

City Environmental Quality Review

Environmental Assessment Statement

CEQR# 23DEP032M

**New York City Health and Hospitals
Corporation – Bellevue Hospital**

Installation of Two New Cogeneration Units

August 2026

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**CITY ENVIRONMENTAL QUALITY REVIEW ENVIRONMENTAL ASSESSMENT
STATEMENT (EAS) FULL FORM**



ENVIRONMENTAL ASSESSMENT STATEMENT (EAS) FULL FORM

Please fill out and submit to the appropriate agency ([see instructions](#))

Part I: GENERAL INFORMATION

PROJECT NAME HHC New Bellevue Hospital Cogeneration Installation

1. Reference Numbers

CEQR REFERENCE NUMBER (to be assigned by lead agency)
23DEP032M

BSA REFERENCE NUMBER (if applicable)

ULURP REFERENCE NUMBER (if applicable)

OTHER REFERENCE NUMBER(S) (if applicable)
(e.g., legislative intro, CAPA) PW002422

2a. Lead Agency Information

NAME OF LEAD AGENCY

New York City Department of Environmental Protection

NAME OF LEAD AGENCY CONTACT PERSON

Phil Simmons

ADDRESS 59-17 Junction Boulevard

2b. Applicant Information

NAME OF APPLICANT

New York City Health & Hospitals Corporation

NAME OF APPLICANT'S REPRESENTATIVE OR CONTACT PERSON

Yunjung Lee

ADDRESS 462 First Ave

CITY Flushing

STATE NY

ZIP 11373

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STATE NY

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3. Action Classification and Type

SEQRA Classification

☒ UNLISTED ☐ TYPE I: Specify Category (see 6 NYCRR 617.4 and NYC Executive Order 91 of 1977, as amended):Action Type (refer to [CEQR Technical Manual Chapter 2](#), "Establishing the Analysis Framework" for guidance)☒ LOCALIZED ACTION, SITE SPECIFIC☐ LOCALIZED ACTION, SMALL AREA☐ GENERIC ACTION

4. Project Description

NYC HHC - New Bellevue Hospital is seeking approval to operate a Combined Heat and Power (CHP) system comprising of two (2) new natural gas fired cogeneration engines, Caterpillar / G3516H, each with a 1982 kW rating. Installation will be in an existing open lot on the Hospital's property. The CHP system will provide continuous power and heat to the hospital in the event of an outage on the utility grid.

Project Location

BOROUGH Manhattan

COMMUNITY DISTRICT(S) 6

STREET ADDRESS 462 First Ave

TAX BLOCK(S) AND LOT(S) Block: 962 Lot: 100

ZIP CODE 10016

DESCRIPTION OF PROPERTY BY BOUNDING OR CROSS STREETS Property bounded by FDR Drive to the East, 1st Ave to the West, 26th St to the South and 28th St to the North

EXISTING ZONING DISTRICT, INCLUDING SPECIAL ZONING DISTRICT DESIGNATION, IF ANY R8

ZONING SECTIONAL MAP NUMBER 8D

5. Required Actions or Approvals (check all that apply)

City Planning Commission: ☐ YES ☒ NO ☐ UNIFORM LAND USE REVIEW PROCEDURE (ULURP)☐ CITY MAP AMENDMENT☐ ZONING CERTIFICATION☐ CONCESSION☐ ZONING MAP AMENDMENT☐ ZONING AUTHORIZATION☐ UDAAP☐ ZONING TEXT AMENDMENT☐ ACQUISITION—REAL PROPERTY☐ REVOCABLE CONSENT☐ SITE SELECTION—PUBLIC FACILITY☐ DISPOSITION—REAL PROPERTY☐ FRANCHISE☐ HOUSING PLAN & PROJECT☐ OTHER, explain:☐ SPECIAL PERMIT (if appropriate, specify type: ☐ modification; ☐ renewal; ☐ other); EXPIRATION DATE:

SPECIFY AFFECTED SECTIONS OF THE ZONING RESOLUTION

Board of Standards and Appeals: ☐ YES ☒ NO☐ VARIANCE (use)☐ VARIANCE (bulk)☐ SPECIAL PERMIT (if appropriate, specify type: ☐ modification; ☐ renewal; ☐ other); EXPIRATION DATE:

SPECIFY AFFECTED SECTIONS OF THE ZONING RESOLUTION

Department of Environmental Protection: ☒ YES ☐ NO ☒ Cogeneration Facility ☐ Title V Permit

Other City Approvals Subject to CEQR (check all that apply)

- | | |
|--|--|
| ☐ LEGISLATION | ☐ FUNDING OF CONSTRUCTION, specify: |
| ☐ RULEMAKING | ☐ POLICY OR PLAN, specify: |
| ☐ CONSTRUCTION OF PUBLIC FACILITIES | ☐ FUNDING OF PROGRAMS, specify: |
| ☐ 384(b)(4) APPROVAL | ☐ PERMITS, specify: |
| ☐ OTHER, explain: | |

Other City Approvals Not Subject to CEQR (check all that apply)

- | | |
|---|---|
| ☐ PERMITS FROM DOT'S OFFICE OF CONSTRUCTION MITIGATION AND COORDINATION (OCMC) | ☐ LANDMARKS PRESERVATION COMMISSION APPROVAL |
| | ☒ OTHER, explain: NYCDOB Permits |

State or Federal Actions/Approvals/Funding: ☒ YES ☐ NO If "yes," specify: NYSDEC State Facility Permit Update-financed by New York Power Authority (NYPA)

6. Site Description: The directly affected area consists of the project site and the area subject to any change in regulatory controls. Except where otherwise indicated, provide the following information with regard to the directly affected area.

Graphics: The following graphics must be attached and each box must be checked off before the EAS is complete. Each map must clearly depict the boundaries of the directly affected area or areas and indicate a 400-foot radius drawn from the outer boundaries of the project site. Maps may not exceed 11 x 17 inches in size and, for paper filings, must be folded to 8.5 x 11 inches.

- | | | |
|--|---|---|
| ☒ SITE LOCATION MAP | ☒ ZONING MAP | ☒ SANBORN OR OTHER LAND USE MAP |
| ☒ TAX MAP | ☐ FOR LARGE AREAS OR MULTIPLE SITES, A GIS SHAPE FILE THAT DEFINES THE PROJECT SITE(S) | |
| ☒ PHOTOGRAPHS OF THE PROJECT SITE TAKEN WITHIN 6 MONTHS OF EAS SUBMISSION AND KEYED TO THE SITE LOCATION MAP | | |

Physical Setting (both developed and undeveloped areas)

Total directly affected area (sq. ft.): 3,500 Waterbody area (sq. ft.) and type: N/A
 Roads, buildings, and other paved surfaces (sq. ft.): 3,500 (Open Lot) Other, describe (sq. ft.): N/A

7. Physical Dimensions and Scale of Project (if the project affects multiple sites, provide the total development facilitated by the action) SIZE

OF PROJECT TO BE DEVELOPED (gross square feet): 11,000

NUMBER OF BUILDINGS: 1	GROSS FLOOR AREA OF EACH BUILDING (sq. ft.): 11,000
HEIGHT OF EACH BUILDING (ft.): 42	NUMBER OF STORIES OF EACH BUILDING: 2

Does the proposed project involve changes in zoning on one or more sites? ☐ YES ☒ NO

If "yes," specify: The total square feet owned or controlled by the applicant:

The total square feet not owned or controlled by the applicant:

Does the proposed project involve in-ground excavation or subsurface disturbance, including, but not limited to foundation work, pilings, utility lines, or grading? ☒ YES ☐ NO

If "yes," indicate the estimated area and volume dimensions of subsurface disturbance (if known):

AREA OF TEMPORARY DISTURBANCE: sq. ft. (width x length)	VOLUME OF DISTURBANCE: 11,060 cubic ft. (width x length x depth)
AREA OF PERMANENT DISTURBANCE: 3,500 sq. ft. (width x length)	

8. Analysis Year [CEQR Technical Manual Chapter 2](#)

ANTICIPATED BUILD YEAR (date the project would be completed and operational): 2026

ANTICIPATED PERIOD OF CONSTRUCTION IN MONTHS: 24

WOULD THE PROJECT BE IMPLEMENTED IN A SINGLE PHASE? ☒ YES ☐ NO IF MULTIPLE PHASES, HOW MANY?

BRIEFLY DESCRIBE PHASES AND CONSTRUCTION SCHEDULE:

- Interior Mechanical, Electrical, Plumbing (MEP) Construction Activities 5/16/22 to 12/12/23: Installing mechanical pipe and electrical conduit for the CHP to tie-in to buildings existing hot water system for energy efficiency.
- Emergency Department (ED) Roof Mechanical Piping & Electrical Conduit 11/7/22 to 12/12/23: Installing mechanical pipe and electrical conduit across the ED roof to the CHP to tie-in to mechanical pipe installed in the building.
- CHP Plant / Structure / Equipment / Roof 5/20/22 to 12/15/23: Installing a two-story structure separate from the facility to house a 2 x 2MW natural gas cogenerators and associated electrical equipment
- Anticipated startup and commissioning of CHP early 2026

9. Predominant Land Use in the Vicinity of the Project (check all that apply)

- | | | | | |
|---|--|--|---|--|
| ☒ RESIDENTIAL | ☐ MANUFACTURING | ☒ COMMERCIAL | ☐ PARK/FOREST/OPEN SPACE | ☐ OTHER, specify: |
|---|--|--|---|--|

DESCRIPTION OF EXISTING AND PROPOSED CONDITIONS

The information requested in this table applies to the directly affected area. The directly affected area consists of the project site and the area subject to any change in regulatory control. The increment is the difference between the No- Action and the With-Action conditions.

