3.7 Water and Sewer Infrastructure

3.7.1 Introduction

This chapter assesses the potential impacts of the Proposed Project on water and sewer infrastructure and has been prepared following the methodologies of the 2021 *City Environmental Quality Review (CEQR) Technical Manual*. The Proposed Project would not add population that would generate new water supply or wastewater demands; however, modifications to the existing combined and storm sewer systems, along with the installation of new drainage management infrastructure, are proposed to address storm event conditions. Therefore, this chapter focuses on analyzing these proposed modifications.

3.7.2 Principal Conclusions

The Proposed Project would not introduce any new sewer demands that would overburden the existing capacity of the combined and separate stormwater sewer systems that serve the area. The Proposed Project would, however, install a flood barrier system to meet the flood protection goal. The Proposed Project would also modify the sewer system to include isolation measures to prevent inflow of coastal storm surge into the Protected Area through the sewer system. In addition, the Proposed Project would provide stormwater management measures to handle a simultaneous tidal and rainfall event, including a new pump station, near surface isolation measures such as tide gates, upgraded manholes, and green infrastructure. Therefore, with these modifications in place, it is concluded that the Proposed Project would not result in any significant adverse impacts to the City's infrastructure systems.

3.7.3 Regulatory Context

Provided below is a summary description of the relevant federal, state, and local laws, programs, rules, legal requirements, and policies that pertain to the regulation of water and sewer infrastructure in New York City.

3.7.3.1 Federal

Clean Water Act (33 USC §§ 1251 to 1387)

The Federal Water Pollution Control Act, also known as the Clean Water Act, is the primary federal law in the United States governing the reduction of water pollution. It regulates sources of water pollution, such as discharges of municipal sewage and industrial wastewater, which are known as point sources. The Clean Water Act also regulates runoff from streets, agricultural fields, and construction sites that enter waterbodies, known as non-point source pollution.

Under Section 401 of the Clean Water Act, any applicant for a federal permit or any license for an activity that may result in a discharge to navigable waters must provide to the federal agency issuing a permit a certificate, either from the state where the discharge would occur, or from an interstate water pollution control agency, stating that the discharge would comply with Sections 301, 302, 303, 306, 307, and 316(b) of the Clean Water Act. Applicants for discharges to navigable waters in the State of New York must obtain

such a Water Quality Certificate from the New York State Department of Environmental Conservation (NYSDEC).

Section 402 of the Clean Water Act provides guidance on the National Pollutant Discharge Elimination System (NPDES), which governs the issuance of permits to control and prevent water pollution at point sources that discharge pollutants. In the State of New York, the NPDES permit program is administered through NYSDEC's State Pollution Discharge Elimination System (SPDES) permit program. Consistency with the Clean Water Act is evaluated for the Proposed Project, as changes to the sewer system (e.g., outfall locations and capacities) may require modifications to any existing SPDES permit(s) within the Study Area.

Combined Sewer Overflow Control Policy

The objective of the Combined Sewer Overflow (CSO) Control Policy (EPA FRL-4732-7, 59 Federal Register 18688) is to provide guidance to help areas served by combined sewer systems meet the objectives of the Clean Water Act. The policy provides site-specific guidance and flexibility to help communities implement appropriate CSO controls to meet appropriate health and environmental objectives. It also ensures that CSOs are only the result of wet weather events and that all discharge points are in compliance with the technological and water quality requirements of the Clean Water Act. It also establishes reporting measures to assess the progress made on federal, state, and local levels in enforcing and implementing the policy. Consistency with the CSO Control Policy is evaluated for the Proposed Project to confirm that any changes to the combined sewer system meet the Study Area's CSO control objectives.

3.7.3.2 New York State

State Pollutant Discharge Elimination System

Title 8 of Article 17 of the New York Environmental Conservation Law, Water Pollution Control, authorized the creation of the SPDES permit program to regulate discharges to the state's waters. Activities requiring a SPDES permit include point source discharges of wastewater into surface or ground waters of New York State, including the intake and discharge of water for cooling purposes; constructing or operating a disposal system (sewage treatment plant); discharge of stormwater; and construction activities that disturb one acre or more. Consistency with the SPDES program is evaluated for any proposed changes to the sewer system and construction activities that would disturb an area greater than one acre.

