pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Northeast Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0070386**
Facility Type	**Municipal**	APS ID	**557578**
Major / Minor	**Major**	Authorization ID	**1395434**

NPDES PERMIT FACT SHEET INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Shenandoah Municipal Sewer Authority Schuylkill County**	Facility Name	**Shenandoah Municipal Sewer Authority POTW (Treatment Plant & CSOs)**
Applicant Address	15 W Washington Street Borough Hall Shenandoah, PA 17976-1708	Facility Address	5 Mount Olive Boulevard (SR 0054) Shenandoah, PA 17976-1708
Applicant Contact	Andrew Szczylak (Authority Chairman)	Facility Contact	George Myers (Certified Operator)
Applicant Phone	(570) 462-1918	Facility Phone	(570) 462-4257
Client ID	39486	Site ID	240446
Ch 94 Load Status	Not Overloaded	Municipality	Shenandoah Borough
Connection Status	No Limitations	County	Schuylkill
Date Application Received	May 4, 2022	EPA Waived?	No
Date Application Accepted	July 21, 2022	If No, Reason	Major Facility, CSOs, Significant CB Discharge, EPA enforcement

Purpose of Application: RENEWAL OF EXISTING NPDES PERMIT.

Summary of Review

The 2.0 MGD Shenandoah Municipal Sewer Authority POTW (with CSOs) discharges to Shenandoah Creek (CWF; Stream Code No. 17683; Impaired due to AMD Siltation/metals/habitat alterations; Municipal Point Source Discharges – Organic Enrichment; subject to Mahanoy Creek TMDL (AMD); negative pathogen/organic impacts per June 30, 2022 DEP Biologist (Timothy Daley) “Point of First Use/Cause Effect Survey Memo”; and also CSOs discharging to additional intermittent/dry streams (Kohinoor Creek and Sewer Creek) within the Shenandoah Creek watershed.

Main Permitting Issues:

- **Failing WWTP with major compliance issues (NPDES Permit Part B.I.E (Proper Operation and Maintenance), Part C.IV.D (LTCP Schedule of Implementation), Part C.X.G (Responsible Operator and DMR/EDMR Reporting); Part C.X.H (New WWTP O&M Plan); and Part C.X.K (POTW Operator)**: The old WWTP is failing, with long-term out-of-service WWTP units and/or equipment, plus known contributions to ongoing receiving stream impairment. The 9/28/2020 US EPA Administrative Order for Compliance on Consent Docket No. CWA-03-2020-0067DN required the WQM Permit No. 5422401 (WWTP Upgrade) as a necessary corrective action, but that only addresses some WWTP-specific issues (via replacement WWTP treatment system), with some additional benefit in terms of other CSO-related issues by an increase in the WWTP peak wet weather design flow capacity. **This NPDES Permit was prepared on the basis of the 2020 EPA AOCC (for the replacement WWTP Treatment System (onsite) and other corrective actions), with special NPDES Permit conditions to address assorted CSO-related issues (CSO LTCP Schedule of Implementation), and assorted other O&M issues.**
  - DEP/EPA may have to separately address any remaining outstanding compliance issues.
    - See Compliance History Section for other compliance issues.

Approve	Deny	Signatures	Date
X		James D. Berger (signed) James D. Berger, P.E. / Environmental Engineer	March 25, 2024
X		Amy M. Bellanca (signed) Amy M. Bellanca, P.E. / Acting Engineer Manager	5-28-24

Summary of Review

- See Treatment Section for Chapter 94 Annual Municipal Wasteload Report issues/Annual CSO Status Report issues.
- See POTW Operator/Permittee Identity comment below due to Shenandoah Borough operation of the POTW, while not being a NPDES co-permittee nor AOCC "respondent".

- The POTW (in the WQM Permit No. 5422401 Application) has committed to sewer separation projects in event that the facility is required to capture/treat greater flows than its replacement WWTP treatment system's design flows (2.0 MGD hydraulic design capacity; 5.83 MGD daily max flow while achieving secondary treatment; 8.0 MGD peak wet weather flows). Information was missing to quantitatively or qualitatively ballpark CSS flows.

- **POTW Operator/Permittee (NPDES Permittee Requirement to be the Operator with Financial Control) and & Potential PA CSL/Chapter 91.26 Compliance Bar if the Borough remains in operational control (NPDES Permit Part C.X.K)**: At this time, Shenandoah Municipal Sewer Authority (SMSA) is not operating the existing POTW (Treatment Plant and sewer system). SMSA states that the Authority is the party in financial control for the system (Letter Response Item 1.b) but that appears to be incorrect due to application information showing the Borough is entangled with all financial decision-making as well as POTW operations.
  - Shenandoah Borough (DEP Client No. 91098, EIN# 23-6003008) is not an existing NPDES/WQM Co-permittee or AOCC "respondent", but operates the POTW (under an existing lease agreement), appoints the SMSA board members, hires/oversees the SMSA employees, and is entangled with SMSA's financial decision-making in addition to exercising operational control of the POTW. The Authority likens the Borough's involvement to a "circuit rider" (i.e. hired certified operator) to operate the system or contractor for contracted out billing and collections. User fees are deposited into the Sewer Revenue Account, with O&M expenses paid out it. A separate SMSA Capital Projects Account exists for larger projects. The Authority employees on the revised organizational chart are Borough employees. See the Compliance Section (below) for the Application information on Borough role at this POTW and historic/ongoing compliance O&M issues (i.e. during the Borough operation of the POTW facilities)
  - SMSA has hired a certified operator (MES) but their role appears limited to process control advice, EDMR reporting, and reporting to the SMSA board.

  The Authority states (8/16/2023 Letter Response Item 1.a, 1.c.i): "If the Borough defaults on any obligations for the operation and maintenance of the system, SMSA has the right to terminate the lease agreement just like any other contracted service". In this case, the long-term and ongoing compliance issues indicate the Borough's basic inability to meet NPDES Permit requirements (including POTW O&M requirements). Normally, an incompetent contractor would have been replaced in such circumstances. To allow permitting to go forward, the **NPDES Permit Part C.X.K special condition** gives SMSA the option of fulfilling its commitment of replacing the Borough as a contract operator or submitting of a NPDES/WQM Permit Transfer Application to make the Borough the NPDES co-permittee within ninety (90) days of Permit Effective Date. (Separate AOCC requirements would apply in that case.)
  - **DEP E-facts Information**:
    - SMSA: Client No. 39486 with EIN# 83-0389262 per 2022 WQM permit application.
    - Shenandoah Borough:
      - Client No. 91098 with EIN# 23-6003008
      - Client No. 342353 ("Shenandoah" only, but identified as a municipality, no EIN#, and no permits when queried in E-facts)
    - Separate Authority: A different entity, Shenandoah Municipal Authority (recently reportedly bought by Aqua PA), has a separate NPDES permit for the local Water Treatment Plant. It is a different legal entity with a different DEP Client number and EIN Number, but only supplies potable water to the WWTP. It is therefore not part of this permitting action.
  - **NPDES Permittee/Operator with Financial Control (Chapter 92a.21 and IBR 40 CFR 122.21(b))**: When a facility or activity is owned by one person but is operated by another person, it is the operator's duty to obtain a permit. Per DEP Policy No. 362-2000-001 CW "Permitting & Policy Manual" Section 201.1.A (developed to implement the applicable Federal/state statutes and permit regulations), the NPDES permittee must be the "person" discharging pollutants from a point source into navigable waters (surface waters of the Commonwealth). The Application for NPDES permits for the discharge of wastewater to the waters of the Commonwealth must be submitted by the "person" which is legally responsible for operating the facility. Operator in this context is the "person" who has financial control over the operation of the facility, not the

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person contracted to run the treatment program or other third party (not subsidiary company, contract certified operator, owner or other).
  - The Borough is the POTW operator, per the Application information summarized in the Compliance Section.
  - Please note that "operator" in this context does not refer to a contracted Chapter 302 Certified Operator (with limited Chapter 302 duties).
- **Part C.X.K (POTW Operator) Special Condition language**: Within ninety (90) days of Permit Effective date, the Permittee (SMSA) must either:
  - Terminate the existing POTW lease agreement and take over all NPDES/WQM permittee responsibilities (removing Shenandoah Borough from the POTW Chain-of-Command and operational decision-making (including financial decision-making)); with submittal of updated NPDES permit documents including organizational charts, site PPC plan, O&M Plans, etc.) addressing this change in operational control and demonstrating the Authority has the capability of meeting all NPDES/WQM permit requirements. Copies of any lease and/or other written agreements with the Borough must be submitted. Copies of any contract with a contracted third-party facility operator must be included in the submittal.
  - Submit a complete and technically adequate NPDES/WQM Permit Transfer Application (with EDMR registration) to add Shenandoah Borough as co-permittee for all POTW (Treatment Plant and sewer system) NPDES and WQM permits. Copies of any lease and/or other written agreements with the Borough must be submitted.

  See September 28, 2020 US EPA Administrative Order for Compliance on Consent (AOCC) Docket No. CWA-03-2020-0067DN (as amended) requirements in event of permit transfer and/or amendments of AOCC-required documentation.

- **CSO Discharges (NPDES Permit Part A.I.J, Part C.III, and Part C.IV)**: The POTW-reported magnitude and frequency of CSO discharges (101 CSO discharges for 101 precipitation events of ≥0.02-inches in 2021) to the relatively small impaired Shenandoah Creek (with 2022 DEP sampling indicating apparent negative impacts from organic sources in the CSO discharge areas and with outdated/inaccurate flow estimation methods) trigger additional site-specific requirements (addressed in the LTCP Schedule of Compliance) including but not limited to:
  - Engineering analyses to show that all CSO discharges are required by identified hydraulic capacity exceedances (per NPDES Permit Part A.I.J and Part C.IV.A)
  - Need to either install CSO flow meters and/or provide an adequate (calibrated) method of determining CSO discharge cause, frequency, duration, and quantity of flow. Please note the POTW has committed to sewer separation projects in event that the WWTP must treat greater flows than the WWTP Upgrade project was designed for (2.0 MGD hydraulic design capacity; 5.83 MGD daily max flow while meeting secondary treatment; 8.0 MGD peak wet weather flows).
  - Apparent requirement to meet the more stringent CSO LTCP Demonstration Goal due to ongoing stream impairments and 2022 DEP sampling data for Shenandoah Creek. The permittee may want to do DNA analyses to determine the source(s) of the detected pathogens in Shenandoah Creek.
    - Additional in-stream Water Quality Monitoring Plan requirements
    - Additional CSO Flow Study Plan requirements
    - Additional PCCM requirements
  - Potential need for substantial CSO Manhole modification to reduce CSO outfall discharges per existing NMC requirements (in addition to current POTW commitments for installation of bar screens, duck bill tide gates, visual aids for off-hour CSO discharge detection, visual aid for measuring CSO pipe flow depths, etc.).
  - See below CSO review highlights, Special Permit Conditions; Stream Information Section, Treatment Information Section, and Additional CSO Information Section for details.

Background Information:

- **Separate 3/25/2024 WQM Permit No. 5422401 (WWTP Upgrade)**: Required by the 2020 EPA AOCC. The new (2.0 MGD hydraulic capacity; 5.83 MGD Daily Max capacity while achieving secondary treatment; 8.0 MGD peak instantaneous/hourly flow) WWTP treatment system can manage greater peak wet weather flows.
  - Existing WWTP is failing, with long-term out-of-service WWTP treatment units and equipment (see Compliance Section): "The original maintenance program was sufficient; however, **the useful life of such equipment has far exceeded the projected lifecycle at the construction of the plant in the 1970's**.

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Many of the out of repair units have components and parts that are irreplaceable due to manufacturers that are no longer in operation. SMSA has worked with many local service shops who have fortunately had the ability to reproduce or repair the antiquated equipment". "SMSA is attempting to construct a new WWTP that will replace the majority of equipment and tankage and update to current technologies. As part of the new WWTP project, SMSA will work with the Contractor and Engineer to develop an updated maintenance program". (8/16/2023 Letter Response Item 5.k (with bolding added))

- NPDES Permit Requirements:
  - New WQBELs: The POTW indicates that the new WWTP treatment process will be able to meet the majority of the new WQBELs set forth in the Draft NPDES Permit.
  - Design Flows: The POTW has committed to sewer separation projects in event the upgraded WWTP facility must handle greater flows that it was designed for (as needed to address NPDES Permit CSO-related requirements).
  - Existing WET Test TRE requirements: "A TRE has not been developed at this time since a new WWTP is proposed, of which the design of the new WWTP acts as a TRE". (8/16/2023 Letter Response Item 3.h)
- Phased Construction:
  - Phase I consists of constructing the new headworks building, CSBR /Digesters, UV disinfection system and all associated piping, pumps, blowers, and controls in order to provide a completely new treatment system prior to demolition of existing facility. Digital rain gage will be installed and tied into SCADA System. Offsite Pump Station No. 1 will be upgraded to include flow meter, level alarms, and SCADA connection to WWTP. Existing single Sludge Rotary Press will be retained. Chlorine contact tanks will be repurposed for utility water. Chlorine disinfection system removed. New chemical treatment provisions for PAC, Magnesium Hydroxide or Sodium Carbonate (soda ash).
  - Phase II consists of demolition of existing treatment system units and post-demolition construction of an onsite post-construction stormwater control bioretention basin (footprint overlapping old WWTP units that will be demolished).

- **Application-related On-Base Submittals**:
  - No. 49267 (3/7/2022): Concurrent Part II WQM Permit Application (WWTP Upgrades)
  - No. 56960 (5/4/2022): NPDES Permit renewal Application with Attachment L (WET Tests)
  - No. 59095 (5/31/2022): Revised 5/31/2022 WQM Permit Application for WWTP upgrades
  - No. 59309 (6/2/2022): May 2022 Long Term Control Plan Update
  - **No. 61917 (6/30/2022):** June 22, 2022 Revised NPDES Permit Renewal Application with corrected Pollutant Group Tables, WET tests in Attachment L and AOCC-documentation (compliance-related).
  - **No. 119023 (8/17/2023)**: Revised NPDES Permit Application. Due to deficient Table of Contents, sheer size (with multiple redundant obsolete documents), and poor organization, here is a breakdown of the revised application contents (with some informational commentary):
    - 8/16/2023 Response letter to 5/25/2023 DEP Tech Def Letter for NPDES Permit Renewal Application – referenced missing additional analytical data (4 samples) for selected toxics.
    - Table of Contents – not listing assorted attachment documents
    - August 16, 2023 General Information Form – GIF says Andrew Szczylak is the SMSA Chairman but Charles Lawson is Chairman per SMSA Organizational Chart and 2022 Chapter 94 Report. Anthony Sajone (Borough Manager and SMSA position) and Brian Pritula (Maintenance Supervisor) were also listed alternate client contact names.
    - NPDES Application Checklist
    - Two NPDES Application forms (existing & proposed WWTP) - unsigned and missing Pollutant Table-required information (obsolete versions previously replaced), not updated to be consistent with assorted Letter Responses (GC-MS 5-peak information, etc.). See earlier submittal for previous Pollutant Group tables.
    - Attachment A (Act 14 public notice/transmittal letters)
    - Attachment B (USGS location map) – with grayed-out Shenandoah Borough area including its topography, for the required topographic map showing Kohinoor Creek flow path (with Sewer Creek not found by applicant). The response stated a corrected figure had been provided, but it was not found.
    - Attachment C (Existing WWTP site plan) – no CSS secondary treatment bypassing shown, only showing bypass of primary clarifier shown

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- Attachment D (Proposed WWTP site plan) – no CSS secondary treatment flow other than increased SBR flows to short-circuit secondary treatment.
- Attachment E (Existing WWTP process schematic) – no CSS secondary treatment flow bypassing shown. Only bypass line is bypassing of primary clarifier.
- Attachment F (Proposed WWTP process schematic) – no CSS secondary treatment flow bypassing possible other than increase SBR treatment flows to short-circuit secondary treatment
- Attachment G (CSO system map) – Not updated to show both diversion manhole and outfall locations (unlike other application figure).
- Attachment H (CSO outfall details) – updated figures (CSOs 002 – 014) with new vertical cross-sections but not showing proposed CSO upgrades (insert manhole covers for flood zone locations; bar screens and duckbill check valves/tide gates, trash racks, visual aid chalk & block provisions, measurement rod for pipe flow depth measurements) or other upgrades.
- Attachment I (CSO flows – 2021) – based on a 3-month (April – June) 2003 Hydraulic Flow model outputs per precipitation amounts. They are not using the 1995 Hydraulic Study that estimated CSO discharge flows by CSO discharge pipe flow depths.
- Attachment J (2014 Long Term Control Plan (LTCP) Update) – They noted that they did not receive a specific letter approval for this LTCP Update. However, LTCP approvals are now mostly in the form of the subsequent NPDES Permit renewal(s) which essentially approve the LTCP with NPDES permit conditions, regulations, and statutes governing in event of a conflict.
- Attachment K (Industrial user information) – industrial/commercial wastewater contributions
- Attachment L (Whole Effluent Toxicity (WET) test reports) – did not include the 2023 WET Test Reports
- Attachment M (May 2022 Wet weather operating plan – existing WWTP) – not valid with the primary clarifier out-of-service.
- Attachment N (May 2022 Wet weather operating plan – proposed WWTP) – will need to be updated upon WWTP upgrade project completion.
- Attachment O (June 16, 2022 PAG-02 NPDES general permit approval) – No. PAC540119 construction stormwater (WWTP upgrade project).
- Attachment P (EPA AOCC correspondence) – submitted as part of compliance documentation, including, but not limited to:
    - November 23, 2020 Benesch Letter & attachments including:
        - November 2020 Corrective Action Plan
        - Old WWTP O&M Plan Chapter VIII (Maintenance)
    - November 2020 and May 2023 CSO System O&M Plan(s) (stamped: “This document has been revised Please see updated version”) – The NPDES Permit Renewal Application did not contain an updated “CSO System O&M Plan” but contained an “Operation and Maintenance Collection and Conveyance System Plan”.
    - December 2020 Quarterly update
    - December 23, 2020 Industrial Pretreatment Program Letter
    - PPC Plan – stamped: “This document has been revised Please see updated version”
    - Old WET Test reports
    - May 2021 Local Limits Development Sampling Plan
    - Inflow & Infiltration (I&I) Abatement Plan – stamped: “This document has been revised Please see updated version”
    - 6/11/2021 SMSA Letter indicating an IPP would be submitted separately for approval in accordance with the AOCC. No IPP found in available DEP Files.

- Attachment Q (August 2023 Long Term Control Plan (LTCP) Update):
    - Attachment A (Location Map) – some figure information blacked out
    - Attachment B (Sewershed Map & Collection System Map) – shows manholes and lines that SMSA knows about. Includes second drawing with proposed Flow Study drainage areas (20) but sub-sewer sheds numbering differed from other application documents.
    - Attachment C (Active CSO Sketches) – updated 2023 versions (includes new manhole cross-sections in addition to previous information). Horizontal Flat Weir manhole design clarified (influent/CSO pipes on same elevation with drop via weir opening to effluent pipeline to Interceptor).
    - Attachment D (2004-approved Long Term Control Plan)

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- Attachment E (Implementation Schedule) – proposed SMSA LTCP Implementation Schedule including:
  - Stream Water Quality Monitoring Plan implementation – they propose quarterly monitoring for first year, and annual sampling for flowing four years, assuming 2023 approval and start in 2024 through 2028. **NOTE**: This is insufficient if they fall under the Demonstrative LTCP Goal. They also need to fix known CSO structure issues (which they blame for high pathogen/organic levels found in 2022 DEP Biologist sampling) in order to show any subsequent stream improvements. See related comments below.
  - Flow Study Monitoring Plan implementation – they propose a 3-year schedule (assuming approval in 2023, field investigation of flow meter locations with installation in 2024-2025, 1 year of flow monitoring in 2025-2026, and 184 days for data evaluation and submittal of Flow Study Report (circa 8/31/2026). **NOTE**: The Flow Study Plan only addresses sewer system flows at 7 sewer main locations (no CSO discharge monitoring). They also need to calibrate any proposed method of estimating CSO Discharge Flow volume, frequency, duration, and intensity going forward. In terms of related information:
    - "The CSO regulators will be verified and corrected if necessary first prior to flow meters being installed".
    - "Depending upon when and if PADEP issues the Construction Permit, the Flow Study will analyze flow to pump station as well as flow into the WWTP". Reference is to WWTP Upgrade WQM Permit No. 5422401.
    - They do not show the proposed flow monitoring locations on drawings showing the sewer system layout, so their placement locations cannot be evaluated. As noted above, they also need to be consistent with sewer shed numbering system, and otherwise calibrate any CSO discharge flow estimation method in the absence of CSO flow meters.
  - WWTP Upgrade Construction – now obsolete due to WQM permit action.
  - Proposed LTCP Implementation Schedule including:
    - GPS mapping of collection system – 2024-2028
    - Cleaning, Televising, and Evaluation of Collection system – 2026-2035
    - Development of GIS model of Collection System – 2036-2037
    - Flow Study Recommended project construction – 2026-2041
  - NMC Implementation Schedule including:
    - Annual Borough-wide street sweeping
    - Cap/Plug PS No. 1 bypass – 2023
    - Adopt IPP Ordinance – 2024
    - WQM Permitting for CSO Modifications – 2025-2026
    - CSO Elimination Study – 2026
    - Collection System-Manhole Inspections – 2023-2028
    - Collection System Inlet Cleaning – 2023-2028
- Attachment F (August 2023 Preparedness, Prevention, And Contingency (PPC) Plan) – existing WWTP only, to be updated after WWTP upgrade.
  - "The existing Emergency Response Plan was prepared by PennEast Corporation in 1973 and is included in the original Operation and Maintenance Manual for the facility. A copy of this plan is included for reference purposes as Attachment 6".
  - "A copy of the Shenandoah Sewer Treatment Plant, West Mahanoy Township Off-site Response Plan (March 9, 2023) prepared by the Schuylkill County Local Emergency Planning Commission has been reviewed and additional information supplemented by this document. A copy of this plan is included for reference purposes as Attachment 7".
  - Enclosure Three Emergency Phone Numbers had a typo for the DEP emergency response telephone number.
- Attachment G (August 2023 Stream Water Quality Monitoring Plan) – Five (5) monitoring locations proposed but eight (8) are listed for various constituents (pH, Temperature, DO, CBOD5, TDS, TSS, E Coli, Fecal Coliforms, Total Hardness, TN, TP, Total Aluminum, Total Copper, Total Iron, Total Lead, Total Manganese, Total Zinc, O&G, and floatable/solids visual observation). Monitoring plan is insufficient to address a Demonstration LTCP Goal.

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- Attachment H (SMSA Organization Chart) – Shenandoah Borough is shown to be an integral part of POTW decision-making. See Compliance Section for narrative information.
- Attachment I (6/8/2023 Interceptor Televising Inspection Reports) - Per letter response, approximately 800 LF (MH43-MH39) of Shenandoah Creek Interceptor was cleaned and televised in June 2023. Future televising will be done as problems are found during inspections, complaints are made by the public, and as determined by future flow studies in order to determine the most appropriate areas to maximize the use of limited funds. **NOTE**: The structurally unsound stone sewers, if any remain, should be investigated. See comments below.
- Attachment J (CSO Investigation/Inspection Photos) – not dated, and could be from either the 2022 or 2023 Benesch Engineering Inspections. 8/16/2023 Response Letter indicated missing/deteriorated bulkheads in CSO Nos. 002, 006 and 007. Response also indicated weir plate openings below minimum opening size in assorted weir CSOs, which is throttling the influent flow dropping to the pipe going to the Interceptor. Photo conflicted with design-detail assumed pipe size for one CSO Manhole.
- Attachment K (July 2023 Operation and Maintenance Collection and Conveyance System FKA "CSO Operation & Maintenance Plan" per page footer) – this plan referenced inspecting bar screens, tide gates, etc. that are not currently present in the CSOs.
- Attachment L (Street Sweeping Schedule & Mapping)
- Attachment M (Fats, Oils, And Grease Public Education Flyer)
- Attachment N (EPA CSO Model for Small Communities a.k.a. Hydrologic and Hydraulic Report) – uncalibrated Modeling.
- Attachment O (August 2023 Flow Study Plan) – Location Map has grayed out topography. SMSA figures disagree about sewer shed numbering. 7 flow meters (including Pump Station No. 1 permanent flow meter) for ~20 drainage areas. One drainage area (numbered differently on different figures) was subdivided by the main drainage divide (between Pump Station No. 1 and Shenandoah Interceptor). No CSO discharge flow monitoring proposed. Flow meters not shown in relation to collection system piping (shown on other application figures) to validate their proposed locations. Flow Meter 001 (if located on interceptor) location will be receiving separated sewer shed flows in addition to CSS flows. Flow Meter 002 appears to be the influent to Pump Station No. 001 (which is supposed to get its own flow meter). Flow Meter 003 appears to be located at CSO Outfall No. 008 and below Ateeco Inc. facility. Flow meter 007 will be receiving Shenandoah Interceptor flows (prior to Kohinoor Creek interceptor contributions) at the CSO Outfall No. 002 location. The figures are unclear regarding which flow meters will receive separated sewer shed drainage along the Shenandoah Creek Interceptor route. They are relying on the WWTP flow meter for total service area flows.
- Attachment P (Alternatives Funding Analysis)
- Attachment Q (August 2023 Nine Minimum Controls Plan) – including updated coordinates for CSO Diversion manholes and outfalls, and discusses implementing assorted NMC controls. The Plan noted a 2022 Benesch Inspection (did not mention the 2023 inspection) and indicated recommended repairs: "These repairs include the addition of weirs, the addition of bar screens, duck bill check valves, fabricated staff gauges, and flow indicators. CSO signage was also to be updated or installed at a number of CSO outfalls".
- Attachment R (August 2023 Post Construction Compliance Monitoring Plan)
- Attachment S (July 2023 Inflow and Infiltration (I&I) Abatement Plan) – references the separate CSO Flow Study Plan (sewer subsheds) to define the prioritized areas. Unclear what has been implemented or whether implementation awaits DEP and/or EPA approval of the Sewer System flow study.

  - Attachment R (Borough of Shenandoah Sewer Ordinance) – existing ordinance.
  - Attachment S (One-time Compliance Report for Dental Dischargers) – one-time compliance report per 40 CFR 441.50.

- **WWTP Discharge Points**:
  - Outfall No. 001: Authorized 2.0 MGD treated sewage discharge to Shenandoah Creek.
  - Stormwater Outfall Nos. 015, 016 and 017 (existing); Nos. 018, 019, and 020 (proposed): This is a major STP with existing NPDES Permit Part C Stormwater Conditions. WWTP upgrade project will replace the existing stormwater outfalls with new Outfalls Nos. 018, 019, and 020. Any stormwater from the highway is captured and discharged in Outfall 020 (a.k.a. EWA-1) per Response Letter Item 5.a. **NOTE**: Existing stormwater outfalls direct discharge to the proposed future fill/new WWTP unit location. It is uncertain when

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the new stormwater outfalls will start discharging during the construction sequence, but sampling will be required after stormwater discharging begins.

- **Facility Flows**:
  - Application-reported Flows: Annual Average Daily Flows were 1.53 MGD (2019), 1.248 MGD (2020), and 1.316 MGD (2021). The highest 2021 monthly average flow was 1.74 MGD (May), with 3.121 MGD peak instantaneous flow.
    - These figures do not account for potential need for the Treatment Plant to treat additional peak wet weather flows to meet existing/future NPDES CSO-related requirements.
    - The NPDES permit application's Attachment I (CSO Flows – 2021) table reports WWTP Plant flow, but it is unclear if influent or effluent flow. **NOTE**: The Attachment I CSO discharge flow figures were based on an obsolete/inaccurate 2003 Flow Methodology (discussed below).
  - New WWTP Design Flows: The proposed (WQM Permit Application No. 5422401) WWTP Upgrade CSBRs will decant at a peak rate of 8,102 GPM (11.67 MGD) through the UV disinfection system and Outfall No. 001. The system continuously receives influent flow and once flow exceeds a peak day flow of 5.0 MGD, the system automatically switches to storm cycle and is capable of treating 8.0 MGD.
    - Peak instantaneous and peak hourly flow: 8.0 MGD. **NOTE**: The daily max flow was identified as 5.83 MGD (while achieving secondary treatment). Application also indicated that it could handle a peak 8.0 MGD flow for one hour before losing secondary treatment capacity.
    - Normal Cycle Time: 72 minutes (4.8 cycles/day)
    - Normal Decant Rate: 6,076 GPM.
    - Storm Cycle Time: 54 minutes (3.6 cycles/day)
    - Storm Decant Rate: 8,102 GPM (~11.67 CFS). **NOTE**: Outfall No. 001 will be modified with R-8 riprap to enable it to handle higher discharge flows.
    - UV Disinfection System: Designed for PI/PH of 11.7 MGD (SBR decant feed maximum).
    - SBR Operating Modes: The proposed WWTP is designed to provide a "storm mode" and "super storm mode" to account for increased wet weather flow. (8/16/2023 Letter Response Item 5.y.vi).
    - Post-WWTP Upgrade Peak Wet Weather Flow Capacities: This new WWTP will increase peak daily capacity from 5.0 MGD to 5.83 MGD. It will also increase peak instantaneous capacity to 8.0 MGD. This will allow for more flow at the WWTP. While the new WWTP is designed for the ADF of 2.0 MGD, this is due to the organic loading. Hydraulically the new WWTP can pass 8.0 MGD while still providing primary treatment and disinfection. (2023 LTCP Section 1.4) Primary treatment and disinfection can be provided in the new WWTP in the future for 8.0 MGD continuously. (2023 NMC Plan Section 2.4)
  - Contributing Service Area Information to help estimate expected dry weather flows: Per NPDES Permit Application form (but with conflicting application information regarding what areas are separated versus combined sewer system sewer sheds):
    - Borough of Shenandoah: 100% CSS with 4,712 population (85% flow contribution): **NOTE**: Application elsewhere noted separated sewer sheds in the Borough, but was unclear on which sewer sheds are separated sewers.
    - West Mahanoy Township: 70% CSS with 1,400 population (15% flow contribution)
    - Total Population per NPDES Permit Renewal application: 6,112 persons.
    - 2023 LTCP Section 1.2-estimated population: ~5,615 people.
    - 2023 LTCP Appendix N (Hydrologic Report using EPA CSO Model): The SMSA treatment plant serves approximately 3,243 residential units (approximately 5,615 persons) and 410 commercial/industrial accounts. A total of 3,500 Equivalent Dwelling Units was estimated.
    - SMSA Estimated Flows: (July 2023 O&M Collection & Conveyance System Section 2.2)
      - Annual Average Daily System Flow: 1.537 MGD (2.0 MGD WWTP hydraulic capacity).
      - Average Daily Dry Weather Flow: 0.720 MGD
      - Peak Day Wet Weather Flow: 4.3 MGD (5.0 MGD WWTP peak flow capacity)
      - CSO flows per NPDES Application CSO Information for 2022: See CSO section below. In practical terms, they do not have qualitative or quantitative discharge data to estimate actual CSO discharge, and consequently might be required to treat substantially greater volumes of CSS flows to meet their chosen LTCP Goal.

Sewer System Information: See Treatment Information Section for additional Chapter 94 Report and Annual CSO Status Report information.

Summary of Review

- Overall Breakdown: The 2023 LTCP Section 2.4 estimated a total ~680 acres sewer-shed broken down into twenty (20) sewer sub-sheds.
  - Application figures conflicted in terms of sub-shed numbering and which are the separated sewer sheds, plus at least one sewer shed was indicated to discharge to both PS No. 1 and the separate Shenandoah Interceptor.
  - There are two designated main stormwater drainage areas (A and B). Stormwater Drainage Area/Sewershed A drains to interceptor along Shenandoah Creek. Stormwater Drainage Area/Sewershed B drains to Pump Station No. 1 and is then directed to WWTP. The drainage divide is shown on the first figure below (but other application information reverses the designations).
  - Fourteen (14) areas have combined sewers for ~52% of sewer system. 48% (326.50 acres) are separated sewers per one part of the application. The separated sewer sheds include regions of Shenandoah Heights, Turkey Run, and the Borough of Shenandoah (with estimated ~206 EDUs). However, other Application information conflicted in terms of which sewer sheds are separated and percentage CSS/Separated Sewer System. Separated Sewer System Areas:
    - A portion of the collection system was installed in 2003-2004 in West Mahanoy Township. This section is entirely separated from the storm sewer system.
    - A separation project was completed on Emerich Street in the 1980s. Additional plans were developed to continue with work in that area, but no further construction was completed due to a lack of funds.
    - LTCP Section 3.4: “Multiple areas throughout the SMSA collection system have been separated including sections of Shenandoah Heights, Turkey Run, Weston Place, Brownsville, Shenandoah Schools, and Herald Creek. Reduction in wet weather flow is achieved by these separation projects. Additional separation projects will be evaluated in the future in addition to the removal of CSO #007, CSO #009, and CSO #014”.
- Existing CSS System information:
  - The combined sewer pipe system includes 6-, 8-, 10-, 12-, 15-, 24-, and 36-inch pipe. The combined length of all gravity flow-pipe is estimated at 20 miles. The Pump Station No. 1 sewage force main is approximately 1/8 mile.
  - The CSO diversion manholes were constructed in 1972 at the time of construction of the SMSA Wastewater Treatment Plant and accompanying interceptor collection system. The interceptor line was constructed to connect these lines which previously discharged directly to the streams and convey the sewage to the treatment plant. (LTCP Section 2.1)
  - The original combined sewer system is made up of stone culverts and terra cotta pipelines which previously carried wastewater to either the Shenandoah Creek or the Kohinoor Creek in the Borough. (2023 CSO O&M Plan)
  - The I&I in the Shenandoah Creek interceptor is suspected from infiltration in the pipeline and not from the manhole per SMSA. SMSA began televising the interceptor in 2023 to attempt to identify where the potential infiltration is located. (Response Letter Item 6.I.ix)
  - The sanitary sewer collection system, installed between 1973 and 1975, is in fair condition. The numerous combined sewers installed prior to 1973 are in various conditions. In several cases the combined sewers constructed of stone are **structurally unsound**. (2023 NMC Plan Section 2.1, bolding added)
  - Alfred Benesch & Company completed an inspection of all diversion manholes on June 28, 2022, and concluded that they are either in proper operating condition or recommended repairs to be completed by SMSA personnel. These repairs include the addition of weirs, the addition of bar screens, duck bill check valves, fabricated staff gauges, and flow indicators. CSO signage was also to be updated or installed at a number of CSO outfalls. (2023 NMC Plan Section 2.1, bolding added). **NOTE**: The LTCP also referenced a 2023 Benesch Inspection but no Benesch Inspection Reports were provided.
  - “Items identified for repair include the replacement of bulkhead in CSO #002, replacement of bulkhead in CSO #006, investigation and repair of bulkhead in CSO #007, cleaning of CSO #010, and to ensure all weir plates are open to dimensions specified within CSO drawings included as Attachment C. Investigation photos are included as Attachment J”. (2023 LTCP Section 3.1)
  - CSO Manhole Types: There are 14 CSO Outfalls at present, with three basic types.
    - Bulkhead Manhole design (CSO Outfall Nos. 002, 006, and 007) along the Shenandoah CSS interceptor): The three (3) CSOs use a vertical weir plate or bulkhead.
    - Horizontal/Flat Weir Plate Manhole design (CSO Outfall Nos. 003, 004, 005, 009, 010, 011, 012, 013A/013B (being renumbered to 013 and 021), and 014): The ten (10) diversions are the “flat” weir

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plate diversion manholes. Design details did not show elevations for the flat weir elevations for the weir manholes.

- Design: The weir plate manholes design involves a horizontal sliding weir plate (at elevation below both influent pipe and CSO discharge pipe bottom invert elevations per LTCP figures) with the weir opening allowing dry weather influent flow to drop to an effluent pipe (to the Interceptor or pipe to the interceptor) at variable depths. Higher wet weather influent flows can "jet" across the weir opening directly into the CSO discharge pipes (at same elevation as influent pipe). The flat weir plates limit splashing/backflow and solids only after the flow has dropped through the weir openings. They do not otherwise restrict flow or solids to the CSO Outfall. Benesch Inspections noted the majority of weir openings were less than recommended minimum opening sizes (i.e. smaller weir opening increased likelihood of CSO discharge jetting and even possibly dry weather discharges during peak daily diurnal flows). They have not been reporting CSO discharge pipe flows or flow depths in the CSO Monitoring Reports (relying on 2003 Flow Estimation correlation tied to precipitation in inches).
- CSO Outfall Nos. 010 through 013A & 013B: Discharges to Kohinoor Creek (intermittent/dry or underground UNT to Shenandoah Creek not shown in E-maps). Outfall Nos. 013A/013B will be renamed Outfall Nos. 013 and 021 per general EPA recommendations when dual CSO outfalls are in the same regulator structure.
- CSO Outfall No. 014: Discharges to Sewer Creek (intermittent/dry UNT to Shenandoah Creek not shown in E-maps). Per application: "CSO No. 14 discharges to a dry swale that dissipates after crossing the historic Mine Access Road, which presumably flows through the Upper/Lower Brownsville area. Supplemental field investigations conducted in June 2023 were unable to identify a definitive pathway for Sewer Creek. Based on topography, the Sewer Creek cannot cross SR54 upstream of the WWTP". **NOTE**: "The referenced unnamed tributary east of the WWTP is runoff from mining activities" (but appears to be the historic Kohinoor Creek pathway before historic rerouting).

- Standpipe Manhole Design (CSO Outfall No. 008): In addition to the flat weir plate design, a standpipe raises the CSO Discharge Pipe inlet above the flat weir plate. CSS Interceptor is directly below manhole. Design detail showed a cap on the stand-pipe.
- Underground CSO Outfalls discharge points:
  - 2021 DEP Inspection notes Shenandoah Creek goes underground at the E Mount Vernon bridge just downstream of CSO 009 outfall, and daylights near CSO No. 008.
  - 2021 DEP Inspection Report noted Kohinoor Creek runs underground from the intersection of W. Coal Street & Walnut Street and resurfaces at the west side of Boyers Food Market parking lot on W. Centre Street. Underground discharge noted at CSO Nos. 010, 011, 012, 013A/B.
- Unpermitted Pump Station No. 1 bypass/CSO Outfall (at Center Street, located along Route 54 found during DEP Inspection): This unauthorized bypass discharge was reported as plugged in a WQM Permit Application No. 5422401 submittal (with WWTP upgrade including new flow meter, alarms and SCADA connection to new WWTP). In terms of Pump Station No. 1 information:
  - The 2001 LTCP noted the PS force main at 1/8th mile in length. Current LTCP indicates the Authority is uncertain about the number and length of force mains in their sewer system.
  - Per 8/16/2023 Response Letter Item 6.b.iii: "The unpermitted Pump Station No. 1 CSO discharges directly into Kohinoor Creek (see updated Topographic Location Map). This outfall will be capped/plugged at the Pump Station Wet Well as detailed in the LTCP Schedule of Compliance".
    - Per their 2014 LTCP (application document): "The rated capacity (with one pump out of service) of Pump Station No. 1 is 1.0 MGD. Estimated present flows are 0.4 MGD during dry weather and 0.6 MGD during wet weather. Pump station No. 1 is monitored continually by a leased telephone line "closed loop" alarm system. In addition to the alarm system, the pump station is checked daily by the plant's maintenance staff. Since there are no flow meters at the station, the available capacities and present maximum flow cannot be projected".
    - Per 8/16/2023 Response Letter Item 6.h.i: "There have been no reportable incidents due to excessive flow. The capacity of Pump Station No. 1 is 1.0 MGD. Dry weather

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flow is estimated to be approximately 0.4 MGD and wet weather flow is estimated to be 0.6 MGD based on normal pump run times.

- Currently, there is no flow meter located within the pump station, however as part of the proposed WWTP Upgrade Project, a magnetic flow meter will be added. The signal will be transmitted to the proposed SCADA system via radio telemetry. Standard Operating Procedures for Pump Station No. 1 will be completed following upgrades. (2023 LTCP Section 2.1). The 2023 O&M Collection & Conveyance System Plan Section 6 indicates plan for SCADA system to monitor/control the pump station in addition to flow meter installation.

- Figures showing CSOs: See figures below:
  - First figure shows sewersheds (separated sewer sheds in green with red line with original drainage divide between Shenandoah Creek Interceptor drainage area and Pump Station No. 1 drainage area. The first figure below conflicts with other NPDES Permit figures/information in terms of sewer shed numbering; the subdivision between area flowing to Pump Station No. 1 versus Shenandoah Creek Interceptor (Drainage Area A versus B); and which sewer sheds are separated sewer system areas versus combined sewer system (CSS) sheds.
  - Second figure shows CSOs relative to the 100-year floodplain.
    - Per application: “A review of PADEP E-maps show numerous areas within the Borough as the 100-yr floodplain. This data is inconsistent with the FEMA floodplain data effective 5/18/2021. We are unsure of where this flooding data is derived from. We also note there is a significant in the layer file titled "Floodplains” verses “100 Year Floodplains”. **Utilizing the FEMA floodplain as our data, a significant portion of the Shenandoah Creek Interceptor is located within the Shenandoah Creek 100-Yr Floodplain. The inflow in this area would be captured by the WWTP influent flow meter”. (Response Letter Item 6.z.v, with bolding added). NOTE**: In practical terms, the WWTP Influent Flow Meter would not catch CSO discharge flow volumes, with SMSA reporting several of the Shenandoah Creek Interceptor CSO regulator having missing/deteriorated weir bulkheads. DEP E-maps (below) indicated additional (green) 100-year flood areas which would also have manholes/sewer lines including what was apparently the old/new Kohinoor Creek and old Sewer Creek stream pathways, and along several Borough Streets. The referenced FEMA mapping was not provided with the SMSA response. Localized areas of flooding might be contributing to peak wet weather influent flows being discharged via the CSO outfalls.
    - There was a reported 2023 dry weather “SSO” but it was unclear whether it was within the CSS area (near Shenandoah Creek) or not. The event was blamed on blockages.
    - The second figure below shows 100-year flooding area which help show were inflow into manholes would be a special concern. It appears to show the historic Kohinoor Creek flow route (prior to mining disturbances) as compared the first figure’s showing the rechanneled Kohinoor Creek route to Shenandoah Creek.

