monthly average**	**New reporting requirement for existing regulatory and NPDES Permit Part A.I Additional Requirements Item 2 requirement. DRBC requirement**.
TSS Minimum Monthly Average Reduction	**85%**	**Minimum monthly average**	**New reporting requirement for existing regulatory and NPDES Permit Part A.I Additional Requirements Item 2 requirement.**
CBOD5 (5/1 – 10/31)	200 Lbs/d 307 Lbs/d 15.0 23.0 30.0	Monthly Average Weekly Average Monthly Average Weekly Average IMAX	Existing WQBELs supported by updated water quality modeling. Application data: 5.8 mg/l max, <3.4 mg/l max avg. monthly, <2.8 mg/l LTA average (104 samples).
CBOD5 (11/1 – 4/30)	334 Lbs/d 534 Lbs/d 25.0 40.0 50.0	Monthly Average Weekly Average Monthly Average Weekly Average IMAX	Existing WQBELs supported by updated water quality modeling.
TSS	400 Lbs/d 600 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: 8.0 mg/l max, 4.4 mg/l max avg. monthly, 2.4 LTA mg/l average (104 samples).
pH	6.0 – 9.0 SU	Inst. Min - IMAX	Existing Technology limit (Chapter 92a.47). Application data: 7.0 – 7.5 SU (365 samples)
Dissolved Oxygen (DO)	6.0	Inst. Minimum	Existing WQBEL consistent with dry stream discharge.

Parameter	Limit (mg/l unless otherwise specified)	SBC	Model/Basis
			Application data: 6.8 mg/l min (365 samples).
Fecal Coliform (5/1 – 9/30)	200/100 ml 1,000/100 ml	Geo Mean IMAX	Existing Technology limit (Chapter 92a.47). Application data: 201.4/100 ml max, 33/100 ml max avg. monthly, and 26/100 ml (104 samples).
Fecal Coliform (10/1 – 4/30)	2,000/100 ml 10,000 ml/100 ml	Geo Mean IMAX	See above.
Total Residual Chlorine (after UV upgrade)	0.39 1.3**0**	Monthly Average IMAX	Existing WQBEL after UV upgrade. **Significant digit added. DMRs indicated compliance with post-UV TRC disinfection limits in May 2024. Chlorine Minimization condition applies when chlorine is used for emergency disinfection or other usage resulting in discharge.** Application data: 0.8 mg/l max,0.4 mg/l monthly maximum, <0.35 mg/l LTA (365 samples).
UV Intensity (after UV upgrade)	**Report µw/cm²**	**Instantaneous Minimum**	**New standard requirement for UV disinfection. DMRs indicated compliance with post-UV TRC disinfection limits in May 2024.**
Ammonia-Nitrogen (May 1 – Oct 1)	20 Lbs/d **Report Lbs/d** 1.5 **3.0** 3.**0**	Monthly Average **Daily Max** Monthly Average **Daily Max** IMAX	Existing WQBEL. **Significant digit added.** Application data: 0.56 mg/l max, 0.3 max avg. monthly, 0.2 mg/l average (104 samples).
Ammonia-Nitrogen (Nov 1 – Apr 30)	60 Lbs/d **Report Lbs/d** 4.5 **9.0** 9.**0**	Monthly Average **Daily Max** Monthly Average **Daily Max** IMAX	See above (with standard winter multiplier)
Total Phosphorus	41.4 Lbs **Report Lbs/d** Report **Report**	Monthly Average **Daily Max** Monthly Average **Daily Max**	Existing (DRBC) mass load WQBEL. Application data: 4.1 mg/l max, 2.6 mg/l average (12 samples). 27.4 lb/day daily max mass load.
Total Nitrogen (TN = Nitrate- Nitrite-N + TKN measured in same sample) (5/1 – 10/31)	72.0 Lbs/d **Report Lb/d** Report **Report**	Monthly Average **Daily Max** Monthly Average **Daily Max**	Existing mass load WQBEL and monitoring requirement. Application data: 7.8 mg/l max, 4.8 mg/l average (12 samples). 66 lb/day daily max mass load.
Total Nitrogen (TN = Nitrate- Nitrite-N + TKN measured in same sample) (11/1 – 4/30)	Report Lbs/d **Report Lb/d** Report **Report**	Monthly Average **Daily Max** Monthly Average **Daily Max**	Existing (DRBC) mass load reporting requirement. **Additional reporting added in this cycle.**
Nitrate-Nitrite as N	Report Lbs/d **Report Lbs/d** Report **Report**	Monthly Average **Daily Max** Monthly Average **Daily Max**	Existing monitoring requirement. Application data: 5.4 mg/l max, 2.5 mg/l average (12 samples).

