



State of New Jersey

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September 6, 2019

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590 Smith Street
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Kevin Aiello, Environmental Quality Director
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Re: Review of Development and Evaluation of Alternatives
City of Perth Amboy, NJPDES Permit No. NJ0156132
Middlesex County Utilities Authority (MCUA), NJPDES Permit No. NJ0020141

Dear Permittees:

Thank you for your submission dated July 1, 2019 to the New Jersey Department of Environmental Protection (the Department or NJDEP) which contains the “Development and Evaluation of Alternatives” (hereafter “the report”) for the City of Perth Amboy and MCUA. This report was submitted in a timely manner and was prepared in response to Part IV.D.3.v of the above referenced NJPDES permits. The report is part of the development of the Long-Term Control Plan (LTCP) submittal requirements, of which the next deliverable is due on June 1, 2020.

The overall objective of the Development and Evaluation of Alternatives Report is to develop and evaluate a range of CSO control alternatives that meet the requirements of the Federal CSO Control Policy Section II.C.4, N.J.A.C. 7:14A-11, Appendix C, and the USEPA Combined Sewer Overflows Guidance for Long-Term Control Plan (EPA 832-B-95-002). Such evaluation shall include a range of CSO control alternatives for eliminating, reducing, or treating CSO discharge events. This subject report builds on other previously submitted LTCP reports referenced in Part IV.D.3.b of the NJPDES permit, which includes an approved hydrologic, hydraulic and water quality model and other information in the June 2018 “System Characterization Report” (approved by the Department for the City of Perth Amboy on January 15, 2019 and MCUA on January 31, 2019); the June 2018 “Public Participation Process Report” (approved by the Department on February 6, 2019); the June 30, 2018 “NJCSO Group Compliance Monitoring Program Report” (approved by the Department on March 1, 2019; and the June 2018 “Identification of Sensitive Areas Report” (approved by the Department on April 8, 2019).

This subject letter serves to provide a response to the Development and Evaluation of Alternatives Report.

As per Part IV.G.4.e.i – vii of the above referenced NJPDES permits, the Development and Evaluation of Alternatives for the LTCP shall include, but not be limited to, an evaluation of the following CSO control alternatives:

- i. Green infrastructure.
- ii. Increased storage capacity in the collection system.
- iii. Sewage Treatment Plant (STP) expansion and/or storage at the plant while maintaining compliance with all permit limits.
- iv. Inflow and Infiltration (I/I) reduction to meet the definition of non-excessive infiltration and non-excessive inflow as defined in N.J.A.C. 7:14A-1.2 in the entire collection system that conveys flows to the treatment works.
- v. Sewer separation.
- vi. Treatment of the CSO discharge.
- vii. CSO related bypass of the secondary treatment portion of the STP in accordance with N.J.A.C. 7:14A-11.12 Appendix C, II C.7.

The Department finds that the report is a comprehensive analysis of a range of CSO control alternatives as identified in the NJPDES permit. A general overview of the information provided for the CSO control alternatives, as provided in response to Part IV.G.4.e, can be summarized below where the Department's comments follow:

- A variety of **green infrastructure** (GI) technologies were evaluated in Section 4.2.1 (Green Infrastructure), including rain gardens, right-of-way bioswales, enhanced tree pits, green roofs, porous asphalt, pervious concrete, and permeable interlocking concrete pavers. In Section 6.4.4 (Mixed Technology C – Summary and Estimated Cost), the impact of controlling runoff from 10% of impervious area was considered in addition to other CSO control alternatives.
- The report acknowledged **inflow and infiltration (I/I) reduction** efforts in Perth Amboy in Section 4.2.5 (Inflow and Infiltration Reduction). In Section 4.2.5.1 (Perth Amboy I/I Reduction Efforts) on page 4-37 it is stated, “Infiltration and inflow reduction on a system-wide scale is extremely costly to achieve, and the actual reduction levels to be achieved are not known until after the extensive sewer rehabilitation efforts are completed and evaluated with post-improvement flow monitoring.”

I/I reduction efforts by MUA were presented in Section 4.2.5.2 (MUA I/I Reduction Efforts). The report indicated that municipalities that convey flow to the MUA are obliged to maintain their local sewage systems in order to reduce I/I. Projects undergone by the MUA to rehabilitate its portion of the Main Trunk Sewer to reduce I/I are also discussed in this section of the report.
- **Sewer separation** in the City of Perth Amboy was discussed in Section 4.2.6 (Sewer Separation) and within Section 6 (Development and Evaluation of Alternative Approaches for CSO Control). Due to the amount of combined sewers within the City and the costly nature of complete sewer separation, the report determined that partial separation, in addition to other CSO control alternatives, would be an appropriate approach.
- The report includes an evaluation of a new **force main** (or multiple force mains) connecting Second Street Pumping Station to a new diversion chamber at the MUA Central Treatment Plant (CTP).