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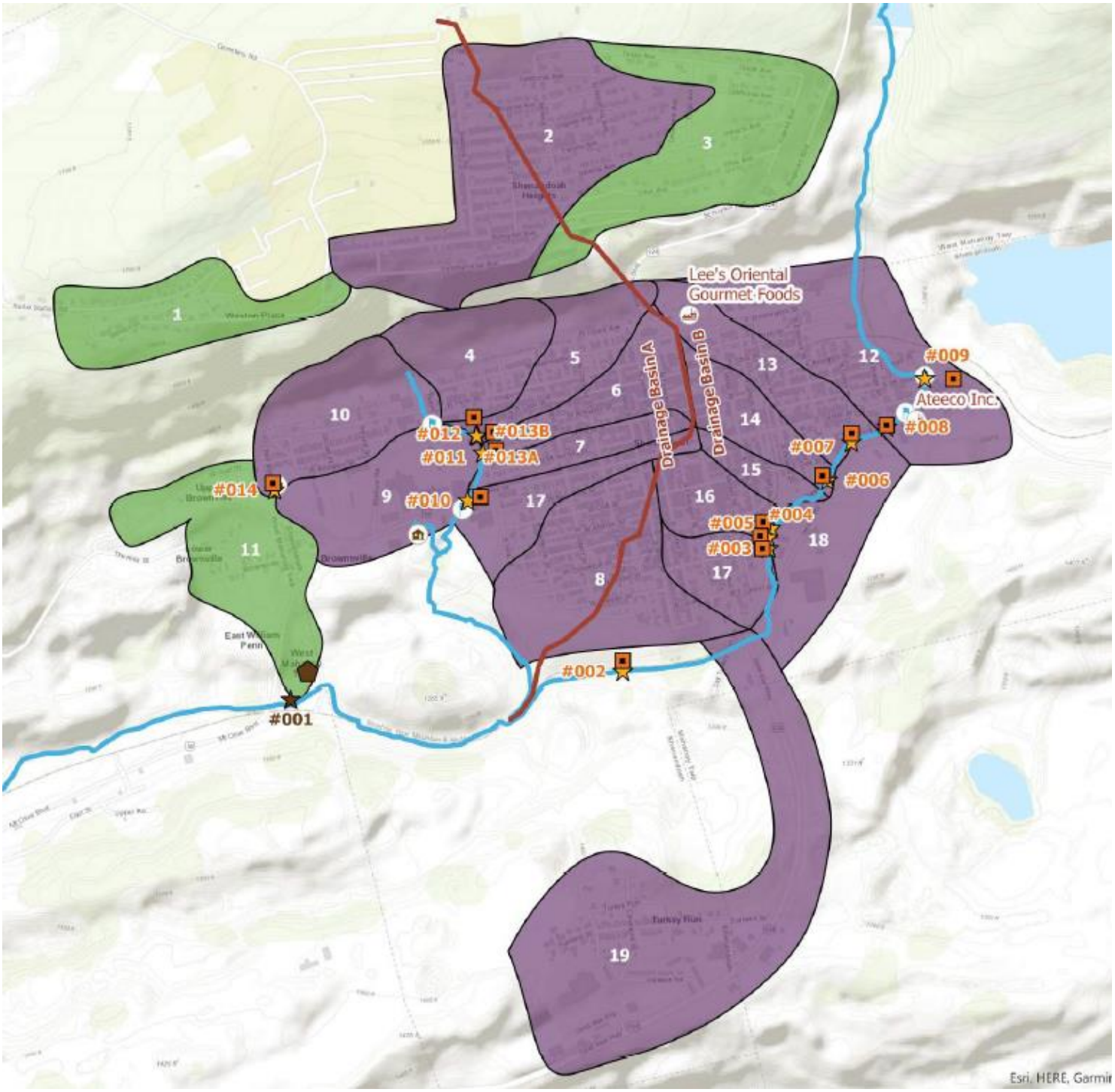

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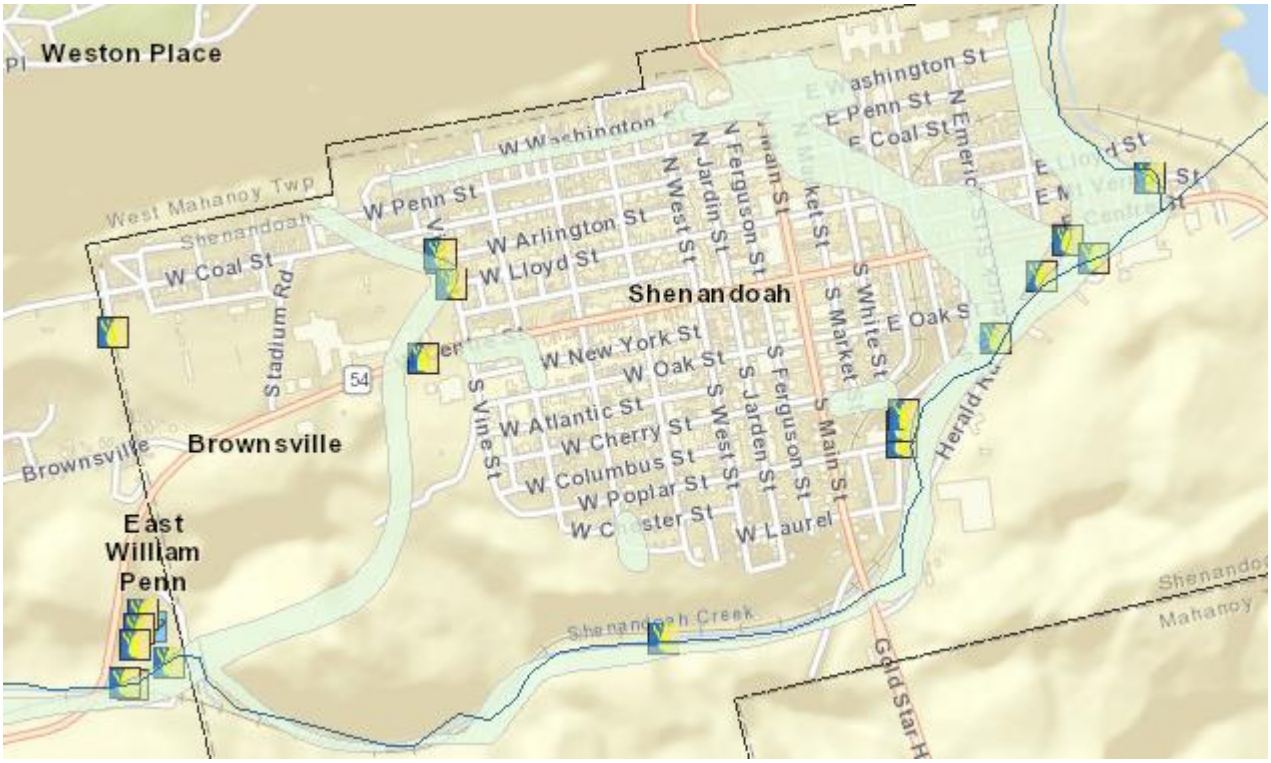

CSO-related Review Highlights: See the Discharge & Receiving Waters Section (including stream sampling data showing CSO impacts); Treatment Plant Section for Annual CSO Status Report information; Compliance Section (for CSO-related compliance issues); and Additional CSO Information Summary Section for more CSO information/comments. Highlights:

- **NPDES Permit Application CSO Discharge Information**: **101 precipitation events with 101 discharges with 0.02-inch precipitation triggering CSO events in one year of operation (2021), i.e. any precipitation event triggers CSO discharges. The Attachment I (CSO Flows – 2021) shows (2003 CSO flow estimation method-estimated 8,468,972 gallon annual flow, max 1,327,526 gallons, average 23,203 gallon flow).** Please note the following:
  - The above estimates are underestimates. They are reporting based on 2003 CSO Flow Estimation Method (based on >20-year old 3-month study when I&I problems tend to worsen over time) and in the absence of any quantitative (flow data) or qualitative flow data (such as CSO discharge flow pipe depths and other CSO Monitoring Report-required information) to support the current estimates. The actual CSO discharges would have been substantially greater due to the LTCP-reported O&M issues (missing weir plates bulkheads at CSO 002 and CSO 006; a partially blocked sewer main at CSO 002; and a deteriorated bulkhead at CSO 007; and failure to maintain minimum weir openings in most of the Flat Weir Manholes).
  - CSO discharges (during each precipitation event) are expected due to the majority of the CSO outfalls using a “horizontal flat weir plate” design where wet weather influent flows can “jet” directly over the horizontal weir drop opening into the CSO discharge pipes (at same elevation as the influent pipe).
  - At the Application-estimated 83,851 gallons/precipitation event estimate (from the outdated and now inaccurate/uncalibrated 2003 Flow Correlation Method), a minimum of 8.47 Million gallons annual discharge of untreated CSO discharge was discharged to the waters of the Commonwealth (averaging ~0.71 MG per month for each of 12 months) as a ballpark estimate into the relatively small Shenandoah Creek (Q7-10 low flow value of 0.9162 CFS, which may be factoring in the 2.0 MGD SMSA Treatment Plant historic discharges in the calculated Low Flow Yield). The Shenandoah Creek is already 3.4:1 effluent-dominated, with the CSO discharges potentially contributing a significant percentage to historic stream flows. See Treatment Section for Annual CSO Status Report-reported flow information.

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- The CSO discharges receive limited additional dilution in the receiving stream. Portions of the Shenandoah Creek are were noted as "dry" during DEP Inspections. Kohinoor Creek and Sewer Creek are intermittent streams at best.

- Other Issues:
  - Potential CSO discharges below Hydraulic Capacities: The 2021 flow estimates do not show the POTW is meeting its current NPDES permit requirements for CSO discharges (authorized only when exceeding hydraulic capacity of the WWTP or conveyance system during or immediately after precipitation events). The Attachment I (CSO Flows – 2021) shows CSO discharges when the identified Treatment Plant flows had not exceeded its permitted 2.0 MGD hydraulic capacity (let alone the identified 5.0 MGD daily max flow). The LTCP Update did not contain engineering analyses to show that WWTP and/or collection/conveyance system hydraulic capacities exceedances (see Chapter 94.1 definition for "hydraulic design capacity") required the 101 reported CSO discharges, nor whether collection/conveyance system maximize storage/maximize flow to the Treatment Plant NMCs were met. The hydraulic design capacities of the as-built CSS interceptors were not identified. See also comments below on the EPA CSO Model regarding CSO manhole engineering calculations.
  - Potential Dry weather CSOs: Because they have installed no visual aid to detect off-hour dry weather discharges and are only reporting CSO discharges when they apply precipitation data to their outdated 2003 CSO flow estimation method, they have not ruled out potential dry weather CSO discharges. The Treatment Plant flows (unclear if influent or effluent flow being reported) shows flows substantially above the estimated dry weather flows during weeks of no identified precipitation (i.e. potential for significant groundwater infiltration issues or dry weather CSO discharges in the collection/conveyance system during even relatively dry periods).
  - Reported Incorrect CSS Flow Capture Rates: The POTW has been reporting >85% Annual Capture rates based upon the outdated/uncalibrated 2003 CSO Flow Estimation Method, but with negative receiving stream impacts found in DEP sampling (see Stream information section). In addition, they would have to account for and separate out any potential separated Sewer shed I&I flows from the CSS-only flows in their calculations. If their flow estimates were correct, it would only prove that the 85% Capture/Treatment LTCP Presumption Goal does not apply to the POTW.
- The Application included LTCP Update Attachment N (EPA CSO Model for Small Communities): The Attachment including the following information: Approximately 52% (353.83 acres) of the sewer system is designated as "Combined, while the remaining 48% (326.50 acres) are designated as "Sanitary Only". Six (6) different rainfall events were analyzed within the model: the 85th percentile rainfall depth (0.90 inches) as provided on tab A1 of the model, the 1-Year 24-hr rainfall event (2.8 inches), the 10-Year 24-hr rainfall event (4.90 inches), 25-Year 24-hr rainfall event (6.05 inches), the 50-Year 24-hr rainfall event (7.12 inches), and the 100-Year 24-hr rainfall event (8.39 inches). A NOAA D nested hyetograph distribution was utilized over historical rainfall data due to nested hyetographs typically being used for design and regulatory purposes. Based on the EPA CSO Model for Small Communities, the permittee estimated the SMSA collection system would receive a total peak day flow of 16.63 MGD for the 100-Year Storm. The collection system would convey 8.65 MGD to the WWTP and 7.98 MGD would overflow at the CSOs (without calibrating the EPA CSO Model with actual flow data). Please note the following:
  - This EPA model defaults to a mere screening tool in the absence of model calibration with real data. Actual flow data & analysis would be required to calibrate the EPA model to allow for its usage in CSO discharge flow DMR/EDMR reporting and/or determine compliance with the LTCP Goal.
    - The outdated and now uncalibrated 2003 Flow Estimate model cannot be used to calibrate another uncalibrated model.
    - The provided engineering analysis (for CSO manhole discharge calibration) was too simplistic to address the horizontal flat weir manhole design. The Appendix N Attachment 3 calculations (based on calculating the point of transition "from weir flow to orifice flow within the CSOs that utilize a weir plate" is of doubtful value. Setting an orifice flow equation to a weir equation becomes useless when the flat weir plate height is effectively zero. In addition, the 1970s CSO Manhole designs might require substantial modification to meet existing NPDES CSO-related permit requirements.
    - There was no supporting data on actual CSO discharge flows (either quantitative or qualitative) due to lack of visual aid and lack of CSO monitoring report information such as CSO discharge pipe flow depths (for qualitative ballparking of flows) or any CSO flow

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measurements. Site-specific considerations can include springs or mine seeps directing flows into the collection system, etc.
- The proposed Sewer System Flow Study does not include any provisions for measuring CSO discharges at the present time.
- The POTW may have to meet the more stringent Demonstration LTCP Goal, not the assumed 85% capture/treatment Presumption Goal due to ongoing stream impairments.
- The application also included conflicting information on the breakdown of combined versus separated sewer sheds, so the drainage area inputs are suspect.

▪ The 2014 LTCP information: They apparently did not implement the 2014 LTCP:
- Missing Flow Study: A CSO flow study had been recommended. The Plan recommended the Authority conduct a six (6) month study of the seven (7) largest known CSO discharge points to compare additional data to determine if they are meeting Criteria #2. If they are not, this data should be utilized to further refine the iterative charts which are in the Combined Sewer Overflow Monitoring Report and determine an additional course of action to meet the requirements. (2014 LTCP). **NOTE**: This proposed study was not done. Criteria #2 is the 85% capture/treat LTCP Goal.
- 2003 Flow Study noted the following pattern: Overflow is also characterized by infiltration. CSO's 002, 004, 007, and 009 exhibit a large overflow value with small duration storms. Similarly, CSO's 003, 006, 008, 011-013A, and 013B demonstrate excessive overflow for long duration storms. In both cases, infiltration is limited by either very rapid runoff with no account for water infiltration or very saturated surfaces with little ability for the ground to accept runoff. Other CSO's are sensitive to both types of storms, such as CSO's 005, 007, 010, and 014.
- Weir Plate Settings: The 2014 LTCP appeared to indicate the flat weir plate manhole opening settings had been modified since the 2003 flow study, with the 2023 LTCP Update indicating minimum weir openings not maintained (i.e. invalidating the 2003 Flow Estimation method):
  - The CSO manhole weir plates are adjusted from time to time depending on the impending weather forecasts. In order to maximize flow to the treatment plant, SMSA personnel have adjusted the weir plates to the maximum openings to force as much flow as possible to the treatment plant. (2014 LTCP)
  - The SMSA has installed sliding plates at the diversion manholes which are adjusted to minimize overflows during wet weather and maximize use of the collection system for storage. During the extended length of time that this system has been in operation, SMSA personnel have established the optimal locations for this plating. (2014 LTCP)

- Potential WWTP undersizing: The WWTP upgrade design (2.0 MGD ADF, 5.86 MGD daily max flow (achieving secondary treatment); 8.0 MGD peak instantaneous flow) might be undersized but the POTW has committed to sewer separation projects in that event in the WQM Permit design flows are exceeded.

- **POTW Chosen LTCP Goal**: **The NPDES permit requires the permittee to re-evaluate the applicable LTCP Goal, which will impact LTCP requirements going forward.** The POTW previously chose the 85% Volume Capture/Treat LTCP Presumption Goal which is a minimum level of treatment that is presumed to meet the water quality-based requirements of the CWA, unless data indicate otherwise ("presumption approach") if a demonstration approach is not required due to ongoing stream impairment. In this case, there are known stream impairments, 2022 DEP sampling data indicating likely CSO-discharge contributions, and the sheer frequency/magnitude of the CSO discharges to the relatively small Shenandoah Creek makes impact likely.
  - The POTW indicated that its (obsolete) 2003 CSO Flow Estimation Method and the (uncalibrated) EPA CSO Flow Model both showed the facility had achieved >85% capture, despite stream sampling data showing negative impacts, which indicates the 85% capture/treatment LTPC Presumption Goal is not adequately protective of the waters of the Commonwealth (if the model estimates were correct). They may have to demonstrate that the CSO discharges are not causing exceedances of the Chapter 93 Water Quality Standards (including new E Coli Standard), i.e. the more stringent Demonstration LTCP Goal.
  - The POTW hopes that CSO O&M will address the apparent CSO-related impacts, but that would have to be shown in a future LTCP Update.
  - No wildcat sewers are suspected by the POTW to be contributing to the identified stream impacts per 8/17/2023 Response Letter Item 6.w

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- **CSO manhole Design Requirements: The existing CSO manhole design dates from the 1970s, predating existing NPDES permit CSO-related requirements.** While the POTW is considering limited upgrades including additional CSO solids/floatable controls**,** the facility may be required to install vertical weirs (in the flat weir manholes) and/or otherwise substantially modify the existing CSO manhole/regulators to meet compliance with the applicable NPDES Permit requirements only discharging when hydraulic capacity is exceeded during or immediately after a precipitation event, the existing NMCs (including storage in the collection system and maximization of flow to the WWTP), and applicable Long Term Control (LTPC) Goal.
- **Small Systems LTCP Request**: SMSA has requested a Small Systems LTCP as it is a facility with less than 75,000 persons. The minimum Small Systems LTCP requirements include:
    - Implementation of the NMCs: Not all NMCs (enforceable narrative Technology-Based Effluent Limits) requirements have been adequately implemented at present per the application and DEP Inspection Reports. They have included some future steps in their LTCP Schedule of Implementation and promised to take some corrective actions. Available information includes:
        - Assorted CSO-related O&M issues were noted in the NPDES permit application and DEP/EPA Inspection reports, including missing or defective weir/bulkheads, etc.
        - A pre-treatment program is currently being developed due to a single user (Ateeco) discharging high BOD and TSS per 2022 LTCP Section 3.3. The draft EPA Model Ordinance is currently under review by the SMSA Solicitor. Once his review is complete, the Ordinance will be properly advertised and adopted. Ateeco and Lee Oriental Foods discharge food processing wastes to sewer system (PPC Pan Section 1.2.2).
        - LTCP Section 3.4 Table 2 lacked minimum weir opening information for Outfall Nos. 13A/13B (being renumbered) and 014.
        - LTCP Section 3.4 states: All CSOs do not currently have screening or tide gates on discharge piping. SMSA plans to submit a WQM Part II Permit for CSO modifications which will include the installation of bar screens to catch any large floatables which may have entered the CSO portion of the diversion manholes before discharging. Duck billed check valves will be installed to prevent backflow from the discharge streams from entering the CSOs.
        - LTCP Section 3.8 states: Signs are placed at CSO discharge locations or if the CSO is not visible where it discharges, the sign is placed where the receiving stream daylights. Several signs were identified as missing in a recent inspection. Additional signs have been ordered and received in 2022. These signs will be placed at each CSO in 2023.
        - LTCP Section 6 states:
            - Chalk and blocks will also be installed in CSOs to notify if any overflows occurred when SMSA personnel were not present to witness them.
            - SMSA is also currently inspecting all CSOs daily to identify if any overflow has occurred. SMSA is looking to implement a chalk method or block method in each CSO to help identify if any overflow occurred between inspections. Fabricated staff gauges are also proposed to be inserted in each CSO. These staff gauges will help staff identify the flow exiting the overflow if overflow is happening during staff inspection. These gauges will also help when overflow happens between inspections because any chalk marks or trash caught in trash racks will help indicate the maximum overflow water depth. (2023 NMC Plan Section 2.9)
            - Additional compliance monitoring items can be found in the Implementation Schedule and Post Construction Compliance Monitoring Plan (see Attachment R) including flow monitoring to be completed as part of the Flow Study Plan (Attachment O). Other future monitoring improvements include installation of a flow meter at Pump Station No. 1, new meters and controls with the replacement of the WWTP, and improved monitoring capabilities with the installation of a new SCADA system.
    - Public participation: The standard NPDES Permit Part C CSO conditions now include additional requirements that must now be met for the next LTCP Update.
    - Consideration of sensitive areas: Please note that this requires a stream inspection (downstream of CSO outfalls) to verify that there are no downstream areas of public exposure (swimming, fishing), even with known AMD-stream impairments. If any such are found, CSO warning sign placement or other action might be required.
    - Post-Construction compliance monitoring program (PCCM): The PCCM program must address monitoring now (for constructed CSO facilities) and future monitoring to demonstrate compliance with NPDES Permit

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CSO-related requirements including the applicable Long Term Control Plan (LCTP) Goal which is an enforceable narrative Water Quality-Based Effluent Limit (WQBEL).

- Stream Monitoring:
  - Due to evidence of CSO impacts on the receiving stream (see Receiving Waters section), the facility might have to demonstrate that it is not contributing to the known stream impairments or impacts. Known stream impairments/impacts include: pathogens (E Coli and Fecal Coliforms), AMD (pH, AMD metals including Aluminum, Manganese, Iron), Zinc, organic enrichment, and Chesapeake Bay (Total Nitrogen and Total Phosphorus with a statewide CSO TMDL WLA). The two SIUs (food processing industry) would be likely sources of organic enrichment (with whole pierogies caught in the WWTP bar screen per 2023 EPA Compliance Inspection). The zinc source is unknown.
  - The POTW has not addressed the standard LTCP requirement for information on known in-stream water quality impacts (Organic, Pathogen (Fecal Coliform and E Coli), Zinc, AMD (Aluminum, Manganese, Iron), Total Nitrogen and Total Phosphorus), their causes, and effects on downstream water uses, despite receipt of DEP Biologist memo (see Stream Section for details). They indicated that they plan to address these issues in the 2023 Annual CSO Status Report (due in March 2024) per Response Item 6.aa.ii, but it is a basic LTCP requirement.
  - They do not want to conduct any CSO outfall sampling due to cost, but it is required for the CSO Outfalls receiving the SIU discharges (and at any other CSOs discharging to the stream segments with known organic enrichment) plus at least one other CSO outfall for comparison, and as needed to track down the source for zinc or other impairment (if not otherwise known).
- CSO Discharge Monitoring: The POTW does not any present means to accurately monitor and report CSO discharge volume, frequency or duration per the NPDES Permit requirements. The POTW's 2003 CSO Discharge Estimation Method (based on three months of monitoring) is obsolete (I&I problem worsen over time with potential manhole inflow during flood events), limited (since it only covered 3-months with the flat weir plate design expected to increase CSO discharge rates during greater precipitation events), inaccurate (missing/deteriorated bulkhead and failure to maintain minimum horizontal weir plate openings), etc.
  - No quantitative flow data is available to calibrate any flow model. There are no CSO flow monitors or CSO discharge flow monitoring proposed.
  - The POTW does not have any qualitative data to calibrate the model. The POTW has not been providing all information required by the NPDES Permit and CSO Monitoring Reports including details on precipitation for each day, flow depth in CSO discharge pipe, visual confirmation of CSO discharge to bracket discharge event duration, etc. The POTW did not have any visual aid to detect off-hour flows or other information to qualitatively calibrate the 2003 modeling.
- Proposed Sewer System Flow Study: The LTCP includes a proposed Flow Study. Seven (7) out of twenty (20) sewer sheds will be monitored (at 7 sewer main locations including pump station), but no CSO discharge monitoring to measure flows or otherwise calibrate any CSO discharge flow estimation method. SMSA is already warning that any additional flow monitoring would substantially increase costs and claiming "limited financial resources" (Response Letter Item 6.z.vi).
  - The existing flow study plan does not include any CSO outfall monitoring to calibrate any flow estimation method.
  - The conflicting information on sewer sheds raises questions on flow meter placement.
  - See Additional CSO Information section for additional comments.

- Preliminary SMSA Screening for CSO Outfall Prioritization:
  - They plan to investigate potential elimination of CSO Outfall Nos. 008, 009, and 014.
  - Per the application, the SMSA (Benesch) preliminary analysis determined that the limiting hydraulic controls throughout the distribution system include CSO #009 (0.107 MGD), CSO #013B (0.251 MGD), CSO #012 (0.387 MGD), CSO #014 (0.387 MGD), and CSO #005 (0.490 MGD). Further investigation into these CSOs will be made to determine whether they can be removed, or whether adjustments must be made to the devices per application. However, the hydraulic engineering analysis was not provided for technical review.

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        - For comparison, the 2021 annual CSO discharges were estimated (from greatest annual discharge to least): CSO No. 010 (>3 MG), CSO No. 004 (>2.97 MG), CSO No. 007 (>2.2 MG), CSO No. 012 (>1.9 MG), CSO No. 013B (>1.6 MG), CSO No. 009 (>1.1 MG), CSO No. 13A (>0.85 MG), CSO No. 014 (>0.64 MG), CSO No. 002 (>0.58 MG), CSO No. 011 (>0.49 MG), CSO No. 006 (>0.48 MG), CSO No. 005 (>0.15 MG), CSO No. 003 (>0.94 MG), CSO No. 008 (>0.024 MG but shown capped in figure). This gives a relative ranking of CSO discharge magnitudes circa 2003 Flow Methodology estimates (not presently valid).
    - 85% BOD5/CBOD5 & TSS Minimum Monthly Average Reduction Requirements: To date, they have not shown that they qualify for relief from the existing 85% requirement under Chapter 92a.47(g, h). Instead of addressing the regulatory requirement, they are arguing that there is not excessive infiltration, thereby negating the basis for any relief under Chapter 92a.47(g, h).
- Additional CSS System investigations: As part of the LTCP, further studies are planned to evaluate capacities of the collection system which may provide potential for increasing storage in the collection system. These flow studies will also help determine whether or not certain CSO diversion manholes can be eliminated. The elimination of diversion manholes will divert all flow to the treatment plant, eliminating certain overflow discharges. (2023 NMC Plan Section 2.4). No details provided.
- CSO Monitoring Reports:
    - They have not been completing the CSO Monitoring Report forms with all NPDES Permit-required and Monitoring Report-required information. They wish to omit providing NPDES Permit-required information. They stated: According to Item No. 2 of the Instructions to Completing the Detailed Supplemental Report, frequency of events can be determined in various ways and implies that not all events will be known based on the methods of determination noted (e.g., inspection, complaint, alarm). Item No. 3 of the instructions states that the code "U – Unable to Determine" is an option for frequency. (Letter Response Item 6). **NOTE**: Occasionally, a facility operator might not be able to provide required information for good reasons, but that is not a permanent waiver from minimum NPDES reporting requirements.
    - In practical terms, the CSO Monitoring Reports must have all NPDES Permit-required and Form-required information, especially when that information will be needed to qualitatively calibrate any CSO discharge flow estimation method (in the absence of flow meters) in terms of CSO pipe flow depths, precipitation events, and other signs/indicators of CSO discharges
- Other Comments: See Additional CSO Information Section for additional comments on LTCP Update Attachments (In-stream WQ Monitoring: Sewer System flow study; I&I Abatement Plan, etc.).

Sludge use and disposal description and location(s): 1 dry ton of dewatered sludge disposed at Commonwealth Landfill in 2021. Concurrent WQM Permit Application estimated 400 TPD of site-produced sludge.

- No Sewage Sludge Management Inventory (following NPDES Permit Part C-referenced methodology) found in the available (up to 2022) Chapter 94 Reports.
- EPA AOCC correspondence indicated previous issues with sludge-related information submitted to EPA.

Special Conditions:

- **Part A.I.B and A.I.C & Part C.II (Schedule of Compliance)**: These new WQBELs requirements are tied to WWTP upgrades/start-up requirements tied to within first and second calendar month after Phase I substantial completion (WQM Permit No. 5422401) when the new WWTP treatment process has been constructed and should start-up. The WWTP upgrade is how they plan to meet the new WQBELs per the NPDES Permit Application. (Other new WQBELs are under Part A.I.A, A.I.D, and C.VII 3-year schedule of compliance.)
- **Part A.I.E New Footnote (See Part A.I Additional Requirements Item 2 requirements)**: The Minimum Monthly Average Reduction monitoring & reporting requirements (BOD5 and TSS) is linked by footnote to the applicable Part A.I Additional Requirements Item 2 language (85% minimum monthly average reduction unless Chapter 92a.47(g, h) requirements are addressed). The permittee(s) will have an opportunity to address the Federal/State requirements for any exception to the 85% reduction requirements in the LTCP Update required by the Part C.IV conditions. Please note that the applicant has not met the Chapter 92a.47(g, h) requirements to date. Their Engineer is claiming that the facility has a dry weather flow of ~720,000 GPD for an estimated 8,312 person population (~0.83 MGD at standard 100 GPDC default which assumes an allowance for normal I&I), which was equate to 88 GPCD. However, this calculation does not meet the Chapter 92a.47(g, h) minimum requirements as set forth in the regulation to obtain any relief. In practical terms, the calculation is only stating that there is little wet weather (I&I) inflow & infiltration on rare prolonged dry weather occasions, which is what is expected at any POTW (separated or combined sewer

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system), not estimating what percentage reductions have been or can be achieved, etc. If they do not have excessive I&I issues, there is also no basis for granting relief per Chapter 92a.47(g, h).

- **Part A.I.F**: Existing stormwater outfall monitoring continues until Phase II substantial completion (when new bioretention pond has been constructed). "No discharge" reporting required if these outfalls are eliminated earlier.
- **Part A.I.G**: New stormwater outfalls monitoring & reporting begins after their construction. Not clear when they will be constructed and start discharging during the construction phases.
- **Part A.I.J (CSO Outfalls) Footnotes**: Footnotes clarify the type of CSO diversion manhole and cross-references additional applicable CSO-related permit conditions (Part A.I Additional Requirements Item 1 (TBELs); Part C.III Maximize Treatment; Part C.IV CSOs). CSO Outfall Nos. 013A/B have been renumbered per EPA guidance for CSO numbering in dual discharge CSO structures.
- **Part B.I.D (General Pretreatment Requirements)**: Updated standard template language has been added (PFAS related).
- **Part C.I**: Existing Chesapeake Bay Nutrient Requirements
- **Part C.II: New Schedule of Compliance (CBOD5, TSS, TRC, Ammonia-N, DO, Zinc, Acrolein, and Vinyl Chloride)**: The POTW indicated that it will be able to meet proposed new WQBELs for DO, Ammonia-N, CBOD5, TSS, TRC, Zinc, Acrolein, and Vinyl Chloride upon completion of WWTP Upgrade. The POTW has also indicated that the WWTP Upgrade Project is its selected method of resolving assorted compliance issues (see FS Compliance Section) including the permit limit exceedances. Therefore, this condition formally incorporates the AOCC by reference and supplements the AOCC Schedule of Compliance to ensure that the POTW can meet its additional NPDES Permit final WQBELs within the 5-year NPDES Permit Term (per Chapter 92a.51). The milestones have been correlated to the equivalent AOCC milestones as the latest acceptable dates of completion.
- **Part C.III**: **Revised** Maximizing Treatment at Existing POTW (CSO bypassing) **–** Bypassing secondary treatment.
  - Existing WWTP:
    - This condition does not apply to the existing WWTP in the absence of a secondary treatment (Aeration Tank) bypass line or coverage in the LTCP Update.
    - This condition does not authorize any Primary Clarifier bypassing as primary clarification is one of the minimum requirements for peak wet weather influent flows. Part B.I.G applies to any primary clarifier bypassing.
  - WWTP Upgrade: Bypassing of complete secondary treatment (by SBR operational mode storm/superstorm mode) is authorized after influent flows exceed the 5.83 MGD daily max flow. The SBR storm mode and superstorm mode involve increasing SBR loadings to the point where secondary treatment is no longer assured, i.e. "bypassing" for purposes of this permit condition. The application indicates secondary treatment can be achieved for a 5.83 MGD daily max flow and otherwise achieve secondary treatment at peak 8.0 MGD peak flows for 1 hour (prior to losing secondary treatment capacity due to washouts).
    - Per Response Letter Item 6.b.iv: "There is no throttling proposed at the new WWTP. The new WWTP design includes a storm mode and super storm mode to allow for increased wet weather flows. The new WWTP is designed for a peak hourly flow of 8.0 MGD. Full treatment will be provided up to that point. Beyond that the flow will pass through the WWTP with partial treatment, but considering the flow is diluted due to the wet weather event this should not be an issue and effluent discharge limits should still be met. Any valves which would restrict flow are only proposed for maintenance purposes on the system. The proposed WWTP is designed with storm and super storm operational modes in case of wet weather".
    - There is no bypassing expected to be needed in the new WWTP and therefore no plans to throttle flows. (Response Letter Item 6.o). **NOTE**: The Flat Horizontal CSO manhole/regulators "throttle" flow going to the Treatment Plants whenever the minimum weir openings are not maintained. This throttling is not approved by the NPDES permit.
- **Part C.IV**: **Updated** Combined Sewer Overflows (updated standard template conditions with site-specific requirements):
  - **Part C.IV.B (Continued Implementation of Nine Minimum Controls (NMCs)**: POTW commitments have been incorporated into the NMCs, plus some additional minimum requirements were clarified:
    - NMC 1 (Conduct proper operations and regular maintenance programs NMC):
      - Daily inspections of CSOs regulator/manholes, Pump Station No. 1, and accessible CSO Outfalls for presence of deposited solids/debris, dry weather overflows, and surcharging. (LTCP Section 3.1). Pump Station No. 1 run-times shall be recorded. (LTCP Section 3.2).

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- Precipitation amount shall be reported for each operating day. SMSA shall install and operate a digital rain gauge capable of recording to 0.01" accuracy. (Response Letter Item 6.aa.v)
- Observed Pipe Flow Depth in CSO Outfall Discharge Pipe(s) shall be recorded with date and time.
- Accessible Outfall locations shall be inspected for solids and floatables and/or other nuisance on minimum annual basis.
- Manholes are to be inspected once every five (5) years at minimum. (Response Letter Item 6.l.iii)
- Sewer lines are to be inspected at the same time the connecting manholes are inspected once every 5 years. (Response Letter Item 6.l.iv)
- Pump Station No. 1 Inspection frequency will stay daily after SCADA tie-in. (Response Letter Item 6.l.iiv)
- Future sewer system televising will be done as problems are found during inspections, complaints are made by the public, and as determined by future flow studies in order to determine the most appropriate areas to maximize the use of limited funds. (Response Letter Item 6.l.i) Records of sewer system areas inspected and date of inspection and/or maintenance action will be retained at the WWTP.

▪ NMC 2 (Maximize use of the collection system for storage NMC):
- No influent "throttling" is authorized at the Flat Weir Plate CSO diversion manholes/regulators unless explicitly addressed under the approved LTCP. The minimum flat horizontal weir plate opening size(s), as set forth in the LTCP, and/or larger flat weir plate openings must be maintained at all time.

▪ NMC 3 (Review and modify pretreatment program NMC):
- Cross-referencing to applicable NPDES permit requirements included.
- Any acceptance of non-sewage wastewater will require Part A.III.C.2 (Planned Changes in Waste Stream) notification at least ninety (90) days prior to acceptance. The Part A.III.C.2 notification shall identify any CSO Outfall (if any) that might receive industrial wastes/wastewater. The Department reserves the right to require an LTCP Update as needed.
- The WWTP shall retain records onsite of commercial/industrial indirect dischargers with applicable SIC Code, discharger address and discharger contact information.

▪ NMC 4 (Maximize Flow to POTW):
- Adjustments will be made to all flat/horizontal weir plate manhole openings to ensure maximum influent flow is directed to the Treatment Plant. (Response Letter Item 6.o)

▪ NMC 5 (Prohibit combined sewer overflows during dry weather NMC): To clarify requirements:
- Chalking, block testing, bottle-on-a-string or other Department-approved methodology (meeting EPA Technical Guidance requirements) shall be installed at each CSO Diversion Structure/Outfall, that can be checked and reset after each inspection. (Response Letter Item 6.p) Resetting the visual aid shall be verified by digital photograph with date stamp retained in the WWTP Records with the CSO Monitoring Report for that calendar month.
- Any CSO discharges continuing >48 hours after significant precipitation (≥0.01-inches) has ceased, must be reported as a potential dry weather and/or unauthorized CSO discharge. The permittee shall investigate and report the cause of the discharge to the Department within seven (7) days. The CSO Monitoring Reports shall record daily precipitation, whether CSO discharges were seen during inspection, indications of previous CSO discharges, visual aid resetting, and observed CSO discharge pipe flow depth during inspection and/or as otherwise indicated by visual aids or other means (debris elevation on trash racks, etc.).

▪ NMC 6 (Control solid and floatable materials in CSOs NMCs):
- Bar screens and duckbill check valves will be placed at each CSO as provided within the LTCP Schedule of Implementation. (Response Letter Item 6.j.ii)
- Screens and backflow preventers are to be installed at the CSOs. (Response Letter Item 6.q)

▪ NMC 7 (Develop and implement a pollution prevention program NMC):
- Street Sweeping: The Shenandoah Borough Street Sweeping Map-identified streets shall be swept on a monthly basis. The remaining streets will be swept annually.

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- Catch Basins shall be inspected once per year (minimum) and cleaned as needed. (Response Letter Item 6.r)
- The permittee shall record and retain records of any Borough/other party street sweeping or catch basin cleaning within the collection system. The records shall include street sweeping and catch basin cleaning (date, street block, and CSO sewer shed or other). A full-sized drawing shall show the locations of all known catch basins/manholes within the CSO Outfall sewer sheds. If third party cleaning of catch basins is not documented, the permittee shall conduct catch basin inspection and cleaning for that calendar year.

▪ NMC 8 (Notify the public of CSOs NMC): To clarify minimum requirements:
- Additional signs will be ordered and placed at the (underground stream segment with CSOs) daylighting location areas as a public notice. (Response Letter Item 6.s.ii)
- The Authority and/or Borough website shall include a CSO Outfall/Stream map with explicit warning regarding potential exposure during wet weather events, using CSO sign location and warning language.
- Social media outreach options may include notification of customers by social media, callouts, and/or flyers at public buildings.

▪ NMC 9 (Monitor to effectively characterize CSO impacts and the efficacy of CSO controls NMC): To clarify minimum requirements:
- The CSO Monitoring Reports shall include all information required by this NPDES Permit and the applicable DEP CSO Report form (monthly and annual), and document inspection information including estimated CSO Discharge Pipe flow depths, precipitation per day, etc.
- Minimum annual Stream monitoring (including E Coli and all known causes of stream impairment) is required. In-stream water quality monitoring data shall be reported via DMR Supplemental Report “Surface Water Data Monitoring Report” via eDMR in addition to the CSO Annual Status Report
- Minimum annual CSO discharge sampling (one CSO outfall plus other CSO outfalls at locations of apparent stream impact by pathogens, organic enrichment, and zinc) is required.

○ **Part C.IV.C (Long Term Control Plan)**:
▪ The 2023 LTCP Update is explicitly approved except as superseded by statutory, regulatory, and permit requirements.
▪ Due to ongoing stream impacts (despite >85% claimed capture rates), the permit condition requires an updated LTCP to determine an applicable LTCP Goal as Presumption LTCP Goals might not apply. The previous 85% Presumptive LTCP Goal presumed that the CSOs are not adding to existing stream impairments (pathogen, metals, etc.) in the absence of data showing otherwise, but 2022 DEP Biologist sampling indicated impacts (organic enrichment, pathogens) with an unknown potential contribution to AMD-related impairments and Chesapeake Bay TMDL loadings. The permittee is hoping that corrective actions will mitigate the impacts, but that is speculative.
▪ Including E Coli monitoring/reporting requirements explicitly per EPA feedback on other CSO permits and known pathogen issues in the receiving stream.

○ **LTCP Implementation Schedule**:

Milestone	Completion Date	Comment
Continue Implementation of the NMCs	Upon PED	Existing permit requirement
Continue Implementation of the LTCP including all documents incorporated by reference.	Upon PED	Existing permit requirement
Continue GPS mapping of Sewer System with concurrent cleaning, televising and evaluation, plus concurrent manhole inspections	Upon PED	POTW commitment for 4-year project for GPS mapping and 9-year schedule for cleaning, televising, and evaluating the Collection System (1/1/2026-12/31/2035). The POTW proposed a second GIS Modeling stage (1/1/2036-12/31/2037) but that is not a DEP requirement if they can quantify CSO discharge flows otherwise. Collection

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		system-wide manhole inspections were estimated to take 5-years.
Implementation of EPA-approved I&I Abatement Plan (CSS and separated sewer sheds)	Upon PED	The I&I Abatement Plan was submitted as part of the approved LTCP (with concurrent EPA AOCC requirements). Cleaning, Televising, and Evaluating of collection system was proposed from 1/1/2026 – 12/31/2035 which requires concurrent EPA approval. See Flow Study item for estimated time-frame for Study Report-recommended projects.
WWTP Upgrade Project Construction	NPDES Permit Part C.II (Schedule of Compliance is incorporated by reference)	NPDES permit and AOCC commitment overlapping with CSO requirements. The POTW assumed immediate approval with public bidding within 182 days and new construction within 518 days (2023 – 9/30/2025). New WWTP rain gage to be installed in 91 days (2023).
Submit Annual CSO Status Report to Department with Chapter 94 Report including all Permit/Form-required information incorporated into the form itself. Update shall be included for any Chapter 94 separated sewer system Corrective Action Plan* milestone status, findings, and identification of any required or proposed corrective action. The Annual CSO Status Report Form shall include all required information reported on the form itself.	March 31 of each year	Clarifying minimum reporting requirements plus site-specific requirements. SSOs reported by POTW.
Submit DMR Supplemental Reports for CSOs including CSO discharge pipe flow depth and all NPDES Permit-required information reported on the submitted form itself.	Within 28 days of the end of a month	Clarifying minimum reporting requirements.
Submit proof of CSO O&M NMC including signage at each CSO discharge location and where underground segments (with CSOs) discharge daylights (LTCP Section 3.8)	Three (3) months of PED	This is an existing NMC requirement and POTW commitment.
Annual sewer system (Borough and West Mahanoy Township) Street sweeping with catch basin inlet cleaning as needed.	Annually by December 31	This is an existing NMC requirement and POTW commitment.
Submittal of proof of installation of Chalking, block testing, bottle-on-a-string or other Department-approved inspection visual aid (meeting EPA Technical Guidance requirements) shall be installed at each CSO Diversion Structure/Outfall, that can be checked and reset after each inspection. Resetting the visual aid shall be verified by digital photograph	Three (3) months of PED	This is an existing NMC requirement for detection of dry weather discharges and POTW commitment.