Parameter	Limit (mg/l unless otherwise specified)	SBC	Model/Basis
Total Kjehldahl Nitrogen (TKN)	Report Lbs/d **Report Lbs/d** Report **Report**	Monthly Average **Daily Max** Monthly Average **Daily Max**	Existing monitoring requirement. Application data: 2.4 mg/l max, 1.31 mg/l average (12 samples).
Total Dissolved Solids (TDS)	Report Lbs/d **Report** 1000.0 **1000.0** 1000.**0**	Quarterly Average **Daily Max** Quarterly Average **Daily Max** IMAX	Existing DRBC IMAX limit. **Significant digit added.** Application data: 444 mg/l max, 354 mg/l average (8 samples).
Copper, Total	**Report Lbs/d** Report **Report**	**Quarterly Average** Quarterly Average **Daily Max**	Existing quarterly Monitoring requirement retained per Reasonable Potential Analysis**.** Application data: 7 ug/l max, 5 ug/l average (8 samples). Single influent sample was 50 ug/l.
Free Cyanide **(Interim)**	**Report Lbs/d** **Report Lbs/d** 9.2 ug/l 23**.0** ug/l 23.0 ug/l	**Monthly Average** **Daily Max** Monthly Average Daily Max IMAX	Existing WQBEL**.** Application data: 6 ug/l max, 5 ug/l average (12 samples). 3 samples above the lab of 5 ug/l. DEP TQL of 1 ug/l. Single influent sample was 5 ug/l.
Free Cyanide **(Final)**	**0.073 Lbs/d** **0.11 Lbs/d** **5.51 ug/l** **8.59 ug/l** **13.8 ug/l**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max** **IMAX**	**More stringent WQBEL required per Reasonable Potential Analysis.**
Zinc, Total **(Interim)**	**Report Lbs/d** **Report Lbs/d** 0.21 **0.42** 0.42	**Monthly Average** **Daily Max** Monthly Average **Daily Max** IMAX	Existing WQBEL**.** Application data: **0.134 mg/l max, 0.101 mg/l average (12 samples)**. All samples above lab RL of 10 ug/l. DEP TQL of 5 ug/l. Single influent sample was 360 ug/l.
Zinc, Total **(Final)**	**2.48 Lbs/d** **2.48 Lbs/d** **186.0 ug/l** **186.0 ug/l** **186.0 ug/l**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max** **IMAX**	**More stringent WQBEL required per Reasonable Potential Analysis.**
Dichlorobromomethane	**Report lb/d** Report **Report**	**Annual Average** Annual Average **Daily Max**	Existing annual monitoring requirement **(after UV upgrade)** retained per Reasonable Potential Analysis. Application data: 1.1 ug/l max, 0.8 ug/l average (8 samples). Single influent sample was <0.5 ug/l. Single influent sample was <0.5 ug/l.
Aluminum, Total	**Report lb/d** **Report lb/d** **Report** **Report**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max**	**New monitoring requirement per Reasonable Potential Analysis** Application Data: <100 ug/l (3 samples, all ND at lab QL of 100 ug/l). **DEP TQL of 10 ug/l (insensitive ND).** Single influent sample was 337 ug/l.
Antimony, Total	**Report lb/d** **Report lb/d** **Report** **Report**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max**	**New monitoring requirement per Reasonable Potential Analysis** Application Data: 0.9 ug/l max and 0.833 ug/l average (3 samples detected with lab QL of