	EXISTING CONDITION	NO-ACTION CONDITION	WITH-ACTION CONDITION	INCREMENT
LAND USE				
Residential	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," specify the following:				
Describe type of residential structures				
No. of dwelling units				
No. of low- to moderate-income units				
Gross floor area (sq. ft.)				
Commercial	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," specify the following:				
Describe type (retail, office, other)				
Gross floor area (sq. ft.)				
Manufacturing/Industrial	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," specify the following:				
Type of use				
Gross floor area (sq. ft.)				
Open storage area (sq. ft.)				
If any unenclosed activities, specify:				
Community Facility	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," specify the following:				
Type				
Gross floor area (sq. ft.)				
Vacant Land	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," describe:				
Publicly Accessible Open Space	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," specify type (mapped City, State, or Federal parkland, wetland—mapped or otherwise known, other):				
Other Land Uses	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," describe:				
PARKING				
Garages	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," specify the following:				
No. of public spaces				
No. of accessory spaces				
Operating hours				
Attended or non-attended				
Lots	☒ YES ☐ NO	☒ YES ☐ NO	☒ YES ☐ NO	
If "yes," specify the following:				
No. of public spaces	0	0	0	0
No. of accessory spaces	52	52	52	0
Operating hours	24/7	24/7	24/7	N/A
Other (includes street parking)	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," describe:				
POPULATION				
Residents	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," specify number:				
Briefly explain how the number of residents was calculated:				

	EXISTING CONDITION	NO-ACTION CONDITION	WITH-ACTION CONDITION	INCREMENT
Businesses	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If "yes," specify the following:				
No. and type				
No. and type of workers by business				
No. and type of non-residents who are not workers				
Briefly explain how the number of businesses was calculated:				
Other (students, visitors, concert-goers, etc.)	☐ YES ☒ NO	☐ YES ☒ NO	☐ YES ☒ NO	
If any, specify type and number:				
Briefly explain how the number was calculated:				
ZONING				
Zoning classification	R	R	R	N/A
Maximum amount of floor area that can be developed	740,124	740,124	740,124	0
Predominant land use and zoning classifications within land use study area(s) or a 400 ft. radius of proposed project	R,C	R,C	R,C	N/A
Attach any additional information that may be needed to describe the project.				
If your project involves changes that affect one or more sites not associated with a specific development, it is generally appropriate to include total development projections in the above table and attach separate tables outlining the reasonable development scenarios for each site.				

Part II: TECHNICAL ANALYSIS

INSTRUCTIONS: For each of the analysis categories listed in this section, assess the proposed project's impacts based on the thresholds and criteria presented in the CEQR Technical Manual. Check each box that applies.

- If the proposed project can be demonstrated not to meet or exceed the threshold, check the "no" box.
- If the proposed project will meet or exceed the threshold, or if this cannot be determined, check the "yes" box.
- For each "yes" response, provide additional analyses (and, if needed, attach supporting information) based on guidance in the CEQR Technical Manual to determine whether the potential for significant impacts exists. Please note that a "yes" answer does not mean that an EIS must be prepared—it means that more information may be required for the lead agency to make a determination of significance.
- The lead agency, upon reviewing Part II, may require an applicant to provide additional information to support the Full EAS Form. For example, if a question is answered "no," an agency may request a short explanation for this response.

	YES	NO
1. LAND USE, ZONING, AND PUBLIC POLICY: CEQR Technical Manual Chapter 4		
(a) Would the proposed project result in a change in land use different from surrounding land uses?	☐	☒
(b) Would the proposed project result in a change in zoning different from surrounding zoning?	☐	☒
(c) Is there the potential to affect an applicable public policy?	☐	☒
(d) If "yes," to (a), (b), and/or (c), complete a preliminary assessment and attach.		
(e) Is the project a large, publicly sponsored project?	☐	☒
o If "yes," complete a PlaNYC assessment and attach.		
(f) Is any part of the directly affected area within the City's Waterfront Revitalization Program boundaries ?	☒	☐
o If "yes," complete the Consistency Assessment Form . Attached		
2. SOCIOECONOMIC CONDITIONS: CEQR Technical Manual Chapter 5		
(a) Would the proposed project:		
o Generate a net increase of more than 200 residential units or 200,000 square feet of commercial space?	☐	☒
▪ If "yes," answer <i>both</i> questions 2(b)(ii) and 2(b)(iv) below.		
o Directly displace 500 or more residents?	☐	☒
▪ If "yes," answer questions 2(b)(i), 2(b)(ii), and 2(b)(iv) below.		
o Directly displace more than 100 employees?	☐	☒
▪ If "yes," answer questions under 2(b)(iii) and 2(b)(iv) below.		
o Affect conditions in a specific industry?	☐	☒
▪ If "yes," answer question 2(b)(v) below.		
(b) If "yes" to any of the above, attach supporting information to answer the relevant questions below. If "no" was checked for each category above, the remaining questions in this technical area do not need to be answered.		
i. Direct Residential Displacement		
o If more than 500 residents would be displaced, would these residents represent more than 5% of the primary study area population?	☐	☐
o If "yes," is the average income of the directly displaced population markedly lower than the average income of the rest of the study area population?	☐	☐
ii. Indirect Residential Displacement		
o Would expected average incomes of the new population exceed the average incomes of study area populations?	☐	☐
o If "yes:"		
▪ Would the population of the primary study area increase by more than 10 percent?	☐	☐
▪ Would the population of the primary study area increase by more than 5 percent in an area where there is the potential to accelerate trends toward increasing rents?	☐	☐
o If "yes" to either of the preceding questions, would more than 5 percent of all housing units be renter-occupied and unprotected?	☐	☐
iii. Direct Business Displacement		
o Do any of the displaced businesses provide goods or services that otherwise would not be found within the trade area, either under existing conditions or in the future with the proposed project?	☐	☐
o Is any category of business to be displaced the subject of other regulations or publicly adopted plans to preserve,	☐	☐

	YES	NO
enhance, or otherwise protect it?		
iv. Indirect Business Displacement		
o Would the project potentially introduce trends that make it difficult for businesses to remain in the area?	☐	☐
o Would the project capture retail sales in a particular category of goods to the extent that the market for such goods would become saturated, potentially resulting in vacancies and disinvestment on neighborhood commercial streets?	☐	☐
v. Effects on Industry		
o Would the project significantly affect business conditions in any industry or any category of businesses within or outside the study area?	☐	☐
o Would the project indirectly substantially reduce employment or impair the economic viability in the industry or category of businesses?	☐	☐
3. COMMUNITY FACILITIES: CEQR Technical Manual Chapter 6		
(a) Direct Effects		
o Would the project directly eliminate, displace, or alter public or publicly funded community facilities such as educational facilities, libraries, health care facilities, day care centers, police stations, or fire stations?	☐	☒
(b) Indirect Effects		
i. Early Childhood Programs		
o Would the project result in 20 or more eligible children under age 6, based on the number of low or low/moderate income residential units? (See Table 6-1 in Chapter 6)	☐	☒
o If "yes," would the project result in a collective utilization rate of the Early Childhood Programs in the study area that is greater than 100 percent?	☐	☒
o If "yes," would the project increase the collective utilization rate by 5 percent or more from the No-Action scenario?	☐	☒
ii. Public Schools		
o Would the project result in 50 or more elementary or middle school students, or 150 or more high school students based on number of residential units? (See Table 6-1 in Chapter 6)	☐	☒
o If "yes," would the project result in a utilization rate of the elementary or middle schools that is equal to or greater than 100 percent?	☐	☒
o If "yes," would the project generate 100 or more elementary or middle school students past the 100% utilization rate?	☐	☒
o If "yes," would the project result in a utilization rate of the high schools that is equal to or greater than 100 percent?	☐	☒
o If "yes," would the project increase the high school utilization rate by 5 percent or more from the No-Action scenario?	☐	☒
iii. Libraries		
o Would the project result in a 5 percent or more increase in the ratio of residential units to library branches? (See Table 6-1 in Chapter 6)	☐	☒
o If "yes," would the project increase the study area population by 5 percent or more from the No-Action levels?	☐	☒
o If "yes," would the additional population impair the delivery of library services in the study area?	☐	☒
iv. Health Care Facilities		
o Would the project result in the introduction of a sizeable new neighborhood?	☐	☒
o If "yes," would the project affect the operation of health care facilities in the area?	☐	☒
v. Fire and Police Protection		
o Would the project result in the introduction of a sizeable new neighborhood?	☐	☒
o If "yes," would the project affect the operation of fire or police protection in the area?	☐	☒
4. OPEN SPACE: CEQR Technical Manual Chapter 7		
(a) Would the project change or eliminate existing open space?	☐	☒
(b) Would the project generate more than 200 additional residents or 500 additional employees?	☐	☒
5. SHADOWS: CEQR Technical Manual Chapter 8		
(a) Would the proposed project result in a net height increase of any structure of 50 feet or more?	☐	☒
(b) Would the proposed project result in any increase in structure height and be located adjacent to or across the street from a sunlight-sensitive resource?	☐	☒
(c) If "yes" to either of the above questions, attach supporting information explaining whether the project's shadow would reach any sunlight-sensitive resource at any time of the year.		