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with date stamp retained in the WWTP Records with the CSO Monitoring Report for that calendar month.		
Repair of bulkhead-type CSO Outfall Nos. 002, 006, 007 (LTCP Section 3.1) and Flat Weir Plate-type CSO Outfall resetting weir plate settings to minimum openings (set forth in the LTCP Sections 3.2 and 3.4) or larger opening size.	Three (3) months of PED	This is an existing NMC permit requirement and POTW commitment. Repair does not require WQM permitting and cannot be delayed.
Adopt Updated Industrial Pretreatment Ordinance	Three (3) months of PED	This is an existing NMC permit requirement and POTW commitment. The POTW assumed 3 months (i.e. by 3/31/2024).
Plugging Pump Station No. 001 bypass to prevent any potential CSO discharge	Three (3) months of PED unless the Department specifies an alternate schedule in writing.	This is an existing NMC permit requirement and POTW commitment. Plugging an unauthorized bypass does not require any additional Pump Station upgrades. The POTW assume plugging in 2023 (122 days). WQM permit application indicated it might already have been plugged, but no confirming documentation.
Submittal of PA Professional Engineer-signed and sealed engineering report identifying a visual aid, mechanical device or other option (consistent with EPA Technical Guidance) for each CSO Diversion Chamber/Outfall structure able to detect dry or wet CSO discharges.	Four (4) months of PED	The POTW's Engineer must verify adequacy of the installed visual aid to achieve its purpose to detect dry or wet weather CSO discharges.
Submittal of complete and technically adequate Part II Water Quality Management (WQM) Permit application for: Installation of tide gates (duck bill check valves) at all CSOs and Installation of any needed trash rack or bar screen or other solids/floatable controls and method of measuring CSO discharge pipe flow depth (LTCP Sections 3.1, 3.2).	Six (6) months of PED	This is a POTW commitment. The POTW assumed submittal by 8/31/2024 (i.e. equivalent to minimum 60-day NPDES permitting time plus 6 months). The POTW assumed approval in 31 days (90 days is PDG time-frame) with construction in 1 year (by 5/31/2026)
Submittal of revised CSO and CSS Flow Study Plan (LTCP Section 3.4) to quantify CSS and CSO flows and to develop/calibrate any CSO Flow Model (LTCP Section 3.9). The Flow Study Plan shall include PA Professional Engineer-sealed hydraulic correlations of observed CSO outfall discharge pipe flow depths to CSO discharge rate (MGD) with reporting of CSO discharge pipe flow depths and estimated observed discharge rates in CSO Monitoring Reports thereafter.	Six (6) months of PED	POTW assumed upfront approval of their 3-year plan (3/1/2024 – 8/31/2026 for Report submittal), but the plan is not adequate due to site-specific issues. Time has been granted to allow for submittal and approval of an adequate CSO/CSS Flow Study Plan. The Flow Study Recommended projects were assumed to take 15 years (9/1/2026 – 8/30/2041). The reported CSO discharge pipe depths/estimated flows shall be used to qualitatively evaluate CSO Flow estimation modeling outputs.

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Submittal of revised In-stream Water Quality Monitoring Plan able to address Demonstration LTCP Goal requirements (including CSO discharge sampling, sampling of stream for E Coli, Ammonia-N, TP).	Six (6) months of PED	POTW assumed upfront approval of their 5-year plan (1/1/2024 – 12/30/2028), but their plan is not adequate due to site-specific issues. Time has been granted to allow for submittal and approval of an adequate Stream Water Quality Monitoring Plan.
Installation of tide gates (duck bill check valves) at all CSOs and Installation of any needed trash rack or bar screen or other solids/floatable controls. (Response Letter Item 6.l)	Twelve months after WQM permit approval	The POTW assumed completion of construction by 5/31/2026 (with year to construct).
Manhole inserts will be used to keep floodwaters out of identified manholes within the FEMA-identified 100-year floodplain areas and as needed in event of manhole location flooding elsewhere. (Response Letter Item 6.j.v)	Twelve (12) months of PED	They have identified the Shenandoah Creek 100-year floodplain per FEMA, but E-maps indicate other 100-year flood areas that might require manhole inserts to reduce inflow.
Engineering Evaluation of Weir Settings (and bulkhead weir settings) to maximize storage within the collection system prior to discharge to Treatment Plant and maximize flow to the Treatment Plant. (LTCP Sections 3.2 and 3.4)	Twelve (12) months of PED	This is required to determine if the previously determined Flat Weir Manhole minimum opening sizes address NMC requirements. Some weir openings might have to be enlarged.
Implement DEP-approved CSO/CSS Flow Study Plan	Upon DEP Approval with conditions	-
Implement DEP-approved Stream Water Quality Monitoring Plan (first year monitoring and annual monitoring thereafter)	Upon DEP Approval with conditions	-
CSO Flow Study Report submittal with calibration of chosen model for calculation of CSO discharge (volume, frequency, duration, and intensity) and/or schedule for installation of CSO Flow Meters. Flow Study Report shall include recommended plan/schedule for any sewer system projects to allow for compliance with NMCs and Long Term Control Plan Goal.	15 months of DEP Approval of the CSO Flow Study Plan	-
Stream Water Quality Monitoring Report Submittal determining stream conditions, any CSO discharge impact on the receiving stream, and whether any Chapter 93 Water Quality Standards are exceeded therein. The burden falls on the permittee to demonstrate that any Presumptive LTCP Goal will allow for compliance with the Chapter 93 Water Quality Standards. Minimum Annual (summer) monitoring thereafter.	15 months of DEP Approval of the Stream Water Quality Study Plan	-
Submittal of stand-alone LTCP Update with chosen LTCP Goal, addressing all	30 months of PED	They need to determine what LTCP Goal can be met, whether they can

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requirements with all supporting data/analysis (with summarization tables) and information, addressing any applicable Chapter 92a.47(g, h) requirements, updated LTCP Schedule of Compliance addressing all CSO-related projects and permit requirements (including PCCM Plan), and an engineering study to determine if CSO's 008, 009, and 014 can be eliminated (Response Letter Item 6.j.iv). The LTCP Update shall include all still applicable CSO-related information including CSO discharge pipe flow depth correlations.		obtain any relief from the 85% minimum monthly average reduction requirements (BOD5/TSS), address whether the proposed minimal O&M issues have resolved apparent CSO discharge impacts on the receiving stream, etc. The CSO Nos. 008, 009, and 014 elimination study was estimated to take 1 year (2026).
Implementation of the LTCP Update	Upon Department approval or approval with conditions in writing (NPDES permit amendment or otherwise)	-
Submit LTCP Update with Post-Construction Compliance Monitoring (PCCM) Plan Corrective action plan (sewer separation projects) and schedule required if projected CSS flows exceed 8.0 MGD peak instantaneous flows and/or 2.0 MGD WWTP hydraulic design capacity.	54 months after PED	Required with NPDES Permit Renewal Application. This would address any progress since interim LTCP Update submittal, etc. Additional corrective action plan and schedule requirement if projected CSS flows exceed new WWTP treatment process peak instantaneous design flow or hydraulic capacity (with POTW committing to sewer separation projects per WQM permit application in that event).
Implement LTCP Update	Upon Department Approval via NPDES permit renewal or otherwise	-
LTCP Final Compliance Date	December 31, 2042	The POTW indicated LTCP implementation by 8/30/2041.

*Separated Sewer System Areas I&I corrective actions (including SSOs) are not subject to CSO conditions/regulations and are subject to the Chapter 92a.51 requirements (5-year schedule of compliance). However, CSO-related documents such as the I&I Abatement Plan can have overlapping requirements.

- **Part C.IV.D.2.h**: Additional Annual CSO reporting requirements to ensure adequate reporting.
- **Part C.V**: **Updated** POTW Pretreatment Program Development and Implementation conditions. No IPP submittal to date. The conditions have been updated to address implementation of the AOCC-required sampling plan and submittal of completed IPP Program to DEP and EPA within six months of PED. The condition has been updated to address new PFAS-related requirements.
- **Part C.VI**: **Revised** Solids Management: Language added to require use of DEP Operator Spreadsheet to address Sewage Sludge Management Inventory requirements and to maintain inventory record of solids in aerobic/anaerobic digesters and otherwise stored onsite.
- **Part C.VII**: **New WQBELs for Toxic Pollutants (Copper, Bis(2-Ethylhexyl) Phthalate, and Indeno (1,2,3-cd) Pyrene) with 4-year schedule of compliance (for consistency with WWTP Upgrade Project schedule based on maximum AOCC WWTP Upgrade milestone with WQM permit issued 3/25/2024).** The POTW has indicated that these were the only toxic pollutant constituents for which it cannot currently meet the proposed limits. The POTW can also pursue relief from monitoring requirements for Total Cobalt, Total Lead, Total Nickel, Carbon Tetrachloride, Chloroform, Dichlorobromomethane, and Trichloroethylene in the Final WQBEL Compliance Report (using collected monitoring data and site-specific data collected per this condition). Post-WWTP upgrade data might support elimination of the chlorine residual byproduct monitoring.
- **Part C.VIII**: **Revised** Whole Effluent Toxicity (WET) Conditions **with updated dilution ratios and TUc limits because of repeated WET Test failures**.

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- **Part C.IX**: **Updated** Stormwater Template conditions with clarification on Stormwater Benchmark (TSS) and Annual IW Stormwater Report submittal requirements. Application-identified stormwater BMPs incorporated into permit:
  - Implementation of Borough Ordinance for land development plans to include stormwater requirement and Erosion & Sedimentation controls for new development.
  - Vegetated channels at WWTP facility.
  - Street Sweeping to minimize pollutants entering stormwater systems.
- **Part C.X.A, B, C**: Existing Stormwater prohibition (clarified to apply for **separated sewer sheds);** Necessary property rights, Residuals management
- **Part C.X.D**: **New Chlorine Minimization Condition** due to current chlorine usage and WWTP Upgrade including conversion to UV disinfection. Future monitoring will only be required if they use chlorine.
- **Part C.X.E**: **New Dry Stream condition** due to effluent-dominated stream by WWTP Outfall, indications of dry conditions upstream of mine seeps, and CSO Outfalls on intermittent UNTs to Shenandoah Creek
- **Part C.X.F**: **New SBR discharge condition** due to new SBRs discharges (post-WWTP upgrade). The SBR decant flows (~11.7 MGD) is effectively increasing discharge rates to the effluent-dominated stream. Such discharges can negatively impact aquatic life.
- **Part C.X.G**: **New Responsible Operator condition** due compliance history and to ensure adequate DMR/EDMR and Supplemental Report reporting. Also need updated client/site contact information.
- **Part C.X.H**: **New (post-WWTP upgrade) O&M Plan submittal requirement.** The failure of the POTW to restore WWTP units to operation and to meet all permit requirements with the present (AOCC-submittal) O&M Plan means it has failed in practice. A revised O&M Plan is needed and which may require annual revision. This condition clarifies the minimum O&M Plan requirements including HFMP/Wet Weather Operating Plan, Solids management, etc.
- **Part C.X.I**: **Revised Post-WWTP Upgrade** High Flow Management Plan (HFMP) must be submitted with future NPDES Permit Renewal applications.
- **Part C.X.J**: **New Quarterly WET Tests** for the first year of permit term due to continued pattern of WET Test failures with no TRE performed to determine causes of failure. If tests fail, quarterly monitoring requirements will continue.
- **Part C.X.K**: **POTW Operator condition**: See Main Permitting Issues section above.
- **Part C.X.L**: **Sampling Upon Request**: Due to pattern of failed Whole Effluent Toxicity (WET) Tests (with no TRE completed to define cause and any required corrective action) and failure to complete the Major NPDES Permit Application “GC/MS "Five Peaks" Pollutants” table, this condition will requires the applicant to do additional analyses and reporting upon written Department request.
- **Part C.XI**: **New WQBELs below Quantitative Limits:** Several new Final WQBELs are below the DEP TQL.

Public Participation

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

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001 015-020 (SW outfalls) 002 – 014, 021 (CSOs)	Design Flow (MGD)	2.0 (001) Zero (SW outfalls) Zero (CSO Outfalls)
	40º 48' 50.44" (001) 40º 48' 50.28" (015) 40º 48' 50.28" (016) 40º 48' 50.30" (017) 40º 48' 50.20" (018) 40º 48' 51.40" (019)		-76º 12' 55.14" (001) -76º 12' 56.32" (015) -76º 12' 56.32" (016) -76º 12' 56.18" (017) -76º 12' 56.10" (018) -76º 12' 52.70" (019)
Latitude	40º 48' 51.40" (020)	Longitude	-76º 12' 52.70" (020)
Quad Name	Shenandoah	Quad Code	1236 (5.19.3)
Wastewater Description:	Sewage Effluent (001) CSO Outfalls Nos. 002 through 009 (direct discharge to Shenandoah Creek) CSO Outfall Nos. 010 through 013A & 013B (indirect discharge to Shenandoah Creek watershed via Kohinoor Creek). Outfall No. 13A/13B being redesignated No. 013 and 021. See Additional CSO information Section for coordinates. CSO Outfall No. 014 (indirect discharge to Shenandoah Creek watershed via Sewer Creek). See Additional CSO information Section for coordinates. Stormwater Outfalls Nos. 015 – 017 (Pre-WWTP upgrade stormwater outfalls) Stormwater Outfalls Nos. 018 – 020 (WWTP upgrade stormwater outfalls)		

Receiving Waters	Shenandoah Creek (CWF)	Stream Code	17683
NHD Com ID	133385308	RMI	-
Drainage Area	4.38	Yield (cfs/mi^2)	0.2092
Q_{7-10} Flow (cfs)	0.9162	Q_{7-10} Basis	USGS PA Streamstats using downstream point for LFY method.
Elevation (ft)	~1109 (PA Streamstats-estimate)	Slope (ft/ft)	-
Watershed No.	6-B	Chapter 93 Class.	CWF
Existing Use	-	Existing Use Qualifier	-
Exceptions to Use	-	Exceptions to Criteria	-
Assessment Status	Impaired		
Cause(s) of Impairment	HABITAT ALTERATIONS, METALS, ORGANIC ENRICHMENT, SILTATION; PATHOGENS		
Source(s) of Impairment	ACID MINE DRAINAGE, MUNICIPAL POINT SOURCE DISCHARGES; UNKNOWN		
TMDL Status	Final	Name	Mahanoy Creek

Background/Ambient Data:		Data Source:
pH (SU)	5.61	DEP Sampling Results (Station 3 (immediately upstream of Shenandoah WWTP discharge, subject to AMD seeps). pH ranged from 5.72 – 6.85 SU along Shenandoah Creek sampling locations.
Temperature (°C)	11.1	See above
Hardness (mg/L)	115	See above. Application information was 240 mg/l, but DEP sample used for conservatism.
Aluminum (ug/l)	697	See above. **Limited assimilative capacity.**
Total Iron (ug/l)	3,900	See above. **No assimilative capacity**.
Dissolved Iron (ug/l)	No data	Given Total Iron value, likely limited assimilative capacity.
Manganese (ug/l)	1710	See above

Magnesium (mg/l)	13.60	See above

Nearest Downstream Public Water Supply Intake		Duncannon Municipal Auth Water System ID# 101982-001	
PWS Waters	Susquehanna River	Flow at Intake (cfs)	-
PWS RMI	-	Distance from Outfall (mi)	>70 miles

Changes Since Last Permit Issuance:

- **WWTP Upgrade Project permitted**: ~11.7 MGD SBR decant flow discharge proposed. See Part C.X.F Special Condition to address potential future negative impacts on the receiving stream.
- **June 30, 2022 DEP Biologist (Timothy Daley) "Point of First Use/Cause Effect Survey Memo" for Shenandoah Creek (attached)**. Memo highlights include:
  - Station 1 (Upstream of Shenandoah Borough): Somewhat acidic (pH of 5.72 SU), but low AMD metals. Attaining.
  - Station 2 (in Shenandoah Borough at SR-924, upstream of WWTP): **Exceedances of Chapter 93 Water Quality Criteria or elevated results (E Coli, Fecal Coliform and Zinc)**. E coli, CBOD5 and TP indicates an organic source present (non-AMD parameters). No surface discharge from the Shen Penn Pit strip mining area per BAMR.
    - **"The high E. coli counts found at this station can be considered unsafe for water contact sports". NOTE: The Department usually requires additional pathogen sample results to formally designate an impaired stream per the DEP Biologist.**
    - **"zinc (19.00 ug/l) was above the Chapter 93 water quality criteria for toxic substances Criteria Continuous Concentration (CCC) and Criteria Maximum Concentration (CMC) (both 17.03 ug/l) for aquatic life based on the low hardness present (10 mg/l)".**
  - Station 3 (immediately upstream of Shenandoah WWTP discharge): Exceedances of Chapter 93 Water Quality Criteria or elevated results (Aluminum, Iron, Manganese). Downstream of visible AMD seeps.
  - **Station 4 (Downstream of Shenandoah WWTP Outfall No. 001 discharge): Exceedances of Chapter 93 Water Quality Criteria or elevated results (E Coli, Fecal Coliform, Total Phosphorus, CBOD5, Copper, Aluminum, Iron, Manganese, Zinc).** Iron staining on stream substrate.
    - **"The E. coli/Fecal results of 4600/>6000/100 ml respectively, CBOD5 of 29.05 mg/l, and phosphorus of 0.854 mg/l all indicate a problematic discharge and the proliferation of worms indicates an organic food source and solids". NOTE: The Department usually requires additional pathogen sample results to designate a pathogen-impaired stream per the DEP Biologist.**
    - **"Lead (3.31 ug/l) and copper (10.5 ug/l) results were also above the CCC (3.14 ug/l, 9.25 ug/l, respectively) for aquatic life based on the measured hardness of 99 mg/l".**
  - Station 5 (Upstream of Raven Run Road): **Exceedances of Chapter 93 Water Quality Criteria or elevated results (E Coli, Fecal Coliform, Total Phosphorus, CBOD5, Aluminum, Iron, Manganese, Zinc)**. Substrate is iron stated. Mild sewage odor in air. White particles in stream bed dislodged when disturbed (sewage solids and/or toilet paper).
  - Station 6 (At mouth in Girardville): **Exceedances of Chapter 93 Water Quality Criteria or elevated results (E Coli, Fecal Coliform, Total Phosphorus, CBOD5, Aluminum, Iron, Manganese, Zinc).** Stream bed with heavy iron precipitate and slight odor in air present. There is an apparent AMD wetland upstream of this location. AMD impacts. The memo notes that the data shows the designated water use is being achieved and should be protected at this point.

ShenandoahCksurvey.pdf

- **WWTP Outfall Locational Update**: Locational information updated by application. No updated elevational data for outfall. Proposed WWTP Upgrades will result in SBR decant discharges of up to 11.7 MGD to Shenandoah Creek.
- **CSO Outfall Locational Update**: The CSO outfall coordinates have been updated per Application data.

Other Comments:

- **Dry Stream Discharge**:

- Shenandoah Creek: This is a **3.4:1** effluent-dominated stream at Q7-10 low flows with portions of Shenandoah Creek being underground (or dry) upstream of WWTP, but receiving mine seeps prior to WWTP Outfall No. 001 and with CSO discharges upstream. CSOs discharge during every ≥0.02-inch precipitation event per application, with less dilution during drier months.
- Kohinoor Creek and Sewer Creek (with CSO outfalls): These streams are not shown as perennial streams in PADEP E-maps (subject to historic land disturbance from Mining).

- **Q7-10 Low Flow and LFY**: This Fact Sheet used the USGS PA Streamstats-calculated Q7-10/Low Flow Yield (LFY) as best available data. (LFY = PA Streamstats-estimated Q7-10 low flow divided by estimated drainage area).
  - The previous Fact Sheet used a different gaged stream location to calculate the LFY, but did not provide explanation why that other stream was considered representative of site-specific conditions. The previous FS-referenced gaged location (USGS 01554500 Shamokin Creek near Shamokin, PA; Latitude 40°48'37", Longitude 76°35'04"; NAD27 Northumberland County, Pennsylvania, Hydrologic Unit 02050301; Drainage area: 54.20 square miles; Datum of gage: 608.28 feet above NGVD29) is on a different stream and was not shown to be representative.
  - The USGS calculation represents best available data, but might be biased due to influence of historic SMSA POTW discharges and downstream orphan AMD discharges on historic gage data. The LFY of 0.2092 CFS/square mile (based on historic watershed stream gage information and USGS empirical calculations) is a factor of 2 times greater than the statewide LFY default of 0.1 CFS/square mile. However, there are mining seeps directly upstream of Outfall No. 001, which are assumed to contribute flow during normal low flow periods. Any CSO-related sewer separation projects would tend to restore normal stream flows upstream of the mine seeps.
- **Receiving Streams**:
  - **Shenandoah Creek**: This is an existing perennial stream. See above additional details.
    - The 8/18/2021 DEP CSO Inspection Report included the following information: Portions of the creek was dry (or underground) upstream of mine seeps/WWTP during the 8/18/2021 Inspection at CSO Outfall Nos. 002 and 003 (with outfall buried under debris), 004, 005, 006, 007, 008 (with CSO Outfall not located), 009 (with the report noting that Shenandoah Creek goes underground at the E. Mount Vernon Street bridge and daylighting downstream near CSO Outfall No. 008). See DEP Biologist memo for additional stream information.
    - Per the Application: See Topo Map (below) for the Authority's identification of the existing Shenandoah Creek flow path.
  - **Kohinoor Creek**: This former stream (trib to Shenandoah Creek) is not shown as a perennial stream in PADEP E-maps. It is an intermittent stream subject to historic land disturbance.
    - The 8/18/2021 DEP CSO Inspection Report included the following information: The 8/18/2021 Inspection noted that Kohinoor Creek comes off the mountain from the Shenandoah Heights section and runs underground from the intersection of W. Coal Street and Walnut Street to where it resurfaces at the west side of Boyers Food Market parking lot on Centre Street. CSO Outfall Nos. 010, 011, 012, 013A and 013B were noted to be located underground.
    - Per the Application: See Topo Map for the Authority's guestimate of old Kohinoor Creek flow path. The present location of Kohinoor Creek, both surface and underground, was developed using a combination of satellite imagery in the updated Application drawing, SMSA sewer as-built drawings dated 1971, and Benesch site investigation on May 18, 2022.
    - E-maps shows some small 100-year floodplain areas that looks like they might have been part of the old Kohinoor Creek waterway.
  - **Sewer Creek**: This former stream (trib to Shenandoah Creek) is no longer a perennial stream and not shown in PA E-maps. It is an intermittent stream subject to historic land disturbance, without an existing flow path connection to Shenandoah Creek.
    - The 8/18/2021 DEP CSO Inspection Report included the following information: CSO Outfall No. 014 was covered by trash and debris. No comment regarding Sewer Creek flows, but inspection picture and description indicate little to no flow.
    - Per the Application: See Topo Map for the Authority's guestimate of old Sewer Creek flow path. The present location of Sewer Creek (downstream of CSO #014) is unknown per the Application. A (Benesch) site investigation was conducted on public right-of-way on May 18, 2022 to determine Sewer Creek's location/confluence but could not be determined.
    - E-maps does not show this creek. A 100-year floodplain appears to correspond to site drawings showing an UNT adjacent to the WWTP, which might represent a part of the original Sewer Creek flow path.

Stream Impairment Issues: Known impairments include Organic Enrichment (municipal source) and metals. The 2022 DEP sampling indicate issues include pathogens (E Coli and Fecal Coliform), Total Phosphorus, Total Zinc, in addition to known stream issues (organic enrichment; AMD metals including Aluminum, Manganese, Total & Dissolved Iron):

- **Mahanoy Creek Watershed TMDL (AMD)**: A TMDL (Total Maximum Daily Load) for the Mahanoy Creek Watershed (Columbia, Northumberland, Schuylkill), including the receiving Shenandoah Creek, was approved by EPA on 3/13/2007. The TMDL addresses metals (iron, manganese, and aluminum), and depressed pH associated with acid mine drainage (AMD). The TMDL recommendations focus upon AMD abatement projects and active mining operations through the NPDES permit program, and did not set Waste Load Allocations (WLAs) for sewage treatment plants.
    - **New limits and monitoring requirements**: Due to TMDL loading considerations and high background concentrations, WQS-based effluent limits (Aluminum, Manganese, Dissolved Iron, and Total Iron) are being incorporated into the NPDES Permit in the absence of facility-specific WLAs. The Reasonable Potential Analysis is addressing other metals (Zinc, etc.) as needed.
    - **Other Area source of AMD flows**. Topography indicated mining-disturbed lands surrounding Shenandoah Borough except to the uphill areas (northern direction).
        - Upstream AMD seeps: The DEP Biologist indicates there are AMD seeps upstream of Outfall No. 001.
        - Downstream AMD discharges: There are known orphan AMD discharges between the Shenandoah MA Outfall No. 001 and the confluence with Mahanoy Creek, within historically mining-disturbed areas visible from aerial photography.
        - Chapter 95: The Department presumes all AMD-impaired streams will recover over the long-term.
- **Habitat Alterations (historic mining impacts)**: The POTW will not contribute to habitat alterations.
- **Organic Enrichment (Municipal Point Source)**: More stringent CBOD5 permit limits will be imposed upon WWTP upgrade. Updated CSO conditions to address any CSO discharge contributions (AMD I&I)
    - **BOD5/CBOD5**: More stringent CBOD5 ABACT/Dry stream Technology-Based Effluent Limits are being incorporated into this permit renewal for the WWTP Outfall (post-WWTP Upgrade). The LTCP will address any loadings from the CSO Outfalls. In practical terms, the Part II WQM Permit Application indicated a peak 24-hour maximum organic loading of 5,612 lb BOD5/day and average daily loading of 1,133 lbs BOD5/day for the 2019 – 2022 time-frame, indicating likely IU discharge source that might contribute to CSO discharges and plant overloading.
    - **Total Phosphorus**: The elevated Total Phosphorus levels below the WWTP Outfall indicated an organics-related issue. There is no existing Chapter 93 Total Phosphorus WQS (in the absence of a known problem such as an algal bloom triggering stream-specific TMDL considerations in addition to the Chesapeake Bay TMDL Waste Load Allocations). Chapter 96.5(c) would impose a 2 mg/l TP limit if it was determined that TP was contributing to or threatening stream impairment due to TP-related issues. **The WQM permit application indicated planned post-WWTP Upgrade TP treatment to meet Susquehanna River Basin Commission BNR goals.**
- **Siltation**: The facility's Total Suspended Solids (TSS) effluent limits should prevent negative impacts, if they restore out-of-service clarifiers to operation.
- **Pathogens (E Coli and Fecal Coliform)**: The facility should meet existing Fecal Coliform limits upon WWTP Upgrade to UV disinfection (assuming AMD metals do not reduce UV disinfection effectiveness). Updated CSO conditions to address any CSO discharge contributions (sewage). The Department is evaluating whether the new E Coli WQS require permit limits on a statewide level, with only monitoring required a present. Future stream monitoring will clarify if E Coli limits are otherwise needed.
- **Chesapeake Bay Watershed TMDL (Total Nitrogen and Total Phosphorus)**: This is a significant Chesapeake Bay facility with WLAs. Consistent with the Phase 2 implementation plan nutrient frequencies will remain at 2/week with eDMR requirements. The total Nitrogen limit is 36,529 lbs/year and the Total Phosphorus is 4,871 lbs/year (Phase 2 Wastewater Implementation Plan Supplement, Revised April 5, 2016). The facility CSO discharge nutrient loadings are addressed under the statewide CSO Allocation in the Chesapeake Bay TMDL at present. The Department reserves the right to impose future TP limits in event that the CSO discharges exceed the statewide CSO Chesapeake Bay TMDL WLAs. The WQM permit application indicated planned post-WWTP Upgrade TP treatment to meet Susquehanna River Basin Commission BNR goals.

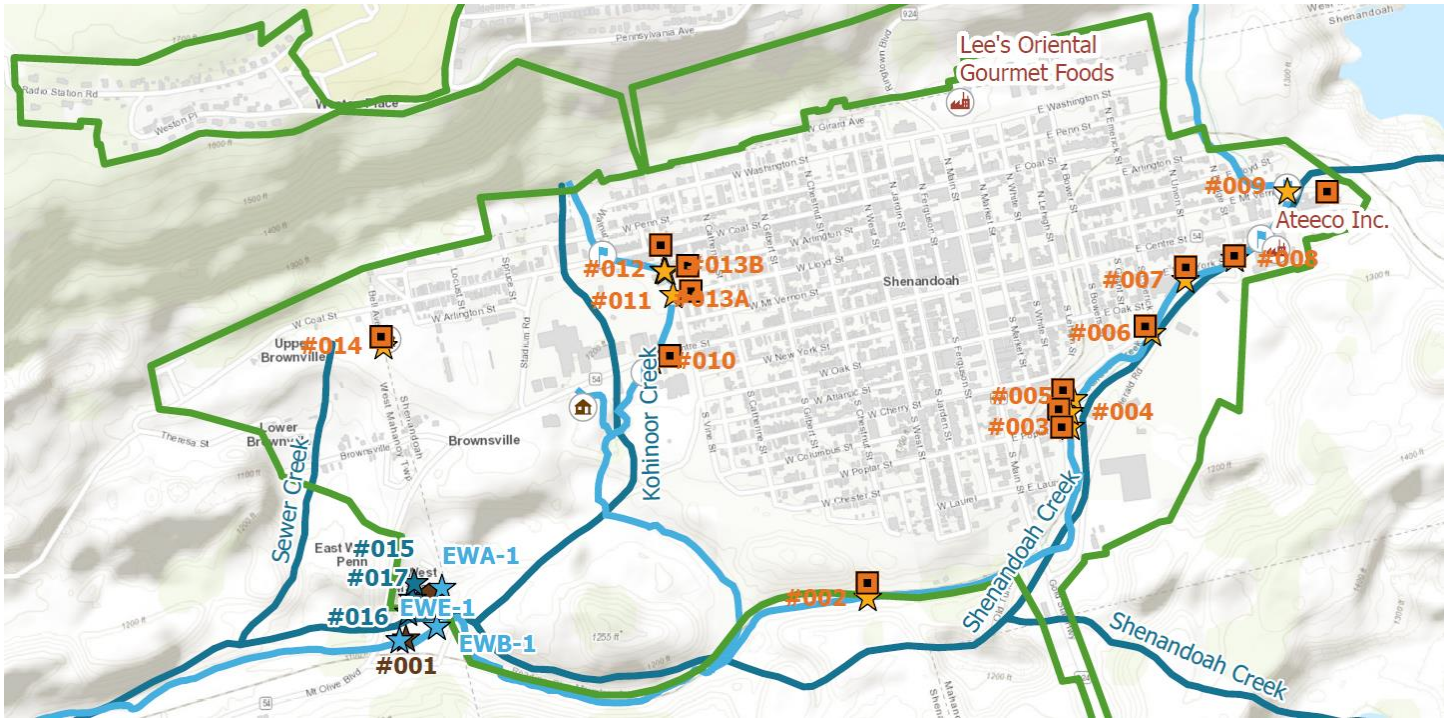
DEP Biologist Sampling Data (April 2022): Sampling Station Nos. 01 and 02 are upstream of the WWTP (01 is above CSO discharge points and 02 is between CSO discharges). Sampling Station No. 03 is directly above Outfall No. 001 (i.e. is ambient background for the permitted WWTP discharge point, but downstream of permitted CSO discharges).

Sampling Station Nos. 04 and 05 are downstream of Outfall No. 001. The sampling took place during dry weather conditions per DEP Biologist.

Table 3. Water Chemistry Results For Shenandoah Creek - April, 2022.

		0209561	0209562	0209555	0209554	0209553	0209556
		STATION NUMBER					
	UNITS	01	02	03	04	05	06
Temperature (field)	^{0}C	12.6	13.7	11.1	9.7	9.0	10.6
Dissolved Oxygen (field)	mg/l	10.06	8.87	9.47	8.67	10.22	9.04
pH (field)	pH units	5.72	6.27	5.61	6.41	6.85	6.77
Specific Conductivity	umhos/cm	67.50	83.20	347.00	341.00	335.00	531.00
E. Coli	/100ml	<25	>8000	<25	4600	25	2750
Fecal Coliforms	/100 ml	<25	>6000	<25	>6000	575	3400
Alkalinity	mg/l	0.2	4.2	3.0	17.4	13.0	42.4
Hardness	mg/l	8	10	115	99	96	220
Ammonia	mg/l	<0.02	0.13	0.16	1.36	0.71	0.31
Nitrite	mg/l	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Nitrate	mg/l	0.07	0.07	0.08	0.12	0.16	0.26
Nitrogen	mg/l	<0.25	0.96	0.29	5.36	1.65	2.18
Phosphorus	mg/l	<0.01	0.176	<0.01	0.854	0.175	0.364
Ortho Phosphorus	mg/l	<0.01	0.081	<0.01	0.014	0.034	<0.01
TDS@180C	mg/l	28	46	228	232	210	354
Total Suspended Solids	mg/l	<20	<20	<20	58	<20	42
Sulfate-IC	mg/l	5.53	6.43	121.18	90.56	90.94	178.83
CBOD5	mg/l	n/a	n/a	1.87	29.05	13.34	7.96
Aluminum	ug/l	166.00	134.00	697.0	629.00	346.0	1030
Antimony	ug/l	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
Arsenic	ug/l	<3.00	<3.00	<3.00	<3.00	<3.00	<3.00
Barium	ug/l	17.00	17.00	13.00	16.00	11.00	19.00
Bromide (low)	ug/l	<25.0	<25.0	<25.0	<25.0	<25.0	<25.0
Cadmium	ug/l	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200
Calcium	mg/l	1.890	2.64	23.500	20.50	20.300	46.2
Chloride	mg/l	14.96	17.14	18.61	28.87	29.24	20.26
Chromium	ug/l	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00
Cobalt	ug/l	<1.00	<1.00	20.5	12.4	12.2	17.1
Copper	ug/l	<4.00	<4.00	<4.00	10.50	<4.00	8.4
Iron	ug/l	222.00	<100.0	3900.00	2430.0	1740.0	4680
Lead	ug/l	<1.00	<1.00	<1.00	3.310	1.00	3.09
Magnesium	mg/l	0.78	0.89	13.60	11.50	11.10	25.5
Manganese	ug/l	28.00	27.00	1710.00	1140.0	1110.00	1810
Mercury	ug/l	<0.200	<0.200	<0.200	<0.200	<0.200	<0.200
Nickel	ug/l	<8.00	<8.00	25.900	16.60	16.500	23.4
Potassium	mg/l	<1.00	1.20	1.28	3.76	3.51	2.77
Selenium	ug/l	<4.00	<4.00	<4.00	<4.00	<4.00	<4.00
Silver	ug/l	<0.400	<0.400	<0.400	<0.400	<0.400	<0.400
Sodium	mg/l	9.26	11.10	11.70	17.60	17.40	15.5
Strontium	ug/l	13.00	18.00	132.00	116.00	114.00	466
Thallium	ug/l	<2.00	<2.00	<2.00	<2.00	<2.00	<2.00
Vanadium	ug/l	<12.0	<12.0	<12.0	<12.0	<12.0	<12.0

USGS Topo Map Excerpt: Sewer Creek and Kohinoor Creek based on historical info per Application.



Treatment Facility Summary

Treatment Facility Name: Shenandoah Municipal Sewer Authority POTW

WQM Permit No.	Issuance Date	Scope
A7329	1/26/1938	Construction of combined sewer on West Coal Street (24-inch Terracotta pipe)
665S44	06/20/1966	Construction and operation of an interceptor sewer system and primary treatment STP. Fact Sheet noted 7/14/1941 permit for combined sewer extension. The interceptor pipe system was to have three branches from STP: One branch paralleling Shenandoah Creek, one branch will parallel Kohinoor Creek, and one branch to extend north along the western boundary of the Borough to Coal Street. Diversion chambers were to be constructed.
5471406	06/29/1971	Intercepting Sewers (with diversion chambers along Shenandoah Creek and Kohinoor Creek drainage area), 3 Pumping Stations (Route 54, Coal Street, and Furnace Street), 2.0 MGD Secondary Treatment at STP.
5405404	1/5/2006	Replacing existing sludge dewatering equipment with rotary press.
5422401	3/25/2024	WWTP Upgrades (concurrent WQM permit application) that amount to new WWTP. New Headworks (new screens and grit removal system), new SBR treatment, new UV disinfection, new Aerobic digesters) and upgrade of offsite 1.0 MGD Pump Station No. 1 with flow meter/SCADA tied to WWTP. Rotary Press will be retained. Chlorine contact tank will be repurposed for utility water. Other existing units/equipment (old headworks, clarifiers, aeration tanks, anaerobic digesters, sludge thickener, chlorine gas disinfection system) will be demolished.

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary	Activated Sludge/Aeration (present); SBRs (proposed)	Gas Chlorine (present); UV disinfection (proposed)	2.0

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
2.0*	3400*	Not Overloaded	Anaerobic digestion and rotary press (present); Aerobic digestion and rotary press (proposed)	Landfilled

*No change to original hydraulic design capacity or organic design capacity proposed in the WWTP upgrade project. Increase in daily max design flow to 5.83 MGD per application.

Changes Since Last Permit Issuance:

- Long-term out-of-service units/equipment being corrected by EPA AOCC and Part C.II Schedule of Compliance. **Off-line units during 10/31-11/1/2023 EPA Compliance Inspection included: Primary Clarifier, Sludge Thickener, one secondary clarifier, both anaerobic digester units, and sludge press. One aeration tank was being used for sludge management during inspection.**
- WQM Permit for WWTP upgrades (new treatment system on same site). See above.
- 6/18/2021 SMSA (Benesch) Letter indicated a programmable composite sampler had been installed and that it would be converted to flow-proportional sampling by the end of June.

Other Comments:

Existing WWTP: The plant consists of a grit collector with a manually cleaned bypass bar screen; two (2) influent wet wells; one (1) primary clarifier; two (2) aeration tanks (198,000-gallon); two (2) secondary clarifiers; chlorine gas disinfection (chlorine contact tank); one (1) primary digester (188,000-gallon anaerobic); one (1) secondary digester (188,000-gallon anaerobic); one (1) sludge thickener, sludge pit; and rotary press for dewatering.

- O&M Issues: See Compliance Section for reported out-of-service units/equipment. Per the 5/23/2023 DEP Inspection Report, the facility is now using soda ash instead of magnesium hydroxide for pH and alkalinity control.
- PPC Plan Information: The plant was constructed in 1975 and consists of screening, grit removal, primary clarification, secondary clarification, aeration, sludge thickening, anaerobic digestion, dewatering, and chlorination. The facility consists of five (5) buildings which include the influent pumping station (Centre Street Pump Station aka, Pump Station 1), raw wastewater pumphouse, maintenance garage, control building, chorine building. The facility also houses a sewer vacuum truck, sludge hauling truck and several utility vehicles. The plant services approximately 2,898 residential units and 51 commercial/industrial accounts. The plant utilizes the conventional activated sludge process as secondary treatment and is permitted for 2.0 MGD, with a wet weather peak of 5.0 MGD. All industries generate domestic sewage except Ateeco and Lee's Oriental which discharges food processing waste".
- Existing WWTP Process Flow Diagram (NPDES Application Attachment E): This figure has been updated to show an **unauthorized** bypass pipe (bypassing the single long-term out-of-service Primary Clarifier) which conveys sewage from the influent wet well to a manhole upstream of the aeration tanks. The NPDES permit application does not contain any information to show that the Part B.I.G (bypassing) or Part C.II (Maximize Treatment**)** requirements have been met to allow for this bypassing.

Minimum Monthly Average Percentage Reduction: New NPDES Permit will require reporting of minimum monthly average reduction percentage. They will have the option of determining if they can qualify for the Chapter 92a.47(g, h) relief from the 85% minimum monthly average reductions.

- BOD5: 150.0336 mg/l - (1.2 x 13.63 mg/l CBOD5 LTA) = 133.67 mg/l removed, ~89% removed on an annual basis.
- TSS: 80.1826 mg/l - <18.39 mg/l TSS LTA = 61.79 mg/l removed **on an annual basis**, **77% removed (assuming EPA Sufficiently Sensitive Rule treating insensitive ND concentration levels as the constituent being present at the insensitive ND level)**. Existing LTCP does not include any request for relief from the 85% minimum monthly average removal requirement (Chapter 92a.47), DEP Target QL is 2.0 mg/l for TSS).
- The 11/20/2020 SMSA Letter (AOCC-related correspondence) including a table with monthly average daily BOD5 loading and average CBOD5 effluent concentrations for 2018 and 2019. BOD5 average influent concentrations were down to a minimum 52.5 mg/l (i.e. substantial I&I dilution may make it difficult or impossible to meet the 85% minimum monthly average reduction goal. The information indicated CBOD5 effluent concentration exceeding the average influent concentration (negative reduction) and other times at less than 85% monthly average reduction. Other AOCC correspondence blamed BCBOD5/TSS effluent violations on the primary clarifier being out of service (even with dilution of influent raw sewage).

