pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

NORTHEAST REGIONAL OFFICE
CLEAN WATER PROGRAM

NPDES PERMIT FACT SHEET ADDENDUM

Application Type	**Renewal**	Application No.	**PA0026042**
Facility Type	**Sewage**	APS ID	**785283**
Major / Minor	**Major**	Authorization ID	**980088**

Applicant and Facility Information

Applicant Name	**Bethlehem City**	Facility Name	**Bethlehem POTW (STP and sewer system) a.k.a. Bethlehem WWTP**
Applicant Address	10 East Church Street Bethlehem, PA 18018	Facility Address	144 Shimersville Road Bethlehem, PA 18015
Applicant Contact	Edward Boscola	Facility Contact	Jack Lawrence
Applicant Phone	(610) 865-7207	Facility Phone	(610) 865-7168
Client ID	74720	Site ID	443353
SIC Code	4952	Municipality	Bethlehem City
SIC Description	Trans. & Utilities - Sewerage Systems	County	Northampton
Date Published in PA Bulletin	Redraft: 11/18/2017 2nd Redraft: TBD	EPA Waived?	No
Comment Period End Date	Redraft: 2/9/2018 (extended) 2nd Redraft: TBD	If No, Reason	Major Facility; Pretreatment; CSOs
Purpose of Application	Application for a renewal of an NPDES permit for discharge of treated Sewage		

Internal Review and Recommendations

This **Redraft NPDES Permit and Fact Sheet Addendum** addresses public comments and other changes to the previous 11/2/2017 Redraft NPDES Permit.

- The previous 2017 Redraft NPDES Permit had been long-term hold due to (now withdrawn) general statewide EPA objections to previous standard Part C permit CSO language. A new Redraft NPDES Permit was required due to previous Redraft NPDES Permit age (rendering it obsolete and previous public notice stale), new CSO permit language, new standard template language, new applicable Chapter 93 Water Quality Standards (E Coli, etc.), updated 2021 application information resulting in permit condition changes, additional Chapter 94 Annual Municipal Wasteload Report-information, responses to previous 2018 public comments, etc.
- See the 11/2/2017 Redraft NPDES Permit Cover Letter and Fact Sheet Addendum for previous public comments on the original 2014 Draft NPDES Permit. See the 2014 Draft NPDES Permit Fact Sheet for additional information on this facility.
- The 3/5/2021 DEP Letter required updating of the NPDES Permit Application and requested any additional information that the City wished the Department to consider during permitting. The City response was received electronically on 6/26/2021. The City e-mailed response was forwarded to the US EPA and DRBC as application updates via 6/29/2021 DEP (Berger) E-mail.

Background Information for Context: This is a 20.0 MGD POTW (with CSOs). Estimated service area population of 126,000 residents, with ~ 247 miles of CSS/Separated sewers with six LTCP-identified City-operated pump stations. The service area includes an 18 square miles area including the City of Bethlehem, a portion of the City of Allentown, Hanover

Approve	Return	Deny	Signatures	Date
X			James D. Berger (signed) James D. Berger, P.E. / Environmental Engineer	December 13, 2022
X			Amy M. Bellanca (signed) Amy M. Bellanca, P.E. / Environmental Engineer Manager	12-15-22
NA			**NA – not required for issuance of Redraft NPDES Permit** Bharat Patel, P.E. / Environmental Program Manager	**NA**

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Township (Lehigh and Northampton counties), Lower Saucon Township, Hellertown, Fountain Hill Borough, Salisbury Township, Palmer Township, Bethlehem Township, and Borough of Freemansburg. The tributary municipalities do not have CSS areas per City submittals.

- **Outfalls Nos. 001 and 012 (CSO)**: Discharging to the Lehigh River (WWF; Stream Code No. 3335; impaired by: Urban runoff/storm sewers – siltation, **Combined sewer overflows - total suspended solids (TSS)**, **Municipal Point Source discharges - organic enrichment per DEP E-maps**; WMS/E-Facts noted PCBs from unknown source). The impairments begin well upstream in Lehigh County (i.e. other sources contributing). The CSO Outfall rarely discharges.
- **Outfalls Nos. 003 (CSO), 006 (Emergency Outfall when Lehigh River levels do not allow for discharge via Outfall No. 001) and Stormwater Outfalls Nos. 007 through 011**: Discharging to Saucon Creek (CWF; Stream Code No. 3345; Natural Trout Reproduction; Impaired by: Urban runoff/storm sewers – siltation per DEP E-maps). Former CSO Outfall No. 004 (formerly on Saucon Creek) is no longer authorized to discharge as it has been replaced by CSO Outfall No. 012 (on the Lehigh River) under the CSO LTCP. The CSO Outfall rarely discharges.
- **WWTP Information**: The (approved 2010) LTCP Section 9 (WWTP Wet Weather Capacity Summary) describes the existing WWTP as a two-stage secondary treatment process after primary treatment. The first 20 MGD flows through the first stage, with 10 – 15 MGD diverted to Stage 2 during wet weather events. The first stage is an activated sludge process (20 – 25 MGD aeration basin with Intermediate Clarifiers) that allows for nitrification depending upon wastewater temperature and operating mixed liquor (MLSS) concentrations per LTCP Section 9.1. Plant experience has shown that aeration limitations, poor sludge settleability, and high clarifier solids loadings can lead to washout of solids from the intermediate clarifiers at flows above 20 – 25 MGD. The second stage of the treatment process is designed to be a nitrification process utilizing the existing Trickling Filters (with ~30 MGD sustained capacity). In August 2016, the WWTP applied Modified Ludzack-Ettinger (MLE) process modifications to the activated sludge process. The City has continued to implement and fine tune this process. (2017 Chapter 94 Section 4.2).
    - The Post Construction Certification for WQM Permit No. 4818402 (headworks upgrades) was received by the Department on 10/13/2021.
    - The facility receives septage.
- **Approved 2010 CSO LTCP Requirements**: The (Approved 2010) LTCP "WWTP Improvements Plan" (LTCP Executive Section, pages ES-4 – ES-5; Section 9.2 "Summary of 2008 Act 537 Recommended Improvements and Impact on Wet Weather Capacity"; Section 13.2 "Plan of Action") included a proposed (unbuilt) new secondary treatment train (extended aeration basins) to enable the WWTP to handle the 50 MGD "hydraulic capacity" (peak wet weather design flow for a POTW with a 20.0 MGD hydraulic design capacity) and other improvements already approved by Act 537 Planning and the Delaware River Basin Commission (DRBC). LTCP Figure 9-3 indicated the "new aeration basins & blower building" were originally projected to be installed by 2016.
    - Older City correspondence/Chapter 94 Reports indicate the new secondary treatment train was the City's chosen option to eliminate in-plant CSO bypasses, etc.
    - The December 14, 2009 DRBC Letter (CSO Expansion, DRBC Docket No. D-1971-78 CP) indicated the "project as described" is not a "substantial addition or alteration under the SPW rules and therefore will not require a NMC to EWQ or natural treatment alternatives (NTA) analysis" (while noting any future changes increasing loading above present 20.0 MGD AADF dry weather and/or 726.5 lbs/day CBOD5 or 1,927.7 lbs TSS loadings might trigger additional requirements). The project was noted to still be subject to DRBC review and approval and assorted DRBC requirements (stand-by power; remote alarms; emergency management plan; and a non-point source pollution control plan (NPSPCP). The DRBC Docket Project Description included the following unbuilt site changes:
        - Second Aeration Treatment Train (4.5 MG)
        - Conversion of existing chlorine gas system to liquid sodium hypochlorite disinfection system
        - Construction of 600,000-gallon sludge storage tank
- **PAG082224 Coverage (Class B Biosolids):** Facility has obtained biosolids General Permit Coverage allowing for beneficial use of biosolids for land application.
- **Bethlehem City MS4 Permit**: The City has an existing Municipal Storm Sewer System (MS4) NPDES Permit ID# PAI132210 for the separated sewer system sewer sheds. The MS4 Permit does not pertain to the Combined Sewer System areas except as the City addresses overlapping system-wide requirements in common documents applicable to both CSS and separated sewer system areas.
- **Potential Facility Rerating**: The NPDES Permit template incorporates the existing WWTP's organic design capacity for Chapter 94 purposes. If the City pursues WWTP rerating (for increased organic design capacity as discussed separately with the Department), any future final Part II WQM Permit would note that the rerated value governs until the NPDES Permit is subsequently amended or renewed.

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- **Compliance History Issues**. See attached Compliance History Section. Main issues include a pattern of Ammonia-N exceedances and SSOs (being addressed by Schedules of Compliance for any recurrent SSO area due to hydraulic restriction) with related information below.

Changes from Previous 2017 Redraft NPDES Permit:

- **General Updating:** Permit has been regenerated with most recent NPDES Permit template language in Parts A, B, and C (including updated Annual Fee section and revised CSO Special Conditions). The regeneration plus deletion of unneeded Copper-related Part C TRE conditions resulted some renumbering.
- **Part A: Minimum Monthly Average Reduction (TSS):** Reporting is required in this permit term as the facility indicated it would pursue the Chapter 92a.47 relief options from the 85% minimum reduction requirement in the LTCP Update. In addition to the Chapter 92a.47 requirements, the TSS loadings must be shown to not be contributing to the existing Lehigh River TSS impairment to obtain relief.
- **Part A: TRC Limits:** Proposed limits deleted from Redraft NPDES Permit. Updated water quality modeling (incorporating site-specific data) showed existing permit limits are adequately protective. See TRC Spreadsheet below.
- **Part A: Ammonia Limits:** The daily max monitoring & reporting requirement was changed to the existing Ammonia-N IMAX limit (as any exceedance of an IMAX limit, of whatever duration, is a violation). Updated modeling showed the existing Ammonia-N permit limits are protective, but it was noted that EDMR was not reporting potential Ammonia-N IMAX exceedances due to EDMR limits coding.
- **Part A: E Coli Monitoring & Reporting:** Monthly monitoring is required for Outfall No. 001 due to new Chapter 93 E Coli Water Quality Criteria. Daily when discharging for emergency Outfall No. 006 and CSO Outfall Nos. 003 and 012.
- **Part A: New limits due to Chapter 92a.12 Requirements:** The 6/12/2019 DRBC Docket No. D-1971-078 CP-4 Table C-2 (DRBC Parameters Not Included in NPDES Permit) requirements, when more stringent than DEP requirements, have been incorporated into the Redraft NPDES Permit per Chapter 92a.12, including:
  - **Total Dissolved Solids (TDS)**: Quarterly TDS limit with (revised) daily max/IMAX limit of 2000.0 mg/l per 2.0 DEP standard sewage multiplier (the 2.5 multiplier is for industrial facilities). The Daily Max limit was set equal to the IMAX limit to ensure reporting (since any exceedance of the IMAX limit of any duration is a violation of the IMAX limit).
  - **Quarterly True Color (Pt-Co Scale)**: Monitoring and reporting requirement
  - **85% CBOD5 Minimum Monthly Average Reduction**: Included.
  - **CBOD5 Influent Monitoring requirement**: Included (in addition to Chapter 94 BOD5 monitoring requirement). **NOTE**: See new Outfall/Internal Monitoring Point requirements due to site-specific issues requiring BOD5 influent monitoring and reporting.
- **Revised Part A Limits/Monitoring Per Reasonable Potential Analysis (Cadmium, Copper, Hexavalent Chromium, Zinc, Total Phenols and Total PCBs Monitoring Requirements):** The Department updated its Reasonable Potential Analysis for Toxic Pollutants with additional site-specific information using the DEP Toxic Management Spreadsheet (attached). The analysis showed only monitoring was required, so proposed Copper limit and Part WQBELs for Toxic Pollutants (limits) condition was deleted. Chloride, Bromide, and Sulfate monitoring is no longer required. See below for related information.
  - **Modeling Assumptions:**
    - **City-provided stream and discharge data:**
      - Stream width: 248 feet
      - Average Stream Depth: 4.97 feet
      - Receiving stream Total Hardness: Used City 2019 Chapter 94 In-stream sampling hardness (64 mg/l) as sampling took place during normal low flow period, and confirmed by other City sampling data (submitted as part of LTCP PCCM stream monitoring).
      - Discharge Total Hardness: 90.3 mg/l.
    - **Stream pH:** 8 SU. The Lehigh River watershed includes areas carbonate/limestone areas. **NOTE**: 9/2/2010 CSO LTCP Table 7-3 indicated 7.7 – 8.2 SU in-stream range.
    - **Stream Temperature:** 25 ºC (WWF stream)
    - **Stream Slope:** Using Upstream Gage 01453000 (Elevation of 210.94 Feet) and Downstream Gage 01457000 (Elevation of 164.3 Feet), separated by ~9.49 miles results in an average slope of 4.914 feet/mile. The distance between Outfall 001 and confluence with Saucon Creek is ~0.04 miles. The elevation change would be ~0.1965 feet.