New York State Sanitary Code

Part 5 of the New York State Sanitary code (10 NYCRR 5) regulates public water supply. It ensures protection of drinking water resources both at the source and throughout the water treatment and distribution processes. This code is evaluated to ensure compliance for any modifications to or reconstruction of the existing water distribution system in the Study Area resulting from the Proposed Project.

3.7.3.3 New York City

Rules of the City of New York

Chapter 19.1 of Title 15 of the Rules of the City of New York is the Stormwater Construction Permitting Program and Chapter 31 of Title 15 of the Rules of the City of New York establishes guidelines for the issuance of permits for the construction, repair, alteration, and inspection of all sewer connections. The Unified Stormwater Rule (USWR) established in 2022 amended portions of Chapters 19.1 and 31 to align stormwater quantity and quality objectives established in those chapters. All USWR permit applications are to be submitted to and reviewed by the New York City Department of Environmental Protection (NYCDEP). The Proposed Project includes modifications of the combined sewer and separate storm sewer systems. As such, the Proposed Project would need to demonstrate compliance with these rules.

Combined Sewer Overflow Abatement Program and Combined Sewer Overflow Long-Term Control Plan (NYCDEP)

Implemented by NYCDEP, the objective of this program and the associated long-term control plans (LTCP) is to reduce pollutant loadings to the City's waters. The plans include field investigations, sewer system and water quality monitoring, and modeling in areas that are heavily impacted by CSOs to determine appropriate mitigation measures directed at the source controls and stormwater best management practices best suited for New York City. The CSO abatement program is being implemented in accordance with a 2005 Consent Order executed between NYSDEC and NYCDEP that establishes milestones for the completion of various planning and capital projects associated with the program. A 2011 modification to the Consent Order identified changes to various planned and ongoing CSO abatement construction projects as well as to LTCP milestones, funding for green infrastructure, and fines for any missed LTCP milestones. Consistency with the LTCP is evaluated for the Proposed Project since modifications to the existing combined sewer system are proposed.

Municipal Separate Storm Sewer System (MS4) Permit

Issued by NYSDEC, the Municipal Separate Storm Sewer System (MS4) permit is a Citywide permit program to address the Clean Water Act obligations to manage urban sources of stormwater runoff and reduce pollutants discharging to separate storm sewer systems. The purpose of the permit is to protect and improve water quality in receiving waterbodies. Under this permit, the City of New York is developing a Stormwater Management Program to address issues including runoff from municipal operations and facilities, floatable and settleable trash and debris, construction site stormwater runoff, and post-construction stormwater management. The guidelines of the MS4 permit are considered for the Proposed Project as they relate to its proposed modifications to storm and combined sewer systems.

3.7.4 Methodology

The Study Area for this assessment is comprised of the Project Area and the Protected Area (see **Figure 3.7-1**). As per the *CEQR Technical Manual*, no further analysis of water supply systems is needed if a project:

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Existing Sewer Infrastructure

NORTH/WEST BATTERY PARK CITY RESILIENCY

Figure 3.7-1

1. Does not result in an exceptionally large demand for water (more than one million gallons per day); or
2. If the project is not located in an area that experiences low water pressure.

Since the Proposed Project would not generate any new or increased water demand, no further demand analysis is required. With the exception of minor relocations that may be necessary to install or relocate sewer infrastructure, no modifications to existing water supply infrastructure are proposed as part of the Proposed Project. Construction will include measures to protect this existing infrastructure to ensure service is maintained throughout construction. Therefore, it is concluded that the Proposed Project would not result in any significant adverse impacts on the City's water supply system and no further analysis is required.

Similarly, the Proposed Project would not generate wastewater or increase impervious surfaces that generate stormwater runoff flows to the combined system. Therefore, it is concluded that the Proposed Project would not result in any significant adverse impacts with respect to added wastewater or runoff demands on the separate or combined sewer collection and conveyance systems.

Finally, per the *CEQR Technical Manual*, the purpose of this chapter is to describe the existing combined and storm sewer infrastructure and the drainage infrastructure improvements necessary to protect property and City streets from flooding under the design storm (i.e., a combined storm tide and rain event). Since the Project Area is served by both a combined sewer system and a separate stormwater sewer system, an analysis of both is provided below.

