Chapter 20: Construction

A. INTRODUCTION

This chapter summarizes a reasonable worst-case conceptual construction scenario for the proposed project under the Halletts Point Rezoning Large-Scale General Development (LSGD) Plan, and considers the potential for adverse impacts during construction. Construction activities, although temporary, can include noticeable and disruptive effects. Determination of the significance of construction impacts and need for mitigation is generally based on the duration and magnitude of the impacts. For construction activities of the scale and duration estimated for the proposed development, the *City Environmental Quality Review (CEQR) Technical Manual* (January 2012 edition) calls for an assessment of construction-related impacts, with a focus on transportation, air quality, and noise, as well as consideration of other technical areas such as historic and cultural resources, hazardous materials, and open space. The assessment focuses on project construction activities within the Halletts Point Rezoning LSGD Plan project site. As described in Chapter 1, "Project Description," the proposed project is expected to result in the development of new residential, retail, structured and surface parking, and open space uses on the Halletts Point Rezoning project site. The project site would contain eight building sites on which new development would occur with the proposed project, in addition to new publicly accessible open space, a waterfront esplanade, and a variety of infrastructure (sewer, water supply, and roadway) improvements that would occur within the LSGD Plan area. As discussed in detail in Chapter 1, "Project Description," seven of the building sites would be developed as part of the Applicant's proposal and one would be developed as part of a future request for proposals (RFP) by the New York City Housing Authority (NYCHA). In total, eight buildings (Buildings 1 through 8) would be developed on the project site.[1]

For analysis purposes, a reasonable worst-case conceptual construction phasing and schedule for the development anticipated to occur under the proposed project was developed to illustrate how development of the Halletts Point Rezoning Area could occur over approximately the next 10 years. Under the Applicant's currently contemplated construction schedule for the building sites under its control, construction of the proposed project would begin at the end of 2014, starting with site demolition and Building 1, followed by concurrent construction of Buildings 2 and 7A; next Building 5A would commence construction, followed by the concurrent construction of

[1] As discussed in Chapter 22, "Mitigation," a new school building on the Astoria Houses Campus is proposed to mitigate the proposed project's potential significant adverse impact on public elementary schools. The construction of the proposed school mitigation on the project site is not considered in this construction analysis. The potential effects of construction of the proposed school, as well as the effects of the construction of other project buildings on the school once completed, are addressed in Chapter 22, "Mitigation."

Buildings 5B and 7B; the simultaneous construction of Buildings 4 and 6B would follow, with the concurrent construction of Buildings 3 and 6A concluding the construction of the Applicant-controlled sites. As Building 8 is not controlled by the Applicant, it is assumed that this building would be constructed at the end of the overall project construction period. Overall, project construction would be completed in 2022. However, the reasonable worst-case conceptual construction schedule described in this chapter has been analyzed instead of the Applicant's currently contemplated schedule because it provides a more conservative representation of potential construction impacts. The reasonable worst-case schedule conservatively accounts for overlapping construction activities and simultaneously operating construction equipment, thus capturing the cumulative nature of construction impacts which would result in the greatest impacts at nearby receptors, and assumes overlapping activities at Buildings 5 and 8, which would have the potential for the greatest impacts on adjacent NYCHA properties and the Hallet's Cove Playground. The reasonable worst-case conceptual construction phasing and schedule for the proposed project is described in this chapter, followed by the types of activities likely to occur during construction. An assessment of potential impacts of construction activity and the methods that may be employed to avoid or minimize the potential for significant adverse impacts are then presented.

For each of the various technical areas presented below, appropriate construction analysis years were selected to represent reasonable worst-case conditions relevant to that technical area, which can occur at different times for different analyses. For example, the noisiest part of the construction may not be at the same time as the heaviest construction traffic. Therefore, the analysis periods may differ for different analysis areas. Where appropriate, the analysis accounted for the effects of elements of the proposed project that would be completed and operational during the selected construction analysis years.

While the anticipated construction durations have been developed with an experienced New York City construction manager, the discussion is only illustrative as specific means and methods will be chosen at the time of construction. At this time, there are no specific construction programs or finalized designs for the proposed project. The construction durations have been conservatively chosen to serve as the basis of the analyses in this chapter and are representative of the reasonable worst-case assumptions for determining potential construction period impacts. The conceptual schedule represents a conservative potential timeline for construction, which shows overlapping construction activities and simultaneously operating construction equipment for the proposed project's eight building sites and other planned project elements (i.e., new open spaces, the proposed waterfront esplanade, and/or infrastructure improvements) in proximity to one another. Thus, the analysis captures the cumulative nature of construction impacts, which would result in the greatest impacts at nearby receptors.

PRINCIPAL CONCLUSIONS

There would be temporary inconvenience and disruption arising from the construction of the proposed project throughout the Halletts Point LSGD Plan area. Given that the eight building sites and other proposed area improvements (public spaces, waterfront esplanade, and infrastructure improvements) are distributed over the approximately 12 acres of the proposed LSGD Plan area, one or more building sites and other portions of the project site would be under construction over the course of the approximately nine year construction duration anticipated for the "build out" for the proposed project. As construction activity associated with the Halletts Point LSGD Plan area would occur on multiple building sites and other locations within the same geographic area, such that there is the potential for several construction timelines to overlap, an assessment of potential construction impacts was prepared in accordance with the guidelines of the *CEQR Technical Manual*, and is presented in this chapter. As detailed below, construction of the proposed project would result in significant adverse construction impacts related to transportation and noise. Potential mitigation for these significant adverse impacts is discussed in Chapter 22, "Mitigation."

TRANSPORTATION

Construction in the future with the proposed project (the Build condition) is expected to result in significant adverse traffic impacts during peak construction, but generally at lesser magnitudes than impacts identified under the Build condition, as summarized below. For purposes of the construction traffic analysis, the first quarter of 2021 (peak construction traffic is expected to occur during this quarter) was assessed. For transit, although construction worker trips would not result in any significant adverse impacts during construction, bus line-haul impacts identified for the 2022 Build condition may also occur during peak construction in 2021 during the commuter peak hours. Similar mitigation measures as those identified for the 2022 Build condition (i.e., bus frequency increase) are expected to also address the potential impacts during construction. The proposed project is not expected to result in any significant adverse parking or pedestrian impacts during construction.

Traffic

During peak construction in 2021, the project-generated trips would be less than what would be realized upon the full build-out of the proposed project in 2022. Therefore, the overall extent of potential traffic impacts during peak construction would be within the envelope of significant adverse traffic impacts identified for the Build condition in Chapter 15, "Transportation." However, because Astoria Boulevard may not be open to traffic until the proposed project is near completion and traffic patterns near the project site would be different from those analyzed for potential operational traffic impacts, a detailed analysis during construction was prepared for several key study area intersections (seven in total) near the project site to identify potential construction-related significant adverse traffic impacts. During this time, the projected construction activities would result in 348 passenger car equivalents (PCEs) between 6 and 7 AM and 292 PCEs between 3 and 4 PM on weekdays. Since some components of the proposed project would have already been completed and occupied, operational traffic generated by those completed components together with the projected construction traffic were considered for the construction traffic impact analysis. The total number of project generated (construction-related and operational) vehicle trips generated during construction would be approximately 49 percent less than the total number of vehicle trips generated by the completed development project during the weekday AM peak hour and 31 percent lower during the PM peak hour. Nevertheless, a detailed analysis of traffic conditions was completed for seven key intersections near the project sites, and this analysis indicated that significant adverse traffic impacts would occur at five locations during construction, but generally at lesser magnitudes than impacts identified under the Build condition. Where impacts during construction may occur, measures similar to the ones recommended to mitigate impacts of the proposed actions could be implemented early to aid in alleviating congested traffic conditions.

Maintenance and Protection of Traffic (MPT) plans would be developed, reviewed, and approved by the New York City Department of Transportation's (NYCDOT) Office of Construction Mitigation and Coordination (OCMC) for curb lane and sidewalk closures as well as equipment staging activities. It is expected that traffic and pedestrian flow along all surrounding streets would be maintained throughout the entire construction period, with the exception of sidewalks adjacent to two of the project's northern buildings near the intersection of 26th Avenue and 1st Street.

Parking

The majority of construction workers (approximately 70 percent) are expected to drive to the project site. It is expected that all construction worker parking would be accommodated on-site within areas yet to undergo construction or within completed parking garages.

Transit

The estimated number of total peak hour transit trips would be 150 during peak construction in 2021. These construction worker trips would occur outside of peak periods of transit ridership, would be distributed and dispersed to nearby transit facilities, and would not result in any significant adverse transit impacts during construction. However, bus line-haul impacts identified for the 2022 Build condition may also occur during peak construction in 2021 during the commuter peak hours. Similar mitigation measures as those identified for the 2022 Build condition (i.e., bus frequency increase) are expected to also address the potential impacts during construction.

Pedestrians

The estimated number of construction-related peak hour pedestrian trips traversing the area's sidewalks, corners, and crosswalks would be up to 500 during peak construction in 2021. These trips are expected to have minimal effects on pedestrian operations during the construction peak hours. As discussed in Chapter 15, "Transportation," the proposed project would not result in any significant adverse pedestrian impacts at any of the analysis locations. Therefore, like the Build condition, there would not be any significant adverse pedestrian impacts during peak construction.

AIR QUALITY

The *CEQR Technical Manual* lists several factors for consideration in determining whether a detailed construction impact assessment for air quality is appropriate. These factors include the need for a transportation analysis, the duration of construction tasks, the intensity of construction activities, the location of nearby sensitive receptors (such as residences), and emissions control measures. All of these factors have been taken into consideration in the detailed construction air quality analysis undertaken for the proposed project.

Almost all emissions from construction activities would be near ground level; therefore, the highest air quality impacts from construction activities would be expected at ground level locations. The increments from elevated operational stationary sources at ground level locations would be negligible. In addition, as described above under "Transportation," the cumulative operational and construction traffic increments would be of lower magnitudes than what would result from the overall proposed project when completed in 2022. A detailed analysis of the combined effects of on-site and on-road emissions determined that annual-average nitrogen dioxide (NO_2), carbon monoxide (CO), and particulate matter with an aerodynamic diameter less than 10 microns (PM_{10}) concentrations would be below their corresponding National Ambient Air Quality Standards (NAAQS). Therefore, the construction of the proposed project would not cause or contribute to any significant adverse air quality impacts with respect to these standards.

Dispersion modeling determined that the maximum predicted incremental concentrations of particulate matter with an aerodynamic diameter less than 2.5 microns ($PM_{2.5}$) (using a worst-case emissions scenario) would not exceed the City's applicable annual interim guidance criterion of 0.3 $\mu g/m^3$ but would exceed the 24-hour interim guidance criterion of 2 $\mu g/m^3$ at a few receptor locations, including at proposed Buildings 6A and 7A and the open space area southwest of proposed Building 8, where the likelihood of prolonged exposure is very low. The occurrences of elevated 24-hour average concentrations for $PM_{2.5}$ would be limited in duration, frequency, and magnitude. Therefore, after taking into account the limited duration and extent of these predicted exceedances, and the limited area-wide extent of the 24-hour impacts, it is concluded that no significant adverse air quality impacts for $PM_{2.5}$ are expected from the on-site construction sources.

NOISE AND VIBRATION

Noise

Development pursuant to the proposed project would have the potential to result in significant adverse impacts with respect to construction noise. This conclusion is based on a conservative analysis of the construction procedures, including peak quarterly (i.e., three month) levels assumed to represent each year of construction, a maximum amount of construction equipment assumed to be operational on each development site and at locations closest to nearby receptors, peak hour construction equipment and truck delivery operations occurring simultaneously, and a compressed construction schedule with a maximum amount of development sites under construction simultaneously.

Construction on the proposed building sites would include noise control measures as required by the New York City Noise Control Code, including both some path and source controls. Even with these measures, the results of detailed construction analyses indicate that elevated noise levels are predicted to occur at fifty-one (51) of the seventy-nine (79) existing receptor sites analyzed. Affected locations include residential, institutional and open space areas adjacent to the proposed development sites and along routes expected to be traveled by construction-related vehicles to and from the project site. However, most affected buildings have double-glazed windows and air-conditioning, and would consequently be expected to experience interior $L_{10(1)}$ values less than 45 dBA, which would be considered acceptable according to CEQR criteria. At affected locations that do not already have double-glazed windows and air conditioning, interior $L_{10(1)}$ values resulting from construction may consistently exceed 45 dBA, and even at some locations that do already have double-glazed windows and an alternate means of ventilation, interior $L_{10(1)}$ values may exceed 45 dBA during construction.

Thus, should the proposed project be developed and constructed as conservatively presented in this conceptual schedule, up to fifty-one (51) existing locations could experience significant impacts for certain limited periods during construction. At the two open space locations with the potential to experience construction noise impacts, there would be no feasible or practicable mitigation to mitigate the construction noise impacts.

Additionally, because of very high levels of construction noise from construction on buildings attached to them, Buildings 6A/6B and 7A/7B would have the potential to experience significant adverse noise impacts during construction if either segment of either building is occupied during the construction of the other segment of the building.

Some potential receptor controls that could be used to mitigate the impacts at residential locations where interior L_{10} values would be expected to exceed the value considered acceptable by CEQR criteria are discussed in Chapter 22, “Mitigation.”

Between the Draft Environmental Impact Statement (DEIS) and Final Environmental Impact Statement (FEIS), a refined construction noise analysis will be undertaken to more precisely determine the magnitude and duration of the elevated noise levels resulting from construction at these locations. The refined analysis will examine the practicability and feasibility of relocating some equipment within the construction sites to add distance and/or shielding between the equipment and the adjacent receptors. It will also analyze in detail additional time periods throughout the construction period to determine whether the analysis results in the DEIS are conservatively overstated as a result of representing each year during the construction period based on peak construction quarters that include the greatest amount of construction activity according to the conceptual construction schedule.

Vibration

The proposed project is not expected to result in significant adverse construction impacts with respect to vibration. While construction may result in vibrations that would be perceptible and annoying, they would not result in vibration levels with the potential to result in damage to nearby structures. Use of construction equipment that would have the most potential to exceed the 65 vibration decibels (VdB) criterion within a distance of 230 feet of sensitive receptor locations (e.g., equipment used during pile driving) would be perceptible and annoying. Therefore, for limited time periods, perceptible vibration levels may be experienced by occupants and visitors to all of the buildings and locations on and immediately adjacent to the construction sites. However, the operations which would result in these perceptible vibration levels would only occur for finite periods of time at any particular location and, therefore, the resulting vibration levels, while perceptible, would not result in any significant adverse impacts.

OTHER TECHNICAL AREAS

Historic and Cultural Resources

As described in Chapter 8, “Historic and Cultural Resources,” there are no archaeological resources on the project site. Therefore, construction of the proposed project would have no significant adverse impact on such resources.

Architectural resources are defined as buildings, structures, objects, sites, or districts listed on the State and National Registers of Historic Places (S/NR) or determined eligible for such listing, National Historic Landmarks (NHLs), New York City Landmarks (NYCLs) and Historic Districts, and properties that have been found by the New York City Landmarks Preservation Commission (LPC) to appear eligible for designation, considered for designation (“heard”) by LPC at a public hearing, or calendared for consideration at such a hearing (these are “pending” NYCLs). There are no known architectural resources located on the project site or in the study area. Therefore, construction of the proposed project would have no significant adverse impact on architectural resources.

Hazardous Materials

The proposed project would not result in significant adverse impacts with respect to hazardous materials during construction.

The proposed project would result in the demolition of existing structures and excavation on the eight building sites, and areas of the other project elements. Development would occur on the Eastern (i.e., Building 1) and WF Parcels (i.e., Buildings 2 through 5), and the sites of Buildings 6, 7, and 8 (collectively, the building sites) within the NYCHA Astoria Houses Campus. No development would occur at Whitey Ford Field or Hallet's Cove Playground, or elsewhere on the project site. Although certain new buildings would include cellar space (primarily for parking), this space would be created through a combination of raising the grade around the building and limited excavation (likely less than six feet). Construction would also entail some deeper excavation, e.g., for construction of elevator pits and certain utilities. The proposed project would also include a new connecting street segment between existing mapped portions of Astoria Boulevard on the NYCHA Parcel. An assessment of potential hazardous materials impacts was performed for the Halletts Point LSGD Plan area where ground disturbance from construction activities could occur as part of the proposed project. The hazardous materials assessment identified potential historical and existing sources of contamination within the project site.

The Phase I ESAs identified potential hazardous material concerns at all of the building sites and the connecting street segment location. All parcels likely have fill materials of unknown origin and all existing structures have the potential to contain asbestos-containing materials (ACM), lead-based paint (LBP) and polychlorinated biphenyls (PCB) -containing electrical components. ACM may also be present as insulation around underground steam lines, several of which are known to be present. The Limited Phase II Subsurface Investigations, performed at the proposed locations of Buildings 1A through 5B (the Eastern and WF Parcels), found generally elevated levels of semi-volatile organic compounds (SVOCs) and metals, but the levels were typical of urban fill materials, rather than indicative of a spill or release. Evidence of volatile organic compounds (VOCs) contamination in groundwater was found at two locations which could be associated with historical on- or off-site releases.

Excavation activities associated with construction of the proposed project could temporarily increase pathways for human exposure. To reduce the potential for human or environmental exposure to known or unexpectedly encountered contamination during and following construction of the proposed project, supplemental testing and a Remedial Action Plan (RAP) and associated Construction Health and Safety Plan (CHASP) would be prepared for implementation at all development sites during proposed construction.

For sites under the Applicant's control (Building Sites 1-5), an (E) designation would be assigned (requiring the owner to comply with MOER investigative and remedial requirements as a condition of obtaining Department of Buildings' construction and occupancy permits) and sampling and remedial protocols and reports will be submitted for review and approval by the New York City Mayor's Office of Environmental Remediation (MOER).

For sites subject to disposition by NYCHA (Building Sites 6-8), the New York City Department of Environmental Protection (DEP) and the New York City Department of Housing Preservation & Development (HPD) would review and approve sampling protocols and the RAP and CHASP. Implementation of any approved RAP/CHASP would occur as part of construction and would be required through a Development Agreement between NYCHA and the Applicant/developer or a Restrictive Declaration.

Demolition of existing structures would be conducted in accordance with applicable regulatory requirements relating to asbestos, lead-based paint and PCB-containing components. Any dewatering required for construction of the proposed project would be conducted in accordance with DEP sewer use requirements (and New York State Department of Environmental Conservation [NYSDEC] requirements in the case of discharge to the East River). If petroleum storage tanks are encountered during project construction, these tanks would be properly closed and removed, along with any contaminated soil, in accordance with the applicable regulations, including NYSDEC spill reporting and registration requirements.

With these measures, construction of the proposed project would not result in any significant adverse impacts related to hazardous materials.

Open Space

Construction of the proposed project would not result in any significant adverse impacts to open space. Construction of the proposed project would not remove or alter any existing publicly accessible open spaces, and construction of the proposed project would not change the use of Hallet’s Cove Playground or Whitey Ford Field. Furthermore, construction of the proposed project would not limit access to these parks or other open space resources in the vicinity of the project’s building sites or other project elements.

However, because construction of Building Sites 1 and 2 on the project site would occur immediately adjacent to Whitey Ford Field, and construction of Building Site 5 would occur immediately adjacent to Hallet’s Cove Playground, special measures would be taken to prevent construction activities intrusion into these open spaces. In each case, a solid fence would be erected along the perimeter of the site that borders the open spaces. The fence would have no openings between the construction site and the open spaces and would be high enough to reduce sound from construction activity from these building sites, to the extent practicable, and to minimize dust. The hoists, cranes, and other equipment would be located on the side of the building sites away from the open spaces. As the superstructure is being erected, netting would be installed on the side of the building facing the open space to prevent any materials from falling into the open spaces.

Construction activities would be conducted with the care mandated by the close proximity of an open space to the project site. Dust control measures—including watering of exposed areas and dust covers for trucks—would be implemented to ensure compliance with the New York City Air Pollution Control Code, which regulates construction-related dust emissions. As discussed below, there would be no significant adverse air quality impacts on open spaces.

However, as described in the Noise section of this chapter, at limited times some project site and study area public and private open spaces (including some of the private open spaces at the NYCHA Astoria Houses Campus) would experience project-related short-term significant noise impacts from activities such as excavation and foundation construction. This would also be the case for new project site open spaces being developed incrementally as part of the proposed project–the waterfront esplanade. In these instances, the portion of the new esplanade already completed, would experience project-related short-term significant noise impacts for the construction of subsequent adjacent building sites. These activities would generate noise that could impair the enjoyment of nearby public open space users, but such noise effects would be temporary and of short duration (3 to 4 months for each building site adjacent to the open spaces). However, because of the temporary nature of these impacts, and their short duration (in all cases less than 5 months), these would not be considered significant.

Socioeconomic Conditions

The proposed project would not result in significant adverse construction impacts with respect to socioeconomic conditions.

Construction could, in some instances, temporarily affect pedestrian and vehicular access on street frontages immediately adjacent to the proposed project's eight building sites or the areas of the other project elements. However, lane and/or sidewalk closures are expected to be of very limited duration, and are not expected to occur in front of entrances to any existing or planned retail businesses, construction activities would not obstruct major thoroughfares used by customers or businesses, and businesses would not be significantly affected by any temporary reductions in the amount of pedestrian foot traffic or vehicular delays that could occur as a result of construction activities, because of the MPT measures required by NYCDOT. Utility service would be maintained to all businesses, although very short-term interruptions (i.e., hours) may occur when new equipment (e.g., a transformer, or a sewer or water line) is put into operation. Overall, construction resulting from the proposed project is not expected to result in any significant adverse impacts on surrounding businesses.

Construction would create direct benefits resulting from expenditures on labor, materials, and services, and indirect benefits created by expenditures by material suppliers, construction workers, and other employees involved in the direct activity. Construction also would contribute to increased tax revenues for the city and state, including those from personal income taxes.

Community Facilities

Construction activities related to the proposed project would not physically displace or alter any existing community facilities. No study area community facilities would be directly affected by construction activities for an extended duration. However, because the proposed project has been found to have the potential to result in a significant adverse impact on elementary schools, preliminary discussions have been held between the Applicant and the School Construction Authority (SCA), and are expected to continue between the DEIS and FEIS, with regard to the provision of a new school building serving kindergarten through grade 8 within the NYCHA Astoria Houses Campus, as a mitigation measure for a potential school impact. The construction of the school as a mitigation measure, as well as ongoing project construction effects on the school once it is operational, is discussed in detail in Chapter 22, "Mitigation." The construction sites would be surrounded by construction fencing and barriers that would limit the effects of construction on nearby facilities. Construction workers would not place any burden on public schools and would have minimal, if any, demands on libraries, child care facilities, and health care. Construction of the proposed buildings and the other project elements would not block or restrict access to any facilities in the area, and would not materially affect emergency response times. New York Police Department (NYPD) and Fire Department (FDNY) emergency services and response times would not be materially affected as a result of the geographic distribution of the police and fire facilities and their respective coverage areas.

Natural Resources

Construction of the proposed project would not result in significant adverse impacts to groundwater, floodplains, water quality, aquatic biota, wetlands, terrestrial natural resources, and threatened or endangered species within and near the project site. Construction activities along the East River waterfront would include rehabilitation and stabilization of failing shoreline revetments, installation of four new stormwater outfalls, and rehabilitation of two existing DEP stormwater outfalls, and construction of an esplanade. The proposed stabilization and repair of shoreline armoring would be limited to the replacement of existing rip-rap and debris in some areas with granite rip-rap for improved scour protection. These activities would not result in a net increase in fill below Mean High Water (MHW) and Spring High Water (SHW) or a change in the shoreline configuration that would result in loss of bottom habitat. The four new stormwater outfalls would be constructed above the SHW elevation and within the riprap revetment. Maintenance and minor repair of two existing DEP outfalls would consist of clearing of debris and obstructive vegetation growth, and augmentation of deficient rip-rap. The proposed boardwalk esplanade would not extend over the MHW or SHW elevation.

Within the upland portion of the project site, construction of the proposed project would result in removal of existing vegetation and buildings. While construction of the proposed project would require minimal tree removal, it would not eliminate or degrade valuable wildlife habitat. No threatened or endangered terrestrial species are known to occur or have the potential to occur on or in the vicinity of the project site. Overall, the proposed project would not result in any significant adverse impact to threatened, endangered, and special concern species and significant habitat areas.

The proposed project would be covered under the NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity Permit No. GP-0-10-001. To obtain coverage under this permit, a stormwater pollution prevention plan (SWPPP) would be prepared and Notice of Intent (NOI) would be submitted to NYSDEC. The SWPPP would comply with all of the requirements of GP-0-10-001, NYSDEC's technical standard for erosion and sediment control, presented in "New York Standards and Specifications for Erosion and Sediment Control," and NYSDEC's Stormwater Management Design Manual. The SWPPP would include both structural (e.g., silt fencing, inlet protection, and installation of a stabilized construction entrance) and non-structural (e.g., routine inspection, dust control, cleaning, and maintenance programs; instruction on the proper management, storage, and handling of potentially hazardous materials) best management practices (BMPs). Implementation of erosion and sediment control measures and stormwater management measures identified in the SWPPP would minimize potential impacts to wetlands and aquatic resources along the edges of the project site associated with discharge of stormwater runoff during land-disturbing activities resulting from the construction of the proposed project.