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- **Ambient Stream Metals:** Used available upstream metal sampling data for 29.6 ug/l Aluminum, 41 ug/l Total Iron and 7.67 ug/l Zinc (other metals were below sample detection limits and not modeled) from 12/15/2017 Sample ID No. 2185758 Sequence No. 255 (about 1.7 mile upstream of Outfall No. 001).
- **Stream LFY and Q7-10 Low Flow at Outfall No. 001 (RMI 9.54):** 0.2898 CFS/square mile LFY (USGS 2011-1070 "Selected Streamflow Statistics for Streamgage Locations in and near Pennsylvania" (1929-2008 data basis)) for upstream stream gage location. 370.944 CFS Q7-10 low flow.
- **Modeling nodes:**
  - Outfall No. 001 (at RMI 9.54): 1280 square miles (from USGS PA Streamstats) at elevation 199 Feet.
  - Modeled Downstream Point (at RMI 9.51, USGS PAStreamstats point just before Saucon Creek confluence): USGS PAStreamstats did not calculate any differences. For purposes of TMS modeling, a minimal change in drainage area (0.5 square miles) and elevation (0.25 feet) was assumed to calculate WQBELs.
- **New Sampling Data & Information:** The new City-provided 2018. 2019, and 2020 analytical information was not provided in the form of NPDES Pollutant Group Tables. Not all Pollutant Group Table constituents were analyzed for, so original application data was inputted for: Aluminum, Barium, Boron, Cobalt, Dissolved Iron, Total Iron, Manganese, and Pollutant Group 7 constituents. Chromium result was unclear if for Total or hexavalent chromium (so used for both constituents). Cyanide result was unclear if Total or Free Cyanide (so used for both constituents). It is assumed that the "effluent- grab-in Composite" sampling/analysis meets the volatile organic chemical composite sampling requirements. Some 2013 original application results used insensitive Non-Detect Levels was replaced by new data meeting DEP Target Quantitation Limits.
  - **Pre-Draft Permit Survey Form for Toxic Pollutants (Copper and Total Phenols)**: The City noted it was uncertain as to the source of Total Copper and Total Phenols, and uncertain about meeting the tentative preliminary limits. No studies were conducted to control these constituents except an old Copper Water Effects Ratio Study (in the 1990s). Additional effluent data was provided in the application. Several IUs have copper pretreatment limits addressed by the existing facility Industrial Pretreatment Plan (IPP).
  - **Updated SIU Information**: The City updated its NPDES Permit Renewal application IU section and provided SIC codes for its IUs. The City also noted that it had been in contact with EPA regarding what is considered a categorical industry and understands that if the industry has no POTW pretreatment limits, then it is not a categorical IU as defined by EPA.
- **Long Term Average Monthly Effluent Concentrations (Arsenic, Copper, and Zinc)**: The City-provided new information was used in TOXCONC Spreadsheet to calculate the LTAMEC and (daily) Coefficient of Variability for use in water quality modeling for those constituents for which there were the minimum 10 samples). Silver was below the identified QL for all samples (preventing TOXCONC from calculating a LTAMEC, so the detected concentration level of (2018-2019 sampling) was used in water quality modeling.

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		Reviewer/Permit Engineer:	Berger
Facility:	City of Bethlehem POTW		
NPDES #:	PA0026042		
Outfall No:	001		
n (Samples/Month):	4		

Parameter	Distribution Applied	Coefficient of Variation (daily)	Avg. Monthly
Arsenic (mg/L)	Delta-Lognormal	0.6953570	0.0012583
Copper (mg/L)	Lognormal	0.3315330	0.0094609
Silver (mg/L)	Delta-Lognormal	#DIV/0!	#DIV/0!
Zinc (mg/L)	Lognormal	0.2040476	0.0750395

- **New Reasonable Potential Results**: Monitoring only was recommended for Cadmium, Copper, Hexavalent Chromium, and Zinc. No limits. Previously proposed limits dropped. Previously required Chlorides, Bromides, Sulfates monitoring is no longer required by the TMS. (Data was being collected by the Department in previous years.) There is an Industrial Pretreatment Program (IPP) in place.
- **Toxic Management Screen (TMS) Output**: See also Water Quality Model Section below.

☑ ***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 Cadmium	Report	Report	Report	Report	Report	µg/L	2.58	CFC	Discharge Conc > 10% WQBEL (no RP)
Hexavalent Chromium	Report	Report	Report	Report	Report	µg/L	46.3	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Copper	Report	Report	Report	Report	Report	µg/L	23.9	AFC	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	Report	Report	Report	Report	Report	µg/L	172	AFC	Discharge Conc > 10% WQBEL (no RP)

- **Other Reasonable Potential Analysis Considerations (Chapter 92a.61):**
  - **Total Phenols**: The historic application data (summarized in the 2021 application update table), with no known source per City, indicated potential for spiking from an unknown source. Monitoring will be required in this permit term to gather information.
  - **Total PCBs**: The Lehigh River is impaired due to PCBs of unknown origin. Annual monitoring has been added to the NPDES permit to gather information.

- **Other Part A.I Changes:**
  - **Part A.I.D and A.I.I: CSO Outfall Nos. 003 and 012:** The existing (CSO) duration monitoring & reporting requirements have been added to the Part A reporting. E Coli monitoring has been added due to new Chapter 93 Water Quality Standards.
  - **Part A.I.H (Stormwater Outfalls):** Chapter 95.2 regulatory limits and TSS Stormwater benchmark condition added. Part A footnote clarifies reporting requirements for representative stormwater sampling.
  - **Part A.I.J (Outfall/Internal Monitoring Point No. 101 (Raw Sewage Influent))**: The Department has created this internal monitoring point/outfall for reporting raw sewage influent monitoring (separate from Outfall No. 001 effluent monitoring) to allow for influent monitoring and to clarify reporting requirements.
    - **Hauled in Wastewater Flows & Loadings**: For purposes of Chapter 94 Reporting (Hydraulic and Organic Loadings), the reporting must account for hauled-in wastewater flows and organic loadings received. This will require calculation using accurate and representative influent sampling data (both piped in influent plus hauled-in wastewater flows/loading).
    - **BOD5/CBOD5 Reporting:** The BOD5 reporting requirement is required due to Chapter 94 Reporting requirements and facility approaching its existing organic design capacity limit. The DRBC Docket specified CBOD5 influent monitoring & reporting, added per Chapter 92a.12. The footnote clarifies that if the City can demonstrate a consistent influent BOD5/CBOD5 correlation, the

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Department retains authority to allow its usage to calculate the BOD5 loading based on CBOD5 influent sampling results. Please note the standard effluent correlation (1.2 BOD5/1.0 CBOD5) is accepted for treated effluent, not influent raw sewage coming in from the collection system and/or hauled-in wastewater (septage).

- **Part C.II (Schedules of Compliance: Ammonia-N)**: The Ammonia-N and SSO Schedules of Compliance have been separated. See Ammonia-N Comment/Response sections (below) for additional changes and related information.
- **Part C.III (Schedule of Compliance: Dissolved Oxygen (DO))**: Reference to TRC has been deleted as updated water quality modeling indicated existing TRC limits are adequately protective. The DO Schedule has been retained in event WWTP upgrades are required to meet the new 4.0 mg/l Instantaneous Minimum Limit. The Department notes the facility should have been monitoring effluent DO in accordance with its DRBC Docket requirements, and now has data to determine if STP upgrading is needed.
- **Part C.IV (Schedule of Compliance: Hydraulic Restrictions resulting in Recurrent SSOs)**: For convenience and clarification, the SSO and Ammonia-N schedules were separated. The purpose for the SSO Schedule of Compliance has been clarified in response to public comments to clearly express the schedule applies to removal of existing hydraulic restrictions that contribute to recurring SSO events. See SSO Comment/Response sections (below) for additional changes and related information.
- **Part C.V (Combined Sewer Overflows (CSO)):** This section has been substantially updated with revised standard Part C permit language and per internal and public comments. See CSO section below for changes and related information.
- **Part C.IX (Stormwater)**:
  - **Stormwater BMPs**: The City's MS4 permit has been incorporated-by-reference to the extent that the City implements common plans for both the CSS (including treatment plant) and Separated Sewer System Areas due to overlapping requirements. The standard TSS benchmark condition has also been added.
  - **Annual Stormwater Report**: Due to CSO/overflow considerations, the condition explicitly requires submittal of the Annual IW Stormwater Report to help demonstrate no negative impacts on the receiving streams.

Public Comments/Responses: The Department has summarized and arranged the comment/responses by topic and by Permit Condition numbering. For the sake of brevity, "no comment" comments/responses have been omitted. See 2/8/2018 Bethlehem Public Comment Letter and Fact Sheet Addendum Communications Log Meeting Summary for complete set of City comments. Comments on deleted permit conditions (due to deleted proposed permit limits/monitoring) were addressed above. Responses are bolded.

Part C.IV (SSO Hydraulic Restrictions resulting in recurrent SSOs) and related NPDES Permit Part B.I.H requirements: The Department has separated out the SSOs into its own Part C.IV Schedule of Compliance as it refers to non-STP areas (unlike the DO or Ammonia-N Schedules). The condition has also been clarified to clearly refer to existing hydraulic restriction resulting in recurrent SSOs. **The City has made progress, but available documentation is unclear if all collection/conveyance hydraulic restrictions contributing to recurrent SSOs have been adequately addressed at this time. It is assumed additional time is required completion of additional separated sewer system upgrades to eliminate hydraulic restrictions. This schedule does not pertain to normal O&M requirements such as the City-commitment to a Fats, Oil & Grease (FOG) Program as part of its Industrial Pretreatment Program (IPP). If there are no remaining collection/conveyance system hydraulic restrictions contributing to recurrent SSOs, the City can pursue "no action" in its Feasibility Study/Final Plan stages or request deletion of this condition.**

Background: To clarify applicable SSO-related requirements:

- **Chapter 92a.51 (Schedules of Compliance)**: "With respect to an existing discharge that is not in compliance with the water quality standards and effluent limitations or standards in § 92a.44 or § 92a.12 (relating to establishing limitations, standards, and other permit conditions; and treatment requirements), the applicant shall be required in the permit to take specific steps to remedy a violation of the standards and limitations in accordance with a legally applicable schedule of compliance, in the shortest, reasonable period of time, the period to be consistent with the Federal Act. Any schedule of compliance specified in the permit must require compliance with final enforceable effluent limitations as soon as practicable, but in no case longer than 5 years, unless a court of competent jurisdiction issues an order allowing a longer time for compliance". The Compliance Milestone date is the "latest acceptable date" for the applicable interim or final compliance milestone.