3.7.5 Existing Conditions

The Project Area is primarily waterfront open space and the Battery Park City Esplanade but includes segments of existing City- and State-owned street rights-of-way. Existing infrastructure in the Project Area is comprised of a system of water supply mains, storm sewers, sanitary sewers, and combined sewers, with three combined sewer outfalls and sewer regulators upstream of those outfalls as well as three separate stormwater outfalls (see **Figure 3.7-1**).

The Project Area is part of a larger sewershed, which is defined as the stormwater and wastewater collection area that drains to a single point, or outlet. All combined and sanitary sewers in the service area are hydraulically connected to an interceptor sewer, which in the Study Area is a large-diameter (up to 108-inch) pipe that collects drainage flows from smaller-diameter collection sewers (see **Figure 3.7-2**). All non-storm event combined and sanitary sewer flows generated in the Project Area and the Protected Area are conveyed to the Manhattan Pump Station located at East 13th Street and Avenue D where it is pumped to NYCDEP's Newtown Creek Water Resource Recovery Facility (WRRF). The Newtown Creek WRRF has a SPDES permit with a maximum permitted treatment flow rate capacity of 310 million gallons per day (mgd); the most recent reported average monthly dry weather flow data to the Newtown Creek WRRF is 212 mgd,[1] which is approximately 68 percent of its permitted capacity.

[1] Average monthly flow for the 12-month period through March 2017, the latest period for which data are available.

Existing Drainage to Manhattan Pump Station

NORTH/WEST BATTERY PARK CITY RESILIENCY

Figure 3.7-2

The portion of the Study Area within Battery Park City is served by separate sanitary and stormwater sewer systems. Sanitary flows are conveyed to the Manhattan Pump Station and Newtown Creek WRRF as described above, and stormwater runoff discharges directly to the Hudson River through a combination of storm sewer outfalls and direct drainage.

3.7.6 Environmental Impacts

Per the *CEQR Technical Manual*, an action has the potential for significant adverse impacts on water and sewer infrastructure if it results in physical changes to water or sewer infrastructure, increases demand for water or sewer service, or affects capacities for water or sewer service.

3.7.6.1 No Action Conditions

Under the No Action condition (i.e., the future condition without the Proposed Project) no flood barrier system would be installed nor would there be any upgrades in the existing sewer infrastructure within the Project Area, aside from one project to improve drainage in Rockefeller Park, described below. There are no known projects planned for the Study Area through 2030 that would result in large demands on the City sewer infrastructure.

An independent project within Battery Park City that will move forward under the direction of BPCA is comprised of targeted drainage improvements in Rockefeller Park with the objective of repairing and improving the existing drainage system and including repair and replacement of inlets coupled with the replacement of broken pipes, where needed. These improvements, which include raising seven currently buried/covered inlet structures, restoring full drainage function at four inlets, and cleaning out twenty inlets, would have very limited and targeted areas of disturbance and are expected to be completed in 2025.

One of the No Action projects is the South Battery Park City Resiliency (SBPCR) Project. Some components of the City sewer system will be modified per the SBPCR project for the purpose of isolating the sewer system from coastal storm surge. These modifications, however, would not affect the capacity or service of the existing sewer systems in the Project Area.

3.7.6.2 Proposed Action Conditions

To meet the Federal Emergency Management Agency (FEMA) flood protection certification requirements and to reduce flooding risk in the area, modifications to the existing drainage infrastructure are proposed to control the conveyance of floodwaters through the existing sewer system and into the Protected Area (i.e., the Study Area) during coastal surges. As described below, a number of sewer system improvements are proposed to preclude floodwater entry through existing stormwater outfalls and to manage interior drainage that collects from rainfall during coastal storm events.