	YES	NO
6. HISTORIC AND CULTURAL RESOURCES: CEQR Technical Manual Chapter 9		
(a) Does the proposed project site or an adjacent site contain any architectural and/or archaeological resource that is eligible for or has been designated (or is calendared for consideration) as a New York City Landmark, Interior Landmark or Scenic Landmark; that is listed or eligible for listing on the New York State or National Register of Historic Places; or that is within a designated or eligible New York City, New York State or National Register Historic District? (See the GIS System for Archaeology and National Register to confirm)	☒	☐
(b) Would the proposed project involve construction resulting in in-ground disturbance to an area not previously excavated?	☐	☒
(c) If "yes" to either of the above, list any identified architectural and/or archaeological resources and attach supporting information on whether the proposed project would potentially affect any architectural or archeological resources. No Adverse Impact Letter from New York State Parks, Recreation, and Historic Preservation attached		
7. URBAN DESIGN AND VISUAL RESOURCES: CEQR Technical Manual Chapter 10		
(a) Would the proposed project introduce a new building, a new building height, or result in any substantial physical alteration to the streetscape or public space in the vicinity of the proposed project that is not currently allowed by existing zoning?	☐	☒
(b) Would the proposed project result in obstruction of publicly accessible views to visual resources not currently allowed by existing zoning?	☐	☒
(c) If "yes" to either of the above, please provide the information requested in Chapter 10 .		
8. NATURAL RESOURCES: CEQR Technical Manual Chapter 11		
(a) Does the proposed project site or a site adjacent to the project contain natural resources as defined in Section 100 of Chapter 11 ?	☐	☒
o If "yes," list the resources and attach supporting information on whether the project would affect any of these resources.		
(b) Is any part of the directly affected area within the Jamaica Bay Watershed ?	☐	☒
o If "yes," complete the Jamaica Bay Watershed Protection Plan Project Tracking Form and submit according to its instructions .		
9. HAZARDOUS MATERIALS: CEQR Technical Manual Chapter 12		
(a) Would the proposed project allow commercial or residential uses in an area that is currently, or was historically, a manufacturing area that involved hazardous materials?	☐	☒
(b) Would the proposed project introduce new activities or processes using hazardous materials and increase the risk of human or environmental exposure?	☐	☒
(c) Does the proposed project site have existing institutional controls (e.g., (E) designation or Restrictive Declaration) relating to hazardous materials that preclude the potential for significant adverse impacts?	☐	☒
(d) Would the project require soil disturbance in a manufacturing area or any development on or near a manufacturing area or existing/historic facilities listed in the Hazardous Materials Appendix (including nonconforming uses)?	☐	☒
(e) Would the project result in the development of a site where there is reason to suspect the presence of hazardous materials, contamination, illegal dumping or fill, or fill material of unknown origin?	☐	☒
(f) Would the project result in development on or near a site that has or had underground and/or aboveground storage tanks (e.g., gas stations, oil storage facilities, heating oil storage)?	☒	☐
(g) Would the project result in renovation of interior existing space on a site with the potential for compromised air quality; vapor intrusion from either on-site or off-site sources; or the presence of asbestos, PCBs, mercury or lead-based paint?	☐	☒
(h) Would the project result in development on or near a site with potential hazardous materials issues such as government-listed voluntary cleanup/brownfield site, current or former power generation/transmission facilities, coal gasification or gas storage sites, railroad tracks or rights-of-way, or municipal incinerators?	☐	☒
(i) Has a Phase I Environmental Site Assessment been performed for the site?	☐	☒
o If "yes," were Recognized Environmental Conditions (RECs) identified? Briefly identify:	☐	☒
(j) Based on the Phase I Assessment, is a Phase II Investigation needed?	☐	☒
10. WATER AND SEWER INFRASTRUCTURE: CEQR Technical Manual Chapter 13		
(a) Would the project result in water demand of more than one million gallons per day?	☐	☒
(b) If the proposed project located in a combined sewer area, would it result in at least 1,000 residential units or 250,000 square feet or more of commercial space in Manhattan, or at least 400 residential units or 150,000 square feet or more of commercial space in the Bronx, Brooklyn, Staten Island, or Queens?	☐	☒
(c) If the proposed project located in a separately sewer area , would it result in the same or greater development than that listed in Table 13-1 in Chapter 13 ?	☐	☒
(d) Would the project involve development on a site that is 5 acres or larger where the amount of impervious surface would increase?	☐	☒
(e) If the project is located within the Jamaica Bay Watershed or in certain specific drainage areas , including Bronx River, Coney Island Creek, Flushing Bay and Creek, Gowanus Canal, Hutchinson River, Newtown Creek, or Westchester Creek, would it involve development on a site that is 1 acre or larger where the amount of impervious surface would increase?	☐	☒

	YES	NO
(f) Would the proposed project be located in an area that is partially sewerage or currently unsewerage?	☐	☒
(g) Is the project proposing an industrial facility or activity that would contribute industrial discharges to a Wastewater Treatment Plant and/or contribute contaminated stormwater to a separate storm sewer system?	☐	☒
(h) Would the project involve construction of a new stormwater outfall that requires federal and/or state permits?	☐	☒
(i) If "yes" to any of the above, conduct the appropriate preliminary analyses and attach supporting documentation.		
11. SOLID WASTE AND SANITATION SERVICES: CEQR Technical Manual Chapter 14		
(a) Using Table 14-1 in Chapter 14 , the project's projected operational solid waste generation is estimated to be (pounds per week): N/A		
o Would the proposed project have the potential to generate 100,000 pounds (50 tons) or more of solid waste per week?	☐	☒
(b) Would the proposed project involve a reduction in capacity at a solid waste management facility used for refuse or recyclables generated within the City?	☐	☒
o If "yes," would the proposed project comply with the City's Solid Waste Management Plan?	☐	☐
12. ENERGY: CEQR Technical Manual Chapter 15		
(a) Using energy modeling or Table 15-1 in Chapter 15 , the project's projected energy use is estimated to be (annual BTUs): 292,698 mmBTU		
(b) Would the proposed project affect the transmission or generation of energy?	☒	☐
13. TRANSPORTATION: CEQR Technical Manual Chapter 16		
(a) Would the proposed project exceed any threshold identified in Table 16-1 in Chapter 16 ?	☐	☒
(b) If "yes," conduct the appropriate screening analyses, attach back up data as needed for each stage, and answer the following questions:		
o Would the proposed project result in 50 or more Passenger Car Equivalents (PCEs) per project peak hour?	☐	☐
If "yes," would the proposed project result in 50 or more vehicle trips per project peak hour at any given intersection? **It should be noted that the lead agency may require further analysis of intersections of concern even when a project generates fewer than 50 vehicles in the peak hour. See Subsection 313 of Chapter 16 for more information.	☐	☐
o Would the proposed project result in more than 200 subway/rail, bus trips, or 50 Citywide Ferry Service ferry trips per project peak hour?	☐	☐
If "yes," would the proposed project result, per project peak hour, in 50 or more bus trips on a single line (in one direction), 200 subway/rail trips per station or line, or 25 or more Citywide Ferry Service ferry trips on a single route (in one direction), or 50 or more passengers at a Citywide Ferry Service landing?	☐	☐
o Would the proposed project result in more than 200 pedestrian trips per project peak hour?	☐	☐
If "yes," would the proposed project result in more than 200 pedestrian trips per project peak hour to any given pedestrian or transit element, crosswalk, subway stair, bus stop, or Citywide Ferry Service landing?	☐	☐
14. AIR QUALITY: CEQR Technical Manual Chapter 17		
(a) Mobile Sources: Would the proposed project result in the conditions outlined in Section 210 in Chapter 17 ?	☐	☒
(b) Stationary Sources: Would the proposed project result in the conditions outlined in Section 220 in Chapter 17 ?	☒	☐
o If "yes," would the proposed project exceed the thresholds in Figure 17-3, Stationary Source Screen Graph in Chapter 17 ? (Attach graph as needed)	☒	☐
(c) Does the proposed project involve multiple buildings on the project site?	☒	☐
(d) Does the proposed project require federal approvals, support, licensing, or permits subject to conformity requirements?	☐	☒
(e) Does the proposed project site have existing institutional controls (e.g., (E) designation or Restrictive Declaration) relating to air quality that preclude the potential for significant adverse impacts?	☐	☒
(f) If "yes" to any of the above, conduct the appropriate analyses and attach any supporting documentation. AQDM Attached		
15. GREENHOUSE GAS EMISSIONS: CEQR Technical Manual Chapter 18		
(a) Is the proposed project a city capital project or a power generation plant?	☒	☐
(b) Would the proposed project fundamentally change the City's solid waste management system?	☐	☒
(c) Would the proposed project result in the development of 350,000 square feet or more?	☐	☒
(d) If "yes" to any of the above, would the project require a GHG emissions assessment based on guidance in Chapter 18 ?	☒	☐
o If "yes," would the project result in inconsistencies with the City's GHG reduction goal? (See Local Law 22 of 2008 ; § 24-803 of the Administrative Code of the City of New York). Please attach supporting documentation. CLCPA Attached	☐	☒
16. NOISE: CEQR Technical Manual Chapter 19		
(a) Would the proposed project generate or reroute vehicular traffic?	☐	☒
(b) Would the proposed project introduce new or additional receptors (see Section 114 in Chapter 19) near heavily trafficked roadways, within one horizontal mile of an existing or proposed flight path, or within 1,500 feet of an existing or proposed	☐	☒