WWTP Upgrade Project (WQM Permit No. 5422401):

- General Information:

- The only units that do not include duplicity (redundancy) are the influent medium-pore screen (with bar screen bypass), grit removal system and rotary sludge press. Any grit removal system bypassing would direct grit to the influent pump station wet well and CSBR Units where it would settle out. Sludge hauling trucks would be used if the rotary sludge press is taken out of service.
- There are no provisions for CSO-related internal bypassing at the proposed WWTP (other than SBR operating changes).
- There are no provisions for additional vector attraction reduction at the proposed WWTP. Treated sewage sludge will be properly disposed of at a landfill. They are not proposed for beneficial reuse.
- Estimated Removal Efficiencies: 95% BOD5 and TSS; 90% TP; and 87.5% TN

- Upgraded WWTP: As proposed:
  - One (1) new influent manhole (MH 448) prior to influent sampling/primary treatment, receiving flows from:
    - 15-inch Interceptor from PS No. 1 (estimated 1 MGD peak flow)
    - 20-inch Gravity Interceptor (Shenandoah Interceptor)
    - 8-inch West Mahanoy Township Interceptor
    - Sludge Filtrate recycling flow
    - Influent sampling location is shown at headworks entrance, prior to any screening and downstream of sludge filtrate flow recycling to manhole.
  - One (1) new screening units in new headworks building (2.0 MGD design flow, 5.0 peak daily flow, and 9.0 MGD PI flow) with manual bypass bar screen (2.0 MGD design flow, 5.0 peak daily flow, and 9.0 MGD PI flow). The manual bypass bar screen flow is not subject to grit removal.
  - One (1) replacement grit removal unit in new headworks building (2.0 MGD design flow and 8.0 MGD PI flow)
  - One (1) ultrasonic influent flow meter shall be located after the grit system and prior to the 17,200-gallon raw wastewater wet well.
  - One (1) existing Headworks pump station with four (4) new pumps with VFDs (1900 GPM with one pump for standby)
  - One (1) electromagnetic flow meter shall be located after the pumping station wet well on the force main.
  - One (1) two-gated flow splitter box
  - Two (2) Continuous-flow SBRs (CSBRs, with proposed Intermittent Cycle Extended Aeration System (ICEAS) system) designed for 2.00 MGD design flow and 8.00 MGD peak flow, with provisions for poly-aluminum chloride addition for phosphorus control:
    - 5 decant cycles per day; 72 minutes each; 6,076 GPM decant rate (8.749 MGD)
    - Influent flow enters tank during decant cycles (i.e. continuous inflow but discontinuous discharge).
    - Waste Activated Sludge is directed to the two new Aerobic Digesters (Nos. 1 and 2) prior to sludge press (with Sludge recirculation line back to Aerobic Digesters).
  - Wastewater Treatment Chemicals:
    - Magnesium Hydroxide (or Sodium carbonate soda ash) for pH adjustment and alkalinity
    - Poly Aluminum Chloride (PAC) for TP reduction and TSS reduction
  - One UV Reactor with Three (3) UV disinfection units in series within new UV/blower building sized for 11.7 MGD peak flow, followed by Effluent Sampling Location.
  - Repurposed Utility Water Holding Tank/Former Chlorine Contact Tanks: The Process Flow Schematic NMC Plan noted the UV discharge will be directed into the existing repurposed Utility Water Holding Tank for:
    - Discharge into Shenandoah Creek through the existing Outfall (No. 001).
    - Utility Water System (0 – 750 GPM @ 70 PSI)
  - Effluent Flow Meter prior to Outfall No. 001 discharge to Shenandoah Creek
  - Two (2) Aerobic Digesters
  - Proposed SCADA System
- One (1) Rotary Press retained

- Three replacement (3) stormwater outfalls (Nos. 018-020) will be installed. R-8 stone will be required at the plant discharge to prevent scouring from the stream based on the 500-Year storm which is what the design proposes. (Letter Response Item 4.b.i)
- As part of the WWTP Upgrade Project:
  - An 8" magnetic flowmeter will be added to Pump Station No. 1, and the signal will be transmitted to the proposed SCADA system via radio telemetry.
  - The automated rain gauge will be permanently installed at the WWTP during the new plant construction and data will not be available until after the treatment plant is in operation. SMSA has ordered and will be installing a digital rain gauge capable of recording to 0.01" accuracy. A digital rainfall gauge is to be integrated as part of the SCADA System in the proposed WWTP project.
  - Should tertiary treatment be required in the future, provisions have been made to reserve space for effluent disk filters per application.
- Abandonment/removal: One (1) Primary Clarifier, two (2) existing Aeration Basins, two (2) secondary clarifiers, two (2) chlorination units, and two (2) anaerobic digesters

Chapter 94 Report and Annual CSO Status Report Information:

- **2022 Chapter 94 Report (On-Base#100247)**: The Report was prepared by the SMSA Engineer (M. Christopher McCoach of Alfred Benesch) but the signature was dated 2020. The Authority Chairman was identified as Charles Lawson (different from the NPDES Permit Application GIF form). George Myers (Myers Environmental Services) was identified as contact person/operator.
  - **Form Items 1, 2, 3, and 9**:
    - Hydraulic Loadings (2.0 MGD Hydraulic Design Capacity): No existing or predicted hydraulic overloading identified, but actual CSS flows are unquantified at present. There is engineering risk that the proposed WWTP upgrade facility design might become subject to hydraulic overloading when meeting the CSO LTCP Goal requirements. 2022 AADF Flow was 1.537 MGD (ranging from 1.042 MGD – 2.047 MGD monthly average flows), not counting the unquantified CSO discharges. See 2021 Report comment about a misprint that obscured a hydraulic overload during the record year of precipitation (2018).
    - Organic Loading (3,400 lbs BOD5/day Organic Design Capacity): No existing or predicted organic overloading identified. Annual organic loading at 1,275 lbs BOD5/day, with monthly average ranging from 435 – 1,906 lbs BOD5/day.
    - Other Report Information:
      - Existing EDUs: 3,500
      - Persons/EDU: 3.5 (Default assumption is 2.5/EDU)
      - Flow/EDU: 439.1 GPD (Default assumption is 250/EDU)
      - Flow/Capita: 125.5 GDP (Default assumption is 100 GPCD for non-CSS systems)
      - Load/EDU: 0.364 lbs BOD5/day
      - Load/Capita: 0.104 lbs BOD5/day (Default Assumption is 0.17 lbs BOD5/day)
      - New EDUs/Year: Assumed 1 per year (but no increase in 2020-2022)
      - Two known IUs (Ateeco/Mrs. T and Lee Oriental Gourmet Food) in the food industry
    - NPDES Permit Renewal Flows: Total Population: 6,112 (combined). Using DWFM Section 43.51 default values (discounting IUs):
      - At 100 GPCD default: Dry weather flow would be estimated at 0.6112 MGD.
      - At 0.17 lb BOD5/day default: Organic loading would be at 1039 lbs BOD5/day
      - Atteeco (IU) flow estimated at 58,000 GPD. Percentage process wastewater not identified. 2000 GPD sewage was estimated in the 2001 LTCP (from NPDES application excerpt)
      - Lee's Oriental Gourmet Foods Inc. (IU) flow was unknown. Percentage process wastewater not identified.
  - **Form Item 4 (Sewer service area)**: No sewer extensions constructed or are anticipated.

- The Sewer Shed figure conflicts with the 2023 NPDES Permit application (including flow study) sewer shed figures regarding multiple Sewer Shed's numbering. The discrepancies are too numerous and confusing. Clarification is required both here and in the NPDES Permit Application (especially proposed Flow Study). Also, shows one sewer shed subdivided by the overall drainage area divide (A for flow to Shendandoah Interceptor and B for Pump Station No. 1).
- One provided figure shows the assumed original flow paths for the historic (impacted by mining and borough) flow paths of Sewer Creek (destroyed flow path) and Kohinoor Creek (rerouted flow path), not shown on various 2023 NPDES permit renewal application figures.

- **Form Item 5 (Sewer System O&M, Attachment D)**:
  - Assorted repairs of WWTP units was mentioned, but it is unclear if all WWTP units/equipment have been returned to service. WWTP upgrade project was mentioned.
  - The Borough is identified as responsible for the repair and maintenance of the sewage collection system, with potential assistance from the three (3) WWTP employees. They refer to the 2003 Flow Study correlation (called an algorithm here), but that is outdated due to both time (sewer systems I&I issues tend to worsen over time) and failure of the Borough to maintain three "bulkhead manhole" bulkheads or maintain minimum weir openings on most of the remainder. They are counting on the WWTP Upgrade project to "allow for better operational control of the influent".
- **Form Item 6 (capacity-related issues)**: No capacity-related bypassing, SSOs or surcharging reported for 2022. However, it was unclear if all WWTP units/equipment had been returned to service, with the NPDES permit application process schematic showing a bypass line around the primary clarifier. **NOTE**: 2023 EPA Compliance Inspection found assorted WWTP units out-of-service.
- **Form Item 7 (Pump Stations, Attachment E)**: No estimated or project pump station flows identified. They note the discovery of "an overflow pipe at Pump Station No. 1, which was investigated and determined to not discharge. The Authority plans to plug the pipe in 2023". However, the 2023 NPDES Permit Application appears to put off this project until the unpermitted WWTP Upgrade project is permitted. As the PS receives CSS sewer sheds flow, it is unknown if the PS is properly sized for the unquantified flows that may have to be pumped to meet the applicable CSO LTCP Goals.
- **Form Item 8 (IW, Attachment F):**
  - No copy/amendment of the Borough Ordinance governing IW discharges provided. The 2023 NPDES Permit Application indicated an amended version was under review by the Authority's attorney.
  - No mention of existing NPDES Permit requirements for an Industrial Pretreatment Program (IPP).
  - No mention of the EPA AOCC-required pretreatment sampling to develop local limits.
  - No Annual IPP Report was provided in accordance with existing NPDES Permit Part B.I.4.e and Part C.IX (POTW Pretreatment Program Development and Implementation). They have not met the Part C.IX schedule for IPP development and implementation.
  - No discussion of the permittee or municipality's program for surveillance and monitoring of industrial discharge (to the sewer system) was found, other than comment on what Ateeco has been doing. The requirement is for information for what the permittee (and/or municipality) is doing to monitor industrial discharges.
- **Form Item 10 (Sewage Sludge Inventory, Attachment G)**: They produced 27,500 gallons of liquid sewage sludge at 1.40% solids in 2022. They estimated 1.61 dry tons. However, the provided table did not address the existing NPDES Permit Part C.IV.C requirement (This summary shall include the expected sewage sludge production (estimated using the methodology described in the U.S. EPA handbook, "Improving POTW Performance Using the Composite Correction Approach" (EPA-625/6-84-008)), compared with the actual amount disposed during the year). **NOTE**: The DEP Operators Webpage tools include a spreadsheet incorporating the referenced EPA methodology that was not used in the Chapter 94 Report.
- **Form Item 11 (Annual CSO Status Report, Attachment H)**: The Annual CSO Status Report was deficient.
  - Part C.III.D.2 (Annual Report): The DEP Annual CSO Status Report form was not used despite permit condition requirement. A few paragraphs of information, resubmittal of the incomplete monthly CSO Supplemental Reports, and the self-generated table does not

substitute for completion of the required Annual Report form. Assorted DEP Annual CSO Report-required information was not provided or summarized as required.

- Part C.III.D.2.a.1 (Summary of CSO frequency, duration and volume): They estimated CSO discharge volumes, apparently using the obsolete 2003 Flow Study method, to claim a 93.55% capture rate.
  - Volumes: The volume estimate (using 2003 CSO flow correlations) is worthless due to expected sewer shed deterioration over time (I&I problems expected to worsen over time, rending 20-year old correlations worthless without recent calibration/validation) and 2022/2023 Benesch Inspection-reported CSO Diversion Manholes' O&M issues (missing/deteriorated bulkheads in the CSO Nos. 002, 006 and 007 bulkhead manholes and "throttling" of flows to the Interceptor pipes at most of the rest of the Diversion Manholes (horizontal weir plates not meeting required minimum settings except for CSO Outfall No. 010 and possibly unverified CSO Nos. 013A, 013B, and 014). They broke down the inaccurate estimated total annual 13,241,313 gallon/year CSO Discharge into annual flow and averaged over a 365-day year (i.e. as if continuously discharging, and not the 103 calculated discharge dates in 2022):
    - CSO No. 002 (bulkhead type): ~0.402 MG total, average 1,106 GPD
    - CSO No. 003: ~0.090 MG total, average 247 GPD
    - CSO No. 004: ~2.26 MG total, average 6,192 GPD
    - CSO No. 005: ~0.107 MG total, average 293 GPD
    - CSO No. 006 (bulkhead type): ~0.376 MG total, average 1,033 GPD
    - CSO No. 007 (bulkhead type): ~2.069 MG total, average 5,669 GPD
    - CSO No. 008 (standpipe design): ~0.021 MG total, average 58 GPD
    - CSO No. 009: ~0.808 MG total, average 2,214 GPD
    - CSO No. 010: ~2.456 MG total, average 6,730 GPD
    - CSO No. 011: ~ 0.414 MG total, average 1,136 GPD
    - CSO No. 012: ~1.684 MG total, average 4,614 GPD
    - CSO No. 013A: ~ 0.423 MG total, average 1,106 GPD
    - CSO No. 013B: 1.399 MG total, average 3,835 GPD
    - CSO No. 014: ~0.727 MG total, average 1,994 GPD
  - Claimed Capture Rate: The claimed 93.55% capture rate (using the 2003 CSO flow correlations to estimate CSO discharge volume) is contradicted by 2022 DEP Biologist sample results (high pathogen levels and high organic levels found in Shenandoah Creek downstream of CSO outfalls) and the 2023 NPDES Permit Application-contained Benesch inspection CSO O&M issues.
  - CSO Discharge Duration: No estimates of CSO Discharge durations provided (other than predicted by the CSO flow method by precipitation that day). Some CSO Monthly Reports identified estimated duration, but basis of estimation was not identified.
  - CSO Discharge Frequency: The frequency estimate was found in Attachment 13 Report (apparently generated from 2003 Flow Study methodology) that indicated 103 days of CSO discharges broken down into: Three (3) January CSO discharge days, four (4) February CSO discharge days, eleven (11) March CSO discharge days, ten (10) April CSO discharge days, eleven (11) May CSO discharge days, eleven (11) June CSO discharge days, eight (8) July CSO discharge days, eight (8) August CSO discharge days, eleven (11) September CSO discharge days, nine (9) October discharge days, nine (9) November discharge days, and ten (10) December discharge days. These may be underestimates due to obsolete 2003 Flow Study correlations (plus unclear if they accounted for all precipitation events >0.01-inches) as they have no method of identifying dry weather discharges (in absence of chalk/block method, trash rack, etc.).
- Part C.III.D.2.a.2 (Operational Status): The NPDES permit application indicated Benesch did engineering inspection in both 2022 and 2023. Therefore, it is unknown why CSO Diversion Chamber O&M issues were not identified here.

- Part C.III.D.2.a.3 (Identification of known in-stream water quality impacts, their causes, and their effects on downstream water uses): This requirement was not addressed. 2022 DEP Biologist sampling found evidence of in-stream impacts that the 2023 NPDES Permit Application is now attributing to CSO Diversion Chamber O&M issues.
- Part C.III.D.2.a.4 (Summarize all actions taken to implement the NMCs and the LTCP and their effectiveness): No summarization found, despite DEP Inspection Report noting assorted CSO NMC-related issues (missing signs, etc.). The 2023 NPDES Permit Application now indicates need to take assorted actions to meet existing NMC requirements.
- Part C.III.D.2.b.1 (Rain Gauge reporting to 0.01-inches): The WWTP upgrade project proposes a more accurate digital rain gage, but accuracy of existing rain gauge/informational source is unknown. Rain events might have been not reported.
- Part C.III.D.2.b.2 (Inspections and maintenance):
  - Total number of regulator inspections conducted during the period of the report (reported by drainage system): Not reported despite requirement.
  - A list of blockages (if any) corrected or other interceptor maintenance performed, including location, date and time discovered, date and time corrected, and any discharges to the stream observed and/or suspected to have occurred: Not reported despite requirement. NPDES Permit application indicated partial blockage found at CSO Outfall No. 002 by Benesch.
- Part C.III.D.2.b.2 (Dry weather overflows): They propose to install the chalk or block method of identifying dry weather discharges, but there is no existing method of detecting dry weather discharges unless seen during an inspection.
- Attached CSO Supplemental Reports: They attached copies of CSO Monitoring Reports rather than the required annual summarization on the DEP Annual CSO Status Report form.
  - Monthly Inspection Reports:
    - John Mazack signed the reports until July as the “plant operator”. George Myers (as “Operations”) thereafter. The requirement is for the job title. George Myers is identified as the “Chief Operator” per SMSA organizational chart.
    - The Monthly Inspection Reports indicated “OK MH” or “OK-LR” or equivalent despite O&M problems identified by Benesch Inspections. No other comment/information provided. Benesch engineering inspections in 2022 and 2023 found missing or deteriorated bulkheads, CSO No. 002 partial blockage, and failure to maintain minimum flat weir plate openings.
  - Detailed Outfall Reports:
    - John Mazack signed the reports until July as the “plant operator”. George Myers (as “Operator”) thereafter. The requirement is for the job title. George Myers is identified as the “Chief Operator” per SMSA organizational chart.
    - The identification column was left blank (but required how the CSO discharge was identified). The discharge volumes were calculated (2003 Flow correlations).
    - The duration column (in hours) was provided, but method of determining was not identified as required.
    - The cause column was completed as “rain” but the form instructions require greater detail (line or gate blockage, malfunction, hydraulic load or other).
    - The comments column was left blank. It is meant to record other important information (such as verification of daily CSO inspections and any findings during that particular inspection, recording Engineer inspections, etc.). At this point, it is impossible to determine if the CSOs are being inspected daily and there is no information to validate/calibrate the 2003 Flow Study calculations (no visual confirmation of discharges, not CSO pipe flow depths, no information on status of bulkhead/weirs, etc.).

- **Form Item 12 (Calibration, Attachment I)**: The Chapter 94 Report Additional Information section noted that the Influent flow meter (with flow totalizer) is used for Chapter 94 Reports and DMRs. The Effluent flow meter (Fischer and Porter) is used as a back-up for the influent meter. They need to identify which calibration form pertains to which flow meter (influent or effluent) on the calibration report.

- **2021 Chapter 94 Report (On-Base Reference No. 52826):**
  - **Cover Letter**: The Transmittal letter was signed by both Zachary R. Sullivan EIT, and M. Christopher McCoach, P.E., Project Manager. McCoach's signature is on the Report Preparer Section, but was dated 2020.
  - **General Information Section**: Mr. John Mazack is identified as the contact person and operator, but Mr. Navitsky signed as the Responsible Official. He was also copied on the Report Transmittal Letter. Contact clarification is required.
    - The 12/28/2021 DEP NOV-cited newspaper article (8/20/2019 Republican Herald) indicated Mr. Mazak's previous retirement as of September 27, 2019.
    - Mr. Mazack is not listed as either client or site contact in the 2022 WQM Permit Application (WWTP upgrades) General Information Form, which listed Mr. Jeff Navitsky as the site contact with the title of operator (plus Authority Chairman as client contact).
    - Mr. Navitsky signed the Responsible Official Certification for the 2021 Chapter 94 Report. Mr. Navitsky also signed assorted 2021 CSO Supplemental Reports as the "Asst. Plant Operator" (per the Annual CSO Status Report attachments).
  - **Form Items 1, 2, 3 and 9; Referenced Attachment A and B**: No existing or projected overloading claimed, but that is incorrect. There is a misprint in the 2018 data (0.339 MGD September flow) that **obscured hydraulic overloading during July – October 2018**. At present, it is unclear if the LTCP Goal might require the WWTP to treat additional flows in the absence of an LTCP Update. No corrective action plan was proposed in the 2021 Chapter 94 Report. Previous Chapter 94 Reports were found to also have included the incorrect September 2018 data, and consequent failure to address the historic hydraulic overloading.
    - Claimed Capacities: Actual WWTP capacities might be reduced due to long-standing plant O&M issues:
      - Hydraulic Design Capacity: 2.0 MGD
      - Organic Design Capacity: 3,400 lb BOD5/day
      - 2021 EDU data:
        - Persons/EDU Assumed: 3.5 persons per EDU
        - Existing EDUs: 3,500. At 3.5 person/EDU, this equates to 12,290 persons (with the 2022 NPDES Permit Renewal Application indicating a total population of 6,112 persons (not counting IU loadings). At 2.5 person/EDU, the estimated population would be 8,750. Using standard DWFM Defaults (100 GPCD; 0.17 lb BOD5/day), the 3,500 EDUs (at 3.5 persons/EDU) would be expected to result in the following flow/loading:
          - 1.229 MGD ADF (dry weather flow)
          - 2,089.3 lbs BOD/day
        - Load/EDU: 0.494 lbs BOD5/day
        - Load/Capita: 0.141 lbs BOD5/day
        - Projected Growth: 1 EDU/year
    - Flow Data:
      - ADF: 1.316 MGD with monthly average flows ranging from 0.895 MGD to 1.74 MGD. Max 3-month flow: 1.712 MGD. Highest month was May.
    - 2022 NPDES Permit Renewal Application Information:
      - Borough of Shenandoah: 85% flow contribution; 100% CSS; and 4,712 population
      - West Mahanoy Township: 15% flow contribution; 30% separated; 1,400 population.
      - Total Population: 6,112 (combined). Using DWFM Section 43.51 default values (discounting IUs):
        - At 100 GPCD: Dry weather flow would be estimated at 0.6112 MGD.
        - At 0.17 lb BOD5/day: Organic loading would be at 1039 lbs BOD5/day.
    - 2022 WQM Permit Application Information:

- The initial WWTP was designed for a population of 20,000 persons. The current population is approximately 5,615 persons. There are currently 3,243 EDUs (2,185 residential in Shenandoah Borough, 648 residential in West Mahanoy Township, and 410 commercial).
- The Chapter 105 Environmental Assessment indicate the Authority expanded its service area in 2009 to include 240 EDUs (Shenandoah Heights, Weston Place, Upper and Lower Brownsville area) for total of 2,598 residential EDUs. The Assessment noted the facility serves 263 commercial/industrial accounts for an equivalent of 291 EDUs. They assumed 2,889 EDUs as the current customer basis. They noted there is potential for future expansion in the areas of Lost Creek (179 EDUs) and William Penn (191 EDUs) in West Mahanoy Creek.
- The (undated) Alfred Benesch Preliminary Engineering Report noted that when the surrounding areas of Mahanoy Township (Shenandoah Heights, Weston Place, Upper and Lower Brownsville, Lost Creek and William Penn) and the existing commercial/industrial base to the existing residential population of Shenandoah, the population equivalent is approximately 7,500. The Report indicated that sizing the new WWTP to the existing facility size will allow for "reasonable growth capacity".

- **Form Item 4 (Sewer Extensions; Referenced Attachment C)**: No extensions constructed or anticipated. The referenced Attachment C figure showed the Shenandoah MA service area but lacked important information such as Outfall locations, failure to clearly delineate the Shenandoah Tribs (Kohinoor Creek and Sewer Creek) with existing CSO overflows, failure to show previous LTCP-identified Sewer Sheds A and B, and failure to identify any separated sewer shed areas. Previous LTCPs indicated there have been separation projects since 1972, but no breakdown of separated from combined sewer system areas was provided by the figure. One project apparently eliminated former Pump Station No. 2, but no details were provided in the 2021 Chapter 94 Report.
- **Form Item 5 (Sewer System Monitoring, Maintenance, Repair, and Rehabilitation Discussion; Referenced Attachment D)**:
  - Attachment D noted regular sewer maintenance crew (2 laborers with potential assistance from the 2 WWTP operators and 1 laborer) duties, but did not identify the Catch basin cleaning/refurbishing or CSO inspection schedule (except "as necessary").
  - Attachment D noted the Authority is proceeding with design and construction of the existing WWTP which "will allow better operational control of the influent". A USDA Rural Development grant ($5,474,000) and loan ($12,532,000) were noted for the project. The Authority noted it had closed in interim financing loan through RBC Capital to finance the design. **NOTE**: The WWTP Upgrade WQM Permit Application No. 5422402 was received 3/7/2022. A 3/16/2022 DEP Incompleteness letter was subsequently issued (with response due in 60 days).
  - Attachment E noted that Authority had re-applied for a grant to rehabilitate Pump Station No. 1, but no details were provided.
  - "Since the collection system is a combined system it is difficult to remove infiltration and inflow due to its nature. Removal of I/I would require separation of the system which would be cost prohibitive". See Form Item 6 for a proposed CSS Flow Study but no mentioned ongoing I&I work other than emergency work.
  - No mention of out-of-service WWTP treatment units despite the 12/28/2021 NOV statement that some units have been inoperable for years. The 9/24/2020 EPA Compliance Order Docket No. CWA-2020-0067DN Item 39.a required documentation that the primary clarifier, sludge thickener and final clarifier No. 2 have been repaired and are operational. Item 39.b required that the influent treatment units (Comminutor, Barscreen, and Grit Chamber) be operational and in good order.
- **Form Item 6 (System Conveyance Exceedances, Bypassing, SSOs, excessive Infiltration Etc.; No referenced attachment)**: The Authority indicated the "System did not experience capacity-related bypassing, SSOs or surcharging during the report year". **This is incorrect as the 12/28/2021 NOV noted daily in-plant bypassing due to units having been inoperable for years**. The provided Treatment Plant Schematic figure did not who any provisions for bypassing inoperable units or any CSS in-plant WWTP bypassing of secondary treatment (and did not break out the headworks units for any bypassing of the grit collector or comminutor. The Authority indicated it has developed a Flow Study Plan for quantifying I&I with the following components, but no copy and/or schedule for Flow Study Plan submittal or implementation was found in the 2021 Chapter 94 Report. The 9/24/2020 EPA Compliance Order Docket No. CWA-2020-0067DN Item 39.c required submittal for review of a Infiltration abatement plan plus copies of any I&I investigations conducted since November 2016. Mentioned Flow Study components included:

- Review existing Authority mapping
- Establish/identify major drainage areas and/or subareas
- Determine strategic locations for installation of flow meters
- Data collection (flow and rainfall monitoring)
- Data evaluation (I&I quantification)
- Ranking subareas in terms of I&I after receiving and analyzing the results of flow metering for prioritization of sub-drainage areas in terms of highest I&I:
- Future development and submittal of a Recommendation and Implementation Report to PADEP/EPA for approval prior to beginning design and construction activities for I&I abatement projects: **NOTE:** Report Attachment D stated: "Since the collection system is a combined system it is difficult to remove infiltration and inflow due to its nature. Removal of I/I would require separation of the system which would be cost prohibitive".

- **Form Item 7 (Pump Stations; Referenced Attachment E)**: Only one (1) existing Pump Station No. 1(located on PA Route 54 near the West End of Shenandoah). A second pump station No. 2 (Belmont street, north of the Shenandoah Valley High School Stadium) was said to have been eliminated as part of the West Mahanoy Township Extension. Pump Station No. 1 information:
  - Rated Capacity (one pump out of service): 1.0 MGD
  - Estimated Flows (no existing flow monitoring device, method of estimation not identified, with overflow pipe found in recent Inspection Report, so flow data is suspect) and other information provided:
    - Estimated Dry weather flow: 0.4 MGD
    - Estimated Wet weather flow: 0.6 MGD
    - "Because of the age of the pump station, more frequent maintenance is required from year to year. A grant has been re-applied for by the Sewer Authority to rehabilitate Pump Station No. 1".
    - "Since the connection of Shenandoah Heights to this pump station, there have been no problems with excessive flow. A recent inspection has found an overflow pipe at Pump Station No. 1, which is being investigated. The plan is to block off the pipe once it is confirmed that it does not discharge".
    - "Pump Station No. 1 is monitored continually by a leased telephone line "closed-loop" alarm system. In addition to the alarm system, the pump station is checked daily by the plant's maintenance staff. Since there are no flow meters at the station, the available capacities and present maximum flow are estimated. Remote monitoring via a new SCADA system is included as part of the WWTP replacement under design".
- **Form Item 8 (Industrial Wastes Report; Referenced Attachment F)**:
  - **Missing IPP Report**: The IPP Report block was left unchecked and no IPP Report meeting NPDES Permit Part B.I.C.4.e and Part C.IX.D (Annual Report Requirements) requirements was found in the Report. See below for provided Attachment F information. The 9/24/2020 EPA Compliance Order Docket No. CWA-2020-0067DN Item 38.b required a plan and schedule for developing an IPP.
  - Item 8.a: No copy of any ordinance or regulation governing IW discharges was found. It is unknown when any previous submittal might have occurred. This and previous Chapter 94 Reports mentioned modification of the existing ordinances were in progress.
  - Item 8.b: There was no discussion about the Authority's program for surveillance of monitoring of IU discharges other than what is quoted below:
    - "All industries generate domestic sewage. In addition, Ateeco, Inc., discharges food-processing wastewater, and Alex Chemical Co. occasionally discharges dye waste".
    - "Industries of potential concern served by the Authority are listed as follows": Alex Chemical Co.; Ateeco, Inc.; Lee's Potstickers; and Triway Metal Workers. **NOTE**: In the absence of SIC Classification or other information, it is unclear if any of these industries are subject to Federal Pretreatment ELGs and the NPDES Permit Part B.I.C.4.b reporting requirements for such industrial sources.

- "The Authority currently has an ordinance that limits commercial/industrial waste into its collection system. The ordinance and limits are being modified to meet the standards of a POTW Pretreatment Program in accordance with 40 CFR Part 403". NOTE: This language has been in the last two Chapter 94 Reports.
- "In the past, there has been an occurrence of slug loads at the WWTP causing upsets. Ateeco manufactures Mrs. T's pierogies. The parameters which appeared to be causing the upsets at the WWTP were low pH, high BOD and/or high TSS. The low pH and high TSS were resolved during 2017. In 2018, Ateeco tested their wastewater with a pilot vacuum filtration and evaporation pre-treatment plant to reduce the BOD in their discharge. Initial samples showed positive results, but the pilot plant did not work as expected. Ateeco is continuing to pursue treatment methods to reduce BOD in their discharge to the Authority's collection system. Ateeco is currently being surcharged for high BOD in accordance with the Borough Ordinance".
- "Any facilities whose discharge is not within the limits of the pre-treatment ordinance are surcharged a Penalty".

▪ Item 8.c: There was no discussion of specific problems in the sewer system or treatment plant in 2021.
▪ Hauled-In Wastewater: Report was unclear. None per 2022 NPDES Permit Renewal Application.
▪ 2022 NPDES Permit Renewal Application: Two non-categorical industries (food processing) identified. The IU section lacked data on Wastewater flows and types (sanitary versus process versus NCCW) from Mrs. T's (Ateeco Inc.) with known/suspected causes of upsets, pass-through, and TSS due to High BOD, Organics, and TSS. Another food producer (Lee's Oriental Gourmet Foods, Inc.) also had unknown wastewater flows, but was not indicated to be a known source of problems.

o **Form Item 10 (Sewage Sludge Management Inventory; Referenced Attachment G)**:
▪ **NPDES Permit Part B.I.C.4.c and Part C.IV.C-required "Sewage Sludge Management Inventory"**: **Not provided.** This condition required following a specific EPA methodology to estimate sludge production and compare it to predicted production rates. The DEP Wastewater Operator Webpage resources includes a spreadsheet tool to help address this requirement.
▪ The provided table identified the monthly average flow (MGD), Average Influent BOD5 (mg/l), Average Effluent CBOD5 (mg/l), liquid sewage sludge/biosolids hauled offsite (gallons, percent solids, and dry tons). A total of 8,025 gallons, estimated average 1.65% solids, and 1.00 dry ton was hauled offsite in 2021. No dewatered sludge was hauled offsite. No mention of any problems with the existing anaerobic digester units or rotary press to explain why no dewatered sludge was hauled offsite in 2021.
▪ The 9/24/2020 EPA Compliance Order Docket No. CWA-2020-0067DN Item 36.b requires submittal of a Sewage Sludge Management Inventory for the 2018 and 2019 Calendar Years. That information was missing from the Chapter 94 Reports for those years.
▪ 2022 NPDES Permit Renewal Application: 1.00 dry tons estimated production, landfilled. The application indicated the biosolids are not expected to be land applied under DEP beneficial use permits. Application indicated anaerobic digestion and unidentified vector reduction methods, but anaerobic digesters to be abandoned per WQM permit application and vector reduction methods can require physical facilities for lime addition, etc. that were not identified in the NPDES Permit Renewal Application.

o **Form Item 11 (Annual CSO Report; Referenced Attachment H)**:
▪ **Background:**
- The 12/28/2021 DEP Notice of Violation indicated an 8/18/2021 Inspection found apparent noncompliance with existing NPDES Permit requirements (apparent unpermitted Pump Station **overflow bypass pipe/unpermitted CSO**, pump station O&M issues, missing required CSO signage, failure to implement visual CSO discharge, etc.). The NPDES Permit-required 2018 LTCP Update could not be located. The 9/24/2020 EPA Compliance Order Docket No. CWA-2020-0067DN Item 37.c required the Authority to implement a CSO monitoring plan that addresses CSO monitoring on a daily basis.
- 2022 NPDES Permit Renewal Application Information: 101 storm events with 101 wet weather CSO events. Estimated 5.26 hour average duration discharge event, with average 83,851 gallons, with minimum CSO event precipitation trigger level of 0.02 inches

▪ **NPDES Permit Part C.III.D.2 (Annual CSO Status Report) requirements were not addressed**:
- Part C.III.D.2:

- Part C.III.D.2.a(1): The summary of the frequency, duration and volume of CSO discharges was required in a 2021 table. The provided Table was based solely on calculated CSO discharges from an Authority estimation methodology. It simply does not address snow-melt discharges for example. There was no actual inspection data that would identify any non-calculated discharges.
- Part C.III.D.2.a(3): Missing the required identification of known in-stream water quality impacts, their cause, and their effects on downstream water users.
- Part C.III.D.2.a(4): Missing the required summarization of all actions taken to implement the NMCs and LTCP and their effectiveness. The vague statement that: "All CSO are regularly inspected and presently functioning as designed" is effectively meaningless in the absence of a summarization of actually undertaken actions in 2021, plus the DEP Inspection Report indicating noncompliance with existing NPDES Permit requirements. The submitted CSO Supplemental Form did not identify any action undertaken (inspection, cleaning, etc.).
- Part C.III.D.2.a(5): Missing the required evaluation and progress report on the implementing and necessary revisions to the NMC and LTCP. No mention of the unlocated LTCP Update (required in 2018 per the existing NPDES Permit Part C.III.G and Part C.III.C.5) or any update to address post-2018 changes.
- Part C.III.D.2.b(2): The report did not identify the total number of regulator inspections conducted during the 2021 reporting period (reported by drainage area). No identification of regulator inspections was found in the report. No listing of blockages corrected or other interceptor maintenance performed (with location, date and time discovered), date and time corrected, and any stream discharges observed/suspected was found.
- Part C.III.D.2.b(3): The DEP Inspection Reports indicate the facility has apparently no method of detecting dry weather overflows, and therefore reporting requirements could not possibly be met.
- Part C.III.D.2.b(4): It is unclear if any of the regulators have any form of automatic level monitoring. If so, that information was required to be submitted.

▪ In terms of provided Information:

- All CSOs were said to have been regularly inspected and said to be "presently functioning as designed": No inspection schedule or standards provided. Present weir/bulkhead settings not identified.
- Flow Monitoring Methodology: The Report referenced a previous "CSO report which was previously submitted to PADEP". That Report was noted to "have been developed based on flowmeters that were installed at the CSO discharges in the Authority system". "The report provides a methodology to estimate CSO discharges during precipitation events based on recorded rainfall and duration. The Authority has a rain gauge installed at the treatment plant and is utilizing these items to submit CSO Reports with their monthly DMRs which provide estimates of the overflows". NOTE: A 2003 CSO Report was found in the available Department Files.
- Authority-Estimated Capture: The existing NPDES Permit incorporated the 85% Presumption Approach.
  - Total 2021 Volume Treated at WWTP during Wet Weather: 137,111,000 gal
  - Total 2021 Estimated Volume CSO Discharged: 8,468,972 gal
  - Total 2021 Wet Weather Volume: 145,579,972 gal
  - 2021 Treated Flow During Wet Weather: 94%
- Attachments: January through December 2021 CSO Supplemental Report Detailed Outfall Reports:
  - That form was partially completed with estimated discharge volumes based upon the Authority estimation methodology, but only for those days when they calculated a discharge from the applicable CSO Outfall. Then they provided the estimated volume, duration, cause (rain) and measured inches of precipitation. The 2003 methodology would not capture snow melts or non-calculated discharges. The Comments section (for additional outfall-specific information such as inspection dates) was left blank.

- CSO Monthly Summary Report (3800-FM-BPNPSM0441): This form was not submitted as part of the Annual CSO Status Report attachment. It is the required monthly summary of all CSO discharges for the calendar month (CSO outfall, outfall location, and comments with any additional outfall-specific information).

- 2021 Annual Data Summary Table Printout: The columns included "Measured Rainfall (in)"; Storm Duration (hrs); CSO Nos. 002 through 14 flows (gallons); Total CSO Flow (gallons); WWTP Plant Flow (MGD); WWTP Plant Flow (gpd); Total Wet Weather Flow (gpd); and % Treated.
  - When no flow was calculated, no CSO flow value was identified.
  - This methodology would not address snow melts and did not estimate multi-day flow events (unless there was rain recorded on consecutive days).
  - They estimated 44.67 inches of precipitation in 2021 with an average 5.26 hours of discharge per their methodology, plus their calculated maximum and average CSO discharge.
    - Total CSO Flow Estimate: 8,468,972 gallons
      - Average Flow: 23,203 gallons
      - Maximum Flow: 1,327,526 gallons
    - Total WWTP Flow: 480,567,000 gallons
      - Minimum WWTP Flow: 352,000 gallons
      - Maximum WWTP Flow: 3,121,000 gallons

- Attachment J (Additional Information): The following information is relevant to CSO issues:
  - "The service area of the wastewater treatment plant consists of combined sanitary sewage and stormwater collection, conveyance, diversion structures, and one pump station. The combined sewer pipe system includes 6-, 8-, 10-, 12-, 15-, 24-, and 36-inch pipe. The combined length of all gravity flowpipe is estimated at 20 miles. The sewage force main is approximately 1/8 mile".
  - "The Authority operates thirteen (13) stormwater diversion structures under its National Pollutant Discharge Elimination System (NPDES) Permit. Diversion manholes numbered 002 through 009 discharge to Shenandoah Creek; numbers 010 through 013A & 13B discharge to the Kohinoor Creek; and number 014 discharges to Sewer Creek. The Kohinoor and Sewer Creeks are tributaries to the Shenandoah Creek".
  - The existing WWTP was described and a process flow diagram provided, but no information on out-of-service treatment units or out of service bypassing lines was included. No CSO bypassing provisions of secondary treatment to meet minimum CSS treatment requirements was found. Flow meter not identified on process flow diagram.

- **Form Item 12 (Calibration Report and Attachment I)**: Calibration reports included for effluent flow meter (Ultrasonic for 3 foot Rectangular Weir w/o End Cont.), Primary Sludge flow meter (4-inch Mag meter), Influent Area Velocity Flow Meter (head versus flow), Return Sludge (8-inch Mag meter), chlorine meter, pH meter. Attachment J noted the effluent flow meter is used as a back-up for the influent flow meter.
- **Preparer Certification (McCoach of Alfred Benesch)**: The date of the signature was 3/31/2020. It should have been 2022. Given the transmittal letter included two signatures, it is unclear who was the actual preparer of this Report.

2020 Chapter 94 Report (On-Base Reference No. 49267): Here are some information excerpts and comments:

- **DEP Form Heading**: They incorrectly referenced the prior NPDES permit. The NPDES Permit Renewal Application is due 5/4/2022. The last issued permit was described as issued on 10/6/2017 and expires 10/31/2022. **NOTE**: Outfall No. 001 is located in West Mahanoy Township, not Shenandoah Borough.

- **Form Items 1, 2, 3 and 9**: No existing or projected hydraulic or organic overloading was identified, but that was due to an incorrect September 2018 value (0.339 MGD versus EDMR reported 3.339 MGD) that otherwise obscured the 2018 Hydraulic Overload. No corrective action was proposed.
  - Existing Plant Hydraulic Design Capacity:
    - 2020: 1.248 MGD ADF; 356.6 GPD/EDU; 101.9 GPD/Capita
    - Uncertainties due to offsite CSO discharges if more flow must be treated to comply with LTCP Goal
  - Existing Plant Organic Design Capacity: 3,400 lb/day (proposed to be retained in Part II WQM Permit application). Facility was to install Flow-proportional 24-hour composite sampler per 2020 EPA Order, so this previous organic loading data might be biased until flow-proportional composite sampler was installed:
    - Annual Average Load: 1,449 lb BOD5/day
    - Max Monthly Flow: 1,951 lb BOD5/day
  - Existing EDUs:
    - 3,500 (decreasing over last 5 years from 3,706 EDUs)
    - 3.5 persons/EDU estimated
    - No sewer extensions planned or anticipated.
  - EDU Load: 0.414 lb/EDU
  - Per Capita Load: 0.118 lb/capita
- Form Item 5 (sewer system O&M/Attachment D): No mention of inoperable units etc.
- Form Item 6 (surcharging, flows, bypassing/Attachment I): They report none, but existing NPDES Permit allows for CSO bypassing in-plant during high flows and DEP Inspection Report noted unpermitted bypass in their existing pump station. Daily bypassing due to long-term inoperable treatment units. **NOTE**: NPDES Permit has CSO bypassing condition (of secondary treatment), but no internal WWTP CSS bypass (of secondary treatment units) shown on submitted facility flow diagram.
- Item 7 (Pump Station/Attachment E): 2021 DEP Inspection Report indicate the existing pump station has an unpermitted bypass and alarm was disconnected, so any flow estimates are suspect. "Pump Station No. 1 is monitored continually by a leased telephone line "closed-loop" alarm system. In addition to the alarm system, the pump station is checked daily by the plant's maintenance staff. Since there are no flow meters at the station, the available capacities and present maximum flow are estimated. Remote monitoring via a new SCADA system is included as part of the WWTP replacement under design".
- Item 8 (IW/Attachment F):
  - "The Authority currently has an ordinance that limits commercial/industrial waste into its collection system. The ordinance and limits are being modified to meet the standards of a POTW Pretreatment Program in accordance with 40 CFR Part 403".
  - "In the past, there has been an occurrence of slug loads at the WWTP causing upsets. Ateeco manufactures Mrs. T's pierogies. The parameters which appeared to be causing the upsets at the WWTP were low pH, high BOD and/or high TSS. The low pH and high TSS were resolved during 2017. In 2018, Ateeco tested their wastewater with a pilot vacuum filtration and evaporation pre-treatment plant to reduce the BOD in their discharge. Initial samples showed positive results, but the pilot plant did not work as expected. Ateeco is continuing to pursue treatment methods to reduce BOD in their discharge to the Authority's collection system. Ateeco is currently being surcharged for high BOD in accordance with the Borough Ordinance".
  - "Occurrences of objectionable wastes have been noticed at the plant on several occasions in the past. The Authority has made notices to the industries served and is presently active in monitoring industries for objectionable discharges. Industries of potential concern served by the Authority" were listed, including: "Ateeco, Inc., discharges food-processing wastewater, and Alex Chemical Co. occasionally discharges dye waste" (with two other IUs noted including a "Triway Metal Workers").
  - No attached IW ordinance copy or local limits included.
  - No mention of the existing NPDES Permit Part IX.D (POTW Pretreatment Program Development and Implementation) IPP Annual Report (with missing description of IU pretreatment, no industrial listing in terms of SICs or applicable ELGs, no identification of special reporting requirements,

no identification of NCSIUs as such, no mention of any waiver request, no identification of any mass-based effluent IU limits). No mention if hauled-in wastes are accepted. Etc.). No mention of whether any of the IUs have pre-treatment ELGs which require additional reporting under NPDES Permit Part B.I.C.4 requirements.
    - DEP Inspection Reports have noted lack of local IU limits (NPDES Permit Part B.I.D General Pretreatment Requirements).
- Item 10 (Sewage Sludge Inventory/Attachment J): No sludge removed from site in 2020 (liquid or solid). They did not submit the NPDES Permit Part C.IV.C "Sewage Sludge Management Inventory", only estimating influent BOD5, effluent CBOD5, and total flows.
- Item 11 (Annual CSO Status Report/Attachment G with additional information in Attachment I): They did not submit the required DEP Annual CSO Status Report form to provide the required summarized information. Provided information included:
    - "The effluent is continuously recorded using a flow meter manufactured by Fischer and Porter. The influent flow meter, which is equipped with a flow totalizer, is used for Chapter 94 Report and Discharge Monitoring Report purposes. The calibration report is included in this report as Attachment H. The effluent flow meter is used as a backup for the influent flow meter".
    - "Also included in this section is a table summarizing the estimated CSO discharges and WWTP treated flows along with the percentage of flow treated during wet weather events. The yearly totals are as follows":
        - Total 2020 Volume Treated at WWTP during Wet Weather: 163,290,000 gal
        - Total 2020 Estimated Volume CSO Discharged: 12,156,495 gal
        - Total 2020 Wet Weather Volume: 175,446,495 gal
        - 2020 Treated Flow During Wet Weather: 93%
    - "The annual percentage of treated flow during wet weather events is 93% which meets the EPA Presumption Approach. (Note: The treated flow may include flow over multiple days after a wet weather event occurs until the WWTP flow returns to normal dry weather flow. It also may include the treated flow on wet weather events caused by snow melt or thaw as can be seen by high days of treated flow rates during spring.)".
- DEP Form Signature Section: The signer (Mr. Mazack, previously facility certified operator) retired (with last day indicated to be September 27) per August 20, 2019 Republican Herald newspaper article cited in the December 28, 2021 Notice of Violation. It is unclear if he had the authority to sign the Chapter 94 Report on behalf of the Authority when it was submitted in March 2020.

