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SHAWN M. LATOURETTE
*Acting Commissioner*

**Via E-mail**
June 11, 2021

Fred Margron, Town Engineer
City of Paterson
111 Broadway
Paterson, NJ 07507

Re: Review of the City of Paterson CSO Long Term Control Plan (LTCP) Selection and Implementation of Alternatives Report – Appendix N
City of Paterson, NJPDES Permit No. NJ0108880

Dear Mr. Margron:

Thank you for your submission dated October 1, 2020 entitled "The City of Paterson CSO Long Term Control Plan (LTCP) Selection and Implementation of Alternatives Report", as submitted, in a timely manner, to the New Jersey Department of Environmental Protection (the Department).

This report was submitted by the Passaic Valley Sewerage Commission (PVSC) on behalf of the City of Paterson as "Appendix N" in the "Selection and Implementation of Alternatives for Long Term Control Planning for Combined Sewer Systems – Regional Report" (Regional Report), where it was prepared in accordance with Part IV.D.3.b.vi of the above referenced New Jersey Pollutant Discharge Elimination System (NJPDES) permit. The Regional Report serves to comply with the Long-Term Control Plan (LTCP) submittal requirements as due on October 1, 2020.

The Regional Report presents a "Regional Alternative" for all PVSC's combined sewer communities as well as a "Municipal Alternative" which is shown in the individual appendices for each of its eight (8) member combined sewer municipalities. This subject letter serves to provide a response to Appendix N which is specific to the City of Paterson whereas a response to the Regional Report is provided under separate cover.

The overall objective of the LTCP is to identify and select 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). The Federal CSO Policy establishes a framework for the coordination, planning, selection, and implementation of CSO controls required for permittee compliance with the Clean Water Act. 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 on April 12, 2019); the June 30, 2018 "NJCSO Group Compliance Monitoring Program Report" (approved by the Department on March 1, 2019); the June 2018 "Public Participation Process Report" (approved by the Department on March 29, 2019); the

June 2018 "Identification of Sensitive Areas Report" (approved by the Department on April 8, 2019) and the June 2019 Development and Evaluation of Alternatives Regional Report (DEAR) (approved by the Department on January 17, 2020).

The below represents the Department's initial comments. The Department reserves the right to further comment on these issues. Comments are as follows.

**Section A, Introduction**

Comment 1: Section A.2, Description of the Combined Sewer System states the following:

> "Over the years, the City has constructed relief sewer systems (consisting of weirs, internal overflow chambers (IOCs), and large diameter relief sewers) in order to provide hydraulic relief to the combined sewer system. The relief sewer systems were specifically designed to prevent surcharging of the combined sewer systems and alleviate street flooding. (The relief sewer systems are prevalent in CSO Areas 028, 029, 030 and 031). When it was convenient, storm water inlets along the route of the relief sewers were connected directly to the relief sewer; however, most of the inlets in upstream areas remained connected to the combined sewer system. It should be noted that the relief sewer systems were constructed to provide hydraulic relief and alleviate street flooding; they were not intended to function as separated storm sewer systems. These new control facilities (weirs and IOCs) divert excess flow from the combined sewer system to the relief sewers, with the ultimate discharge of this excess flow being to the Passaic River. Overall, the relief sewer system contains 24 active internal control facilities, owned and operated by the City, which are tributary to four (4) combined sewer overflow discharge pipes."

While this comment does not necessitate a response, the Department acknowledges the inclusion of this descriptive information that provides an overview of the combined sewer system and serve to assist in providing background for the rest of the report.

Comment 2: Section A.3, Description of the City's Combined Sewer System Areas further states the following regarding CSO 028 (which is a brief description as reported in the 2007 Schoor DePalma Cost and Performance Analysis Report.):

> ***"CSO028 - S.U.M. Park 2***
> Outfall 028 (also known as the S.U.M. Park 2 Overflow) discharges to the Passaic River approximately 250 feet southeast of Hinchcliffe Stadium and approximately 500 feet east of the Great Falls. The 90" to 116" relief sewer was constructed as a bypass for the Molly Ann Brook into which additional storm sewers were constructed and connected. To provide hydraulic relief to the combined sewer system, nine (9) City owned and operated internal overflow chambers (IOCs) were constructed between the combined sewer system and the Molly Ann Brook bypass.
>
> As stated above, CSO Area 028 consists of nine (9) internal overflow chambers (IOC). It was determined that one (1) IOC has been plugged, and five (5) others did not record overflows during wet weather events. The five (5) IOCs will be plugged and abandoned in place, thus leaving three (3) functioning IOCs in this CSO Area. Static bar screens are proposed to be installed within the remaining three (3) roes (A I-3, A I-4, and A I-5). Each static bar screen will be constructed of 1" x 1/2" steel bars at 1/2" maximum spacing between bars. Additional support will be provided from 1/4" x 1/8" steel bars welded perpendicular to the screening bars at 10" center minimum. The bar screens will be angled (when possible) to facilitate manual servicing."