		YES	NO
(c)	Would the proposed project cause a stationary noise source to operate within 1,500 feet of a receptor with a direct line of sight to that receptor or introduce receptors into an area with high ambient stationary noise?	☒	☐
(d)	Does the proposed project site have existing institutional controls (e.g., (E) designation or Restrictive Declaration) relating to noise that preclude the potential for significant adverse impacts?	☐	☒
(e) If "yes" to any of the above, conduct the appropriate analyses and attach any supporting documentation.			
17. PUBLIC HEALTH: CEQR Technical Manual Chapter 20			
(a)	Based upon the analyses conducted, do any of the following technical areas require a detailed analysis: Air Quality; Hazardous Materials; Noise?	☒	☐
(b)	If "yes," explain why an assessment of public health is or is not warranted based on the guidance in Chapter 20 , "Public Health." Attach a preliminary analysis, if necessary.		
18. NEIGHBORHOOD CHARACTER: CEQR Technical Manual Chapter 21			
(a)	Based upon the analyses conducted, do any of the following technical areas require a detailed analysis: Land Use, Zoning, and Public Policy; Socioeconomic Conditions; Open Space; Historic and Cultural Resources; Urban Design and Visual Resources; Shadows; Transportation; Noise?	☐	☒
(b)	If "yes," explain why an assessment of neighborhood character is or is not warranted based on the guidance in Chapter 21 , "Neighborhood Character." Attach a preliminary analysis, if necessary.		
19. CONSTRUCTION: CEQR Technical Manual Chapter 22			
(a) Would the project's construction activities involve:			
	o Construction activities lasting longer than two years?	☐	☒
	o Construction activities within a Central Business District or along an arterial highway or major thoroughfare?	☐	☒
	o Closing, narrowing, or otherwise impeding traffic, transit, or pedestrian elements (roadways, parking spaces, bicycle routes, sidewalks, crosswalks, corners, etc.)?	☐	☒
	o Construction of multiple buildings where there is a potential for on-site receptors on buildings completed before the final build-out?	☐	☒
	o The operation of several pieces of diesel equipment in a single location at peak construction?	☐	☒
	o Closure of a community facility or disruption in its services?	☐	☒
	o Activities within 400 feet of a historic or cultural resource?	☐	☒
	o Disturbance of a site containing or adjacent to a site containing natural resources?	☐	☒
	o Construction on multiple development sites in the same geographic area, such that there is the potential for several construction timelines to overlap or last for more than two years overall?	☐	☒
(b)	If any boxes are checked "yes," explain why a preliminary construction assessment is or is not warranted based on the guidance in Chapter 22 , "Construction." It should be noted that the nature and extent of any commitment to use the Best Available Technology for construction equipment or Best Management Practices for construction activities should be considered when making this determination.		
20. APPLICANT'S CERTIFICATION			
I swear or affirm under oath and subject to the penalties for perjury that the information provided in this Environmental Assessment Statement (EAS) is true and accurate to the best of my knowledge and belief, based upon my personal knowledge and familiarity with the information described herein and after examination of the pertinent books and records and/or after inquiry of persons who have personal knowledge of such information or who have examined pertinent books and records.			
Still under oath, I further swear or affirm that I make this statement in my capacity as the applicant or representative of the entity that seeks the permits, approvals, funding, or other governmental action(s) described in this EAS.			
APPLICANT/REPRESENTATIVE NAME		SIGNATURE	DATE
PLEASE NOTE THAT APPLICANTS MAY BE REQUIRED TO SUBSTANTIATE RESPONSES IN THIS FORM AT THE DISCRETION OF THE LEAD AGENCY SO THAT IT MAY SUPPORT ITS DETERMINATION OF SIGNIFICANCE.			

PART I: GENERAL INFORMATION

This Environmental Assessment Statement (EAS) has been prepared to examine the potential impacts of installation of Two New Cogeneration Units at New York City Health and Hospital Corporation-Bellevue Hospital, New York City, on the environment. This Environmental Assessment Statement (EAS) is one of the documents (the other being Environment Impact Assessment or EIS) used in City Environmental Quality Review or “CEQR” which is the New York City’s process for implementing the State Environmental Quality Review (SEQR), by which agencies of the City of New York review proposed discretionary actions to identify and disclose the potential effects those actions may have on the environment (see Part II for details). The following section describes the project, its purpose and need, proposed activities including schedule, required permits and approval for implementing the proposed project.

1.1 PROJECT DESCRIPTION

New York City Health + Hospitals (NYCHHC) Bellevue (herein referred to as “Bellevue,” “HHC,” “the Hospital,” or “the facility,”) is the oldest hospital in America that traces its roots back to 1736. Over the years, it has become a major academic medical institution of international renown. It currently purchases power and heat supplied by Con Edison for its various hospital operations (e.g. HVAC, lighting, etc.). The facility also has nine (9) diesel generators, all of which are used for emergency purposes. The hospital is proposing to install a Combined Heat and Power (CHP) system (herein referred to as “the CHP system,” “the Proposed Project” or “the Cogens,”) comprising two (2) cogeneration engines, Caterpillar / G3516H, each with a 1,982 kW rating in an existing open lot on its property. This project is being enabled and financed by New York Power Authority (NYPA) while NYC HHC owns the CHP plant. A CHP plant is an energy efficient system that generates electricity while capturing the heat that is typically seen as waste. The simultaneous generation of electrical power and capture of thermal heat allow CHP systems to achieve higher efficiency than conventional electric generation plants. The CHP system will provide continuous power and heat to the hospital and will be able to support the hospital in the event of an outage. This is a site-specific action

contained within the boundaries of the Hospital property located on 462 First Avenue, Manhattan, 10016, New York. (See Figures 1, 2 and 3).