2019 Chapter 94 Report Information included:

The Authority attempted to televise a portion of the sewer interceptor along Shenandoah Creek in 2019 to check for sources of inflow/infiltration. Due to low pH in the WWTP influent and the Shenandoah Creek having a low pH, it is suspected there may be infiltration from the Creek entering the collection system. During the physical inspection of the line, it had been determined that the access point for the sewer line had been washed away during flooding making the interceptor inaccessible for the camera truck. The Authority is currently investigating a way to access the site to televise the line to determine if there is a need to repair, line or replace the line. The Authority will apply for permits where necessary to complete the repairs.

Also included in this section is a table summarizing the estimated CSO discharges and WWTP treated flows along with the percentage of flow treated during wet weather events. The yearly totals are as follows:

• Total 2019 Volume Treated at WWTP during Wet Weather	180,273,000 gal
• Total 2019 Estimated Volume CSO Discharged	14,202,451 gal
• Total 2019 Wet Weather Volume	194,475,451 gal
• 2019 Treated Flow During Wet Weather	93%

The annual percentage of treated flow during wet weather events is 93% which meets the EPA Presumption Approach. (Note: The treated flow may include flow over multiple days after a wet

The Authority has an ordinance that limits commercial/industrial waste into its collection system. The ordinance and limits are being modified to meet the standards of a POTW Pretreatment Program in accordance with 40 CFR Part 403.

Occurrences of objectionable wastes have been noticed at the plant on several occasions in the past. The Authority has made notices to the industries served and is presently active in monitoring industries for objectionable discharges. Industries of potential concern served by the Authority are listed as follows:

Compliance History

DMR Data for Outfall 001 (from February 1, 2023 to January 31, 2024)

Parameter	JAN-24	DEC-23	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23	MAR-23	FEB-23
Flow (MGD) Average Monthly	**1.8031**	**1.4161**	**0.6944**	**1.0911**	**1.2411**	**1.0163**	**1.1737**	**1.1921**	**0.9395**	**0.9327**	**1.0989**	**1.1434**
Flow (MGD) Daily Maximum	**4.4827**	**3.9204**	**2.3751**	**3.0436**	**2.7271**	**1.9363**	**2.025**	**3.3647**	**2.4041**	**3.4822**	**1.9599**	**1.4804**
pH (S.U.) Minimum	6.0	6.3	6.3	6.3	6.4	6.4	6.2	6.1	6.0	6.2	6.0	6.0
pH (S.U.) Instantaneous Maximum	6.7	7.0	7.1	7.1	7.3	7.0	7.2	7.1	7.0	7.3	6.8	6.7
TRC (mg/L) Average Monthly	**0.6**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.9**	**0.9**	**0.9**	**0.8**	**0.7**	**0.6**
TRC (mg/L) Instantaneous Maximum	**0.9**	**1.1**	**1.0**	**1.1**	**1.4**	**1.3**	**1.6**	**1.7**	**1.5**	**1.0**	**1.0**	**1.0**
CBOD5 (lbs/day) Average Monthly	< 96	< 49.8	45	< 30	< 47	< 48	< 50	86	71	43	< 79	< 67
CBOD5 (lbs/day) Weekly Average	< 141	59	57	42	97	82	93	176	124	48	137	78
CBOD5 (mg/L) Average Monthly	< 6.2	< 4.5	7.5	< 4.0	< 5.4	< 6.1	< 5.1	7.4	8.9	6.7	< 9.2	< 6.6
CBOD5 (mg/L) Weekly Average	11.0	5.0	11.0	5.0	9.0	11.0	8.0	11.0	13.0	8.0	16.0	8.0
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	1127	1127	1289	1089	1114	1173	918	1575	1521	1694	1334	1616
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	1592	1490	2516	1283	1305	1464	1532	1836	1887	1807	1617	2037
BOD5 (mg/L) Raw Sewage Influent Average Monthly	**78**	**114**	**181**	**150**	**148**	**165**	**115**	**167**	**203**	**263**	**157**	**161**
TSS (lbs/day) Average Monthly	< 157	< 47	< 51	< 69	< 58	< 49	< 59	136	93	41	< 72	< 96

TSS (lbs/day) Raw Sewage Influent Average Monthly	761	754	1005	803	880	703	858	975	1097	1125	815	886
TSS (lbs/day) Raw Sewage Influent Daily Maximum	1080	933	2852	1025	1064	980	1311	1150	1487	1512	1099	1408
TSS (lbs/day) Weekly Average	342	< 63	87	166	98	91	141	214	148	72	246	102
TSS (mg/L) Average Monthly	< 8.9	< 4.4	< 9.2	< 9.0	< 6.8	< 6.3	< 6.1	11.6	11.6	6.5	< 7.9	< 9.4
TSS (mg/L) Raw Sewage Influent Average Monthly	**51**	**73**	**116**	**110**	**114**	**98**	**107**	**105**	**156**	**176**	**98**	88
TSS (mg/L) Weekly Average	14.0	6.0	11.5	20.5	9.0	12.0	13.5	14.0	18.5	11.5	22.0	10.0
Fecal Coliform (No./100 ml) Average Monthly	48	< 7	< 13	< 8	< 1	< 2	< 3	< 3	< 10	22	< 115	< 9
Fecal Coliform (No./100 ml) Instantaneous Maximum	817	**2420**	**2420**	117	4	29	19	49	**2420**	**1554**	**2420**	2420
Nitrate-Nitrite (mg/L) Average Monthly	< 0.51	< 0.58	< 0.51	< 0.41	0.52	1.26	0.48	0.47	< 0.47	< 0.45	< 0.29	< 0.2
Nitrate-Nitrite (lbs) Total Monthly	< 328.4	< 218.6	< 77.4	< 95.5	137.7	308	137.3	175	< 147.9	< 81	< 78.2	< 57.9
Total Nitrogen (mg/L) Average Monthly	< 5.39	< 6.14	< 10.12	< 4.89	7.42	10.01	8.34	11.22	< 11.64	< 10.99	< 6.59	< 6.05
Total Nitrogen (lbs) Effluent Net Total Monthly	< 2633.9	< 2102	< 2033.1	< 1104.8	1848.4	2221.2	2357.1	3308.8	< 2511.6	< 2025.9	< 1871.5	< 1730.3
Total Nitrogen (lbs) Total Monthly	< 2633.9	< 2102	< 2033.1	< 1104.8	1848.4	2221.2	2357.1	3308.8	< 2511.6	< 2025.9	< 1871.5	< 1730.3
Total Nitrogen (lbs) Effluent Net Total Annual					< 25361							
Total Nitrogen (lbs) Total Annual					< 25361							
Ammonia (mg/L) Average Monthly	**3.0**	**3.91**	**7.1**	**2.8**	**4.7**	**6.47**	**6.46**	**8.2**	**8.5**	**7.9**	**4.4**	3.66
Ammonia (lbs) Total Annual					16546							

TKN (mg/L) Average Monthly	4.89	5.57	9.61	4.48	6.91	8.75	7.85	10.75	11.17	10.54	6.3	5.85
TKN (lbs) Total Monthly	2305.5	1883.4	1955.6	1009.2	1710.7	1913.2	2219.7	3133.7	2363.8	1944.8	1793.3	1672.3
Total Phosphorus (mg/L) Average Monthly	0.52	0.4	1.73	0.76	0.93	1.69	0.83	1.32	1.54	1.35	1.65	1.1
Total Phosphorus (lbs) Effluent Net Total Monthly	280.2	116.8	350.6	169.7	246.4	366	256.5	406	327.6	252.9	440.1	314.8
Total Phosphorus (lbs) Total Monthly	280.2	116.8	350.6	169.7	246.4	366	256.5	406	327.6	252.9	440.1	314.8
Total Phosphorus (lbs) Effluent Net Total Annual					4000							
Total Phosphorus (lbs) Total Annual					4000							
Total Aluminum (mg/L) Average Quarterly		< 0.1			< 0.1			< 0.10			< 0.1	
Total Copper (mg/L) Average Quarterly		0.01			< 0.01			0.02			0.01	
Dissolved Iron (mg/L) Average Quarterly		0.13			0.05			0.03			0.12	
Total Iron (mg/L) Average Quarterly		**0.45**			0.14			**0.29**			**0.29**	
Total Magnesium (mg/L) Average Quarterly		7.08			4.29			3.76			6.12	

DMR Data for Outfall 001 (from April 1, 2021 to March 31, 2022)

Parameter	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21	APR-21
Flow (MGD) Average Monthly	**0.812**	**1.262**	**1.038**	**1.170**	**1.244**	**1.135**	**1.138**	**1.042**	**0.894**	**1.130**	**1.740**	1.693
Flow (MGD) Daily Maximum	**1.594**	**2.386**	**1.823**	**1.389**	**1.840**	**2.591**	**3.121**	**1.999**	**1.388**	**1.583**	**2.216**	1.923
pH (S.U.) Minimum	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0

pH (S.U.) Instantaneous Maximum	6.2	6.2	6.2	6.3	6.2	6.3	6.2	6.4	6.4	6.4	6.1	6.2
TRC (mg/L) Average Monthly	**0.7**	**0.7**	**0.7**	**0.8**	**0.8**	**0.8**	**0.8**	**0.9**	**0.9**	**0.8**	**0.8**	0.9
TRC (mg/L) Instantaneous Maximum	**0.81**	**0.96**	**0.93**	**0.94**	**0.98**	**0.88**	**0.98**	**0.98**	**0.96**	**0.97**	**0.93**	0.94
CBOD5 (lbs/day) Average Monthly	61.3	153.2	109.1	150.0	187.0	82.0	78.0	88.0	59.0	92.4	241.0	199.0
CBOD5 (lbs/day) Weekly Average	88.0	205.0	114.0	188.0	354.0	123.0	286.3	109.0	85.1	153.0	304.0	219.3
CBOD5 (mg/L) Average Monthly	10.0	**16.0**	**14.2**	**16.0**	**19.0**	9.1	6.3	**11.3**	9.0	**11.1**	**17.0**	**14.4**
CBOD5 (mg/L) Weekly Average	14.4	**20.3**	14.2	**20.3**	**37.0**	12.3	11.0	**15.2**	12.0	**21.0**	**20.0**	**18.2**
BOD5 (lbs/day) Raw Sewage Influent Average Monthly	**756.4**	**817.0**	**1054.0**	**1233.0**	**1687.0**	**1416.1**	**1426.4**	**2640.0**	**1500.0**	**2238.0**	**1890.0**	1897.2
BOD5 (lbs/day) Raw Sewage Influent Daily Maximum	1536.2	1082.0	1486.2	2580.1	3716.0	2093.1	2639.0	5612.4	3791.0	3356.0	3329.0	2364.4
BOD5 (mg/L) Raw Sewage Influent Average Monthly	**107.0**	**86.2**	**128.0**	**136.0**	**175.2**	**168.2**	**125.0**	**292.0**	**214.2**	**255.8**	**121.0**	**137.1**
TSS (lbs/day) Average Monthly	80.0	202.0	196.0	181.2	171.0	105.0	210.0	180.0	77.0	120.0	363.0	299.0
TSS (lbs/day) Raw Sewage Influent Average Monthly	**267.1**	**416.0**	**558.0**	**552.0**	**527.0**	**908.0**	**502.0**	**863.0**	**963.0**	**675.0**	**667.3**	**761.1**
TSS (lbs/day) Raw Sewage Influent Daily Maximum	**420.0**	**814.0**	**729.0**	**874.0**	**1513.1**	**1513.1**	**963.0**	**1811.0**	**2150.0**	**841.0**	**1001.3**	**1001.3**
TSS (lbs/day) Weekly Average	139.0	328.0	263.0	216.0	280.2	208.0	1249.4	227.1	85.0	213.0	483.2	408.0
TSS (mg/L) Average Monthly	12.1	21.1	25.1	20.0	17.0	12.0	13.2	20.0	11.4	15.0	29.0	22.0
TSS (mg/L) Raw Sewage Influent Average Monthly	40.0	45.0	68.3	60.2	56.0	109.0	45.0	95.0	135.0	76.0	55.0	55.0

TSS (mg/L) Weekly Average	23.0	33.0	33.0	25.0	29.0	21.0	48	24.0	12.0	29.0	29.0	27.0
Fecal Coliform (No./100 ml) Average Monthly	50.2	61.4	34.3	31.0	23.0	0.8	10.4	4.0	16.3	12.0	54.0	1.4
Fecal Coliform (No./100 ml) Instantaneous Maximum	10100	**20000**	4400	3200	4200	11.0	**13400**	30	800	580	540	20
Nitrate-Nitrite (mg/L) Average Monthly	1.0	1.0	2.0	2.0	0.4	2.0	1.3	2.2	3.3	0.5	0.4	0.3
Nitrate-Nitrite (lbs) Total Monthly	108.0	139.0	116.0	476.0	127.0	467.0	503.0	629.3	652.2	128.0	173.0	123.0
Total Nitrogen (mg/L) Average Monthly	5.2	6.0	8.0	9.4	6.4	7.0	4.4	6.2	8.3	6.0	6.4	5.7
Total Nitrogen (lbs) Effluent Net Total Monthly	951.0	1452.0	1815.0	2666.0	1801.3	1805.4	1559.3	1698.3	1625.2	1516.0	2737.3	2310.0
Total Nitrogen (lbs) Total Monthly	951.0	1452.0	1815.0	2666.0	1801.3	1805.4	1559.3	1698.3	1625.2	1516.0	2737.3	2310.0
Total Nitrogen (lbs) Effluent Net Total Annual							24861.2					
Total Nitrogen (lbs) Total Annual							**24861.2**					
Ammonia (mg/L) Average Monthly	**1.4**	**1.3**	**3.0**	**4.1**	**2.4**	**2.1**	**1.4**	**0.7**	**2.0**	**2.3**	**2.0**	**2.0**
Ammonia (lbs) Total Annual							7640.2					
TKN (mg/L) Average Monthly	4.2	5.0	7.1	7.4	6.0	5.0	3.1	4.0	5.0	5.4	6.0	5.4
TKN (lbs) Total Monthly	843.0	1313.0	1699.0	2190.0	1674.3	1338.4	1056.3	1069.0	973.0	1388.0	2563.3	2187.0
Total Phosphorus (mg/L) Average Monthly	**1.0**	**1.0**	**1.1**	**1.3**	**0.9**	**1.0**	**0.9**	**2.0**	**1.3**	**1.0**	**1.0**	0.9
Total Phosphorus (lbs) Effluent Net Total Monthly	213.0	213.0	264.0	391.3	266.0	221.0	326.3	462.2	288.0	268.0	428.0	644.3
Total Phosphorus (lbs) Total Monthly	121.0	213.0	264.0	391.3	266.0	221.0	326.3	462.2	288.0	268.0	428.0	644.3

Total Phosphorus (lbs) Effluent Net Total Annual							**3988.3**					
Total Phosphorus (lbs) Total Annual							**3988.3**					
Total Aluminum (mg/L) Average Quarterly	**0.116**			**0.10**			**0.10**			**0.10**		
Total Copper (mg/L) Average Quarterly	0.014			0.02			0.01			0.01		
Dissolved Iron (mg/L) Average Quarterly	0.04			0.06			0.02			0.08		
Total Iron (mg/L) Average Quarterly	**0.15**			**0.23**			**0.07**			**0.32**		
Total Magnesium (mg/L) Average Quarterly	4.82			0.80			9.45			22.9		

DMR Data for Outfall 015 (from February 1, 2023 to January 31, 2024)

Parameter	JAN-24	DEC-23	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23	MAR-23	FEB-23
TSS (mg/L) Daily Maximum		67										
Oil and Grease (mg/L) Daily Maximum		< 5.0										

DMR Data for Outfall 015 (from April 1, 2021 to March 31, 2022)

Parameter	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21	APR-21
TSS (mg/L) Daily Maximum				68.0								
Oil and Grease (mg/L) Daily Maximum				5.0								

DMR Data for Outfall 016 (from February 1, 2023 to January 31, 2024)

Parameter	JAN-24	DEC-23	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23	MAR-23	FEB-23
TSS (mg/L) Daily Maximum		67										
Oil and Grease (mg/L) Daily Maximum		< 5.0										

DMR Data for Outfall 016 (from April 1, 2021 to March 31, 2022)

Parameter	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21	APR-21
TSS (mg/L) Daily Maximum				15.0								
Oil and Grease (mg/L) Daily Maximum				5.0								

DMR Data for Outfall 017 (from February 1, 2023 to January 31, 2024)

Parameter	JAN-24	DEC-23	NOV-23	OCT-23	SEP-23	AUG-23	JUL-23	JUN-23	MAY-23	APR-23	MAR-23	FEB-23
TSS (mg/L) Daily Maximum		67										
Oil and Grease (mg/L) Daily Maximum		< 5.0										

DMR Data for Outfall 017 (from April 1, 2021 to March 31, 2022)

Parameter	MAR-22	FEB-22	JAN-22	DEC-21	NOV-21	OCT-21	SEP-21	AUG-21	JUL-21	JUN-21	MAY-21	APR-21
TSS (mg/L) Daily Maximum				13.0								
Oil and Grease (mg/L) Daily Maximum				5.0								

Compliance History

Effluent Violations for Outfall 001, from: May 1, 2021 To: January 31, 2024

Parameter	Date	SBC	DMR Value	Units	Limit Value	Units
TSS	09/30/21	Wkly Avg	1249.4	lbs/day	750	lbs/day
TSS	09/30/21	Wkly Avg	48	mg/L	45.0	mg/L
Fecal Coliform	05/31/23	IMAX	2420	No./100 ml	1000	No./100 ml
Fecal Coliform	06/30/22	IMAX	2420	No./100 ml	2000	No./100 ml
Fecal Coliform	03/31/22	IMAX	10100	No./100 ml	10000	No./100 ml
Fecal Coliform	02/28/22	IMAX	20000	No./100 ml	10000	No./100 ml
Fecal Coliform	09/30/21	IMAX	13400	No./100 ml	1000	No./100 ml

Summary of Inspections:

SITE NAME	INSP PROGRAM	INSPECTED DATE*	INSP TYPE	INSPECTION RESULT DESC	INSPECTION COMMENT	# OF VIOLATIONS
SHENANDOAH MUNI SEW AUTH	WPCNP	05/03/2023	Follow-up Inspection	Violation(s) Noted		1
SHENANDOAH MUNI SEW AUTH	WPCNP	10/05/2022	**Combined Sewer Overflow-Non-Sampling**	Violation(s) Noted		4
SHENANDOAH MUNI SEW AUTH	WPCNP	09/01/2022	Compliance Evaluation	Violation(s) Noted		9

SHENANDOAH MUNI SEW AUTH	WPCNP	08/09/2022	Compliance Evaluation	Violation(s) Noted		7
SHENANDOAH MUNI SEW AUTH	WPCNP	06/30/2022	Follow-up Inspection	Violation(s) Noted		2
SHENANDOAH MUNI SEW AUTH	WPCNP	06/14/2022	Administrative/File Review	Violation(s) Noted		1
SHENANDOAH MUNI SEW AUTH	WPCNP	12/28/2021	Routine/Partial Inspection	Violation(s) Noted		2
SHENANDOAH MUNI SEW AUTH	WPCNP	12/20/2021	Compliance Evaluation	Violation(s) Noted		6
SHENANDOAH MUNI SEW AUTH	**WPCNP**	**12/03/2021**	**Combined Sewer Overflow-Non-Sampling**	Violation(s) Noted		**4**
SHENANDOAH MUNI SEW AUTH	WPCNP	09/29/2021	Chesapeake Bay Cap Load Compliance Eval	No Violations Noted		0
SHENANDOAH MUNI SEW AUTH	WPCNP	08/18/2021	Compliance Evaluation	Violation(s) Noted		7
SHENANDOAH MUNI SEW AUTH	WPCNP	08/17/2021	Follow-up Inspection	Violation(s) Noted		1
SHENANDOAH MUNI SEW AUTH	WPCNP	08/26/2020	Follow-up Inspection	Violation(s) Noted		1
SHENANDOAH MUNI SEW AUTH	WPCNP	08/26/2020	Follow-up Inspection	Violation(s) Noted		1
SHENANDOAH MUNI SEW AUTH	WPCNP	03/09/2020	Routine/Partial Inspection	Violation(s) Noted		1
SHENANDOAH MUNI SEW AUTH	WPCNP	08/28/2019	Follow-up Inspection	No Violations Noted		0
SHENANDOAH MUNI SEW AUTH	WPCNP	07/29/2019	Compliance Evaluation	Violation(s) Noted		3
SHENANDOAH MUNI SEW AUTH	WPCNP	06/14/2019	**Combined Sewer Overflow-Non-Sampling**	Violation(s) Noted		1

SHENANDOAH MUNI SEW AUTH	WPCNP	12/26/2018	Follow-up Inspection	Violation(s) Noted		1
SHENANDOAH MUNI SEW AUTH	WPCNP	08/21/2018	Follow-up Inspection	No Violations Noted		0
SHENANDOAH MUNI SEW AUTH	WPCNP	04/30/2018	Administrative/File Review	Violation(s) Noted		7
SHENANDOAH MUNI SEW AUTH	WPCNP	04/09/2018	Compliance Evaluation	Violation(s) Noted		7
SHENANDOAH MUNI SEW AUTH	WPCNP	03/28/2018	Routine/Partial Inspection	Violation(s) Noted		2
SHENANDOAH MUNI SEW AUTH	WPCNP	03/08/2018	Compliance Evaluation	Violation(s) Noted		9
SHENANDOAH MUNI SEW AUTH	WPCNP	08/03/2017	Follow-up Inspection	No Violations Noted	Primary clarifier and sludge thickener down - identified as violations in previous inspections	0

*See below for 2023 EPA Compliance Inspection Report information.

Other Comments:

- **NPDES Permit Renewal Application Compliance History Certification Section Information**: Described noncompliance included: 1) Violation of NPDES effluent limits, (2) failure to submit monitoring reports, (3) failure to prevent any discharge or sludge use or disposal, (4) failure to properly operate and maintain all required facilities, (5) Owner failed to comply with the Act or Chapter 302 regulations, (6) failure to document monitoring activities and results, (7) violation of Part C permit conditions, (8) Violation of effluent limits in Part A, (9) Unauthorized or unpermitted discharge of sewage to waters of the Commonwealth, (10) failure to implement required NMC #8, (11) failure to implement NMC #9, (12) failure to comply with terms and conditions of WQM permit, (13) failure to properly document monitoring activities and results, (14) failure to operate and maintain all facilities required for compliance, (15) unauthorized bypass, (16) discharge containing substances that produced deposits in receiving waters, (17) failure to comply with terms of WQM permit, (18) operator failed to comply with the Act or Chapter 302 regulations.
  - Identified steps taken to achieve compliance: “Design of new WWTP”
  - See Main Permitting Issues (above) for the issue of who is the correct NPDES Permit applicant and compliance bar issues. Below is a summary of application information on Borough operational control of the POTW.
  - See NOVs, Inspection Report issues, AOCC requirements, Open Violations, and applicable NPDES Permit conditions below for more details.

- **DEP Notices of Violation**: Assorted issues were noted:
  - 3/3/2015 NOV: TSS, CBOD5, Fecal Coliform and pH issues
  - 9/9/2015 NOV: TN and TP issues.
  - 3/7/2016 NOV: TSS, CBOD5, Fecal Coliforms and late DMR issues.
  - 2/15/2019 NOV: Missing DEP Supplemental Reports

- 4/16/2019 NOV: Inoperable offline treatment units and failure to notify Department. Lack of operator (with required certifications) for collection system, failure to develop/implement PPC Plan; effluent violations including Fecal Coliform, CBOD5. TSS. EDMR issues including late submittals, failure to report required information, etc. Missing WET Tests.
- 12/28/2021 NOV: Violations for TSS, Fecal Coliform, CBOD5, Ammonia-N. Missing stormwater sampling data. Conflicting TN/TP data regarding Chesapeake Bay Annual Mass loadings and nutrient trading. Operating without a certified operator. Missing laboratory quality assurance procedure documentation. Failure to remove sludge per NPDES Permit Part B.I.E.2. Incorrectly completed reporting forms (DMRs and supplemental forms). The revised NPDES Application indicated the following information: A reply specific to the December 28, 2021 PADEP NOV was not made since DEP was copied on all correspondence with updates for the AOCC, which included items related to the NOV. Items to address the 12/28/21 NOV include:
  - Providing additional operator support through an outside licensed operator to assist with operator training, sampling, reporting and O&M.
  - Putting existing secondary clarifier No. 2, sludge thickener and sludge press back in operation.
  - Proceeding with WWTP replacement.
  - Elsewhere, the NPDES Permit Application indicated an IPP was being prepared.
- 9/21/2022 NOV: Issues include: Inoperable WWTP treatment units; unauthorized bypassing of WWTP treatment units; failure to maintain WWTP treatment units in operable condition; discharge of floating materials, scum, sheen, foam, oil, grease or substances that produced an observable change or resulted in deposits in receiving waters; failure to provide copy of current NPDES permit to all available operators; Effluent limit violations for fecal coliform, CBOD5, TSS; failure to report pollution incident (primary clarifier overflow); failure to collect representative samples; failure to document monitoring activities and results; unsubmitted required WET Test results; unaddressed WET Test-failure triggered requirements for TRE and quarterly WET Testing; etc.
- 3/15/2023 NOV: Issues included:
  - Missing 2nd and 3rd Quarter 2022 Whole Effluent Toxicity (WET) Test results
  - Failed 4th Quarter WET Test triggering quarterly WET Test and TRE requirements.
  - 2022 Exceedances for Fecal Coliform and pH
  - Failure to meet minimum frequency sampling requirements of pH and TRC
  - Late DMRs
  - WWTP overflow
  - Failure to provide DEP-requested amended DMRs
- 10/4/2023 NOV: Failure to submit Whole Effluent Toxicity (WET Test), late WET Test submittal, WET Test failure triggering quarterly WET testing requirements, and pattern of effluent violations (fecal coliform)

- **Shenandoah Borough and POTW Compliance History**: See Main Permitting Issues section above and Special Condition C.X.K. The Borough has been operating the POTW under a lease agreement (and is involved with Authority financial decisions relating to compliance issues), but is not a current NPDES permittee or co-permittee. Nor is it an EPA AOCC "respondent". Therefore, its compliance status has not been addressed by the US EPA AOCC. The Authority (8/16/2023 Letter Response Item 1.a, 1.c.i) commitment was: **"If the Borough defaults on any obligations for the operation and maintenance of the system, SMSA has the right to terminate the lease agreement just like any other contracted service"**. See this section for ongoing/long-term compliance issues (with Borough involvement bolded for emphasis. In terms of the NPDES Permit Renewal Application information (with bolding of some information):
  - The Authority likens the Borough's involvement to a "circuit rider" to operate the system or contracts out their billing and collections. The Authority has contracted MES, but indicated the other employees on the revised organizational chart are Borough employees. (8/16/2023 Response Item 1.a, 1.c.i)
  - The requested "copy of the November 23, 2020, Combined Sewer System Operation and Maintenance Plan Section II.B.3-referenced "lease agreement with the Borough of Shenandoah" that "**allows the Borough to maintain administrative function and financial capability for**

SMSA" and any other lease regarding the POTW (which includes the Treatment Plant and collection/conveyance system)" was not provided despite Letter request. (8/16/2023 Response Letter Item 1.b).

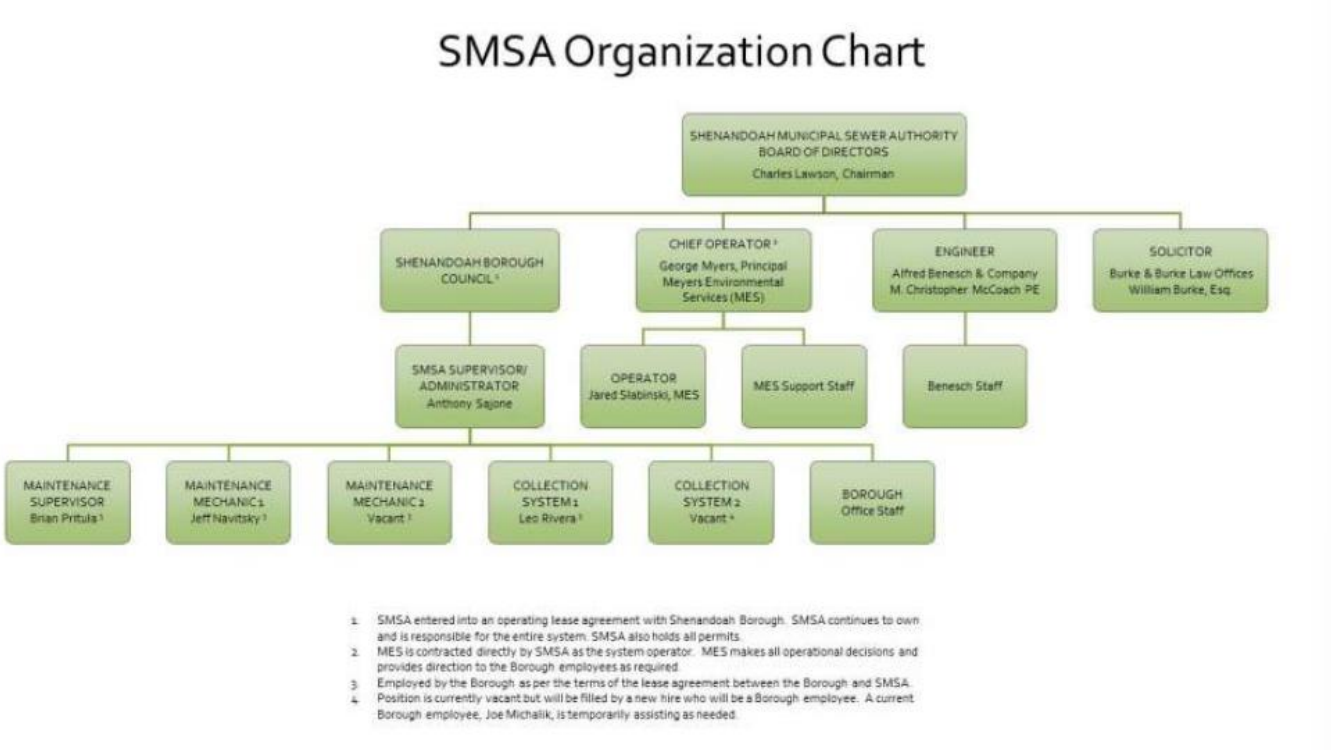
- The Supervisor/Administrator, Anthony Sajone, develops the budget for the Sewer Revenue Account, which includes the WWTP and collection system. Input for the budget comes from the SMSA Board of Directors, the Engineer, the Solicitor, the operators and other staff. **Mr. Sajone is also the Borough Manager and thus has knowledge of the aspects of the budget relative to Borough employee wages, benefits, etc. Borough Council adopts the Sewer Revenue Account budget upon the recommendation of Mr. Sajone as part of its overall budget. (Response Letter Item 1.d.i)**
- The SMSA Board consists of five (5) members. **Members are appointed by Shenandoah Borough Council.** (PPC Plan Section 2.1)
- **Borough Council formally hires the position of Supervisor/Administrator. This position is typically filled also as the Borough Position of Borough Manager.** (PPC Plan Section 2.1)
- July 2023 O&M Collection & Conveyance System Plan Info:
  - **Shenandoah Municipal Sewer Authority has entered into an operating lease agreement with Shenandoah Borough for operation and maintenance of the existing sanitary sewer system and treatment plant. The latest agreement is dated July 15, 1998.** (July 2023 O&M Collection & Conveyance System Section 1.10.2).
  - SMSA is a separate utility, however a **lease agreement with the Borough of Shenandoah** allows the Borough to maintain administrative function and financial capacity for SMSA. (July 2023 O&M Collection & Conveyance System Section 1.5 Relation to Other Municipal Functions)
  - SMSA is responsible solely for management, operations, and maintenance of the wastewater treatment facilities, whereas Shenandoah Borough is responsible solely for the collection system. **SMSA and Borough personnel are utilized for the benefit of each other's functions or other utilities.** Many activities of the SMSA sewer collection system are supported by the following **Shenandoah Borough** Roadway Department and other partners listed below. (July 2023 O&M Collection & Conveyance System Section 1.5 Relation to Other Municipal Functions)
- Shenandoah Borough Responsibilities: (July 2023 O&M Collection & Conveyance System Section 1.5 Relation to Other Municipal Functions)
  - **Resources and budget are overseen by SMSA and Shenandoah Borough**.
  - Heavy Construction equipment is shared by Shenandoah Borough.
  - Inspection of grease interceptors/separators is performed by the Shenandoah Borough Building Code Inspector or Borough collection system employees.
  - Outreach for Fats, Oils and Grease is performed jointly by SMSA personnel and Shenandoah Borough Building Code Inspector.
  - **Personnel hiring and administration are performed by Shenandoah Borough Human Resources Department**.
  - The Shenandoah Borough provides paving services to SMSA on all sewer repairs performed within public streets and works to coordinate street-paving schedules with sewer work.
  - The **Shenandoah Borough Manager and Staff** maintains copies of Resolutions and passed by the SMSA Board.
  - The other listed parties were: Schuylkill County for GIS property parcel info and Emergency Response; Authority Engineer (Alfred Benesch) for design/construction standards, collection system mapping, and inspection and testing standards; and Authority Solicitor for legal services and prosecuting violations of all Sewer Use Ordinances. The SMSA Organization Chart includes **Shenandoah Borough Council, Borough Office Staff**, Engineer, Solicitor and Chief Operator (Myers Environmental). See chart below.
- Other Borough responsibilities:
  - The Shenandoah Borough Building Code officer has obligations regarding oil & grease traps for new buildings per Response Letter Item 1.e.iv)
  - Presumably the Borough is the party that will have to enact any updated Wastewater-related ordinance, including the IPP-related one under review by the SMSA solicitor (Response Letter Item 4.c).

- **The Response Letter Item 4.e is placing responsibility on the WWTP operators for failure to conduct WETT tests in 2018 and 2019, but the Borough was the operator at that time**. "New operators have since been hired to correct this situation" (Response Letter Item 4.e), but this is outside the scope of normal Certified Operator responsibilities, with responsibility falling on the permittee and the Borough (in operational control of the facility) along with any failure to conduct annual stormwater sampling/inspections for 2019 – 2021 (Response Letter Item 5).
- SMSA is the owner and responsible party for the WWTP, and the collection system as evidenced by being the permits holder. **SMSA has an operating lease agreement with the Borough. It is no different than when an Authority hires a circuit rider to operate the system or contracts out their billing and collections. User fees are deposited into the Sewer Revenue Account. All operation and maintenance expenses are paid out of the Sewer Revenue Account. A separate SMSA Capital Projects Account exists for larger projects. MES is contracted by SMSA. The other employees on the revised organizational chart are Borough employees. If the Borough defaults on any obligations for the operation and maintenance of the system, SMSA has the right to terminate the lease agreement just like any other contracted service. (Letter Response Items 1.a, 1.c)**. **NOTE**: A copy of the operating lease agreement was requested, but not provided in DEP Technical Deficiency Letter Item 1.b.
- The hiring of Myers Environmental Services (MES), which includes two licensed operators has provided the additional personnel needed to meet all commitments. (Letter Response Item 1.c).
- MES is contracted by SMSA (Letter Response Item 1.c.ii)
- Individual LTCP responsibilities are managed by MES. These will vary depending on availability. (Letter Response Item 1.c)
- The GIF Form has been updated to include Mr. George Meyer who is the contract operator for SMSA. (Letter Response Item 1.c)
- Operation of the WWTP and collection system is performed by licensed operators (George Myers and Jeff Slabinski of MES). George Myers is the Chief Operator and Jeff Slabinski is also a licensed Operator who are responsible for the WWTP and collection system. (Letter Response Item 1.c).
- MES, specifically George Myers and Jeff Slabinski, have all duties and responsibilities as the licensed Operators for the SMSA system. Their address is 66 East Main Street, PO Box 800, Millville, PA 17846-0800. Phone: 570-458-5701 (o), 570-594-5710 (c). Email: gmyers@myersenv.com (Letter Response Item 1.c.x)
- SMSA's new Licensed Operators are now overseeing necessary reporting. (Letter Response Item 6.dd.vi)
- The Supervisor/Administrator, Anthony Sajone, develops the budget for the Sewer Revenue Account, which includes the WWTP and collection system. Input for the budget comes from the SMSA Board of Directors, the Engineer, the Solicitor, **the operators and other staff. Mr. Sajone is also the Borough Manager and thus has knowledge of the aspects of the budget relative to Borough employee wages, benefits, etc. Borough Council adopts the Sewer Revenue Account budget upon the recommendation of Mr. Sajone as part of its overall budget.** (Letter Response Item 1.d)
- The Borough is represented by James J. Amato of Fanelli, Evans & Patel, P.C. and SMSA is represented by William Burke of Burke and Burke Law Office. (Letter Response Item 1.d.iv.4) **NOTE**: If the Borough controls the budget, it is unclear how any SMSA attorney would not have a conflict of interest.
- SMSA is the owner of the sewer system and permit holder. As such, SMSA is responsible for compliance. (Letter Response Item 1.d).
- **In response to a question on what the Borough administrative staff does: The administrative staff handles billing, collection, payments, deposits and other financial aspects for the Sewer Revenue Account. They provide regular financial reports to the SMSA Board and provide all information to SMSA's Auditor for the annual Audit.** (Letter Response Item 1.e.i).
- In response who makes the ultimate hiring decisions question: **Borough Council. (Letter Response Item 1.e.iv)**
- In response to who is the Authority and Borough Attorneys in event of a dispute: The Borough is represented by James J. Amato of Fanelli, Evans & Patel, P.C. and SMSA is represented by William Burke of Burke and Burke Law Office. (Letter Response Item 1.e.iv)
- In response to who mans the SMSA billing office and its location: **The Supervisor/Administrator, Anthony Sajone, who is also the Borough Manager works full time at Borough Hall**. In addition, there are two office staff who handle various duties including billing, collections, etc. (Letter Response Item 1.f)

- The collection system staff will be doing the inspections under supervision of the Licensed Operators. (Letter Response Item 6)
- **Who will do the I&I Abatement Plan Inspections: Borough collection system staff with oversight from Licensed Operators. (Letter Response Item 6)**
- Updated General Information Form Information:
  - Three different client contacts listed including:
    - Anthony Sajones (**Borough manager** and SMSA Supervisor)
    - Brian Pritula
    - Anthony Szczylak (Authority Chairman) – retained as client contact in E-facts for the moment but not listed as Chairman in new SMSA Organizational chart.
  - Three (3) onsite employees listed.
  - Site Contact: George Myers of Meyers Environmental
- **Borough Council formally hires the position of Supervisor/Administrator. This position is typically filled also as the Borough Position of Borough Manager. (PPC Plan Section 2.1)** (July 2023 O&M Collection and Conveyance System Plan Section 1.4.1)
- **Borough Office Staff (Support Staff): Support staff position. Staff operations are completed by Shenandoah Borough who leases the system and its operation. Staff assist with data entry and quality control, etc. (PPC Plan Section 2.1)**
- PPC Emergency Coordinator Chain-of-command: Tony Sajones (SMSA Supervisor/Administrator), George Myers (SMSA Operator), Jared Slabinski (SMSA Operator), Brian Pritula (SMSA Maintenance Supervisor), Jeff Navitsky (SMSA Maintenance Mechanic), and Leo Rivera (SMSA Street Crew). (PPC Plan Section 2.2). See PPC Plan Section 2.4 for SMSA Organizational Chart (which includes their contract engineer and solicitor) in addition to Shenandoah Borough.
- **Resources and budget are overseen by SMSA and Shenandoah Borough. (July 2023 O&M Collection and Conveyance System Plan Section 1.5)**
- The 2022 Chapter 94 Report Appendix D indicated that Myers Environmental Services, LLC (MES) was hired as the new Certified operators for the WWTP. "**MES was hired to provide training to the existing WWTP staff regarding operation and maintenance tasks for the WWTP and collection system. The staff training includes sampling and testing methods and recording of sampling results to be used for reporting and process control decisions". NOTE**: This language appears to restrict the authority of MES certified operators in terms of making any O&M decisions.
- SMSA Supervisor/Administrator position (per LTCP Ops Plan FKA CSO O&M Plan Section 1.4.1): "SMSA Supervisor/Administrator (1 Required) **– This position is typically filled also as the Borough Position of Borough Manager. Responsible for administration of the Shenandoah Municipal Sewer Authority and staff. Exercise direct authority over the function of the facilities and personnel, in accordance with approved policies and procedures. Controls expenditure of budgeted funds and request approval for major expenditures, if required**. Recommends specification for major equipment and material purchases. Organizes and directs activities of all personnel including training programs. Maintains effective communication and working relationship with employees, government officials, and general public".
- SMSA Operator (per LTCP Ops Plan FKA CSO O&M Plan Section 1.4.1): Responsible for direct operation, and maintenance of all facilities including collection system. Exercise direct authority over the function of the facilities and personnel, in accordance with approved policies and procedures. Inspection faculties regularly. Analyzes and evaluates operation and maintenance functions; initiates or recommends new or improved practices. Develops plans and procedures to ensure efficient operation. Recommends improvements and additions. Coordinates data and prepares or reviews and approves operation reports and budget requests. **Position works with Supervisor/Administrator to control expenditure of budgeted funds and request approval for major expenditures, if required**. Recommends specification for major equipment and material purchases. Organizes and directs activities of all personnel including training programs. Maintains effective communication and working relationship with employees, government officials, and general public. SMSA's Chief Operator is required to have a Class B Operator's License. Responsible for the operation of all equipment and unit processes withing the plant. Should be able to detect inefficient operation of plan and correct the same. Performs all required laboratory tests and maintain operation records. **Assist Super with Plan inspection, development**

of new and improved procedures, operation reports, budget determinations, and equipment and material requirements.