Significant adverse impacts to groundwater would not occur as a result of construction or operation of the proposed project. Because groundwater is not used as a potable water supply in the area, there would be no potential impacts to drinking water supplies. In the event that construction dewatering is necessary, the recovered groundwater would be pretreated, if necessary, in accordance with NYSDEC and/or DEP requirements prior to being discharged to the East River or the DEP storm sewer. Any hazardous materials encountered during grading or other land-disturbing activities would be handled and removed in accordance with DEP, NYSDEC, OSHA, and EPA requirements, and the required RAP/CHASP approved by DEP and HPD (for Building Sites 6-8, subject to disposition by the city), or MOER (for Building Sites 1-5, under the Applicant's control). To ensure these required procedures are followed, Building Sites 1-5 will have (E) designations assigned, whereas the Building Sites 6-8 requirements would be incorporated into the Development Agreement between NYCHA and the Applicant/developer or a Restrictive Declaration.

Land Use and Neighborhood Character

Construction activities resulting from the proposed project would affect land use on the eight building sites and the areas of the other project elements, but would not alter surrounding land uses. As is typical with construction projects, during periods of peak construction activity there would be some disruption, predominantly noise, to the nearby area. There would be construction trucks and construction workers coming to the various sites. There would also be noise, sometimes intrusive, from building construction as well as trucks and other vehicles backing up, loading, and unloading. These disruptions would be temporary in nature and would have limited effects on land uses within the study area, particularly as most construction activities would take place within each of the building sites, areas of the other project elements, or within portions of sidewalks, curbs, and travel lanes of public streets immediately adjacent to these sites. Throughout construction, access to surrounding residences, businesses, and institutions in the area would be maintained. In addition, measures would be implemented to control noise, vibration, emissions, and dust on construction sites, including the erection of construction fencing incorporating sound-reducing measures. Overall, while the construction at the various building sites and areas of the other project elements within the Halletts Point LSGD Plan area would be evident to the local community, the limited duration of construction at each of the proposed project's building sites and the areas of the other project elements would not result in significant or long-term adverse impacts on local land use patterns or the character of the nearby area.

Rodent Control

Construction contracts for the seven building sites (Building Sites 1-7) and areas of the other project elements which are controlled by the Applicant would include provisions for a rodent (mouse and rat) control program. Similarly, such controls would be expected to be provided by any future developer of Building Site 8, as standard construction practice. Before the start of construction at any given site in the Rezoning Area, construction contractors would survey and bait the appropriate areas and provide for proper site sanitation. During the construction phase, as necessary, the contractors would carry out a maintenance program. Coordination would be maintained with appropriate public agencies. Only U.S. Environmental Protection Agency-(EPA) and NYSDEC-registered rodenticides would be utilized, and the contractors would be required to perform rodent control programs in a manner that avoids hazards to persons, domestic animals, and non-target wildlife.

B. ANALYSIS APPROACH

The construction analysis presented in this chapter considers the potential impacts of construction activities anticipated to occur throughout the Halletts Point Rezoning LSGD Plan area (the project site) as a result of the proposed project. As discussed in Chapter 1, "Project Description," while the actual timeline for construction of Building Site 8 is not known at this time, it has been conservatively assumed to occur within the overall 9 year construction period anticipated for the proposed project, and therefore has been included in this assessment.

C. METHODOLOGY

This section discusses the level of analysis used to assess the potential for significant adverse impacts in each of the construction-related analysis areas presented in the *CEQR Technical Manual*. For each of the various technical areas presented below, appropriate construction analysis years were selected (as necessary) to represent reasonable worst-case conditions relevant to that technical area, which can occur at different times for different analyses. For example, the noisiest part of the construction may not be at the same time as the heaviest construction traffic. Therefore, the analysis periods may differ for traffic, air quality, and noise. In each section, the methodologies to determine the period of reasonable worst-case conditions for assessing potential impacts are explained. All methodologies used in the impact analyses are in accordance with the *CEQR Technical Manual.* For all construction-related analysis areas, the methodologies used to assess potential construction-related impacts can be found in the chapters for each analysis area addressing potential operational impacts. Additional details relevant only to the construction air quality and noise analysis methodologies are given in their respective analysis sections below.

The next section in this chapter describes the conceptual construction schedule, the construction methods to be used, and city, state, and federal regulations and policies that govern construction. This section also establishes the framework used for the assessment of potential impacts from construction. The construction timeline—determined by the timing of the various major construction stages associated with constructing a building, such as excavation and foundation, core and shell construction, and interior finishing—is described. The types of equipment are discussed, and the number of workers and truck deliveries estimated. The analyses use these data to determine the potential for significant adverse environmental impacts.

D. CONSTRUCTION PHASING AND ACTIVITIES

INTRODUCTION

The following section describes the conceptual construction schedule and methods and means of construction. While the methods and means described below have been developed with an experienced New York City construction manager (and are commonly used in New York City), the discussion is only illustrative as other means and methods may be chosen at the actual time of construction. The described means and methods are conservatively chosen to serve as the basis of the analyses in this chapter and are representative of the reasonable worst-case for potential impacts.

If the proposed project is approved, complete build-out of the various project elements and the eight building sites within the overall project site would occur over time, with the last buildings (Buildings 5 and 8) anticipated to be completed in 2022. If the proposed project is not approved, it is expected that no development would occur on project site, which would be expected to remain in its current condition. This section of the chapter first gives an overview of the anticipated conceptual construction phasing and schedule for the proposed project, and then provides a detailed description of each type of major construction activity and the types of equipment typically associated with each. The major construction activities discussed include: abatement and demolition; site preparation and utilities; excavation and foundations; construction of the core and shell of the building; exterior cladding; interior fit-out; and site work and finishing. General construction practices are then presented, including those associated with deliveries and access, hours of work, and sidewalk and lane closures. Finally, the estimated number of workers and truck deliveries for project construction are presented. Following the discussion of construction techniques, the chapter discusses potential impacts with regard to transportation, air quality, noise and vibration, historic and cultural resources, hazardous materials, open space, socioeconomic conditions, community facilities, natural resources, land use and neighborhood character, and rodent control.

CONCEPTUAL CONSTRUCTION PHASING AND SCHEDULE

While the anticipated construction durations described below have been developed with an experienced New York City construction manager, the discussion is only illustrative as means and methods may be chosen at the time of construction. At this time, there are no specific construction programs or finalized designs for the proposed project. The described construction durations are conservatively chosen to serve as the basis of the analyses in this chapter and are representative of the reasonable worst-case for potential impacts. The analyses conservatively account for overlapping construction activities at the eight building sites in proximity to one another to capture the cumulative nature of construction impacts with respect to numbers of workers, trucks, and non-road engines on site at the various building sites within the project site at any given time, within reasonable construction scheduling constraints for the proposed project. Additionally, the reasonable worst-case conceptual construction schedule conservatively identifies the first quarter of 2021 as the period of peak construction activity as well as the peak for cumulative effects, because the reasonable worst-case conceptual construction schedule accounts for the cumulative effects of overlapping operational and construction activities for the proposed project as well as nearby no build projects, most notably the proposed Astoria Cove project.

Figure 20-1 and **Table 20-1** present a conceptual schedule of construction for the proposed project. In the conceptual construction schedule, construction activities are assumed to begin in the last quarter of 2014, with the onset of area-wide demolition and remediation activities on the project site. If the proposed project is approved, complete build-out of the eight proposed building sites and other associated project elements would occur over time, with the last building sites (Building Sites 5 and 8), and the new connecting street segment of Astoria Boulevard on the NYCHA parcel, estimated to be completed in 2022.

Table 20-1
Conceptual Construction Schedule

Proposed Project Building Sites and Associated Project Elements	Start Month	Finish Month	Approximate duration (months)
Area-wide Demolition of Existing Structures	October 2014	December 2015	15
Building Site 1 (Buildings 1A & 1B)	December 2014	October 2016	21
Building Site 2	April 2016	February 2018	23
Building Site 3	September 2017	July 2019	23
Building Site 4	December 2018	October 2020	23
Building Site 5 (Buildings 5A & 5B)	May 2020	April 2022	24
Building Site 6: Building 6A	September 2017	June 2019	22
Building Site 6: Building 6B	December 2018	August 2020	21
Building Site 7: Building 7A	April 2016	January 2018	22
Building Site 7: Building 7B	July 2020	February 2022	20
Building Site 8 [1]	June 2020	April 2022	23
Astoria Boulevard Roadway Paving [2]	November 2021	April 2022	6

Notes:
Construction of the proposed Waterfront Esplanade and associated upland connections is included in the construction durations and estimates for the construction of Buildings 2 through 5, as each of these building sites will also involve the construction of the corresponding portion of the esplanade and upland connections.
[1] Building Site 8 would be developed as part of a future RFP by NYCHA. While the actual timeline for construction of Building Site 8 is not known at this time, it has been conservatively assumed to occur within the overall 9 year construction period anticipated for the proposed project.
[2] The roadway paving indicated is for the new connecting street segment between existing mapped portions of Astoria Boulevard on the NYCHA parcel, which would be constructed as part of the proposed project.
Source: Lend Lease (US) Construction LMB, Inc.

Construction activities for the proposed project would begin in October 2014 with the onset of area-wide demolition and remediation activities, which would be completed in about 15 months. Construction at Building Site 1 would begin in December 2014 and is expected to take about 21 months to complete. Construction on Building Site 2 and of Building 7A would begin in April 2016. Construction on Building Site 2 would be completed in approximately 23 months, while Building Site 7A is expected to take about 22 months to complete. Construction on Building Site 3 and of Building 6A would begin in September 2017. Construction on Building Site 3 would be completed in approximately 23 months, while Building Site 6A is expected to take about 22 months to complete. Construction would commence in December 2018 at Building Site 4 and Building 6B, and would take approximately 23 and 21 months to complete, respectively. Construction at Building Site 5, Building 7B, and Building Site 8 would all be anticipated to commence in 2020. Building Site 5 construction activities would begin in May 2020, and would take about 24 months to complete. Construction activities for Building Site 8 and Building 7B are anticipated to begin in June and July of 2020, respectively, and are anticipated to take about 23 months to complete for Building Site 8, and about 20 months for Building 7B. Construction and paving of the new connecting street segment between existing mapped portions of Astoria Boulevard on the NYCHA parcel would commence in November 2021 and would be completed in about 6 months, by April 2022.

During construction of the proposed project, the highest number of workers and trucks would both be expected to occur in the first quarter of 2021. These peak construction activities during the early part of 2021 reflect the anticipated concurrent construction at three building sites in the project area (Buildings 5, 7B, and 8), with all three undergoing labor intensive overlapping construction stages (Building Core, Shell, and Finishing) simultaneously during that quarter.

CONSTRUCTION DESCRIPTION

OVERVIEW

Construction of mid-rise or large-scale buildings in New York City typically follows a general pattern. The first task is construction startup, which involves the siting of work trailers, installation of temporary power and communication lines, and the erection of site perimeter fencing. Then, if there is an existing building on the site, any potential hazardous materials (such as asbestos) are abated, and the building is then demolished with some of the materials recycled and the debris taken to a licensed disposal facility. For sites requiring new or upgraded public utility connections, these activities are undertaken next (e.g., electrical connections, and installation of new water or sewer lines and hook-ups, etc.). Excavation and removal and/or addition and re-grading of the soils is the next step, followed by construction of the foundations. When the below-grade construction is completed, construction of the core and shell of the new building begins. The core is the central part of the building and is the main part of the structural system. It contains the elevators and the mechanical systems for heating, ventilation, and air conditioning (HVAC). The shell is the outside of the building. As the core and floor decks of the building are being erected, installation of the mechanical and electrical internal networks would start. As the building progresses upward, the exterior cladding is placed, and the interior fit out begins. During the busiest time of building construction, the upper core and structure are built while the mechanical/electrical connections, exterior cladding, and interior finishing progress on lower floors. Finally, site work, including landscaping, and other site work associated with a particular building site, like completing or resurfacing new access roadway and sidewalks (or for Building Sites 2-5, completing the associated segments of waterfront esplanade and upland connections) is undertaken, and site access and protection measures required during construction are removed.

GENERAL CONSTRUCTION PRACTICES

Certain activities would be ongoing throughout the construction period for the proposed project. For the areas which are under the control of the Applicant (Building Sites 1-7 and the areas of the other project elements), there would be a field representative designated to serve as the contact point for the community and local leaders. The representative would be available to meet and work with the community to resolve concerns or problems that arise during the construction process. This is a fairly standard practice for the construction of large buildings or large-scale area developments in New York City, and it is anticipated that the ultimate developers of Building Site 8 (which would be developed as part of a future RFP by NYCHA) would also designate field representatives to serve as contact points for the community with respect to construction on that site, when it is under construction. New York City maintains a 24-hour-a-day telephone hotline (311) so that concerns can be registered with the city.

Governmental Coordination and Oversight

The following describes governmental construction oversight agencies and typical construction practices in New York City. In certain instances, specific practices may vary from those described below. However, the typical practices are expected to be used because they have been developed over many years and have been found to be necessary to successfully complete large projects in a confined urban area. All deliveries, material removals, and hoist uses have to be tightly scheduled to maintain an orderly work area and to keep the construction on schedule and within budget.

The governmental oversight of construction in New York City is extensive and involves a number of city, state, and federal agencies. **Table 20-2** shows the main agencies involved in construction oversight and the agency's areas of responsibilities. The primary responsibilities lie with New York City agencies. The New York City Department of Buildings (NYCDOB) has the primary responsibility for ensuring that the construction meets the requirements of the Building Code and that the building is structurally, electrically, and mechanically safe. In addition, NYCDOB enforces safety regulations to protect both the workers and the public. The areas of responsibility include installation and operation of the equipment, such as cranes and lifts, sidewalk shed, and safety netting and scaffolding. In addition, DOB approves the CPP used when the construction is in proximity to historic structures. DEP enforces the Noise Code and regulates water disposal into the sewer system. FDNY has primary oversight for compliance with the Fire Code and for the installation of tanks containing flammable materials. NYCDOT reviews and approves any traffic lane and sidewalk closures. New York City Transit (NYCT) is responsible for subway access and, if necessary, bus stop relocations. NYCT also coordinates construction work which could affect the subway system. LPC approves studies and testing to prevent loss of archaeological materials and to prevent damage to fragile historic structures. The New York City Department of Parks and Recreation (DPR) is responsible for the oversight, enforcement, and permitting of the replacement of street trees that are lost due to construction. Section 5-102 et. seq. of the Laws of the City of New York requires a permit to remove any trees and the replacement of the trees as determined by calculating the size, condition, species, and location rating of the tree proposed for removal.

NYSDEC regulates discharge of water into rivers and streams, disposal of hazardous materials, and construction, operation, and removal of bulk petroleum and chemical storage tanks. The New York State Department of Labor (DOL) licenses asbestos workers. On the federal level, the

EPA has wide ranging authority over environmental matters, including air emissions, noise, hazardous materials, and the use of poisons. Much of the responsibility is delegated to the state level. The Occupational Safety and Health Administration (OSHA) sets standards for work site safety and the construction equipment.

Table 20-2
Construction Oversight in New York City

Agency	Areas of Responsibility
New York City	
Department of Buildings	Primary oversight for Building Code and site safety
Department of Environmental Protection	Noise, hazardous materials, dewatering
Department of Environmental Protection and/or Office of Environmental Remediation	RAPs/CHASPs
Fire Department	Compliance with Fire Code, tank operation
Department of Transportation	Lane and sidewalk closures
New York City Transit	Subway access, bus stop relocation
Department of Parks & Recreation	Street trees
Landmarks Preservation Commission	Archaeological and architectural protection
New York State	
Department of Labor	Asbestos workers
Department of Environmental Conservation	Dewatering, hazardous materials, tanks, Stormwater Pollution Prevention Plan, Industrial SPDES, if any discharge into the Hudson River
United States	
Environmental Protection Agency	Air emissions, noise, hazardous materials, toxic substances
Occupational Safety and Health Administration	Worker safety

Deliveries and Access

Access to the various construction sites of the proposed project would be controlled. The work areas would be fenced off, and limited access points for workers and trucks would be provided. Private worker vehicles would not be allowed into the construction area. Security guards and flaggers may be posted as necessary, and all persons and trucks would have to pass through security points. Workers or trucks without a need to be on the site would not be allowed entry. After work hours, the gates would be closed and locked. Security guards may patrol the construction sites after work hours and over the weekends to prevent unauthorized access.

Material deliveries to the site would be controlled and scheduled. Unscheduled or haphazard deliveries would be minimized. To aid in adhering to the delivery schedules, as is normal for building construction in New York City, flaggers would be employed at each of the gates. The flaggers could be supplied by the subcontractor on-site at that time or by the construction manager. The flaggers would control trucks entering and exiting the site, so that they would not interfere with one another. In addition, they would provide an additional traffic aid as the trucks enter and exit the on-street traffic streams.

Hours of Work

Construction activities for the proposed project's various building sites and other project elements would take place in accordance with New York City laws and regulations, which allow construction activities to take place between 7 AM and 6 PM. Construction work would begin at 7 AM on weekdays, with most workers arriving between 6 AM and 7 AM. Typically, work would end at 3:30 PM, but could be extended until 6 PM for such tasks as finishing a concrete pour for a pad, or completing the bolting of a steel frame erected that day. Extended workday activities would not include all construction workers on site, but only those involved in the specific task. Extended workdays would be most likely to occur during foundation and superstructure tasks, and limited extended workdays could occur during other tasks over the course of construction, but would likely be minimized.

At limited times over the course of constructing a building; weekend work could be required to make up for weather delays or other unforeseen circumstances. In such cases, the numbers of workers and pieces of equipment in operation would be limited to those needed to complete the particular authorized task. Therefore, the level of activity for any weekend work would be less than a normal workday. Weekend work requires a permit from NYCDOB and, in certain instances, approval of a noise mitigation plan from the DEP under the City's Noise Code. The New York City Noise Control Code, as amended in December 2005 and effective July 1, 2007, limits construction (other than special circumstances as described below) to weekdays between the hours of 7 AM and 6 PM, and sets noise limits for certain specific pieces of construction equipment. Construction activities occurring after hours (weekdays between 6 PM and 7 AM and on weekends) may be permitted only to accommodate: (1) emergency conditions; (2) public safety; (3) construction projects by or on behalf of City agencies; (4) construction activities with minimal noise impacts; and (5) undue hardship resulting from unique site characteristics, unforeseen conditions, scheduling conflicts, and/or financial considerations. In such cases, the numbers of workers and pieces of equipment in operation would be limited to those needed to complete the particular authorized task. Therefore, the level of activity for any weekend work would be less than a normal workday. If it were to become necessary, the typical weekend workday would be on Saturday, beginning with worker arrival and site preparation at 7 AM, and ending with site cleanup at 5 PM.

A few tasks may have to be completed without interruption, and the work can extend past 6 PM. In certain situations, concrete must be poured continuously to form one structure without joints. This type of concrete pour is usually associated with foundations and structural slabs at grade, which could require a minimum of 12 hours or more to complete, depending on the size of the area being poured.

Sidewalk and Lane Closures

During the course of construction, traffic lanes and sidewalks would be closed or protected for varying periods of time. Truck movements would be spread throughout the day and would generally occur between the hours of 6:00 AM and 3:00 PM, depending on the stage of construction. No rerouting of traffic is anticipated and moving lanes of traffic are expected to be available at all times. Some street lanes and sidewalks could be continuously closed, and some lanes and sidewalks would be closed only intermittently to allow for certain construction activities. For construction at the various building sites, any necessary sidewalk and lane closures would maintain pedestrian flow throughout the construction period for each site, and would generally not divert pedestrians to the other side of the street. Pedestrian circulation and access would be maintained through the use of protected sidewalk enclosures, temporary sidewalks or sidewalk bridges. NYCDOT would be consulted to determine the appropriate protective measures for ensuring pedestrian safety surrounding the various building sites; this work would be coordinated with and approved by NYCDOT.

GENERAL CONSTRUCTION TASKS

Abatement, Demolition, and Remediation

The proposed project would result in the demolition of surface parking and/or loading areas and existing buildings on the proposed project's building sites and areas of the other project elements. As indicated in **Figure 20-1** (see above), all project site-wide demolition activities required for the proposed project have been assumed would be undertaken at one time, and would be anticipated to last for about 15 months. These areas would be abated of asbestos and any other hazardous materials within the existing buildings and structures, where applicable.

A New York City-certified asbestos investigator would inspect the buildings for asbestos-containing materials (ACMs), and those materials must be removed by a NYCDOL-licensed asbestos abatement contractor prior to interior demolition. Asbestos abatement is strictly regulated by DEP, NYCDOL, EPA, and OSHA to protect the health and safety of construction workers and nearby residents and workers. Depending on the extent and type of ACMs, these agencies would be notified of the asbestos removal project and may inspect the abatement site to ensure that work is being performed in accordance with applicable regulations, including the new February 2, 2011 DEP regulations. These regulations specify abatement methods, including wet removal of ACMs that minimize asbestos fibers from becoming airborne, and containment measures. The areas of the building with ACMs would be isolated from the surrounding area with a containment system and a decontamination system. The types of these systems would depend on the type and quantity of ACMs, and may include hard barriers, isolation barriers, critical barriers, and caution tape. Specially trained and certified workers, wearing personal protective equipment, would remove the ACMs and place them in bags or containers lined with plastic sheeting for disposal at an asbestos-permitted landfill. Depending on the extent and type of ACMs, an independent third-party air-monitoring firm would collect air samples before, during, and after the asbestos abatement. These samples would be analyzed in a laboratory to ensure that regulated fiber levels are not exceeded. After the abatement is completed and the work areas have passed a visual inspection and monitoring, if applicable, the general demolition work can begin.

Any activities with the potential to disturb lead-based paint would be performed in accordance with the applicable OSHA regulation (OSHA 29 CFR 1926.62—*Lead Exposure in Construction*). When conducting demolition (unlike lead abatement work), lead-based paint is generally not stripped from surfaces. Structures may be disassembled or broken apart with most paint still intact. Dust control measures (spraying with water) would be used if necessary. The lead content of any resulting dust is therefore expected to be low. Work zone air monitoring for lead may be performed during certain activities with a high potential for releasing airborne lead-containing particulates in the immediate work zone, such as manual demolition of walls with lead paint or cutting of steel with lead-containing coatings. Such monitoring would be performed to ensure that workers performing these activities are properly protected against lead exposure.

Any suspected PCB-containing equipment (such as fluorescent light ballasts) that would be disturbed would be evaluated prior to disturbance. Unless labeling or test data indicate that the suspected PCB-containing equipment does not contain PCBs, it would be assumed to contain PCBs and removed and disposed of at properly licensed facilities in accordance with all applicable regulatory requirements.

All of these procedures related to the handling of ACM, lead-based paint, and potential PCB-containing equipment would be contained in the DEP-approved CHASP.

General demolition is the next step, where necessary. Demolition would occur in accordance with NYCDOB guidelines/requirements. In general, the first step is to remove any economically salvageable materials. Then the building is deconstructed using large equipment. Typical demolition requires fencing around the building to prevent accidental dispersal of building materials into areas accessible to the general public. The demolition debris would be sorted prior to being disposed at landfills to maximize recycling opportunities. For the general demolition activities necessary for the proposed project, it is estimated that there would be approximately 15 workers per day on-site, and typically approximately three truckloads of debris would be removed per day from the project site. The general demolition phase is expected to last approximately two to three months at any given occupied building site, with the project site-wide demolition activities anticipated to last approximately 15 months.

Site Preparation and Utilities—Construction Startup Tasks

The following tasks are considered to be typical startup work to prepare a site for construction. The tasks could include, but are not limited to, the following items. The means and methods and order of completion of these tasks could change as necessary. Startup work generally involves the installation of public safety measures, such as fencing, sidewalk sheds, and Jersey barriers. The site is fenced off, typically with solid fencing to minimize interference between the persons passing by the site and the construction work. Separate gates for workers and for trucks are installed, and sidewalk shed and Jersey barriers are erected. Trailers for the construction engineers and managers are hauled to the site and installed. These trailers could be placed within the fence line, in the curb lane, or over the sidewalk sheds. Also, portable toilets, dumpsters for trash, and water and fuel tankers are brought to the site and installed. Temporary utilities are connected to the construction trailers. During the startup period, permanent utility connections may be made, especially if the contractor has obtained early electric power for construction use, but utility connections may be made almost any time during the construction sequence.

Installation of new or upgraded utilities would occur during this stage, and are anticipated to take an average of 3 months at each building site. It should be noted that Buildings 6B and 7B would not require separate site utility installation, and other site preparation would be minimal, as most these activities would occur at these building sites when Buildings 6A and 7A are being constructed. New utility connections for any given building can be made at any time during the construction process. The initial investigatory work often occurs early during excavation and foundations, with the actual connections typically occurring once the building mechanical, electrical and plumbing systems are installed. The existing utility lines in the streets within the Rezoning Area have sufficient capacity to support the development anticipated as a result of the proposed project. Connections to new buildings would be made from the existing utility lines.