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- **SSO Schedule of Compliance**: The Chapter 94 Annual Reports had indicated an apparent pattern of recurrent SSO events. The Three-Year SSO Schedule of Compliance is for recurrent prohibited SSOs which are uncontrolled discharges of raw sewage to the waters of the Commonwealth (with potential for public exposure) due to existing hydraulic restrictions in the collection/conveyance system. The SSO Schedule of Compliance was previously proposed in the 2017 Redraft NPDES Permit.
- **SSOs versus CSOs**: The City public comments indicated potential confusion between SSO and CSO requirements, regulations, and applicable permit conditions. To clarify applicable requirements:
    - **Sanitary Sewer Overflows (SSOs):** SSOs are strictly prohibited. SSOs are overflows within the separate sewer system areas that are essentially discharges of raw sewage to the waters of the Commonwealth with potential negative impacts on public health.
        - Redraft NPDES Permit Part B.I.H (SSOs): "An SSO is an overflow of wastewater, or other untreated discharge from a separate sanitary sewer system (which is not a combined sewer system), which results from a flow in excess of the carrying capacity of the system or from some other cause prior to reaching the headworks of the sewage treatment facility". This definition excludes "Combined Sewer System" (CSS) that include CSS sewer sheds, CSS flow-conveying conveyance lines, and overflows in the WWTP itself.
        - Administratively Extended NPDES Permit Part C.I Twelve (retained in Redraft): "Unless otherwise authorized under Part B of this permit, any discharge from any point other than a permitted treatment outfall or permitted combined sewer system is prohibited. See e.g. Section 301(b)(1)(B) & (C); 40 CFR 122.44 & 133.102 (relating to limitations, standards and permit conditions; and secondary treatment). In the event there is a prohibited discharge from a sewer conveyance system, report every such discharge to the Department within 24 hours of the discharge and on your monthly Discharge Monitoring Report (DMR) in the Remarks block. Indicate the date of discharge, action taken and volume of discharge. (40 CFR 122.41(I(6) & (7) (relating to reporting requirements)."
        - SSOs are not subject to CSO-related regulatory options and CSO permit conditions (except as a permittee might voluntarily commit to minimum requirements applicable to both Combined and Separated Sewer System areas in the CSO LTCP) in common O&M documents. For example, the City made a system-wide Fats, Oil & Grease (FOG) Program implementation commitment in the CSO LTCP.
    - **Combined Sewer Overflows (CSOs):** CSOs occur within the Combined Sewer System (CSS) sewer-sheds (including CSS flow-receiving conveyance lines and WWTP) only. The City has estimated that its collection system contains ~40% Combined Sewers (with no CSS areas in the tributary municipality sewer systems).
        - The only permitted CSO discharges are CSO Outfalls Nos. 003 and 012 under the NPDES Permit CSO Permit conditions and approved CSO Long Term Control Plan (LTCP). Previous approval for former CSO Outfall No. 004 usage terminated under the CSO LTCP when the (replacement) CSO Outfall No. 012 became available. Any other overflow in the combined sewer system areas would be an unpermitted CSO (dry or wet weather) subject to CSO-specific requirements. The Department would exercise enforcement discretion as appropriate in event of extreme weather conditions (hurricanes) triggering additional CSO discharges.
        - All CSOs are subject to NPDES Permit CSO-specific conditions including the enforceable narrative Technology-Based Effluent Limits known as the Nine Minimum Controls (NMCs); the enforceable narrative Water Quality-Based Effluent Limits known as the LTCP Goals; and other CSO-specific regulations/permit conditions that do not apply to SSO events.
        - The Administratively Extended NPDES Permit Part C.I Twelve applies to any unpermitted CSO.
    - **In-plant spills, leaks, and other WWTP releases (including overflow events other than at the permitted CSO Outfalls Nos. 003 and 012):** These escape the Part B.I.H SSO definition.
        - The WWTP receives combined sewer system flows, and is subject to CSO conditions.
            - In-plant overflows during influent peak wet weather flows (>20.0 MGD WWTP hydraulic capacity) must meet all CSO-related requirements.
            - In-plant overflows at less than the 20.0 MGD influent flow (WWTP hydraulic capacity) might or might not be classified as CSO events, depending on the case-specific circumstances (cause). The City will have to determine if any overflow event is attributable to CSS flows/loadings.
            - Other in-plant spills, leaks and releases, not related to CSS flows/loadings, are subject to non-CSO compliance reporting requirements.

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- In-plant bypassing is not considered CSO-related unless attributable to >20.0 MGD peak wet weather influent flows and conducted in accordance with the approved LTCP. Other bypassing must meet all Part A.I Additional Requirements, Part A.II bypass-related definitions, and Part B.I.G (Bypassing) requirements.

- **City-Provided SSO Events Information**: In the 2021 Application Update, the City summarized SSO data and indicated significant progress has been made in ending any pattern of recurrent SSO events:
  - Two tables in Attachment No. 4 summarized SSO data included in the City's Chapter 94 Reports. SSO events were generally blamed on debris, grease and/or rags in the collection system**.** The information did not identify/define recurrent overflow locations/areas or their location relative to CSS sewer sheds and/or Conveyance lines that carry CSS flows (i.e. part of CSS areas)**:**
    - 2016: 7 dry weather SSOs, 1 wet weather SSO
    - 2017: 6 dry weather SSOs, no wet weather SSO
    - 2018: 6 dry weather SSOs, 2 wet weather SSOs
    - 2019: 4 dry weather SSOs, no wet weather SSO
    - 2020: 5 dry weather SSOs, 1 wet weather SSO
    - The City's "SSO dashboard" with a map was said to be at the following link (**but the link did not work when tried, resulting in lack of data during Department review with no other identification of recurrent SSO locations available**): https://bethlehempa.maps.arcgis.com/apps/dashboards/b6a522cc84e34a8f8fdfd8a8d5b22e47
  - Work to implement a FOG program in the City is ongoing. **NOTE**: The (approved 2010) CSO LTCP Appendix D (August 2009 Updated Implementation Report for the Nine Minimum Technology Based Combined Sewer Overflow Controls) Section 6.0 (Elimination of CSO Events during Dry Weather) stated the City was "in the process of developing a Fats, Oils and Grease (FOG) Program for implementation through its IPP to further minimize the potential for dry weather SSOs." No copy of the existing FOG Program was found in the submittal or in the 2020 Chapter 94 Report or 2020 Industrial Pretreatment Program (IPP) Report. Attribution of SSO events to grease/debris build-up indicates the existing FOG program might require enhancement.
  - The following is a summary of the City's recently completed, ongoing or planned projects to address SSOs**:**
    - 500 ft of new sanitary sewer main was installed at 3rd Street & Founders Way in 2019 to address capacity issues and alleviate recurring SSOs. **Noted.**
    - Construction will commence in 2021 for replacement and upgrade of approximately 800 feet of sanitary sewer main at 5th & Pierce Streets to address capacity deficiencies as described in the City's Act 537 Plan. **Noted. The project was not defined in terms of benefits in preventing recurrent overflow areas/locations. Act 537 Planning capacity changes are outside the scope of this condition.**
    - Design is underway for replacement and upgrade of approximately 1200 feet of sanitary sewer main along Broadway to address capacity deficiencies as described in the City's Act 537 Plan. This will be the first phase of a multi-phase/multi-year project. **Noted. The project was not defined in terms of benefits in preventing recurrent overflow areas/locations. No overall schedule was provided. Act 537 Planning capacity changes are outside the scope of this condition.**
    - In 2020, the City purchased a second jet flusher truck which, along with reallocation of resources, has allowed the City to triple the total length of collection mains flushed annually. Average length of mains flushed annually for 5 years 2015-2019 = 78 miles; 2020 = 234 miles. **Noted.**
    - In 2020, the City engaged a consultant, MicroSpring, to install biological additives in manholes that can breakdown grease in the collection system. The City has targeted approximately 80 manholes in areas known to be problem spots for FOG. Initial results are positive. This program has significantly reduced the frequency of jet flushing in known grease producing areas as well as reduced the number of backups in these areas to zero. The City will continue to monitor the effectiveness of this program and expand its use if warranted. **Noted.**
    - In 2021, the City engaged a consultant, Duke's 360, to install flow meter in a section of the City's collection system encompassing 60 manholes and 11,300 feet of collection main. Dry and wet weather flows will be measured and modeled to assess pipe condition, and identify I&I and flow capacity issues. Results will be used to target repairs of problem areas. If successful, the City will expand the program to assess additional sections the city's collection system on an ongoing basis. **Noted.**
- City-proposed SSO Schedule of Compliance:

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- **Proposed Combined SSO/CSO Schedule of Compliance**: The City proposed combining the Three-Year SSO Schedule of Compliance with the separate LTCP Schedule of Compliance in the 2/8/2018 Public Comment Letter Item 9. **The Department could not agree to combining the SSO and CSO Schedules of Compliance. CSO-specific regulations, policies, and NPDES permit conditions (including schedules of compliance) do not apply to SSOs. Any misidentified CSO would be subject to the CSO Implementation Schedule.**
- Request for a >3-Year SSO Schedule of Compliance (see 2/8/2018 Letter Item 9 combined SSO/CSO Schedule): **The Department could not grant any extension to the Three-Year SSO Schedule of Compliance in the absence of demonstrated need for additional time to eliminate any existing hydraulic restriction contributing to recurrent SSO events and applicable interim compliance milestones (no more than 1 year apart). As the City has indicated significant progress in terms of completed/proposed City projects, no additional time appears needed at this time.**
  - 12-Month SSO Feasibility Study Stage (12 months after PED): **Same as existing proposed SSO Schedule.**
  - 24-Month Final Plan Stage (24 months after PED) including submittal of Part II WQM permit Application for Design: **Final Plan stage proposed SSO Schedule.**
  - Proposed 36-Month WQM Permit Application Submittal (36 months after PED) citing also CSO-related work: **The Department could not grant this request.**
    - **Most sewer system O&M and replacement projects do not require permitting when done to eliminate an existing hydraulic restriction. Without an identified project and time-frame, no additional time was justified. The SSO Schedule of Compliance is meant to correct hydraulic restrictions causing recurrent prohibited SSOs as soon as practicable, not to address other capacity issues (present or future). The permittee can contact DEP Planning Section directly about any Act 537 Planning requirements for any future proposed capacity increases.**
    - **CSO-related actions such as river study, LTCP letter report, PCCM or LTCP update are irrelevant to SSOs.**
    - **This schedule of compliance does not address O&M Plans including the FOG Program implementation.**
  - 48-Month Completed LTCP Update Stage (48 months after PED): **This requested interim compliance milestone could not be granted. No identifiable SSO-related action.**
  - Final Compliance with Effluent Limits (36 months after PED): **The condition has been clarified that the effluent limits for SSOs is "zero discharge" from any recurrent SSO. The Department will take compliance action as appropriate in event of future SSO events.**
  - Report Submittals and Construction Progress Reporting: **Per DEP internal comments, the reporting of SSO-construction work has been changed to monthly with required submittal of the Feasibility Study and Final Plan to document progress for the public record. The Department also requests that any significant changes to SSO-related O&M be noted in the Monthly Reports to document any progress for the public record and compliance monitoring purposes.**

Ammonia-N Background: The facility has had a long-term pattern of exceedances of existing monthly average Ammonia-N limits (with no EDMR reporting of IMAX exceedance). Previous City-identified Ammonia-N exceedance causes included: Biomass solids discharge due to Intermediate Clarifier freezing and thawing; Solids backlog; Cold weather impacting nitrification in aeration basins and intermediate clarifiers; operational, mechanical, and disposal issues with the temporary sludge dewatering facility; high strength centrate (pass-through) including new ammonia-N loadings from new centrifuges; conversion problems to a "modified MLE" (Modified Ludzack-Ettinger) process (for a treatment plant not originally designed for that process); wet weather flows; washouts; etc. The City also noted these causes might have contributed to or caused TSS and pH exceedances. The Department also considers potential inadequate overall plant aeration capacity and impaired Trickling Filters (frozen "arms" and cold weather impacts) as likely contributing factors. Per the 2010 Long Term Control Plan (LTCP) Section 9, the facility has a two-stage nitrification system, with initial nitrification in the Aeration Basins (Stage 1) and additional nitrification in the Trickling Filters (Stage 2). See compliance history section for recent compliance.

- Chapter 92a.51: The long-term pattern of Ammonia-N exceedances are exceedances of existing Monthly Average and/or Instantaneous Maximum (IMAX) permit limits. Per Chapter 92a.51: "With respect to an existing discharge that is not in compliance with the water quality standards and effluent limitations or standards in § 92a.44 or § 92a.12 (relating to establishing limitations, standards, and other permit conditions; and treatment requirements), the

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applicant shall be required in the permit to take specific steps to remedy a violation of the standards and limitations in accordance with a legally applicable schedule of compliance, in the shortest, reasonable period of time…" (underlining added). The burden falls on the City to show that any additional time is needed.