- **SMSA Organizational Chart (from Appendix Q PPC Plan update)**: **The SMSA Organizational chart places third parties (Shenandoah Borough Council) in charge of it's the SMSA Supervisor/Administrator and site personnel**. The SMSA Operator (2 required) positions, listed in the PPC Plan Section 2.1, and reporting to the SMSA Supervisor and Administrator are not listed in this figure. **The Table 8 Chain-of-Command shows the MES certified operators as the SMSA Operators (Mr. Meyer and Mr. Slabinski) reporting to the SMSA Supervisor/Administrator (Borough Manager).**



- **9/28/2020 US EPA Administrative Order for Compliance on Consent (AOCC) Docket No. CWA-03-2020-0067DN**:
  - **Compliance Status**: **EPA will have to determine whether the POTW is in compliance with AOCC requirements**:
    - It is unclear whether the POTW has actually implemented multiple AOCC CSO-related documents that will be incorporated into the Approved Long Term Control Plan (LTCP) upon NPDES Permit Effective date. Several AOCC-required documents referenced non-operating units and not-yet-installed CSO bar screens. The POTW also might be assuming it needs written EPA and/or DEP approvals to begin implementation of the I&I Abatement Plan, CSO O&M Plan, etc**.**

- The 2023 EPA Compliance Inspection Report indicated multiple WWTP Units remained out-of-service, but did not comment on the POTW's implementation of assorted AOCC-requirements.

- AOCC Respondent: Shenandoah Municipal Sewer Authority (SMSA)
- Scope: The AOCC noted that it did not supersede the NPDES Permit requirements.
- The AOCC findings of fact included: Permit limit exceedances (CBOD5, TSS, and Fecal Coliform); Solids deposits in Shenandoah Creek; long-term offline WWTP treatment units (primary clarifier, sludge thickener), Final/Secondary Clarifier No. 2, assorted pumps/primary clarifier telescoping valve issues; lack of required PPC Plan; Failure to complete NPDES DMRs/Supplemental Reports information; sampling issues; lack of certified operator.:
- The AOCC requirements included (but not limited to):
  - AOCC Item 34: Submittal of plan/schedule for meeting (existing) NPDES Permit effluent limitations.
  - AOCC Item 35: Requirement to submit all NPDES Permit-required information and documentation.
  - AOCC Item 36:
    - Requirement to certify to EPA and DEP that **Respondent** is implementing standard operating procedures for ensuring that appropriate management in Authority and Borough are timely notified of inspections, notices of violation, and other instances of potential violations identified at the plant.
    - Requirement to submit a Sewage Sludge Management Inventory that meets specific EPA methodology requirements. **NOTE**: The requirements mirror current NPDES Template Solids management conditions (with requirement to utilize EPA-specified methodology) with site-specific addition of required information for volume of sludge, ages of sludge, utilized storage capacity, and available unused storage capacity within the individual sludge drying/Reed bed bays and anaerobic digester(s) in table format. DEP Operator webpage tools include an available spreadsheet with the EPA-specified methodology.
  - AOCC Item 37:
    - Requirements included certification that the **Respondent** is compliant with NPDES Permit Part C.III.B (Continued Implementation of Technology-Based Nine Minimum Controls).
    - Requirements included implementation of a CSO Monitoring Plan including CSO monitoring on a daily basis.
  - AOCC Item 38:
    - Requirement for submittal to both EPA and DEP of a plan and schedule for developing a pretreatment program. **NOTE**: The existing 2017 NPDES Permit Part C.IX (POTW Pretreatment Program Development and Implementation) included a compliance schedule that was not met. The NPDES Permit Renewal Application compliance documents included a sampling plan (among submitted AOCC compliance documentation), but it is unclear if it was implemented or status/schedule for submittal of the NPDES Permit-required Industrial Pretreatment Plan (IPP).
    - Certification that the Respondent has implemented an "Operation and Maintenance Manual for ensuring that appropriate preventive maintenance is conducted **and "all portions of the treatment train at the current wastewater treatment plant are properly maintained and operational at all times"**. (Bolding added.)
  - AOCC Item 39: Requirements included documentation that the primary clarifier, Final Clarifier, and a sludge thickener unit **"have been repaired and are operational"**. (Bolding added.)
  - AOCC Item 40: The (EPA signed 9/24/2020) AOCC Item 40 (page 8) addressed the Authority's plans to construct a new wastewater treatment plant. A Part II WQM permit application was due within 270 days of the effective date of the AOCC, with additional requirements triggered within 90 days of issuance of the Part II WQM permit. Construction must be completed within four years of bid solicitation. Flow-proportional 24-hour composite sampler required. A Corrective Action Plan was required to get nonfunctional treatment units operating. **The status of the Corrective Action Plan is unknown to this reviewer.**
  - **AOCC Item 40 (Construction of a new wastewater treatment plant)**: The AOCC-required WQM permit application for a new wastewater treatment plant has been submitted and is under separate review (see below). The subsequent AOCC milestones include:

- **Soliciting bids for construction within 90 days of WQM permit issuance**. **NOTE**: See WQM Permit Application comments below about an expiring grant. The Respondent may need to pursue additional funding options to meet this milestone.
- Quarterly progress reports, starting upon the first quarter after AOCC issuance.
- Notification of completion of construction within 14 days of completion of construction.
- **If the WQM permitted construction is not completed within four (4) years of the bid solicitation date, the Respondent shall certify to EPA/DEP the reasons why construction is not complete**.
- O&M Manual and sampling SOPs are due within three months of construction completion.

▪ **AOCC-related submittals**: **EPA will have to determine whether the AOCC requirements have been met to date.** Copies of AOCC-submittals were requested as part of the Renewal Application's compliance section as part of compliance record. EPA comments were found in the submittals:

- EPA Correspondence Comment on Required Sludge Management Inventory sent in per AOCC: Paragraph 36(b): The submission is not in compliance with the AOCC. The sewage sludge amounts in the sewage sludge management inventory appear to have been miscalculated. The totals for multiple columns (including average daily flow, estimated sewage sludge production, sewage sludge to digester, and sewage sludge post digester) appear to simply sum the average lbs/day for one day of each month to obtain a total of 12 days of sludge production for the year. The sludge production calculation does not accurately provide the amount of sewage sludge produced during the year and is significantly lower than expected values of a wastewater treatment plant of this size. The sludge table does not appear to identify the utilized storage capacity and the available unused storage capacity within the individual sludge drying/Reed beds bays, anaerobic/aerobic digestors per the terms of the AOCC. The thickener capacity columns are marked as being measured in percent ("%"), however the values in these columns range as high as 2,787 and do not appear to, in fact, be percentages. The table indicates that no sludge was disposed of in 2018. Please provide an updated sludge table that is accurate and meets the terms of the AOCC, including a comparison of the expected sewage sludge production compared with the actual amount disposed during the year and a certification consistent with Paragraph 44 of the AOCC verifying that the calculations are accurate.
- EPA Comment on old existing WWTP O&M Plan:
  - Paragraph 37(b): The SOP for preventative maintenance/work order system for the WWTP appears old and out of date. For example, it references a card file system for preventative maintenance, and the sample Automatic Control Panel Log is dated August 6, 1974. The purpose of Paragraph 37(b) is to ensure that SMSA is implementing a preventive maintenance/work order system that ensures the plant remains sufficiently operational. EPA is concerned that aspects of the provided SOP are more than 40 years old and unlikely to be suitable for the current operations. While we recognize that SMSA intends is constructing a new plant, the new plant will not be operational for many months. In the interim, it is expected that SMSA will operate and maintain its current plant in such a manner as to meet the terms and conditions of its NPDES permit. Please revise and update the Preventative Maintenance/ Work Order System and resubmit to EPA/DEP. A revised and updated Preventative Maintenance/Work Order System should be implemented as soon as possible and for the remaining life of the current plant.
  - Paragraph 38(c)(1): The submission is inconsistent with the AOCC. We recognize that the Authority has submitted the existing O&M Manual and that the Authority acknowledges the O&M Manual is out of date (for example, it refers to EPA offices that have not been occupied in approximately 20 years). Paragraph 38(c)(1) requires certification that the Authority is implementing an O&M Manual "for ensuring that appropriate preventive maintenance is conducted and all portions of the treatment train at the current wastewater treatment plant are properly maintained and operational at all times." The outdated O&M Manual is not consistent with Paragraph 38(c)(1). We recognize that the Authority's certification states that it will be updating the O&M Manual when the future wastewater treatment plant goes online. While we understand that a new treatment plant will be constructed, the Authority has a responsibility to ensure that the current treatment plant

remains sufficiently operational to meet the terms and conditions of the NPDES permit. Please update the O & M Manual and resubmit to EPA/DEP.
    - Per the terms of the AOCC, please submit SMSA's Standard Operating Procedure for identifying sampling locations and taking samples at the current wastewater treatment plant.
    - Paragraph 38(c)(3): The submission is inconsistent with the AOCC, specifically Paragraph 38(c)(3). The O&M Manual appears to be old and includes procedures that may no longer be used by SMSA for laboratory analysis (such as using a reflux condenser and titrating in order to calculate chemical oxygen demand). In addition, SMSA does not have the Standards Method book that SMSA indicates is used for sampling and laboratory analysis. Per the terms of the AOCC, please submit SMSA's Standard Operating Procedure for all laboratory analysis performed by SMSA.
  - EPA Comment on IPP Development: In SMSA's plan and schedule for developing and implementing a pretreatment program, SMSA proposed to submit a sampling plan to EPA/DEP review by January 29, 2021. Please submit SMSA's Sampling Plan for Local Limits Development. SMSA also proposed to compile a master list of industrial users by January 29, 2021 to be submitted to EPA/DEP by December 31, 2021 with the entire Industrial Waste Survey. Please verify whether this was completed by January 29, 2021 as proposed.
- **Inspection Report Issues**: Assorted issues were noted in the recent inspection reports:
  - 10/31-11/1/2023 EPA Compliance Inspection: DEP M&C personnel attended the inspection, but did not write-up the EPA Inspection Report. The EPA Compliance Inspection Report noted the following issues (among others):
    - Offline/Out-of-Service WWTP Units: The single Primary Clarifier (with bypassing of primary clarification); the single sludge thickener unit; one secondary clarifier; the single sludge dewatering rotary press; and the two anaerobic digesters. One of the two Aeration tanks was being used for sludge holding and decant thickening (i.e. not available for wastewater treatment).
    - CSO Outfalls: CSO Outfall Nos. 008, 009, and 014 could not be physically located (with discharge monitoring only at upstream manhole). No discharge event confirmation method was being employed, Only visual observation for active discharge during weekly inspections was performed, and only at the known outfalls where the location was known. Lack of sufficient public notification was noted (with Report noting options such as social media, callouts, flyers at public buildings, or updated signage at the Outfall locations).
    - Assorted Sampling issues
    - Need for WWTP Plan/procedure for pH adjustment (using sodium carbonate a.k.a. soda ash)
    - Industrial Pretreatment Plan (IPP): No record of IPP submission found. Pierogies (from IU presumably) found in influent bar screenings
  - 8/21/2021 DEP CSO Inspection Issues included:
    - Unauthorized/unpermitted CSO at the Pump Station No. 1 (Center Street/Route 54). Per Application: There are no overflows that the Authority is aware of in the separated sewer service areas. These areas include sanitary sewage only. The pump station overflow discovered during the August 2021 DEP inspection will be plugged by Authority personnel as part of the 2022 Long Term Control Plan Update (but no specific commitment found therein).
    - Offline primary clarifier and sludge thickener
    - Failure to submit required DEP Supplemental Forms
    - Failure to update site PPC Plan (IW stormwater requirements)
    - Need for Certified Operator for collection system (part of POTW by definition)
    - Fecal Coliform and CBOD5 issues.
    - CSO Nine Minimum Control (NMC) noncompliance issues.
  - 10/5/2022 DEP Inspection Report issues included:
    - Facility is currently utilizing one of the two chlorine contact tanks. They alternate tanks every couple weeks. Mr. Slabinski said heavy solids make it through to chlorine contact due to the #2 secondary clarifier being offline. The solids settle out in the chlorine contact tank and bulking occurs due to denitrification. Therefore more frequent cleaning is necessary to improve effluent quality. Using one chlorine contact at a time helps the operator better manage the solids that pass through secondary clarification.

- Operational changes made by Myers Environmental:
  - Operating one chlorine contact tank at a time to help manage solids.
  - Aeration tank #2 is being operated as a sludge holding tank for primary and secondary waste sludge. Decant is sent back to the headworks.
  - Two loads (5,500 gallons each) of settled sludge has been pumped and hauled by Biros from the sludge holding tank at the end of September. Three loads of settled sludge (at 5,500 gallons each) are scheduled to be removed by Biros on Monday October 10th. The operator plans to remove 2-4 loads (at 5,500 gallons each) of settled sludge every other week until the sludge press is operable.
  - Process control tests and record keeping: effluent Ammonia, 30 Min Settleability, Aeration Dissolved Oxygen, Clarifier sludge blanket

- 5/3/2023 DEP Inspection Report issues:
  - Secondary clarifier #2 is still under repair. The parts are onsite and the contractor (A-One Services) is expected to make the repairs within the next few weeks.
  - The (single) primary clarifier is offline.
  - Magnesium hydroxide is no longer being used for pH and alkalinity adjustment.
  - Soda ash is now being used instead of mag hydroxide and is added to the aeration basin. Chlorine gas - disinfection soda ash - pH and alkalinity adjustment Polymer – sludge thickening. Chlorine gas – added at Chlorine contact tank; soda ash – added at aeration basin; and Polymer – added at sludge press.
  - There are 2 Anaerobic Digestors, 1 aerated sludge holding tank and a sludge thickener tank.
  - There was an SSO on 4/25/2023 from an interceptor manhole located just upstream of the WWTP. The manhole was on the adjacent coal company property and located on the old railroad bed. The SSO occurred due to a blockage and the volume was unknown. Immediate telephone notification to the Department was received as well as the required 5-day written report

- **Known Shenandoah Creek Impairment/Impacts**: See Stream Information Section for details.
- **NPDES Permit Part A.I.D, E, F and Part C.VII (Stormwater Requirements)**: Stormwater sampling data for 2019, 2020, and 2021 could not be located per the NPDES Permit application.
- **NPDES Permit Part A.I. Additional requirements Item 4 and B.I.G (bypassing)**: Additional sampling and bypassing requirements pertain due to long-term out-of-service treatment units, particularly the bypassing of the Primary Clarifier. Please note the Part C.II (Maximize Treatment at POTW) condition only addresses bypassing of secondary treatment in accordance with the approved LTCP.
- **NPDES Permit Part A.I.G (Identification of Combined Sewer Overflow Discharges) and Forms Inventory**: The CSO Supplemental Reports do not include all information required by the existing NPDES Permit in terms of CSOs (including CSO discharge cause, frequency, duration, and quantity of flow) and/or by the forms themselves. Using the June 2022 submittal for an example, they were only reporting 2003 CSO flow estimated calculated information but not inspection comments such as visually detected flows, condition of Manhole, etc. Other CSO Monitoring Report information was missing or problematic:
  - The June CSO Monthly Inspection Report comment was “OK MH” (which means what)? Mr. Mazack signed the form, but newspaper reports indicated he previously retired. Mr. Navitsky was the application-designated site contact at that time. Benesch inspections (2022 and 2023) found CSO issues with the bulkhead manhole bulkhead/weirs, flat weir space openings, etc.
  - The June CSO Detailed Outfall Report were also signed by Mr. Mazack and did not document EPA-required daily CSO/pump station inspection nor the unpermitted Pump Station No. 1’s unpermitted CSO Overflow. Rainfall events were not reported down to 0.01-inch precipitation. Comment sections were left blank.
  - They have not been using the DEP Annual CSO Status Report form as required as of the 2022 Chapter 94 Report. See Treatment Section for related Chapter 94/Annual CSO Status Report issues.

- **NPDES Permit Part B.I.D (Pretreatment) and Part C.IX (IPP)**: The previous NPDES Permit required IPP development of the Local Limits within three months of PED and submittal of IPP Plan within one year of PED. Revised submittals were due within three (3) months of DEP or EPA comments.
  - "This plan is currently being prepared".
  - "The Industrial Pretreatment Program plan is not yet approved. A copy of the currently in place ordinance user requirements can be found in Attachment R" (May 2021 "Local Limits Development Sampling Plan".
  - Status of Ateeco Inc. IU Issues: The Application indicated: The low pH was resolved by changing their cleaning schedules. The cleaning agents were the source of the pH issue. This has been resolved. They attempted to resolve the high BOD and TSS issues by revising some of their manufacturing processes and installing screens in all drains. This has reduced BOD and TSS somewhat, but still not within required pretreatment ordinance requirements. Presently, Ateeco is being surcharged in accordance with the ordinance for exceeding discharge limits to the collection system. They have hired a consultant who is in the process of designing a pretreatment system to address the remaining BOD and TSS issues. They have thus far did one pilot study which wasn't successful but are continuing to work on it.
- **NPDES Permit Part B.I.E (Proper Operation and Maintenance)**: The long-term out-of-service units and needed repairs show this condition was not complied with.
- **NPDES Permit Part B.I.H (SSOs)**: Per the 5/3/2023 DEP Inspection Report, there was an SSO on 4/25/2023 from an interceptor manhole located just upstream of the WWTP. The manhole was on the adjacent coal company property and located on the old railroad bed. The SSO occurred due to a blockage and the volume was unknown. Unclear if this location was in the CSS (or separated) sewer shed area (with conflicting area breakdowns between CSS and separated sewer system areas).
- **NPDES Permit Part C.III.G (LTCP Schedule of Implementation)**: They were unable to locate an updated 2018 LTCP (due 11/1/2018) as required by the previous NPDES Permit Part C.III (only finding the previous 2014 version that apparently they did not implement on the basis that they did not receive a separate approval letter from the 2017 NPDES permit).
- **NPDES Permit Part C.VI (WET)**:
  - No WET TRE conducted for failed WET Tests (they are relying on WWTP upgrade to resolve TRE issues)
  - 2022 WET Test submitted via DEP On-Base No. 98983.
  - 2023 Revised NPDES Permit Application did not include 2023 failed WET Test. DEP Biologist indicated WET Test failure.
- **NPDES Permit Part IX (POTW Pretreatment Program Development and Implementation)**: The previous NPDES Permit required an Industrial Pretreatment Program (IPP) submittal, but no such IPP submittal found in available DE Files. Status of IPP development is unknown to this reviewer. **NOTE**: EPA is the lead reviewer for the IPP Program, but the Department was to be copied per by existing NPDES Permit Part C.IX (IPP Development).
  - AOCC Item 41 gives the EPA the authority to review and approve/disapprove any AOCC-required submittal and require correction within fourteen (14) days.
  - The 12/23/2020 SMSA (Benesch) IPP Letter stated that a copy of the Pretreatment Program (meeting specific listed requirements) would be submitted (to both EPA and DEP) by 12/31/2021.
  - Unclear whether SMSA has implemented the May 2021 "Sampling Plan for Local Limits Development". This document was not submitted as part of the NPDES Permit Renewal but as AOCC-related submittal

3/19/2024 WMS Query (Open Violations by Client Number): 34 open violations per WMS query (open violations by client number):

FACILITY	INSP PROGRAM	INSP ID	VIOLATION ID	VIOLATION DATE	VIOLATION CODE	VIOLATION
SHENANDOAH MUN SEW AUTH	WPC NPDES	3238111	927083	10/05/2022	92A.61(F)1	NPDES - Failure to properly document monitoring activities and results

SHENANDOAH MUN SEW AUTH	WPC NPDES	3238111	927084	10/05/2022	92A.41(A)5	NPDES - Failure to properly operate and maintain all facilities which are installed or used by the permittee to achieve compliance
SHENANDOAH MUN SEW AUTH	WPC NPDES	3238111	927085	10/05/2022	92A.41(A)13B	NPDES - Unauthorized bypass occurred
SHENANDOAH MUN SEW AUTH	WPC NPDES	3238111	927086	10/05/2022	92A.41(C)	NPDES - Discharge contained floating materials, scum, sheen, foam, oil, grease or substances that produced an observable change or resulted in deposits in receiving waters for NPDES permitted activities
SHENANDOAH MUN SEW AUTH	WPC NPDES	3238111	927087	10/05/2022	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit
SHENANDOAH MUN SEW AUTH	WPC NPDES	3238111	927088	08/09/2022	302.1201	Operator Certification - Operator failed to comply with the Act or Chapter 302 regulations
SHENANDOAH MUN SEW AUTH	WPC NPDES	3239581	927280	08/09/2022	CSL201	CSL - Unauthorized, unpermitted discharge of sewage to waters of the Commonwealth
SHENANDOAH MUN SEW AUTH	WPC NPDES	3239581	927281	08/09/2022	CSO-NMC8	NPDES CSO - 92A.47(B)NMC8 Failure to implement required NMC #8 (Public notification)
SHENANDOAH MUN SEW AUTH	WPC NPDES	3239581	927282	06/30/2022	CSO-NMC9	NPDES CSO - 92A.47(B)NMC9 Failure to implement required NMC #9 (Monitoring)
SHENANDOAH MUN SEW AUTH	WPC NPDES	3239581	927283	06/14/2022	CSL611	CSL - Failure to comply with terms and conditions of a WQM permit
SHENANDOAH MUN SEW AUTH	WPC NPDES	3259370	934076	06/14/2022	92A.44	NPDES - Violation of effluent limits in Part A of permit
SHENANDOAH MUN SEW AUTH	WPC NPDES	3299982	940279	06/14/2022	92A.44	NPDES - Violation of effluent limits in Part A of permit
SHENANDOAH MUN SEW AUTH	WPC NPDES	3299982	940281	06/14/2022	92A.41(A)12B	NPDES - Failure to submit monitoring report(s) or properly complete monitoring reports

SHENANDOAH MUN SEW AUTH	WPC NPDES	3299982	940282	06/14/2022	92A.41(A)4	NPDES - Failure to take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of a permit
SHENANDOAH MUN SEW AUTH	WPC NPDES	3299982	940283	06/14/2022	92A.41(A)5	NPDES - Failure to properly operate and maintain all facilities which are installed or used by the permittee to achieve compliance
SHENANDOAH MUN SEW AUTH	WPC NPDES	3299982	940284	06/14/2022	302.1202	Operator Certification - Owner failed to comply with the Act or Chapter 302 regulations
SHENANDOAH MUN SEW AUTH	WPC NPDES	3299982	940285	12/28/2021	92A.61(F)1	NPDES - Failure to properly document monitoring activities and results
SHENANDOAH MUN SEW AUTH	WPC NPDES	3299982	940286	12/28/2021	92A.46	NPDES - Violation of Part C permit condition(s)
SHENANDOAH MUN SEW AUTH	WPC NPDES	3378535	959160	12/28/2021	92A.41(C)	NPDES - Discharge contained floating materials, scum, sheen, foam, oil, grease or substances that produced an observable change or resulted in deposits in receiving waters for NPDES permitted activities
SHENANDOAH MUN SEW AUTH	WPC NPDES	3378535	959161	12/28/2021	92A.41(A)5	NPDES - Failure to properly operate and maintain all facilities which are installed or used by the permittee to achieve compliance
SHENANDOAH MUN SEW AUTH	WPC NPDES	3378535	959162	12/28/2021	92A.41(A)5	NPDES - Failure to properly operate and maintain all facilities which are installed or used by the permittee to achieve compliance
SHENANDOAH MUN SEW AUTH	WPC NPDES	3378535	959163	12/28/2021	302.1202	Operator Certification - Owner failed to comply with the Act or Chapter 302 regulations

SHENANDOAH MUN SEW AUTH	WPC NPDES	3378535	959165	12/28/2021	302.1202	Operator Certification - Owner failed to comply with the Act or Chapter 302 regulations
SHENANDOAH MUN SEW AUTH	WPC NPDES	3378535	959166	09/29/2021	92A.41(A)13B	NPDES - Unauthorized bypass occurred
SHENANDOAH MUN SEW AUTH	WPC NPDES	3378535	960311	08/18/2021	92A.44	NPDES - Violation of effluent limits in Part A of permit
SHENANDOAH MUN SEW AUTH	WPC NPDES	3385160	962474	08/18/2021	92A.44	NPDES - Violation of effluent limits in Part A of permit
SHENANDOAH MUN SEW AUTH	WPC NPDES	3406286	964749	08/18/2021	91.33(A)	CSL - Failure to immediately report to DEP a pollution incident
SHENANDOAH MUN SEW AUTH	WPC NPDES	3406286	964750	08/18/2021	92A.61(F)1	NPDES - Failure to properly document monitoring activities and results
SHENANDOAH MUN SEW AUTH	WPC NPDES	3406286	964751	08/17/2021	92A.41(A)10C	NPDES - Failure to collect representative samples
SHENANDOAH MUN SEW AUTH	WPC NPDES	3436366	971327	08/17/2021	92A.47(C)	NPDES - Illegal discharge to waters of the Commonwealth from a sanitary sewer overflow (SSO)
SHENANDOAH MUN SEW AUTH	WPC NPDES	3436366	988002	08/17/2021	92A.46	NPDES - Violation of Part C permit condition(s)
SHENANDOAH MUN SEW AUTH	WPC NPDES	3436366	988003	08/17/2021	92A.44	NPDES - Violation of effluent limits in Part A of permit
SHENANDOAH MUN SEW AUTH	WPC NPDES	3436366	988004	08/17/2021	92A.61(C)	NPDES - Failure to monitor pollutants as required by the NPDES permit
SHENANDOAH MUN SEW AUTH	WPC NPDES	3436366	988006	08/17/2021	92A.41(A)12B	NPDES - Failure to submit monitoring report(s) or properly complete monitoring reports

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 2.0
Latitude 40º 48' 50.1" **Longitude** -76º 12' 55.4"
Wastewater Description: Sewage Effluent

Permit Limits and/or Monitoring Requirements: Changes bolded.

Parameter	Limit (mg/l unless otherwise specified)	SBC	Model/Basis
CBOD5 **(Interim Limit prior to new WWTP startup)**	417 Lbs/d 667 Lbs/d 25.0 40.0 50.0	Monthly Average Weekly Average Monthly Average Weekly Average IMAX	Existing Technology limit (Chapter 92a.47) is not supported by water quality modeling. Application data: **86.2 mg/l max, 32.99 max average monthly**, and <13.63 mg/l LTA (207 samples).
CBOD5 **(Final Limit after new WWTP startup)**	**166.8** Lbs/d **333.6** Lbs/d **10.0** **15.0** **20.0**	Monthly Average Weekly Average Monthly Average Weekly Average IMAX	**New WQBEL (based on ABACT technology limit) due to organic enrichment in receiving stream. See attached April 2022 stream sampling data. The concurrent WQM Permit Application indicated they expect to meet the 10 mg/l CBOD5 monthly average.**
TSS	500 Lbs/d 750 Lbs/d 30.0 45.0 60.0	Monthly Average Weekly Average Monthly Average Weekly Average IMAX	Existing Technology limit (Chapter 92a.47). Application data: **61 mg/l max**, 28.75 mg/l max average monthly and **<18.38 LTA** (207 samples). DEP TQL is 2.0 for TSS.
pH	6.0 – 9.0 SU	**Inst.** Min - IMAX	Existing Technology limit (Chapter 92a.47) Application data: 6 to 6.4 SU (730 samples).
Dissolved Oxygen (DO) (Interim Limit prior to new WWTP startup)	**Report**	**IMIN**	Interim monitoring requirement due to new WQBEL (to be effective after new WWTP startup) Application Data: None
Dissolved Oxygen (DO) (Final Limit after new WWTP startup)	**6.0**	**IMIN**	**New WQBEL per updated Water Quality Modeling and due to organic enrichment issues. WQM Permit Application did not estimate DO concentration in effluent**
Fecal Coliform (5/1 – 9/30)	200/100 ml 1,000/100 ml	Geo Mean IMAX	Existing Technology limit (Chapter 92a.47) Application data: **104,000/100 ml max, 19224/100 ml max average monthly** and <10.85/100 ml LTA (113 samples)
Fecal Coliform (10/1 – 4/30)	2,000/100 ml 10,000 ml/100 ml	Geo Mean IMAX	See above
E Coli	**Report #/100 ml**	**IMAX**	**New standard monthly monitoring requirements for major STPs (Chapter 92a.61)**
Total Residual Chlorine (TRC) **(Interim until new facility start-up)**	1.0**0** 2.0**0**	Average Monthly IMAX	Existing Facility-specific BAT with significant digit added, which will be superseded by new WQBEL and change in applicable TBEL

			when the facility converts to UV disinfection. Application data: 0.98 mg/l Max, 0.9054 max average monthly and 0.82 mg/l average (730 samples). **NOTE**: TRC (0.51 mg/l) and (3.4 ug/l) chloroform detected in influent sample, with no recycling shown on process diagram.
Total Residual Chlorine (TRC) **(Final after new WWTP start-up)**	**0.07** **0.17**	Average Monthly IMAX	New WQBEL after **facility converts to UV disinfection and then uses chlorine in manner that chlorine is in the effluent. See Chlorine Minimization condition.** Application data: **See above**
Ammonia-Nitrogen **(Interim until new WWTP start-up)**	**Report Lbs/d** **Report Lbs/d** 17.2 **34.4** 34.4	**Monthly Average** **Daily Max** Monthly Average **Daily Max** IMAX	Existing WQBEL. Chapter 92.61 and Chesapeake Bay monitoring requirement. Application data: 9.37 mg/l max, 4.147 mg/l max average monthly, 2.03 mg/l LTA. WQM Application indicated 1.0 mg/l monthly average, 2.0 mg/l daily max, **and 20.0 mg/l max**.
Ammonia-Nitrogen **(May 1 through Oct 31)** **(Final after new WWTP start-up)**	**Report Lbs/d** **Report Lbs/d** **2.01** **4.02** **4.02**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max** **IMAX**	**New WQBEL per updated water quality modeling.**
Ammonia-Nitrogen **(Nov 1 through April 30)** **(Final after new WWTP start-up)**	**Report Lbs/d** **Report Lbs/d** **6.03** **12.06** **12.06**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max** **IMAX**	**See above. Winter multiplier applies.**
Total Phosphorus	4,871 Lbs Report Lbs Report lb/d Report lb/d Report Report	Net Total Annual Total Annual Monthly Average Daily Max Monthly Average Daily Max	Ongoing Chesapeake Bay requirement. Please note that there is no existing Chapter 93 Total Phosphorus WQS (in the absence of algal blooms, etc.). Chapter 96.5(c) would allow for TP limits of 2 mg/l or per any applicable TMDL, but the Chesapeake Bay TMDL only sets watershed-wide WLAs. Application data: 2.93 mg/l max, 1.6177 mg/l max average monthly, and <0.93 mg/l LTA (207 samples).
Total Nitrogen (Nitrate-Nitrite-N + TKN measured in same sample)	36,529 Lbs Report Lbs Report lb/d Report lb/d Report Report	Net Total Annual Total Annual Monthly Average Daily Max Monthly Average Daily Max	Ongoing Chesapeake Bay requirement. Additional reporting of mass loading and daily max values. Application data: 16.08 mg/l max, 9.131 mg/l max average monthly, and <5.96 mg/l LTA.
Nitrate-Nitrite as N	Report lb/d Report lb/d Report Report	Monthly Average Daily Max Monthly Average Daily Max	Ongoing Chesapeake Bay requirement. Additional reporting of mass loading and daily max values. Application data: 5.69 mg/l max, 3.2737 mg/l max avg. monthly, and <0.66 mg/l LTA.

Total Kjehldahl Nitrogen (TKN)	Report lb/d Report lb/d Report Report	Monthly Average Daily Max Monthly Average Daily Max	Ongoing Chesapeake Bay requirement. Additional reporting of mass loading and daily max values. Application data: 15.7 mg/l max, 8.598 mg/l max avg. monthly, and 5.3 mg/l LTA.
TDS, Chlorides, Sulfates, and Bromide	Not needed	-	No monitoring or permit limits per Reasonable Potential Analysis. Application data: TDS: 300 mg/l max and 281 mg/l average (3 sample). Chlorides: 127 mg/l max and 80.1 mg/l average (3 samples) Bromide: <0.1 mg/l max and average (3 samples) Sulfate: 54.1 mg/l max and 44.83 mg/l average (3 samples)
Copper, Total **Interim monitoring (3-years)** **Final Limits**	**0.18 Lbs/d** **0.27 Lbs/d** **11.1** **16.5** **16.5**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max** **IMAX**	**New WQBEL due to Reasonable Potential analysis (no stream data inputted). Interim Monitoring for 3 years.** Application data: **20 ug/l max and 14.22 ug/l average (9 samples).** Available EDMR data range: 0.010 – **0.041** mg/l (18 samples).
Lead, Total	**Report Lbs/d** **Report Lbs/d** **Report** **Report**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max**	**Monitoring only per Reasonable Potential Analysis.** Application data: <1.04 ug/l max and <1.02 ug/l average, 1 ND.
Zinc, Total **Interim monitoring (3-years)** **Final Limits**	**1.83 lb/d** **2.08 lb/d** **110.0** **124.0** **124.0**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max** **IMAX**	**New WQBEL per Reasonable Potential Analysis.** Application data: 89.1 ug/l max and 67.46 ug/l average (3 samples).
Aluminum, Total **Interim monitoring (3-years)** **Final Limits**	**12.5 lb/d** **12.8 lb/d** **750.0 ug/l** **766.0 ug/l** **766.0 ug/l**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max** **IMAX**	**New WQBEL per Reasonable Potential Analysis Facility also uses PAC. Facility indicated it could meet these new limits. Previously quarterly monitoring.** Application data:160 ug/l max and 98.81 ug/l average (9 samples). Available EDMR data range: 0.10 – **1.02 mg/l** (18 samples)
Total Iron	**Report lb/d** **Report lb/d** Report ug/l **Report ug/l**	**Monthly Average** **Daily Max** **Monthly** Average **Daily Max**	**Monitoring per Reasonable Potential Analysis. Previously quarterly monitoring but heavily AMD-impaired stream merits more frequent monitoring.** Application data: 570 ug/l max and 281.89 ug/l average (9 samples) Available EDMR data range: 0.02 – 0.57 mg/l (18 samples)
Dissolved Iron **Interim monitoring (3-years)**	**6.49 lb/d** **10.1 lb/d** **300.0 ug/l**	**Monthly Average** **Daily Max** **Monthly Average**	**New WQBEL per Reasonable Potential Analysis. Facility indicated it could meet these new limits.**

Final Limits	**607.0 ug/l** **972.0 ug/l**	**Daily Max** **IMAX**	Application data: **570 ug/l max** and 281.89 ug/l average **(9 samples)** Available EDMR data range: 0.02 - 0.325 mg/l (18 samples)
Manganese, Total	**Report lb/d** **Report lb/d** **Report ug/l** **Report ug/l**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max**	**Monitoring per Reasonable Potential Analysis.** Application data: 420 mg/l max and 308.66 ug/l average (9 samples). Available EDMR data range: No data.
Magnesium	**Report lb/d** **Report lb/d** Report **Report**	**Quarterly Average** **Daily Max** Quarterly Average **Daily Max**	Existing monitoring requirement (quarterly) will be retained due to use of magnesium hydroxide for alkalinity control. Application Data: WQM Application Module 6 indicated an increase in total solids of 81 mg/l for combined MgOH and PAC addition for TP reduction. Available EDMR data: 0.0680 mg/l – 45.2 mg/l range (18 samples).
BOD5 Minimum Monthly Average Reduction	**Report %**	**Minimum Monthly Average**	**New reporting requirement. Existing POTW condition and Chapter 92a.47 Requirement requires 85% reduction unless they make a case for relief under Chapter 92a.47(g,h) requirements.**
TSS Minimum Monthly Average Reduction	**Report %**	**Minimum Monthly Average**	**See above.**
Acrolein **Interim monitoring (3-years)** **Final Limits**	**0.05 lb/d** **0.065 lb/d** **3.0 ug/l** **3.89 ug/l** **3.89 ug/l**		**New WQBEL due to Reasonable Potential Analysis** Application Data: <4.7 ug/l max and <2.23 ug/l averge (3 samples), all non-detect. DEP Target QL is 2.0 ug/l. **Insensitive ND concentration.**
Vinyl Chloride **Interim monitoring (3-years)** **Final Limits**	**0.001 lb/d** **0.002 lb/d** **0.054 ug/l** **0.10 ug/l** **0.15 ug/l**		**New WQBEL due to Reasonable Potential Analysis** Application Data: <0.6 ug/l max and <0.53 ug/l average (3 samples), all non-detect. DEP TQL is 0.5 ug/l. **Insensitive ND concentration. WQBELs below QL condition will apply.**
Bis (2-Ethylhyexyl Phthalate) **Interim monitoring (3-years)** **Final Limits**	**0.017 lb/d** **0.027 lb/d** **1.03 ug/l** **1.61 ug/l** **2.58 ug/l**		**New WQBEL due to Reasonable Potential Analysis.** Application Data: 2.85 ug/l max and 2.26 ug/l average (3 samples), three detects. DEP Target QL is 5 ug/l. **WQBELs below QL condition will apply.**
Carbon Tetrachloride	**Report Lbs/d** **Report Lbs/d** **Report** **Report**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max**	**Monitoring per Reasonable Potential Analysis.** Application data: <0.6 ug/l max and <0.53 ug/l average (3 samples, all ND). DEP QL is 0.5 ug/l. **Insensitive ND**.

Chloroform	**Report Lbs/d** **Report Lbs/d** **Report** **Report**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max**	**Monitoring per Reasonable Potential Analysis.** Application data: 3.2 ug/l max and 2.8 ug/l average (3 samples, all detects).
Dichlorobromomethane	**Report Lbs/d** **Report Lbs/d** **Report** **Report**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max**	**Monitoring per Reasonable Potential Analysis.** Application data: 1.4 ug/l max and 0.8 ug/l average (3 samples, all detects).
Trichloroethylene	**Report Lbs/d** **Report Lbs/d** **Report** **Report**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max**	**Monitoring per Reasonable Potential Analysis.** Application data: <0.6 ug/l max and <0.53 ug/l average (3 samples, all ND). DEP Target QL is 0.5 ug/l. **Insensitive ND.**
Toxicity, Chronic Ceriodaphnia Survival	**1.29 (TUc)**	**Daily Max**	**See WET Test Section. Quarterly WET Tests for first year and annually thereafter (if no failures).**
Toxicity, Chronic Ceriodaphnia Reproduction	**1.29 (TUc)**	**Daily Max**	**See above**
Toxicity, Chronic – Pimephales Survival	**1.29 (TUc)**	**Daily Max**	**See above**
Toxicity, Chronic – Pimephales Reproduction	**1.29 (TUc)**	**Daily Max**	**See above**

Comments:

- General updating to current EMDR requirements (Instantaneous Minimums/IMAX limits for grab samples, adjusted fecal coliform units). Significant units added to TRC limits.
- Additional mass loading reporting (no additional sampling required) and daily max reporting or limits added. Daily max limit based on water quality modeling or existing IMAX limit to ensure reporting of exceedances (any duration exceedance of IMAX is a violation)
- Influent BOD5 and TSS monitoring relocated to administratively created Outfall/IMP 101 (Raw Sewage Influent) at headworks. Influent CBOD5 monitoring converted to BOD5 monitoring per applicant request.
    - **Proposed CBOD5, TSS, Ammonia-N, DO, and TRC Limits:** Upgraded WWTP expected to meet the new limits. (Letter Response Item 2.b,c, and d)
    - **85% Minimum Monthly Average Reduction (BOD5 and TSS)**: SMSA requested exception from the existing NPDES Permit Part A.I Additional Requirements Item 2 (85% BOD5 and TSS minimum monthly average reduction on a concentration basis) under Chapter 92.a.47(g, h). The new WWTP will consistently meet its permit effluent concentration limits, but the percent removal requirements may not be met due to low concentrations of pollutants in the influent wastewater. With dry weather flow of approximately 720,000 gpd and an estimated equivalent population of 8,213 persons, the resulting equivalent per capita flow rate is less than 88 gallons per capita per day. 40 CFR 35.2005(b)(28) describes that if the domestic base flow and infiltration is less than 120 gallons per capita per day then the CSS is considered non-excessive infiltration. Therefore, Chapter 92.a.47 (g,h) is met. (Letter Response Item 2.e). **NOTE**: They simply did not address the Chapter 92a.47(g, h) requirements. Their calculations essentially only indicate that they have no excessive I&I issues during rare dry stretches. Non-excessive I&I would negate the regulatory basis for any relief under Chapter 92a.47(g. h). They will have option to address this as part of the next LTCP Update.
    - **Future UV Intensity Monitoring**:
        - The UV sensor in the reactor measures the intensity of the UV on the detector after the light is passed through the AFP Tube and Effluent. There is one sensor per bank. Changes in the water quality will be reflected in the UVI signal diminishing. In addition, iron in the effluent will foul the

collection tubing for the On-Line UVT analyzer, required for providing UV Dose. (Letter Response Item 2.g)
- Regarding the note that "that iron and other substances can reduce the effectiveness of UV disinfection," we do not foresee this to be an issue for the new WWTP. (Letter Response Item 2.g) **NOTE**: This assumption might be over-optimistic if there is significant AMD-impaired I&I in collection system with pass through to the proposed disinfection system.