Construction startup tasks, including utility work, may have anywhere from 5 to 20 workers on site, and usually fewer than 5 truck deliveries per day. Most, construction startup tasks are normally completed within several weeks, with more involved utility work (especially for the installation of new utilities, taking up to 3 months).

Excavation and Foundation

Soil excavation, supplementation, re-grading, and foundation construction for the eight building sites anticipated to be constructed as part of the proposed project has been estimated to take approximately three months to complete (except at Building Site 5, which is estimated to take 4 months), as indicated in **Figure 20-1** (see above). Excavators would be used for the task of digging foundations. Incoming soil to be used to raise the site grade at certain of the building sites (Buildings 2-5) along the waterfront would be delivered by dump truck, and spread and re-graded using small bulldozers. Any excavated soil to be removed from the project site would be loaded onto dump trucks for transport to a licensed disposal facility or for reuse elsewhere on the project site, or on another construction site. Foundation work could include pile driving and pouring concrete footings and foundation. The excavation/foundation task could involve the use of excavators, cranes, pile drivers, concrete pumps, concrete trucks, generators, and hand tools. Anywhere from 5 to 85 workers would be on-site at each building site, at any given time. About 2 to 28 trucks per day are expected for this phase of work at any given building site.

Below-Grade Hazardous Materials

All construction subsurface soil disturbances would be performed in accordance with an agency-approved RAP and CHASP. For sites under the Applicant's control (Building Sites 1-5), an (E) designation would be assigned and review and approval would be by the New York City Mayor's Office of Environmental Remediation (MOER). For sites subject to disposition by NYCHA (Building Sites 6-8), the New York City Department of Environmental Protection (DEP) and the New York City Department of Housing Preservation & Development (HPD) would conduct the review. At a minimum, the RAP would provide for the appropriate handling, stockpiling, testing, transportation, and disposal of excavated materials, as well as any unexpectedly encountered tanks, in accordance with all applicable federal, state, and local regulatory requirements. The RAP would also provide for vapor control measures such as vapor barriers. The CHASP would ensure that all subsurface disturbances are done in a manner protective of workers, the community, and the environment.

Dewatering

The excavated area at any given site could be subject to accumulating groundwater until the slab-on-grade is built. In addition to groundwater, rain and snow could collect in the excavation, and that water would have to be removed. If necessary, the water would be pretreated prior to discharge. The decanted water would then be discharged into the New York City sewer system. Discharge in the sewer system is governed by DEP regulations.

DEP has a formal procedure for issuing a Letter of Approval to discharge into the New York City sewer system. The authorization is issued by the DEP Borough office if the discharge is less than 10,000 gallons per day; an additional approval by the Division of Connections & Permitting is needed if the discharge is more than 10,000 gallons per day. All chemical and physical testing of the water has to be done by a laboratory that is certified by the New York State Department of Health (NYSDOH). The design of the pretreatment system has to be signed by a New York State Professional Engineer or Registered Architect. For water discharged into New York City sewers, DEP regulations specify the following maximum concentration of pollutants.

- Petroleum hydrocarbons — 50 parts per million (ppm)
- Cadmium — 2 ppm
- Hexavalent chromium — 5 ppm
- Copper — 5 ppm
- Amenable cyanide — 0.2 ppm
- Lead — 2 ppm
- Mercury — 0.05 ppm
- Nickel — 3 ppm
- Zinc — 5 ppm
- pH — between 5 to 12
- Temperature — less than 150 degrees Fahrenheit (F)

• Flash Point	greater than 140 degrees F
• Benzene	134 parts per billion (ppb)
• Ethylbenzene	380 ppb
• Methyl-Tert-Butyl-Ether (MTBE)	50 ppb
• Naphthalene	47 ppb
• Tetrachloroethylene (perc)	20 ppb
• Toluene	74 ppb
• Xylenes	74 ppb
• PCB	1 ppb
• Total Suspended Solids	350 ppm

Any groundwater discharged in the New York City system would meet these limits. DEP can also impose project-specific limits, depending on the location of the project and contamination that has been found in nearby areas.

Core and Shell

In general, core (superstructure) and shell (exterior fit out) construction of the various buildings anticipated to be constructed as part of the proposed project would last approximately 6 to 8 months for construction of the building cores, and 6 to 9 months for the shell, depending on the size of the building. Construction of the interior structure, or core, of the buildings would include elevator shafts; vertical risers for mechanical, electrical, and plumbing systems; electrical and mechanical equipment rooms; core stairs; and restroom areas. This phase of work would also include construction of the building's framework (installation of beams and columns), and floor decks. Exterior construction involves the installation of the façade (exterior walls, windows, and cladding) and the roof. Cranes would be used to lift the façade into place, and welding machines and impact wrenches would secure the exterior to the superstructure. These activities would require the use of cranes, delivery trucks, concrete pumps, concrete trowels, welding equipment, and a variety of handheld tools. Temporary construction elevators (hoists) would also be constructed for the delivery of materials and vertical movement of workers during this stage where necessary. For each building, it is estimated that there would be approximately 5 to 145 daily workers and between 1 and 28 daily truck deliveries required for the core construction; approximately 5 to 85 daily workers and about 1 daily truck delivery would be required for construction of the shell for each building, depending on the size of the building.

Interior Fit-Out

This stage of construction would include the construction of interior partitions, installation of lighting fixtures, interior finishes (flooring, painting, etc.), and mechanical and electrical work, such as the installation of elevators. Mechanical and other interior work at each building would take between 14 and 16 months, depending on the size of the building, and at each building would overlap with the building core and shell construction for between eight and nine months. This activity would employ the greatest number of construction workers: with a peak of between 15 to 152 workers per day at each of the building sites, depending on the size of the building. In addition, anywhere from 1 to 9 truck deliveries would be expected per day at each building site. Equipment used during interior construction would include hoists, delivery trucks, and a variety of small hand-held tools. However, this stage of construction is the quietest, and does not generate fugitive dust.

Site Work and Finishing

This stage of construction would include the final finishing of the building and grounds, including landscaping activities, and for the building sites that have a section of the new waterfront esplanade and upland connections associated with them (Building Sites 2-5), this work would occur during this phase. This is also when the construction protection measures (fencing, sidewalk enclosures, bridges, or temporary sidewalk, remaining scaffolding, etc.) around the building sites would be removed. This activity would employ the least number of construction workers: with about 2 to 6 workers per day at each building. In addition, minimal daily truck deliveries would be expected at each building during this stage of construction, with most days having no deliveries. This stage of construction is anticipated to last for about 2 months at each building. Equipment used during this stage of construction would include hoists, delivery trucks, and a variety of small hand-held tools.

NUMBER OF CONSTRUCTION WORKERS AND MATERIAL DELIVERIES

Construction is labor intensive, and the number of workers varies with the general construction task and the size of the building. Likewise, material deliveries generate many truck trips, and the number also varies. **Table 20-3** shows the estimated numbers of workers and deliveries to the project area by calendar quarter for all construction. The average number of workers would be about 230 per day throughout the construction period. The peak average number of workers would be 628 per day in the first quarter of 2021. For truck trips, the average number of trucks would be 26 per day, and the peak average would also occur in the first quarter of 2021 with 67 trucks per day. The 1-month peak numbers of workers and deliveries estimated for the construction of the proposed project show that the 1-month daily worker peak of 652 workers, would be expected to occur in February 2021 (during the simultaneous construction of Buildings 5, 7B, and 8); the 1-month daily delivery peak of 72 trucks, would be expected to occur in October 2020 (during the simultaneous construction of Buildings 4, 5, 7B, and 8); Detailed workforce and delivery projections can be found in **Appendix F**.

Table 20-3
Average Number of Daily Workers and Trucks by Quarter

Year	**2014**				**2015**				**2016**				**2017**			
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Workers	-	-	-	19	94	154	354	298	199	213	148	244	288	207	160	144
Trucks	-	-	-	3	24	31	37	23	11	24	30	30	29	15	16	28
Year	**2018**				**2019**				**2020**				**2021**			
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Workers	153	339	283	207	233	183	218	182	125	115	153	373	**628**	476	366	290
Trucks	28	36	24	17	28	29	27	18	12	14	45	61	**67**	31	24	23
Year	**2022**												**Average**		**Peak**	
Quarter	1st	2nd	3rd	4th												
Workers	116	47	-	-									230		628	
Trucks	11	5	-	-									26		67	

Notes: Construction assumed to begin in the fourth quarter of 2014.
Sources: Lend Lease (US) Construction LMB, Inc. and AKRF, Inc.

E. THE FUTURE WITHOUT THE PROPOSED PROJECT

In the future without the proposed project, the project site is expected to be occupied by existing uses. The waterfront and eastern parcels will remain underutilized sites occupied by vacant land and building and manufacturing and storage uses. However, as discussed in Chapter 3, "Land

Use, Zoning, and Public Policy," a portion of a planned development near the project site has been assumed to be completed by the 2021 analysis year. The proposed Astoria Cove project is a proposal that will require discretionary land use approvals; however, because it is located in close proximity to the project site, the portion that is assumed to be completed by the 2022 Build year has been incorporated into the future without the proposed project for conservative impact analysis. Astoria Cove, if approved, will transform five lots (totaling approximately 8.4 acres) on the northeastern portion of the Halletts Point peninsula, on either side of 26th Avenue, into a mixed-use, predominantly residential waterfront development. At partial build-out in 2021, Astoria Cove is expected to add residential units (including both market-rate and affordable units), local retail (including a supermarket), parking, and publicly accessible open space to the study area. The Astoria Cove project site currently encompasses two mapped but unbuilt segments of 8th Street (to the north and south of 26th Avenue), as well as an unimproved portion of 26th Avenue west of 9th Street. Both street segments are expected to be built and improved under the No Build condition. Due to its proximity to the project site, Astoria Cove's operational trips generated by the portion that is assumed to be completed by the 2021 and its construction trips have been incorporated into the future without the proposed project for a conservative impact analysis. It should also be noted that as the Astoria Cove project will be seeking discretionary approvals and will undergo its own environmental review process, it will have to account for the Halletts Point project as part of its future baseline conditions as well.

F. PROBABLE IMPACTS OF THE PROPOSED PROJECT

Similar to many large development projects in New York City, construction can be disruptive to the surrounding area for periods of time. While the anticipated construction durations for the proposed project have been developed with an experienced New York City construction manager, the discussion is only illustrative as specific means and methods will be chosen at the time of construction. At this time, there are no specific construction programs or finalized designs for the proposed project. The construction durations have been conservatively chosen to serve as the basis of the analyses in this chapter and are representative of the reasonable worst-case assumptions for determining potential construction period impacts. The proposed project's conceptual schedule represents a conservative potential timeline for construction, which shows overlapping construction activities and simultaneously operating construction equipment for the proposed project's eight building sites and other planned project elements (i.e., new open spaces, the proposed waterfront esplanade, and/or infrastructure improvements) in proximity to one another. Thus, the analysis captures the cumulative nature of construction impacts, which would result in the greatest impacts at nearby receptors.

The following analyses describe the potential impacts that could result from construction of the proposed project, with respect to transportation, air quality, noise and vibration, historic and cultural resources, hazardous materials, open space, socioeconomic conditions, community facilities, natural resources, land use and neighborhood character, and rodent control.

TRANSPORTATION

TRAFFIC

Construction activities would generate construction worker and truck traffic. Based on the construction sequencing and worker/truck projections presented above, detailed trip generation estimates were developed to identify the construction-related peak hour trip-making activities.

These estimates were then used as the basis for assessing the potential transportation-related impacts during construction. During peak construction in 2021, the project-generated trips would be less than what would be realized upon the full build-out of the proposed project in 2022 as shown in **Table 20-4**. Therefore, the overall extent of potential traffic impacts during peak construction would be within the envelope of significant adverse traffic impacts identified for the Build condition in Chapter 15, "Transportation."

Table 20-4
Comparison of Weekday Vehicle Trip Generation—Construction and Operational

	Peak Construction in 2021									2022 Full Build-Out Incremental Operational Trips in PCEs		
	Incremental Construction Trips in PCEs (Q1 2021)			Incremental Operational Trips from Completed Projects in PCEs			Total PCEs					
Time	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
6-7 AM	314	34	348	15	15	30	329	49	378	21	21	42
7-8 AM	84	14	98	32	140	172	116	154	270	17	136	153
8-9 AM*	14	14	28	120	354	474	134	368	502	177	525	702
12-1 PM*	14	14	28	155	153	308	169	167	336	221	217	438
3-4 PM	6	286	292	124	124	248	130	410	540	189	189	378
4-5 PM	0	52	52	167	120	287	167	172	339	287	200	487
5-6 PM*	0	0	0	327	199	526	327	199	526	482	291	773

Notes: Traffic volumes summarized for the 8-9 AM, 12-1 PM, and 5-6 PM account for a conservative overlap of construction-related traffic during these hours and operational trips during the operational analysis peak hours.
PCEs = passenger car equivalents where 1 truck trip equals 2 PCEs.

As presented below, the detailed analysis of traffic operations during construction concluded that there would be a potential for significant adverse traffic impacts at five of the seven analyzed intersections. Three of these impacted intersections could be fully mitigated using standard mitigation measures typically implemented by NYCDOT, while the other two intersections could be mitigated during one, but not both, of the peak hours analyzed. The recommended mitigation measures would be consistent with those proposed to mitigate the intersection impacts associated with the project's full build-out and occupancy, as identified for the 2022 Build condition in Chapter 15, "Transportation," and can be similarly addressed with the mitigation measures described in Chapter 22, "Mitigation," to mitigate the projected significant adverse traffic impacts. Locations where construction period impacts are projected to be unmitigatable, were also identified as being unmitigatable during at least one peak hour for the full project build-out conditions.

Because an additional 71 dwelling units of affordable housing and 25 accessory parking spaces were added shortly prior to certification of the DEIS, after substantial transportation-related analysis work had been completed and reviewed, the analyses and conclusions presented in this chapter are based on a slightly smaller version of the development program than that described above. These programming changes represent a less than 3-percent increase in the number of dwelling units and a comparable level of increase in trip-making. These changes are not expected to alter the overall conclusions of the transportation analyses but could result in new or worsened impacts at specific analysis locations. Between the DEIS and FEIS, the transportation and transportation-related analyses will be updated to reflect the proposed project's programming changes. These changes could result in new, different, or worsened significant adverse impacts, all of which will be further detailed in the FEIS.

Furthermore, since significant adverse impacts and mitigation measures required at the analyzed locations in the construction period are similar to those needed for the full buildout, it is anticipated that most, if not all, mitigation measures identified for the full build-out would be needed in the construction period. Therefore, all mitigation measures identified for the full build-out in 2022 should be implemented at least one year earlier in 2021 for the construction peak. However, an analysis will be performed between the DEIS and FEIS to determine if the proposed mitigation measures would be needed even before the peak construction period in 2021 and, if so, when they would be needed. As noted in Chapter 15, "Transportation", other analysis modifications will be done for the FEIS that could affect the mitigation findings presented in this chapter. Analysis assumptions made for the proposed Astoria Cove project and analysis findings documented in the *Cornell NYC FEIS* may change and such changes, when available, may affect the mitigation measures and findings in this (Halletts Point) project's FEIS. This may result in either fewer impacts or greater impacts and could potentially result in one or more additional unmitigated impacts. The two additional intersections that would be addressed in the FEIS may also result in significant impacts and require the same types of mitigation measures as described earlier in the chapter or could also result in a newly identified unmitigated significant adverse impact if suitable mitigation is not available. All of these assessments will be fully documented in the FEIS.

The Applicant would be responsible for the costs associated with the design and implementation of these traffic signals proposed as mitigation and, should the analysis of the two additional signalized intersection identify significant traffic impacts that also require traffic signals, for those two as well. As the analyses of the Astoria Boulevard and the 27th Avenue corridors undergo further study for the FEIS, discussions will be held with representatives of NYCDOT and the prospective developer of the Astoria Cove project regarding a sharing of the new traffic signal costs to the extent that each project contributes to the impacts generating the need for these traffic signals.

Construction Trip Generation

Average daily construction worker and truck activities by quarter were projected for the entire construction period. Construction is anticipated to begin in the fourth quarter of 2014 and be completed by the early part of 2022. Construction worker and truck trip projections were refined to account for worker modal splits and vehicle occupancy, arrival and departure distribution, and passenger car equivalent (PCE) factors for construction truck traffic.[1] These estimates are presented in **Table 20-5**.

Daily Workforce and Truck Deliveries

Peak construction traffic is expected to take place during the first quarter of 2021. For a reasonable worst-case analysis of potential transportation-related impacts during construction, the daily workforce and truck trip projections during this period were used as the basis for estimating peak hour construction trips. It is expected that construction activities would generate the highest amount of daily traffic in the first quarter of 2021, with an estimated average of 628 workers and 67 truck deliveries per day (see **Appendix F** for details). By the first quarter of 2021, first seven buildings of the proposed project would be completed and would also generate operational traffic. This operational traffic is combined with the construction traffic to estimate the worst-case traffic impact during this period. Estimates of construction activities are further discussed below.

Construction Worker Modal Splits and Vehicle Occupancy

Based on the 2000 Census data on the construction and excavation industry, approximately 70 percent of the construction workers would be expected to travel to the site by private autos at an average occupancy of 1.25 persons per vehicle. The remaining 30 percent would use public transportation.

[1] The traffic analysis assumed that each truck has a PCE of 2.0.

Table 20-5
Construction Trip Generation

Vehicle PCEs (Autos + Trucks)	2014				2015				2016				2017			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
6 AM - 7 AM	-	-	-	13	93	101	195	158	101	120	100	145	154	108	84	89
7 AM - 8 AM	-	-	-	2	25	29	56	41	26	32	29	40	43	31	21	27
8 AM -9 AM	-	-	-	0	8	12	16	8	4	8	12	12	12	8	4	12
9 AM -10 AM	-	-	-	0	8	12	16	8	4	8	12	12	12	8	4	12
10 AM - 11 AM	-	-	-	0	8	12	16	8	4	8	12	12	12	8	4	12
11 AM - 12 PM	-	-	-	0	8	12	16	8	4	8	12	12	12	8	4	12
12 PM - 1 PM	-	-	-	0	8	12	16	8	4	8	12	12	12	8	4	12
1 PM - 2 PM	-	-	-	0	4	8	8	4	4	4	8	8	4	4	4	4
2 PM - 3 PM	-	-	-	1	8	12	18	12	10	10	12	15	12	10	8	8
3 PM - 4 PM	-	-	-	9	73	77	167	138	93	100	76	121	130	96	72	65
4 PM - 5 PM	-	-	-	2	13	13	30	25	17	18	13	21	24	17	13	12
5 PM – 6 PM	-	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0
Daily Total	-	-	-	27	256	300	554	418	271	324	298	410	427	306	222	265

Vehicle PCEs (Autos + Trucks)	2018				2019				2020				2021			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
6 AM - 7 AM	96	186	146	107	131	105	126	96	69	61	109	232	348	239	181	144
7 AM - 8 AM	29	53	38	31	38	31	37	28	18	16	32	66	98	64	47	39
8 AM -9 AM	12	16	8	8	12	12	12	8	4	4	16	24	28	12	8	8
9 AM -10 AM	12	16	8	8	12	12	12	8	4	4	16	24	28	12	8	8
10 AM - 11 AM	12	16	8	8	12	12	12	8	4	4	16	24	28	12	8	8
11 AM - 12 PM	12	16	8	8	12	12	12	8	4	4	16	24	28	12	8	8
12 PM - 1 PM	12	16	8	8	12	12	12	8	4	4	16	24	28	12	8	8
1 PM - 2 PM	4	8	4	4	4	4	4	4	4	4	8	12	12	8	4	4
2 PM - 3 PM	8	17	12	10	10	9	10	9	8	7	12	23	30	21	14	12
3 PM - 4 PM	72	158	126	95	107	81	102	84	61	53	73	180	292	215	161	128
4 PM - 5 PM	13	28	23	17	19	14	18	15	11	9	12	32	53	39	29	23
5 PM – 6 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Daily Total	282	530	389	304	369	304	357	276	191	170	326	665	973	646	476	390

Vehicle PCEs (Autos + Trucks)	2022			
	1Q	2Q	3Q	4Q
6 AM - 7 AM	62	25	-	-
7 AM - 8 AM	16	9	-	-
8 AM -9 AM	4	4	-	-
9 AM -10 AM	4	4	-	-
10 AM - 11 AM	4	4	-	-
11 AM - 12 PM	4	4	-	-
12 PM - 1 PM	4	4	-	-
1 PM - 2 PM	4	0	-	-
2 PM - 3 PM	7	1	-	-
3 PM - 4 PM	54	21	-	-
4 PM - 5 PM	9	4	-	-
5 PM – 6 PM	0	0	-	-
Daily Total	172	80	-	-

Peak Hour Construction Worker Vehicle and Truck Trips

Construction activities would mostly take place during the construction shift of 7:00 AM to 3:30 PM. While construction truck trips would be made throughout the day (with more trips made during the early morning), most trucks would remain in the area for short durations and construction workers would typically commute during the hours before and after the work shift. For analysis purposes, each worker vehicle was assumed to arrive in the morning and depart in the afternoon or early evening, whereas each truck delivery was assumed to result in two truck trips during the same hour (one “in” and one “out”). Furthermore, in accordance with the June 2012 *City Environmental Quality Review (CEQR) Technical Manual*, the traffic analysis assumed that each truck has a PCE of 2.0.

The estimated daily vehicle trips were distributed throughout the workday based on projected work shift allocations and conventional arrival/departure patterns of construction workers and trucks. For construction workers, the majority (approximately 80 percent) of the arrival and departure trips would take place during the hour before and after each shift. For construction trucks, deliveries would occur throughout the day when the construction site is active. Construction truck deliveries typically peak during the early morning (approximately 25 percent), overlapping with construction worker arrival traffic. The peak construction hourly trip projections summarized in **Table 20-6**.

Table 20-6
Peak Construction Vehicle Trip Projections

	Auto Trips			Truck Trips			Total					
	Regular Shift			Regular Shift			Vehicle Trips			PCE Trips		
Hour	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Weekday (1st Quarter of 2021)												
6 AM - 7 AM	280	0	280	17	17	34	297	17	314	314	34	348
7 AM - 8 AM	70	0	70	7	7	14	77	7	84	84	14	98
8 AM - 9 AM	0	0	0	7	7	14	7	7	14	14	14	28
9 AM - 10 AM	0	0	0	7	7	14	7	7	14	14	14	28
10 AM - 11 AM	0	0	0	7	7	14	7	7	14	14	14	28
11 AM - 12 PM	0	0	0	7	7	14	7	7	14	14	14	28
12 PM - 1 PM	0	0	0	7	7	14	7	7	14	14	14	28
1 PM - 2 PM	0	0	0	3	3	6	3	3	6	6	6	12
2 PM - 3 PM	0	18	18	3	3	6	3	21	24	6	24	30
3 PM - 4 PM	0	280	280	3	3	6	3	283	286	6	286	292
4 PM - 5 PM	0	52	52	0	0	0	0	52	52	0	52	52
Daily Total	350	350	700	68	68	136	418	418	836	486	486	972

Notes: Hourly construction worker and truck trips were derived from an estimated quarterly average number of construction workers and truck deliveries per day, with each truck delivery resulting in two daily trips (arrival and departure). Construction peak hours are shaded in this table.

The projected construction activities in the first quarter of 2021 would result in 348 PCEs between 6 and 7 AM and 292 PCEs between 3 and 4 PM on weekdays. Since some components of the proposed project would have already been completed and occupied, operational traffic generated by those completed components together with the projected construction traffic were considered for the construction traffic impact analysis. The analysis results are presented below.

Construction Traffic Capacity Analysis

Seven study area intersections were selected for analysis of peak construction conditions (first quarter of 2021). The operations at these intersections were analyzed using the Highway Capacity Software (HCS+) version 5.5, which is based on the methodologies presented in the *2000 Highway Capacity Manual (HCM)*. A discussion of the analysis methodology can be found in Chapter 15, "Transportation."

Future Without Construction of the Proposed Project

Since the peak construction period is only one year before the Build year, 2022 No Build traffic volumes were used as the baseline for the detailed construction traffic analysis which is slightly conservative because it includes one extra year (from 2021 to 2022) of background traffic growth and No Build projects. Additionally, vehicle trips from the partial build-out of the Astoria Cove development project conservatively included in the 2022 No Build volumes were replaced with cumulative trips from construction and operational activity (based on Astoria Coves project's anticipated schedule) projected for the first quarter of 2021. According to these projections, Astoria Cove construction and operational activity would generate 70 auto trips and

8 truck trips during the 6-7 AM morning construction peak hour and 222 auto trips and 2 truck trips during the 3-4 PM afternoon construction peak hour (See **Appendix F**).

Based on the Automatic Traffic Recorder (ATR) traffic volume data collected to determine existing conditions (see Chapter 15, "Transportation"), overall background traffic volumes during the 6-7 AM construction peak hour are approximately 14 percent lower than the 7:30-8:30 AM peak hour analyzed for the traffic peak; therefore traffic volumes for the 6-7 AM construction peak hour were decreased proportionally from the 7:30-8:30 AM volumes. Overall traffic volumes during the 3-4 PM construction peak hour were similar to the 4:30-5:30 PM peak hour; therefore the existing PM traffic peak hour volumes were used for the 3-4 PM existing PM construction peak hour volumes (See **Appendix F**).