- The 2017 Chapter 94 Report included the following information: In the 2017 Chapter 94 Report, the City noted that it had already taken many actions to help resolve the Ammonia-N issues including: Implemented Modified MLE treatment process in 2016; Increased Return Activated Sludge (RAS) flow rates (use of spare 5 MGD RAS pump) in 2016 and installation of an additional (temporary) 3 MGD RAS pump in 2017; Modified operation of centrate equalization tanks to manage recycled ammonia loadings; Daily addition of Bio-augmentation of cold weather organisms (to enhance BOD removal) and nitrifying organisms (Ammonia treatment); Planned installation of HACH Monitoring System to include ammonia, nitrate and ORP probles to allow for better Treatment Plant decision-making and operational decisions. The City noted that it planned to investigate potential modifications to the Trickling Filters in 2018 to improve flow distribution.
- 2/8/2018 Bethlehem Letter Public Comment Information regarding Ammonia-N Issues: The City noted it was proactively working on resolving the recurring Ammonia-N violations via the following:
    - Initiated Study "to identify the current Ammonia-N treatment needs and potential approaches for a path forward to address the needs in a holistic fashion".
    - Implemented the Modified Ludzack-Ettinger (MLE) Process in 2016, with ongoing optimization efforts. Including increased Return Activated Sludge (RAS) flow rates via starting to use a "spare" RAS pump (5 MGD) in 2016. Installed an additional (temporary) RAS pump (RAS) in April 2017.
    - Modification of centrate equalization tanks to manage recycled ammonia loadings.
    - Daily addition of bio-augmentation (Toler-X cold weather organisms (BOD removal) and nitrifying organisms (ammonia treatment))
    - HACH Monitoring System (purchased December 2017, to be installed in Spring 2018) which includes ammonia, nitrate and ORP probes for continuously monitoring aeration tank to inform WWTP staff decision-making regarding operational adjustments (e.g., DO levels, enlarge/reduce anoxic zone size, RAS and/or WAS rates) as needed to maintain nitrification and good overall system performance.
    - The City is planning to investigate potential Trickling Filter modifications in 2018 to improve flow distribution across media (e.g., temporary grid system or other enhancements).
- The 2019 Chapter 94 Report included the following information:
    - The 2019 Chapter 94 Report (Sections 2.1.6) noted the City had hired a technical consultant to review the 2012 Act 537 Plan and to provide recommendations based on current WWTP and collection system conditions and provide recommendations for process improvements based on conditions and potential advances in treatment technologies. The Chapter 94 Report indicated that the review would address wet weather improvements which should allow secondary treatment of all flow to alleviate in-plant bypasses and solids washouts. COB anticipates receiving a final report in 2020.
    - The 2019 Chapter 94 Reports also included noncompliance notification requirements indicating the City is proceeding with the design of "centrate side stream treatment system to manage the additional ammonia loading from the centrifuge dewatering operation". Other City noncompliance correspondence noted the City had Act 537 Plan approval for an additional 4.5 Million Gallon of aeration capacity that should allow full secondary treatment of all flow without concern for hydraulic overload and solids wash-outs (that is also expected to address ammonia-N treatment per the CSO Long Term Control Plan).
    - The 2019 Chapter 94 Report Section 2.2.4 stated the City has contracted AECOM Engineers to review its current Act 537 Plan and provide recommendations for process improvements based on current WWTP and collection conditions and potential advances in treatment strategies. The 2019 Chapter 94 Report Section 2.1.6 noted the Report would include wet weather improvements "which should allow secondary treatment of all flow to alleviate in-plant bypasses and solids wash-out". Previous Chapter 94 Reports indicated the City had previously investigated other plant upgrade options such as UV disinfection.
- The 2020 Chapter 94 Report included the following information:

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In 2019, the City solicited proposals from qualified and experienced engineering consulting firms to conduct a review of the City's Act 537 Sewage Facilities Plan Update Revision ("Act 537 Plan"). The City contracted with AECOM Technical Services, Inc. to review its current Act 537 Plan and provide recommendations for process improvements based on current WWTP and collection system conditions and potential advances in treatment strategies.

In 2020, AECOM submitted the "Act 537 Sewage Facilities Planning Review" to the City. Also, AECOM completed the following reports: "Influent Sampling Improvements Concept", "Hydraulic Modeling and Intermediate Settling Tank Preliminary Design Memo", "Chemically Enhanced Primary Treatment Preliminary Design Memo" and "Aeration Demand and MLE Evaluation Design Memo".

In 2021, the City and AECOM will be proceeding with design projects including the Chemically Enhanced Primary Treatment (CEPT) Final Design and the Aeration Demand and MLE Preliminary Design. In addition, the West Secondary Clarifier Upgrade Project should be completed.

- **2022:** The City has submitted a separate Part II WQM Permit Amendment Application No. 4818402-A1 for a Chemically Enhanced Primary Treatment Project (CEPT) to increase primary settling by the addition of a coagulant and polymer at the primary clarifiers). The WQM Amendment Application stated: "CEPT will improve nitrification stability by reducing the organic and solids load to the secondary process, which in turn decrease waste activated sludge (WAS) production and increases solids residence time (SRT) at the same Mixed Liquor Suspended Solids (MLSS) to improve nitrification stability and ammonia treatment". CEPT was also indicated "to improve the City's wet weather treatment strategy. When wet weather flow exceeds the process capacity of the aeration basin, additional flow is diverted to 4 trickling filters and the enhanced primary settling efficiency from CEPT reduces BOD and TSS loading to the tricking filters, final settling and disinfection systems".

- **Part C.IV (City-proposed 54-month Ammonia-N Schedule of Compliance)**: The City requested alternate milestone schedule and date of compliance with existing Ammonia-N limits in the 2/8/2018 Public Comment Letter Item 1:
  - **General:**
    - **Documented progress (see above) indicates this public comment is obsolete. Workable options exist including repair and return to full functionality the Trickling Filters (which are part of the facility's two stage nitrification a.k.a. Ammonia-N reduction process) if that would resolve the Ammonia-N issues.**
    - The City noted that if the facility could demonstrate compliance with all existing Ammonia-N limits within the 12-month Feasibility Study, then no further action might be required per January 16, 2018 Meeting discussions. **The Department concurs but notes Ammonia-N exceedances continued into 2021. The City could provide a written determination that the feasible option/final plan is "no further action" if it will be able to comply with the permit limits throughout the NPDES permit term. Future permit limit exceedances would be subject to the appropriate compliance action.**
  - 12 months (after PED) for Feasibility Study (with no further action if the City achieves compliance during this stage): **Same as existing proposed Schedule.**
  - 24 months (after PED) for Final Plan Letter (reporting status of studies and design work performed to date; additional sampling results performed or intended to be performed; initial results of Trickling Filter modification or other field testing as available; and schedule of activities planned in following year toward Final Plan completion): **Same as existing proposed Schedule. Detailed design, permitting and financing can be addressed in this stage due to City-documented progress (see public comments below) and previous Planning/DRBC approval of a second aeration treatment train. The City noted it**

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was looking at potential design bases as one reason for delay. Besides its consultant's report (noted above):

- **The existing WWTP design basis is found in the existing NPDES/WQM permits (incorporating applications by reference), Redraft NPDES Permit, DRBC Docket requirements, existing Act 537 Planning, and existing influent data (DMRs and Chapter 94 Reports). Future Planning will not impact existing permit limits.**
- **The DRBC should be directly contacted regarding potential DRBC Docket permit limits triggered by any proposed WWTP modifications during the feasibility study stage.**
- **Technical guidance regarding minimum design requirements is available from the DEP (including the Domestic Wastewater Facilities Manual (DWFM) and DEP SOPs for WWTP permitting) to help evaluate options. Other industry and/or technology-provider guidance is also available to help evaluate potential options upfront.**

- 36 months (after PED) for completion of Final Plan and Submittal of any required Part II WQM Permit Application: **The Department could not grant this request. A Part II WQM Permit Amendment Application No. 4818402-A1 for a Chemically Enhanced Primary Treatment Project (CEPT) to help improve ammonia-N reduction has been received. In event another WWTP upgrade is required (sidestream ammonia-N treatment; construction of DRBC/Planning-approved Second Aeration Train or other), a complete and technically adequate Part II WQM Permit Application submittal is subject to DEP Permit Decision Guarantee time-frame of 90 days for permit action.**
- 42 months (after PED) for Construction Start: **The Department could not grant this request. The existing Schedule provides ample time for construction and coming into compliance.**
- 54 months (after PED) for Construction End: **See above.**
- Date of compliance: Not specified: **See above.**

EPA Part C.II (Schedule of Compliance: Ammonia-N and SSOs) Comment:

- The fact sheet states that the facility continues to have Ammonia-N exceedances and Part C of the draft permit provides three years to comply with the final limits; however, the WQBEL for this pollutant was already in effect in the previous permit. 40 CFR 122.44(l)(1) states that when a permit is renewed or reissued, interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit (unless circumstances that formed the basis of the previous permit have materially and substantially changed). Since the ammonia-nitrogen WQBEL was already in effect in the previous permit, affording a compliance schedule to meet the existing WQBEL would be considered backsliding per 40 CFR 122.44(l)(1). Any proposed permit requirement that is less stringent, would need to meet one of the exceptions listed under 40 CFR 122.44(l)(2)(i). Based on the discussion in the fact sheet it does not appear that the exceptions apply, so it is our position that a compliance schedule should not be granted for Ammonia-N.
  - **No change in established permit limits have been proposed. Chapter 92a.51 (Schedules of Compliance) states "With respect to an existing discharge that is not in compliance with the water quality standards and effluent limitations or standards in § 92a.44 or § 92a.12 (relating to establishing limitations, standards, and other permit conditions; and treatment requirements), the applicant shall be required in the permit to take specific steps to remedy a violation of the standards and limitations in accordance with a legally applicable schedule of compliance, in the shortest, reasonable period of time, the period to be consistent with the Federal Act. Any schedule of compliance specified in the permit must require compliance with final enforceable effluent limitations as soon as practicable, but in no case longer than 5 years, unless a court of competent jurisdiction issues an order allowing a longer time for compliance." (Underlining added.)**
    - **The Ammonia-N effluent limits are the existing permit limits. See Ammonia-N comment/responses for related information.**
    - **SSO effluents limits are existing "no discharge" limits due to existing prohibitions.**
    - **The Schedule also addresses the prohibition against interim milestones more than one (1) year apart.**
- The permit should not provide a compliance schedule to address collection system SSOs, since SSOs are not authorized by the permit. **Chapter 92a.51 (Schedule of Compliance) addresses schedules of compliance for facilities to come into compliance with existing permit limits ("no discharge limits" in the case of SSOs). The SSO Schedule of Compliance was proposed due to hydraulic restrictions in the old City**

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collection/conveyance system that might require major sewer projects to eliminate. The scope of the Schedule of Compliance has been clarified in the Redraft NPDES Permit

- If time is needed for the facility to come into compliance with these permit requirements and collection system issues, additional time could be afforded through an enforcement action outside of the permitting process.
    - **The Department believes an enforceable NPDES Permit Schedule of Compliance is an alternative method of resolving the issues in accordance with Chapter 92a.51: "With respect to an existing discharge that is not in compliance with the water quality standards and effluent limitations or standards in § 92a.44 or § 92a.12 (relating to establishing limitations, standards, and other permit conditions; and treatment requirements), the applicant shall be required in the permit to take specific steps to remedy a violation of the standards and limitations in accordance with a legally applicable schedule of compliance, in the shortest, reasonable period of time, the period to be consistent with the Federal Act. Any schedule of compliance specified in the permit must require compliance with final enforceable effluent limitations as soon as practicable, but in no case longer than 5 years, unless a court of competent jurisdiction issues an order allowing a longer time for compliance." (Underlining added)**
    - **The Department concurs that a CO&A is a desirable method of resolving noncompliance with NPDES permit requirements, but it is not the only one. The Department believes that an enforceable NPDES Permit Schedule of Compliance can be used in the absence of a negotiated CO&A and/or concurrently with a negotiated CO&A. The Department does not believe the public or environment is served by delaying permit actions (or postponing enforceable compliance milestones) by a potentially lengthy CO&A negotiation.**

CSO-related (NPDES Permit Parts A.I.D, A.I.I, A.I.K, C.V, and C.VI):

Background: The 2009 (approved 2010) CSO Long Term Control Plan (LTCP) and existing administratively extended NPDES Permit CSO conditions are presently in effect. US EPA previously commented that the CSO LTCP should be updated in public comments received for the Draft NPDES Permit to address assorted documentation issues. The US EPA CSO-related comments were previously forwarded to the City for their consideration. US EPA later made statewide general objections to standard NPDES Permit Part C CSO permit condition language, which has since been resolved by updated Part C CSO condition language (incorporated into this Redraft NPDES Permit). The new E Coli Chapter 93 Water Quality Standard now applies to the receiving streams.