Reasonable Potential Analysis: See TMS output (below) and TMS spreadsheet.

- Missing Toxic Pollutant Data:
  - Missing Sampling & Analysis Data: No response to 9/15/2023 Reminder E-mail for promised additional (4) sampling data received to date, and the POTW failed to submit the completed Pre-Draft Permit Survey for Toxics Pollutants Survey Form. Proposed WQBELs incorporated into the Part C.VII (WQBELs for Toxic Pollutants) condition.
  - Other Constituents: The response that there were no GC-MS 5-peak chemicals is not credible, especially with WET Test failures.
    - The new PFAS sampling language (Part B.I.D and Part C.V) will address PFAS.
    - New Part C.X.L condition will require sampling and analysis for all Pollutant Group Tables 1 through 7 constituents and 5-peak GC-MS chemicals upon written Department request. Given only two food IUs, statements of cessation of discharge from other IUs (see below), and mostly non-detect organics on lab sheets, the other chemicals would normally be presumed to be the expected chemicals (organic acids, etc.). If WET test failures continue, the Department can require new sampling & analysis if needed to identify cause of failure.
    - New IW WQBELs: Pre-draft Survey form not provided in letter response (Letter Response Item 2). POTW failed to provide promised additional 4-sample effluent data for select priority pollutants. 9/15/2023 Reminder E-mail gave them till Oct 2 to provide.
  - Missing TRE (existing WET Test Condition): No TRE was provided with the renewal application for the WET Test failures (previous NPDES permit Part C.VI) or Ammonia-N issues (previous NPDES Permit Part C.V condition). The application indicates the permittee believes the WWTP replacement project addresses the WET Test TRE requirements.
- **Other Toxics**: Part C.VII (WQBELs for Toxic Pollutants) includes a 3-year schedule of compliance for the new WQBELs.
  - AMD Metals (Aluminum, Dissolved Iron, Manganese, and Total Iron): The Major POTW has no existing Mahanoy Creek Watershed (AMD) TMDL Waste Load Allocation (WLAs) for the AMD metals (Aluminum, Iron, and Manganese).
    - It is possible that future TMDL updates might include mass load WLAs for the AMD metals.
    - It is possible that facility effluent concentrations will increase upon reduction in I&I and compliance with NMC/LTCP requirements to maximize capture for treatment at the WWTP.
  - Total Aluminum, Dissolved Iron, Total Zinc, Acrolein, Vinyl Chloride: The POTW indicated that it expected to be able comply with new WQBELs for Total Aluminum, Dissolved Iron, Total Zinc, Acrolein, and Vinyl Chloride upon completion of WWTP Upgrade (WQM Permit No. 5422401)
  - Copper, Bis(2-Ethylhexyl)Phthalate, and Indeno (1,2,3-cd) pyrene: The POTW indicated it might be able to comply with these new WQBELs, but indicated:
    - The new WWTP should be able to reduce copper levels to meet the future limits through better sludge handling and removal. (Letter Response Item 2)
    - Bis(2-ethylhexyl)phthalate has been tracked to plastic container use when sampling which is what SMSA used to take their samples. Future samples are to be taken with glass containers which should eliminate this issue. (Letter Response Item 2)
    - The available sampling results show indeno (1,2,3-cd)pyrene as non-detect in the influent. The effluent results do show the presence of this parameter; therefore, it is being picked up somewhere in the WWTP. This could be from a number of things such as bitumastic coatings that may have been used in the past, oil/lubricant leaks, diesel exhaust or a number of other items. Since the entire WWTP process and tanks are being replaced it should eliminate the source of the contaminant. (Letter Response Item 2)
  - Monitoring for Total Cobalt, Total Lead, Total Nickel, Carbon Tetrachloride, Chloroform, Dichlorobromomethane, and Trichloroethylene: The POTW can investigate whether relief if possible while addressing the WQBELs for Toxic Pollutant condition requirements for the other constituents. For example, after conversion to UV disinfection, it is likely that chlorine residual products should be reduced in effluent concentration.

- Significant Industrial User Sources:
  - Status of Ateeco Inc. (a.k.a. Mrs. T's) Noncategorical SIU Issues: An estimated 58,000 GPD total flow (no breakdown of process, NCCW sanitary or other wastewater types) from a food industry (with high BOD5, organics, and TSS issues). The low pH was resolved by changing their cleaning schedules. The cleaning agents were the source of the pH issue. This has been resolved. They attempted to resolve the high BOD and TSS issues by revising some of their manufacturing processes and installing screens in all drains. This has reduced BOD and TSS somewhat, but still not within required pretreatment ordinance requirements. Presently, Ateeco is being surcharged in accordance with the ordinance for exceeding discharge limits to the collection system. They have hired a consultant who is in the process of designing a pretreatment system to address the remaining BOD and TSS issues. They have thus far did one pilot study which wasn't successful but are continuing to work on it. **NOTE**: An excerpt from an earlier NPDES Permit Renewal Application indicated then-flows of 44,575 GPD process wastewater and 2,000 GPD sanitary wastewater (total of 46,575 GPD). The two-year BOD5 high concentration high (595 mg/l; 5612.36 lb BOD5/day), as compared to the LTA (150 mg/l; 1488.6215 lb BOD5/day) is likely from the SIU source(s).
  - Lee's Oriental Gourmet Foods, Inc.: Frozen Food Manufacturer with unknown wastewater flows.
  - Alex Chemical Co.: Appears to be out of business and will be removed from future Chapter 94 Reports per POTW.
  - Triway Metal Workers: Appears to be out of business and will be removed from future Chapter 94 Reports per POTW.
  - Dentists: A "One-Time Compliance Report for Dental Dischargers" form to comply with 40 CFR 441.50 has been mailed to identified dental practices, with the Authority awaiting responses.

Toxic Management Spreadsheet (TMS) Output:

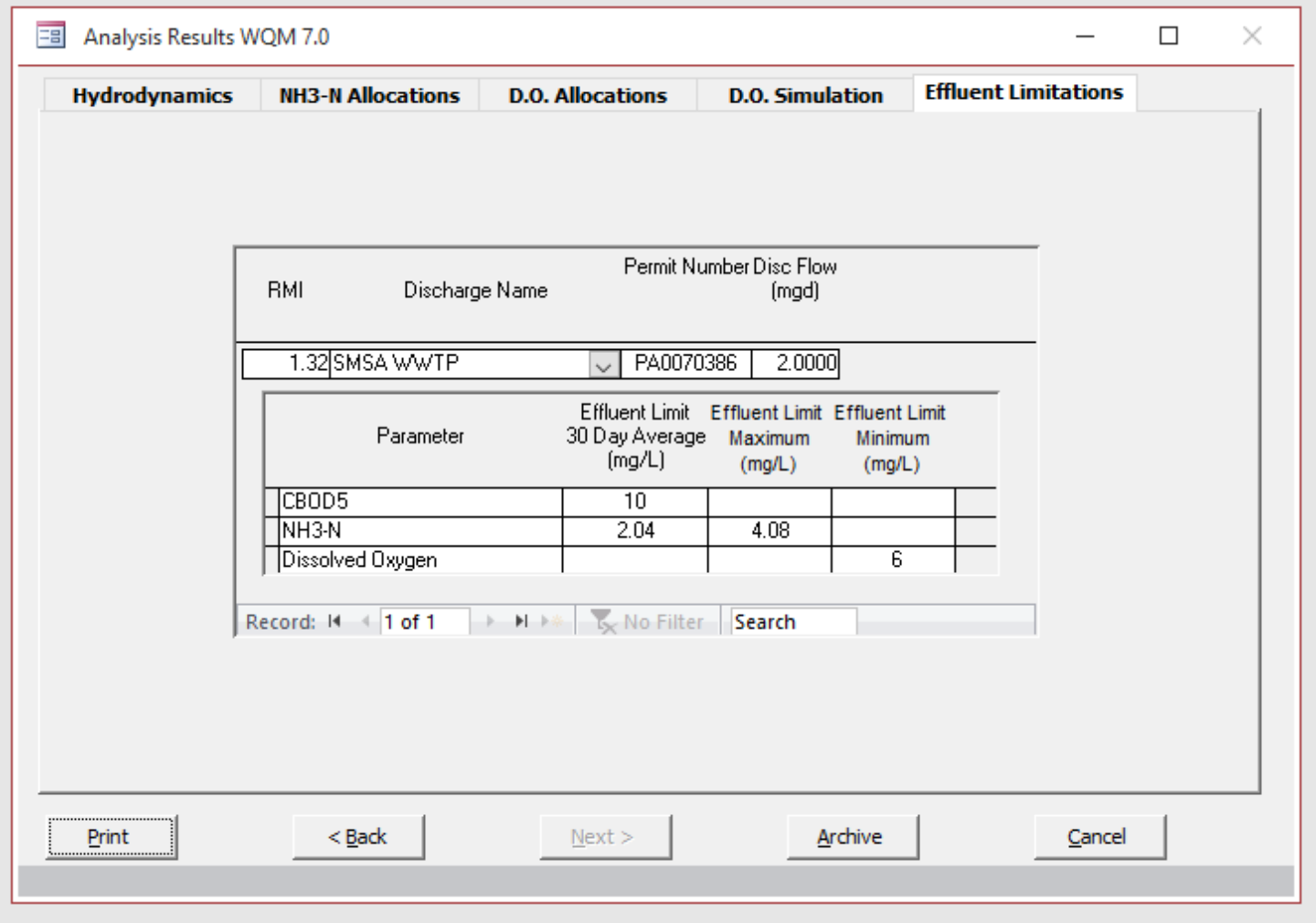
☑ ***Recommended WQBELs & Monitoring Requirements***

No. Samples/Month: 4

	Mass Limits		*Concentration Limits*						
Pollutants	AML (lbs/day)	MDL (lbs/day)	AML	MDL	IMAX	Units	Governing WQBEL	WQBEL Basis	Comments
Total Aluminum	12.5	12.8	750	766	766	µg/L	750	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Total Cobalt	Report	Report	Report	Report	Report	µg/L	19.0	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Copper	0.18	0.27	11.1	16.5	16.5	µg/L	11.1	CFC	Discharge Conc ≥ 50% WQBEL (RP)
Dissolved Iron	6.49	10.1	389	607	972	µg/L	389	THH	Discharge Conc ≥ 50% WQBEL (RP)
Total Iron	Report	Report	Report	Report	Report	µg/L	1,500	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Lead	Report	Report	Report	Report	Report	µg/L	3.62	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Manganese	Report	Report	Report	Report	Report	µg/L	1,000	THH	Discharge Conc > 10% WQBEL (no RP)
Total Nickel	Report	Report	Report	Report	Report	µg/L	54.3	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	1.83	2.08	110	124	124	µg/L	110	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Acrolein	0.05	0.065	3.0	3.89	3.89	µg/L	3.0	AFC	Discharge Conc ≥ 50% WQBEL (RP)
Carbon Tetrachloride	Report	Report	Report	Report	Report	µg/L	1.29	CRL	Discharge Conc > 25% WQBEL (no RP)
Chloroform	Report	Report	Report	Report	Report	µg/L	7.39	THH	Discharge Conc > 25% WQBEL (no RP)
Dichlorobromomethane	Report	Report	Report	Report	Report	µg/L	3.06	CRL	Discharge Conc > 25% WQBEL (no RP)
Trichloroethylene	Report	Report	Report	Report	Report	µg/L	1.93	CRL	Discharge Conc > 25% WQBEL (no RP)
Vinyl Chloride	0.001	0.002	0.064	0.1	0.16	µg/L	0.064	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Bis(2-Ethylhexyl)Phthalate	0.017	0.027	1.03	1.61	2.58	µg/L	1.03	CRL	Discharge Conc ≥ 50% WQBEL (RP)
Indeno(1,2,3-cd)Pyrene	0.00005	0.00008	0.003	0.005	0.008	µg/L	0.003	CRL	Discharge Conc ≥ 50% WQBEL (RP)

ShenandoahTMSPDF2.pdf

WQM Model 7.1.1 Output:



ShenandoahWQModel1.pdf

TRC Spreadsheet Output: The below limits are the limits applicable upon start-up of UV disinfection (Chapter 92a.48):

TRC EVALUATION						
Input appropriate values in A3:A9 and D3:D9			Shenandoah Municipal Sewer Authority			
0.9162	= Q stream (cfs)		0.5	= CV Daily		
2	= Q discharge (MGD)		0.5	= CV Hourly		
4	= no. samples		1	= AFC_Partial Mix Factor		
0.3	= Chlorine Demand of Stream		1	= CFC_Partial Mix Factor		
0	= Chlorine Demand of Discharge		15	= AFC_Criteria Compliance Time (min)		
0.5	= BAT/BPJ Value		720	= CFC_Criteria Compliance Time (min)		
0	= % Factor of Safety (FOS)			=Decay Coefficient (K)		
Source	Reference	AFC Calculations		Reference	CFC Calculations	
TRC	1.3.2.iii	WLA afc = 0.113		1.3.2.iii	WLA cfc = 0.103	
PENTOXSD TRG	5.1a	LTAMULT afc = 0.373		5.1c	LTAMULT cfc = 0.581	
PENTOXSD TRG	5.1b	LTA_afc= 0.042		5.1d	LTA_cfc = 0.060	
Source		Effluent Limit Calculations				
PENTOXSD TRG	5.1f	AML MULT = 1.720				
PENTOXSD TRG	5.1g	AVG MON LIMIT (mg/l) = 0.073		AFC		
		INST MAX LIMIT (mg/l) = 0.170				

WLA afc	**(.019/e(-k*AFC_tc)) + [(AFC_Yc*Qs*.019/Qd*e(-k*AFC_tc))...**
	...+ Xd + (AFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT afc	EXP((0.5*LN(cvh^2+1))-2.326*LN(cvh^2+1)^0.5)
LTA_afc	wla_afc*LTAMULT_afc
WLA_cfc	**(.011/e(-k*CFC_tc) + [(CFC_Yc*Qs*.011/Qd*e(-k*CFC_tc))...**
	...+ Xd + (CFC_Yc*Qs*Xs/Qd)]*(1-FOS/100)
LTAMULT_cfc	EXP((0.5*LN(cvd^2/no_samples+1))-2.326*LN(cvd^2/no_samples+1)^0.5)
LTA_cfc	wla_cfc*LTAMULT_cfc
AML MULT	EXP(2.326*LN((cvd^2/no_samples+1)^0.5)-0.5*LN(cvd^2/no_samples+1))
AVG MON LIMIT	MIN(BAT_BPJ,MIN(LTA_afc,LTA_cfc)*AML_MULT)
INST MAX LIMIT	**1.5*((av_mon_limit/AML_MULT)/LTAMULT_afc)**

Development of Effluent Limitations

Outfall No.	015, 016, 017 (existing) 018, 019, 020 (replacement)	**Design Flow (MGD)**	0 (stormwater only)
	40º 48' 54.20" (015) 40º 48' 53.30" (016) 40º 48' 52.40" (017) 40°48'50.2" (018) 40°48'51.4" (019)		-76º 12' 54.70" (015) -76º 12' 55.00" (016) -76º 12' 55.30" (017) -76°12' 56.1" (018) -76°12' 52.7" (019)
Latitude	40°48' 54" (020)	**Longitude**	-76°12' 52.1" (020)
Wastewater Description:	Stormwater		

Permit Limits and/or Monitoring Requirements: Changes bolded:

Parameter	Limit (mg/l unless otherwise specified)	SBC	Model/Basis
TSS	Report	IMAX	Existing monitoring requirement Application data: None. See DMR data above. 100 mg/l Benchmark
pH	**6.0 – 9.0 SU**	**Inst. Min - IMAX**	**Technology limit (Chapter 95.2). Stream is AMD-impacted with stormwater discharges from mining-impacted areas.** **Application data:** None
Oil & Grease	**30.0**	IMAX	Existing monitoring requirement being replaced with Technology-limit. (Chapter 95.2) Application data: None. See DMR data above.
Total Iron	**Report**	**IMAX**	**New monitoring requirement due to AMD-impaired receiving streams. Stormwater discharges from mining-impacted areas.** **Application data: None.**

Comments:

- Existing Stormwater Outfall Nos. 015-017 will be replaced by Nos. 018-020 upon WWTP Upgrade.
- Outfall location and drainage areas will change in WWTP upgrade. See below
- Sites-specific stormwater BMPs include: Vegetated channels at WWTP outfalls. Use of street sweeping to minimize pollutants entering stormwater controls.
- PAG-02 NPDES Permit No. PAC540119 issued 6/12/2022 for WWTP Upgrade project's construction stormwater management.

Pre-WWTP Existing Outfalls: From previous NPDES permitting:

Outfall No.	Area Drained (ft^2)	Latitude	Longitude	Description
015	1,300	40°48'54.2"	76°12'54.7"	Stormwater Only, discharging to existing drainage pathway to

				Shenandoah Creek, along western side of WWTP. Drain inlet access road area near Primary Digester.
016	440	40°48'53.3"	76°12'55"	Stormwater Only, discharging to existing drainage pathway to Shenandoah Creek, along western side of WWTP. Drain inlet near Control Building (sludge press area).
017	870	40°48'52"	76°12'55.3"	Stormwater Only discharging to existing drainage pathway to Shenandoah Creek, along western side of WWTP. Drain inlet near Secondary Clarifier

After WWTP Upgrade: Existing Outfalls No. 015 – 017 will be eliminated, with existing drainage route filled in during WWTP construction. New Stormwater Outfalls will be installed (along with a PCCM Bioretention Basin) during WWTP upgrade.

Outfall No.	Area Drained (ft^2)	Latitude	Longitude	Description
018 (EWE-1)	39,640	40°48'50.2"	76°12'56.1"	Stormwater Only, discharging site run-on via 36-inch pipe to UNT to Shenandoah Creek (adjacent to Treatment Plant on eastern side)
019 (EWA-1)	143,748	40°48'51.4"	76°12'52.7"	Stormwater Only, discharging site runoff via 18-inch RCP from western side of plant to Shenandoah Creek
020 (EWB-1)	236,095	40°48'54"	76°12'52.1"	Stormwater Only, discharging site runoff via 30-inch pipe from PCCM Bioretention Basin to be installed after WWTP start-up (since existing aeration tanks must be removed to allow installation), to Shenandoah Creek

- **IW Stormwater**:
  - Sampling data: Stormwater sampling data for 2019, 2020,and 2021 could not be located. (Letter Response Item 5)
  - Any stormwater from the highway is captured and discharged in Outfall 020 (EWA-1). (Letter Response Item 5). (Replacement site IW Stormwater Outfall proposed)
  - A new updated PPC Plan with information updated for this response will be incorporated into the proposed when the treatment plant comes online. (Letter Response Item 5)
  - A 48-inch CMP pipe is being eliminated since it has no flow to it. (Letter Response Item 4.a.ii)
  - As covered in greater detail in the WQM Part II Permit application, the existing 48-inch storm piping in the PennDOT ROW will be capped and eliminated. A field investigation was performed with both SMSA and PennDOT engineers in 2022 and determined the upstream end of the pipe is exposed and higher than the existing grade around the pipe. Any stormwater from the highway is captured and discharged in Outfall 020 (EWA-1). (Letter Response Item 5)

Development of Effluent Limitations

Outfall No. 101 **Design Flow (MGD)** NA – influent monitoring point
Latitude 40º 48' 50.98" **Longitude** -76º 12' 55.09"
Wastewater Description: Raw Sewage Influent (at headworks)

Permit Limits and/or Monitoring Requirements:

Parameter	Limit (mg/l unless otherwise specified)	SBC	Model/Basis
Flow	**Report (MGD)** **Report (MGD)**	**Monthly Average** **Daily Max**	**New reporting requirement due to peak wet weather flows and CSO requirements.** **Application data: None**
BOD5	Report (lb/d) Report (lb/d) Report **Report**	Monthly Average Daily Max Monthly Average **Daily Max**	Existing Chapter 94 Monitoring Requirement now incorporated into Part A reporting, and to allow calculation of minimum monthly average reduction. **Daily max reporting now required.** Application data: 595 mg/l max, 291.725 max monthly, and 150.03 mg/l LTA (104 samples)
TSS	Report (lb/d) Report (lb/d) Report **Report**	Monthly Average Daily Max Monthly Average **Daily Max**	Existing Chapter 94 Monitoring Requirement now incorporated into Part A reporting, and to allow calculation of minimum monthly average reduction. **Daily max reporting now required.** Application data: 288 mg/l max, 150.75 max monthly average, and 80.18 mg/l LTA (104 samples)
Aluminum, Total	**Report (lb/d)** **Report (lb/d)** **Report** **Report**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max**	**Monitoring and Reporting upon request only.** Application data: 182 ug/l (1 sample)
Manganese, Total	**Report (lb/d)** **Report (lb/d)** **Report** **Report**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max**	**Monitoring and Reporting upon request only.** Application data: 298 ug/l (1 sample)
Iron, Total	**Report (lb/d)** **Report (lb/d)** **Report** **Report**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max**	**Monitoring and Reporting upon request only.** Application data: 380 ug/l (1 sample)
Iron, Dissolved	**Report (lb/d)** **Report (lb/d)** **Report** **Report**	**Monthly Average** **Daily Max** **Monthly Average** **Daily Max**	**Monitoring and Reporting upon request only.** Application data: 190 ug/l (1 sample)

Comments:

- Due to site issues, the Raw Sewage Influent Monitoring requirements have been relocated to its own Internal Monitoring Point/Outfall (administratively created) and corresponding to the headworks sampling location. AMD metal sampling upon request to gather information if needed on raw sewage concentrations and influent loadings.

- The May 2021 “Local Limits Development Sampling Plan” also indicated plant influent, effluent, and collection system samples will be tested for pH, TRC, CBOD, TSS, Fecal Coliform, Nitrate-Nitrite as N, Magnesium, etc. in addition to the NPDES Permit Application’s influent Pollutant Group Tables.
- AMD parameter monitoring upon request to gather information on AMD loadings and in event of UV disinfection being impacted by presence of iron and other metals.

Whole Effluent Toxicity (WET)

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

X Other: **See below**

The dilution series used for the tests was: 100%, 94%, 87%, 44%, and 22%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 87%.

Summary of Four Most Recent Test Results

NOEC/LC50 Data Analysis

	***Ceriodaphnia* Results (% Effluent)**			***Pimephales* Results (% Effluent)**			
Test Date	**NOEC Survival**	**NOEC Reproduction**	**LC50**	**NOEC Survival**	**NOEC Growth**	**LC50**	**Pass? ***
11/13/2020	**<22%**	**<22%**	**31.1%**	**22%**	**22%**	**30.5%**	**Fail**
1/22/2021	100%	100%	100%	**22%**	**22%**	**30.5%**	**Fail**
7/2/2021	100%	100%	100%	100%	100%	>100%	Pass
9/2/2021	87.3%	**44%**	100%	100%	100%	>100%	**Fail**
11/5/2021	100%	100%	100%	100%	100%	>100%	Pass
3/17/2022	100%	100%	>100%	**Invalid****	**Invalid****	**Invalid****	Pass/**Invalid**
10/18/2022***	94%	94%	**No info**	100%	100%	**No info**	**Failed T Test for Ceriodaphnia Reproduction***.**
11/22/2022	100	100	**No info**	100	100	**No info**	Passed per DEP Biologist review
5/16/2023	**44%**	**22%**	**No Info**	100%	100%	**No info**	**Failed (both tests) for water flea**

***** A "passing" result is that which is greater than or equal to the TIWC value. When there is no data, the test does not pass for the omitted results.*
*** Not valid test – the PMSD for Growth Endpoint above upper bound >30% per DEP Biologist review.*
****Failed T Test per DEP Biologist, which governs even if they pass the NOEC test.*

Is there reasonable potential for an excursion above water quality standards based on the results of these tests? **YES – failed tests, invalid test, missing TRE submittal.**

Comments:

- Due to revised Q7-10 Low Flow estimate, this permit renewal incorporates revised dilution series and TIWC. See calculations below.
- See Compliance History and Stream Section (DEP Biologist memo). Long-term Out-of-Service Treatment Units would be expected to contribute to any WET Test failures. Permittee indicates it does not know the reason for the failures.
- Lack of Ceriodaphnia data and Pimephales failures trigger TUc limits.
- Quarterly WET Tests until pattern of failure ceases, then annually thereafter.
- **WET Testing (missing WET Tests) and TRE Requirements from Existing NPDES Permit in Event of WET Test Failure**:
    - No 2023 WETT Test copy.
    - No WETT Testing results could be located for the years 2018 and 2019. WETT Testing was likely not conducted by the previous operator for those years. New operators have since been hired to correct this situation. A copy of the Wett Testing Report dated October 20, 2020, was including in the NPDES permit package. (Letter Response Item 4.e)
    - A TRE has not been developed at this time since a new WWTP is proposed, of which the design of the new WWTP acts as a TRE. No WETT Testing results could not be located for the years 2018 and 2019.

WETT Testing was likely not conducted by the previous operator for those years. New operators have since been hired to correct this situation. (Letter Response Item 2.h)

- The NPDES Permit Part C.X.L will require additional sampling and analysis for the Pollutant Group Tables 1 through 7, and completed GC-MS 5 peak table upon Department request, in event the WET Test failures continue without permittee-identification for the cause of failure.

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

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

1. Determine IWC – Acute (IWCa):

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

[(2.0 MGD x 1.547) / ((0.9162 cfs x 1) + (2.0 MGD x 1.547))] x 100 = **IWCa% = 22.84%**

Is IWCa < 1%? X **NO**

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

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

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

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

[(2.0 MGD x 1.547) / ((0.9162 cfs x 1) + (2.0 MGD x 1.547))] x 100 = **TIWCc% = 77.15% (rounded to 77%)**

3. Determine Dilution Series

(NOTE – check Attachment C of WET SOP for dilution series based on TIWCa or TIWCc, whichever applies).

Dilution Series = 100%, 89%, 77%, 39%, and 19%.

WET Limits

Has reasonable potential been determined? YES

Will WET limits be established in the permit? YES

If WET limits will be established, identify the species and the limit values for the permit (TU). **Permit Limits are 1/TIWC, i.e. 1.29 TUc for both Ceriodaphnia and Pimphelas.**

Communication Log:

3/7/2022: On-Base No. **49267**: Part II WQM Permit Application (WWTP Upgrades)
5/4/2022: On-Base No. **56960**: NPDES Permit renewal Application with Attachment L (WET Tests)
5/31/2022: On-Base No. **59095**: Revised 5/31/2022 WQM Permit Application for WWTP upgrades)
6/2/2022: On-Base No. **59309**: May 2022 Long Term Control Plan Update
6/30/2022: On-Base No. **61917**: June 22, 2022 Revised NPDES Permit Renewal Application with WET tests in Attachment L and AOCC-responses including at least one WET Test in Attachment P.
3/24/2023*:* On-Base No. **98983:** 2022 WET Test submitted to the Department
8/17/2023: On-Base No. **119023:** Revised NPDES Permit Application
9/15/2023: DEP (Berger) reminder E-mail for promised additional (4) sampling data
3/4/2024: On-Base No. **216289:** Revised WQM Permit Application No. 5422401 (WWTP Upgrade, i.e. overlapping issues)

Additional CSO-related Information (in addition to the above Sectons)

Application Figure below: Stars are Outfalls. Blocks are CSO regulator/manholes. The two SIUs locations are shown. The main drainage divide (between sewer areas directing flow to the Shenandoah Interceptor (parallel to Shenandoah Creek) and areas directing flow to either the intermittent Kohinoor Creek or Sewer Creek is not accurately defined in the application figure. Dark green represents the historic stream pathways, and blue represents the rerouted streams. Shenandoah Creek receives discharges from CSO Outfall Nos. 002 thorough 009. Kohinoor Creek receives CSO Nos. 010 – 013A/B and Pump Station No. 1 (unapproved) bypass discharges. Sewer Creek (receiving CSO Outfall No. 014 discharge) is directed into a mining depression without existing pathway to Shenandoah Creek. EW stormwater outfalls will replace existing WWTP Stormwater Outfall Nos. 015-017 upon WWTP upgrade. Outfall No. 001 is the permitted WWTP discharge.

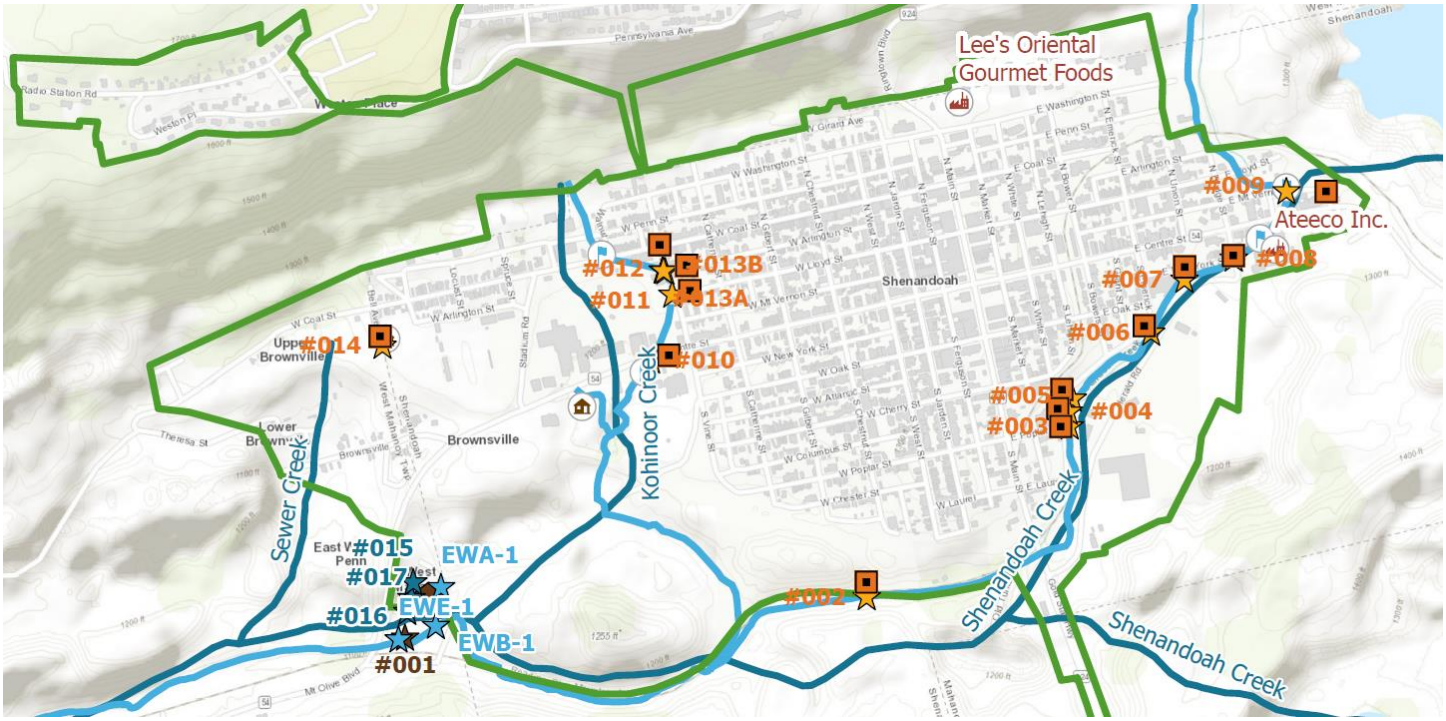


TABLE 1 – CSO Outfalls

CSO Outfall No. & Diversion MH No. (same)	Location & Description	Receiving Stream	Latitude (old coords; new outfall cords; PPC Plan coordinate)	Latitude (old coords; new outfall cords; PPC Plan coordinates)	2023 CSO LTCP Update plus historical 1995 CSO Final Plan of Action Information for comparison*
Drainage Area A (gravity flow to WWTP)	-	-	-	-	1806 EDUs (previously 1426 EDUs) Total (includes Ateeco IU discharge but unclear if Lee Oriental IU discharges to drainage area)
002	South of Gilbert Street & West Laurel Street (by Shenandoah Creek)	Shenandoah Creek (CWF)	40° 48’ 54” 40° 48’ 52.8” 40° 48’ 53.8”	-76° 12” 14” -76° 12” 14.4” -76° 12” 14.20”	580 (previously 452 EDUs)

	– bulkhead type (5-inch H by 24-inch W dimensions). 24-inch VCP influent pipe 10-inch VCP pipe to interceptor 24-inch VCP CSO Discharge pipe. 2023 Figure shows bulkhead on ramped slope to bottom of CSO discharge pipe.				71.81 acres (previously estimated at 25-acre drainage area) 15.16 impervious acres (21% of area) 2001 Figure shows Effluent Pipe to Interceptor at 0.20 slope (0.28/100 feet DWFM sewer pipe requirement). 2023 NMC Plan Table 2 indicated a calculated a limiting Interceptor capacity at 2.54 MGD for a 36.98 acres sewer shed upstream of CSO.
003	Poplar & White Streets – drop with flat weir plate* (12 by 6-inch opening). 24-inch VCP influent pipe 8-inch VCP pipe to interceptor 24-inch TCP CSO Discharge pipe (same elevation as influent pipe). Influent drops 23-inches to Interceptor bottom invert. **NOTE**: Benesch Inspection photo appears to indicate difference between influent and CSO pipe size. Clarification is needed.	Shenandoah Creek (CWF)	40° 49’ 04” 40° 49’ 4.2” 40° 49’ 3.90”	-76° 11” 57” -76° 11” 56.1” -76° 11” 56.80”	130 (previously 123 EDUs); 0.83 acres (previously 8.39-acre drainage area) 0.19 acres impervious (22% of area) 2001 LTCP Figure showed 12-inch by 4.5-inch opening dimension. 0.0417 influent pipe and 0.03 CSO pipe (0.08/100 feet minimum slope for 24-inch pipe per DWFM). 8-inch effluent pipe to Interceptor at 0.02 (0.40/100 feet per DWFM for 8-inch pipe) 2023 NMC Plan Table 2 indicated a calculated limiting Interceptor capacity at 3.84 MGD for a 1.52 acres sewer shed upstream of CSO.

004	White & Abbatoir Streets – drop with flat weir plate (12-inch by 8-inch opening). 24-inch VCP influent 12-inch VCP pipe to interceptor 24-inch VCP CSO Overflow pipe (same elevation as influent pipe). Influent drops 19-inches to Interceptor bottom invert.	Shenandoah Creek (CWF)	40° 49' 05"; 40° 49' 5.2" 40° 49' 5.00"	-76° 11" 57" -76° 11" 56.1" -76° 11" 56.90"	198 EDUs (previously 276 EDUs) 3.89 acres (previously 7.35-acre drainage area) 0.87 acres impervious (22% of area) 2023 NMC Plan Table 2 indicated a calculated limiting Interceptor capacity at 6.57 MGD for a 5.58 acres sewer shed upstream of CSO.
005	White Street & Abbatoir Street (by 5-bay garage) – drop with flat weir plate* (3 by 12-inch opening). 18-inch VCP influent 8-inch VCP pipe to interceptor 18-inch VCP CSO Overflow pipe (same elevation as influent pipe). Influent drops 19-inches to Interceptor bottom invert.	Shenandoah Creek (CWF)	40° 49' 06" 40° 49' 5.8" 40° 49' 6.50"	-76° 11" 57" -76° 11" 55.9" -76° 11" 56.60"	71 EDUs (previously 5 EDUs) 9.84 acres (previously 2.38-acre drainage area) 2.21 acres impervious (22% of area) 18-inch influent/CSO pipes slope of 0.083 (0.12/100 feet is current DWFM requirement). 8-inch effluent pipe of 0.083 (0.40/100 feet is current DWFM standard) 2023 NMC Plan Table 2 indicated a calculated limiting Interceptor capacity at 5.67 MGD for a 6.40 acres sewer shed upstream of CSO.
006	Abbatoir & Emerick Streets (old directions mentioned Grant & Oak Streets) – acts bulkhead type (vertical weir plate) when influent line flowing, CSO flow through opening,	Shenandoah Creek (CWF)	40° 49' 11" 40° 49' 10.3" 40° 49' 10.70"	-76° 11" 49" -76° 11" 48.9" -76° 11" 49.20"	147 EDUs (previously 413 EDUs) 42.51 acres (previously 25-acre drainage area) including separated sewer areas

	acts as broad crest weir (18-inch W by 20-inch H opening inside of MH) when flowing full. Conflict if influent pipe is 12-inch PVC pipe or 24-inches VCP. 12-inch per 2001 and 2014 LTCP. 24-inch VCP per a 2023 figure. 12-inch PVC pipe to interceptor, 20-inch Concrete CSO Overflow pipe with zero slope but elevated above influent and effluent pipe (with weir plate shown as reaching to top of CSO outfall pipe).				7.48 acres impervious (18% of area) 12-inch influent/effluent pipes at 0.023 slope (0.22/100 feet is DWFM standard) CSO Pipe is “flat” (zero slope).18-inch pipe is 0.12/100 feet and 21-inch pipe is 0.10/100 feet (DWFM standard) 2023 NMC Plan Table 2 indicated a calculated limiting Interceptor capacity at 3.00 MGD for a 8.75 acre sewer shed upstream of CSO.
007	E. New York & Bridge Streets (old directions referenced Union Street) – bulkhead type (15-inch W by 7-inch H). 15-inch diameter grouted channel in 24-inch stone arch influent Channel grouted into 15-inch CSO pipe circular flume. 8-inch Effluent pipe. Bulkhead height is not shown on figure. 2014 LTCP indicated 15-inch wide by 7-inch bulkhead 15-inch Concrete (old figure/VCP 2023 figure) (channel grouted in 15-inch diameter circular flume) influent, 8-inch VCP pipe to interceptor, 15-inch Concrete (channel grouted in 15-inch diameter circular flume) CSO	Shenandoah Creek (CWF)	40° 49’ 15” 40° 49’ 13.9” 40° 49’ 14.70”	-76° 11” 46” -76° 11” 45.3” -76° 11” 45.60”	217 EDUs (previously 72 EDUs) 14.74 acres (previously 8.61-acre drainage area) 3.22 acres impervious (22% of area) 15-inch influent pipe is 0.040 and 15-inch CSO pipe is 0.005 (DWFM standard is 0.15/100 feet). 8-inch Effluent pipe is 0.200 (0.40/100 feet DWFM standard) Channel grouted into 15-inch circular flume 2023 NMC Plan Table 2 indicated a calculated limiting Interceptor capacity at 1.48 MGD for a 12.79 acres sewer shed upstream of CSO.

	Overflow pipe. Bulkhead height not identified.				
008	Bridge & E. New York Streets – drop with flat flat weir plate* (6-inch by 5-inch), Interceptor runs directly below manhole. Detail shows cap on elevated pipe to 8-inch CSO outfall pipe. 2014 LTCP noted 8-inch TC Standpipe with invert located 15 inches above weir plate. ~38-inch drop to interceptor pipe. 10-inch VCP influent, 8-inch vertical TCP standpipe for flow into underlying interceptor, 12-inch concrete interceptor pipe 8-inch TCP CSO Overflow pipe.	Shenandoah Creek (CWF)	40° 49’ 15” 40° 49’ 15” 40° 49’ 15.30”	-76° 11” 41” -76° 11” 41.3” -76° 11” 41.20”	459 EDUs (previously 80 EDUs) 15.30 acres (previously 8.36-acre drainage area) 3.22 acres impervious (21% of area) 10-inch influent pipe is 0.005 (0.28/100 feet DWFM standard). 8-inch CSO pipe is 0.012 (0.40/100 feet DWFM standard) – 8-inch pipe direct drop to Interceptor. 2023 NMC Plan Table 2 indicated a calculated limiting Interceptor capacity at 1.64 MGD for a 25.70 acres sewer shed upstream of CSO.
009	Centre & E. Mt. Vernon Ste (old directions referenced Franklin Street) – drop with flat weir plate (8-inch by 2.5-inch opening). ~33-inch drop to interceptor pipe. 8-inch TCP influent pipe 8-inch TCP pipe to interceptor 8-inch TCP CSO Overflow pipe (same elevation as influent pipe)	Shenandoah Creek (CWF)	40° 49’ 20” 40° 49’ 19.7” 40° 49’ 19.60”	-76° 11” 33” -76° 11” 36.9” -76° 11” 32.90”	4 EDUs (previously 5 EDUs) 1.27 acres (previously 1.84-acre drainage area) 0.28 acres impervious (21% of area) 8-inch influent/effluent/CSO pipes at 0.02 slope (0.40/100 feet DWFM Standard). 2023 NMC Plan Table 2 indicated a calculated limiting Interceptor capacity at 1.00 MGD for a 31.12 acres sewer shed upstream of CSO.