Parameter	Limit (mg/l unless otherwise specified)	SBC	Model/Basis
			0.4 ug/l). DEP TQL of 2 ug/l. Single influent sample was 0.9 ug/l.
Boron, Total	**Report lb/d** **Report lb/d** **Report** **Report**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max**	**New monitoring requirement per Reasonable Potential Analysis** Application Data: 256 mg/l max and 229 mg/l average (3 samples, all detected, lab QL of 50 mg/l). DEP TQL of 200 ug/l. Single influent sample was 160 ug/l.
Silver Total	**Report lb/d** **Report lb/d** **Report** **Report**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max**	New monitoring requirement per Reasonable Potential Analysis Application Data: <1 ug/l (3 samples, all ND at lab QL of 1 ug/l). **DEP TQL of 0.4 ug/l (insensitive ND). Single influent sample was < 2 ug/l.**
Cadmium, Total	**0.007 lb/d** **0.011 lb/d** **0.55 ug/l** **0.85 ug/l** **1.37 ug/l**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max** **IMAX**	**New WQBEL per Reasonable Potential Analysis(effective in 3 years, with interim monitoring)** Application Data: <0.4 ug/l (3 samples, all ND at lab QL of 0.4 ug/l). **DEP TQL of 0.2 ug/l (insensitive ND).** Single influent sample was <0.8 ug/l.
Chlorodibromomethane	**0.041 lb/d** **0.064 lb/d** **3.06 ug/l** **4.77 ug/l** **7.65 ug/l**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max** **IMAX**	**New WQBEL per Reasonable Potential Analysis (effective in 3 years, with interim monitoring)** Application Data: 2 ug/l max and 1.95 ug/l average (3 samples, 1 ND at lab QL of 0.5 ug/l). DEP TQL of 0.5 ug/l. Single influent sample at <0.5 ug/l
Chloroform	**0.10 lb/d** **0.16 lb/d** **7.85 ug/l** **12.2 ug/l** **19.6 ug/l**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max** **IMAX**	**New WQBEL per Reasonable Potential Analysis (effective in 3 years, with interim monitoring)** Application Data: 11.7 ug/l max, **10.6667 ug/l** average (3 samples, all detected at lab QL of 0.5 ug/l). DEP TQL of 0.5 ug/l. **Single influent sample at 3.7 ug/l.**
Hexachlorobutadiene	**0.0005 lb/d** **0.0008 lb/d** **0.038 ug/l** **0.060 ug/l** **0.096 ug/l**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max** **IMAX**	**New WQBEL per Reasonable Potential Analysis (effective in 3 years, with interim monitoring)** Application Data: <0.98 ug/l (3 samples, all ND at lab QL of 0.98 ug/l). **DEP TQL of 0.5 ug/l (insensitive ND).** Single influent sample was <4.9 ug/l. **WQBEL below TQL.**
1,2,4-Trichlorobenzene	**0.001 lb/d** **0.002 lb/d** **0.096 ug/l** **0.15 ug/l** **0.24 ug/l**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max** **IMAX**	**New WQBEL per Reasonable Potential Analysis (effective in 3 years, with interim monitoring)** Application Data: <0.98 ug/l (3 samples, all ND at lab QL of 0.98 ug/l). **DEP TQL of 0.5 ug/l (insensitive ND).** Single influent sample at <4.9 ug/l. **WQBEL below TQL.**
Beta-BHC	**0.0004 lb/d** **0.0006 lb/d** **0.031 ug/l** **0.048 ug/l** **0.076 ug/l**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max** **IMAX**	**New WQBEL per Reasonable Potential Analysis** Application Data: 0.02 ug/l max and 0.02 ug/l average (3 samples, 2 NDs at lab QL of 0.005 ug/l). DEP TQL of 0.05 ug/l. Single