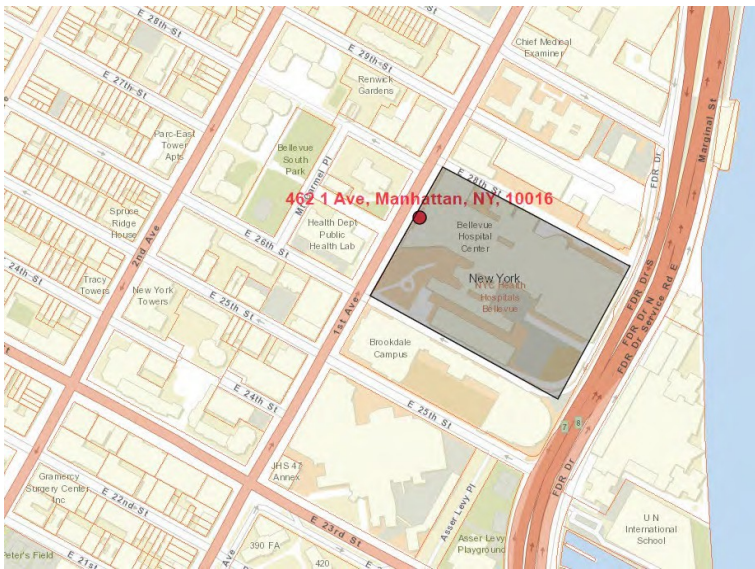


Figure 1. NYC HHC Bellevue Hospital Property Boundary

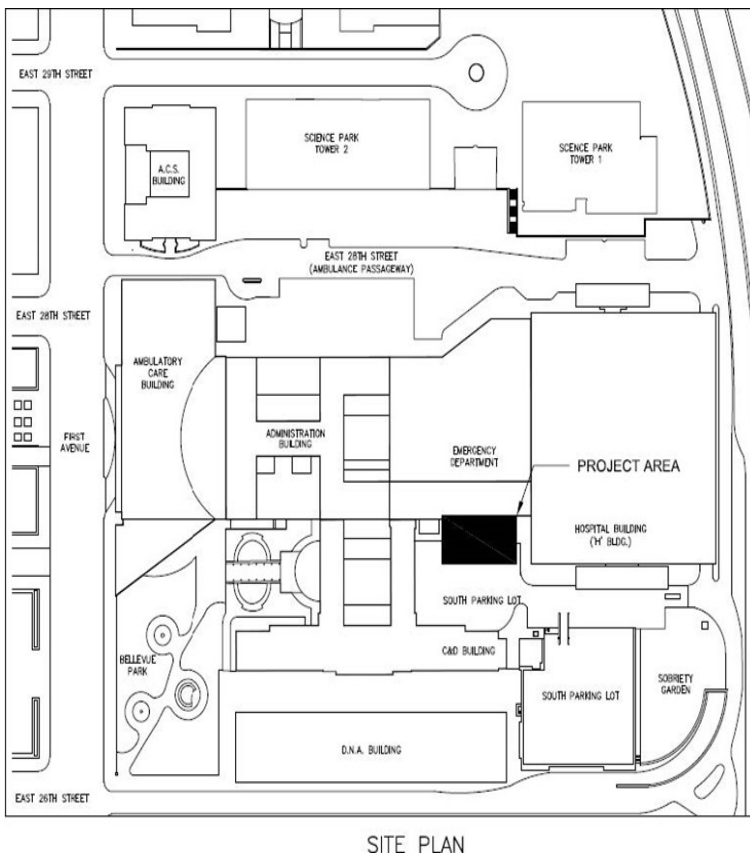


Figure 2. Project Area

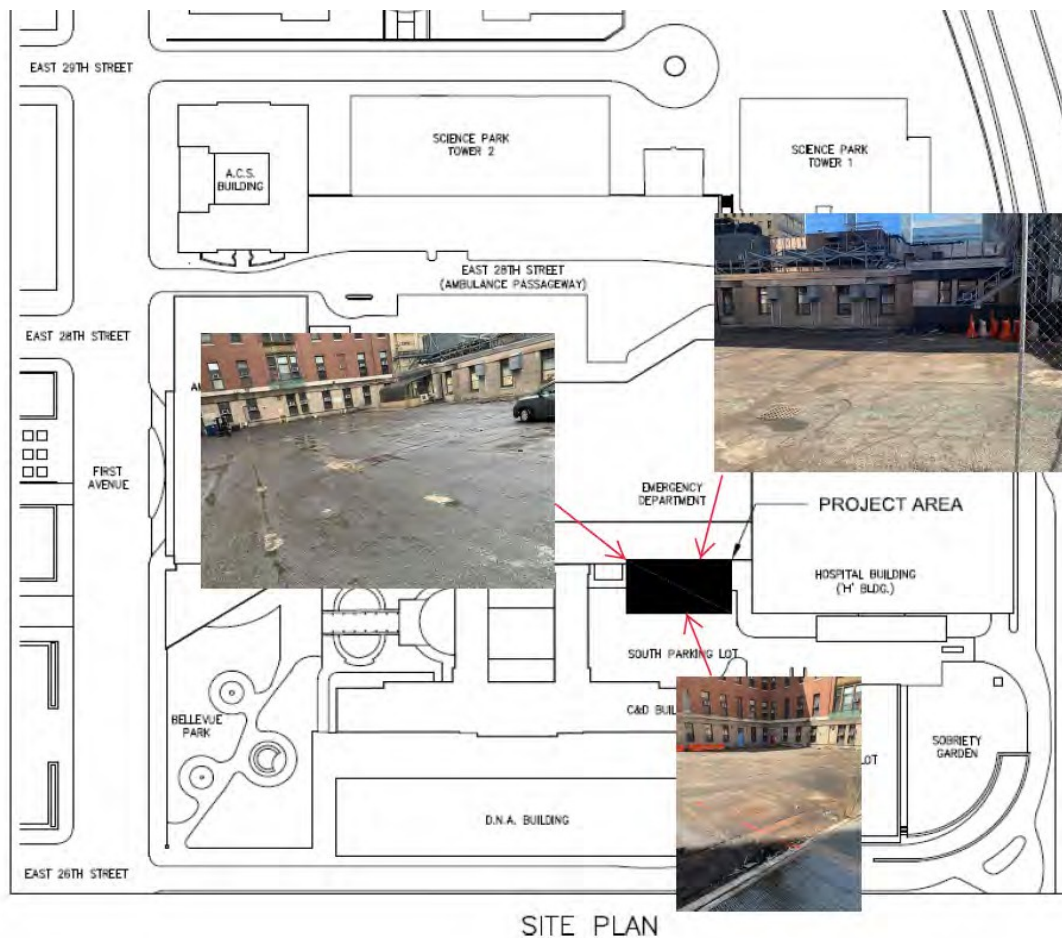


Figure 3. Project Area Keyed with Site Photos

The CHP system has been installed. The hospital currently holds a State Facility Air Permit from the New York State Department of Environmental Conservation (NYSDEC) for their emission sources. The proposed CHP system would consist of two (2) 1,982 kW (approximately 2 MW) natural gas fired co-generation engines anticipated to operate continuously to provide electrical and thermal energy to the facility 24 hours per day. Bellevue Hospital will be on a firm gas rate with Con Edison, and no back-up fuel source is anticipated. Both engines will be equipped with a Selective Catalytic Reduction (SCR) and Oxidation Catalyst System for reduction of nitrogen oxides (NO_x), carbon monoxide (CO), and volatile organic compounds (VOC) emissions. The engines will be housed on a newly built platform approximately 25 ft above grade at the hospital site adjacent to the Emergency Department. Each engine will have an individual stack that will be routed up the adjacent A-Building (See Appendix A) exterior wall to a height of 180 ft above the Emergency Department roof and CHP enclosure. The stacks

will extend 10 feet above the A-Building façade and 30 feet above the A-Building Roof/Penthouse.

1.2 PURPOSE AND NEED

The primary goal of this project is to provide Bellevue Hospital with a CHP system capable of meeting two tasks:

- i) Delivering on-site power to the facility on a 24 hr/ day base load operation and will be able to support the hospital in the event of an electrical utility outage for an extended amount of time, and
- ii) Reducing energy costs and increasing energy efficiency for the facility.

The purpose of the CHP system is to operate a ‘baseload’ manner. Electrical power will be generated by two cogeneration engines, each rated at 1,982 kW which will be in separate enclosures. Thermal ‘waste’ energy will be simultaneously recovered from both engines’ cooling water systems and exhaust gas streams to produce hot water, offsetting steam purchased from Con Edison and reducing the hospital’s reliance on off-site energy sources. The energy and economic analysis suggest the CHP system will save the hospital about \$67,082,600 in 20 years and decrease Greenhouse Gas (GHG) emissions by about 1.63%.

1.3 PROJECT ACTIVITIES AND SCHEDULE

Pursuant to NYC DEP Work Permit, NYSDEC State Facility Permit and NYC Department of Buildings (DOB), the project commenced with the initial structural, mechanical and general construction works, which are still ongoing. Mechanical equipment has been installed on the 13th floor and the slab on grade base has been poured in the South Parking Lot. The project near-term work includes steel erection, radiator rigging, breeching installation, and mechanical/electrical equipment. The installation of the CHP system will depend on CEQR, DEP and DEC approval.

Below is the estimated project timeline:

- Interior mechanical, electrical and plumbing (MEP) Construction Activities- May 2022 to May 2024: Installing mechanical pipe and electrical conduit for the CHP to tie-in to building's existing hot water system for energy efficiency.
- Emergency Department (ED) Roof Mechanical Piping & Electrical Conduit November 2022 to June 2024: Installing mechanical pipe and electrical conduit across the ED roof to the CHP to tie-in to mechanical pipe installed in the building.
- CHP Plant / Structure / Equipment / Roof June 2022 to June 2024: Installing a two- story structure separate from the facility to house the two (2) x 2 MW natural gas generators and associated electrical equipment. Note: CHP equipment is not installed, only structural work is being undertaken, in preparation for CHP installation once permits and approvals are issued.
- Once air permits are received and structural work has taken place it will take 12 months for the installation and commissioning of the CHP project.
- Project finish date: 2026

1.4 REQUIRED APPROVALS

The project requires approvals from the following agencies:

- NYC DEP – Certificate of Operation
- NYS DEC – State Facility Permit Modification
- NYPA – Project Financing.

PART II: TECHNICAL ANALYSIS

As mentioned previously, the environmental review process provides a means for decision-makers to systematically assess, disclose and mitigate to the greatest extent practicable the potential significant environmental consequences of their decision to fund, directly undertake or approve a project (see 2021 CEQR Technical Manual). Any proposed action funded, approved, or directly undertaken by a New York State or local agency must comply with the provisions of the State Environmental Quality Review Act (SEQRA) and its implementing regulations (6 NYCRR Part 617).

Once an agency determines a project is subject to environmental review, a list of technical areas or categories (see 2021 CEQR Technical Manual) are assessed to determine whether the project may have a significant adverse impact on the environment. For each of the analysis categories, an assessment of the Proposed Project's potential impacts based on the thresholds and criteria presented in the CEQR Technical Manual was considered. As detailed in Project Description (1.1), the Proposed Project would involve construction and operation of a new CHP system.

The project would meet or not exceed the analysis thresholds for these categories as set forth in the CEQR Technical Manual: Community Facilities and Service, Socioeconomic Conditions, Open Space, Shadows, Urban Design and Visual Resources, Solid Waste and Sanitation Services, Water and Sewer Infrastructure, Neighborhood Character, Natural Resources, Traffic and Transportation, and Construction.