General (Statewide) EPA CSO Comments Received: EPA had previously commented on the old Part C Standard Template CSO language. **The Department and US EPA have agreed upon new CSO-related standard language that has been incorporated into this Redraft NPDES Permit. In addition:**

- Request for the NPDES Permit to incorporate Specific NMC requirements as metrics and delete references to approved LTCP and NMC Documentation:
    - **The Part C Conditions now include assorted (Approved 2010) CSO LTCP NMC commitments.**
    - **The LTCP Implementation Schedule includes new LTCP Update milestones.**
    - **The Department has incorporated language allowing the City to make a final choice of its LTCP Goal in the LTCP Schedule of Implementation due to the new E Coli Water Quality Standard (that might impact the final City choice of achievable Goal).**
        - **The City indicated it wanted the 6 CSO Event/year Presumption Goal (but the Presumption Goals is not automatically available when there are stream impairments such as the Lehigh River CSO-related TSS impairment). The new E Coli WQS must also now be addressed. Additional supporting data/analysis is required to verify the Presumption Goal is adequately protective.**
        - **The Approved 2010 CSO LTCP Section 6.3 Conclusions indicated the City believed that it could comply with both the 4 CSO Events/year and 85% Capture/minimum treatment Presumption goals. The LTCP Update will clarify if the Presumption Goal(s) are achievable and applicable given ongoing stream impairments.**
        - **The CSO LTCP Post-Construction Monitoring Plan will have to be updated with updated data/analysis.**

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- **Previous CSO-related EPA Comments**: The previous CSO-related EPA public comments were previously forwarded to the City for consideration when updating the CSO LTCP (according to the CSO LTCP Schedule of Implementation).

EPA Comment Regarding the Appropriateness of the Part C.V CSO Compliance Schedule: The permit affords a compliance schedule to implement the LTCP and meet the CSO performance standard. Specifically, the permit uses language such as: "The long term goal of the LTCP requirements…is to achieve compliance with the state water quality standards upon completion of the LTCP implementation."; "The permittee shall implement…the CSO controls identified in the LTCP pursuant to the LTCP implementation schedule, which is incorporated herein by reference."; and includes a "Combined Sewer Overflow Compliance Schedule". However, no discussion is provided in the fact sheet regarding the appropriateness of including such a schedule. EPA's 1994 CSO Policy requires that all Phase II Permits contain WQBELs requiring compliance with, no later than the date allowed under the State's water quality standards, the numeric performance standards for the selected CSO controls. Any such compliance schedule in the permit would, therefore, need to be accompanied by a fact sheet discussion that addresses issues such as:

- The ability of the permit to include a schedule for complying with water quality standards no later than the date allowed under the state's water quality standards (for example, if PA's bacteria standards were adopted prior to July 1, 1977, a compliance schedule in the permit would not be appropriate to meet those standards – see the attached 2007 EPA Hanlon Memo regarding Compliance Schedules for Water Quality-Based Effluent Limitations in NPDES Permits).
- How the permit meets PADEP's regulation at 25 Pa Code 92a.51, which limits schedules of compliance to no longer than 5 years unless a court of competent jurisdiction issues an order allowing a longer time for compliance. Since previous permits have already allowed time for compliance with CSO water quality requirements, the time afforded by 92a.51 has already passed.
- EPA attached its proposed changes to the Part C CSO condition to address the compliance schedule concerns. Additional proposed changes include recommendations for the NMC language, inclusion of a specific requirement to implement an approved Post Construction Compliance Monitoring (PCCM) plan, and requests clarification of the performance standard language for the permittee's selected alternative. EPA recommends that any CSO activities to be performed in the permit cycle be added directly under the Schedule Activity Description heading

To clarify the Fact Sheet:

- **The Department and EPA have resolved general statewide objections to the Part C CSO language with agreed-upon language. The Department is presently working on revising the Chapter 92a.51 (Schedule of Compliance) to allow for longer CSO-related schedules of compliance (per the agreement with EPA). See above SSO-related discussions about appropriate enforcement documents and general applicability of Chapter 92a.51 in general.**
- **A revised LTCP Implementation Schedule a.k.a. Schedule of Compliance is required because site-specific issues cannot be resolved upfront.**
    - **The existing Approved 2010 CSO Long Term Control Plan (incorporated by reference into the prior NPDES Permit) included an existing multi-year compliance schedule that was not limited to the previous NPDES Permit term and was essentially open-ended (milestone completion dates for assorted Treatment Plant upgrades and "final completion" not specified) due to the nature/magnitude of LTCP-related milestone requirements (including substantial Treatment Plant upgrades that remain to be designed, permitted, and constructed).**
    - **The City separately indicated it delayed designing/permitting/constructing some LTCP-approved construction (4.5 MG Extended Aeration Train) because of lack of previous need with the facility receiving ~50% of NPDES Permit basis flows. The Redraft NPDES Permit is setting forth a Final LTCP Compliance date of December 31, 2042.**
    - **The new Chapter 93 E Coli Water Quality Standard applies, which require updating of the CSO LTCP.**
    - **The Presumption Goals are not automatically applicable when there are existing stream impairments which CSO discharges can contribute to. The Lehigh River is presently impaired by TSS from CSO sources. The CSO LTCP Update would have to show that any proposed Presumption Goal is adequately protective of the receiving stream or otherwise demonstrate no impact (a higher burden). This would require additional data/analysis in a substantially updated LTCP Update.**
- **Substantial Progress has been made**: **Substantial LTCP-related progress has been made in implementing the existing LTCP Schedule (i.e. elimination of CSO Outfall #004 on Saucon Creek; replacement CSO Outfall #012 on Lehigh River; new pumps to increase ability of Treatment Plant to handle higher peak wet weather**

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influent flows, etc.). CSO discharges have been substantially reduced since 2010 (to zero in some recent years).

Part A.I Additional Requirements 85% TSS and CBOD5 Minimum Monthly Average Removal): The City noted that its plants receives flows from combined sewers and requested relief from the 85% minimum monthly average reduction requirements under Chapter 92a.47(g) and 40 CFR 133.103(a) by excluding data during the (sampling) days when the plant receives flows greater than 20 MGD. **The Department could not grant this request in part. Chapter 92a.12 would prohibit any relaxation of the DRBC Docket's 85% minimum monthly average CBOD5 reduction requirements. The City public comments did not meet the Chapter 92a.47(g) regulatory requirement for relief of the existing TSS requirement. There is an existing TSS impairment issue in the receiving stream which must also be addressed in any relief request. To clarify minimum regulatory requirements:**

- **Chapter 92a.47(g): "**POTWs subject to this section may not be capable of meeting the percentage removal requirements established under subsection (a)(3) during wet weather, where the treatment works receive flows from combined sewers (that is, sewers which are designed to transport both storm water and sanitary sewage). For those treatment works, the decision must be made on a case-by-case basis as to whether any attainable percentage removal level can be defined, and if so, what the level should be.**" The City did not identify/define site-specific attainable percentage removal values to obtain any coverage under this regulation. There are no regulatory provisions allowing for ignoring accurate sampling results from required monitoring/reporting/compliance. The City can pursue the Chapter 92a.47(g) option in the CSO LTCP Update for TSS reduction but ongoing receiving stream TSS and siltation impairments might not allow for any relief. If approved in a CSO LTCP Update, a major NPDES Permit Amendment would be required to change the CSO LTCP Goal.**
- **40 CFR 133.103(a): This regulation was not incorporated by reference by PA regulations, but mirrors Chapter 92a.47(g).**

Part C.VI.C.2 (LTCP Presumptive Goal): The City requested a six (6) CSO events per year LTCP Presumption Goal in the final NPDES permit. **The Department could not grant this request at this time and has included permit language allowing the City to make its final choice of LTCP Goal in a required LTCP.**

- **The Presumption Goals presume that there is no ongoing stream impairment attributable to the CSO discharges. The Lehigh River is impaired by TSS from CSOs, with the impairment beginning in Lehigh County (i.e. other sources are contributing). The City will have to show that its infrequent CSO discharges are not contributing to the existing impairment in the LTCP Update.**
- **The existing (Approved 2010) NMC/PCCM Stream Monitoring (including previous base line monitoring data) is now outdated (due to the new E Coli Water Quality Standard, lack of analysis of collected E Coli stream/CSO data, etc.) and cannot presently demonstrate compliance with WQS.**

Part C.VI.C.3 (LTCP Implementation Schedule):

- **City Workload Concerns**: The City stated that the NPDES Permit requires "numerous other studies and documentation (e.g. SSO study, ammonia-N study, O&M updates, etc.). and increase monitoring demands" (not specified) in addition to river monitoring to assess impact of CSO Outfall No. 012 (Lehigh River) and potential site-specific criteria for copper and TRC limits (pending City review of revised permit limits). Any proposed plant Ammonia-N treatment modification should be developed first to be taken into account by the LTCP and which might impact peak system flows. **This comment is now obsolete due to the City-identified progress in terms of the separate requirements. Adequate time has been given in the NPDES permit conditions for all submittals.**
  - **Ammonia-N**: **No "ammonia-N" study is needed to meet existing permit limits. The City has had ample time to investigate assorted options as noted above.**
  - **SSO Issues: The City has made significant progress in resolving recurrent SSO issues as discussed above. The City should be able to identify any remaining hydraulic restrictions triggering recurrent SSOs.**
  - **Copper TRE**: **As the proposed new permit limit has been dropped, no additional requirements pertain.**
  - **TRC: As the proposed revised permit limit has been dropped, no additional requirements pertain.**
  - **Dissolved Oxygen (DO): As DO monitoring is a present DRBC Docket requirement, the City should be able to determine whether the proposed limit can be met.**
  - **O&M Updates including High Flow Management Plan (HFMP): The City should be able to update and consolidate all site O&M Plans as needed.**

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- City proposed combined SSO/CSO LTCP Schedule: **The Department could not combine the two Schedules of Compliance due to conflicting statutory, regulatory, and permit condition requirements as noted above.**
- CSO Schedule of Compliance:
  - 12 months after PED: The City proposed a SSO Feasibility Study interim milestone and delayed submittal any CSO LTCP Update "if needed" to the 48th month of the NPDES permit term. **The Department could not grant this request.**
    - **SSO milestones cannot be used in the CSO Schedule of Compliance as stated above.**
    - **Chapter 92a.51 prohibits interim milestones more than one (1) year apart. The City has not proposed interim milestones.**
    - **The LTCP Update is required upfront:**
      - **LTCP Obsoleteness: The LTCP is now substantially obsolete due to old data/analysis, assorted site changes, the new E Coli Water Quality Criteria, and new CSO-related permit conditions that will become effective on the Final NPDES Permit Effective Date. It must be updated to verify compliance with all permit conditions and to include up-to-date information, data and analysis. The US EPA also noted assorted documentation issues in its public comments (previously forwarded to the City).**
      - **CSOs: The Department requires written verification that none of the identified SSOs are within the CSS collection/conveyance areas (i.e. not misidentified dry or wet weather CSOs).**
      - **NMC/PCCM Stream Monitoring: The Approved 2010 LTCP Section 14.2.6 required all monitoring data be used to determine whether or not the remaining CSO discharges preclude the attainment of the water quality standards in the receiving streams. No such evaluation or determination by the City has been located.**
  - 24 months after PED:
    - The City proposed a SSO Final Plan and Submittal of WQM Permit Application Design (SSOs). **SSO milestones cannot be used in the LTCP Implementation Schedule as stated above.**
    - To "initiate river study to determine impact since the CSO Outfall #012 was put into service and determine if LTCP measures have been met (presumptive goals valid)". **The River Study implementation milestone has been incorporated, which presumes prior submittal of a River Study Plan for Department review and approval.**
  - 36 months after PED: Complete river study, submit letter report whether LTCP measures have been met and presumptive goals are valid, and move to post-construction monitoring, or if update to the LTCP is required. **The Department could only grant this request in part:**
    - **Determination of validity of any Presumption Goal requires showing that the CSO discharges are not contributing to stream impairments, including existing TSS impairment and/or exceedance of pathogen (Fecal Coliform and E Coli) Water Quality Standards.**
    - **The Department has moved the proposed "River Study Report" submittal milestone to the 48th Month (below) to allow for more time to gather information on impact of CSO events on receiving streams if the initial River Study results are inconclusive.**
    - **The next LTCP Update would be required on the 54th month (see below).**
    - **Reporting of compliance with the NPDES Permit-identified and/or LTCP-identified LTCP Goal and NMCs is an Annual CSO Status Report requirement that cannot be deferred.**
  - 48 months after PED: Submit completed LTCP Update (if necessary based on prior 36 month Interim Milestone). **This milestone has been moved to 54th month in accordance with Department requirements for the CSO LTCP Updates to be included in the NPDES Permit Renewal Application.**
  - **54 months after PED: Final LTCP Plan and Final PCCM Plan submittal (concurrent with next NPDES Permit Renewal Application).**
  - **December 31, 2042: Final Compliance date based on the facility presently receiving 50% of NPDES Permit-basis flows and no present plan to construct remainder of 2010 LTCP Upgrades (new secondary treatment train, etc.).**