Seven intersections most likely to be most affected by the absence of the proposed Astoria Boulevard connection (since it was assumed that it would not be in place during the construction period) were analyzed for potential construction traffic impacts. These intersections are:

- 27th Avenue and 1st Street
- 27th Avenue and 2nd Street
- 27th Avenue and 4th Street
- 27th Avenue and 8th Street
- Astoria Boulevard and 8th Street
- Astoria Boulevard and 18th Street
- Astoria Boulevard and 21st Street

For the construction No Build condition, all seven intersections during the 6-7 AM construction peak hour and six of the seven intersections in the 3-4 PM construction peak hour would operate at an overall acceptable level of service. In the 3-4 PM period, Astoria Boulevard and 21st Street would operate at overall unacceptable LOS E. Of the 24 traffic movements analyzed during the AM and PM construction peak hours, three movements – all at the intersection of Astoria Boulevard and 21st Street – would operate at unacceptable levels of service (i.e., mid-LOS D or worse) during the PM construction peak hour. There would be no traffic movements operating at unacceptable levels of service in the 6-7 AM peak construction hour. A detailed summary of the No Build construction peak hour analysis results is provided in **Table 20-7**.

Future With Construction of the Proposed Project

According to projections presented above (see **Table 20-6**), peak construction activities would generate 280 autos and 34 trucks during the 6-7 AM construction peak hour (trip assignment presented in **Appendix F**) and 280 autos and 6 trucks during the 3-4 PM construction peak hour (trip assignment presented in **Appendix F**). The overall projected 6-7 AM and 3-4 PM construction peak hour traffic volumes are also presented in **Appendix F**.

An analysis of the seven construction study area intersections showed that five of the seven intersections would be significantly impacted during at least one of the peak hours analyzed. Three intersections (27th Avenue at its intersections with 4th and 8th Streets, and Astoria Boulevard at 21st Street) would be significantly impacted during both the 6-7 AM and 3-4 PM construction peak hours and two intersections (27th Avenue at 2nd Street and Astoria Boulevard at 18th Street) would be significantly impacted only during the 3-4 PM construction peak hour.

Table 20-7
No Build Construction Traffic Levels of Service

Intersection	App	Construction 6-7 AM Peak Hour				Construction 3-4 PM Peak Hour			
		Lane Group	V/C Ratio	Delay (SPV)	LOS	Lane Group	V/C Ratio	Delay (SPV)	LOS
27th Avenue and 8th Street									
27th Avenue	EB	TR	0.60	19.1	B	TR	0.62	19.3	B
	WB	LT	0.73	24.8	C	LT	0.53	18.1	B
8th Street	NB	L	0.40	24.3	C	L	0.39	24.1	C
		R	0.41	26.2	C	R	0.66	39.1	D
Overall Intersection		-	0.60	23.0	C	-	0.64	22.8	C
Astoria Boulevard and 8th Street									
Astoria Boulevard	EB	LR	0.23	28.2	C	LR	0.28	29.0	C
	WB	L	0.29	29.1	C	L	0.25	28.6	C
		TR	0.21	27.9	C	TR	0.16	27.1	C
8th Street	NB	LT	0.34	15.0	B	LT	0.46	16.4	B
	SB	TR	0.46	17.2	B	TR	0.36	15.8	B
Overall Intersection		-	0.40	20.6	C	-	0.39	20.2	C
Astoria Boulevard and 21st Street									
Astoria Boulevard	EB	L	0.67	39.6	D	L	0.46	29.9	C
		TR	0.51	33.9	C	TR	0.67	37.3	D
	WB	L	0.83	40.7	D	L	0.82	49.9	D
		TR	0.51	33.3	C	TR	0.47	33.1	C
21st Street	NB	LTR	0.71	28.3	C	LTR	1.21	128.1	F
	SB	LTR	0.92	30.0	C	LTR	0.99	45.5	D
Overall Intersection		-	0.91	32.3	C	-	1.06	68.5	E
27th Avenue and 1st Street									
27th Avenue	WB	LR	-	8.9	A	LR	-	8.8	A
1st Street	NB	TR	-	7.6	A	TR	-	7.4	A
	SB	LT	-	8.4	A	LT	-	8.3	A
Overall Intersection		-	-	8.4	A	-	-	8.3	A
27th Avenue and 2nd Street									
27th Avenue	EB	LT	-	7.7	A	LT	-	7.8	A
2nd Street	SB	LR	-	11.9	B	LR	-	12.7	B
Overall Intersection		-	-	1.3	A	-	-	2.1	A
27th Avenue and 4th Street									
27th Avenue	EB	LT	-	9.5	A	LT	-	10.3	B
	WB	TR	-	11.1	B	TR	-	12.6	B
4th Street	SB	LR	-	9.6	A	LR	-	10.4	B
Overall intersection		-	-	10.3	B	-	-	11.4	B
Astoria Boulevard and 18th Street									
18th Street	SB	LR	-	19.9	C	LR	-	20.0	C
Overall Intersection		-	-	2.0	A	-	-	3.8	A

Notes: Control delay is measured in seconds per vehicle. Overall intersection V/C ratio is the critical lane group's V/C ratio.

Significant impacts at the intersections of 27th Avenue at 2nd Street, 27th Avenue at 4th Street, and Astoria Boulevard at 18th Street could be fully mitigated during all peak hours applying mitigation measures similar to those proposed for mitigation under the Build condition (the project's full build-out). The two other impacted locations could only be fully mitigated during one peak hour and would either be partially mitigated or unmitigatable during the other peak hour. Locations that could not be fully mitigated during the construction conditions could also not be fully mitigated in the Build conditions.

Tables 20-8 and **20-9** summarize the capacity analysis results and mitigation recommendations for the 6-7 AM and 3-4 PM construction peak hours, respectively. A discussion of these results for each of the impacted intersections is provided below.

Table 20-8
No Build, Build, Mitigated Conditions Construction AM Peak Hour Traffic Levels of Service

Intersection	App	Construction No Build Condition Lane Group	V/C Ratio	Delay (SPV)	LOS	Construction Build Condition Lane Group	V/C Ratio	Delay (SPV)	LOS	Construction Mitigated Condition Lane Group	V/C Ratio	Delay (SPV)	LOS	Recommended Mitigation Measures
27th Avenue and 8th Street														
27th Avenue	EB	TR	0.60	19.1	B	TR	0.71	23.4	C	T	0.18	11.3	B	Unmitigatable Impact Install "No Standing Anytime" regulations along the EB approach for 100 feet to daylight the approach. Restripe the EB approach from one 11-foot wide travel lane, one 5-foot wide bike lane, and one 9-foot wide parking lane to one 11-foot wide through lane, and one 14-foot wide right turn lane with "share the road" bike provisions for 100 feet. [Measures reflect improvements needed for the PM peak period.]
		-	-	-	-	-	-	-	-	R	0.51	17.5	B	
	WB	LT	0.73	24.8	C	LT	1.16	113.5	F	LT	1.00	57.5	E	
8th Street	NB	L	0.40	24.3	C	L	0.80	38.8	D	L	0.80	38.8	D	
		R	0.41	26.2	C	R	0.44	27.5	C	R	0.44	27.5	C	
Overall Intersection		-	0.60	23.0	C	-	1.02	66.1	E	-	0.92	40.1	D	
Astoria Boulevard and 8th Street														
Astoria Boulevard	EB	LR	0.23	28.2	C	LR	0.23	28.3	C					Mitigation not required.
	WB	L	0.29	29.1	C	L	0.29	29.1	C					
		TR	0.21	27.9	C	TR	0.38	31.6	C					
8th Street	NB	LT	0.34	15.0	B	LT	0.47	17.0	B					
	SB	TR	0.46	17.2	B	TR	0.50	18.0	B					
Overall Intersection		-	0.40	20.6	C	-	0.45	21.8	C					
Astoria Boulevard and 21st Street														
Astoria Boulevard	EB	L	0.67	39.8	D	L	0.71	43.1	D	L	0.71	43.1	D	Install "No Standing Anytime" regulations along the NB approach for 165 feet, along the NB receiving side for 135 feet, along the SB approach for 340 feet, and along the SB receiving side for 125 feet to allow for thee moving lanes at the NB and SB approaches. Shift the NB approach centerline 3 feet to the west and restripe the NB approach from one 11-foot wide travel lane, one 20-foot wide travel lane with parking, one 12-foot wide receiving lane, and one 18-foot wide receiving lane with parking to two 11-foot wide travel lanes, one 12-foot wide right turn lane, one 12-foot wide receiving lane, and one 15-foot wide receiving lane for 125 feet from the intersection. Shift the SB approach centerline 4 feet to the east and restripe the SB approach from one 11-foot wide travel lane, one 19-foot wide travel lane with parking, one 11-foot wide receiving lane, and one 19-foot wide receiving lane with parking to two 11-foot wide travel lanes, one 12-foot wide right turn lane, one 11-foot wide receiving lane, and one 15-foot wide receiving lane for 135 feet from the intersection.
		TR	0.51	33.9	C	TR	0.54	34.4	C	TR	0.54	34.4	C	
	WB	L	0.83	40.7	D	L	0.85	42.5	D	L	0.85	42.5	D	
		TR	0.51	33.3	C	TR	0.57	34.1	C	TR	0.57	34.1	C	
21st Street	NB	LTR	0.71	28.3	C	LTR	1.03	65.4	E	LT	0.61	25.8	C	
		-	-	-	-	-	-	-	-	R	0.29	20.5	C	
	SB	LTR	0.91	30.0	C	LTR	1.05	57.1	E	LT	0.68	24.1	C	
		-	-	-	-	-	-	-	-	R	0.64	24.9	C	
Overall Intersection		-	0.91	32.3	C	-	0.98	50.2	D	-	0.79	29.7	C	
27th Avenue and 1st Street														
27th Avenue	WB	LR	-	8.9	A	LR	-	16.8	C					Mitigation not required.
1st Street	NB	TR	-	7.6	A	TR	-	8.8	A					
	SB	LT	-	8.4	A	-	-	-	-					
Overall Intersection		-	-	8.4	A	-	-	15.2	C					

Table 20-8 (cont.)
No Build, Build, Mitigated Conditions Construction AM Peak Hour Traffic Levels of Service

Intersection	App	Construction No Build Condition Lane Group	V/C Ratio	Delay (SPV)	LOS	Construction Build Condition Lane Group	V/C Ratio	Delay (SPV)	LOS	Construction Mitigated Condition Lane Group	V/C Ratio	Delay (SPV)	LOS	Recommended Mitigation Measures Lane Group
27th Avenue and 2nd Street														
27th Avenue	EB	LT	-	7.7	A	-	-	-	-	T	0.20	17.1	B	Mitigation not required.
	WB	-	-	-	-	-	-	-	-	T	0.90	36.5	D	Restripe the SB approach from one 35-foot wide travel lane with parking on both sides to one 22-foot wide travel lane with parking, one 5-foot wide buffer, and one 8-foot wide parking lane.
2nd Street	SB	LR	-	11.9	B	LR	-	18.7	C	LR	0.20	15.1	B	Install a traffic signal with a 90-second cycle length and two phases. [EB/WB phase green time is 38 s; SB phase green time is 42 s; all phases have 3 s of amber and 2 s of all red time.
Overall Intersection		-	-	1.3	A	-	-	2.3	A	-	0.53	30.8	C	[Measures reflect improvements needed for the PM peak period.]
27th Avenue and 4th Street														
27th Avenue	EB	LT	-	9.5	A	LT	-	11.1	B	LT	0.30	12.0	B	Install a traffic signal with a 90-second cycle length and two phases. [EB/WB phase green time is 49 s; SB phase green time is 31 s; all phases have 3 s of amber and 2 s of all red time.
	WB	TR	-	11.1	B	TR	-	42.2	E	TR	0.91	33.7	C	
4th Street	SB	LR	-	9.6	A	LR	-	11.1	B	LR	0.15	21.1	C	
Overall intersection		-	-	10.3	B	-	-	32.2	D	-	0.62	27.5	C	
Astoria Boulevard and 18th Street														
Astoria Boulevard	EB	-	-	-	-	-	-	-	-	T	0.56	25.2	C	Install a traffic signal with a 120-second cycle length and two phases. [EB/WB phase green time is 55 s; SB phase green time is 55 s; all phases have 3 s of amber and 2 s of all red time.
	WB	-	-	-	-	-	-	-	-	T	0.58	25.2	C	
18th Street	SB	LR	-	19.9	C	LR	-	22.9	C	LR	0.18	19.9	B	
Overall Intersection		-	-	2.0	A	-	-	2.2	A	-	0.38	24.7	C	[Measures reflect improvements needed for the PM peak periods.]

(highlighted) = Denotes a significant impact.

Table 20-9
No Build, Build, Mitigated Conditions Construction PM Peak Hour Traffic Levels of Service

Intersection	App	Construction No Build Condition				Construction Build Condition				Construction Mitigated Condition				Recommended Mitigation Measures
		Lane Group	V/C Ratio	Delay (SPV)	LOS	Lane Group	V/C Ratio	Delay (SPV)	LOS	Lane Group	V/C Ratio	Delay (SPV)	LOS	
27th Avenue and 8th Street														
27th Avenue	EB	TR	0.62	19.3	B	TR	1.44	227.6	F	T	0.59	17.1	B	Install "No Standing Anytime" regulations along the EB approach for 100 feet to daylight the approach. Restripe the EB approach from one 11-foot wide travel lane, one 5-foot wide bike lane, and one 9-foot wide parking lane to one 11-foot wide through lane, and one 14-foot wide right turn lane with "share the road" bike provisions for 100 feet.
		-	-	-	-	-	-	-	-	R	0.84	36.2	D	
	WB	LT	0.53	18.1	B	LT	1.11	107.2	F	LT	0.85	38.5	D	
8th Street	NB	L	0.39	24.1	C	L	0.50	26.2	C	L	0.50	26.2	C	
		R	0.66	39.1	D	R	0.71	43.2	D	R	0.71	43.2	D	
Overall Intersection		-	0.64	22.8	C	-	1.15	156.2	F	-	0.79	29.4	C	
Astoria Boulevard and 8th Street														
Astoria Boulevard	EB	LR	0.28	29.0	C	LR	0.28	29.1	C					Mitigation not required.
	WB	L	0.25	28.6	C	L	0.25	28.6	C					
		TR	0.16	27.1	C	TR	0.22	28.1	C					
8th Street	NB	LT	0.46	16.4	B	LT	0.53	17.6	B					
	SB	TR	0.36	15.8	B	TR	0.57	19.6	B					
Overall Intersection		-	0.39	20.2	C	-	0.45	21.6	C					
Astoria Boulevard and 21st Street														
Astoria Boulevard	EB	L	0.46	29.9	C	L	0.51	32.3	C	L	0.49	30.1	C	Partially Mitigated Install "No Standing Anytime" regulations along the NB approach for 165 feet, along the NB receiving side for 135 feet, along the SB approach for 340 feet, and along the SB receiving side for 125 feet to allow for thee moving lanes at the NB and SB approaches. Shift the NB approach centerline 3 feet to the west and restripe the NB approach from one 11-foot wide travel lane, one 20-foot wide travel lane with parking, one 12-foot wide receiving lane, and one 18-foot wide receiving lane with parking to two 11-foot wide travel lanes, one 12-foot wide right turn lane, one 12-foot wide receiving lane, and one 15-foot wide receiving lane for 125 feet from the intersection. Shift the SB approach centerline 4 feet to the east and restripe the SB approach from one 11-foot wide travel lane, one 19-foot wide travel lane with parking, one 11-foot wide receiving lane, and one 19-foot wide receiving lane with parking to two 11-foot wide travel lanes, one 12-foot wide right turn lane, one 11-foot wide receiving lane, and one 15-foot wide receiving lane for 135 feet from the intersection. Modify signal timing: Shift 2 s of green time from the NB/SB phase to the EB/WB phase [EB/WB phase green time shifts from 39 s to 41 s; NB/SB phase green time shifts from 56 s to 54 s; EBL/WBL phase green time remains the same.
		TR	0.67	37.3	D	TR	0.93	50.5	D	TR	0.88	44.6	D	
	WB	L	0.82	49.9	D	L	1.01	88.5	F	L	0.97	75.4	E	
		TR	0.47	33.1	C	TR	0.50	33.6	C	TR	0.47	31.8	C	
21st Street	NB	LTR	1.21	128.1	F	LTR	1.38	201.7	F	LT	0.92	32.7	C	
		-	-	-	-	-	-	-	-	R	0.44	22.9	C	
	SB	LTR	0.99	45.5	D	LTR	1.06	66.8	E	LT	0.75	29.1	C	
		-	-	-	-	-	-	-	-	R	0.48	34.4	C	
Overall Intersection		-	1.06	68.5	E	-	1.19	99.0	F	-	0.95	35.6	D	
27th Avenue and 1st Street														
27th Avenue	WB	LR	-	8.8	A	LR	-	12.5	A					Mitigation not required.
1st Street	NB	TR	-	7.4	A	TR	-	11.7	B					
	SB	LT	-	8.3	A	-	-	-	-					
Overall Intersection		-	-	8.3	A	-	-	12.0	B					

[highlighted] = Denotes a significant impact.

Table 20-9 (con't)
No Build, Build, Mitigated Conditions Construction
PM Peak Hour Traffic Levels of Service

Intersection	App	Construction No Build Condition				Construction Build Condition				Construction Mitigated Condition				Recommended Mitigation Measures Lane Group
		Lane Group	V/C Ratio	Delay (SPV)	LOS	Lane Group	V/C Ratio	Delay (SPV)	LOS	Lane Group	V/C Ratio	Delay (SPV)	LOS	
27th Avenue and 2nd Street														
27th Avenue	EB	LT	-	7.8	A	-	-	-	-	T	0.56	17.5	B	Restripe the SB approach from one 35-foot wide travel lane with parking on both sides to one 22-foot wide travel lane with parking, one 5-foot wide buffer, and one 8-foot wide parking lane. Install a traffic signal with a 90-second cycle length and two phases. [EB/WB phase green time is 47 s; SB phase green time is 33 s; all phases have 3 s of amber and 2 s of all red time.
	WB	-	-	-	-	-	-	-	-	T	0.46	14.0	B	
2nd Street	SB	LR	-	12.7	B	LR	-	50.3	F	LR	0.62	30.7	C	
Overall Intersection		-	-	2.1	A	-	-	11.4	B	-	0.58	19.3	B	
27th Avenue and 4th Street														
27th Avenue	EB	LT	-	10.3	B	LT	-	80.0	F	LT	0.86	27.8	C	Install a traffic signal with a 90-second cycle length and two phases. [EB/WB phase green time is 51 s; SB phase green time is 29 s; all phases have 3 s of amber and 2 s of all red time.
	WB	TR	-	12.6	B	TR	-	28.4	D	TR	0.64	16.1	B	
4th Street	SB	LR	-	10.4	B	LR	-	13.4	B	LR	0.38	26.1	C	
Overall intersection		-	-	11.4	B	-	-	54.1	F	-	0.69	23.5	C	
Astoria Boulevard and 18th Street														
Astoria Boulevard	EB	-	-	-	-	-	-	-	-	T	0.67	28.4	C	Install a traffic signal with a 120-second cycle length and two phases. [EB/WB phase green time is 55 s; SB phase green time is 55 s; all phases have 3 s of amber and 2 s of all red time.
	WB	-	-	-	-	-	-	-	-	T	0.27	20.1	C	
18th Street	SB	LR	-	20.0	C	LR	-	76.0	F	LR	0.62	29.1	C	
Overall Intersection		-	-	3.8	A	-	-	23.8	C	-	0.64	27.1	C	

[highlighted] = Denotes a significant impact.

27th Avenue and 8th Street

Impacts along the westbound 27th Avenue approach would occur during the weekday AM and PM construction peak hours and impacts along the eastbound 27th Avenue approach would occur during the PM construction peak hour. Weekday AM construction peak hour impacts could not be mitigated. Impacts during the PM construction peak hour could be mitigated by installing "No Standing Anytime" regulations along eastbound 27th Avenue for 100 feet from the intersection (a loss of approximately five parking spaces) to "daylight" the approach, and restriping the eastbound approach from one 11-foot wide shared through/right-turn lane, one 5-foot wide bike lane, and one 9-foot wide parking lane to one 11-foot wide through lane, and one 14-foot wide right-turn lane with "share the road" bike provisions for a distance of 100 feet back from the intersection.

Astoria Boulevard and 21st Street

Impacts would occur along the northbound and southbound 21st Street approaches during the AM and PM construction peak hours. Impacts would also occur along the eastbound Astoria Boulevard shared through-right movement and the westbound Astoria Boulevard left-turn movement during the PM construction peak hour. Impacts could be fully mitigated during the AM construction peak hour, and partially mitigated during the PM construction peak hour with the following measures:

- Installing "No Standing Anytime" regulations along the northbound 21st Street approach for 165 feet from the intersection (a loss of approximately six parking spaces), along the northbound receiving side for 135 feet from the intersection (a loss of approximately two parking spaces), along the southbound 21st Street approach for 340 feet from the intersection (a loss of approximately 13 parking spaces) and along the southbound receiving side for 125 feet from the intersection (a loss of approximately one parking space), to allow for three moving lanes northbound and southbound.

Shifting the northbound approach centerline three feet to the west and restriping the northbound approach from one 11-foot wide shared left-turn/through lane and one 20-foot wide shared through/right-turn lane with parking (with one 12-foot wide lane and one 18-foot wide lane with parking on the southbound "receiving" side) to two 11-foot wide general travel lanes and one 12-foot wide right turn lane (with one 12-foot wide lane and one 15-foot wide lane on the "receiving" side) for a distance of 125 feet back from the intersection.

- Shifting the southbound approach centerline four feet to the east and restriping the southbound approach from one 11-foot wide shared left-turn/through lane and one 19-foot wide shared through/right-turn lane with parking (with one 11-foot wide lane, and one 19-foot wide lane with parking on the northbound "receiving" side) to two 11-foot wide general travel lanes and one 12-foot wide right turn lane (with one 11-foot wide lane and one 15 foot wide lane on the "receiving" side) for a distance of 135 feet back from the intersection.
- Modifying the signal timing during the PM construction peak hour.

27th Avenue and 2nd Street

Significant impacts would occur on the southbound 2nd Street approach during the PM construction peak hour and could be mitigated by installing a traffic signal and restriping the southbound approach from one 35-foot wide roadway with parking on both sides to one 14-foot wide shared left-turn/right-turn lane with 8-foot wide parking lanes on both sides, and a one 5-foot wide buffer which serves as a traffic calming treatment. Should this analysis indicate that a traffic signal is not warranted, other mitigation measures would need to be identified or the significant impacts may only be partially mitigated or remain unmitigated.

27th Avenue and 4th Street

Significant impacts would occur along the eastbound 27th Avenue approach during the AM construction peak hour, and along the westbound 27th Avenue approach during the PM construction peak hour. These impacts could be mitigated by installing a traffic signal. Should this analysis indicate that a traffic signal is not warranted, other mitigation measures would need to be identified or the significant impacts may only be partially mitigated or remain unmitigated.

Astoria Boulevard and 18th Street

Significant impacts would occur along the southbound 18th Street approach during the PM construction peak hour and could be mitigated by installing a traffic signal. Should this analysis indicate that a traffic signal is not warranted, other mitigation measures would need to be identified or the significant impacts may only be partially mitigated or remain unmitigated.

As noted in Chapter 22, "Mitigation" additional review of potential mitigation measures that may fully or partially mitigate other significant impact locations that are identified as unmitigatable in the DEIS will be undertaken for the FEIS. Also, as noted in Chapter 15, "Transportation", other analysis modifications will be done for the FEIS that could affect the mitigation findings presented in this chapter. Analysis assumptions made for the proposed Astoria Cove project and analysis findings documented in the *Cornell NYC Tech FEIS* may change and such changes, when available, may affect the mitigation measures and findings in this (Halletts Point) project's FEIS. This may result in either fewer peak construction period impacts or greater impacts and could potentially result in one or more additional unmitigated impacts

Curb Lane Closures and Staging

Similar to many other construction projects in New York City, temporary curb lane and sidewalk closures are expected to be required adjacent to the project site, which would have dedicated gates, driveways, or ramps for delivery vehicle access. Flag-persons are expected to be present at these active driveways, where needed, to manage the access and movement of trucks and to ensure no on-street queuing. Some of the site deliveries may also occur along the perimeters of the construction site within delineated closed-off areas for concrete pour or steel delivery. MPT plans would be developed for any curb lane and sidewalk closures. Approval of these plans and implementation of all temporary sidewalk and curb lane closures during construction would be coordinated with NYCDOT OCMC. It is expected that pedestrian and traffic flow along all surrounding streets would be maintained throughout the entire construction period, with the exception of sidewalks adjacent to two of the project's northern buildings near the intersections of 26th Avenue and 1st Street.