Parameter	Limit (mg/l unless otherwise specified)	SBC	Model/Basis
			influent sample at <0.02 ug/l. **WQBEL below TQL.**
Alpha-Endosulfan	**0.001 lb/d** **0.002 lb/d** **0.077 ug/l** **0.12 ug/l** **0.19 ug/l**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max** **IMAX**	**New WQBEL per Reasonable Potential Analysis (effective in 3 years, with interim monitoring)** Application Data: 0.04 ug/l max and 0.04 average (3 samples, 1 ND at 0.02 ug/l lab QL). DEP TQL of 0.05 ug/l. Single influent sample at <0.1 ug/l
Heptachlor	**0.000000306 lb/d** **0.000000478 lb/d** **0.02 ng/l** **0.04 ng/l** **0.06 ng/l**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max** **IMAX**	**New WQBEL per Reasonable Potential Analysis (effective in 3 years, with interim monitoring)** Application Data: **0.3 ug/l max and 0.3 ug/l average** (3 samples, 1 ND at Lab QL of 0.005 ug/l). DEP TQL of 0.05 ug/l. Single influent sample at <0.1 ug/l. **WQBEL below TQL.**
PFOA	**Report lb/d** **Report ng/l** **Report ng/l**	**Quarterly Average** **Quarterly Average** **IMAX**	**New PFAS monitoring requirement (quarterly, Chapter 92a.61) until they have four consecutive ND at the DEP TQL of 4.0 ng/l. In that event, they would report "GG"** Application Data: None. (Application predated revised application requirement)
PFOS	**Report lb/d** **Report ng/l** **Report ng/l**	**Quarterly Average** **Quarterly Average** **IMAX**	**New PFAS monitoring requirement (quarterly, Chapter 92a.61) until they have four consecutive ND at the DEP TQL of 3.7 ng/l. In that event, they would report "GG"** Application Data: None. (Application predated revised application requirement)
PFBS	**Report lb/d** **Report ng/l** **Report ng/l**	**Quarterly Average** **Quarterly Average** **IMAX**	**New PFAS monitoring requirement (quarterly, Chapter 92a.61) until they have four consecutive ND at the DEP TQL of 3.5 ng/l. In that event, they would report "GG"** Application Data: None. (Application predated revised application requirement)
HFPO-DA	**Report lb/d** **Report ng/l** **Report ng/l**	**Quarterly Average** **Quarterly Average** **IMAX**	**New PFAS monitoring requirement (quarterly, Chapter 92a.61) until they have four consecutive ND at the DEP TQL of 6.4 ng/l. In that event, they would report "GG"** Application Data: None. (Application predated revised application requirement)

Comments:

Daily Max loading/concentration limits based on existing IMAX limits (any exceedance duration is an IMAX exceedance) or as calculated by updated modeling. Monitoring and reporting otherwise required (no additional sampling).

WQM Modeling (Shoeneck Creek, WWF):

- Stream modeled at 25° C, 8.0 SU pH (carbonate area), and minimum 5.0 DO mg/l in summer.
- The first reach (dry) was modeled to produce inputs for the downstream (starting at POFU) reach. LFY was assumed at 0.001 CFS/square miles to account for chemical/biological activity in dry reach. Please note the DEP

Policy No. 391-2000-014 (Policy and Procedure for Evaluating Wastewater Discharges to Intermittent and Ephemeral Streams, Drainage Channels and Swales, and Storm Sewers) would impose more stringent requirements for a new discharge (10 mg/l CBOD5, 10 mg/l TSS, 5 mg/l TN, 0.5 mg/l TP, and 6 mg/l DO).