As described in Section 4.2.3.1 (Directing Combined Sewer Flows to the CTP) “The proposed force main to convey flow directly from the Second Street Pumping Station in Perth Amboy to the CTP would be approximately 2 miles in length and would be installed by horizontal directional drilling under the Raritan River”. Furthermore, the alternatives presented in the report included the proposed force main, as opposed to the current condition of Perth Amboy’s flow being conveyed from the Second Street Pump Station through Woodbridge Township’s Keasbey Interceptor.

- As discussed in Section 6, concrete **storage tanks** were evaluated as a control alternative for each CSO outfall group where the size and location of storage facilities were considered to meet control objectives. In Section 6.4 (Mixed Technology Alternatives), facility sizing, preliminary siting, and costs were proposed in various scenarios, along with other CSO control alternatives. As discussed in Section 6.3.3 (Tunnel Storage), **deep tunnel storage** was identified as a viable alternative where it is stated that further refinement of tunnel layout, size, and cost would be included in the LTCP.
- The report evaluated **satellite treatment** (i.e., treatment of the CSO discharge) facilities for each CSO outfall group in Perth Amboy as a control alternative in Section 6.3.2 (Satellite Treatment) and throughout Section 6.4 (Mixed Technology Alternatives). The report considered facility sizing, preliminary siting, and cost to include satellite treatment with various CSO control alternatives.
- The MCUA CTP has a NJPDES permitted flow of 147 million gallons per day (MGD), and a maximum peak-hour flow capacity of 340 MGD. The report evaluated the capacity of the CTP to receive higher wet weather flows from Perth Amboy via a new direct force main from the City to the CTP, as discussed in Sections 4.2.3.2 (Evaluation of Available Capacity at the CTP) and 4.2.3.1 (Directing Combined Sewer Flows to the CTP). A **capacity expansion** at the CTP was also discussed in Section 4.2.3.3 (Capacity Expansion at the MCUA CTP) but determined infeasible. Repurposing an off-line Aerobic Digester with a 4 MG storage capacity for **storage at the CTP** was discussed in Section 4.2.3.4 (MCUA CTP Storage Alternatives). Furthermore, **CSO related bypass** was considered in Sections 4.2.3.5 (MCUA CTP CSS Flow Bypass and HRT and Disinfection) and Section 6.5 (MCUA Plant Alternatives), utilizing a new dedicated high-rate treatment process train at MCUA as also referenced on page 4-33.

Specific Comments

Comment 1

The Department acknowledges that the permittees are working cooperatively to submit a single LTCP, as described in Section 1 (Introduction). Similarly, examples of coordination are shown in Section 4.2.3 (Treatment Plant) which includes a detailed discussion on the impact of additional flow conveyed to MCUA for treatment. The Department also acknowledges the completion of the Remington & Vernick Engineers (Revised March 2019) report, titled “Central Treatment Facility – Capacity Report Cost and Performance Analysis” and referenced within the report.

Currently, Perth Amboy’s flow is pumped from the Second Street Pumping Station (which is contractually limited to 13.6 MGD) to Woodbridge Township’s Keasbey Interceptor then ultimately to MCUA’s CTP. Capacity of the Woodbridge Keasbey Interceptor is displayed in Figure 1-2 in Section 1.4 (Regional Sewer System Overview). While there are examples of coordination between the permittees as shown in Section 4.2.3 (Treatment Plant), there is limited discussion within the report as to why the current Second Street Pump flow rates cannot be increased to maximize flow to MCUA’s CTP through the Keasbey Interceptor.

Please provide documentation of any discussions with Woodbridge Township regarding negotiations of the current contractual limitations.

Comment 2

The Department acknowledges the benefits of dividing the system into the depicted outfall groupings in Figure 2-1 within Section 2.4 (Identification of CSO Outfall Groups). Please acknowledge if it is your intention to evaluate percent capture on a system-wide basis, as displayed throughout Section 6.

Comment 3

This report did not explicitly select either the Presumption or Demonstration Approach for each hydraulically connected system; however, the permittee did provide information in support of the Presumption Approach in Section A.8.6 and other portions of the report. Please clarify if a determination has already been made in the selection of the Presumption Approach. If not, know that a final selection is required to be made in the “Selection and Implementation of Alternatives” report as part of the LTCP submission due on June 1, 2020. The Department acknowledges that the report states, “The Alternatives Evaluation Approach (either Presumption or Demonstration) will be selected when identifying the selected controls for implementation and will be presented in the subsequent Selection and Implementation of Alternatives Report in the Final LTCP.”

Comment 4

While a specific approach has not yet been selected as indicated on page 3-1, the Department notes that “percentage capture” is discussed in Section 2.2.2 (Baseline Percentage Capture) and throughout Section 6. Percentage capture is a component under the Presumption Approach.

Please provide the percent capture equation utilized to calculate any baseline and other percent capture values for each hydraulically connected system for report completeness. In addition, the percent capture presented in this report differ from those included in the previous Characterization report. Please verify that the system wide percent capture value is 57% as referenced in this July 1, 2019 submission.