The Department acknowledges that an extensive relief sewer system is operated within the City to minimize street flooding although street flooding does still occur. Street flooding continues to be problematic in the area of DSN 028 where the 19th Street Relief Sewer for CSO 030 project is intended to alleviate flooding in this area. The Department also acknowledges that DSN 028 is not currently equipped with solids/floatables controls although the City does intend to install bar screens as described above in this excerpt.

The Department is in the process of incorporating DSN 028 into the NJPDES CSO permit since it is a CSO outfall via a NJPDES permit action. In addition, a construction schedule will be established through an Administrative Consent Order (ACO) to incorporate solids/floatables at DSN 028. This process is ongoing and it is the Department's intention to issue both documents simultaneously. However, given that DSN 028 is not currently equipped with solids/floatables controls, indicate such on Table A-1: City of Paterson CSO Structure Activity.

Comment 3: Section A.4, Sewer System Model Calibration Update states the following:

> "PVSC updated the calibration and validation of the system-wide InfoWorks Integrated Catchment Model (ICM) of the PVSC system based on in-system and overflow monitored in the 2015-2016 period. Monitored data at the permanent metering location at the Paterson Main Line and at temporary locations, including the inflow into Regulator 006A, underflow from 006A to the PVSC interceptor, and the Paterson Interceptor were used to guide the PVSC system-wide ICM update. The City of Paterson obtained this system-wide ICM model for localized calibration updates, as well as use in the development and evaluation of alternatives in the City's Long Term Control Planning (LTCP) effort.
>
> Hydrology parameter selection and runoff generation methodology were maintained, with the major difference being the disaggregation of large outfall-specific drainage areas into smaller subcatchments based on factors specific to the Paterson system. These factors include: (a) connectivity to internal relief points (regulators); (b) representation of potential locations for green infrastructure implementation; and (c) extent of sewer separation already performed by the City historically, and additional areas being considered for sewer separation to primarily address flooding concerns. The majority of differences between the CSO estimates documented in the 2007 Cost and Performance Report and this calibration update were the result of sewer separation efforts undertaken by the City in CSO028 and CSO029 drainage areas. Further changes came from outfall consolidation and additional sewer separation completed by the City since 2006. The PVSC system-wide model did not account for these changes. Thus, the City implemented these changes in the existing conditions ICM model and reviewed the calibration status at the permanent and temporary monitoring locations. Runoff from the separated areas at specific outfalls, including CSO028 and CSO029, is reported on its own to support the water quality modeling. However, it is not accounted for in the alternatives evaluation.
>
> Even with the changes noted above, the modeled combined sewage hydrographs generally showed higher peak flows and volumes during the chosen storm events. Considering that the Paterson system includes 23 outfalls, and the flow monitoring data was available only for a short period of time at fewer locations, the City decided to progress towards the LTCP effort with this conservative ICM model that overestimates the wet weather flow contributions from the City."

The Department acknowledges that modeling updates were performed for the purposes of the LTCP and that Paterson asserts that the model overestimates wet weather flow contributions. A modeling update is appropriate given the changes to the combined sewer system from sewer separation which have transpired from the last time the system was modeled. The Department also acknowledges that, because Paterson is at the northernmost end of the PVSC interceptor, changes to the Paterson system may not have as significant of an effect on the model as compared to communities that discharge to the interceptor in closer proximity

to the PVSC STP. However, regarding the second paragraph in the excerpt above, provide additional detail as to how runoff from the separated areas at specific areas including CSO 028 and CSO 029 were not accounted for in the alternatives evaluation.

Comment 4: Section A.5, Purpose of the LTCP Project, states the following:

> "In accordance with the Combined Sewer Overflow Individual permit recently issued by the NJDEP to the City of Paterson in 2015, the City is required to prepare its portion of a Long Term Control Plan for implementation into one integrated CSO Plan for the PVSC District service area."

In order to ensure that all nine components of the LTCP within this specific appendix are addressed for compliance purposes as well as for transparency for public review, supplement this section or Section D with a chart of each of the LTCP elements included in Part IV.G of the NJPDES CSO permit along with the identification of the specific section of another report. Below is a section from Appendix F of the Regional Report which can be used as a model:

**Table A-1: Review of Major Requirements of the SIAR**

| Permit Section | Permit Requirement | SIAR Section Reference |
|---|---|---|
| Part IV G1 | Characterization Monitoring and Modeling of the Combined Sewer System | Presented in the Regional LTCP as Appendix A |
| Part IV.G2 | Public Participation Process | Presented in the Regional LTCP as Appendix E |
| Part IV G3 | Consideration of Sensitive Area | Presented in the Regional LTCP as Appendix C |
| Part IV G4 | Evaluation of Alternatives | Presented in the Regional LTCP as Appendix D and summarized in Section C of this SIAR |
| Part IV G5 | Cost/Performance Considerations | See Section D.3 of this SIAR |
| Part IV G6 | Operational Plan | See Section F.6 of this SIAR |
| Part IV G7 | Maximizing Treatment at the Existing STP | See Appendix A of this SIAR |
| Part IV G8 | Implementation Schedule | See Section F.5 of this SIAR |
| Part IV G9 | Compliance Monitoring Program | Presented in Section K of the Regional LTCP |