- Dry Reach: 0.001 CFS/square mile LFY to account for dry stream conditions.
- Wet Reach: 0.156 CFS/square mile LFY Shenandoah Creek watershed for conservatism (disregarding theoretical upstream Shoeneck Creek flow if stream is ever restored).

Point	Elevation (Ft)	Drainage Area (Square Miles)	RMI (measured in e-maps)	Comment
1 (Outfall No. 001)	348.5	2.58	3.62	Dry reach during critical conditions modeled at existing permit limits (modeled at LFY of 0.001 CFS/square mile). At end of subreach, the discharge would be 14.27 mg/l CBOD5, 1.33 mg/l Ammonia-N, and 6.78 mg/l DO for use at POFU modeling (accounting for physical and biological processes in waste stream in dry channel).
2 (Confluence with UNT, WWF)	340.0	5.98 (UNT drainage area is 3.38 square miles).	3.49	Wet reach at Existing POFU. The end subreach CBOD5, Ammonia-N and DO values were inputted as the stream discharge. This showed existing limits are protective at the current POFU. The TMS assumed direct discharge of 1.6 MGD at the POFU location (as most toxic pollutants are conservative).
3 (Downstream UNT 4627 confluence)	331	6.72	2.75	-
4 (At Bushkill Creek Confluence)	283	13.2	0.001	-

WQM Model 7.1.1: Existing permit limits are protective per updated modeling.

NBMAWQMmodel.pdf

Total Residual Chlorine (TRC): Existing TRC limits (post-UV disinfection) retained due to Antibacksliding prohibition, and due to dry stream reach reducing impact of chlorine prior to reaching aquatic life. The facility has converted to UV disinfection with potential use of sodium hypochlorite for emergency disinfection. If the Outfall had discharged directly at the UNT POFU, the following more stringent permit limits would have applied:

TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9 — Nazareth Borough STP

0.932	= Q stream (cfs)	0.5	= CV Daily
1.6	= 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 = 0.139	1.3.2.iii	WLA cfc = 0.128
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.052	5.1d	LTA_cfc = 0.074

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.720	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.089	AFC
		INST MAX LIMIT (mg/l) = 0.209	

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)**

Reasonable Potential Analysis: The Reasonable Potential Analysis is based on Application information and other information available to the Department.

- POTW IUs and PFAS: The POTW does not have an EPA-approved Industrial Pretreatment Program (IPP). Two Categorical Industrial Users identified (Part 463, Plastic Molding and Forming Category). **This category is expected or suspected of PFAS discharges per EPA Fact Sheet.** The application does not have PFAS sampling data (submittal predated revised application forms). The application information included the following additional information:
  - The mining and cement industries do not discharge to the POTW.
  - Victaulic (40 CFR 438) is closed.
  - Kraemer Textiles (40 CFR 410) is closed.
  - Everson Tesla 40 CFR 469) does not discharge any process wastewater to the POTW.
  - Airlite Plastics and Prime Conduit (40 CFR 463) do discharge small amounts of process wastewater and do have specific IU discharge permits and limits.
    - Airlite Plastics Co.: 40 CFR 463: 1100 GPD process wastewater and 800 GPD sanitary for total of 1900 GPD.