PARKING

The anticipated construction activities are projected to generate a maximum parking demand of 413 spaces during the first quarter of 2021. It is expected that all construction worker parking would be accommodated on-site within areas yet to undergo construction or within completed parking garages.

TRANSIT

Approximately 30 percent of workers are estimated to travel to and from the construction site via transit. During peak construction (maximum of 625 average daily construction workers), this distribution would represent correspondingly up to 188 daily workers traveling by transit. With 80 percent of these workers arriving or departing during the construction peak hours, the estimated number of total peak hour transit trips would be 150 for the construction Build condition. These construction worker trips would occur outside of peak periods of transit ridership and be distributed and dispersed to the nearby transit facilities and would not result in any significant adverse transit impacts during construction. However, bus line-haul impacts identified for the 2022 Build condition may also occur during peak construction in 2021 during the commuter peak hours. Similar mitigation measures as those identified for the 2022 Build condition (i.e., bus frequency increase) are expected to also address the potential impacts during construction.

PEDESTRIANS

With a maximum of 625 average daily construction workers, as shown in **Appendix F**, there would be up to approximately 500 workers arriving or departing during the construction peak hours via various modes of transportation. These pedestrian trips would primarily be concentrated during off-peak hours (6 to 7 AM and 3 to 4 PM) and would be distributed among numerous pedestrian facilities (i.e., sidewalks, corner reservoirs, and crosswalks) in the area. Accordingly, there would also not be a potential for significant adverse pedestrian impacts attributable to the projected construction worker pedestrian trips. Furthermore, since the proposed project would not result in operational pedestrian impacts upon completion in 2022, there would not be operational impacts with partial build-out of the project during peak construction in 2021.

Sidewalk protection or temporary sidewalks would be provided in accordance with NYCDOT requirements to maintain pedestrian access for most construction periods. It is expected that full sidewalk closure would be needed for the construction of Buildings 1 and 2 at the northern end of 1st Street and 26th Avenue. The current pedestrian activities level in this area is very low and the redirected pedestrian flow is expected to be adequately accommodated on adjacent pedestrian facilities. Signs would be posted to safely redirect the pedestrians to the opposite sidewalks during the construction.

AIR QUALITY

INTRODUCTION

Emissions from on-site construction equipment and on-road construction-related vehicles, and the effect of construction vehicles on background traffic congestion, have the potential to affect air quality. The analysis of potential impacts of the construction of the proposed project on air quality includes a quantitative analysis of both on-site and on-road sources of air emissions, and the overall combined impact of both sources, where applicable.

In general, most construction engines are diesel-powered, and produce relatively high levels of nitrogen oxides (NO_x) and particulate matter (PM). Construction activities also emit fugitive dust. Although diesel engines emit much lower levels of carbon monoxide (CO) than gasoline engines, the stationary nature of construction emissions and the large quantity of engines could lead to elevated CO concentrations, and impacts on traffic could increase mobile source-related emissions of CO as well. Therefore, the pollutants analyzed for the construction period are nitrogen dioxide (NO_2), particles with an aerodynamic diameter of less than or equal to 10 micrometers (PM_{10}), particles with an aerodynamic diameter of less than or equal to 2.5 micrometers ($PM_{2.5}$), and CO. Since ultra-low-sulfur diesel (ULSD) would be used for all diesel engines used in the construction of the proposed project, sulfur oxides (SO_x) emitted from those construction activities would be negligible. For more details on air pollutants, see Chapter 16, "Air Quality."

Construction activity in general, and large-scale construction in particular, has the potential to adversely affect air quality as a result of diesel emissions. The main component of diesel exhaust that has been identified as having an adverse effect on human health is fine PM. To ensure that the construction of the proposed project results in the lowest practicable diesel particulate matter (DPM) emissions, the project sponsors would implement an emissions reduction program for all construction activities, consisting of the following components:

- *Diesel Equipment Reduction.* Construction of the proposed project would minimize the use of diesel engines and use electric engines, to the extent practicable. The applicant would apply for a grid power connection early on so as to ensure the availability of grid power, reducing the need for on-site generators, and require the use of electric engines in lieu of diesel where practicable.
- *Clean Fuel.* Ultra-low sulfur diesel (ULSD) would be used exclusively for all diesel engines throughout the construction sites.
- *Best Available Tailpipe Reduction Technologies.* Nonroad diesel engines with a power rating of 50 horsepower (hp) or greater and controlled truck fleets (i.e., truck fleets under long-term contract with the project) including but not limited to concrete mixing and pumping trucks, would utilize the best available tailpipe (BAT) technology for reducing DPM emissions. Diesel particle filters (DPFs) have been identified as being the tailpipe

technology currently proven to have the highest reduction capability. Construction contracts would specify that all diesel nonroad engines rated at 50 hp or greater would utilize DPFs, either installed on the engine by the original equipment manufacturer (OEM) or a retrofit DPF verified by the EPA or the California Air Resources Board, and may include active DPFs,[1] if necessary; or other technology proven to achieve equivalent emissions reduction. This measure is expected to reduce site-wide tailpipe PM emissions by approximately 90 percent or more.

- *Utilization of Newer Equipment.* USEPA's Tier 1 through 4 standards for nonroad engines regulate the emission of criteria pollutants from new engines, including PM, CO, NO_x, and hydrocarbons (HC). All nonroad construction equipment in the proposed project with a power rating of 50 hp or greater would meet at least the Tier 3 emissions standard. Tier 3 NO_x emissions range from 40 to 60 percent lower than Tier 1 emissions and considerably lower than uncontrolled engines. All nonroad engines in the project rated less than 50 hp would meet at least the Tier 2 emissions standard.
- *Dust Control.* Fugitive dust control plans would be required as part of contract specifications. For example, stabilized truck exit areas would be established for washing off the wheels of all trucks that exit the construction site. Truck routes within the sites would be either watered as needed or, in cases where such routes would remain in the same place for an extended duration, the routes would be stabilized, covered with gravel, or temporarily paved to avoid the re-suspension of dust. All trucks hauling loose material would be equipped with tight fitting tailgates and their loads securely covered prior to leaving the sites. Chutes would be used for material drops during demolition. Water sprays would be used for all excavation, demolition, and transfer of spoils to ensure that materials are dampened as necessary to avoid the suspension of dust into the air. Loose materials would be watered, stabilized with a biodegradable suppressing agent, or covered. In addition, all necessary measures would be implemented to ensure that the New York City Air Pollution Control Code regulating construction-related dust emissions is followed.
- *Source Location.* In order to reduce the resulting concentration increments, large emissions sources and activities such as concrete trucks and pumps would be located away from residential buildings and publicly accessible open spaces to the extent practicable and feasible. In addition, during the construction of Building 6B, all construction engines would be located at least 15 feet away from any operable windows and/or air intakes of Building 6A to the extent practicable and feasible if Building 6A is already completed and occupied. Similarly, during the construction of Building 7B, all construction engines would be located at least 15 feet away from any operable windows and/or air intakes of Building 7A to the extent practicable and feasible if Building 7A is already completed and occupied. These measures would reduce potential concentration increments from on-site sources at such locations by increasing the distance between the emission sources and the sensitive locations, resulting in enhanced dispersion of pollutants.

---

[1] There are two types of DPFs currently in use: passive and active. Most DPFs currently in use are the "passive" type, which means that the heat from the exhaust is used to regenerate (burn off) the PM to eliminate the buildup of PM in the filter. Some engines do not maintain temperatures high enough for passive regeneration. In such cases, "active" DPFs can be used (i.e., DPFs that are heated either by an electrical connection from the engine, by plugging in during periods of inactivity, or by removal of the filter for external regeneration).

- *Idle Restriction.* In addition to adhering to the local law restricting unnecessary idling on roadways, on-site vehicle idle time will also be restricted to three minutes for all equipment and vehicles that are not using their engines to operate a loading, unloading, or processing device (e.g., concrete mixing trucks) or otherwise required for the proper operation of the engine.

Additional measures may be taken to reduce pollutant emissions during construction of the proposed project in accordance with all applicable laws, regulations, and building codes. Overall, the proposed emission reduction program is expected to significantly reduce DPM emissions consistent with the goals of the currently best available control technologies under New York City Local Law 77, which are required only for publically funded City projects.

As discussed in Chapter 16, "Air Quality," EPA recently established a 1-hour average standard for NO_2. Great uncertainty exists as to 1-hour NO_2 background concentrations at ground level, especially near roadways, since these concentrations have not been measured. In addition, there are no clear methods to predict the rate of transformation of NO to NO_2 at ground-level given the level of existing data and models. Therefore, the significance of predicted construction impacts cannot be determined based on comparison with the new 1-hour NO_2 NAAQS since total 98th percentile values, including local area roadway contributions, cannot be estimated. In addition, methods for accurately predicting 1-hour NO_2 concentrations from construction activities have not been developed. However, exceedances of the 1-hour NO_2 standard resulting from construction activities cannot be ruled out and therefore, as discussed above, non-road diesel-powered vehicles and construction equipment rated Tier 3 or higher would be used during construction to reduce NO_x emissions. The electrification, source location and idling restrictions mentioned above would also reduce NO_X emissions and NO_2 concentration levels.

METHODOLOGY

Chapter 16, "Air Quality," contains a review of the pollutants for analysis; applicable regulations, standards, and benchmarks; and general methodology for stationary and mobile source air quality analyses. The general methodology for stationary source modeling (regarding model selection, receptor placement, and meteorological data) presented in Chapter 16 was followed for modeling dispersion of pollutants from on-site sources during the construction period. Additional details relevant only to the construction air quality analysis methodology are presented in the following section.

The *CEQR Technical Manual* states that the significance of a likely consequence (i.e., whether it is material, substantial, large, or important) should be assessed in connection with its setting (e.g., urban or rural), its probability of occurrence, its duration, its irreversibility, its geographic scope, its magnitude, and the number of people affected. In terms of the magnitude of air quality impacts, an action predicted to increase the concentration of a criteria air pollutant to a level that would exceed the NAAQS, or increase the concentration of $PM_{2.5}$ above the interim guidance thresholds, could have an adverse impact of significant magnitude. The factors identified above would then be considered in determining the overall significance of the potential impact.

On-Site Construction Activity Assessment

To determine which construction periods constitute the worst-case periods for the pollutants of concern (PM, CO, NO_2), construction-related emissions were calculated throughout the duration of construction on an annual and peak day basis for $PM_{2.5}$. $PM_{2.5}$ was selected for determining the worst-case periods for all pollutants as analyzed, because the ratio of $PM_{2.5}$ emissions to impact criteria is higher than for other pollutants. Therefore, initial estimates of $PM_{2.5}$ emissions throughout the construction years were used for determining the worst-case periods for analysis of all pollutants. Generally, emission patterns of PM_{10} and NO_2 would follow $PM_{2.5}$ emissions, since they are related to diesel engines by horsepower (hp). CO emissions may have a somewhat different pattern but generally would also be highest during periods when the most activity would occur. Based on the resulting multi-year profiles of annual average and peak day average emissions of $PM_{2.5}$, and the proximity of the construction activities to residences and publicly accessible open spaces, a worst-case year and a worst-case short-term period for construction were identified for dispersion modeling of annual and short-term (i.e., 24-hour, 8-hour, and 1-hour) averaging periods. Dispersion of the relevant air pollutants from the sites during these periods was then analyzed, and the highest resulting concentrations are presented in the following sections. Broader conclusions regarding potential concentrations during other periods, which were not modeled, are presented as well, based on the multi-year emissions profiles and the worst-case period results.

The sizes, types, and number of construction equipment were estimated based on the construction activity schedule. Emission factors for NO_x, CO, PM_{10}, and $PM_{2.5}$ from on-site construction engines were developed using the EPA's NONROAD2008 Emission Model (NONROAD). Since emission factors for concrete pumps are not available from either the EPA MOBILE6.2 emission model (MOBILE6) or NONROAD, emission factors specifically developed for this type of application were used.[1] With respect to trucks, emission rates for NO_X, CO, PM_{10}, and $PM_{2.5}$ for truck engines were developed using MOBILE6.

As described in the introduction above, the project sponsors would be committed to a number of measures to reduce air pollutant emissions during construction of the proposed project, with special attention given to DPM. These measures include the exclusive use of ULSD for all construction engines, the use of Tier 3 or newer equipment with DPFs (OEM or the equivalent tailpipe controls to reduce DPM emissions by at least 90 percent compared with normal private construction practices) during construction on all nonroad construction engines with an engine output rating of 50 hp or greater. In addition, controlled truck fleets (i.e., truck fleets under long-term contract, such as concrete trucks) would use trucks equipped with DPFs.

Based on the above commitments, emission factors for the construction of the proposed project were calculated assuming the exclusive use of ULSD, diesel engines of Tier 3 certification, and the application of DPFs on all nonroad diesel engines 50 hp or greater and on concrete delivery and pumping trucks; other trucks were assumed to have emissions consistent with the general truck fleet (all on-road diesel vehicles currently use ULSD, as mandated by federal regulations). $PM_{2.5}$ emission factors for engines retrofit with a DPF (i.e., all nonroad engines with a power output of 50 hp or greater and all concrete delivery trucks) were calculated as 10 percent of the NONROAD Tier 3 emission factors. The emission factors specifically developed for concrete pump trucks were also reduced by 90 percent to account for the DPFs. All personnel/material hoists and small hand tools would be electric and would therefore have no associated emissions.

---

[1] Concrete pumps are truck mounted and use the truck engine to power the pumps at high load. This application of truck engines is not addressed by the MOBILE6 model, and since it is not a non-road engine, it is not included in the NONROAD model. Emission factors were obtained from a study which developed factors specifically for this type of activity. *FEIS for the Proposed Manhattanville in West Harlem Rezoning and Academic Mixed-Use Development*, CPC–NYCDCP, November 16, 2007.

In addition to engine emissions, fugitive dust emissions from operations (e.g., excavation and loading excavated materials into dump trucks) were calculated based on EPA procedures delineated in AP-42 Table 13.2.3-1. It was estimated that the planned control of fugitive emissions would reduce PM emissions from such processes by 50 percent. A robust watering program would be implemented for all demolition, excavation, and transfer of loose materials to and from trucks.

The resulting emission factors were used for the emissions and dispersion analyses. Average annual (running 12-month averages) and peak-day $PM_{2.5}$ engine emissions profiles for the entire duration of the construction were prepared by multiplying the above emission rates by the number of engines, the work hours per day, and fraction of the day each engine would be expected to work during each month. The resulting overall peak day and annual average emission profiles are presented in **Figures 20-2** and **20-3**. Based on the $PM_{2.5}$ construction emissions profiles, September 2020 and the year from May 2020 to April 2021 were identified as the worst-case short-term and annual periods, respectively, since the highest project-wide emissions were predicted in these periods, construction activities would occur simultaneously at Buildings 4, 5, 7B, and 8, and the construction activities would take place in close proximity to residential locations and open spaces during these periods.

The dispersion of pollutants during the worst-case short-term and annual periods was then modeled in detail to predict resulting maximum concentration increments from construction activity and total concentrations (including background concentrations) in the surrounding area. Although the modeled results are based on construction scenarios for specific sample periods, conclusions regarding other periods, were derived based on the fact that lower concentration increments from construction would generally be expected during periods with lower construction emissions. As presented in **Figures 20-2** and **20-3**, emissions during other periods would be lower—often much lower—than the peak emissions. However, since the worst-case short-term results may often be indicative of very local impacts, similar maximum local impacts may occur at any stage at various locations but would not persist in any single location, since emission sources would not be located continuously at any single location throughout construction. Equipment would move throughout the site as construction progresses.

For the short-term model scenarios, predicting concentration averages for periods of 24 hours or less, all stationary sources, such as compressors, pumps, or concrete trucks, which idle in a single location while unloading, were simulated as point sources. Other engines, which would move around the site on any given day, were simulated as area sources. For periods of 8 hours or less (less than the length of a shift), it was assumed that all engines would be active simultaneously. All sources would move around the site throughout the year and were therefore simulated as area sources in the annual analyses.

Receptors (locations in the model where concentrations are predicted) were placed along the sidewalks surrounding the construction sites on both sides of the street at locations that would be publicly accessible, at residential and other sensitive uses at both ground-level and elevated locations (e.g., residential windows), at completed and occupied project buildings, and at open spaces. In addition, a ground-level receptor grid was placed to enable extrapolation of concentrations throughout the entire area at locations more distant from the construction sites.

Mobile Source Assessment

The general methodology for mobile source modeling presented in Chapter 15 was followed for intersection modeling during the construction period. The CAL3QHC model was used to perform mobile source CO computations, while CAL3QHCR, a refined version of the CAL3QHC model, was used to determine motor vehicle generated PM concentrations.

Based on the predicted traffic conditions, the traffic scenario for the first quarter of 2021 was determined to demonstrate the highest overall volumes of construction-related vehicles and traffic disruptions, such as street or lane closures; this period would generally represent the highest potential for air quality impacts. This worst-case period was also used to demonstrate the highest predicted mobile source CO and PM increments for all other construction periods when added to the concurrent on-site emissions from construction equipment and activity; this is a conservative assumption, since concentration increments from mobile sources during periods with lower vehicle increments would be lower.

Sites for mobile source analysis were selected based on the construction model scenarios and truck trip assignments analyzed for the assessment of traffic impacts during construction. The sites were chosen with the objective of capturing the highest construction-related concentration increment, the highest expected increments at locations where background concentrations were predicted to be high in the No Build condition, and the mobile source increments in areas near the project site at intersections where relatively high increments are predicted from on-site construction activity. Based on those criteria, three intersections were selected for CO, PM_{10} and $PM_{2.5}$ modeling, as presented in **Table 20-10**.

Table 20-10
Mobile Source Analysis Sites

Analysis Site	Location	Pollutants Analyzed
1	27th Avenue and 4th Street	CO, PM_{10}, $PM_{2.5}$
2	27th Avenue and 8th Street	CO, PM_{10}, $PM_{2.5}$
3	Astoria Boulevard and 21st Street	CO, PM_{10}, $PM_{2.5}$

Cumulative Assessment

Since emissions from on-site construction equipment and on-road construction-related vehicles may contribute to concentration increments concurrently, a cumulative assessment was undertaken to determine the potential maximum effect of these sources combined. On-road emissions adjacent to the construction sites were included with the on-site dispersion analysis (in addition to on-site truck and non-road engine activity) in order to address all local project-related emissions cumulatively.

Conformity with State Implementation Plans

As described in Chapter 16, “Air Quality”, the conformity requirements of the Clean Air Act (CAA) and regulations promulgated thereunder (conformity requirements) limit the ability of federal agencies to assist, fund, permit, and approve projects that do not conform to the applicable State Implementation Plan (SIP). Since the development of Buildings 6, 7, and 8 would be facilitated by the disposition of NYCHA property, which is subject to Section 18 of the U.S. Housing Act of 1937 and approval by the U.S. Department of Housing and Urban Development (HUD), general conformity regulations would apply.

The pollutants of concern on a regional basis are CO, PM_{10}, $PM_{2.5}$, NO_x, and volatile organic compounds (VOC). Emissions from on-road trucks and worker vehicles and from non-road construction equipment were calculated on an annual basis based on the emissions modeling procedures described above for the microscale analysis.

Under the general conformity regulations, a general conformity determination for federal actions is required for each criteria pollutant or precursor in non-attainment or maintenance areas where the action's direct and indirect emissions have the potential to emit one or more of the six criteria pollutants at rates equal to or exceeding the prescribed *de minimis* rates for that pollutant. In the case of this project, the prescribed annual rates are 50 tons of VOCs and 100 tons of NO_x (ozone precursors, ozone non-attainment area in transport region), 100 tons of CO (CO maintenance area), and 100 tons of $PM_{2.5}$, SO_2, or NO_x ($PM_{2.5}$ and precursors in $PM_{2.5}$ non-attainment area).

FUTURE WITHOUT THE PROPOSED PROJECT

Background Air Quality

In the future without the proposed project, the project site is assumed to remain the same as in the existing condition. Several No Build projects are anticipated near the project site—most notably, Astoria Cove, which if approved, will transform five on the northeastern portion of the Halletts Point peninsula, on either side of 26th Avenue, which are currently occupied by industrial uses, into a mixed-use, predominantly residential waterfront development. Since air quality regulations mandated by the Clean Air Act are anticipated to maintain or improve air quality in the region, it can be expected that air quality conditions in the future without the proposed project would be similar to or no worse than those that presently exist.

Concurrent Project Sites

Construction of Astoria Cove, which if approved, is expected to occur during the time period that encompasses the construction schedule for the proposed project. Potential air quality impacts from the construction of Astoria Cove were included as part of a cumulative impacts analysis with the Halletts Point construction.

Mobile Source Assessment

CO

CO concentrations without the proposed project were determined using the methodology previously described. **Table 20-11** shows future maximum predicted 8-hour average CO concentrations at the analysis intersections without the proposed project. The values shown are the highest predicted concentrations for the receptor locations for any of the time periods analyzed. As indicated in **Table 20-11**, the predicted 8-hour concentrations of CO, including background, are below the corresponding ambient air quality standard.

Table 20-11
Maximum Predicted Future No Build
8-Hour Average Carbon Monoxide Concentrations

Analysis Site	Location	8-Hour Concentration (ppm)	NAAQS (ppm)
1	27th Avenue and 4th Street	2.1	9
2	27th Avenue and 8th Street	2.6	9
3	Astoria Boulevard and 21st Street	3.0	9

Note: An adjusted ambient background concentration of 2.0 ppm is included in the No Build values presented above.

PM

Concentrations of PM_{10} and $PM_{2.5}$ from mobile sources without the proposed project were also determined. Concentrations of PM_{10} included a 24-hour averaging period and $PM_{2.5}$ included the 24-hour and annual averaging periods. As shown in **Table 20-12**, including a background concentration of 44 µg/m^3, the maximum PM_{10} 24-hour No Build concentrations are predicted to be below the applicable NAAQS of 150 µg/m^3. Note that $PM_{2.5}$ concentrations for No Build condition are not presented, since impacts are assessed on an incremental basis.

Table 20-12
Maximum Predicted Future No Build
24-Hour Average PM10 Concentrations

Analysis Site	Location	24-Hour Concentration (µg/m^3)	NAAQS (µg/m^3)
1	27th Avenue and 4th Street	49.2	150
2	27th Avenue and 8th Street	49.9	150
3	Astoria Boulevard and 21st Street	65.5	150
Note:	An adjusted ambient background concentration of 44 µg/m^3 is included in the No Build values presented above.		

FUTURE WITH THE PROPOSED PROJECT

On-Site Construction Activity Assessment

Maximum predicted concentration increments from construction of the proposed project, and overall concentrations including background concentrations, are presented in **Table 20-13**. For $PM_{2.5}$, monitored concentrations are not added to modeled concentrations from sources, since impacts are determined by comparing the predicted increment from the proposed project as compared to the No Build with the interim guidance criteria. The total maximum combined concentrations, including mobile sources and construction, are presented in the "Cumulative Assessment" section, below.

The maximum predicted total concentrations of PM_{10}, CO, and annual-average NO_2 are not expected to exceed the NAAQS.

From the on-site sources related to the construction, the maximum predicted 24-hour average $PM_{2.5}$ incremental concentration (3.0 µg/m^3) occurred at a near-side sidewalk receptor location immediately adjacent to the construction. It should be noted that the maximum increments, predicted at sidewalks and covered walkways adjacent to construction, are overstated, since they do not include the effect of the solid fence and sidewalk protection on mixing. In addition, the sidewalk locations are for transient use and people would not be expected to be present for extended durations. Furthermore, the location of the maximum 24-hour average increments would vary based on the location of the sources, which would move throughout the site over time. Therefore, continuous daily exposures would not be likely to occur at these locations.

Table 20-13
Maximum Predicted Pollutant Concentrations from Construction Site Sources ($\mu g/m^3$)

Pollutant	Averaging Period	No Build	Proposed Project	Increment	Interim Guidance Threshold	NAAQS
Residence, Academic Buildings or Open Space						
$PM_{2.5}$	24-hour[1]	—	—	2.3 [3]	2 [2]	35
	Annual Local[1]	—	—	0.16	0.30	15
PM_{10}	24-hour	44	53	9	—	150
NO_2	Annual	43	52	9	—	100
CO	1-hour	3.4 ppm	6.3 ppm	2.9 ppm	—	35 ppm
	8-hour	2.0 ppm	2.2 ppm	0.2 ppm	—	9 ppm
Sidewalks and Covered Walkways Adjacent to Construction						
$PM_{2.5}$	24-hour[1]	—	—	3.0 [3]	2 [2]	35
	Annual Local[1]	—	—	0.19	0.30	15
PM_{10}	24-hour	44	59	15	—	150
NO_2	Annual	43	56	13	—	100
CO	1-hour	3.4 ppm	7.1 ppm	3.7 ppm	—	35 ppm
	8-hour	2.0 ppm	2.2 ppm	0.2 ppm	—	9 ppm

Notes:
Results for any other time period would be lower.
$PM_{2.5}$ concentration increments were compared with threshold values. Total concentrations were compared with the NAAQS.
1 Monitored concentrations are not added to modeled $PM_{2.5}$ values.
2 DEP is currently applying threshold criteria for assessing the significance of 24-hour average $PM_{2.5}$ impacts. The significance of temporary concentration increments greater than 2 $\mu g/m^3$ is assessed in the context of the magnitude, frequency, duration, location and size of area affected by the concentration increment.
3 This value exceeds the interim guidance threshold level. See text for further discussion.