Combined Sewer Infrastructure

As part of the Proposed Project, measures are proposed to prevent coastal storm surge waters from entering the Protected Area through the combined sewer system. These measures include isolating the

Protected Area from adjacent unprotected drainage areas through a Near Surface Isolation (NSI) system, isolation of the Protected Area from the City's existing sewer infrastructure, and management of excess rainfall within the Protected Area (see **3.7-3**). To accomplish this, an interior drainage management system would be implemented as outlined below:

- Tide gates would be installed at existing combined sewer and municipal separate storm sewer system (MS4) outfalls, including combined sewer outfalls NCM-071 and NCM-072; and the existing tide gate at combined sewer overflow NCM-073 would be relocated. New tide gates are also proposed at MS4 outfalls NCM-583 and NCM-584 (see **Figure 3.7-3**). Sluice gates would isolate those direct sanitary connections into the interceptor in the Study Area (discussed below, under "Sanitary Sewer Connections").
- To allow for the proposed flood wall to bridge over the historic bulkhead which is located immediately to the east of Stuyvesant High School and to facilitate the construction of a pump station within the plaza east of the High School (described below), the existing CSO pipe and tide gate structure would be relocated slightly to the east. There would be no changes to the existing CSO outfall would remain in its present location and condition.
- A 24-inch outfall would be installed near Belvedere Plaza to redirect stormwater runoff from the plaza directly to the river. The new outfall is part of the isolation approach for the Proposed Project to prevent storm surge from entering the Protected Area through underground drainage pipes.
- NSI improvements would prevent storm surge from flowing into the Protected Area through the combined sewer system. These improvements would consist of replacing existing sluicegates within the existing combined sewer regulator structures M4, M5, and M6 (see **Figure 3.7-3**), with new sluice gates that would be closed to prevent storm surge from entering the Protected Area through the regulator's connections into the interceptor sewer and then flooding the Protected Area. Also proposed, as part of the NSI system, six existing access manholes to the regulator chambers and seven interceptor manholes along Route 9A/West Street would be pressure-proofed, which would consist of structural retrofits within the existing manhole structures and/or installing manhole covers that can be sealed shut and locked during a flood event to resist pressure from the surge rising through the interceptor line and the piping that connects the manholes to the interceptor.
- Two slide gate structures are proposed, one in Reach 1 (along Harrison Street to the east of the intersection of Route 9A/West Street) and another farther south along Route 9A/West Street, to prevent floodwaters from entering the Protected Area during the storm surge. Both slide gate structures would be connected to one another via an overflow pipe and would redirect flow to the pump station proposed along Route 9A/West Street (see the description below) during design storm conditions. The slide gate along Harrison Street would be connected to the combined sewer that collects flow from Harrison Street and conveys it north along Route 9A/West Street. The slide gate farther south would be connected to the existing combined sewer that flows along Route 9A/West Street, connecting to the M4 regulator structure. During storm event gate closures, combined sewer flows in Harrison Street would be rerouted downstream of the slide gate further south via an overflow pipe and then to the pump station. The slide gate further south along Route 9A/West Street would