  - Prime Conduit: 40 CFR Part 463: 725 GPD process wastewater, 300 GPD NCCW, 200 GPD Sanitary, and 950 GDP "Other" for total of 2200 GPD.
  - Quarterly PFAS monitoring will be required. If the results in four (4) consecutive monitoring periods indicate non-detect results at or below DEP Quantitation Limits of 4.0 ng/l for PFOA, 3.7 ng/l PFOS, 3.5 ng/l for PFBS, and 6.4 ng/l for HFPO-DA. When monitoring is discontinued, permittees must enter a No Discharge Indicator (NODI) of "GG" on DMRs.
- Toxic Management Spreadsheet output: 10 constituents require permit limits and 6 constituents require monitoring. The NPDES Permit Part C (WQBELs for Toxic Pollutants) conditions explains the processes for amending or eliminating new permit limits/monitoring requirements and/or more stringent permit limits prior to their effective date. The POTW declined to provide additional sampling data in response the DEP Technical Deficiency Letter that noted future WQBELs and/or monitoring requirements for these constituents. Of the 16 constituents:
  - More Stringent WQBELs: Free Cyanide and Total Zinc required more stringent limits than the existing limits.
  - Insensitive ND Concentrations: Five (5) constituents' ND concentration data did not meet DEP TQL (Total Aluminum, Total Cadmium, Total Silver, Hexachlorobutadiene, and 1,2,4-Trichlorobenzene). The POTW declined to provide additional sampling meeting DEP TQLs.
  - Conversion to UV disinfection: They indicated UV Disinfection startup was planned in 2024, but no confirmation of startup date received. EDMR indicates conversion to post-UV permit limits (i.e. UV has started up). Conversion to UV disinfection means that additional sampling might allow for elimination of Chloroform, Chlorodibromomethane, Dichlorobromomethane, and possibly Free Cyanide (per applicant statements) due to elimination of treatment plant source(s). The 11/22/2021 DEP Inspection Report indicated the facility had found a correlation between cleaning the chlorine contact tanks and a reduced cyanide result, with subsequent increased chlorine contact tank cleaning frequency, which is apparently the reason for expected free cyanide concentrations. The POTW declined to provide additional (post-UV disinfection start-up) samples to determine if source reduction reduced effluent concentrations.
  - Detected below DEP TQL constituents: Total Antimony (3 detects), Beta-BHC (1 detect), Alpha-Endosulfan (2 detects), Heptachlor (2 detects) with low Chapter 94 Water Quality Standards triggering permit limits. The POTW declined to provide additional sampling data (4 samples) to determine if constituents were present. The Part C (WQBELs below Quantitation Limits) will apply to compliance monitoring, but more sensitive analysis might be required to allow for elimination of known constituents in the effluent via the Part C conditions.

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

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Aluminum	Report	Report	Report	Report	Report	µg/L	750	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Antimony	Report	Report	Report	Report	Report	µg/L	7.71	THH	Discharge Conc > 10% WQBEL (no RP)
Total Boron	Report	Report	Report	Report	Report	µg/L	2,203	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Cadmium	0.007	0.011	0.55	0.85	1.37	µg/L	0.55	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Copper	Report	Report	Report	Report	Report	µg/L	20.0	CFC	Discharge Conc > 10% WQBEL (no RP)
Free Cyanide	0.073	0.11	5.51	8.59	13.8	µg/L	5.51	THH	Discharge Conc ≥ 50% WQBEL (RP)
Total Silver	Report	Report	Report	Report	Report	µg/L	9.25	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	2.48	2.48	186	186	186	µg/L	186	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Chlorodibromomethane	0.041	0.064	3.06	4.77	7.65	µg/L	3.06	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Chloroform	0.1	0.16	7.85	12.2	19.6	µg/L	7.85	THH	Discharge Conc ≥ 50% WQBEL (RP)
Dichlorobromomethane	Report	Report	Report	Report	Report	µg/L	3.63	CRL	Discharge Conc > 25% WQBEL (no RP)
Hexachlorobutadiene	0.0005	0.0008	0.038	0.06	0.096	µg/L	0.038	CRL	Discharge Conc ≥ 50% WQBEL (RP)
1,2,4-Trichlorobenzene	0.001	0.002	0.096	0.15	0.24	µg/L	0.096	THH	Discharge Conc ≥ 50% WQBEL (RP)
beta-BHC	0.0004	0.0006	0.031	0.048	0.076	µg/L	0.031	CRL	Discharge Conc ≥ 50% WQBEL (RP)
alpha-Endosulfan	0.001	0.002	0.077	0.12	0.19	µg/L	0.077	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Heptachlor	3.06E-07	4.78E-07	0.00002	0.00004	0.00006	µg/L	0.00002	CRL	Discharge Conc ≥ 50% WQBEL (RP)