**Section B, Screening of CSO Control Technologies (Intro to DEAR)**

Comment 5: Section B states the following:

> "…The sizing of greywater storage is ultimately limited by the facilities' collective "drain down" time. PVSC mandated that the total draining rate from all proposed storage facilities in an individual permittee's drainage area should not be greater than 75% of the permittee's total average dry weather flows. It was further noted that the drainage of the storage facilities to the PVSC interceptor during dry weather should not exceed three (3) days. With these conditions in mind, Paterson's combined sewer system dry weather flow was estimated at 13 MGD [million gallons per day], meaning that the City's storage alternatives must be sized to not exceed 10 MG of drainage per day, and be fully emptied within three (3) days."

It is then further stated:

> "The City of Paterson is a municipality at the northernmost (upstream) end of the PVSC Combined Sewer System. Given the City's unique geography in relation to the other municipalities in the PVSC District, the City had chosen in the DEAR to not evaluate additional storage at the Treatment Plant further..."

While the Department acknowledges that storage tanks or a tunnel were not selected, it appears that the 19th Avenue Relief Sewer would increase in line capacity. Confirm that the flow from the relief sewer would be routed to the interceptor then sent to PVSC for treatment. Confirm if this understanding is appropriate. Clarify any draw down time or agreement with PVSC to ensure proper conveyance through the sewer system.

**Section C, Evaluation of Alternatives**

Comment 6: Section C.2, Development and Evaluation of Alternatives states the following:

> "Prior to 2010, the City of Paterson had been experiencing street and basement flooding issues in the V2 flow area (upstream of CSO030) during rain events upstream of the V2-1 Regulator, which is located at the intersection of Vreeland Avenue and East 36th Street. The most severe flooding typically occurs on 18th Avenue between East 28th Street and East 31st Street; on 19th Avenue between East 32th Street and East 36st Street; on 20th Avenue between East 19th Street and East 22st Street; and around the St. Joseph's University Medical Center. In an effort to reduce these ongoing flood issues, a relief sewer design concept was proposed in 2010 that would be an extension of the combined sewer system in the V2 flow area. The 7700-linear foot relief sewer concept was estimated in 2012 to be an $18-19 Million project. However, while a general route location was discussed, it has not passed the preliminary discussion & design phase….We have modeled a hypothetical version of this relief sewer in one of the proposed alternative scenarios to analyze its potential impact on the combined sewer system if it was implemented as part of the LTCP."

Based on the above excerpt describe whether or not street and basement flooding is still occurring in the V2 flow area. The Department notes that the proposed 19th Avenue Relief Sewer is a key component of the Paterson LTCP given that it is intended to reduce or eliminate street and basement flooding. However, this project is characterized as being "preliminary" in design. The viability of this project must be expedited as indicated in Comment 14.

Comment 7: Section C.2, Development and Evaluation of Alternatives further states the following:

> "Table C-1 below shows the City's list of Preliminary Alternatives. The table summarizes information presented within the DEAR that shows how the costs and effectiveness of each alternative vary by level of CSO control…

**Table C-1: Summary of Preliminary Alternatives**

| Alternative | % Capture | Volume Captured (MG) | CSO Events | Cost Range ($ Millions) |
|---|---|---|---|---|
| **Baseline Conditions** | 82.1 | 0 | 53 | 0 |
| **Alt. 4A – 4C:** Sewer Separation since 2006 + Planned Sewer Separation + 19th Ave. Relief Sewer + Green Infrastructure (2.5%) + Storage / Treatment required **to reach 0 overflows** | 100.0 | 353.093 | 0 | $ 637 - $ 819 |
| **Alt. 5A – 5C:** Sewer Separation since 2006 + Planned Sewer Separation + 19th Ave. Relief Sewer + Green Infrastructure (2.5%) + Storage / Treatment required **to reach 4 overflows** | 97.9 | 312.177 | 4 | $ 363 - $ 468 |
| **Alt. 6A – 6C:** Sewer Separation since 2006 + Planned Sewer Separation + 19th Ave. Relief Sewer + Green Infrastructure (2.5%) + Storage / Treatment required **to reach 8 overflows** | 95.7 | 271.213 | 8 | $ 234 - $ 368 |
| **Alt. 7A – 7C:** Sewer Separation since 2006 + Planned Sewer Separation + 19th Ave. Relief Sewer + Green Infrastructure (2.5%) + Storage / Treatment required **to reach 12 overflows** | 93.8 | 234.080 | 12 | $ 203 - $ 327 |
| **Alt. 8A – 8C:** Sewer Separation since 2006 + Planned Sewer Separation + 19th Ave. Relief Sewer + Green Infrastructure (2.5%) + Storage / Treatment required **to reach 20 overflows** | 90.1 | 161.991 | 20 | $ 172 - $ 268 |
| **Alt. 9:** Sewer Separation since 2006 + Planned Sewer Separation + 19th Ave. Relief Sewer + Green Infrastructure (2.5%) + Storage required to reach **85% system capture within the City** | 85.3 | 69.894 | 36 | $ 78 |