The following technical areas were subject to further assessment: Land Use, Zoning, and Public Policy, Historic and Cultural Resources, Hazardous Materials, Air Quality, Energy, Greenhouse Gas Emissions and Climate Change, Noise and Public Health.

2.1 LAND USE, ZONING, AND PUBLIC POLICY

2.1.1 LAND USE ANALYSIS

The Hospital property is located at 462 First Avenue, Manhattan, 10016, New York. (See Figures 2 and 3). The project site is located on Block 962 Lots 100 (see Figure 5) and is bounded to the south by East 25th Street, to the west by 1st Avenue, to the north by East 29th Street and to the east by Franklin D Roosevelt Drive. The *CEQR Technical Manual* suggests that land use, zoning and public policy study area should extend 400 feet from the proposed project site. Existing land use patterns of city blocks within approximately 400 feet of the project site are presented in Figure 4. In terms of project's physical setting, it is in a built area comprising residential buildings, commercial buildings (C2-5, C2-6 and C2-7), parks, manufacturing (M1-1 and M2-3) districts, roads and other paved surfaces. The facility's land use is listed as a Public Facility and Institution. (See Figure 4). This property is a hospital which is part of New York City's Health and Hospitals network. The total gross floor area is 2,124,441 sq ft.

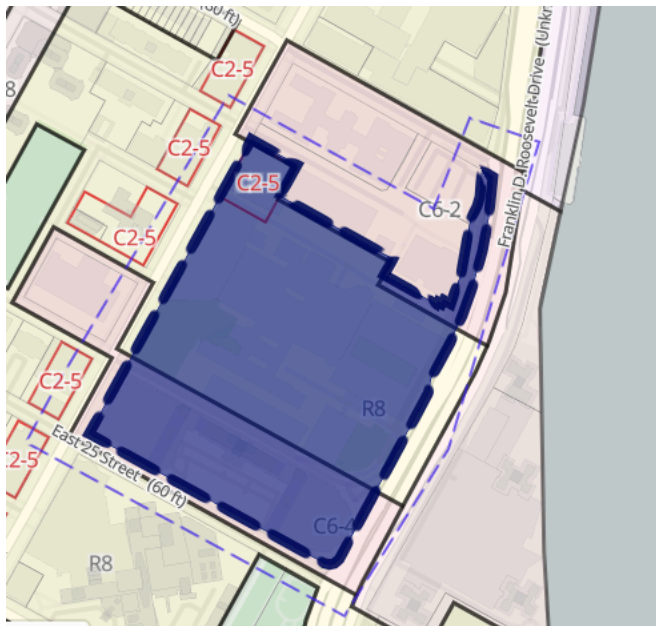


Figure 4. Project Site Land Use Map

2.1.2 ZONING ANALYSIS

The hospital's zoning classification is R8¹ residential district with C2-5² commercial overlays (See Figure 5). The proposed project would install a CHP system to generate electricity and heat on-site as a means to enhance the energy resiliency of Bellevue Hospital in the event of grid electricity outage. The new CHP system is located within the Hospital complex (inner court) and, therefore, it is considered a permitted obstruction pursuant to ZR 24-68 in line with the existing land use and zoning regulations of the area. The hospital will remain as primary Use Group III(A)³ with the cogeneration equipment as an accessory to this Use Group. This group was provided by NYC DOB in response to the filing of this project. The NYC DOB Office has listed this project as an accessory, which allows the installation of this CHP system as an accessory power system in the Hospital. While the CHP unit is being installed, there will be some construction in the parking area; however, the construction will not cause any loss of parking use, HHC is planning to provide additional parking spaces at nearby areas owned by Bellevue Hospital to maintain the same parking spaces. Parking would not be impacted by the proposed project.

The project would not involve any change in zoning or land use or have a negative impact on the residential, commercial, or other facilities in the area. The CHP system will be installed in the South Parking Lot, HHC NYC will add taller and larger car lifts to maintain the same amount of parking spaces. The exhaust stack of the CHP system will rise above the parapet of the building but will not increase the height of the facility given the campus has other hospital buildings that are taller.

¹ Apartment buildings in R8 districts can range from mid-rise, eight- to ten-story buildings to much taller buildings set back from the street on large zoning lots.

² Commercial activities in the city are permitted in eight commercial districts based on their functional similarities and locational requirements. Small retail and service shops in C1 and C2 districts serve the immediate needs of surrounding residential communities. Larger stores with more goods and services are found in C4 districts, borough-wide regional retail centers like Main Street in Flushing and Fordham Road in the Bronx. C5 and C6 districts, central business districts that serve the city, the region and the nation, are mapped in Midtown, Lower Manhattan, Downtown Brooklyn and Long Island City.

³ Use Group III(A) consists primarily of community facilities with sleeping accommodations.

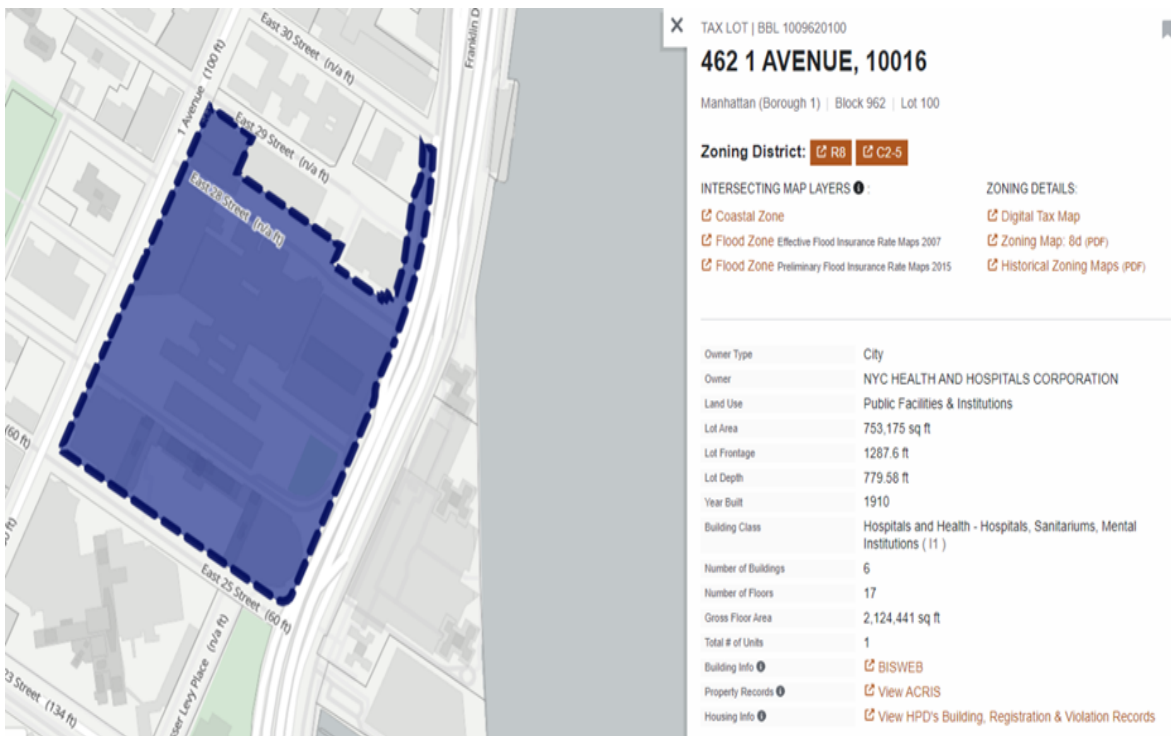


Figure 5. Project Site Tax Map

2.1.3 PUBLIC POLICY ANALYSIS

A preliminary assessment of public policy was carried out to identify and confirm that the proposed project would not alter or conflict with identified policies, such as the New York City's Waterfront Revitalization Program (NYCWRP). The proposed project site is located within the New York State Department of State (NYSDOS) and NYCWRP's Coastal Zone Boundary (see Figures 6 & 7). The NYCWRP establishes the City's policies for waterfront planning, preservation, and development projects to ensure consistency over the long term. The goal of the program is to maximize the benefits derived from economic development, environmental conservation, and public use of the waterfront, while minimizing any potential conflicts among these objectives. The NYCWRP is authorized by New York State's Waterfront Revitalization of Coastal Areas and Inland Waterways Act, which was enacted in response to the Federal Coastal Zone Management Act and allows municipalities to participate in the State's Coastal Management Program by creating their own local Waterfront Revitalization Program.