As shown in **Appendix F**, maximum predicted 24-hour average $PM_{2.5}$ concentration locations exceeded 2.3 $\mu g/m^3$ at several increments at sensitive receptor locations (i.e., residential buildings or open space): Proposed Building 7A (during construction of adjacent Building 7B) and the open space area immediately southwest of the construction of Building 8. Concentrations exceeding 2 $\mu g/m^3$ on Building 7A were predicted on first and second floor. At both the first and second floor locations, the maximum frequency is predicted to be once per year with an annual average frequency of less than once per year. In addition, concentrations exceeding 2 $\mu g/m^3$ were predicted at discrete ground level locations in the open space area southwest of Building 8, with a maximum predicted frequency of once per year with an annual average frequency of less than once per year. The location of the maximum 24-hour average increments would vary based on the location of the sources during construction, which would move throughout the site over time. Therefore, continuous daily exposures would not be likely to occur at any one location. Based on the limited duration and extent of these predicted exceedances, the low frequency of occurrence, and the limited potential for exposure, this would not result in significant adverse impacts.

These maximum increments were computed for the peak construction period; for other construction time periods with lesser emissions, the potential 24-hour increments would be less. However, during the construction of Proposed Building 6B, Proposed Building 6A would be immediately west of the construction site, similar to the configuration of Building 7A relative to Building 7B. Therefore, concentrations at Building 6A would be expected to exceed 2 $\mu g/m^3$ during the construction of Building 6B, similar to the levels predicted at Building 7A. As explained above, based on the limited duration and extent of the predicted exceedances, the low frequency of occurrence, and the limited potential for exposure, this would not result in significant adverse impacts.

The maximum predicted neighborhood-scale annual average $PM_{2.5}$ concentration would be 0.01 µg/m^3—lower than the interim guidance threshold level of 0.1 µg/m^3, and the maximum predicted local annual average $PM_{2.5}$ concentration would be less than the applicable interim guidance threshold.

Mobile Source Assessment

A mobile source air quality analysis was conducted for the project during construction activities at the site for the peak construction traffic year of 2021. Localized pollutant impacts from the vehicles queuing at the selected intersection were analyzed for CO for the 8-hour averaging period. PM_{10} was analyzed for the 24-hour averaging period and $PM_{2.5}$ was analyzed for the 24-hour and annual averaging periods.

CO

CO concentrations with the proposed project were determined using the methodology previously described. **Table 20-14** shows the future maximum predicted 8-hour average CO concentration with the proposed project at the analysis intersections studied. (No 1-hour values are shown, since no exceedances of the NAAQS would occur and the *de minimis* criteria are only applicable to 8-hour concentrations; therefore, the 8-hour values are the most critical for impact assessment.) The values shown are the highest predicted concentrations for the time periods analyzed. In addition, the incremental increases in 8-hour average CO concentrations are very small, and consequently would not result in a violation of the CEQR *de minimis* CO criteria. Therefore, construction of the proposed project would not result in any significant CO air quality impacts in the Build condition.

Table 20-14
Maximum Predicted Future No Build and Build
8-Hour Average Carbon Monoxide Concentrations

Analysis Site	Location	No Build 8-Hour Concentration (ppm)	Build 8-Hour Concentration (ppm)	NAAQS (ppm)
1	27th Avenue and 4th Street	2.1	2.8	9
2	27th Avenue and 8th Street	2.6	2.8	9
3	Astoria Boulevard and 21st Street	3.0	3.1	9
Note:	An adjusted ambient background concentration of 2.0 ppm is included in the No Build values presented above.			

PM

Concentrations of PM_{10} and $PM_{2.5}$ from mobile sources with the proposed project were also determined. **Table 20-15** shows the future maximum predicted 24-hour average PM_{10} concentrations with the proposed project. The values shown are the highest predicted concentrations for all locations analyzed and include the ambient background concentrations. The results indicate that the construction of the proposed project would not result in any violations of the PM_{10} standard or any significant adverse impacts on air quality.

Table 20-15
Maximum Predicted Future No Build and Build
24-Hour Average PM10 Concentrations

Analysis Site	Location	No Build 24-Hour Concentration (µg/m^3)	Build 24-Hour Concentration (µg/m^3)	NAAQS (µg/m^3)
1	27th Avenue and 4th Street	49.2	49.7	150
2	27th Avenue and 8th Street	49.9	50.6	150
3	Astoria Boulevard and 21st Street	65.5	65.8	150
Note: An adjusted ambient background concentration of 44 µg/m^3 is included in the No Build values presented above.				

Future maximum predicted 24-hour and annual average $PM_{2.5}$ concentration increments were calculated so that they could be compared to the interim guidance criteria that would determine the potential significance of any impacts from the proposed project. Based on this analysis, the maximum predicted localized 24-hour average and neighborhood-scale annual average incremental $PM_{2.5}$ concentrations are presented in **Tables 20-16** and **20-17**, respectively. The results show that the annual and daily (24-hour) $PM_{2.5}$ increments are predicted to be well below the interim guidance criteria and, therefore, the construction of the proposed project would not result in significant $PM_{2.5}$ impacts at the analyzed receptor locations.

Table 20-16
Maximum Predicted Future
24-Hour Average $PM_{2.5}$ Concentrations

Analysis Site	Location	Increment (µg/m^3)	Interim Guidance Threshold (µg/m^3)
1	27th Avenue and 4th Street	0.14	2
2	27th Avenue and 8th Street	0.15	2
3	Astoria Boulevard and 21st Street	0.08	2
Note: $PM_{2.5}$ interim guidance criteria—24-hour average, 2 µg/m^3 (5 µg/m^3 not-to-exceed value).			

Table 20-17
Maximum Predicted Future
Annual Average $PM_{2.5}$ Concentrations

Analysis Site	Location	Increment (µg/m^3)	Interim Guidance Threshold (µg/m^3)
1	27th Avenue and 4th Street	0.002	0.1
2	27th Avenue and 8th Street	0.003	0.1
3	Astoria Boulevard and 21st Street	0.003	0.1
Note: $PM_{2.5}$ interim guidance criteria—annual (neighborhood scale) 0.1 µg/m^3.			

Cumulative Assessment

Since emissions from on-site construction equipment and on-road construction-related vehicles may contribute to concentration increments concurrently, a cumulative assessment was undertaken to determine the potential maximum effect of these sources combined. The future maximum cumulative 1-hour and 8-hour average CO concentrations at a sensitive receptor location are predicted to be 7.1 ppm and 2.4 ppm respectively, less than the applicable NAAQS of 35 ppm and 9 ppm respectively. The future maximum cumulative 24-hour average PM_{10} concentration at a sensitive receptor location is predicted to be 62 µg/m^3, well below the applicable NAAQS of 150 μg/m^3. The future maximum cumulative annual average $PM_{2.5}$ concentration is predicted to be 0.26 μg/m^3, less than the applicable interim guidance threshold value of 0.30 μg/m^3.

Cumulative 24-hour average $PM_{2.5}$ concentration at a sensitive residential receptor location from mobile and stationary sources is estimated to be 2.6 μg/m^3 at Proposed Building 7A (during construction of adjacent Building 7B), with most of the contribution from stationary sources. Cumulative 24-hour average $PM_{2.5}$ concentration at a sidewalk receptor location from mobile and stationary sources is estimated to be 3.2 μg/m^3. As explained above, the maximum predicted concentrations are probably overstated because the model did not include the effects of the noise reduction wall along the site perimeter that would be between sensitive receptors and the source of the emissions. The construction wall would cause additional turbulence, and concentrations on the outside of the wall would be lower than predicted by the model, which cannot simulate the effect on concentrations that would result from having an intervening barrier in place. Furthermore, the location of the maximum 24-hour average increments would vary based on the location of the sources, which would move throughout the site over time, unlike a heat and hot water system source, which is often exhausted through a fixed stack location. Therefore, continuous daily exposures would not be likely to occur at any one location. Moreover, since the precise location of engine activity on site would vary from day to day for the various periods, and since peak activity for all tasks would not always coincide, as is assumed in the peak day modeling, it is unlikely that these precise meteorological and construction conditions would coincide. In addition, the sidewalk locations are for transient use; people would not be expected to be present at a given location for extended durations such that people are not expected to be at the same sidewalk location next to the construction site for 24-hours. Based on the limited duration and extent of these predicted exceedances, the low frequency of occurrence, and the limited potential for exposure, the cumulative concentrations from on-site construction equipment and on-road construction related vehicles would not result in significant adverse impacts.

Conformity with State Implementation Plans

Annual construction activity and on-road emissions are presented in **Table 20-18**. The annual emissions would be lower than the *de minimis* rates for the relevant criteria pollutants defined in the general conformity regulations. Since all diesel engines will be using ultra low sulfur diesel, SO_2 emissions would be negligible.

Table 20-18
Emissions from Construction Activities (ton/yr)

Year	$PM_{2.5}$	PM_{10}	NO_x	VOC	CO
2014	0.01	0.01	0.7	0.1	0.3
2015	0.03	0.03	3.3	0.5	6.4
2016	0.03	0.04	3.8	0.6	8.3
2017	0.02	0.03	2.8	0.4	2.9
2018	0.03	0.04	3.3	0.6	11.4
2019	0.03	0.03	3.1	0.6	11.3
2020	0.05	0.06	6.1	1.0	9.3
2021	0.03	0.04	2.3	0.5	11.9
2022	0.001	0.001	0.1	0.0	0.1
De minimis level:	*100*	*100*	*100*	*50*	*100*

CONCLUSIONS

A detailed analysis of the combined effects of on-site and on-road emissions determined that annual-average NO_2, CO, and PM_{10} concentrations would be below their corresponding NAAQS. Therefore, the proposed projects would not cause or contribute to any significant adverse air quality impacts with respect to these standards.

Dispersion modeling determined that the maximum predicted incremental concentrations of $PM_{2.5}$ (using a worst-case emissions scenario) would not exceed the City's applicable annual interim guidance criterion of 0.3 $\mu g/m^3$ but would exceed the 24-hour interim guidance criterion of 2 $\mu g/m^3$ at a few receptor locations, including Proposed Buildings 6A and 7A, and the open space area southwest of Proposed Building 8, where the likelihood of prolonged exposure is very low. The occurrences of elevated 24-hour average concentrations for $PM_{2.5}$ would be limited in duration, frequency, and magnitude. Therefore, after taking into account the limited duration and extent of these predicted exceedances, and the limited area-wide extent of the 24-hour impacts, it is concluded that no significant adverse air quality impacts for $PM_{2.5}$ are expected from the on-site construction sources.

Because background concentrations are not known and the analysis methodology for mobile and stationary sources has not been developed for the new 1-hour NO_2 NAAQS, exceedances of the 1-hour NO_2 standard resulting from construction activities cannot be ruled out. Therefore, measures including diesel equipment reduction, utilization of newer equipment, and source location and idling restriction, would be implemented by the proposed project to minimize NO_x emissions from construction activities.

NOISE AND VIBRATION

INTRODUCTION

Potential impacts on community noise levels during construction of a proposed project can result from noise from construction equipment operation and from construction vehicles and delivery vehicles traveling to and from the site. Noise and vibration levels at a given location are dependent on the kind and number of pieces of construction equipment being operated, the acoustical utilization factor of the equipment (i.e., the percentage of time a piece of equipment is operating at full power), the distance from the construction site, and any shielding effects (from structures such as buildings, walls, or barriers). Noise levels caused by construction activities would vary widely, depending on the phase of construction and the location of the construction relative to receptor locations. The most significant construction noise sources are expected to be impact equipment such as jackhammers, excavators with ram hoes, drill rigs, rock drills, impact wrenches, tower cranes, and paving breakers, as well as the movements of trucks.

Noise from construction activities and some construction equipment is regulated by the New York City Noise Control Code and by the EPA. The New York City Noise Control Code, as amended December 2005 and effective July 1, 2007, requires the adoption and implementation of a noise mitigation plan for each construction site, limits construction (absent special circumstances as described below) to weekdays between the hours of 7:00 AM and 6:00 PM, and sets noise limits for certain specific pieces of construction equipment. Construction activities occurring after hours (weekdays between 6:00 PM and 7:00 AM, and on weekends) may be authorized in the following circumstances: (1) emergency conditions; (2) public safety; (3) construction projects by or on behalf of City agencies; (4) construction activities with minimal noise impacts; and (5) where there is a claim of undue hardship resulting from unique site characteristics, unforeseen conditions, scheduling conflicts, and/or financial considerations. EPA requirements mandate that certain classifications of construction equipment meet specified noise emissions standards.

Given the scope and duration of construction activities for the proposed project, a quantified construction noise analysis was performed. The purpose of this analysis was to determine if significant adverse noise impacts would occur during construction, and if so, to examine the feasibility of implementing mitigation measures to reduce or eliminate such impacts.

CONSTRUCTION NOISE IMPACT CRITERIA

The *CEQR Technical Manual* states that significant noise impacts due to construction would occur "only at sensitive receptors that would be subjected to high construction noise levels for an extensive period of time." This has been interpreted to mean that such impacts would occur only at sensitive receptors where the activity with the potential to create high noise levels would occur continuously for approximately two years or longer. In addition, the *CEQR Technical Manual* states that the impact criteria for vehicular sources, using the No Action noise level as the baseline, should be used for assessing construction impacts. As recommended in the *CEQR Technical Manual,* this study uses the criteria to define a significant adverse noise impact as follows:

- If the No Action noise level is less than 60 dB(A) $L_{eq(1)}$, a 5 dB(A) $L_{eq(1)}$ or greater increase would be considered significant.
- If the No Action noise level is 61 dB(A) $L_{eq(1)}$, a 4 dB(A) $L_{eq(1)}$ or greater increase would be considered significant.
- If the No Action noise level is equal to or greater than 62 dB(A) $L_{eq(1)}$, or if the analysis period is a nighttime period (defined in the CEQR criteria as being between 10:00 PM and 7:00 AM), the incremental significant impact threshold would be 3 dB(A) $L_{eq(1)}$.

The criteria described above are used in this study to identify potential long-term significant adverse construction noise impacts. In addition, this study also uses a short-term impact criterion to define potential significant adverse noise impacts. Specifically for the purposes of this analysis, very large noise level increases (i.e., 18 dBA or more) lasting between 12 and 24 months were also considered to constitute potential significant adverse noise impacts.

As discussed below, the presence of window/wall attenuation measures at noise receptor sites, such as double-glazed windows and alternate means of ventilation, is considered when evaluating locations predicted to experience noise level increments from construction in excess of CEQR impact criteria.

NOISE ANALYSIS METHODOLOGY

Construction activities for the proposed project would be expected to result in increased noise levels as a result of: (1) the operation of construction equipment on-site; and (2) the movement of construction-related vehicles (i.e., worker trips, and material and equipment trips) on the surrounding roadways. The effect of each of these noise sources was evaluated. The results presented below show the effects of construction activities (i.e., noise due to both on-site construction equipment and construction-related vehicle operation) and the total cumulative impacts due to operational effects (caused by project-generated vehicular trips) and construction effects (as construction proceeds on uncompleted components of the project).

Noise from the operation of construction equipment on-site at a specific receptor location near a construction site is calculated by computing the sum of the noise produced by all pieces of equipment operating at the construction site. For each piece of equipment, the noise level at a receptor site is a function of:

- The noise emission level of the equipment;
- A usage factor[1], which accounts for the percentage of time the equipment is operating at full power;
- The distance between the piece of equipment and the receptor;
- Topography and ground effects; and
- Shielding.

Similarly, noise levels due to construction-related traffic are a function of:

- The noise emission levels of the type of vehicle (e.g., auto, light-duty truck, heavy-duty truck, bus, etc.);
- Vehicular speed;
- The distance between the roadway and the receptor;
- Topography and ground effects; and
- Shielding.

CONSTRUCTION NOISE MODELING

Noise effects from construction activities were evaluated using the CadnaA model, a computerized model developed by DataKustik for noise prediction and assessment. The model can be used for the analysis of a wide variety of noise sources, including stationary sources (e.g., construction equipment, industrial equipment, power generation equipment), transportation sources (e.g., roads, highways, railroad lines, busways, airports), and other specialized sources (e.g., sporting facilities). The model takes into account the reference sound pressure levels of the noise sources at 50 feet, attenuation with distance, ground contours, reflections from barriers and structures, attenuation due to shielding, etc. The CadnaA model is based on the acoustic propagation standards promulgated in International Standard ISO 9613-2. This standard is currently under review for adoption by the American National Standards Institute (ANSI) as an American Standard. The CadnaA model is a state-of-the-art tool for noise analysis and is approved for construction noise level prediction by the *CEQR Technical Manual.*

Geographic input data used with the CadnaA model included CAD drawings that defined site work areas, adjacent building footprints and heights, locations of streets, and locations of sensitive receptors. For each analysis period, the geographic location and operational characteristics—including equipment usage rates (percentage of time operating at full power) for each piece of construction equipment operating at the project site, as well as noise control measures—were input to the model. In addition, reflections and shielding by barriers erected on the construction site, and shielding from both adjacent buildings and project buildings as they are constructed, were accounted for in the model. In addition, construction-related vehicles were assigned to the adjacent

[1] Usage factors for each piece of equipment were based on values shown in Section 28-109 of New York City Department of Environmental Protection’s Rules for Citywide Construction Noise Mitigation document.

roadways. The model produced A-weighted $L_{eq(1)}$ noise levels at each receptor location for each analysis period, as well as the contribution from each noise source.

DETERMINATION OF NO ACTION AND NON-CONSTRUCTION NOISE LEVELS

Noise generated by construction activities is added to noise generated by non-construction traffic on adjacent roadways in order to determine the total noise levels at each receptor location. Existing noise levels were conservatively used as the baseline noise levels for determining construction-generated noise level increases. Existing noise levels at the analysis receptors were determined by:

- Performing noise measurements at various at-grade locations;
- Calculating noise levels at the receptor sites and measurement locations using the CadnaA model with existing site geometry and existing traffic on adjacent roadways as inputs;
- Determining adjustment factors based on the difference between the measured and calculated existing noise levels at the measurement locations; and
- Applying the adjustment factors to the calculated existing noise levels at the construction noise receptors.

Since the construction of the proposed Astoria Cove development northeast of the study area is expected to occur during the same period that the proposed project would be constructed, noise due to construction of Astoria Cove was included in the No Action noise levels for this construction analysis. The noise levels generated by construction of Astoria Cove at each of the analyzed receptor locations were calculated based on the methodology described above for modeling of construction noise levels, and combined with the existing noise levels to determine the No Action noise levels at each receptor.

ANALYSIS PERIODS

As described above, construction activities are expected to take place over a period of about eight years (i.e., from 2015 through 2022). Except for unusual circumstances construction activities would occur on weekdays only. Therefore, construction noise analyses were performed only for the weekday AM time period.

Anticipated construction schedule and durations were developed by Lend Lease (US) Construction LMB, Inc., an experienced New York City construction manager, and are representative of the reasonable worst-case conditions for assessing potential impacts. The schedule included projections of the number of workers, types and number of pieces of equipment, and number of construction vehicles anticipated to be operating during each month of the construction period. An analysis was performed based on this construction schedule to determine the quarters (i.e., the 3 month time period) during the construction period (i.e., 2015-2022) when the maximum potential for significant noise impacts would occur. This analysis conservatively assumed that the worst-case quarter of each year would represent the entire year, and the year was modeled according to its peak quarter. According to the conceptual schedule on which the noise analysis is based, during 2018, none of the project buildings would be undergoing the majority of their excavation and/or foundation work, which are generally the loudest phases of construction. Consequently, the noise levels calculated for the fourth quarter of 2017 and the first quarter of 2019 (during which substantial excavation/foundation work is predicted to occur and which were analyzed in detail) were conservatively assumed to apply throughout 2018, since there are only four quarters between these analyzed time periods. Since the conceptual construction schedule indicates only interior construction and site work during the first few months of 2022, that year was not analyzed in detail.

In addition, to be conservative, the noise analysis assumed that both peak on-site construction activities and peak construction-related traffic conditions occurred simultaneously.

Between the DEIS and FEIS, additional time periods within each year may be examined to determine whether the analysis results in the DEIS are conservatively overstated as a result of the assumptions stated above.

NOISE REDUCTION MEASURES

Construction at the project site would be required to follow the requirements of the New York City Noise Control Code (NYC Noise Code) for construction noise control measures. Specific noise control measures will be described in a noise mitigation plan required under the NYC Noise Code. These measures could include a variety of source and path controls.

In terms of source controls (i.e., reducing noise levels at the source or during the most sensitive time periods), the following measures would be implemented in accordance with the NYC Noise Code:

- Equipment that meets the sound level standards specified in Subchapter 5 of the New York City Noise Control Code would be utilized from the start of construction. **Table 20-18** shows the noise levels for typical construction equipment and the mandated noise levels for the equipment that would be used for construction of the proposed project.
- As early in the construction period as logistics will allow, diesel- or gas-powered equipment would be replaced with electrical-powered equipment such as welders, water pumps, bench saws, and table saws (i.e., early electrification) to the extent feasible and practical.
- Where feasible and practical, construction sites would be configured to minimize back-up alarm noise. In addition, all trucks would not be allowed to idle more than three minutes at the construction site based upon New York City Local Law.
- Contractors and subcontractors would be required to properly maintain their equipment and mufflers.
- A properly secured impact cushion (either a commercially available model or one fabricated from scrap wood, leather, or rubber at the job site) shall be installed on top of piles that are being driven by an impact hammer.

In terms of path controls (e.g., placement of equipment, implementation of barriers or enclosures between equipment and sensitive receptors), the following measures for construction, which go beyond typical construction techniques, would be implemented to the extent feasible and practical:

- Where logistics allow, noisy equipment, such as cranes, concrete pumps, concrete trucks, and delivery trucks, would be located away from and shielded from sensitive receptor locations. Once building foundations are completed, delivery trucks would operate behind construction fences, where possible;
- Noise barriers constructed from plywood or other materials would be utilized to provide shielding (e.g., the construction sites would have a minimum 12-foot barrier and, where logistics allow, truck deliveries would take place behind these barriers once building foundations are completed); and
- Path noise control measures (i.e., portable noise barriers, panels, enclosures, and acoustical tents, where feasible) would be used for certain dominant noise equipment to the extent feasible and

practical, i.e., asphalt pavers, drill rigs, excavators with ram hoe, hoists, impact wrenches, jackhammers, power trowels, powder actuated devices, rivet busters, rock drills, concrete saws, and sledge hammers. These barriers were conservatively assumed to offer only a 10 dBA reduction in noise levels for each piece of equipment to which they are applied, as shown in **Table 20-19**. The details to construct portable noise barriers, enclosures, tents, etc. are based upon the instructions of DEP Citywide Construction Noise Mitigation.

Table 20-19
Typical Construction Equipment Noise Emission Levels (dBA)

Equipment List	DEP & FTA Typical L_{max} Noise Level at 50 feet[1]	L_{max} Noise Level with Path Controls at 50 feet[1,2]
Asphalt Laying Equipment	85	
Backhoe/Loader	80	
Compactor	80	
Compressors	58	
Concrete Pump	82	
Concrete Trowel	85	
Concrete Trucks	85	
Concrete Vibrator	80	
Cranes (Crawler Cranes)	85	75
Delivery Trucks	84	
Dozer	85	
Dump Trucks	84	
Excavator	85	
Fuel Truck	84	
Generators	82	72
Hand Tool	59	
Hoist	72[3]	62
Jack Hammer	74	
Lift	85	
Pavement Cutter	85	
Portable Cement Mixer	80	
Pile Driving Rig (Impact)	85	
Pile Driving Rig (Vibratory	85	
Pump	77	
Rebar Bender	80	
Roller	85	
Tamper	80	
Tractor Trailer	84	
Welding Machines	73	

Notes:
1 Sources: Citywide Construction Noise Mitigation, Chapter 28, Department of Environmental Protection of New York City, 2007. Transit Noise and Vibration Impact Assessment, FTA, May 2006.
2 Path controls include portable noise barriers, enclosures, acoustical panels, and curtains, whichever feasible and practical.
3 Source: Kessler, Frederick M., “Noise Control for Construction Equipment and Construction Sites,” report for Hydro Quebec,

RECEPTOR SITES

Eight (8) noise measurement locations (i.e., sites 1 to 8) were selected to determine the baseline existing noise levels, and seventy-nine (79) receptor locations (i.e., sites 0 to 77) close to the project area were selected as discrete noise receptor sites for the construction noise analysis. These receptors were either located directly adjacent to the project site or streets where construction trucks would pass. Each receptor site was the location of a residence or other noise-sensitive use. At some buildings, multiple building façades were analyzed. At high-rise buildings, noise receptors were selected at multiple elevations. At open space locations, receptors were selected at street level. **Figure 20-4** shows the locations of the 83 noise receptor sites, and **Table 20-20** lists the noise receptor sites and the associated land use at each site. The receptor sites selected for detailed analysis are representative of other noise receptors in the immediate project area and are the locations where maximum project impacts due to construction noise would be expected.