"

The Department acknowledges that Section C is intended as a summary of the DEAR which was already approved by the Department. However, there were additional alternatives in the DEAR namely Alternatives 1 through 3. As described in Section D.2.1, Summary of Cost Opinions of the June 2019 DEAR:

> "Working from the City of Paterson's 2006 baseline year model, the City Engineer has reported that sewer separation projects completed since that time have totaled about $5 million This estimate (plus 20-year lifecycle projected maintenance costs) will serve as the cost for Alternative 1, which concludes the categorization of existing improvements made to the City's CSS [combined sewer system] that can be taken credit for under this LTCP.
>
> Alternative 2 is a proposed separation/in-line storage scenario that brings together the benefits of two planned projects aimed to reduce overflows and mitigate known flooding issues in the city. The first project aims to fully separate the storm and sanitary flows in the collection area of CSO023. The City Engineer has projected the costs of implementing this sewer separation project to be about $2.5-3 million. Secondly,…a concept plan for a flood relief sewer in the V2 flow area (towards CSO030) has been discussed since 2010, but has been unable to pass the preliminary discussion & design phase…"
>
> …
>
> Alternative 3 proposes to add green infrastructure technologies. For budget purposes, an estimate to manage the water-quality based storm event (1.25 inches over 2 hours) for approximately 2.5% of land area was conducted…"

It is also stated in Section C.2 of Appendix N that "Alternatives 4 through 8 build upon the benefits from the Alternative 3, using additional greywater storage and/or treatment." In order to ensure completeness

and promote understanding, include additional narrative to explain Alternatives 1 through 3 since it provides the baseline for Alternatives 4 through 8. Also, all the alternatives must include a plan to eliminate flooding in the V2 area.

**Section D, Selection of Recommended LTCP**

Comment 8: Section D.2, Selection Process states the following:

> "Subsequent to the Development and Evaluation of Alternatives Report, PVSC and its District permittee representatives continued to meet twice monthly to discuss various CSO Alternative approaches. As these meetings progressed, more simulations of the PVSC District H&H model were run, and a crucial discovery was made. It became apparent that the permittees fall under one of two categories under the current CSO Policy and Water Quality Standards.
>
> The first category is where a permittee meets water quality in its receiving waters under their current conditions, without any need for further CSO reduction. Several municipalities fit this distinction under the current standards for the Lower Hackensack River (North Bergen, Jersey City) and Newark Bay (Harrison, East Newark, Kearny, Newark, Bayonne). These water quality levels are already attained, and theoretically "doing nothing" will not preclude this attainment."

The Department disagrees with the assertion that available information demonstrates that current standards for the Lower Hackensack River and Newark Bay are already being attained and that "doing nothing" will not preclude this attainment. While this excerpt does not provide specifics to support this assertion, and the Department acknowledges that this assertion is not directed towards water quality in the City of Paterson, the Department maintains that the Baseline Compliance Monitoring Program did not have sufficient data to conduct an analysis against water quality standards to support this statement. In fact, this is stated on page 35 of the June 30, 2018 "NJCSO Group Compliance Monitoring Program Report"

> "The [Baseline Compliance Monitoring Program] BCMP was not designed to provide an adequate data volume for assessing attainment of water quality standards, which would have required five samples per month at each sampling location to compute monthly geometric means."

In addition, while not clear from the excerpt if this statement is intended to mean ambient data or modeling data, note that the Department is in in receipt of the "Calibration and Validation of the Pathogen Water Quality Model," September 2020 as submitted by the NJ CSO Group. Because this model is pending review, it is premature to claim that current water quality meets criteria through the model. Based on the above, delete these statements or revise.

Comment 9: Section D.2, LTCP Selection Process further states the following:

> "The City of Paterson and the Upper Passaic River fall into the second category, where water quality in the receiving waters can never be met, even with complete elimination of combined overflows. The same is true for the Lower Passaic River (Paterson, Harrison, East Newark, Kearny, Newark), as well as the Upper Hackensack River. This is due to a high number of background factors, including stormwater, upstream rivers, treatment plants, wildlife & other dry-weather sources. Recent model runs have clearly shown elevated concentrations of pathogens in certain locations during dry weather, driving the pathogen levels to far exceed current Water Quality Standards. Additionally, the Upper Passaic River has the unique distinction of being a Freshwater FW2 criteria water body source for E. Coli, and thus is subject to more stringent standards that must be met for water quality of this pathogen. Model studies for the District also show that if the background was hypothetically removed from the

equation, contaminants from combined sewer overflows are far below the established standard pathogen levels for the Upper Passaic River, and do not affect the attainment of water quality."