NPDES Permit Part C.III (Maximizing Treatment at Existing POTW a.k.a. Internal WWTP CSS bypassing): The City took no exception to this CSO bypassing condition, noting that flows up to 30 MGD are processed through secondary treatment (including existing Trickling Filters) with in-plant bypass around secondary treatment initiated for flows exceeding 30 MGD as per the approved CSO LTCP. **The Department is providing the following additional clarifications**:

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- **The condition requires "maximizing treatment" of peak wet weather combined flows to the required standard (secondary treatment as much as possible, and then allowing for in-plant bypassing of secondary treatment units while achieving minimum treatment requirements) in the context of the CSO Nine Minimum Controls (NMCs) and Long Term Control Plan (LTCP) requirements.**
- **In practical terms, if WWTP upgrades (construction and/or O&M) allow for further maximization of treatment, then the City should do so and update the LTCP as needed. The City-cited figures represent the "minimum" expected standards based on prior existing conditions at the facility. The City has substantially modified its overall treatment process (going to the MLE process in 2016; installing additional process sensors/SCADA provisions to allow for better operational control in 2018; completion of CSO No. 012 project-related internal pump station(s); concurrent WQM Permit Application for new influent screens (with greater capacity to handle influent flow rates). Therefore, each LTCP Update should include an evaluation of whether treatment can be further maximized.**

Other Public Comments and Responses:

PA Osmotic Pressure Criterion (Part A-related): EPA forwarded a general comment about the PA Osmotic Pressure WQS criterion and water quality modeling. Per Chapter 93.1, "osmotic pressure" (OP) is "The pressure which, when applied to a solution, will just prevent the passage of solvent—usually water—from an area of low solute concentration through a semipermeable membrane to an area of high solute concentration" (i.e. it would be related to the water/wastewater's salt ions content and can impact living biological cells). Per Chapter 93.7, the OP WQS is "Maximum 50 milliosmoles per kilogram". Per the (forwarded e-mail) discussion between EPA and DEP Central Office, the osmotic pressure criterion should be modeled as an acute criterion in water quality modeling (not chronic criterion), which in practice might impact larger streams where complete mixing is not achieved within 15 minutes. **The Department considered the (forwarded) EPA e-mail as a public comment on the Bethlehem WWTP NPDES Permit:**

- **Per the discussion between EPA and DEP Central Office, the next DEP water quality modeling update (addressing triennial WQS changes in 2018) will modify the DEP water quality modeling as needed to address Osmotic Pressure (OP) water quality modeling issues. The Department will further address this issue in the next NPDES Permit Renewal. DEP retains broad authority to reopen the permit if needed in the future.**
- **Reasonable Potential Analysis Update: At present, there is no data indicating reasonable potential for exceeding the OP WQS:**
    - **Osmotic Pressure is not a known problem in the receiving Lehigh River at the Bethlehem WWTP discharge point per the DEP Biologist. Osmotic Pressure would be a potential consideration if the receiving stream was known to be impacted by (very) high salt run-off and/or other known salt sources. No such sources are known to be near the Outfall #001 discharge.**
    - **The Bethlehem WWTP domestic wastewater effluent is not expected to have salt content outside the normal range for domestic wastewater. The (Rev. 4/2005 and existing Rev. 11/2016) Major Sewage NPDES application form Pollutant Group Tables did not require osmotic pressure data (or specific conductivity which is another measure of salt ions content in water/wastewater). However, the NPDES application form (Rev. 4/2005) reported 728 mg/l (influent) and 446 mg/l (effluent) TDS (max daily value) and 96 mg/l (influent) and 112 mg/l (effluent) Total Hardness (CaCO3 max daily value). The values are within the normal range for domestic wastewater. Nothing triggered in the application triggered the need for additional OP and/or Specific Conductivity data during the technical review.**
    - **The potential for OP-related issues is indirectly addressed by the Total Dissolved Solids (TDS) limits.**

NPDES Permit Part A Additional Requirements Item 1.d (Narrative Limits for Foam, color, odor and turbidity): Requested Clarification of Standard: The City requested clarification in order to determine compliance. The City indicated it was concerned about the liability exposure of the City's Certified Operators. Certified Operators are legally required to recognize actual or potential permit violations and report to the City any such occurrence, its cause, the process control decisions necessary to correct it, and the probable effect on human health and the environment (25 Pa. Code 302.1201(c)). Violations of any permit condition is reportable to DEP. Failures to abide by these regulatory requirements can result in significant financial penalties to the City and its individual operators. The City indicated it was concerned that there was "no discernible standard of compliance with the narrative limits as stated in the Permit (i.e., the term "observable change" is not defined), and therefore it is impossible to tell when a violation occurs. The City then referenced a statement by a former DEP

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employee from an unidentified August 17, 2016 meeting to the effect that "DEP Inspectors have been instructed by Central Office that an "observable change" is one that is obvious, objectionable, and significant". The City noted that it would accept that definition of "observable" without objection, but otherwise requested a description of how the City is to identify an "observable changes" so that the requirement can be met. **Please accept the following clarification:**

- **NPDES Permit Condition language: "For the purpose of determining compliance with this condition, DEP will compare conditions in the receiving water upstream of the discharge to conditions in the receiving water approximately 100 feet downstream of the discharge to determine if there is an observable change in the receiving water."**
  - **The Department cannot waive or redefine existing Chapter 92a regulatory language.**
  - **The permit condition language clarifies the normal points used for comparison.**
- **"Observable Change"; "Foam or substances"; and "color, taste, odor or turbidity": See the dictionary definition of NPDES Permit-used words whenever there is not an applicable statutory or regulatory or permit-specified definition. The DEP Inspectors, the City's Certified Operators, and members of the general public are expected to be able to observe and identify changes in the receiving stream conditions between upstream conditions and downstream conditions (relative to the discharge point) by normal operation of human senses.**
  - **If the City Certified Operators observe such changes, then they are required to take the appropriate action.**
  - **The City is free to self-impose more stringent standards if it believes it can identify any objective alternative standard or test method, but the regulatory language would remain in effect.**
  - **The Department has enforcement discretion in any specific situation. Department compliance decision-making will be impacted to the degree that the observed change is obvious; objectionable (i.e. real/potential nuisance including aesthetic impact); and significant (qualitatively; quantitatively; in terms of ongoing duration; impacts on the receiving stream's Chapter 93 protected water uses; etc.).**

NPDES Permit Part A.III.C.2 (Planned Changes to Waste Stream: Planned Increases In Pollutants): The City requested clarification about an apparent conflict between Chapter 92a.24(a) and the permit language stating "that if the Department does not respond to a notice of increased "approved" pollutants within 30 days, the increase is deemed approved. **See Redraft NPDES Permit language. The required notice (meeting all permit requirements) will allow for Department decision-making. The permit language will authorize acceptance of the new wastestream if the conditions are complied with. For further clarification:**

- **Chapter 92a.24(a): This regulation requires prior Department approval of any facility expansions, process modifications, or change in wastestreams that may result in an increase in pollutants that have the potential to exceed ELGs or violation effluent limitations specified in the permit, or a discharge of new or increased pollutants for which no effluent limitation has been issued.**
  - **There is no Sewage Treatment Plant ELG (industry-specific Effluent Limitation Guideline technology-based limits) at present. See the NPDES Permit Part A plus PA Chapters 92a.47 and 95.2 for existing technology limits.**
  - **The permittee retains full responsibility and liability for any effluent violations; any resultant negative impacts on the receiving stream; and any noncompliance with other regulatory/permit requirements (General Pretreatment requirements; Approved Pretreatment Program requirements; WWTP Organic Design Capacity; etc.).**
- **NPDES Part A.III.C.2: "Notice shall be provided on the "Planned Changes to Waste Stream" Supplemental Report (3800-FM-BCW0482), available on DEP's website. The permittee shall provide information on the quality and quantity of waste introduced into the POTW, and any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW (40 CFR 122.42(b)(3)). The Report shall be sent via Certified Mail or other means to confirm DEP's receipt of the notification. DEP will determine if the submission of a new application and receipt of a new or amended permit is required."**
  - **This notice requirement condition does not apply to Act 537 Plan-approved development sewage-only flows.**
  - **The notice submittal must fully address all permit requirements to allow for Department decision-making.**
  - **The Department is developing a FAQ (Frequently Asked Questions) sheet or webpage to further clarify the requirements of the Part A.III.C.2 (Planned Changes in Wastestream) language. In the**

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meanwhile, if you have specific questions, see the DEP website and/or contact the Regional Office for guidance.

NPDES Permit Part A.III.C.2.b.ii (Planned Changes to Waste Stream) and Chapter 94 Referenced Requirements: The City objected to incorporating Chapter 94 restrictions (which is not a Federal requirement) regarding hydraulic or organic overload conditions as an NPDES Permit requirements, and requested the Department confirm that this NPDES Permit condition is for informational purposes only, and does not create a new NPDES Permit Condition. NPDES Permit Part A.III.C.2.b.II Permit Condition language: "The acceptance of increased loading of approved pollutants may not result in an exceedance of ELGs or effluent limitations, may not result in a hydraulic or organic overload condition as defined in 25 Pa. Code § 94.1, and may not cause exceedances of the applicable water quality standards in the receiving stream." (Underlining added.) **This request cannot be granted:**

- **The NPDES Permit is not limited to strictly Federal requirements, but incorporates applicable state statutory (Clean Streams Law), regulatory and policy requirements (including PA Chapter 94 requirements).**
- **NPDES Permit Conditions are NPDES Permit Conditions. The above cited standard permit language clearly prohibits acceptance of new loadings that may result in a Chapter 94-defined hydraulic or organic overload condition (i.e. it is not informational in nature). Violation of this condition would represent noncompliance.**
- **The Department notes that the 2017 Chapter 94 Report indicated one month's organic loading was ~97.4% of the WWTP's Organic Design Capacity (39,365 lb BOD5/day monthly average), and the 2021-projected "max average" organic loadings estimated to be 98% of the Organic Design Capacity. The 2020 Chapter 94 Report indicated the facility will be approaching its Organic Design Capacity limit in the 2024-2025 time-frame. See the Chapter 94 definition for "organic overload" and related Chapter 94 Planning Requirements. Contact the Department if the City wishes to pursue a WWTP "Rerating" application. Contact the Delaware River Basin Commission (DRBC) directly for any separate requirements.**

NPDES Permit Part A.III.C.4 (Requested Clarification of Noncompliance Reporting Requirement): The City requested confirmation that the above Part A.I Additional Requirements narrative TBEL limits provisions "do not trigger the reporting requirements under Section A.III.C.4 of the permit" because the limits are technology-based and are not water quality-based. The City requested the basis for any disagreement with its interpretation. **The Department disagrees with the City's interpretation. Noncompliance Reporting is required for any known violation of permit limits and regulations. There is no reporting exception for violation of technology-based effluent limits (TBELs) in the permit or regulations. These TBELs represent a minimum level of protection to the waters of the Commonwealth.**

NPDES Permit Part C.I.E: Operations & Maintenance (O&M) Plan Submittal): The City requested an extension to 18 months for the Part C.I.E (O&M Plan) required O&M Plan submittal due date requirement due to the amount of other work required by the period during the overlapping time-frame. **The Department has granted this request.**

NPDES Permit Part C.I.G High Flow Management Plan (HFMP)) and Item 7 (NPDES Permit Application Updates): The City took no exception to this requirement. **Noted. The Department looked over the facility's submitted SOP, and notes that it would require substantial revisions to address the HFMP permit condition and other applicable permit conditions previously brought to the City's attention: Part A.I Additional Requirements including bypass sampling; Part A.I.K (CSOs); Part A.II definitions; Part B.I.G Bypass requirements; Part C.I.H (Discharges); Part C.IV (Maximizing Treatment); Part C.V (CSO)). In addition, the updated Process Flow Diagram did not show the LTCP-approved CSO-related bypass flows. The updated HFMP must explicitly address all permit requirements.**