CONSTRUCTION NOISE ANALYSIS RESULTS

Cumulative Analysis

Using the methodology described above, and considering the noise abatement measures for source and path controls specified above, cumulative noise analyses were performed to determine maximum one-hour equivalent ($L_{eq(1)}$) noise levels that would be expected to occur during each year of construction.

The noise analysis results in **Appendix F** show that predicted noise levels due to construction-related activities would result in increases in noise levels that would exceed the CEQR impact criteria during one or more years at sixty-two (62) of the seventy-nine (79) existing receptor sites.

For impact determination purposes, the significance of adverse noise impacts is determined based on whether predicted incremental noise levels at sensitive receptor locations would be greater than the impact criteria suggested in the *CEQR Technical Manual* for two consecutive years or more. While increases exceeding the CEQR impact criteria for one year or less may be noisy and intrusive, they are generally not considered to be significant adverse noise impacts. However, for the purposes of this analysis, very large noise level increases (i.e., 18 dBA or more), lasting between 12 and 24 months, were also considered to constitute significant adverse noise impacts, because of the very large magnitude of the increases.

The noise analysis results show that predicted noise levels would exceed the CEQR impact criteria on one or more floors at fifty (50) of the seventy-nine (79) existing receptor sites. **Figure 20-4** shows the locations and **Table 20-21** summarizes analysis results where predicted noise level increases exceed the CEQR impact criteria (additional results of the construction analysis are presented in **Appendix F**). This table presents sites that exceeded both the longer-term criteria (i.e., 3-5 dBA increase for two or more years) or the short-term criteria (18 dBA or more for 12 months or more).

The conceptual schedule on which the noise analysis was based assumes a conservative potential timeline for construction that tended to show the most construction activity and most construction equipment operating simultaneously, which conditions would result in the largest increase in noise levels at the nearby receptors. Actual construction activities may take place over a longer time period, and result in lower noise levels over a longer period of time than those predicted for the worst-case conditions analyzed.

Table 20-20
Noise Receptor Locations

Receptor	Location	Associated Land Use
1	Corner of 1st Street and 26th Avenue	Open Space / Future Residential
2	1st Street at the eastern end of 27th Avenue	Future Residential / Open Space
3	2nd Street between 26th and 27th Avenues	Future Residential
4	Astoria Boulevard east of 1st Street	Future Residential
5	1st Street between 27th Avenue and Astoria Boulevard	Open Space / Future Residential
6	27th Avenue at the southern end of 4th Street	Future Residential
7	Parking Lot south of 27th Avenue between 3rd and 4th Streets	Future Residential
8	Pedestrian Walkway Near the NYCHA Basketball Courts between Existing Mapped Portions of Astoria Boulevard	Residential / Open Space
0A	Park at northwest corner of 1st Street and 26th Avenue	Open Space
0B	Park west of 1st Street and Astoria Boulevard	Open Space
1A-1D	1-07 27th Avenue	Residential
2A-2C	26-01 2nd Street	Residential
3A-3B	26-03 2nd Street	Residential
4A-4B	26-05 2nd Street	Residential
5A-5C	26-07 2nd Street	Residential
6A-6D	26-24 3rd Street	Residential
7A-7D	26-18 3rd Street	Residential
8A-8C	26-41 2nd Street	Residential
9A-9C	26-37 2nd Street	Residential
10A-10C	2-03 27th Avenue	Residential
11A-11B	2-07 27th Avenue	Residential
12A-12B	2-11 27th Avenue	Residential
13A-13B	2-13 27th Avenue	Residential
14A-14B	2-15 27th Avenue	Residential
15A-15C	2-17 27th Avenue	Residential
16A-16D	26-38 3rd Street	Residential
17A-17C	3-04 26th Avenue	Residential
18A-18B	3-06 26th Avenue	Residential
19A-19B	3-08 26th Avenue	Residential
20A-20C	3-10 36th Avenue	Residential
21A-21E	26-02 4th Street	Institutional
22A-22D	26-11 3rd Street	Residential
23A-23C	26-15 3rd Street	Residential
24A-24C	26-17 3rd Street	Residential
25A-25D	26-18 4th Street	Residential
26A-26C	26-31 3rd Street	Residential
27A-27C	26-33 3rd Street	Residential
28A-28D	23-36 4th Street	Residential
29A-29D	26-25 4th Street	Institutional
30A-30D	4-21 27th Avenue	Institutional
31A-31C	4-27 27th Avenue	Residential
32A-32B	4-29 27th Avenue	Residential
33A-33B	4-31 27th Avenue	Residential
34A-34B	4-33 27th Avenue	Residential
35A-35B	4-35 27th Avenue	Residential
36A-36C	4-37 27th Avenue	Residential
37A-37E	8-15 27th Avenue	Residential
38	26-14 9th Street	Residential
39	26-16 9th Street	Residential
40	26-18 9th Street	Residential
41	26-20 9th Street	Residential
42	26-22 9th Street	Residential
43	26-24 9th Street	Residential
44	26-26 9th Street	Residential
45A-45E	8-10 28th Avenue	Residential

Table 20-20 (cont'd)
Noise Receptor Locations

Receptor	Location	Associated Land Use
46A-46C	28-05 8th Street	Residential
47A-47C	28-07 8th Street	Residential
48A-48C	28-09 8th Street	Residential
49A-49D	8-01 Astoria Blvd	Residential
50A-50B	8-07 Astoria Blvd	Residential / Commercial
51A-51C	8-09 Astoria Blvd	Residential / Commercial
52A-52C	8-13 Astoria Blvd	Residential / Commercial
53A-53D	Astoria Houses Building 1	Residential
54A-54D	Astoria Houses Building 2	Residential
55A-55D	Astoria Houses Building 12	Residential
56A-56D	Astoria Houses Building 3	Residential
57A-57D	Astoria Houses Building 4	Residential
58A-58D	Astoria Houses Building 5	Residential
59A-59D	Astoria Houses Building 6	Residential
60A-60D	Astoria Houses Building 7	Residential
61A-61D	Astoria Houses Building 8	Residential
62A-62D	Astoria Houses Building 9	Residential
63A-63D	Astoria Houses Building 10	Residential
64A-64D	Astoria Houses Building 11	Residential
65A-65D	Astoria Houses Building 22	Residential
66A-66D	Astoria Houses Building 13	Residential
67A-67D	Astoria Houses Building 23	Residential
68A-68D	Astoria Houses Building 15	Residential
69A-69D	Astoria Houses Building 16	Residential
70A-70D	Astoria Houses Building 17	Residential
71A-71D	Astoria Houses Building 18	Residential
72A-72D	Astoria Houses Building 19	Residential
73A-73D	Astoria Houses Building 20	Residential
74A-74D	Astoria Houses Building 21	Residential
75A-75D	4-57 26th Avenue	Future Residential
76A-76D	8-51 26th Avenue	Future Residential
77A-77D	4-55 26th Avenue	Future Residential

Table 20-21
Locations Where Noise Increases Exceed CEQR Construction Noise Impact Criteria

Building/ Location	Associated Land Use	Total Stories	Façade	Associated Receptor(s)	Impacted Floor(s)	Maximum Increase in dBA	Impact Duration (years)	Associated Construction Source Site(s)
Park (Whitey Ford Field) at northwest corner of 1st Street and 26th Avenue	Open Space	N/A	N/A	0A	N/A	14.8	4	1,2
Park (Hallet's Cove Playground) west of 1st Street and Astoria Boulevard			N/A	0B	N/A	16.1	5	4, 5, 7A
1-07 27th Avenue	Residential	4	South	1A	1-4	11.9	7	1, 2, 3, 4
			North	1B	1-4	17.3	7	
			West	1C	3-4	14.3	7	
			East	1D	1-4	12.9	7	
26-07 2nd Street	Residential	4	South	5C	3	18.0	1	1
26-24 3rd Street	Residential	3	South	6D	1-3	8.0	4	7A
26-41 2nd Street	Residential	5	West	8A	1-5	13.3	7	3, 4, 6B
			East	8B	1-2,4-5	6.6	3	3, 4, 6B
			North	8C	3-5	13.9	3	3, 4, 6B
26-37 2nd Street	Residential	5	West	9A	1-5	14.1	7	1, 4, 6A, 6B
			South	9C	1-5	10.6	4	4, 6A, 6B
2-03 27th Avenue	Residential	5	North	10A	1-5	13.7	5	1, 2, 3, 4, 6A, 6B
			West	10B	1-5	15.8	6	
			South	10C	1-5	16.5	6	
2-07 27th Avenue	Residential	5	South	11A	1-5	15.7	6	3, 6A, 6B, 7A
			North	11B	1-5	8.1	5	
2-11 27th Avenue	Residential	5	South	12A	1-5	15.7	6	3, 6A, 6B, 7A
			North	12B	1-5	6.8	2	
2-13 27th Avenue	Residential	5	South	13A	1-5	17.4	7	3, 6A, 6B, 7A, 7B
			North	13B	1-5	9.1	4	
2-15 27th Avenue	Residential	5	South	14A	1-5	16.4	2	3, 6A, 6B, 7A, 7B
			North	14B	2-3,5	8.5	3	
2-17 27th Avenue	Residential	3	South	15A	1-3	14.6	6	6A, 6B, 7A, 7B
			North	15B	3	7.3	3	7A
			East	15C	3	12.2	5	
26-38 3rd Street	Residential	2	West	16A	2	7.6	3	7A
			North	16B	2	7.0	3	
			East	16C	1-2	9.1	5	
3-10 36th Avenue	Residential	4	South	20B	2	6.5	4	1, 2, 3
26-15 3rd Street	Residential	5	West	23A	5	6.5	3	1, 6A, 7A
			North	23B	5	6.0	3	
			East	23C	3-5	6.5	3	
26-17 3rd Street	Residential	5	West	24A	5	6.9	4	1, 6A, 7A, 7B
			East	24B	3-5	7.1	6	
			South	24C	3-5	10.3	6	

Table 20-21 (cont'd)
Locations Where Noise Increases Exceed CEQR Construction Noise Impact Criteria

Building/ Location	Associated Land Use	Total Stories	Façade	Associated Receptor(s)	Impacted Floor(s)	Maximum Increase in dBA	Impact Duration (years)	Associated Construction Source Site(s)
26-18 4th Street	Residential	5	West	25A	3-5	7.0	4	1, 6A, 7A, 7B
			East	25C	1	6.0	2	
			South	25D	3-5	11.4	5	
26-31 3rd Street	Residential	3	East	26B	2-3	8.0	3	1, 6A, 7A, 7B
26-33 3rd Street	Residential	3	East	27B	2-3	10.3	5	1, 6A, 7A, 7B
			South	27C	3	10.0	5	
23-36 4th Street	Public Institution	3	West	28A	1-2	9.0	4	6A, 6B, 7A
			North	28B	3	9.0	6	6A, 6B, 7A, 7B
			East	28C	1-2	10.1	2	7B
			South	28D	2	10.5	6	6A, 6B, 7A, 7B
4-21 27th Avenue	Public Institution	13	West	30A	1-13	20.4	7	1, 6A, 6B, 7A, 7B
			South	30B	1-13	2.0	7	
4-27 27th Avenue	Residential	4	West	31A	1-4	10.3	2	7B
			South	31B	1-4	1.6	6	6A, 6B, 7A, 7B
4-29 27th Avenue	Residential	4	South	32A	1-4	10.8	6	6A, 6B, 7A, 7B
4-31 27th Avenue	Residential	4	South	33A	1-4	0.2	6	6A, 6B, 7A, 7B
4-33 27th Avenue	Residential	4	South	34A	1-4	9.7	6	6A, 6B, 7B
4-35 27th Avenue	Residential	4	South	35A	1-4	9.0	6	7B
4-37 27th Avenue	Residential	4	South	36A	1-4	8.7	6	6A, 6B, 7B
8-15 27th Avenue	Residential	8	South	37A	2-7	7.7	6	6A, 6B, 7B
8-10 28th Avenue	Residential	12	North	45A	10-11	4.3	3	7A
Astoria Houses Building 1	Residential	7	Northwest	53A	1-7	14.3	2	7B, 8
Astoria Houses Building 2	Residential	7	Northwest	54A	1-7	12.6	5	7A, 7B
			Southeast	54C	7	5.8	2	
			Southwest	54D	1-7	18.0	2	
Astoria Houses Building 12	Residential	7	Northwest	55A	1-7	21.7	6	1, 4, 5, 6A, 6B, 8
			Northeast	55B	1-7	20.6	7	
			Southwest	55C	1-7	24.0	6	
			Southeast	55D	1-7	23.3	7	
Astoria Houses Building 3	Residential	7	Northwest	56A	1-7	8.4	6	7B
			Southwest	56D	1-7	10.0	2	
Astoria Houses Building 4	Residential	7	Northwest	57A	1-7	20.5	2	7B
			Northeast	57B	7	8.9	2	
			Southwest	57D	1-7	5.7	5	1, 7A

Table 20-21 (cont'd)
Locations Where Noise Increases Exceed CEQR Construction Noise Impact Criteria

Building/ Location	Associated Land Use	Total Stories	Façade	Associated Receptor(s)	Impacted Floor(s)	Maximum Increase in dBA	Impact Duration (years)	Associated Construction Source Site(s)
Astoria Houses Building 5	Residential	7	Northwest	58A	1-7	19.3	6	6A, 6B, 7A, 7B, 8
			Northeast	58B	1-7	13.5	2	
			Southwest	58D	1-7	8.2	2	
Astoria Houses Building 6	Residential	7	Northwest	59A	1-7	21.7	5	6A, 7A, 7B
			Northeast	59B	1-7	25.8	5	
			Southeast	59C	3-7	18.1	6	
			Southwest	59D	1-7	16.0	6	
Astoria Houses Building 7	Residential	7	Northwest	60A	1-7	15.4	4	1, 4, 5, 6A, 6B, 7A, 7B
			Northeast	60B	1-7	21.0	4	
			Southeast	60C	1-7	22.4	6	
			Southwest	60D	1-7	22.4	6	
Astoria Houses Building 8	Residential	7	Northwest	61A	1-7	22.6	7	1, 4, 5, 6A, 6B, 7A, 7B, 8
			Northeast	61B	1-7	19.3	5	
			Southeast	61C	1-7	14.6	7	
			Southwest	61D	1-7	17.9	7	
Astoria Houses Building 9	Residential	7	Northwest	62A	1-7	18.6	5	5, 6A, 6B, 7A, 7B, 8
			Northeast	62B	1-7	15.5	7	
			Southwest	62C	1-7	17.5	2	
			Southeast	62D	1-7	19.1	2	
Astoria Houses Building 10	Residential	7	Northwest	63A	1-7	15.5	7	1, 4, 5, 6A, 6B, 8
			Northeast	63B	1-7	16.3	7	
			Southwest	63C	1-7	22.3	7	
			Southeast	63D	1-7	19.6	7	
Astoria Houses Building 11	Residential	7	Northwest	64A	1-7	19.6	6	4, 5, 6A, 6B, 8
			Northeast	64B	1-7	21.3	5	
			Southwest	64C	1-7	16.0	7	
			Southeast	64D	1-7	20.4	4	
Astoria Houses Building 22	Residential	7	North	65A	1-7	25.9	6	4, 5, 6A, 6B, 8
			East	65B	1-7	24.2	5	
			South	65C	7	12.8	5	
			West	65D	3-7	16.4	5	
Astoria Houses Building 23	Residential	7	Northwest	67A	1-7	19.8	7	4, 5, 6A, 6B, 7A, 8
			Northeast	67B	1-7	20.9	5	
			Southeast	67C	1-7	28.2	5	
			Southwest	67D	7	17.8	5	
Astoria Houses Building 15	Residential	7	Northwest	68A	1-7	9.4	5	7A, 7B, 8
			Southwest	68D	5-7	9.5	2	
Astoria Houses Building 16	Residential	7	Northwest	69A	4-7	11.0	2	8
			Southwest	69D	1-7	9.1	2	
Astoria Houses Building 17	Residential	7	Northwest	70A	7	6.7	2	8
Astoria Houses Building 18	Residential	7	Northwest	71A	1-7	19.7	2	8
			Northeast	71B	1-7	16.5	2	
			Southwest	71C	7	11.2	2	
			Southeast	71D	4-7	15.2	2	

Table 20-21 (cont'd)
Locations Where Noise Increases Exceed CEQR Construction Noise Impact Criteria

Building/ Location	Associated Land Use	Total Stories	Façade	Associated Receptor(s)	Impacted Floor(s)	Maximum Increase in dBA	Impact Duration (years)	Associated Construction Source Site(s)
Astoria Houses Building 19	Residential	7	Northwest	72A	1-7	23.0	2	8
			Northeast	72B	3-7	16.3	2	
			Southeast	72D	1-7	0.7	2	
Astoria Houses Building 20	Residential	7	Northwest	73A	1-7	20.8	6	6A, 7A, 7B, 8
			Northeast	73B	1-7	11.3	4	
			Southwest	73C	7	11.1	5	
			Southeast	73D	1-7	23.4	5	
Astoria Houses Building 21	Residential	7	Northwest	74A	1-7	23.1	5	6A, 6B, 8
			Northeast	74B	1-7	18.5	2	
			Southwest	74D	5-7	13.8	2	

In addition, as discussed above, the construction noise analysis was performed using the quarter of each year that is anticipated to result in the maximum construction noise levels. The analysis conservatively assumed that this worst-case quarter would represent construction noise levels throughout the entire year. During times of less intense construction activity, construction noise levels are anticipated to be less. For instance, pile driving at any particular building site would be expected to last only two to three months depending on the building, and even shorter durations for each pile location within the building site. Consequently, an individual receptor location would experience pile driving noise for only a limited period of time out of the construction period. Furthermore, many of the loudest pieces of construction equipment, including excavators, asphalt paving equipment, concrete trowels, concrete trucks, portable cement mixers, etc., are mobile, and move about the site throughout the days and months of construction. The construction analysis considers a reasonable worst-case scenario with all mobile equipment in the locations that would tend to generate the most noise at the adjacent receptors. Such a scenario, and the high noise levels associated with it, as have been examined in this noise analysis, would be likely to occur only during limited times throughout the construction period, and thus represent a conservative analysis. Since these predicted construction noise level increases are not anticipated to occur at each receptor location for the entire duration from 2015 to 2022, a timeline discussion of the proposed construction activity and associated noise effects is provided below.

2015 to 2016

Construction activity anticipated to occur between 2015 and 2016includes demolition at all of the building sites, construction of Building 1 in its entirety, and excavation, foundation and superstructure at Buildings 2 and 7A. Building Sites 1 and 2 are located south of 26th Avenue, on the east and west side of 1st Street, respectively. Building Site 7A is located south of 27th Avenue at 2nd Street. The predicted significant increases in noise levels associated with the construction activities outlined above would most likely be limited to locations adjacent to/in proximity to these development sites. Construction noise levels would be expected to be less at locations within the project study area that are farther away from these development sites. Noise contour figures in **Appendix F** illustrate at-grade noise levels at various locations throughout the study area.

2017 to 2019

Construction activity anticipated to occur between 2017 and 2019 includes interior and exterior fit-out and finishing of Buildings 2 and 7A, construction of Buildings 3 and 6A in their entirety, and excavation, foundation, superstructure and exterior and interior fit-out at Buildings 4 and

6B. Building Sites 3 and 4 are located west of 1st Street at 27th Avenue. Building Sites 6A and 6B are located south of 27th Avenue at 4th Street. The predicted significant increases in noise levels associated with the construction activities outlined above would most likely be limited to locations adjacent to/in proximity to these development sites. Construction noise levels would be expected to be less at locations within the project study area that are farther away from these development sites. The noise analysis currently uses the noise levels in the fourth quarter of 2017 and first quarter of 2019 as a conservative representation of the noise levels during 2018, but between the DEIS and FEIS, noise levels during 2018 will be refined based on additional noise modeling. Noise contour figures in **Appendix F** illustrate at-grade noise levels at various locations throughout the study area.

2020 to 2022

Construction activity anticipated to occur between 2020 and 2021 includes interior and exterior fit-out and finishing of Buildings 4 and 6B, and construction of Buildings 5 and 8 in their entirety. Building Site 5 is located west of 1st Street north of Astoria Boulevard. Building Site 8 is located south of Astoria Boulevard, east of 1st Street. The predicted significant increases in noise levels associated with the construction activities outlined above would most likely be limited to locations adjacent to/in proximity to these development sites. Construction noise levels would be expected to be less at locations within the project study area that are farther away from these development sites. The noise analysis currently uses the noise levels in 2021 as a conservative representation of the noise levels during 2022, but between the DEIS and FEIS, noise levels during 2022 will be refined based on additional noise modeling. Noise contour figures in **Appendix F** illustrate at-grade noise levels at various locations throughout the study area.

Discussion

Overall, should the proposed project be developed and constructed as conservatively presented in this analysis, up to fifty-one (51) existing locations could experience significant adverse noise impacts for certain limited periods during construction. Between the DEIS and FEIS, a refined construction noise analysis will be undertaken to more precisely determine the magnitude and duration of the elevated noise levels resulting from construction at these locations.

At these locations, the exceedance of the CEQR impact criteria would be due principally to noise generated by on-site construction activities (rather than construction-related traffic). As previously discussed, this noise analysis examined the reasonable worst-case peak hourly noise levels that would result from construction, and consequently is conservative in predicting significant increases in noise levels. Furthermore, this analysis is based on a conceptual site plan and construction schedule. It is possible that the actual construction may be of lesser magnitude, or that construction on multiple development sites may not overlap, in which case construction noise would be less intense than the analysis predicts.

Most buildings listed in **Table 20-21** have double-glazed windows and alternate ventilation (i.e., air conditioners). For buildings with double-glazed windows and window air conditioners, interior noise levels would be approximately 20 to 25 dBA less than exterior noise levels, and for buildings with double-glazed windows and well-sealed through-the-wall/sleeve/PTAC[1] air conditioners interior noise levels would be approximately 25 to 30 dBA less than exterior noise levels. The

[1] Package Terminal Air-Conditioner

typical attenuation provided by double-glazed windows and the alternate ventilation outlined above would be expected to result in interior noise levels during most of the time that are below 45 dBA $L_{10(1)}$ (the CEQR acceptable interior noise level criteria). However, although these structures have double-glazed windows and alternate ventilation, during some limited time periods (i.e., the periods when exterior $L_{10(1)}$ noise levels due to construction exceed 75 dBA, as shown in **Appendix F**) construction activities may result in interior noise levels that would be above the 45 dBA $L_{10(1)}$ noise level recommended by CEQR for these uses.

Table 20-22 identifies locations that are predicted to experience significant noise level increases and that are either open space locations or residential locations that lack receptor noise control measures such as double-glazed windows and an alternate means of ventilation. These locations are mapped in **Figure 20-4**. Two of the locations listed in **Table 20-22** are public open spaces that would experience substantially elevated noise levels for at least 24 continuous months at an exterior location.

Based on the locations outlined above in **Table 20-21** where predicted noise level increases exceed the CEQR impact criteria for two or more consecutive years, a visual survey was performed to identify which locations may not currently have double-glazed windows and/or a means of alternative ventilation, as these locations would be likely to experience unacceptable interior noise levels. Six locations listed in **Table 20-22** are mixed-use residential/commercial uses predicted to experience noise impacts and would result in interior noise levels exceeding CEQR's acceptability guideline for residential use. These six residential locations do appear to have double-glazed windows, but it was not possible to determine whether they had an alternate means of ventilation. At these locations, if they do not have an alternate means of ventilation, the typical attenuation would be 5 dBA for an open window condition. This level of attenuation would not be expected to result in interior noise levels during most of the time that are below 45 dBA $L_{10(1)}$ (the CEQR acceptable interior noise level criteria). Consequently, these six residential locations, if they do not have an alternate means of ventilation, would be considered to experience a significant adverse impact as a result of construction noise.

Overall, should the proposed project be developed and constructed as conservatively presented in this analysis, up to fifty-one (51) existing locations, as shown in **Table 20-21**, could experience significant impacts for certain limited periods during construction. At the two open space locations with the potential to experience construction noise impacts, there would be no feasible or practicable mitigation to mitigate the construction noise impacts.

Some potential receptor controls that could be used to mitigate the impacts at residential locations where interior L_{10} values would be expected to exceed the value considered acceptable by CEQR criteria are discussed in Chapter 22, "Mitigation."

Between the DEIS and FEIS, a refined construction noise analysis will be undertaken to more precisely determine the magnitude and duration of the elevated noise levels resulting from construction at these locations. The refined analysis will examine the practicability and feasibility of relocating some equipment within the construction sites to add distance and/or shielding between the equipment and the adjacent receptors. It will also analyze in detail additional time periods throughout the construction period to determine whether the analysis results in the DEIS are conservatively overstated as a result of representing each year during the construction period based on peak construction quarters that include the greatest amount of construction activity according to the conceptual construction schedule.