The Department acknowledges that there are background sources contributing to pathogen levels in the Passaic River. The Department disagrees with the conclusion that CSOs do not affect attainment of water quality given that the Pathogen Water Quality Model is pending review as described in the previous comment. Revise accordingly.

Note also that the permittee is required to comply with the Federal CSO Control Policy and has elected to do so through 85% capture of wet weather under the Presumption Approach. While the NJCSO Group permittees have submitted a Pathogen Water Quality Model, a modeling approach is germane to the Demonstration Approach. See Comment 10.

Comment 10: Section D.2, LTCP Selection Process states the following:

"A Presumptive Approach of 85% wet weather capture was chosen in Paterson, both under its proposed Municipal and Regional Alternative Plans. Under the Regional Alternative, the CSO controls implemented under Paterson's share of the LTCP are designed to help the PVSC District Permittees attain 85% wet weather capture as one hydraulically connected sewer system. Conversely, the Municipal Alternative is designed to attain 85% wet weather capture within the city independently. The technologies to be installed would be implemented over a proposed 40-year plan in Paterson..."

The Department acknowledges that the permittee has selected the following option under the Presumption Approach as a means of compliance:

"ii. The elimination of the capture for treatment of no less than 85% by volume of the combined sewage collected in the CSS during precipitation events on a system-wide annual average basis;"

Section D.3.6, Selection of Recommended Alternative Table D-3 is included as follows which shows that the selected projects are intended to attain an 85.3% capture target.

**Table D-3: Selection of Recommended Alternative from DEAR**

| Alternative | % Capture | Volume Captured (MG) | CSO Events | Cost ($ Millions) |
|---|---|---|---|---|
| **Alt. 9:** Sewer Separation since 2006 + Planned Sewer Separation + 19th Ave. Relief Sewer + Green Infrastructure (2.5%) + Storage required to reach **85% system capture within the City** | 85.3 | 69.894 | 36 | $ 78 |

Given the selection of the Presumption Approach, the derivation of percent capture is central to a review of this report. Supplement this report with the specific percent capture equation utilized as well as a detailed table of the numerical values utilized within the equation that was used to derive the baseline percent capture of 82.1% as well as the projected percent capture of 85.3%. Approval of this report hinges in part on the inputs and results of this equation being clearly demonstrated and reproducible.

Comment 11: Section D.3.3, Ability to Meet Water Quality Standards states the following:

"The City of Paterson has the unique distinction of being further north than any of the other PVSC District municipalities, which brings unique challenges. As previously stated in Section D.2 of this

Report, the Upper Passaic River is classified as a Freshwater FW2 water body source for measuring E. Coli. As a result, more stringent standards must be met to reach water quality there. The NJ Pathogen Criteria established for E. Coli in this FW2 receiving water body is currently set at 126 CFU/100 mL (Colony Forming Units per 100 milliliters).

Meanwhile, the standards for Fecal Coliform are already attainable. The Upper Passaic River is classified as an SE2 water body source for measuring Fecal Coliform, and NJ Pathogen Criteria is currently set at 770 CFU/100 mL. These standards of Fecal Coliform in the Upper Passaic far exceed the levels currently measured in these receiving waters, with NJ CSOs being one of the smallest contributors."

First, the Department agrees that the water quality standards for the City of Paterson are FW2-NT where the NJSWQS for E. Coli is currently 126 CFU/100 mL. However, the Department is unclear as to what data is utilized to support the contention that the standards for Fecal Coliform are already attainable. Provide accordingly. Secondly, the Department does not agree that the Upper Passaic River is classified as SE2 where the standard is set at 770 CFU/100 mL. Correct or clarify to state that the classification for Dundee Lake dam to the confluence with the Second River is FW2-NT/SE2. Finally, regarding the last sentence which asserts that NJ CSOs are one of the smallest contributors, provide factual support for this statement or revise to indicate that the Pathogen Water Quality Model is pending, as indicated in Comment 9.

Comment 12: Section D.3.4, Non-Monetary Factors states the following:

"Another important non-monetary factor of the selection process was community benefits. As public participation was maintained in Paterson throughout the development and selection processes, the public was eager to keep Green Infrastructure as a featured CSO control technology. While not capable of capturing wet weather runoff in larger volumes like most other control technologies, the City acknowledges the other benefits of GI apart from improved water quality. These can include enhanced community aesthetics, improved air quality from reconfigured landscapes, additional jobs to help operate and maintain implemented rain gardens and bioswales, and an effective means to eliminate overflow events at select CSO Outfall structures in the City prior to considering greywater technologies. As a result, the City sought to implement a scenario that captures 2.5% of impervious cover, which was determined to be the most achievable in terms of balancing necessary costs, volume capture, and implementation factors."