EPA Comment Regarding Part C.I.H Language: EPA noted that Part C.I.H. may have a typo – the first sentence states that "Unless otherwise authorized under Part B of this permit…". Should this reference be to Part A of the permit? **No (not a typographical error in the present NPDES Permit). This was existing (previously negotiated) permit condition language (unchanged). The referenced Part B language includes applicable requirements, specifically bypassing. To clarify the requirements, the language has been expanded to reference both Part A and B.**

NPDES Permit Part C.VII.C (Solids Management Conditions/Sludge Inventory): The City objected to the requirement for a theoretical sludge production estimate using the permit condition-cited EPA Composite Correction Program Guidance Manual. The City stated it had reviewed the EPA Guidance and views it as "overly simplistic and therefore inaccurate"

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"preliminary screening tool" that is "not a reliable method of assessing treatment plant performance and was never intended for that purpose". The City stated the method does not take into consideration influent TSS, solids added to the process by hauled waste and filtration return flows, added treatment chemicals, and "other processes". The City believes the results would be "erroneous and inaccurate" and requested deletion of this requirement. **The Department acknowledges this comment. Please note the Department's Wastewater Operator Resources Webpage includes a DEP "Sludge Estimating Worksheet" spreadsheet based upon the EPA methodology. The City has the option of submitting additional information/clarifications with the "Sewage Sludge Management Inventory" required in the annual Chapter 94 Report.**

NPDES Permit Part C.VIII.B.2 and B.3 (WET Test "test completion date"): The City requested that the term "test completion" be interpreted "as the date on which the laboratory completes all tasks associated with the testing, including QA/QC, statistical analysis, and final report preparation" (with that language included in the permit condition itself if possible) in order to avoid potentially onerous compliance deadlines. **The Department could not grant this request. The test in question is the WET Test as specified in the WET Test permit conditions. The condition gives forty-five (45) days after WET Test completion to complete and submit the report to the Department. In practical terms, the WET Test Laboratory should be aware whether a WET Test has failed upon WET Test completion, and should be able to complete the required Report within the time-frame. If the City lacks confidence in the ability of its hired laboratory to complete its Report on-time, then the City has the option of going to a different accredited WET Test Laboratory. An open-ended Reporting time-frame is not acceptable to the Department and would result in delays in investigating/resolving any negative impacts on the waters of the Commonwealth.**

NPDES Permit Part C.IX (Requirements Applicable to Stormwater Outfalls): The City stated that it would submit an updated Preparedness, Prevention & Contingency (PPC) Plan, meeting all requirements, within six (6) months of PED. **For purposes of clarification:**

- **The administratively extended NPDES permit included stormwater conditions with PPC Plan Requirements that have been in effect since issuance. Any existing PPC Plan must be fully compliant with the existing NPDES Permit requirements and any additional requirements of the facility's existing Biosolids General Permit.**
- **The facility must be compliant with all Final NPDES permit conditions upon the Permit Effective Date, i.e. the onsite PPC Plan copy must be compliant with all NPDES Permit Part C.X PPC Plan requirements (including incorporated-by-reference PPC Plan Guideline requirements) upon the Permit Effective Date.**
- **The onsite PPC Plan copy must be updated as needed during the NPDES Permit Term as it is a "living document" that is expected to be updated in event of changes to the existing facility/facility operations, contact information, etc. In event of significant site changes affecting site contingency planning, PPC Plan revisions should be provided to the Department for informational purposes.**

Updated Water Quality Modeling:

BethTMSPDF.pdf

BethWQMModel.pdf

Updated Ammonia-N Modeling:

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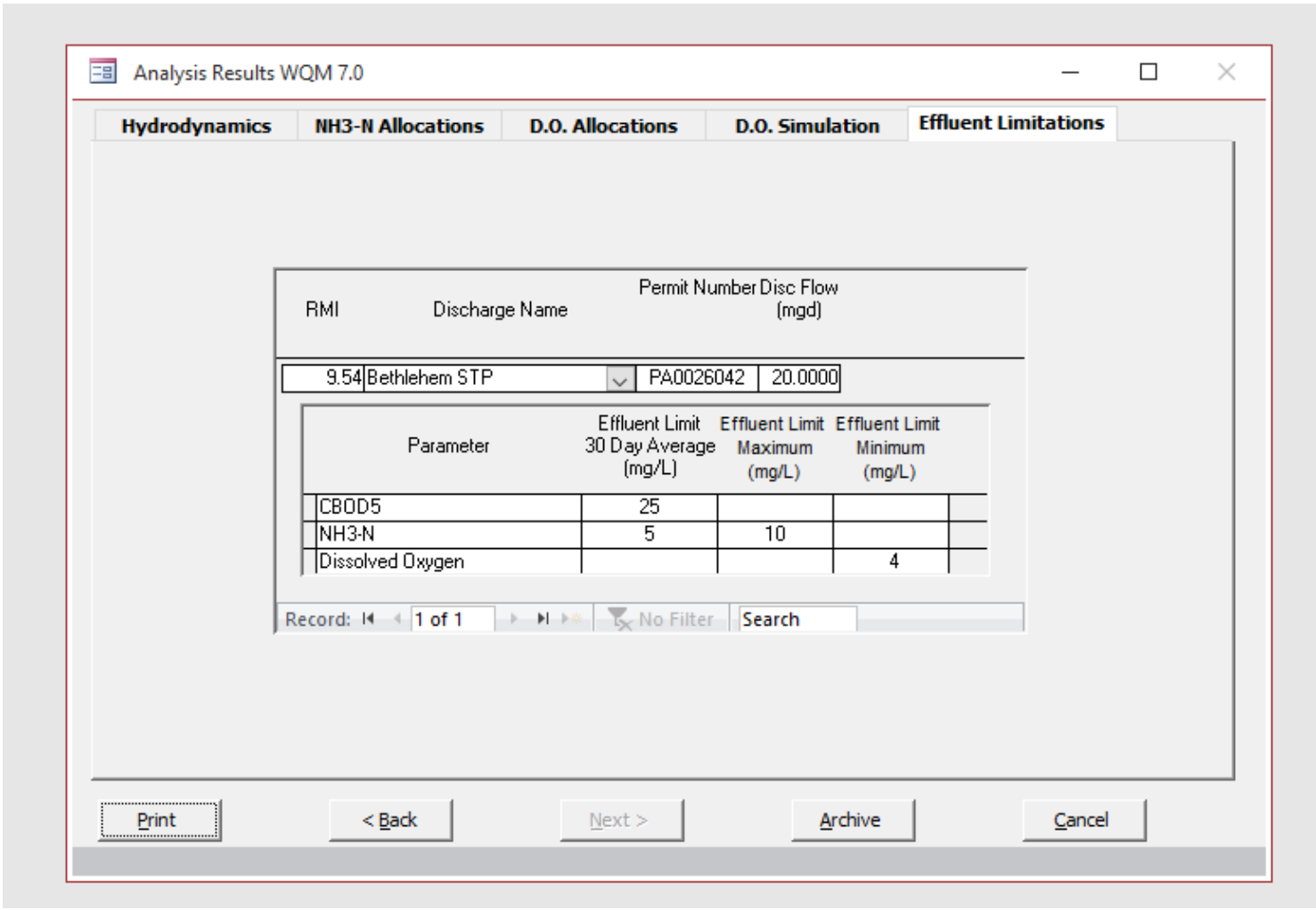

TRC Spreadsheet: Updated modeling (using TMS-generated partial mixing factors) supported the existing TRC limits. Previously proposed new TRC limits and schedule of compliance have been deleted. Antibacksliding prohibitions would prevent any relaxation of the existing IMAX limits. As the City has indicated it is no longer considering UV disinfection, obsolete Part C language (regarding potential use of chlorine as back-up disinfection) has been deleted.

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TRC EVALUATION

Input appropriate values in A3:A9 and D3:D9 — Bethlehem POTW

370.944	= Q stream (cfs)	0.5	= CV Daily
20	= Q discharge (MGD)	0.5	= CV Hourly
30	= no. samples	0.287	= 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 = 1.117	1.3.2.iii	WLA cfc = 3.740
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373	5.1c	LTAMULT cfc = 0.581
PENTOXSD TRG	5.1b	LTA_afc= 0.416	5.1d	LTA_cfc = 2.174

Source		Effluent Limit Calculations	
PENTOXSD TRG	5.1f	AML MULT = 1.231	
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.500	BAT/BPJ
		INST MAX LIMIT (mg/l) = 1.635	

Communications Log Update:

11/2/2017: Redraft NPDES Permit issued for public comment.

11/18/2017: PA Bulletin Notice for Redraft NPDES Permit published. Public Comment period subsequently extended to 1/31/2018 per City Request.

12/26/2017: Bethlehem Submittal (requested NPDES Permit Application update information) containing:

- WQM Permit No. 4812402 Post Construction Certification Form copy
- Figure based on USGS Map excerpt showing CSO Outfall 012 location
- WWTP Site Plan figure
- Updated NPDES Permit Application Form Treatment Section
- Wastewater Process Flow Diagram. NOTE: Did not show CSO LTCP bypassing
- Solids Management Process Flow Diagram
- WQM Permit List
- Bethlehem WWTP CSO LTCP/Act 537 Construction Projects table
- Bethlehem WWTP Non-Functional Units and/or Process Equipment table
- Bethlehem WWTP In-Plant and CSO Operation Start Procedure
- Bethlehem WWTP CSO 012 CSO Operation and SCADA Control Strategy

1/15/2018: Meeting on previous Redraft NPDES Permit per City Request with City-provided Agenda. Meeting Notes:

DEP Attendees: Amy Bellanca, Patrick Musinski, Sandy Insalaco, James Berger, and Chris Harding (participated by telephone).

City Attendees:

- Ed Boscola, Jack Lawrence – City of Bethlehem
- Phil McLachlan, Ed Becker – Arcadis Engineers **(did major plant projects; NPDES permit renewal application; CSO LTCP (same basic people as Malcom Piernie per Arcadis)**
- Jeff Morgan – SC Engineers **(does minor plant projects, Chapter 94 Reports, etc.)**.

Copper and TRC proposed limits:

- Updated receiving stream information and impacts on proposed limits:
    - **City/Jeff Morgan indicated they had new stream discharge hardness data and stream width data to refine Copper PENTOXSD modeling and therefore PENTOSXD-partial mixing factor information used in TRC spreadsheet**. He described previous copper limit history (original copper limit of 0.1 mg/l in 1980s, permit appealed, subsequent stream studies including 2003 WER allowing for dropping of copper limit from 2008 NPDES permit). They may propose BLM and stream depth evaluation (in summer for low flow conditions) in TRE Phase I. They have been in contact with technical people who had done BLMs.
    - Jeff said the NPDES Permit Application stream hardness information was wrong (based on a distant stream gage). They have actual stream data for Outfall location area. They said Lehigh River Total Hardness is more like 120 mg/l, with Saucon Creek (right below Outfall #001 location) at 220 mg/l Total Hardness.
    - Jeff said they will provide Lehigh River width information to refine the PENTOXSD water quality modeling (and the PENTOXSD-generated partial mixing factors used in the TRC water quality modeling).
    - Jeff said they will be looking at stream depths when weather allows. DEP noted that any additional stream information can be submitted with the TRE Phase I report.
    - They asked if BLM guidance is available. DEP noted it was available, and can be obtained from internet (EPA source) or DEP Central Office. Any BLM Study Plan would have to be submitted to the DEP, and DEP Central Office/EPA would have to bless it. Copper WERs are no longer acceptable to EPA.
    - They can e-mail the stream data for DEP review on impact on NPDES Permit upfront, and then provide hard copies with the City Public Comments (due 1/26/2018). DEP would evaluate impact of new information on permit limits/monitoring/TRE conditions per DEP SOPs (available via internet).
    - BLM results are used in the NPDES Permit (and can sometimes result in more stringent limits). City thought it would support old copper WER.
    - The City does not think source reduction is an option for copper as they have looked at sources in past, and do not have an industrial source for it.
- **Previous "studies" information (not previously submitted as part of NPDES Permit Application)*:*** WERs are only good for ten years or two permit terms (whichever comes first). New studies would be required (if needed after updated water quality modeling incorporating new stream info).