Drainage Area B (Pump Station No. 1, then gravity line to WWTP)	-	-	-	-	1488 EDUs (previously 1542 EDUs) Total (includes Lee Oriental Food IU discharge per some figures)
010	W. Centre Street (in IGA lot) – drop with flat weir plate (12-inch by 12-inch opening). 21-inch VCP influent, Drop interceptor ~20-inch drop to pipeline identified as interceptor 18-inch TCP CSO Overflow pipe (same elevation as influent pipe).	Kohinoor Creek (Intermittent stream not shown on E-maps), ultimately to Shenandoah Creek (CWF)	40° 49' 09" 40° 49' 9.1" 40° 49' 9.10"	-76° 12" 32" -76° 11" 33" -76° 11" 31.50"	326 EDUs (previously 548 EDUs) 18.40 acres (previously 27-acre drainage area) 4.07 acres impervious (22% of area) 21-inch influent at 0.0316 slope (0.12/100 feet for 18-inch pipe and 0.10/100 feet DWFM standard). 18-inch CSO pipe at 0.010 slope (0.12/100 feet DWFM standard). Interceptor slope not identified. 2023 NMC Plan Table 2 indicated a calculated limiting Interceptor capacity at 1.00 MGD for a 23.55 acres sewer shed upstream of CSO.
011	W. Lloyd Street & Vine Street – drop with flat weir plate (12-inch by 7-inch opening) with CSO flow through 15-inch VCP collar to stone arch. 15-inch VCP influent 8-inch VCP pipe to interceptor, 15-inch VCP CSO Overflow pipe (same elevation as influent pipe). ~15-inch drop to interceptor pipe.	Kohinoor Creek (Intermittent stream not shown on E-maps), ultimately to Shenandoah Creek (CWF)	40° 49' 14" 40° 49' 13.5" 40° 49' 13.60"	-76° 12" 29" -76° 12" 30.8" 76° 12" 29.50"	256 EDUs (previously 146 EDUs) 25.59 acres (previously 8.82-acre drainage area) 5.65 acres impervious (22% of area) 15-inch influent pipe at 0.0417 and 15-inch CSO pipe at 0.100 (0.15/100 feet DWFM sewer pipe

					Standard). 8-inch effluent pipe at 0.006 (0.40/100 feet DWFM Standard) CSO flow through 15-inch VCP Collar to Stone Arch. 2023 NMC Plan Table 2 indicated a calculated limiting Interceptor capacity at 1.00 MGD for a 11.16 acres sewer shed upstream of CSO.
012	W. Arlington Street & Vine Street – drop with flat weir plate (12-inch by 6-inch opening). 15-inch VCP influent 8-inch VCP pipe to interceptor, 15-inch VCP CSO Overflow pipe (same elevation as influent pipe) ~48-inch drop to interceptor pipe.	Kohinoor Creek (Intermittent stream not shown on E-maps), ultimately to Shenandoah Creek (CWF)	40° 49' 15" 40° 49' 15" 40° 49' 15.30"	-76° 12" 30" -76° 12" 31.6" -76° 12" 29.70"	213 acres (previously 160 EDUs) 14.18 acres (previously 7.46-acre drainage area) 2.98 acres impervious (21% of area) 15-inch Influent pipe at 0.0417 and 15-inch SO pipe at 0.04 slope (0.15/100 feet DWFM sewer pipe standard). 8-inch effluent pipe at 0.119 (0.040/100 feet DWFM standard) 2023 NMC Plan Table 2 indicated a calculated limiting Interceptor capacity at 0.52 MGD for a 11.36 acres sewer shed upstream of CSO.
013 (FKA 013A)	Coal & Vine Streets (MH-13A) from Shenandoah Heights flow – flat weir plate* (12-inch by 13-inches). The manhole is subdivided with two 12-inch influent pipe & two CSO outfall pipes (12 inch to A,	Kohinoor Creek (Intermittent Stream not shown on E-maps), ultimately to Shenandoah Creek (CWF)	40° 49' 17" 40° 49' 15.2" 40° 49' 16.70"	-76° 12" 32" -76° 12" 31.7" -76° 12" 32.10"	477 EDUs (previously 523 EDUs) 95.97 acres (previously 75 acres including separated sewer areas)

	15-inch to B) and one common 18-inch interceptor effluent pipe in A compartment. A: 12-inch TCP influent 18-inch PVC pipe to manhole interceptor 12-inch TCP CSO Overflow pipe. Same elevation as influent pipe. ~37-inch drop to interceptor pipe.				18.50 acres impervious (19% of area) 12-inch influent pipe at 0.10 and CSO pipe at 0.059 (0.22/100 feet DWFM standard). 18-inch pipe at 0.10 slope (0.12/100 feet DWFM standard) 2023 NMC Plan Table 2 indicated a calculated limiting (combined 13A/B) Interceptor capacity at 1.00 MGD for a 62.60 acres sewer shed upstream of CSO.
021 (FKA 013B for EPA reporting purposes)	Coal & Vine Streets (MH-13) from Shenandoah Borough Washington St line to Vine Street line flow – flat weir plate (12-inch by 4.5 inches). 15-inch TCP influent, 18-inch PVC pipe to manhole interceptor, 15-inch TCP CSO Overflow pipe. ~58-inch drop to interceptor pipe.	Kohinoor Creek (Intermittent stream not shown on E-maps), ultimately to Shenandoah Creek (CWF)	40° 49’ 17” 40° 49’ 15.2” 40° 49’ 16.70”	-76° 12” 32” -76° 12” 31.7” -76° 12” 32.10”	115 EDUs (previously 110 EDUs) 27.97 acres (previously 13.31-acre drainage area) 4.85 acres impervious (17% of area) 15-inch influent pipe at 0.06 and CSO pipe at 0.059 (0.15/100 feet DWFM standard). 18-inch pipe at 0.10 slope (0.12/100 feet DWFM standard) 2023 NMC Plan Table 2 indicated a calculated limiting (combined 13A/B) Interceptor capacity at 1.00 MGD for a 62.60 acres sewer shed upstream of CSO.
014	West of Arlington & Vine Streets (old directions referenced Belmont	Sewer Creek (Historic Intermittent stream not	40° 49’ 11” 40° 49’ 10.6” 40° 49’ 10.90”	-76° 12” 57” -76° 12” 57” -76° 12” 57.10”	101 EDUs (previously 56 EDUs)

	Street and former PS-2) – drop with flat weir plate (12-inch by 6 inches) with effluent previously going to PS No. 2 per 12/12/2003 CSO Monitoring Report (3-months of monitoring from April to July 2003). PS#2 has been decommissioned**, but had been located approximately 235 feet WSW of the intersection of Race & W. Lloyd Streets. 12-inch VCP influent 8-inch VCP pipe to interceptor, 12-inch VCP CSO Overflow pipe. (same elevation as influent pipe) Unclear drop depth to interceptor pipe.	shown on E-maps and not locatable by permittee), ultimately to Shenandoah Creek (CWF)			11.53 acres (previously 8.57-acre drainage area) 1.75 acres impervious (15% of area) 12-inch influent pipe at 0.089 and CSO pipe at 0.04 (0.22/100 feet DWFM standard). 8-inch effluent pipe at 0.04 slope (0.40/100 feet DWFM standard) 2023 NMC Plan Table 2 indicated a calculated limiting Interceptor capacity at 5.00 MGD for a 18.64 acre sewer shed upstream of CSO.
Total	-	-	-	-	**3294 EDUs** cumulative, 3297 total per LTCP update Section 2.2 (with 2898 residential units and 51 commercial or industrial customers (previously 2968 EDUs)

*The March 23, 1995 “Final Plan of Action for Identification and Minimization of Dry Weather Combined Sewer Overflow Discharges for the Shenandoah Municipal Sewer Authority” included “Bulkhead diversion hydraulic charts” and “Weir plate hydraulic charts” (to correlate measured flow depth to predicted discharge rate in MGD), and Appendix D (Inspection Data Tabulation Sheets) to record inspection date, rainfall in last 24-hours, wastewater depth, estimated flow, duration of flows (days), volume, and cause identification (“normal diversion during rain”, “suspected infiltration (diversion during dry periods)”, “unknown”, “blockage”, and “The DMH appears to have recently stopped diverting”).

Flat Weir Plate Manhole Weir Openings:

CSO#	Weir Plate Width (inch)	Width of Opening (inch)	Min. Weir Opening Length (inch)	Actual Weir opening Length per Benesch (inch)	Review Comment
003	12	12	6	5	To be adjusted per LTCP. <23-inch drop to pipe going to interceptor.

004	12	12	8	6	To be adjusted per LTCP. <19-inch drop
005	12	12	3	2.5	To be adjusted per LTCP. <19-inch drop
008	6	6	5	4	To be adjusted per LTCP. 38-inch drop. 2021 DEP Inspection and 2023 LTCP figure show cap on standpipe for CSO pipe discharge. Interceptor directly below manhole.
009	8	8	6.5	2.5	To be adjusted per LTCP. <33-inch drop. 2021 DEP Inspection notes Shenandoah Creek goes underground at the E Mount Vernon bridge just downstream of this CSO 009 outfall, and daylights near CSO No. 008.
010	12	12	12	16	Opening > minimum. <20-inch drop 2021 DEP Inspection Report noted Kohinoor Creek runs underground from the intersection of W. Coal Street & Walnut Street and resurfaces at the west side of Boyers Food Market parking lot on W. Centre Street. Underground discharge.
011	12	Could not be measured during Benesch inspection due to blockage per LTCP	7	Could not be measured during Benesch inspection due to blockage per LTCP.	Unknown if needs adjustment. 2001 Figure showed a 12” by 7” opening and “CSO Flow through 15-inch VCP Collar to Stone Arch”. <15-inch drop Underground discharge.
012	12	12	6	4	To be adjusted per LTCP. <48-inch drop Underground discharge
013A (now 013)	Not addressed	-	-	-	Unknown if needs adjustment. 2001 LTCP Figure showed 12-inch by 13-inch opening dimension. Receives 013B flow to common interceptor pipe. 2014 & 2023 Figure indicated 12” by 13” opening. <37-inch drop Underground discharge
013B (now 020)	Not addressed	-	-	-	Unknown if needs adjustment. 2001 LTCP Figure showed 12-inch by 4.5-inch opening dimension. 2014 & 2023 Figure indicated 12” by 4.5” opening.

					<58-inch drop (overflows into common Interceptor pipe from 013A) Underground discharge
014	Not addressed	-	-	-	Unknown if needs adjustment. 2014 & 2023 Figure indicated 12" by 6" opening. <13-inch drop 2021 DEP Inspection Report noted outfall could not be located because it appeared to be covered over by trash and debris.
PS 1 bypass	Not addressed	-	-	-	2021 DEP Inspection Report described this as an unpermitted 16-inch bypass (near top of PS wet well) that discharges to Kohinoor Creek channel (to be capped and plugged). PS Alarm was disconnected at time of inspection.

- **Annual Average Precipitation Year & EPA CSO Model Usage:** They would need to explain the proposed correlation of their assumed 85th percentile storm of 0.90 inches to the Annual Average Precipitation Year to allow for its use in determining compliance with any proposed LTCP Goal. Otherwise, they would need to model every storm event during the calendar year with a calibrated/validated EPA Model to calculate flows and compliance with their chosen goal, year by year. At this time, the 2003 Flow Model is not supported by actual CSO monitoring data and cannot be assumed to be accurate. The EPA CSO Model Guidance notes:
  - "CSO Model can be calibrated and validated using simple, low-cost field monitoring techniques, as described in EPA's 1999 Guidance for Modeling and Monitoring as well as EPA's 2012 CSO Post Construction Compliance Monitoring Guidance. Once calibrated and validated, the CSO Model can serve as a powerful screening-level tool to help communities better understand their CSSs and reduce the need to monitor every rain event".
  - "More accurate estimations of CSO events occur when using high-quality input data (e.g., high resolution rainfall data at a maximum timestep of 15 minutes, accurate estimates of inputs like impervious surface area and regulator capacity), as well as only using the CSO Model for smaller (under 100 acres), less complex systems".
  - "Users can therefore calibrate model inputs and validate model results with monitoring data that record the presence or absence of a CSO, or that record CSO volume. Users can obtain such data using a range of approaches, from the simple and low-cost to highly automated. For example, a strategically placed chalk line on the inside of a CSO outfall or a small piece of woody debris placed atop a diversion structure are simple and low-cost approaches that can indicate whether a CSO occurred. Conversely, a variety of electronic sensors are available that can measure flow depth and velocity within a range of conveyance configurations. Both types of results can be directly compared to CSO Model output and used to determine whether model results are reasonable. If the CSO Model consistently overpredicts or underpredicts overflows when compared to observed data, users can refine or calibrate model inputs such as percent impervious surface, initial abstraction, and regulator capacity so CSO Model outputs better match observed conditions, on average".
  - EPA recommends that CSO permittees verify CSO Model estimates through monitoring at critical locations in their CSS, which may include the following:
    - CSO outfall locations that discharge the most volume.
    - CSO outfall locations that discharge the most often.
    - CSO outfall locations that discharge to sensitive areas.
    - Locations in the CSS that are known to bottleneck.
    - Other specific locations mentioned in the NPDES permit.
  - Any flow exceeding the CSO hydraulic control capacity stays in the individual CSO sub-sewershed and is conveyed to the CSO outfall. If the community has not previously carried out an analysis of the peak hydraulic control capacity of each CSO sub-sewershed, EPA suggests that the determination be carried

out by someone experienced in such hydraulic analyses. EPA also cautions communities against evaluating CSO hydraulic control capacity without considering interceptor capacity as well, because the nominal capacity of a regulator could exceed that of its receiving interceptor under the same peak wet-weather conditions.

- Users can calculate or estimate the hydraulic control capacity of passive regulator structures such as weirs and orifices as long as drawings are available and the dimensions of the structures are known. EPA recommends using standard weir or orifice equations, as appropriate, for the specific structures. In general, the diversion rate of original regulators (i.e., prior to implementing any additional collection system controls) is often three to five times greater than dry-weather flow. For additional collection system controls, use design documentation to revise the total control capacity. If any of these capacities are unknown or resources to determine them are not available, consult a standard hydraulics handbook or a professional engineer familiar with the design and operation of the specific controls.
- Model Line 7b: CSO hydraulic control capacity (MGD).* Enter the capacity of the CSO hydraulic control. In addition to the design capacity of passive control structures like weirs and orifices, CSO hydraulic control capacity should reflect, where applicable, the effects of any of the collection system controls. **NOTE:** See above Sections on need to calibrate this model.
  - The Model does not calculate whether the discharge meets the existing 85% LTCP Presumptive Goal, merely by calculating the flows at the selected design storms. That would require determination of annual average year precipitation and storm frequencies and doing the modeling for the same. If they believe the 85th percentile is the expected annual average flow, explain and identify annual average precipitation (inches) and number of number of 1-year, 10-year, 25-year, 50-year, and 100-year storm events expected in an annual average year of precipitation.
  - "For these reasons we believe the use of the current model provides a more overall accurate discharge estimate (than reporting observed pipe flow depth during inspections). It is not able nor meant to precisely determine every single event, but neither would any of the other methods. This is likely also the reason that EPA's treatment goals based on the annual average". **Uncalibrated models cannot be used for compliance reporting. They need to report actual observed CSO flows, actual precipitation (to 0.01-inches precipitation), have visual indicators to catch any off-hour discharges, etc. to calibrate any flow model qualitatively.**

- **I&I Abatement Plan (LTCP Attachment S Flow Study Plan, revised August 2023)**: Status of implementation unknown.
  - Dependent on proposed 12-month flow study that was to map the sewer subsheds (separate GIS effort planned elsewhere in application) as first step. Not clear what will be done until the 12-month flow study is completed. Second temporary raingage planned for collection system (in addition to WWTP gage). Field inspections are proposed for priority I&I drainage areas, but some areas might deserve upfront evaluation to determine if 100-year flooding/backflow is contributing to CSS flows. Location Map figure blocks off seeing portion of sewer system and does not show proposed flow meter locations. Sewer system map does not show proposed flow meter locations to help determine if they are reasonably placed for initial investigation. No subdrainage area map (for the 20 identified subsheds) with other application figures conflicting on subdrainage area numbering and which are separated sewer sheds.
  - In terms of NPDES Permit requirements: The 12-month sewer system flow monitoring plan is inadequate to define CSO discharges (no CSO discharge monitoring proposed to calibrate any existing or proposed methodology of estimating CSO discharges volumes, frequencies, intensity, and durations. It is unclear where the monitoring points are in relation to the assorted separated sewer sheds (with their own uncertain locations due to conflicting application figures and other information). They indicate that they might do more investigations after the initial 12-month study, but no flow monitoring plan foud (only televising sewer sheds proposed).Other provided information include:
    - 12-month flow study plan for both separated and combined sewer system areas (20 subdrainage areas) but they plan to monitor seven (7) locations with flow meters (with Table 1 showing the breakdown of monitored drainage area being monitored by the individual flow meter). Subdrainage area 11 (West Mahanoy Township, constructed in 2006) will not be monitored. Nor will drainage area No. 10 (directly upstream of No. 11) will not be monitored due to small size.
    - SMSA has dye tables and a small push camera for minor investigations of pipe issues. For larger investigations, such as smoke testing or CCTV inspections, they hire outside contractors.
    - Who will do the I&I Abatement Plan Inspections: Borough collection system staff with oversight from Licensed Operators. (Letter Response Item 6)

- The majority of the manhole that are within the floodplain exist along the Shenandoah Creek Interceptor. Inserts are being consider in these locations. (Letter Response Item 6)
- This Flow Study Plan provides the first step of the I&I Abatement Plan. The purpose of this Flow Study Plan is to develop a methodical procedure for quantifying Infiltration and Inflow (I&I) within the sanitary sewer collection system. (Flow Study Section 1.1)
- After receiving and analyzing the results of the flow metering, the sub-drainage basins will be ranked in order of highest I&I. The highest I&I area will be Priority Area 1 to address, with Priority Area 2 the next to be addressed, etc. A Recommendations and Implementation Report will then be submitted to PADEP/EPA for approval prior to beginning design and construction activities for I&I abatement projects. (Flow Study Section 1.1)
- See additional Attachment O (Flow Study) comments below.
- Correlating Flow Meter Locations to CSOs: The Abatement Plan figure did not show the flow meter locations on the drawings showing the collection system pipeline/manholes, so relationship to CSOs and subdrainage areas is not clear. Not sure which drainage area contributes to which CSO Outfall, as some CSOs are located along drainage area dividing lines. They are also inconsistent with major drainage area is A or B. Narrative A is the interceptor that is gravity flow to the WWTP, and Narrative B is directed to PS/force main, but figures show the reverse. Table below uses figures' A and B main drainage areas.

Flow Meter	**Overall Drainage Basin (corrected)**	**Subdrainage Basins (not sure which basins are which due to conflicting figures' numbering of subdrainage areas)**	**Comment**
1	B (to PS)	1, 2, 3 (Shenandoah Heights)	Flow meter will be located in Drainage Area 4; Shenandoah Heights drainage area included; 1 and 3 are separate sewersheds. No CSOs.
2	B (to PS)	4, 5, 6, 7, 8, 9	Flow meter will be located in Drainage Area 9; 011 (unclear at scale) 012, 013A/B (between 13 and 18) 007 (between 14 and 18) 004 and 005 (between 16 and 18) 002 (not shown in areas, but received B flows might be directed through the interceptor there. Sewer Shed 8 is shown divided into both drainage areas A and B versus assumption all if flowing to B.
3	A	12	Flow meter will be located in drainage area 12; CSOs 008 and 009 (Shed 12, including Ateeco)
4	A	13, 14, 15	Flow Meter will be located in Drainage area 16; CSO 006 is located on division of 13 and 18. Includes Lee's Oriental
5	A	16, 17, 18	Flow Meter will be located in Drainage Area 17; CSO 004 is located on division of 16 and 18
6	A	19	Flow Meter will be located just outside drainage Area 19 (along interceptor pipe) No CSO
7	-	20	Flow Meter is located near CSO Outfall No. 002 along Interceptor Pipe. Drainage area not shown on Figure.
-	B	10	CSO 014 is located on division of 10 and 9 10 (directly upstream of No. 11) will not be monitored due to small size per plan)
-	Separate	11	No CSO Subdrainage area 11 (West Mahanoy Township, constructed in 2006) will not be monitored. Has its own main to WWTP headworks.

*Post-abatement flow monitoring proposed OR use of reduced WWTP influent flows to indicate success. They will be considering whether they need to purchase/rent additional flow meters or extending the flow study contract upon "further investigation and collection of data results". (Letter Response cc.iii)

Other CSO LTCP Related Information:

- Updated CSO Manhole figures: Conflict between pipe sizes in CSO No. 006, CSO No. 007, and CSO No. 003 (compared to old figures or inspection photo). CSO No. 007 Bulkhead height is not shown on figure.
- Interceptor pipe size and type not identified in LTCP (three branches per 1971 WQM permit IRR).
- The majority of manholes located along Shenandoah Creek (downstream of SR924) are within the 100-year floodplain. Manhole inserts will be evaluated based on this comment for this purpose. (6/30/2022 Response Letter)
- The Authority does not have any site-specific data regarding the receiving streams. (6/30/2022 Response Letter)
- The Authority does not have any CSO discharge sampling analytical data nor background stream sampling data. (6/30/2022 Response Letter)
- The Borough has a Subdivision and Land Development ordinance which requires submission of land development plans, including stormwater requirements and E&SC controls for any new development. The Borough also utilizes street sweeping to minimize pollutants from entering stormwater systems. (NPDES Permit Application Form)
- Missing CSO-related information:
    - They were unable to located an updated 2018 LTCP (due 11/1/2018) as required by the previous NPDES Permit Part C.III (only finding the previous 2014 version that apparently they did not implement on the basis that they did not receive a separate approval letter from the 2017 NPDES permit).
    - They are "deferring" to provide some CSO/LTCP-required stream information until the 2023 CSO Annual Status Report (due **March 31, 2024**). **NOTE**: The 2022 DEP Biologist Memo (copy included in their application) identified apparent CSO-related stream impacts in addition to the WWTP discharge impacts. They have the information showing negative impacts.
    - They did not include a copy of the 1995 CSO Submittal that had hydraulic correlations of CSO discharge flow rate (MGD) to CSO Pipe Flow depth. **NOTE**: Since there has been no change in piping (except potential O&M issues over time), the CSO discharge pipe flow depths must be reported to help validate/calibrate any existing/proposed CSO flow model. In absence of better data, the correlations remain the best method of spot-checking CSO discharge rates (MGD/GPM) during CSO discharge inspections and to help calibrate any CSO flow modeling.
    - Benesch did a June 2023 (and earlier 2022) CSO engineering inspection and provided some information in this application, but not their engineering Inspection Report(s). Some information (such as CSOs 13A/13B and 14 weir plate opening sizes) not in the application.
- Attachment A (Location Map) – figure information blacked out. Shows CSO diversion manholes and CSO outfalls, plus assumed underground Kohinoor Creek route to Shenandoah.
- Attachment B (Sewershed Map & Collection System Map) –The initial 7 flow monitoring points are not shown on the drawings, which does not show the sewer collection piping either. Conflicts with other drawings' information, and need to be "flattened" (some information is messed up on figure). A version of this drawing with the proposed Flow Study monitoring points and Stream Monitoring points is also needed.
- Attachment D (2004 Long Term Control Plan) – they do not appear to think the 2017 NPDES Permit approved the 2014 LTCP Update with conditions.
- **Attachment E (Implementation Schedule) – proposed SMSA LTCP Implementation Schedule including:**
    - **Stream Water Quality Monitoring Plan implementation** – they might ask for delay for implementing until after they fix known CSO structure issues to show any benefits from required CSO O&M. Plan not adequate for the Demonstration LTCP Goal.
    - **Flow Study Monitoring Plan implementation** – they probably will ask for delay until WWTP Upgrades starts (for installation of digital rain gage at WWTP) and any required CSO O&M. They do note:
        - "The CSO regulators will be verified and corrected if necessary first prior to flow meters being installed". (i.e. CSO O&M work).
        - "Depending upon when and if PADEP issues the Construction Permit, the Flow Study will analyze flow to pump station as well as flow into the WWTP". (One flow monitoring point is the proposed PS flow meter tied to SCADA).
    - **Proposed LTCP Implementation Schedule including:**
        - Rain gage installation
        - WWTP Construction (assuming 2024 start)

- GPS mapping of collection system
- Cleaning, Televising, and Evaluation of Collection system
- Development of GIS model of Collection System (elsewhere it was implied that the evaluation would be after the 12-month flow study prioritized areas for investigation and corrective action)
- Flow Study Recommended project construction – presumably after initial 12-month flow study, evaluation, and then follow-up field investigation unless they spot specific issues during the GPS mapping but unclear what might be done prior to Flow Study completion

- **Attachment G (August 2023 Stream Water Quality Monitoring Plan):**
  - Missing weir plates at CSO 002 and CSO 006, a partially blocked sewer main at CSO 002, and a deteriorated bulkhead at CSO 007 were found during recent inspections. These items are being corrected and it is expected that this will eliminate the high pathogen/organic enrichment found in Shenandoah Creek. SMSA intends to sample these areas for confirmation as part of the Stream Water Quality Monitoring Plan. Sample points 004 (Shenandoah Creek) and 006 (Kohinoor Creek) (Letter Response Item 6)
  - SMSA has ordered and will be installing a digital rain gauge capable of recording to 0.01" accuracy. A digital rainfall gauge is to be integrated as part of the SCADA System in the proposed WWTP project. (Letter Response Item 6)
  - Proposal for 1-year (quarterly sampling) water quality monitoring of Shenandoah Creek (CWF) and Kohinoor Creek (intermittent, would likely be CWF if perennial flow) during dry/wet weather with following annual monitoring. Wet weather sampling requirement of 0.7-inches minimum precipitation and requirement for at least CSO discharges prior to performing wet weather stream sampling. **NOTE**: They need to do more due to known stream impacts as the Demonstrative LTCP Goal will likely apply. The 85% Presumptive Goal is no longer valid when there is known contributions to ongoing stream impairments.
    - No plan to monitor Sewer Creek as it is a dry swale the discharges into a mine pit during rain events, and SMSA is investigating elimination of only CSO discharge (CSO No. 014) discharge to Sewer Creek.
    - Sampling and Analysis for pH, Temperature, DO, CBOD5, TDS, TSS, E Coli, Fecal Coliforms, Total Hardness, TN, TP, Total Aluminum, Total Copper, Total Iron, Total Lead, Total Manganese, Total Zinc, O&G, and floatable/solids visual observation: Need to add Ammonia-N and Dissolved Iron, plus CSO sampling for the stream impairment parameters.
    - In terms of high pathogens/organic enrichment issues (found by DEP Biologist downstream of CSO locations), the response indicated confirmation sampling proposed at Sample points 004 (Shenandoah Creek Upstream of Kohinoor Creek Confluence) and 006 (Kohinoor Creek Upstream of Shenandoah Creek Confluence). These sampling points must be correlated to the IU dischargers.
    - Five (5) monitoring locations noted but eight (8) are listed, so it is unclear which sampling points will be used:
      - Sample location 001 (Shenandoah Creek Upstream of Shenandoah Borough, near E. Washington Street).
      - Sample location 002 (downstream from Ateeco Inc., downstream of CSO 009 but upstream of CSO 008)
      - Sample location 003 (Shenandoah Creek Downstream of CSOs 003 – 007; Upstream of CSO No. 002, at Route 924/South Main bridge over Shenandoah Creek, unclear if upstream or downstream of confluence as Kohinoor Creek is not shown on E-maps, but appears downstream of apparent old flow path per USGS Topography)
      - Sample location 004 (Shenandoah Creek Upstream of Kohinoor Creek Confluence, downstream of CSO Outfall No. 002, unclear if upstream or downstream of confluence as Kohinoor Creek is not shown on E-maps, but appears downstream of apparent old flow path per USGS Topography)
      - Sample location 005 (Kohinoor Creek Upstream of Shenandoah Borough, near intersection of West Penn & Walnut Streets))
      - Sample location 006 (Kohinoor Creek Upstream of Shenandoah Creek Confluence, but appears downstream of likely old Kohinoor Creek flow path, hard to distinguish creeks at this location)
      - Sample location 007 (Shenandoah Creek Upstream of WWTP; at WWTP downstream of existing IW Stormwater Outfall No. 019)

- Sample location 008 (Shenandoah Creek Downstream of WWTP; downstream of outfalls)

NOTE: The 2022 DEP Biologist Shenandoah Creek sampling was at 6 sample locations on Shenandoah Creek. For comparison with the proposed SMSA sampling locations.

- Station 01 (Upstream of Shenandoah Borough) - 40° 49' 32.196", -76° 11' 44.664" downstream waterfall (location upstream of Shenandoah Borough boundaries and proposed Sample Location 001). Attaining Aquatic life found at this location. Low pH (<6.0 SU).
- Station 02 (Shenandoah Borough at SR924) - 40° 48' 55.440", -76° 11' 56.868" upstream SR0924 (upstream of bridge, not too far from proposed Sample Location 003). High pathogens (unsafe for water contact sports) per Biologist sampling during dry weather with CBOD5 levels indicating organic source. Zinc WQS exceeded. Relatively low AMD parameters and sulfates.
- Station 03 (Immediately upstream of Shenandoah WWTP Discharge) - 40° 48' 50.004", -76° 12' 54.612" upstream SMSA WWTP (downstream of IW Stormwater Outfall but upstream of other existing WWTP outfalls, not far from proposed Sample Location 007). Downstream of visible AMD seeps, with high AMD parameters, low (<6.0 SU) pH, and substrate was stained orange from iron deposition. Bacteria low counts. Very poor macroinvertebrate community dominated by aquatic worms.
- Station 04 (~225 meters Downstream of Shenanodah WWTP discharge) - 40° 48° 49.896", -76° 13' 04.620" downstream SR0054 (downstream of WWTP, and proposed Sample Location No. 008, past existing pond depression). Turbid gray WWTP discharge observed to clear stream. Grossly impaired stream conditions with only "sludge worms" (a.k.a. "blood worms") found, which can flourish in low oxygen sediments including sewage sludge. High AMD metals concentrations plus significant organics and high pathogens. Lead and copper were above WQS at measured hardness of 99 mg/l.
- Station 05 (Upstream of Raven Run Road, ~1.2 miles downstream of WWTP) - 40° 48' 32.688", -76° 14' 14.172" upstream Raven Run Rd (farther downstream from WWTP). Mild sewage smell in air, apparent sewage solids/toilet paper in sediment, dominated in worms, elevated metals, CBOD5, phosphorus, fecal coliforms. However, other potential source(s) than the Shenandoah WWTP might be contributing to issues at this location.
- Station 06 (At mouth to Mahanoy Creek in Girardville) - 40° 47' 43.728", -76° 16' 34.860" Girardville playground (farther downstream from WWTP). Slight sewage odor in air, heavy iron precipitate on stream bed, with aquatic life required to be protected.

- The PCCM is a current and ongoing requirement, but data must be incorporated into Annual CSO Status Report and Surface Water Monitoring Report form. DEP Surface Water Sampling Form will be required with DMRs.
- Wet weather sampling requirement of 0.7-inches has what technical rationale?
- Is Visual monitoring proposed for daylighting stream locations?
- Sampling Point drawing blank or not visible on figures (possibly due to submittal issues requiring resubmittal in smaller chunks and "flattening").
- **Attachment 4 (Sampling Locations Map)** figure unreadable/missing information due to submittal issues (too large and not flattened, with sample point locations not clearly visible with overlapping labels) and must be resubmitted (plus conflicting with other application figures on sewer shed numbering, which are separated sewer sheds, etc.) – so unclear where are the monitoring points (that differ from the DEP Biologist sampling points or any historic TMDL sampling points for purposes of comparison of results). No legend to breakdown symbols used, but triangles appear to be the proposed stream sampling points. Green Triangles versus Purple Triangles stand for what (DEP versus SMSA proposed sampling points)? Not sure where the stream daylights on figure.

- **Attachment K (July 2023 Operation and Maintenance Collection and Conveyance System FKA Combined Sewer System O&M Plan) –** this plan makes reference to inspecting bar screens, tide gates, etc. that are not currently present in the CSOs. It is incorporated by reference into the NMC Plan.
  - **Section 1.3:** SSOs are strictly prohibited and must be eliminated, not just their impact mitigated.
  - **Section 1.4**: See above comments about potential co-permittee and chain-of-command issues.
  - **Section 1.9**: Status of the GIS mapping?

- **Section 2.2**: Outfall Nos. 001 is not a CSO, but a plant outfall. Outfalls Nos. 015-017 are WWTP stormwater only – not CSOs. If there are unpermitted CSOs, the application must be substantially updated.
- **Section 2.3**: See WQM permit for Coal Street extension for info on CSS construction.
- **Section 2.7**: Provide design detail for Interceptor(s) showing pipe size, type, and estimated capacity.
- **Section 3.1**: CSO Inspections: References non-existent bar screen and tide gate – therefore document requires WQM permitting and cannot be followed without CSO manhole upgrades. Daily CSO inspections required but the 2023 EPA Inspection Report Observation 14 indicates that only visual observations for active discharge during weekly inspections was performed, and only at outfalls where the location is known. No visual aid ("discharge event confirmation method") was present either.
- **Section 6.4**: The dissolved oxygen content of the wastewater is often depleted in the wetwell of the Center Street Pumping Station. This wastewater passing through the force main not only lacks oxygen, but often contains sulfides. These sulfides have led to corrosion in the wetwell and force main. Frequent Inspection and cleaning as required of pumping station is required to prevent solids and grease buildup and minimize corrosion due to the high concentration of sulfides.
- **Section 7.3**: FOG Control. The discharge of FOG is regulated through a Resolution adopted on February 25, 1976, which bans the discharge of any water or waste containing more than 10 mg/l of fats, oils, or greases. What is the Enforcement mechanism?
- **Attachment/Figures**: Update per other figure comments.
- **No general O&M inspection table found**.

- **Attachment O (August 2023 Flow Study Plan) – Identified as first step of AOCC I&I Abatement Plan.**
  - Location Map has grayed out topography; figures confusing main drainage areas A & B (area draining to PS-1); SMSA figures disagree about sewer shed numbering (and must be clarified) with the Chapter 94 breakdown having a different numbering, they still proposing 1-year collection system study with 7 flow meters for ~20 drainage areas and mentions potential follow-up monitoring without details. The application figures conflict on drainage area naming (8 or 20 is subdivided by the main drainage divide for example; A versus B main drainage area – i.e. which main drainage area is directing all flow to PS No. 1). No CSO discharge flow monitoring proposed. Flow meters not shown in relation to collection system piping (shown on other application figures). Flow Meter 001 (if located on interceptor) location will be receiving separated sewer shed flows in addition to CSS flows. Flow Meter 002 appears to be the influent to Pump Station No. 001. Flow Meter 003 appears to be located at CSO Outfall No. 008 and below Ateeco Inc. facility. Flow meter 007 will be receiving Shenandoah Interceptor flows (prior to Kohinoor Creek interceptor contributions) at the CSO Outfall No. 002 locatoin. The figures are unclear regarding which other flow meter will receive separated sewer shed drainage along the Shenandoah Creek Interceptor route. They are relying on the WWTP flow meter for total service area flows. **Depending upon when and if PADEP issues the Construction Permit, the Flow Study will analyze flow to pump station as well as flow into the WWTP**. Raingage planned at Pump Station as part of study. See common comments on deficient figures. Sewer shed figure (with numbering) does not show sewer system piping or flow monitoring locations. Conflicts with other figures (and 2022 Chapter 94 Report figure information) must be resolved. Does flow area 18 (across Shenandoah River) actually have CSS? Any surface flows should be routed directly to River (without going into CSS System). Show flow meter location on figure showing known collection/conveyance piping and subdrainage area boundaries! If flow meter is at diversion chamber, state which ones. Main Drainage Divide cuts right across some subdrainage areas (including Shenandoah Heights areas), so they are clearly wrongly defined. **No obvious provisions for post-12 month study follow-up flow monitoring.**
  - The CSO regulators will be verified and corrected if necessary first prior to flow meters being installed per Letter Response Item 6. What is the status/schedule of the proposed verification and correction?
  - The initial plans are to investigate the seven major drainage areas (out of ~20) to determine where to best focus SMSA's limited manpower and financial resources. Data collected in the field will provide SMSA with information to continue further investigation into potential separation projects and problem areas in the future. (Letter Response Item 6). This is plan is inadequate to calibrate CSO discharges.
  - Utilizing the FEMA floodplain as our data, a significant portion of the Shenandoah Creek Interceptor is located within the Shenandoah Creek 100-Yr Floodplain. The inflow in this area would be captured by the WWTP influent flow meter. (Letter Response Item 6). **Incorrect in that CSO discharges are not addressed by the WWTP Influent flow meter.**
  - Depending upon when and if PADEP issues the Construction Permit, the Flow Study will analyze flow to pump station as well as flow into the WWTP. The estimated cost to install/maintain the 7 proposed meters

for a period of one year is $100,000. In theory, the cost to add the monitoring to the 14 CSOs would add approximately $200,000 additional to the Study costs. The base fee does not include the analysis by SMSA's engineer and development of the report/recommendations. As indicated above, SMSA has limited financial resources. (Letter Response Item 6). **An inadequate flow monitoring plan will only result in additional greater costs in the future.**

- **Attachment Q (August 2023 Nine Minimum Controls Plan)** – **including updated coordinates for Diversion manholes and outfalls**, and promises about implementing assorted NMC controls. The Plan noted a 2022 Benesch Inspection (did not mention the 2023 inspection) and indicated recommended repairs: "These repairs include the addition of weirs, the addition of bar screens, duck bill check valves, fabricated staff gauges, and flow indicators. CSO signage was also to be updated or installed at a number of CSO outfalls".
    - **O&M NMC**: Incorporating the CSO O&M Plan and Wet Weather Plan by reference. Need to report issues on DEP CSO Monitoring Report forms in addition to any SMSA internal forms. Table 1 (CSO Information) did not identify minimum weir opening sizes for the flat weir plate manholes or minimum heights for the bulkhead manholes. Hydraulic Control Capacity (from Benesch calculations that have not been validated by any flow data – see future engineering comments on the Benesch Calculations). Need re
    - **Pretreatment O&M**: The existing NPDES Permit and AOCC requires a Pretreatment program, but to date no IPP Program has been received by this reviewer. Status/schedule of local limit development plan and IPP?
    - **Maximizing Flow to POTW for Treatment**: If weirs are set to the maximum opening sizes for flat weir manholes, they should be identified here as the application elsewhere talks of minimum opening sizes (not met per application). CSO No. 10 alone exceeded the minimum. EPA is also indicating it expects 85% secondary treatment to be met with remainder of flow subject to minimum treatment (primary clarification/solids & floatables control/disinfection) in terms. Bulkhead manhole heights must also be specified.
    - **Elimination of CSO discharges during dry weather NMC**: The chalk/block or equivalent method of detecting dry weather CSO discharges is a necessity, not a recommendation. Going back between commitment and non-commitment is not acceptable.
    - **Control of Solids & Floatables NMC**: Design claim not substantiated. No existing control on CSO outfall pipes. See comments on flat weir manhole design and no control other than bulkhead on the bulkhead manholes. Any manhole WQM permit design should include provisions for potential future vertical weir or bulkhead elevation if needed in future.
    - **Public Notification NMC**: Status of new signs? See new NPDES Part C conditions for current requirements going forward for public notice and participation.
    - **Monitoring to Effectively Characterize CSO Impacts and Efficacy of CSO Controls**: CSO Outfall 009 was indicated to be capped, but CSO Outfall No. 008 capped per figures, so which is the case?
        - **See other comments on Flow Study, I&I Abatement Plant, etc**.
        - **GIS Model**: How much of system is not shown on figures showing existing sewer system?
        - **Figures**: See other figure comments. CSO Manhole sketches need to specify MINIMUM WEIR opening sizes for flat weir manholes. Need figures to show post-WQM Permit (second) upgrade design plans.
        - **SMSA CSO Diversion Manhole Inspection Form**: This information must be inputted to the required DEP CSO Monitoring Report forms along with observed or estimated CSO Pipe flow depth, etc. PS No. 1 bypass must be inspected until permanently closed.

- **Attachment R (August 2023 Post Construction Compliance Monitoring Plan**) – Needs substantial updating per above Section comments and apparent Demonstration LTCP Goal requirement.

- **Attachment R (Borough of Shenandoah Sewer Ordinance)** – existing ordinance provided. Where is the updated version?

- **Appendix M (May 2022 Wet Weather Operating Plan for Existing WWTP) issues**: This was self-described as "a guideline of steps to take during wet weather events for the existing facility prior to 2022 proposed upgrades". From a glance-over:

- Bypassing Requirements: This plan did not address NPDES sampling requirements during bypassing (Part A.I Additional Information Item 4) or Part B.I.G (Bypassing) requirements for the out-of-service treatment units (including the sole Primary Clarifier).
- General: Pre-wet weather reduction of operating levels of clarifiers and aeration to maximize wet weather capacity is a potential additional option. Turning off of recycle flows is another standard wet weather option. For quick reference by the operating staff, the referenced O&M Manual Chapter 3 specifics should be summarized and attached to the Wet Weather Operating Plan (or at least with direct cross-refencing for each WWTP unit). In addition, existing Part C Solids Management conditions prohibit storage of excess solids in the clarifiers and disinfection system at all times (not just during wet weather).
- Section 2 (Goal): Identified the facility capacity as 2.0 MGD Average Daily Flow and 5.0 MGD daily max flow (without discussing impact of out-of-service units/equipment on as-operated plant capacities (including the sole primary clarifier per Inspection Reports)
- Section 3 (Critical Components): Indicated the presence of a comminutor which was not shown on the NPDES process flow schematic. Need to add offsite Pump Station No. 1 to critical components.
- Section 4.2 (CSO Nos. 002, 006, and 007): The bulkhead CSO structures (CSO Outfall Nos. 002, 006, and 007) were noted to have significant issues that have not been addressed to date. “These included missing weir plates at CSO 002 and CSO 006, a partially blocked sewer main at CSO 002, and a deteriorated bulkhead at CSO 007”. Status of corrective actions is unknown.
- Section 4.3 (CSO Nos. 003-005, 008-014):
  - The assorted flat horizontal weir plate CSO structures (CSO Outfall Nos. 003, 004, 005, 008 (including standpipe), 009, 010, 011, 012, 013A/B (being renumbered in this permit) and 014) only required that the weir plates “are open”, not required minimum opening size. The section is also referring to a trash rack not shown on available CSO manhole design details.
  - Explain how they check for backflow for the underground CSO discharges when they cannot check the CSO Pipe Outlet.
- Section 4.4 (Pump Station No. 1): No checking of unauthorized PS bypass/CSO discharge is addressed.
- Section 4.9 (Primary Clarifier): It did not address operating without a functional primary clarifier, nor addressed the Part B bypassing requirements for the Primary Clarifier bypassing line shown on the Process Flow Schematic.
- Section 4.10 (Aeration Tanks): Lowering water levels to maximize storage prior to wet weather should be considered. One Aeration Tank was being used as a sludge holding tank during the 2023 EPA Compliance Inspection.
- Section 4.11 (Secondary Clarifier): It did not address operating when a secondary clarifier is out-of-service.

- **Appendix N (Proposed WWTP Upgrade Wet Weather Operating Plan)**: The NPDES Permit Part C.X.G (New WWTP O&M Plan) will require updating of this plan within three (3) months of WWTP project’s Phase I substantial completion (when new WWTP treatment is constructed). See overlapping general comments on Appendix M (above).
  - They will need an influent sampling SOP to ensure accurate/representative sampling due to recycle flows prior to the sampling point.
  - Given application statements that the SBRs can handle 8.0 MGD peak hourly flows for a short interval (defaulting to 5.83 MGD daily max flow for achieving secondary treatment), the method and logic of modifying SBR operations need to be clearly specified here. In practical terms, the Treatment Plant might receive 9.0 MGD from the mechanical bar screens and 9.0 MGD from the manual bypass screen while attempting to address all CSO-related requirements. The UV disinfection is designed for a 11.7 MGD peak instantaneous/hourly flow (if only to address SBR max decant rates).
  - Needs to explicitly address CSBR “superstorm mode” and “storm mode” mentioned in other parts of application, in terms of system settings and when secondary treatment can no longer be achieved.
  - Depending on iron concentration in effluent (AMD-impacted I&I variability that can reduce UV disinfection effectiveness), additional pretreatment and/or supplemental chlorination might be required at peak CSS flows.