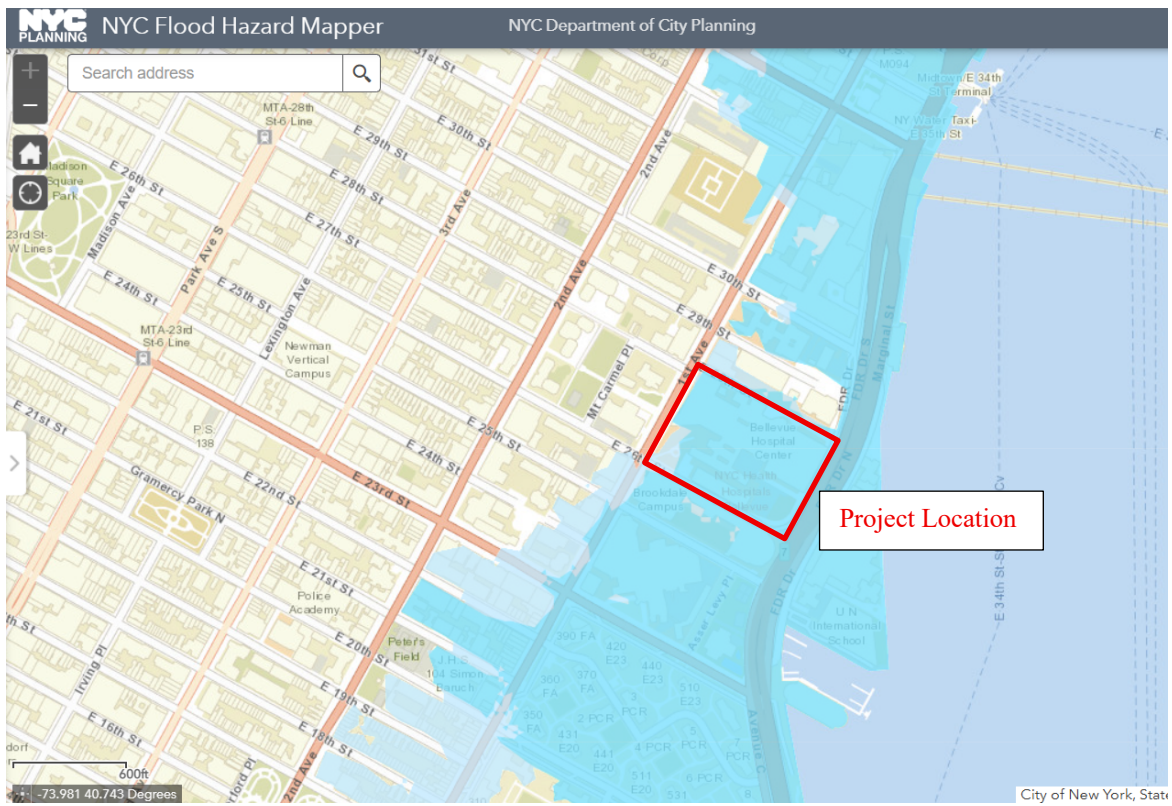


Figure 6: Future Floodplain 2050 (1% & 0.2% Annual Chance Floodplain)

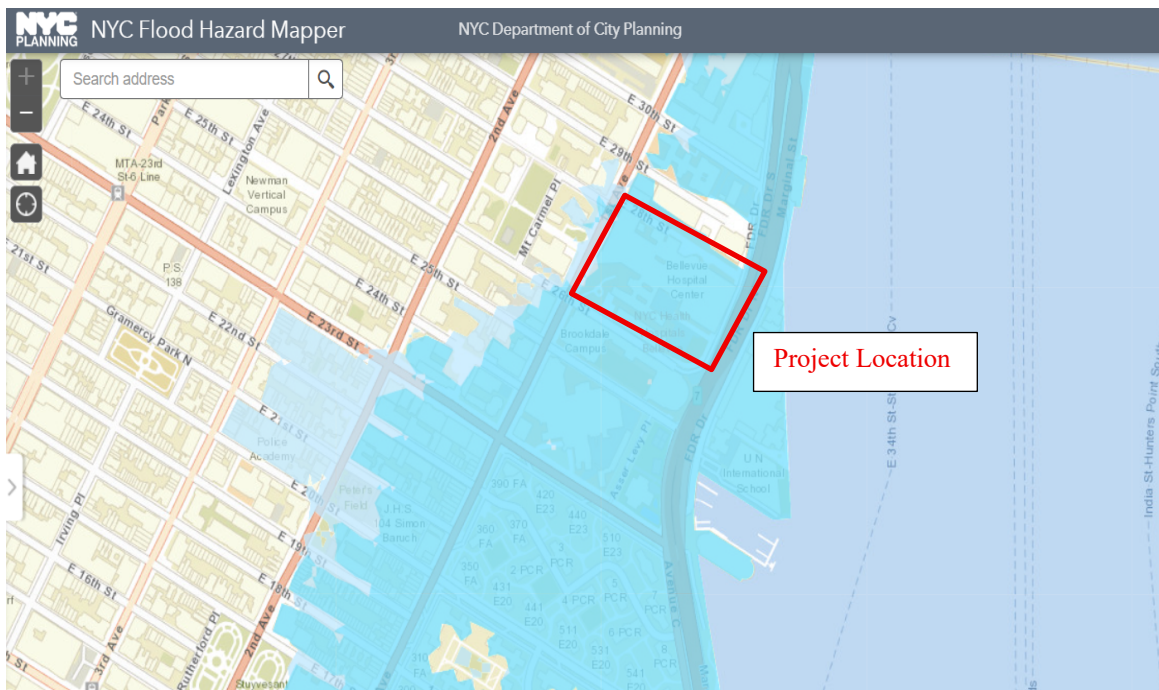


Figure 7: Future Floodplain 2100 (1% & 0.2% Annual Chance Floodplain)

Projects that require certain federal, state, and local discretionary actions that are located within and/or affect the Coastal Zone are reviewed by the responsible government agency to assess the consistency of a proposed activity or project with the NYCWRP's ten policies. This process also serves to better coordinate activities and decisions affecting the waterfront between overlapping jurisdictions and multiple agencies. Since this project is within the Coastal Zone, a consistency review is warranted for the proposed project. A NYCWRP Consistency Assessment Form (CAF) was completed to assess if the proposed project would promote or hinder NYCWRP policies. The proposed project was assessed for following NYCWRP policy areas of 5.2, 5.3, 6.1 and 6.2 (See Appendix B):

Policy 5.2: *Protect the quality of New York City's waters by managing activities that generate nonpoint source pollution.*

In this project, the emissions from the proposed CHP system will be considered as potential nonpoint source pollution. Nitrogen Oxides will be the major pollutant emitted from the CHP system that have influence on NYC's waterbody, however the proposed CHP system will be equipped with a Selective Catalytic Reduction (SCR) and Oxidation Catalyst System for the reduction of Nitrogen of Oxides (NOx), as well as other pollutants such as carbon monoxide (CO), and volatile organic compounds (VOC) emissions. The new proposed CHP system will have a minimal impact on NYC's waterbody.

Policy 5.3: *Protect water quality when excavating or placing fill in navigable waters and in or near marshes, estuaries, tidal marshes, and wetlands.*

Policy 5.3 emphasizes ensuring water quality protection during excavation or fill placement near navigable waters and sensitive habitats, meeting regulatory requirements and minimizing negative impacts on aquatic ecosystems. This policy is not applicable to the proposed CHP project because the construction is 660ft away from the closest waterbody, East River. The construction does not include any dredging in coastal water and no pollutant or waste will discharge into any waterbody. Therefore, the proposed CHP unit will have no impact on NYC's waterbody during construction.

Policy 6.1: Minimize losses from flooding and erosion by employing non-structural and structural management measures appropriate to the site, the use of the property to be protected, and the surrounding area and;

Policy 6.2: Integrate consideration of the latest New York City projections of climate change and sea level rise (as published in New York City Panel on Climate Change 2015 Report, Chapter 2: Sea Level Rise and Coastal Storms) into the planning and design of projects in the city's Coastal Zone.

The proposed project would install a CHP system comprising two (2) gas-fired co-generation engines with a 1,982 kW capacity each in a portion of an existing enclosed parking lot inside the hospital facility. Since the project falls within the FEMA 1% and 0.2% annual chance floodplains for 2050 as well as for 2100, the proposed CHP engines will be installed on a platform raised at least 25 feet above grade to protect against sea level rise and coastal flooding. The project location is not on the waterfront and does not result in the physical alteration of a waterfront site but is located within a FEMA 1% and 0.2% annual chance floodplain. The project site does not fall within any WRP Special Area Designations. The proposed structural management measure in the form of a raised platform 25 feet above grade would protect the CHP system from flooding and erosion. Since this project is contained within Bellevue Hospital property, the only affected area will be the project site. The proposed CHP system is expected to advance or promote specifically WRP policies 6.1.

The Waterfront Revitalization Program Consistency Assessment Form (WRPCAF) and Assessment for all Relevant Policies were reviewed by the DCP on 08/14/2025 and given project identification WRP# 24-010. DCP's Climate and Sustainability Planning Division, on behalf of the New York City Coastal Commission, concluded that the action would not substantially hinder the achievement of any WRP policies. Therefore, the proposed action would not result in potential significant adverse impacts to public policy (See Appendix B).

2.2 HISTORIC AND CULTURAL RESOURCES

A historic and cultural resources assessment is required for projects that can potentially impact archaeological or architectural resources eligible or designated on the New York State Register of Historic Places. Several of the Hospital's buildings, including the Administration Building and Buildings C and D of the Bellevue Hospital complex, are eligible for this listing as architectural resources. No archaeological resource classifications at this site. At the start of the project, the management team reached out to the New York State Division of Historic Preservation of the Office of Parks, Recreation and Historic Preservation (OPHRP). The office determined that the proposed project would have No Adverse Impact on historic resources (see Appendix C). Similarly, the New York City Landmarks Preservation Commission (LPC) was also consulted, and no-effect determination letter was issued dated 2/21/2024 (see Appendix D).