- **Proposed studies and Compliance Schedule**: City is concerned about workload to address all compliance schedules (especially in first year) and that some items are sequential. The City is unsure on what might be needed to meet the new limits or compliance goals, and uncertain if more time might be needed to come into compliance:
    - EPA has already commented on the Schedule of Compliance and Chapter 92a.51 requirements. (Some EPA comments were not forwarded to the City as the Department planned to address them internally).
    - DEP sees the majority of compliance issues as inter-related to each other. Some things have to be done upfront like definition of SSO issues, but potentially impacting CSO LTCP, etc. Others can be done concurrently.
    - Need to address SSOs and Ammonia-N issues upfront for compliance purposes (defining problem; documenting anything done to resolve the problems; etc.) as well as Chapter 92a.51 "as soon as practicable" requirement. Chapter 92a.51 requires compliance with Ammonia-N limits and SSO prohibition as soon as practicable (i.e. high priority with schedule given in case compliance is not achievable upfront). Schedule of compliance were given in case they cannot come into compliance without construction. Other permit conditions and general considerations means that if the facility can comply with new limits sooner, then it should (such as TRC limits due to other conditions such as Chlorine Minimization).
    - Trickling Filter O&M is a standard NPDES O&M requirement.
    - NPDES Part A.III.C.2 (Planned Changes to Physical Facilities) notification requirements might apply to plant modifications to come into compliance (such as modifying Trickling Filters to increase aeration).
    - Nothing prevents the City from acting prior to new NPDES Permit Effective Date to address the issues. City had indicated it was already working on ammonia-N options, TRC options, etc. City noted it might propose a BLM upfront.
    - Interim/final compliance milestones represent the last acceptable date for a required action. Nothing prevents anyone from taking earlier action.
    - City Public comments would have to propose any new Compliance Schedule (with any proposed/modified interim and final compliance date) with justification (and deliverable submittals).
        - Interim milestones cannot be more than 1 year, so they would have to justify any new step during the TRE Phase or Schedule of Compliance milestones. Different milestone dates can be shorter periods than one year.
        - Final compliance date cannot be beyond 5-year permit term per Chapter 92a.51 (without Court of Proper Jurisdiction Order), but can be moved within the term if adequate justification. Could move copper final permit limit effective date for 4.5th year if justified. This might result in new Part A section (for new effective date) for the changed schedule.
        - TRE process and/or permit amendment application allow for modifying compliance dates or permit limits during permit term. The City would have to commit to concrete new schedule dates in any permit amendment application. Antibacksliding rules make limit changes more difficult upon new limits' final effective date. Easier to move interim compliance dates than final dates.
        - City had already discussed some site changes with DRBC. City noted additional DRBC approval might still be needed.
    - Feasibility Study stage includes determining if the facility can meet the requirement upfront, with "no further action needed" being an option if facility is in compliance (with simple letter notification to that effect).
    - Final Plan/Construction Interim Milestone stages can include additional interim steps if justified. Some of the City concerns looked like they might or might not apply or be dependent on Final Plan (i.e. then additional interim steps might be applicable such as City Internal Planning steps or further DRBC docketing requirements).
    - It should not be too difficult to update a generally adequate existing CSO LTCP as needed. Old (10 year old) information should be updated, changes like Oil & Grease Program added to NMC sections, etc. It is an annual requirement for permittees to review/update CSO LTCPs as needed. Potential Complicating factors:
        - If some SSOs were mislabeled CSOs: City indicated that previous CSO Outfall #004 gate closures were causing back-ups into the separated sewers, and that the SSO events have ceased since new CSO Outfall #012 replaced CSO Outfall #004. The Department noted that they would only be CSOs if there were combined sewers upstream of the SSO locations.
        - Presumptive Goals: Lehigh River is impaired due to CSOs per DEP E-maps. LTCP Update has to positively show that the City CSOs are not impairing stream for the Presumptive Goals to apply. This can be done if there are no CSOs. Otherwise, a more detailed stream evaluation might be needed.

Overall suite of activities required:

- **Review list of required documentation and associated timing per current Re-Draft Permit:**
    - **Promised More Info per COB Submittal: Due with final Public Comments.**
    - **Public Comments (due 1/26/2018): Should have all additional City Public Comments and information (additional NPDES Permit Application update information per City Letter; hard copies of all new stream data; proposed schedules of compliance; etc.). If need more time, contact the Department. Hard copies are required. Electronic courtesy copies are also wanted.**

- **Proposed Schedules of Compliance**:
  - **Existing 2008/2012 Amendment NPDES Permit (being replaced)**: **Effective now including PPC Plan requirements*:* Need date for Updated PPC Plan submittal (such as with Annual Report, or other).**
  - **Existing General Permit GP ID# PAG082224 (biosolids)**: **Jeff Morgan indicated unaware of the new PAG-08 coverage and potential need to update PPC Plan (with biosolids activities to start up in 2018).**
  - **Part C.III (Schedule of Compliance) for SSOs**:
    - **As soon as practicable: SSOs are prohibited***.*
      - **Location of Overflow Events: Need to define problem upfront for both NPDES Permit Application and compliance requirements. Noted Redraft NPDES Permit Letter requirements for the City to: Plot out all post-2008 overflow event locations on full-sized pipeline maps (showing streets, manholes, siphons, and pipelines with invert elevations/grades) to determine whether there are specific pipelines and/or areas of recurrent SSO events. Recurrent SSO areas might require enhanced O&M and/or corrective action to eliminate hydraulic restrictions. SSOs versus mislabeled CSOs (notification required as soon as practicable).**
      - Tributary Municipalities SSO notifications: The Department expected to be notified if the City is aware of SSOs in their tributary municipality sewer systems.
  - **Part C.III (Schedule of Compliance) for Ammonia-N**: **As soon as practicable***; no later than 3-years of PED:* **The City indicated it had modified site operations to prevent ammonia-N exceedances and that the cold weather had not triggered ammonia-N issues so far this winter.**
  - **Part C.II (Schedule of Compliance) for new TRC limits**: **City noted that it had scheduled a study of feasible options. DEP noted that the City had been looking at Chlorine systems for years, including mention of a sodium hypochlorite option in CSO LTCP DRBC-related documentation.**
  - **Part C.II (Schedule of Compliance for 4 mg/l DO limit)**: **City thinks it might be able to comply upfront, but will be looking into this further.**
  - **Part C.V.G (CSO Schedule of Compliance)**: **City indicated it would take more time than one year for an LTCP Update.**
    - DEP noted any new schedule must be justified, and that it had previously shared extensive EPA comments, plus DEP Letters had provided extended guidance on updating the LTCP.
    - LTCP and NMC Updating is an annual requirement.
    - The Department needs an LTCP Update that it can approve with conditions, with the next LTCP Update due with the next NPDES Permit Renewal Application. Any additional LTCP work after the new 5-year permit term would require a Court Order. DEP noted that a more extensive stream evaluation would likely be needed
    - **If the City believes that it has resolved the CSO issues, then the next submittal would be the Post Construction Monitoring Plan (PCCM).**
    - **LTCP Update should address 20.0 MGD NPDES permit basis flows, etc. for long-term compliance, not just current flows.**
    - **Additional EPA Guidance: EPA had issued additional 2012 guidance on PCCM requirements. EPA has been stressing that Presumptive Goals only apply when there is no known stream impact in recent communications to the DEP.**
  - **Part C.I.E (Operations & Maintenance (O&M) Plan Submittal for DEP review**: **The City thought that updating the site O&M Plan was beyond the scope of the facility's admin people, requiring engineer time & attention (new equipment, new units, new O&M manuals). The Department would be amenable to an 18-month schedule if there was an interim submittal of some sort. The Department is particularly interested in cold weather operations. The City noted that it had new units/equipment but would probably need an engineer to create an updated O&M Plan. The City thought they had adequately addressed cold weather operations.**
  - **Part C.I.G (High Flow Management Plan (HFMP)) Submittal: The DEP noted that this requirement was tied to the LTCP Update schedule, and included basic considerations such as what is the limiting hydraulic component & how long it can handle flows, and consistency with NMC requirements to maximize treatment at the facility.**
  - **PPC Plan Update: The PPC Plan must meet new/revised Part C Stormwater PPC plan requirements upon PED. The (previously submitted) PPC Plan was not updated per previous Department correspondence and should be updated to reflect site changes, etc. The Department asked for a updated PPC Plan copy to be submitted per City-proposed schedule in public comments (within next six months, perhaps with first Stormwater Annual Report under new Permit Conditions). Should address any PAG-08 biosolids and site bypasses.**

- **Part C Pretreatment Condition Headworks Analysis Requirement (Reevaluation of Local Limits): City (Jeff Morgan) indicated it could meet the standard Part C schedule. It was only on the list the requirement was also for the first year.**
- **Standard Annual Requirements: On table from City (no proposed modifications to Schedule of Compliance) as work that will overlap compliance schedules (Chapter 94 Reports; Annual CSO Status Reports; Annual Stormwater Inspection Report; Pretreatment Program Annual Report; Sewage Sludge Management Inventory).**

Wrap-up – identify action items or outstanding issues requiring follow-up:

- **New public comments submittal with all information is needed by 1/26. They can ask for several more weeks if they have a good reason. They should also document all previous/current steps/progress in meeting compliance goals in the Public Comments.**
- **City noted that it would be including some additional public comments such as clarification on when Part C WET permit condition dates are triggered. No Part A or B language changes will be proposed (when DEP asked due to need for DEP Central Office/EPA concurrence with any Part A or B language changes).**
- **EPA has commented on Redraft, but none seemed to require City feedback at present. EPA will be forwarded any City Public comments and/or information.**
- **The Department will issue a Re-Draft NPDES Permit if permit limits change.**
- **If they cannot find a sample Individual IW Stormwater NPDES Annual Report on DEP website, then they should contact Jim Berger via e-mail for a draft Stormwater Annual Report. It will be similar to the current PAG-03 Annual Report available via DEP website. They have the original Annual Stormwater Inspection from the previous NPDES Permit.**

2/8/2018 (received 2/12/2018): Bethlehem City public comments and new information including:

- Lehigh River width survey at Outfall No. 001
- Lehigh River hydrographic survey at Outfall No. 001
- Lehigh River Hardness sampling report (12/12/2017 sampling)
- 2017 Annual Stormwater Report with the following information.
  - PPC Plan is updated annually and being updated to address PADEP comments.
  - Stormwater BMPs include:
    - Cleaning stormwater channels, inlets and Pump House No. 5 wet well annually at minimum.
    - Stormwater inlet covers are used in appropriate areas of plant.
    - The plant driveway is cleaned manually or with a Street Sweeping Vehicle regularly.
    - Vehicle and equipment washing is done inside garages or covered areas where floor drains are piped to the plant process.
    - All excavation at the plant site will continue to be completed with PADEP E&S control regulations.
    - All stormwater outfalls are inspected once per month.
    - Spill kits have been provided at strategic locations around the plant for use at the stormwater outfalls, if needed.
    - Report recommended regular inspection and maintaining of stormwater inlet covers and log sheet be prepared to document Sump Pump House No. 5 pump run times.
  - Stormwater Drainage Area information:

SW Drainage Area/Outfall	Description	Drainage Area (square foot)	% Paved
007	Gate 46, receiving stormwater from plant area containing empty grit and sludge containers plus normal hauled-in wastewater receiving area, and other primary material delivery and storage area that is discharged via Sump Pump House No. 5 through Stormwater Gate. 16-inch Cast Iron pipe (check valve in sump house) with submerged outfall. No concrete headwall.	120,000	90
008	Gate 45, receiving flow from portion of plant driveway and grassy area between final clarifiers and trickling filters 18-inch Cast Iron pipe with concrete headwall.	70,000	10
009	Gate 43, 1 catch basin in grassy area near intermediate clarifiers 24-inch CMP pipe with concrete headwall.	60,000	10
010	Gate 42, 1 catch basin in grassy area near intermediate clarifiers 24-inch CMP pipe with concrete headwall.	12,000	10

011	Gate 41, 3 catch basins along southside of aeration basins 48-inch CMP pipe with concrete headwall.	11,000	90

NOTE: The City promised additional overflow-related information (under separate cover) in its 2018 public comments on the 2017 Redraft NPDES Permit but nothing was subsequently received.

3/5/2021: DEP Letter required updating of the NPDES Permit Application and requested any additional information that the City wished the Department to consider during permitting. on
6//26/2021: The City response was received electronically. Hard copies received later.
6/29/2021: The City e-mailed response was forwarded to the US EPA and DRBC via 6/29/2021 DEP (Berger) E-mail.