NBMATMSPDF.pdf

- Constituents of Interest per TMS: The permittee declined to conduct additional sampling & analysis meeting DEP TQLs or post-UV disinfection start-up sampling for chlorine residuals. The permittee is uncertain if it can meet any

future limits for assorted constituents of interest (including chlorine disinfection byproducts despite conversion to UV disinfection):

- Total Cadmium, Hexachlorobutadiene, 1,2,4-Trichlorobenzene, Total Aluminum, Total Silver, Beta-BHC, Alpha-Endosulfan, Heptachlor: The permittee indicated it was unaware of the sources.
- Free Cyanide, Chlorodibromomethane, Chloroform, Dichlorobromomethane: The permittee indicated it believed its chlorine disinfection system (now replaced by UV disinfection) was the source for. The facility planned to go to UV disinfection in July 2024, after which it would only use chlorine for emergency disinfection (catastrophic failure of UV system when it would purchase and apply 12.5% hypochlorite within the existing chlorine contact tanks temporarily).
- Boron: The permittee noted Boron can be found in some cleaning agents and in naturally occurring rocks and soils. The permittee is not aware of any industry discharging Boron to the sewer system.
- Total Zinc: The permittee noted Total Zinc is a common corrosion inhibitor in drinking water supplies and is a naturally occurring element in rocks and soils.
- Total Antimony and Total Copper: The permittee noted that both are found in the drinking water supply.

- Five Peak GC/MS: The supplemental application information included amended results for “Analyses with “Five Peak” Pollutants”, but did not update the NPDES Permit Application form to identify which additional constituents were found. Per a glance-over, detected constituents included:
  - Triphenylphosphine oxide: 82.9 ug/l
  - [1-hydroxyhexyl]-(1)-Trichloromethane: 36.1 ug/l
  - Assorted Unknowns: 29.5 ug/l, 90.9 ug/l, 116 ug/l, etc.
  - 1,4-Benzenedicarboxylic acid: 10.6 ug/l
  - Etc.

Development of Effluent Limitations

Outfall No.	002 (discharge to Shoeneck Creek) 003 (discharge to UNT 4628 a.k.a. Nazareth Creek)	**Design Flow (MGD)**	0
Latitude	40º 43' 58.98" (002) 40º 43' 55.51" (003)	**Longitude**	-75º 17' 4.09" (002) -75º 17' 9.17" (003)
Wastewater Description:	Stormwater		

Permit Limits and Monitoring Requirements:

Parameter	Limit (mg/l unless otherwise specified)	SBC	Model/Basis
pH	**6.0 – 9.0 SU**	**Inst. Min - IMAX**	**Chapter 95.2 limit for** PAG-03 Appendix J (Miscellaneous) parameter
Total Suspended Solids (TSS)	Report	IMAX	PAG-03 Appendix J (Miscellaneous) parameter. See Part C benchmark (100 mg/l) (Chapter 92a.61).
Chemical Oxygen Demand (COD)	Report	IMAX	PAG-03 Appendix J (Miscellaneous) parameter. See Part C benchmark (120 mg/l) (Chapter 92a.61).
Oil & Grease	**30**	**IMAX**	**Chapter 95.2 limit for** PAG-03 Appendix J (Miscellaneous) parameter
Total Nitrogen (calculated from TKN and Nitrate-Nitrite measured in same sample)	Report	IMAX	PAG-03 Appendix J (Miscellaneous) parameter. (Chapter 92a.61).
Total Kjehldahl Nitrogen (TKN)	Report	IMAX	PAG-03 Appendix J (Miscellaneous) parameter (Chapter 92a.61)
Nitrate-Nitrite as N	Report	IMAX	PAG-03 Appendix J (Miscellaneous) parameter. (Chapter 92a.61).
Total Phosphorus	Report	IMAX	PAG-03 Appendix J (Miscellaneous) parameter. (Chapter 92a.61).