Comment 5

A discussion of public participation and the CSO supplemental team is included in Section 3.4 and 4.3 (Supplemental CSO Team). As per Part IV.G.2 of the NJPDES CSO permit, public participation shall actively involve the affected public throughout each of the three steps of the LTCP process including the Development and Evaluation of Alternatives phase. The Department acknowledges that a listing of meetings and agendas for the CSO Supplemental Team, as well as a discussion of other public outreach, is included in your Public Participation Process Report dated June 29, 2018. Please amend Section 6.7 (Supplemental CSO Team) of this subject report with a brief summary of public participation activities as well as meeting dates specific to the development and evaluation of alternatives including a general overview of feedback on any alternatives presented that are specific to the City of Perth Amboy.

Moving forward, public participation is a required element of the Selection and Implementation of Alternatives for the LTCP. In addition, continued public participation must be provided to garner public input regarding CSO control alternatives where a description of such activities must be included in the LTCP. The discussion should include a description of the public participation activities that occurred during the development of these reports, the feedback opportunities provided, and how feedback was considered. It is also recommended that members of the CSO Supplemental Team be provided a copy of the report in advance of the June 1, 2020 due date to the Department.

Comment 6

While cost analyses are provided within the report, particularly in Section 5 (Basis for Cost/Performance Consideration), please note that the Department is not commenting on any cost analysis at this time and will defer its comments until the LTCP submission.

Comment 7

Current or “baseline” conditions are not clearly documented within the various control alternative phases on the report due in part to the fact that all considered alternatives include a new pumping station and force main directly connected to MCUA. For example, in Section 6.2.1 (Pumping Scenario 1: Peak Flow to MCUA – 13 MGD) it is stated:

“Peak flow to MCUA of 13 MGD represents the current condition. For the purpose of the LTCP, this scenario applies to the construction of a new pumping station and force main conveying peak flow directly to MCUA for treatment.”

Similarly, Section 6.4.1 is titled “Mixed Technology – Existing Pumpage”, while 13.6 MGD would continue to be pumped to MCUA, this alternative would include the construction of a new pumping station and force main and this should be included and clarified. Furthermore, Section 6.4.1.1 (Second Street Pumping Station) appears to also include this new infrastructure but it is not clarified. Please provide clarification or relabel phase names so that the baseline or “start” point is clear.

Comment 8

There is limited discussion regarding siting or available locations for storage and satellite treatment in Section 6.4 (Mixed Technology Alternatives). Please provide additional information regarding available land or space, particularly for the suggested tank sizes. In addition please describe whether any potential storage tanks would be surface or subsurface and, if subsurface, whether consideration has been given to any amenities such as parks, parking or GI. Note that several tables within Section 6.3 (Single Technology Alternatives) are missing units.

Comment 9

Throughout the report the year 2004 is utilized for the design of potential CSO control alternatives including for the sizing of storage and satellite tanks as well as for various treatment plant scenarios in Section 6. In accordance with the Federal CSO Control Policy, the assessment of system-wide CSO control alternatives is required to be based on an “average” or “typical” rainfall year. As stated within the May 2018 report entitled “Typical Hydrological Year Report”, 2004 was selected as the typical hydrological year. While a long term precipitation data set (i.e. greater than 30 years) was considered as part of this analysis, a more recent period was used in the ultimate selection of 2004 in order to consider local climate change. While use of the year 2004 does consider climate change, please be sure to consider resiliency requirements in the design of any infrastructure (e.g., storage and satellite treatment). Specifically, in accordance with the provisions of Executive Order 11988, the USEPA and the New Jersey Water Bank require that funded infrastructure be located outside of floodplains or elevated above the 500-year flood elevation. Where such avoidance is not possible, the following hierarchy of protective measures has been established:

1. Elevation of critical infrastructure above the 500-year floodplain;
2. Flood-proofing of structures and critical infrastructure;
3. Flood-proofing of system components.

While this comment does not necessitate a response at this time, these protective measures should be a consideration in the LTCP.

Comment 10

The following is stated in Section 6.4.4 (Mixed Technology Alternative C - Summary and Estimated Cost):

“This alternative is based on Alternative B with 10% green infrastructure applied to the entire City. The assumption for GI is that green technology is installed to control runoff coming from 10% of the pervious area.”

Please provide additional detail regarding a list of available locations that could be utilized for GI practices as well as an estimate of the number of acres that would be needed to attain this target. In addition, note that as you move forward with evaluating GI practices and potential siting locations, a quantitative measure or metric will need to be established in order to ensure that any credit is given towards overall CSO reduction goals. For example, an acceptable metric would be gallons of stormwater captured as part of any GI practice(s) that would then contribute to a resultant reduction in CSO volume.

Comment 11

There are certain instances throughout the report where sentences are incomplete. (e.g., in Section 4.2.5.1 (Perth Amboy I/I Reduction Efforts)) on page 4-37. Please revise accordingly.

Please incorporate these changes to the report and submit a revised version to the Department no later than 60 days from the date of this letter. Thank you for your continued cooperation.

Sincerely,



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CSO Team Leader
Bureau of Surface Water Permitting

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