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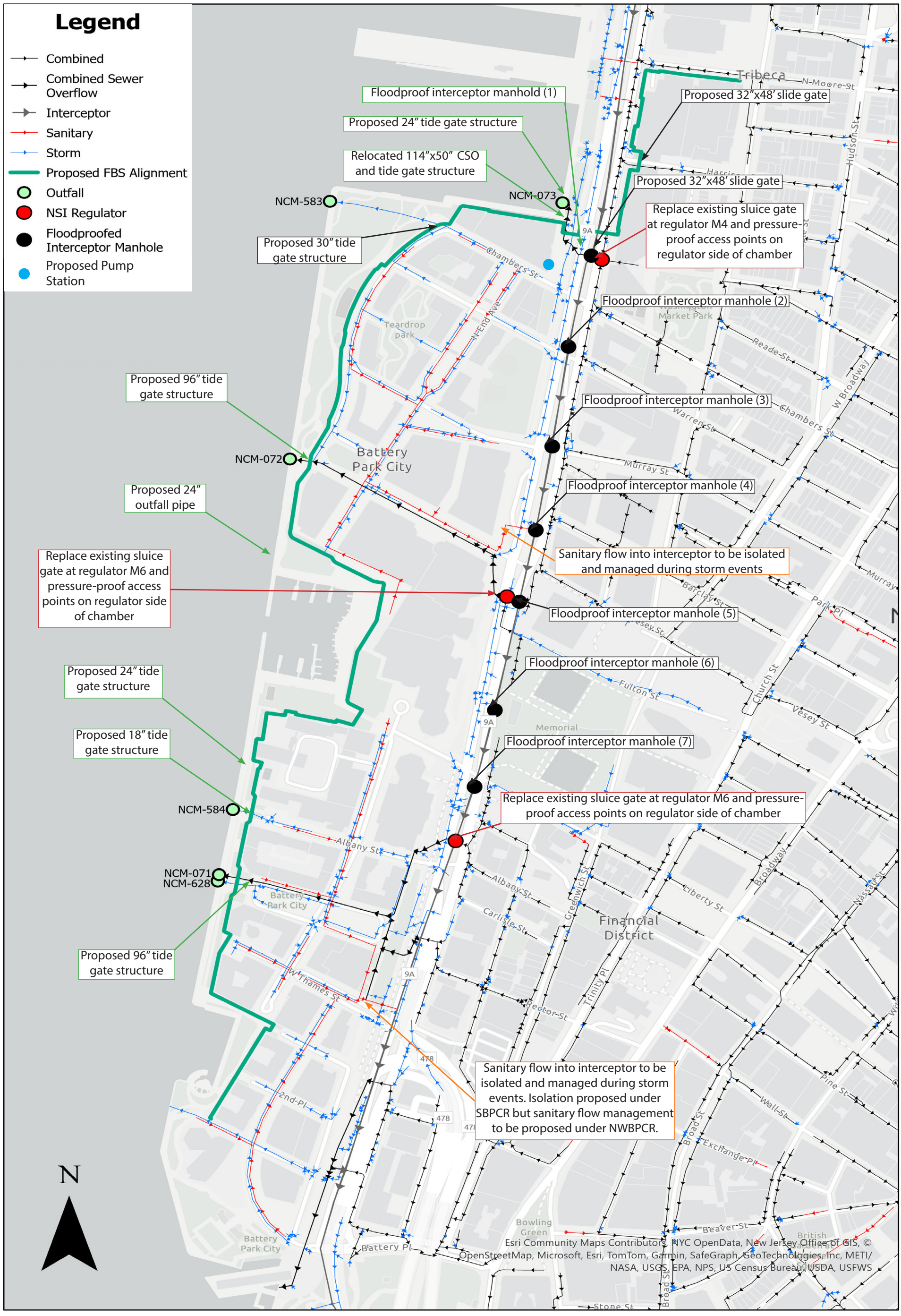


Proposed Sewer System Improvements

also be closed during these conditions to prevent the flows from the combined sewer pipe from entering the structure, allowing for only redirection of the incoming flow from Harrison Street.