Comments:

- See Signature page for more background information.
- IW Stormwater requirements (Stormwater BMPs; implementation of site PPC Plan; other NPDES Stormwater permit conditions) apply to all stormwater drainage areas with industrial activities/material handling areas:

Outfall	Latitude	Longitude	Description
001	40º 43' 58.00"	-75º 16' 59.00"	STP treated effluent discharge to Shoeneck Creek, with some stormwater from “Outfall Area 1” (area around the sludge storage maintenance/garage Storage” is directed into raw influent pumping, after raw influent sampling and influent flow metering (i.e. not accounted in metered flows)).
002	40º 43' 58.98"	-75º 17' 4.09"	Sheet flow along grassy area to Shoeneck Creek. Center of SBR units chosen as coordinates.
003	40º 43' 55.51"	-75º 17' 9.17"	**Southern side retention pond with rock filter discharge** to UNT No. 4628 (known locally as Nazareth Creek). If this point of concentrated flow still exists, its discharge must be sampled.

004	40º 44' 2.7060"	-75º 17' 5.3124"	Stormwater retention pond/rain garden discharge located in front of the administrative building near plant entrance and access road, and on the opposite side of any industrial activity/material handling activities. Discharging to Shoeneck Creek. Will not be monitored in this permit cycle.

Whole Effluent Toxicity (WET)

For Outfall 001, **Chronic** WET Testing was completed:

X For the permit renewal application (5 tests).

The dilution series used for the tests was: 100%, 81%, 61%, 31%, and 15%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 61%.

Summary of Four Most Recent Test Results

NOEC/LC50 Data Analysis

	***Ceriodaphnia* Results (% Effluent)**			***Pimephales* Results (% Effluent)**			
Test Date	**NOEC Survival**	**NOEC Reproduction**	**LC50**	**NOEC Survival**	**NOEC Growth**	**LC50**	**Pass? ***
7/16-19/2019	100%	100%	>100%	100%	100%	>100%	Yes
7/14-21/2020	100%	100%	>100%	100%	100%	>100%	Yes
7/13-20/2021	100%	100%	>100%	100%	100%	>100%	Yes
7/13-20/2022	100%	**81%**	>100%	100%	100%	>100%	Yes
8/15-22/2023	100%	100%	>100%	100%	100%	>100%	Yes

***** *A "passing" result is that which is greater than or equal to the TIWC value.*

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

NO

Comments: Dilution series being recalculated due to change in assumed Q7-10 low flow conditions at the POFU (UNT confluence), but WET tests still passed with revised dilution series..

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

Acute Partial Mix Factor (PMFa): **1** Chronic Partial Mix Factor (PMFc): **1**

1. Determine IWC – Acute (IWCa):

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

[1.6 MGD x 1.547) / ((0.932 cfs x 1) + (1.6 MGD x 1.547))] x 100 = **IWCa% = 72.6%**

Is IWCa < 1%? **NO**

If the discharge is to the tidal portion of the Delaware River, indicate how the type of test was determined: **NA**

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

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

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

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

[(1.6 MGD x 1.547) / ((0.932 cfs x 1) + (1.6 MGD x 1.547))] x 100 = **TIWCc% = 72.6 (rounded to 73%)**

3. Determine Dilution Series

Dilution Series = 100%, 84%, 73%, 37%, and 18%.

WET Limits

Has reasonable potential been determined? **NO**

Will WET limits be established in the permit? **NO**

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

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

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Approve	Deny	Signatures	Date
X		James D. Berger (signed) James D. Berger, P.E. / Environmental Engineer	9/27/2024
X		Amy M. Bellanca (signed) Amy M. Bellanca, P.E. / Acting Engineer Manager	10-7-24