Additional detail regarding the more recent public participation process needs to be included. The Department acknowledges that public participation and public outreach has taken place through the PVSC Supplemental CSO Team as well as through the local group Paterson SMART. Provide a brief summary of public participation activities to date subsequent to the submission of the June 2018 Public Participation Process Report. This may also include any town council or municipality government meetings where CSO alternatives were discussed.

Public participation will continue in the next NJPDES permit and could include three primary goals: inform, educate and engage. The Department is evaluating this issue and is in the process of preparing updated NJPDES permit language to advance this issue for the next permit renewal. One element for future public participation could include public input on the siting of green infrastructure projects. Provide input on the viability of public input on this topic.

Comment 13: Section D.3.5, Cost Opinion states the following regarding storage:

"… It is assumed that storage facilities will require coarse screens at the upstream end, odor control, flushing systems and dewatering pumps sized to drain the tanks following storm events over two days…

…Therefore, annual O&M costs for satellite storage were developed based on assumptions associated with cleaning and maintenance efforts that would be required for such facilities. It was assumed that storage facilities would require a visit by a crew following each storm event for flushing, cleaning and overall maintenance and that there would be 60 storm events per year. The cleaning cost per day is assumed to be $1,500, which includes the cost of a water truck, a jet vac truck and two operators... "

The Department acknowledges that the City of Paterson has selected the following alternatives as shown in Table D-4:

**Table D-4: Recommended Alternative Technologies with Standardized Costs**

| CSO Control Technology | Quantity / Size | Units | Updated Capital Cost Total ($M) | Updated O&M Cost Total ($M) | Updated Life Cycle Cost (CC + Present Worth of Annual O&M Cost) ($M) |
|---|---|---|---|---|---|
| Sewer Separation Projects Completed Since 2006 | 47.5 | Acres | N/A | N/A | N/A |
| Planned Sewer Separation for CSO 023 | 29.8 | Acres | $ 8.9 M | $ 0.00 M | $ 9 M |
| 19th Ave. Relief Sewer for CSO 030 | 7700 | LF | $ 49.9 M | $ 0.00 M | $ 50 M |
| 2.5% Green Infrastructure | 75.0 | Acres | $ 29.3 M | $ 0.17 M | $ 32 M |
| 15' Dia. 1600 LF Storage Tunnel at CSO 025 (towards 85% Capture) | 2.1 | MG | $ 33.7 M | $ 0.10 M | $ 35 M |
| | | **Total** | **$ 121.8 M** | **$ 0.26 M** | **$ 126 M** |

Provide additional detail as to whether or not the 19th Avenue Relief Sewer and the 15' Diameter 1600 Linear Feet Storage Tunnel at CSO025 will require the same cleaning and maintenance procedures as described in Section D.3.5 above and if these operations and maintenance costs are included in the above table.

Comment 14: Regarding operations & maintenance for selected LTCP projects additional detail is required. Part IV.G.6 of the NJPDES CSO permit states the following regarding an Operational Plan:

"a. Upon Departmental approval of the final LTCP and throughout implementation of the approved LTCP as appropriate, the permittee shall modify the O&M Program and Manual in accordance with D.3.a and G.10, to address the final LTCP CSO control facilities and operating strategies, including but not limited to, maintaining Green Infrastructure, staffing and budgeting, I/I, and emergency plans."

In accordance with N.J.A.C. 7:14A-6.12 of the NJPDES Rules, the permittee must maintain and operate the treatment works and facilities installed by the permittee to achieve compliance with the terms and conditions of the discharge permit. The rules provide that proper operation and maintenance includes, but is not limited to, effective performance; adequate funding; effective management; adequate staffing and training; regularly scheduled inspections and maintenance; and adequate laboratory/process controls.

Amend the LTCP to include an Operational Plan, including the Emergency Plan and Asset Management Plan, to address effective performance; adequate funding; effective management; adequate staffing and training; regularly scheduled inspections and maintenance; and adequate laboratory/process controls. In addition, acknowledge that an operational plan will be prepared for the operation and maintenance of green infrastructure.

Comment 15: Section D.4.1, Sewer Separation Projects Completed Since 2006 states the following:

"As previously mentioned in Section B of this Report, sewer separation projects have been ongoing in many parts of Paterson since the early 2000s. The significant sewer separation efforts in the drainage areas to CSO028 and CSO029 are explicitly included in the baseline scenario, since the timeline for this effort has extended over two decades. However, since 2006, the city has undertaken targeted sewer separation efforts in some outfall drainage areas to address either localized flooding concerns or eliminate the need for CSO control. Partial sewer separation was observed in record drawings for the drainage areas serving Outfalls 003, 014, 015, 021, and 024, totaling 47.4 acres. These areas were added to the existing baseline separated areas in order to quantify the estimated CSO reduction benefits that have occurred since 2006. Over the course of the typical year model simulation, these sewer separation projects resulted in a CSO reduction of approximately 10 MG. Furthermore, the City has identified the CSO023 drainage area as a potential site for future sewer separation, totaling 29.8 acres and approximately 9.0 MG of potential CSO volume reduction in the typical year. In total, there are 1058.7 acres of former combined drainage areas that have been separated, or will be in the near future.