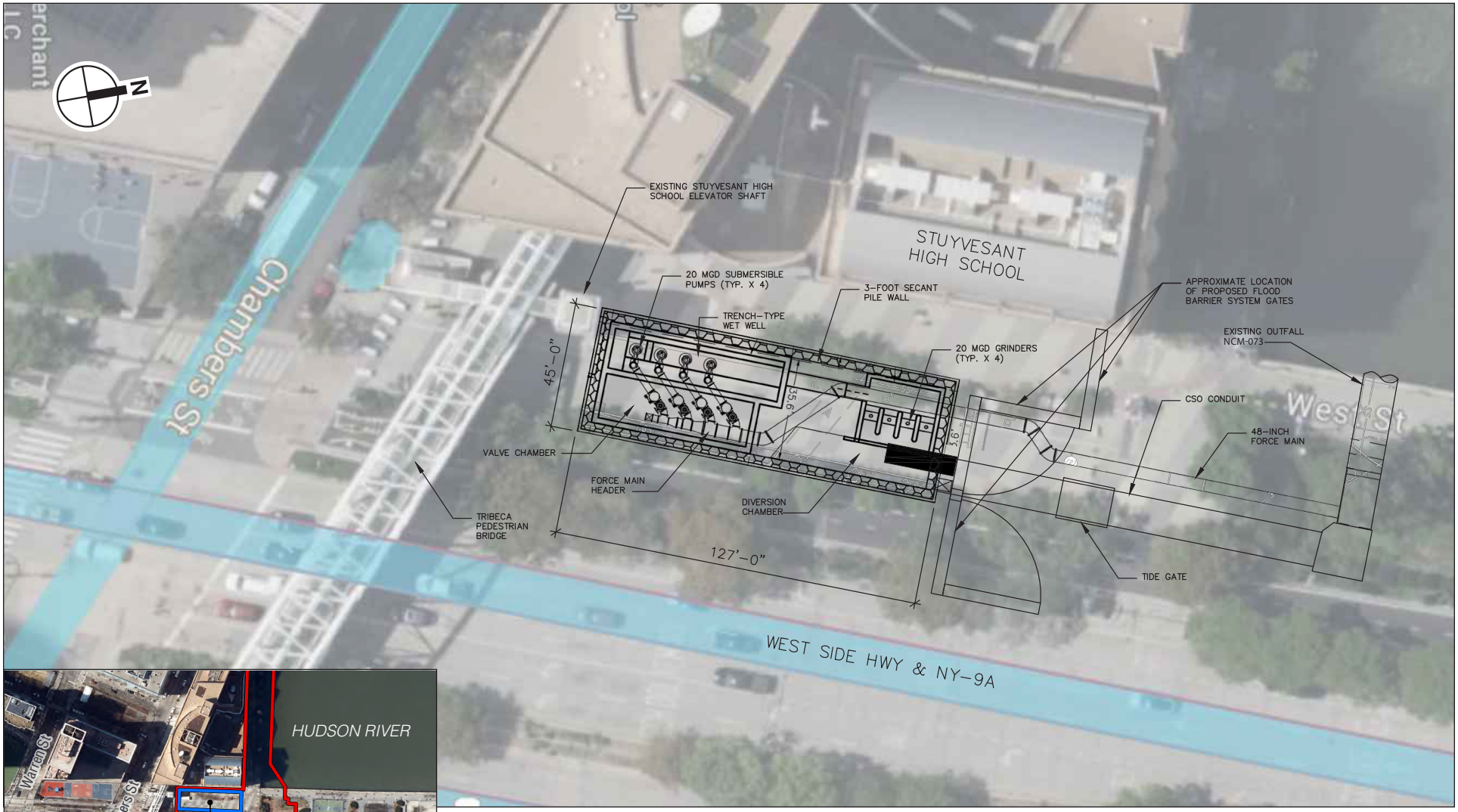
- A pump station would be constructed to pump drainage out from the Protected Area during the storm event. With the existing sewer system's isolation, preliminary modeling determined that interior flooding would result from the sewer system's inability to drain during storm surge events and rain events. Anew 60 million gallons per day (MGD) pump station is therefore proposed to be constructed to address flooding in the northern section Protected Area.[2] The pump station is proposed to be located below-grade at a pedestrian plaza adjacent to Stuyvesant High School, at the intersection of Chambers Street and Route 9A/West Street (see **Figure 3.7-4**). This location was identified as the preferred site for the pump station largely due to its available space and proximity to the proposed NCM-73 outfall discharge location. The primary components of the pump station would include two CSO connecting chambers (one for the influent line and one for the force main), an influent line, submersible centrifugal pumps, grinders, wet well, valve pit, force main, an electrical room, and means for connecting an emergency standby generator. The majority of the pump station components (with the exception of the operations structure and electrical room) would be below grade. See Chapter 1.0, "Project Description," for further details on the options currently under consideration for the above-grade operations structure within the Stuyvesant High School Plaza. New hydraulic connections would be constructed within Route 9A/West Street to connect the areas contributing to outfalls NCM-72 and NCM-73 to the pump station and to maximize the flooding mitigation east of Route 9A/West Street.

In coordination with NYCDEP, model evaluations have been conducted to confirm that there would be no significant adverse flooding impacts to the adjacent unprotected areas; as design progresses, additional modeling will be performed to confirm that the measures outlined above would prevent coastal storm surge waters from entering the Protected Area through the combined sewer system.

Sanitary Sewer Modifications

The Battery Park City portion of the Study Area is served by sanitary sewers that connect to the interceptor at two locations: Vesey Street and West Thames Street. Both connections have existing sluice gates inside the interceptor manhole connection. The sluice gates would remain in the open position during non-coastal storm events and would be activated to prevent interceptor flows from backing up into the sanitary sewer. At the Vesey Street interceptor connection, the sluice gate is proposed to be removed and replaced in case it is in poor condition. At the West Thames Street interceptor connection, the existing sluice gate at the West Thames Street sewer connection will be replaced as part of the SBPCR project described above).