Table 20-22
Significant Noise Level Increases at Open Space Locations or Residential Locations Without Receptor Noise Control Measures

Building/Location	Associated Land Use	Total Stories	Façade	Associated Receptor(s)	Impacted Floor(s)	Impact Duration (years)	Maximum Increase in dBA	# of Impacted Single-Glazed Windows	Air-Conditioning
Park (Whitey Ford Field) at northwest corner of 1st Street and 26th Avenue	Open Space	N/A	N/A	0A	N/A	4	14.8	N/A	N/A
Park (Hallet's Cove Playground) west of 1st Street and Astoria Boulevard			N/A	0B	N/A	5	16.1	N/A	N/A
1-07 27th Avenue	Residential	4	South	1A	1-4	7	11.9	0	None visible
			North	1B	1-4	7	17.3	0	
			West	1C	3-4	7	14.3	0	
			East	1D	1-4	7	12.9	0	
2-17 27th Avenue	Residential	3	South	15A	1-3	6	14.6	0	None visible
			North	15B	3	3	7.3	0	
			East	15C	3	6	12.2	0	
3-10 36th Avenue	Residential	4	South	20B	2	4	6.5	0	None visible
26-31 3rd Street	Residential	3	East	26B	2-3	3	8.0	0	None visible
26-33 3rd Street	Residential	3	East	27B	2-3	5	10.3	0	None visible
			South	27C	3	5	10.0	0	
4-33 27th Avenue	Residential	4	South	34A	1-4	6	9.7	0	None visible

Proposed buildings that would be completed and occupied before construction is completed at other project building sites would also experience exterior noise levels due to construction activities in the low 70s to mid-80s dBA range, with the exception of Building 7A in 2021, which would experience noise levels due to construction up to the high 80s dBA on the north façade, and the 90s dBA on the easternmost sections of the north and south facades (there would be no windows on the east façade of this building) due to construction activities at the Building 7B site immediately adjacent. Although not contemplated under the conceptual construction schedule, other portions of Building 6A/6B and 7A/7B could experience similarly elevated noise levels should they be occupied while the adjacent building segment is under construction. During most of the time, and at most completed project buildings, the noise levels would be in the low to mid-70s dBA range. However, during the times when a project building would be occupied and the immediately adjacent building would be undergoing its most intense construction activities (excavation and foundation work), the occupied building may experience the higher noise levels described above. The specific noise levels predicted to occur at project buildings during construction of other project buildings are shown in **Appendix E**. These predicted noise levels are based on modeling the worst-case hour of the worst-case quarters of construction, based on a schedule of equipment and activity provided by the construction managers. The predicted noise levels would likely not persist at such a high level throughout the day or throughout the year. However, the design of all project buildings would include building façades providing not less than 20 – 28 dBA of attenuation, and alternate means of ventilation (i.e., air conditioners) that does not degrade the acoustical performance of the façade. During the time period when these proposed buildings would be occupied, and loud construction activities would be underway at immediately adjacent building sites (approximately two years according to the conceptual construction schedule on which the construction noise analysis is based), interior noise levels would, during some times (i.e., the periods when exterior $L_{10(1)}$ noise levels due to construction exceed 75 dBA, as shown in **Appendix F**), exceed 45 dBA $L_{10(1)}$ (the CEQR acceptable interior noise level criteria for residential uses). Such exceedances may be intrusive, but would be only temporary and would last at most only as long as the other project buildings are under construction.

For buildings 1, 2, 3, 4, 5, and 8, which are separated from other project buildings by a construction fence and the distance between the buildings, these exceedances would not constitute a significant adverse construction noise impact. However, at Buildings 6A and 7A, these exceedances, which may reach the 90s dBA, would constitute a significant adverse impact at these buildings. Under the conceptual construction schedule, Buildings 6A and 7A could be occupied during construction of Buildings 6B and 7B, but because of the buildings' attached design, the segments cannot be separated from construction by a fence and thus the occupied segment would be immediately adjacent to construction activities. Other portions of Building 6A/6B and 7A/7B could experience similarly elevated noise levels should they be occupied while the adjacent building segment is under construction, and these exceedances would constitute a potential significant adverse impact at these buildings. Consequently, Buildings 6A/6B and 7A/7B would have the potential to experience significant adverse noise impacts during construction if either segment of either building is complete and occupied during the construction of the other segment of the building.

On-site, construction activities would produce $L_{10(1)}$ noise levels at open space areas up to approximately 70 dBA, which would exceed the levels recommended by CEQR for passive open spaces (55 dBA L_{10}). (Noise levels in these areas exceed CEQR recommended values for existing and No Action conditions.) While this is not desirable, there is no effective practical mitigation[1] that could be implemented to avoid these levels during construction. Noise levels in many parks and open space areas throughout the city, which are located near heavily trafficked roadways and/or near construction sites, experience comparable and sometimes higher noise levels.

VIBRATION

Introduction

Construction activities have the potential to result in vibration levels that may in turn result in structural or architectural damage, and/or annoyance or interference with vibration-sensitive activities. In general, vibratory levels at a receiver are a function of the source strength (which in turn is dependent upon the construction equipment and methods utilized), the distance between the equipment and the receiver, the characteristics of the transmitting medium, and the construction of the receiver building. Construction equipment operation causes ground vibrations that spread through the ground and decrease in strength with distance. Vehicular traffic, even in locations close to major roadways, typically does not result in perceptible vibration levels unless there are discontinuities in the roadway surface. With the exception of the case of fragile and possibly historically significant structures or buildings, generally construction activities do not reach the levels that can cause architectural or structural damage, but can achieve levels that may be perceptible in buildings close to a construction site. An assessment

---

[1] Noise barriers would not be practical because of security concerns.

has been prepared to quantify potential vibration impacts of construction activities on structures and residences near the project site.

Construction Vibration Criteria

For purposes of assessing potential structural or architectural damage, the determination of a significant impact was based on the vibration impact criterion used by LPC of a peak particle velocity (PPV) of 0.50 inches/second. For non-fragile buildings, vibration levels below 0.60 inches/second would not be expected to result in any structural or architectural damage.

For purposes of evaluating potential annoyance or interference with vibration-sensitive activities, vibration levels greater than 65 VdB would have the potential to result in significant adverse impacts if they were to occur for a prolonged period of time.

Analysis Methodology

For purposes of assessing potential structural or architectural damage, the following formula was used:

$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

where: PPV_{equip} is the peak particle velocity in in/sec of the equipment at the receiver location;

PPV_{ref} is the reference vibration level in in/sec at 25 feet; and

D is the distance from the equipment to the received location in feet.

For purposes of assessing potential annoyance or interference with vibration sensitive activities, the following formula was used:

$$L_v(D) = L_v(ref) - 30\log(D/25)$$

where: $L_v(D)$ is the vibration level in VdB of the equipment at the receiver location;

$L_v(ref)$ is the reference vibration level in VdB at 25 feet; and

D is the distance from the equipment to the receiver location in feet.

Table 20-23 shows vibration source levels for typical construction equipment.

Table 20-23
Vibration Source Levels for Construction Equipment

Equipment	PPV_{ref} (in/sec)	Approximate L_v (ref) (VdB)
Pile Driver (Impact)	0.644-1.518	104-112
Pile Driver (Sonic)	0.170-0.734	93-105
Clam Shovel drop (slurry wall)	0.202	94
Hydromill (slurry wall in rock)	0.017	75
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drilling	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58
Source: *Transit Noise and Vibration Impact Assessment*, FTA-VA-90-1003-06, May 2006.		

Construction Vibration Analysis Results

The buildings and structures of most concern with regard to the potential for structural or architectural damage due to vibration are the buildings along 1st Street between 26th Avenue and Astoria Boulevard, buildings along Astoria Boulevard between 1st Street and 4th Street, and buildings along 2nd Street between 26th Avenue and 27th Avenue, all of which are adjacent to the project construction sites. Vibration levels at all of these buildings and structures would be well below the 0.50 inches/second PPV limit. At all other locations, the distance between construction equipment and receiving buildings or structures is large enough to avoid vibratory levels that would approach the levels that would have the potential to result in architectural or structural damage.

In terms of potential vibration levels that would be perceptible and annoying, the pieces of equipment that would have the most potential for producing levels that exceed the 65 VdB limit are sonic (vibratory) pile drivers to be used at building sites 1, 6A, 6B, 7A, 7B, and 8. They would produce perceptible vibration levels (i.e., vibration levels exceeding 65 VdB) at receptor locations within a distance of approximately 230 feet. However, the operation would only occur for limited periods of time at a particular location and, therefore, resulting from the proposed project would not result in any significant adverse impacts. In no case are significant adverse impacts from vibrations expected to occur.

OTHER TECHNICAL AREAS

HISTORIC AND CULTURAL RESOURCES

As described in Chapter 8, "Historic and Cultural Resources," there are no archaeological resources on the project site. Therefore, construction of the proposed project would have no significant adverse impact on such resources.

Architectural resources are defined as buildings, structures, objects, sites, or districts listed on the State and National Registers of Historic Places (S/NR) or determined eligible for such listing, National Historic Landmarks (NHLs), New York City Landmarks (NYCLs) and Historic Districts, and properties that have been found by the LPC to appear eligible for designation, considered for designation ("heard") by LPC at a public hearing, or calendared for consideration at such a hearing (these are "pending" NYCLs). There are no known architectural resources located on the project site or in the study area. Therefore, construction of the proposed project would have no significant adverse impact on architectural resources.

HAZARDOUS MATERIALS

The proposed project would not result in significant adverse impacts with respect to hazardous materials during construction.

The proposed project would result in the demolition of existing structures and excavation on the eight building sites, and areas of the other project elements. Development would occur on the Eastern (i.e., Building 1) and WF Parcels (i.e., Buildings 2 through 5), and the sites of Buildings 6, 7, and 8 (collectively, the building sites) within the NYCHA Astoria Houses Campus. No development would occur at Whitey Ford Field or Hallet's Cove Playground, or elsewhere on the project site. Although certain new buildings would include cellar space (primarily for parking), this space would be created through a combination of raising the grade around the building and limited excavation (likely less than six feet). Construction would also entail some deeper excavation, e.g., for construction of elevator pits and certain utilities. The proposed project would also include a new connecting street segment between existing mapped portions of Astoria Boulevard on the NYCHA Parcel. An assessment of potential hazardous materials impacts was performed for the Halletts Point LSGD Plan area where ground disturbance from construction activities could occur as part of the proposed project. The hazardous materials assessment identified potential historical and existing sources of contamination within the project site.

The Phase I ESAs identified potential hazardous material concerns at all of the building sites and the connecting street segment location. All parcels likely have fill materials of unknown origin and all existing structures have the potential to contain asbestos-containing materials (ACM), lead-based paint (LBP) and polychlorinated biphenyls (PCB) -containing electrical components. ACM may also be present as insulation around underground steam lines, several of which are known to be present. The Limited Phase II Subsurface Investigations, performed at the proposed locations of Buildings 1A through 5B (the Eastern and WF Parcels), found generally elevated levels of semi-volatile organic compounds (SVOCs) and metals, but the levels were typical of urban fill materials, rather than indicative of a spill or release. Evidence of volatile organic compounds (VOCs) contamination in groundwater was found at two locations which could be associated with historical on- or off-site releases.

Excavation activities associated with construction of the proposed project could temporarily increase pathways for human exposure. To minimize the potential for such adverse impacts:

- A hazardous materials (E) designation would be placed on the Applicant-controlled development sites (Buildings 1 through 5) to ensure that appropriate testing and measures to protect human health and the environment are incorporated into the development. Based on the results of supplemental Phase II testing, implementation of a RAP/CHASP (all subject to approval by MOER) would be necessary prior to commencement of work involving subsurface disturbance. The RAP would address requirements for items such as: debris removal; soil stockpiling; soil disposal and transportation; dust control; quality assurance; contingency measures for closure and removal of any unexpectedly encountered petroleum storage tanks and addressing any unexpectedly encountered contamination; vapor controls for the new buildings, if required; and requirements for the imported clean soil in landscaped areas. The CHASP would include measures for worker and community protection, including personal protective equipment, dust control and air monitoring. Approval of a Remedial Closure Report by MOER would be necessary prior to use or occupancy of the development sites.
- Since construction of Buildings 6, 7, and 8 would occur following disposition approval from HUD under Section 18 of the U.S. Housing Act of 1937, HPD (acting as Responsible Entity for NYCHA) would require preparation of a Phase II Investigation, and if necessary, a site-specific RAP/CHASP for these building sites. The Phase II Investigation must follow DEP protocols for soil, groundwater, and/or soil gas. Written approval of the testing work plan and RAP/CHASP (if necessary) by HPD and DEP would be required prior to HPD's submission of environmental clearance documentation to HUD for these sites. Implementation of any approved RAP/CHASP would occur as part of construction and would be required through a Development Agreement between NYCHA and the applicant/developer or a Restrictive Declaration. Written approval from DEP of any required RAP/CHASP would also be needed prior to loan closings for any components of the project that may seek financing from HPD for the construction of affordable housing (i.e., Buildings 6, 7, and 8 or any inclusionary housing proposed on other sites).

Demolition of existing structures would be conducted in accordance with applicable regulatory requirements relating to ACM, LBP, and PCB-containing components. Any dewatering required for construction of the proposed project would be conducted in accordance with DEP sewer use requirements (and NYSDEC requirements in the case of discharge to the East River).

With these measures, construction of the proposed project would not result in any significant adverse impacts related to hazardous materials.

OPEN SPACE

Construction of the proposed project would not result in any significant adverse impacts to open space.

As described in Chapter 6, “Open Space,” there are no publicly accessible open spaces on any of the proposed project’s building sites or the areas of other project elements. Furthermore, no open space resources would be used for staging or other construction activities. However, the project site does contain several publicly accessible open spaces. These open spaces include the privately owned publicly accessible open spaces at the NYCHA Astoria Houses Campus (including several well-maintained playgrounds and two basketball courts, along with areas with benches for seating), and a portion of one public open space—Hallet’s Cove Playground, adjacent to Building Site 5. Additionally, one additional public open space—Whitey Ford Field—is adjacent to the project site boundary north of Building Sites 1 and 2. At limited times, activities such as excavation and foundation construction at Building Sites 1, 2, and 5 may generate noise that could impair the enjoyment of nearby public open space users, but such noise effects would be temporary and of short duration (3 to 4 months at each building site). Because construction of Building Sites 1 and 2 on the project site would occur immediately adjacent to Whitey Ford Field, and construction of Building Site 5 would occur immediately adjacent to Hallet’s Cove Playground, special measures would be taken to prevent construction activities intrusion into these open spaces. In each case, a solid fence would be erected along the perimeter of the site that borders the open spaces. The fence would have no openings between the construction site and the open spaces and would be high enough to reduce sound from construction activity from these building sites, to the extent practicable, and to minimize dust. The hoists, cranes, and other equipment would be located on the side of the building sites away from the open spaces. As the superstructure is being erected, netting would be installed on the side of the building facing the open space to prevent any materials from falling into the open spaces.

Construction activities would be conducted with the care mandated by the close proximity of an open space to the project site. Dust control measures—including watering of exposed areas and dust covers for trucks—would be implemented to ensure compliance with the New York City Air Pollution Control Code, which regulates construction-related dust emissions. As discussed below, there would be no significant adverse air quality impacts on open spaces.

Additionally, excavation and foundation construction activities at Building Sites 6, 7, and 8 could impair the enjoyment of some of the privately owned publicly accessible open spaces on the NYCHA Astoria Houses Campus, but again, such noise effects would be temporary and of short duration (about 3 months for each building). This would also be the case for new project site open spaces being developed incrementally as part of the proposed project –the waterfront esplanade. As the waterfront esplanade associated with Buildings 2, 3, and 4 are constructed and become available for use, excavation and foundation construction activities of adjacent buildings could also impair the enjoyment of this new open space resource, but such noise effects would also be temporary and of short duration (3 to 4 months at each building site).

As discussed in Chapter 1, "Project Description," the proposed project would create approximately 2.35 acres of publicly accessible open space including a waterfront esplanade and five new upland connections to 1st Street. The waterfront esplanade would run the length of the site's waterfront, connecting on the south to Hallet's Cove Playground and on the north to Whitey Ford Field and to the existing open space in the NYCHA Astoria Houses Campus across 1st Street. The waterfront esplanade would include landscaping and seating along the waterfront as well as a playground. The upland connections are intended to provide view corridors and physical public access from 1st Street to the East River that does not currently exist. The proposed open space would also include a public plaza at 27th Avenue and a playground. As each building site along the waterfront is built out (Building Sites 2-5), the associated public open space required under the Zoning Resolution would be constructed at the same time as the buildings. As construction of the proposed project progresses, the portions of the waterfront esplanade already completed would be protected from construction activities at subsequent adjacent building sites. For construction at Building Sites 1, 2, and 5, construction fences around these sites would shield the nearby or adjacent parks from construction activities. Construction of the proposed project would not limit access to these parks or other open space resources in the vicinity of the proposed project. Therefore, construction of the proposed project would not result in significant adverse impacts on open space.

SOCIOECONOMIC CONDITIONS

The proposed project would not result in significant adverse construction impacts with respect to socioeconomic conditions.

Construction could, in some instances, temporarily affect pedestrian and vehicular access on street frontages immediately adjacent to the proposed project's eight building sites or the areas of the other project elements. However, lane and/or sidewalk closures are expected to be of very limited duration, and are not expected to occur in front of entrances to any existing or planned retail businesses, construction activities would not obstruct major thoroughfares used by customers or businesses, and businesses would not be significantly affected by any temporary reductions in the amount of pedestrian foot traffic or vehicular delays that could occur as a result of construction activities, because of the MPT measures required by NYCDOT. Utility service would be maintained to all businesses, although very short-term interruptions (i.e., hours) may occur when new equipment (e.g., a transformer, or a sewer or water line) is put into operation. Overall, construction resulting from the proposed project is not expected to result in any significant adverse impacts on surrounding businesses.

Construction would create direct benefits resulting from expenditures on labor, materials, and services, and indirect benefits created by expenditures by material suppliers, construction workers, and other employees involved in the direct activity. Construction also would contribute to increased tax revenues for the city and state, including those from personal income taxes.

COMMUNITY FACILITIES

Construction activities related to the proposed project would not physically displace or alter any existing community facilities. No study area community facilities would be directly affected by construction activities for an extended duration. However, because the proposed project has been found to have the potential to result in a significant adverse impact on elementary schools, preliminary discussions have been held between the Applicant and the School Construction Authority (SCA), and are expected to continue between the DEIS and FEIS, with regard to the provision of a new school building serving kindergarten through grade 8 within the NYCHA Astoria Houses Campus, as a mitigation measure for a potential school impact. The construction of the school as a mitigation measure, as well as ongoing project construction effects on the school once it is operational, are discussed in detail in Chapter 22, “Mitigation.” The construction sites would be surrounded by construction fencing and barriers that would limit the effects of construction on nearby facilities. Construction workers would not place any burden on public schools and would have minimal, if any, demands on libraries, child care facilities, and health care. Construction of the proposed buildings and the other project elements would not block or restrict access to any facilities in the area, and would not materially affect emergency response times. NYPD and FDNY emergency services and response times would not be materially affected as a result of the geographic distribution of the police and fire facilities and their respective coverage areas.

NATURAL RESOURCES

Construction of the proposed project would not result in significant adverse impacts to groundwater, floodplains, water quality, aquatic biota, wetlands, terrestrial natural resources, and threatened or endangered species within and near the project site. Construction activities along the East River waterfront would include rehabilitation and stabilization of failing shoreline revetments, installation of four new stormwater outfalls, and rehabilitation of two existing DEP stormwater outfalls, and construction of an esplanade. The proposed stabilization and repair of shoreline armoring would be limited to the replacement of existing rip-rap and debris in some areas with granite rip-rap for improved scour protection. These activities would not result in a net increase in fill below Mean High Water (MHW) and Spring High Water (SHW) or a change in the shoreline configuration that would result in loss of bottom habitat. The four new stormwater outfalls would be constructed above the SHW elevation and within the riprap revetment. Maintenance and minor repair of two existing DEP outfalls would consist of clearing of debris and obstructive vegetation growth, and augmentation of deficient rip-rap. The proposed boardwalk esplanade would not extend over the MHW or SHW elevation.

Within the upland portion of the project site, construction of the proposed project would result in removal of existing vegetation and buildings. While construction of the proposed project would require minimal tree removal, it would not eliminate or degrade valuable wildlife habitat. No threatened or endangered terrestrial species are known to occur or have the potential to occur on or in the vicinity of the project site. Overall, the proposed project would not result in any significant adverse impact to threatened, endangered, and special concern species and significant habitat areas.

The proposed project would be covered under the NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity Permit No. GP-0-10-001. To obtain coverage under this permit, a stormwater pollution prevention plan (SWPPP) would be prepared and Notice of Intent (NOI) would be submitted to NYSDEC. The SWPPP would comply with all of the requirements of GP-0-10-001, NYSDEC’s technical standard for erosion and sediment control, presented in “New York Standards and Specifications for Erosion and Sediment Control,” and NYSDEC’s Stormwater management Design Manual. The SWPPP would include both structural (e.g., silt fencing, inlet protection, and installation of a stabilized construction entrance) and non-structural (e.g., routine inspection, dust control, cleaning, and maintenance programs; instruction on the proper management, storage, and handling of potentially hazardous materials) best management practices (BMPs).

Significant adverse impacts to groundwater would not occur as a result of construction or operation of the proposed project. Because groundwater is not used as a potable water supply in the area, there would be no potential impacts to drinking water supplies. In the event that construction dewatering is necessary, the recovered groundwater would be treated in accordance with NYSDEC and/or DEP requirements prior to being discharged to the East River or the DEP storm sewer. Any hazardous materials encountered during grading or other land-disturbing activities would be handled and removed in accordance with DEP, NYSDEC, OSHA, and EPA requirements, and the RAP/CHASP prepared for that construction site and approved as follows. For sites under the Applicant's control (Building Sites 1-5), an (E) designation would be assigned and review and approval would be by the New York City Mayor's Office of Environmental Remediation (MOER). For sites subject to disposition by the City (Building Sites 6-8), the New York City Department of Environmental Protection (DEP) and the New York City Department of Housing Preservation & Development (HPD) would conduct the review. Implementation of the measures during construction activities would minimize the potential for significant adverse impacts to groundwater quality.

The potential for these construction activities to affect natural resources is described in detail in Chapter 10, "Natural Resources," and summarized below.

Wetlands and Aquatic Resources

The rehabilitation and stabilization of the shoreline revetments and rehabilitation of the two existing DEP outfalls would not result in a net increase in fill below MHW and SHW or a change in the shoreline configuration that would result in a loss of NYSDEC littoral zone tidal wetlands or a loss of benthic habitat. Any resuspension of bottom sediment resulting from the shoreline stabilization and repair and outfall rehabilitation would be minimal and temporary and would be confined to the immediate area of the activity and would not result in significant adverse impacts to wetlands or aquatic resources. The four new stormwater outfalls and boardwalk esplanade would be constructed above the SHW elevation and would not have the potential to adversely affect NYSDEC littoral zone tidal wetlands or aquatic resources, including federally or state-listed threatened or endangered aquatic species with the potential to occur within the East River near the project site (i.e., Atlantic and shortnose sturgeon, and loggerhead, leatherback, Kemp's ridley and green sea turtles).

Implementation of erosion and sediment control measures and stormwater management measures identified in the Storm Water Pollution Prevention Plan (SWPPP), would minimize potential impacts to wetlands and aquatic resources along the edges of the project site associated with discharge of stormwater runoff during land-disturbing activities resulting from the construction of the proposed project.

LAND USE AND NEIGHBORHOOD CHARACTER

Construction activities resulting from the proposed project would affect land use on the eight building sites and the areas of the other project elements, but would not alter surrounding land uses. As is typical with construction projects, during periods of peak construction activity there would be some disruption, predominantly noise, to the nearby area. There would be construction trucks and construction workers coming to the various sites. There would also be noise, sometimes intrusive, from building construction as well as trucks and other vehicles backing up, loading, and unloading. These disruptions would be temporary in nature and would have limited effects on land uses within the study area, particularly as most construction activities would take place within each of the building sites, areas of the other project elements, or within portions of sidewalks, curbs, and travel lanes of public streets immediately adjacent to these sites. Throughout construction, access to surrounding residences, businesses, and institutions in the area would be maintained. In addition, measures would be implemented to control noise, vibration, emissions, and dust on construction sites, including the erection of construction fencing incorporating sound-reducing measures. Overall, while the construction at the various building sites and areas of the other project elements within the Halletts Point LSGD Plan area would be evident to the local community, the limited duration of construction at each of the proposed project's building sites and the areas of the other project elements would not result in significant or long-term adverse impacts on local land use patterns or the character of the nearby area.

RODENT CONTROL

Construction contracts for Building Sites 1-7, and areas of the other project elements which are controlled by the Applicant, would include provisions for a rodent (mouse and rat) control program. Similarly, such controls would be expected to be provided by any future developer of Building Site 8, as standard construction practice. Before the start of construction at any given site in the Rezoning Area, construction contractors would survey and bait the appropriate areas and provide for proper site sanitation. During the construction phase, as necessary, the contractors would carry out a maintenance program. Coordination would be maintained with appropriate public agencies. Only EPA and NYSDEC-registered rodenticides would be utilized, and the contractors would be required to perform rodent control programs in a manner that avoids hazards to persons, domestic animals, and non-target wildlife. ✷