With these projects completed or already underway, Paterson may take credit for these CSO control benefits that currently exist within their combined sewer system.

Working from the City of Paterson's 2006 baseline year model, the City Engineer has reported that sewer separation projects completed since that time have totaled about $5 Million. This estimate, plus projected lifecycle maintenance costs, had served as the cost for Paterson's Alternative 1 scenario. However, since these separation projects are categorized as existing improvements made to the City's CSS that can be taken credit for under this LTCP, the costs are not factored into the financing of this LTCP."

The City of Paterson has selected the Presumption Approach namely the elimination of the capture for treatment of no less than 85% by volume of the combined sewage collected in the CSS during precipitation events on a system-wide annual average basis. As described previously in Section A.4 and Comment 3, the City obtained the system-wide ICM model from PVSC for localized calibration efforts as well as in use of the City's LTCP effort. As a result, sewer separation will already be accounted for in percent capture results. Confirm what the term "taking credit" is intended to mean regarding the total price tag of costs for the LTCP given that these costs have been incurred.

Comment 16: Section D.4.3, 19th Avenue Relief Sewer at CSO030 states the following:

"The second part of Paterson's Alternative 2 scenario is a concept plan for a relief sewer in the V2 flow area, towards CSO030 and primarily along 19th Avenue. This concept has been discussed since 2010, but has been unable to pass the preliminary discussion & design phase. The 7,700-linear foot relief sewer concept was estimated in 2012 by the City Engineer to be an $18-19 Million project to relieve substantial street and basement flooding that occurs through one of the busiest and most densely populated regions of the City.

The 19th Avenue Relief Sewer at CSO030 was discussed in the DEAR and is included in the final selection as noted in Section F.3, Implementation Cost Opinion. Describe any feasibility studies or engineering evaluation conducted to ensure that this selected alternative is not conceptual in nature but that it is a viable project for the LTCP.

Comment 17: Section D.3.5, Cost Opinion states the following regarding storage:

"… It is assumed that storage facilities will require coarse screens at the upstream end, odor control, flushing systems and dewatering pumps sized to drain the tanks following storm events over two days…

Confirm whether storage facilities are intended to mean the Storage Tunnel at CSO025 or if coarse screens, flushing systems and dewatering pumped are also needed for the 19th Avenue Relief Sewer at CSO030.

Comment 18: Section D.4.5, Storage Tunnel at CSO025 states the following regarding storage:

> **"** The final technology evaluated for feasible implementation in Paterson was in-line storage; more specifically, that which can be achieved through constructing large diameter tunnels deep underground. These can serve to connect the flow area of one CSO to another as regional alternative technologies are implemented. As with storage tanks, tunnels pump back wet weather flow into the system when the PVSC interceptor returns to dry weather conditions.
>
> The most feasible application of a storage tunnel in Paterson is near CSO025. This is an outfall whose drainage area is prone to flooding, lacks available land for a nearby tank, and is currently at the greatest need for greywater storage out of all of Paterson's active outfalls.
>
> The sizing of greywater storage under the LTCP is ultimately limited by the facilities' collective "drain down" time. PVSC mandated to each of the permittees that the total draining rate from all proposed storage facilities in an individual permittee's drainage area should not be greater than 75% of the permittee's total average dry weather flows. It was further noted that the drainage of the storage facilities to the PVSC interceptor during dry weather should not exceed three (3) days. With these conditions in mind, Paterson's combined sewer system dry weather flow was estimated at 13 MGD, meaning that the City's storage alternatives needed to be sized to not exceed 10 MG of drainage per day, and be fully emptied within three (3) days.
>
> … The tunnel is currently planned as 15 feet in diameter and 1,600 feet in length, which would flow south-to-north along East 33rd Street towards CSO025. About 2.1 million gallons of storage would be achieved with a depth likely over 100 feet below grade, dependent on the soil conditions and depth to bedrock, with dropshafts along the route for pumping operations."

Confirm that there is adequate capacity within the interceptor to accept these stored flows.

**Section E, Financial Capability**

Comment 19: Section E.3.2, Financial Capability Assessment quantifies the projected affordability impacts of the LTCP. To supplement this section the Department requests to see in table format in an Excel spreadsheet showing calculations, a year-by-year listing of (1) existing O&M costs and debt service; (2) CSO control program additional O&M costs, capital outlay and loan amounts, additional debt service and other additional costs; (3) current and projected wastewater treatment and CSO costs including residential share, number of households, cost per household; and (4) median household income and resulting residential indicator. A review of the financial capability analysis can not be conducted until this information has been provided.

Comment 20: Section E.3.4, Potential Impacts of the COVID-19 Pandemic in Affordability states the following:

> "Given the current and likely continuing uncertainties as to the New Jersey and national economic conditions, Paterson will be reticent to commit to long term capital expenditures for CSO controls without the incorporation of adaptive management provisions, including provisions to revise and reschedule the long term CSO controls proposed in this SIAR based on emergent economic conditions beyond the permittees' control. A revised affordability assessment should be performed during review

of the next NJPDES permit to identify controls that are financially feasible during that next permit period."