[2] Other City-led projects being developed that will potentially mitigate flooding in the southern portion of Battery Park City and in other parts of Lower Manhattan include the Financial District and Seaport Climate Resilience Master Plan project, which would involve the construction of a 100- to 300-mgd pump station (the FiDi Pump Station) that would mitigate flooding in the Financial District and Seaport area, while having the potential to mitigate flooding in the southern area of Battery Park City with some additional drainage improvements within the Battery Park City drainage area to convey additional flows into the interceptor.



Proposed Pump Station Concept Design

The Proposed Project would include measures to manage sewer flow for both sewer connections during coastal storm surge events. Upstream of the Vesey Street interceptor connection, a new slide gate chamber and sanitary pipe would be constructed to convey flow to the combined sewer network. Upstream of the West Thames Street connection, a small lift station with submersible pumps would be installed to convey flow to the combined sewer.

Gateway Building Stormwater Improvements

At the Gateway Building, preliminary modeling showed that flooding occurs during storm surge conditions on the west side of the building. In addition, during storm surge conditions when water in the outfall is unable to drain, water will back up into the system and subsequently flood two patios located on the north and south sides of the building. To mitigate flooding in these areas, a sump pump would be installed on the south side of the building to manage stormwater for both patio areas. This sump pump would pump water downstream of the proposed tide gate structure.

BMCC Parking Lot Drainage Improvements

Under existing conditions, the BMCC parking lot discharges to a combined sewer in Route 9A/West Street that would be on the wet (west) side of the floodwall. In order to prevent storm surge from the combined sewer from backflowing into the parking lot, a backflow preventer would be installed, and a new overflow pipe would be installed to discharge the runoff produced from stormwater and seepage collected within the lot. The overflow pipe is proposed to allow runoff to be rerouted south along Route 9A/West Street and would be connected downstream of the parking lot's existing catch basin and set at a higher invert than the existing discharge pipe. The discharge pipe would cross under the floodwall to the west of the parking lot, before connecting to a proposed manhole on the unprotected side of the floodwall. The overflow pipe would connect to this manhole and then go south, cross Harrison Street and continue along Route 9A/West Street, until it goes under the floodwall. After going under the floodwall, it would connect with a proposed slide gate structure on the protected side of the floodwall. The flow exiting this structure would be managed by the pump station (described above).

Stormwater Infrastructure

The Proposed Project would not increase impervious surfaces; rather, it would result in a decrease in impervious surface in the Study Area. Similarly, the Proposed Project would not increase stormwater runoff contributions to the separately sewered system and would therefore not result in any significant adverse impacts with respect to runoff volumes to these sewers. This includes the widened North Esplanade where drainage would be addressed through a separate stormwater sewer system. Overall, the Proposed Project would provide the benefits of reduced flood risk in the area during coastal storm events with measures to prevent floodwater entry into the existing sewer systems with targeted infrastructure upgrades to support the management of rainfall runoff. However, as described above, the portion of the Project Area within Battery Park City is served by a separate stormwater sewer system with three stormwater outfalls. To preclude elevated tidal waters from entering the system during the design storm, tide gates are proposed to be installed at each of these existing stormwater outfalls (see **Figure 3.7-3**),

including at SW NCM-583 beneath Rockefeller Park, SW NCM-584 beneath Albany Street, and SW NCM-628 near Rector Park. The tide gate for SW NCM-628 is part of the SBPCR project described above.

Additionally, green infrastructure measures are proposed to provide additional stormwater management along the street corridors that reduce stormwater flooding from rainfall. In particular, Green Infrastructure (GI) post-construction stormwater management practices (PCSMPs) are proposed to meet the water quality stormwater regulations defined by NYCDEP in the USWR. The GI measures would include vegetated practices such as standard and high-performance rain gardens and non-vegetated practices such as hydrodynamic separators and porous pavers to reduce imperviousness, reduce peak flows, and provide some pretreatment of runoff.