The Department agrees that financial capability and economic conditions are critical components of the LTCP review. As a separate process, the Department is currently conducting rulemaking for New Jersey's Environmental Justice Law (N.J.S.A. 13:1D-157) as signed by Governor Murphy on September 18, 2020, as indicated on the Department's website: https://www.nj.gov/dep/ej/

The Department agrees that an Adaptive Management approach could serve as a compliance "check in" as the projects proceed and an Adaptive Management requirement could be a component of a future NJPDES permit action. The Department agrees that Adaptive Management could also allow flexibility from the perspective of treatment technology advancements and compliance provided the resultant percent capture requirement is attained. However, while flexibility can be a component of each five year permit cycle, the permittee is obligated to set forth a path for compliance with the Federal CSO Control Policy through measures set forth in the LTCP. Note that any changes to projects set forth in the NJPDES permit as part of the LTCP will require a NJPDES permit modification or renewal. While this comment does not necessitate a response at this time, the Department hereby notes this information for the Administrative Record.

**Section F, Recommended Long-Term Control Plan**

Comment 21: Section F.3, Implementation Cost Opinion includes Table F-1 as the selected CSO control alternatives:

**Table F-1: Proposed Municipal Alternative Implementation Costs**

| Project Name/Benchmark | Capital Cost Opinion (Standardized) |
|---|---|
| Sewer Separation at CSO 023 | $8,940,000 |
| 19th Ave. Relief Sewer for CSO 030 | $49,872,308 |
| Green Infrastructure (75 acres) | $29,250,000 |
| 15' Diam. 1,600 LF Storage Tunnel at CSO 025 | $33,705,643 |
| Total | $121,767,951 |

Storage is a key component of the LTCP selection. Climate change can have an impact on resiliency for the CSO storage and resiliency requirements must be considered in the design of any infrastructure. 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.

Address how the selected CSO control alternatives address climate change and sea level rise.

Comment 22: Section F.4, Implementation Schedule includes Table F-2 as follows:

**Table F-2: Proposed 40-Year Municipal Alternative Implementation Schedule**

| Project Name/Benchmark | Year [1] | Capital Cost Opinion (Standardized) |
|---|---|---|
| Green Infrastructure - Pilot Study | 2021 | [2] N/A |
| Two (2) additional Sewer Separation projects (in vicinity of CSO 027 + at West Railway Avenue) | 2022 | [3] $4,000,000 |
| Sewer Separation at CSO 023 | 2023 | $8,940,000 |
| Green Infrastructure: +2 acres (2/75 ac. Total) | 2024 | $780,000 |
| Green Infrastructure: +3 acres (5/75 ac. Total) | 2025 | $1,170,000 |
| Green Infrastructure: +10 acres (15/75 ac. Total) | 2030 | $3,900,000 |
| Green Infrastructure: +10 acres (25/75 ac. Total) | 2035 | $3,900,000 |
| 19th Ave. Relief Sewer for CSO 030 | 2040 | $49,872,308 |
| Green Infrastructure: +15 acres (40/75 ac. Total) | 2045 | $5,850,000 |
| Green Infrastructure: +15 acres (55/75 ac. Total) | 2050 | $5,850,000 |
| 15' Diam. 1,600 LF Storage Tunnel at CSO 025 | 2055 | $33,705,643 |
| Green Infrastructure: +20 acres (75/75 ac. Total) | 2060 | $7,800,000 |
| | Total | $121,767,951 |
| Note 1: Projects are to be implemented and operational by the end of the listed year. | | |
| Note 2: The pilot study project is a joint venture with PVSC and is funded by PVSC. | | |
| Note 3: These projects are currently under an EPA consent order to be completed by the end of 2022. They have not been evaluated or priced under this LTCP. However, they are listed in this implementation schedule for the record as a means of taking credit for wet weather capture under a future cycle of the NJPDES CSO Permit. Cost guidance was given by the City Engineer. | | |

Enhance this table by providing a Gantt chart to indicate the start and end time for each of these projects as well as any overlap between projects. Additional detail is also needed for the timeline for those projects planned for the first five years. In addition, describe what is intended by Note 3. Similar to questions raised under Comment 15, describe what is intended by "taking credit."

Also, given that the 19th Avenue Relief Sewer for CSO030 is intended to reduce frequent street and basement flooding and address public health issues, the Department finds that commencement of this project in 2040 is not acceptable. Revisit this timeline.

In addition, describe the areas prone to flooding and explain if this flooding is strictly related to sewer backups, stormwater flooding or tidal inundation. Flooding of combined sewage in streets is a public health concern and is not acceptable. The LTCP must address the elimination of street flooding where this should be the utmost priority.

Please incorporate these changes to the report and submit a revised version of Appendix N 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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