2.3 HAZARDOUS MATERIALS

The facility has five (5) 15,000-gallon underground diesel storage tanks on site to supply their emergency generators. No oil usage will be implemented with the CHP system. The Hospital has an active NYSDEC Petroleum Bulk Storage (PBS) registration for these underground tanks. The only ground disturbance for this project is the drilling of micro pilings. The nearest underground tank is located approximately 230 feet away from the project site, and the drilling of the micro pilings would not result in a pathway for exposure of any potential contaminants from the fuel oil tanks. The slab on grade base has been poured in the South Parking Lot already; however, this action did not result in the pathway of exposure. The tanks and surrounding area will not be disturbed as part of the proposed project and therefore are not considered a pathway of exposure for the proposed project.

2.4 ENERGY ANALYSIS

The proposed project would result in the installation of a CHP system capable of efficiently producing heat and electricity on-site, decreasing the need for electricity consumption from outside sources like Con Edison. In an effort to assess the potential effects of the CHP system on the facility's overall energy production,

an energy model was created (see Appendix E). The energy model considered the influence of the ED building and H building and the proposed CHP unit. The energy model was run using received electrical interval data for both the emergency department service and the H building service. Additionally, thermal data from HHC was utilized in the modeling process to evaluate the project's impact on the preexisting thermal loads of the hospital. The thermal data was only for a subset of the year. Based on this data, forecasts for changes in the facility's thermal load as a result of the project were developed to determine how much usable heat from the CHP system would be consumed by the hospital. The rest of the heat would be unused. These assumptions are shown in Table 1.

Table 1: Assumptions Used in Cogen Energy Model

	MMBTU/hr	MMBTU/yr
Total heat recovery available	11.37	94,689
Constant DHW	1.202	10,010
Summer (JJAS) (rejected 2.776MMBTU/hr)	7.392	20,520
Fall/Spring (MAMSO) (rejected 1.388MMBTU/hr)	8.78	30,467
Winter (NDJF) (rejected 0 MMBTU/hr)	10.17	28,226
Total hours 8328		89,223
432 hours for maintenance		

Energy model calculations were run based on 15-minute demand windows. The model makes a calculation every 15 minutes based on the electric interval data received from HHC and the thermal load profiles that were developed. The calculation sequence is as follows:

- Determine whether the engines are available to run. This allows for the off periods for maintenance.
- Assign the appropriate 15-minute kW generated, fuel usage and thermal available
- Adjust thermal available by table above and account for electrical cost to reject heat
- Apply parasitic loads to total kW output to determine Net power available
- For energy balance, add net kWh generated (in BTU), used thermal (in BTU) and divide by fuel used (in BTU) to determine 15-minute efficiency
- This process is repeated four times per hour or 35,040 times for the year

Pages 3-7 of the Energy Model in Appendix E provide a further narrative for how these values were quantified.

Calculations of the facility energy usage in the With-Action and No-Action scenarios were calculated

using manufacturer specifications for the Cogen and facility electricity and steam consumption. The annual projected energy use of the Cogen firing natural gas is 264,090,874 kBTU/year. CHP system operation will also produce hot water which will then be utilized to offset steam purchased from Con Edison. Reductions in certain areas, such as the decrease in steam and electricity purchases from Con Edison, were calculated using the available waste heat per hour multiplied by the number of available operating hours. The electricity demand of the facility is great enough that the CHP system's electricity and steam generation capacity alone is insufficient to completely offset the supply that the Hospital typically receives from Con Edison. As a result, the facility will still have to supply a small portion of their electricity and steam through Con Edison while operating the CHP system concurrently. However, in the With-Action scenario carbon intensity reduction is achieved through the reduction of grid electricity usage. A grid displacement credit can be applied to the facility for power generation from the CHP system using the New York City Local Law 97 emission factor for electricity from the grid. Applying this grid displacement credit results in a net decrease in energy consumption for the facility in the With-Action scenario. Section 2.6 has more in-depth discussion regarding the net decrease in energy consumption.

2.5 AIR QUALITY ANALYSIS

The proposed CHP system, comprising two (2) 1,982 kW (approximately 2 MW) natural gas fired engines, is anticipated to operate continuously to provide electrical and thermal energy to the facility 24 hours per day. Both engines will be equipped with a Selective Catalytic Reduction (SCR) and Oxidation Catalyst System for reduction of NO_x, CO, and VOC emissions. The engines will be housed on a newly built platform approximately 25 feet above grade in a lot owned by Bellevue Hospital next to the Emergency Department. Each engine will have an individual stack that will be routed up the adjacent A-Building exterior wall to a height of 180 ft above the Emergency Department roof and CHP enclosure (approximately 200 ft above grade). The stacks will extend 10 feet above the A-Building.

The CHP system comprising two natural gas-powered stationary engines, would be considered stationary sources of air pollution. In support of the State (NYSDEC) and City (NYCDEP) air permits for these

engines, various calculations were performed to understand the estimated increase in criteria pollutants: nitrogen oxides (NO_x), sulfur dioxide (SO₂), carbon monoxide (CO), particulate matter (PM), and volatile organic compounds (VOCs).

In the existing, No-Action, condition, the facility operates nine (9) emergency diesel generators. In the With-Action condition, the facility operates all nine (9) emergency generators as well as the two (2) CHP engines. Annual emissions remain below 24.9 tons per year of NO_x, since the new CHP engines utilize SCR/Oxidation Catalyst systems. In the With-Action condition, facility-wide NO_x emissions increase from 2.46 to 10.84 tons per year. A full set of emission calculations are present in Appendix I.

Regulatory Criteria

The proposed project's impacts on air quality were compared against National Ambient Air Quality Standards (NAAQS). For pollutants, New York State sets its own criteria (refer Table 2). These standards were taken from the 2021 CEQR Technical Manual, Chapter 17 (see Table 2).

Table 2. National Ambient Air Quality Standards

Pollutant		Primary/	Averaging Time	Level	Form
[links to historical tables of NAAQS reviews]		Secondary			
Carbon Monoxide (CO)		primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		primary and	Rolling 3 month average	0.15 µg/m3 (1)	Not to be exceeded
		secondary			
Nitrogen Dioxide (NO2)		primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb (2)	Annual Mean
Ozone (O3)		primary and	8 hours	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
		secondary			
Particle Pollution (PM)	PM2.5	primary	1 year	9.0 µg/m3	annual mean, averaged over 3 years
		secondary	1 year	15.0 µg/m3	annual mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m3	98th percentile, averaged over 3 years
	PM10	primary and	24 hours	150 µg/m3	Not to be exceeded more than once per year on average over 3 years
		secondary			
Sulfur Dioxide (SO2)		primary	1 hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards,

and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards

(1.5 µg/m3 as a calendar quarter average) also remain in effect.

(2) The level of the annual NO2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O3 standards are not revoked and remain in effect for designated areas.

Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) O3 standards.

(4) The previous SO2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas:

(1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and

(2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and

approved and which is designated nonattainment under the previous SO2 standards or is not meeting the requirements of a SIP call under the previous SO2 standards (40 CFR 50.4(3)).

A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

Per analysis methods in the CEQR Technical Manual, significance of the air impacts of this project were determined using Air Quality Dispersion Modeling. If the results exceed the NAAQS standards in Table 2, it would be deemed to have a potentially significant adverse impact.

DE MINIMIS CRITERIA – PM_{2.5}

Additionally, the proposed project must meet criteria for specific pollutants under CEQR, specifically for PM_{2.5}. New York City uses *de minimis* criteria to determine the potential for significant adverse PM_{2.5} impacts under CEQR as follows:

- Predicted 24-hour maximum PM_{2.5} concentration increase of more than half the difference between the 24-hour background concentration and the 24-hour standard; or
- Predicted annual average PM_{2.5} concentration increments greater than 0.1 µg/m³ at ground level on a neighborhood scale (i.e. the annual increase in concentration representing the average over an area of approximately 1 square kilometer, centered on the location where the maximum ground-level impact is predicted for stationary sources; or for mobile sources, at a distance from a roadway corridor similar to the minimum distance defined for locating neighborhood scale monitoring stations); or
- Predicted annual average PM_{2.5} concentration increments greater than 0.3 µg/m³ at any receptor location for stationary sources.

Actions under CEQR predicted to increase PM_{2.5} concentrations by more than the above *de minimis* criteria will be considered to have a potential significant adverse impact. The above *de minimis* criteria have been used to evaluate the significance of predicted impacts of the Proposed Action on PM_{2.5} concentrations.

2.5.1 AIR QUALITY MODEL METHODOLOGY

Air Quality Modeling was conducted to determine the proposed project's effects on the two major pollutants – NO₂ and PM_{2.5}. Since the Cogens will be burning natural gas, which has a negligible sulfur fuel content, SO₂ emissions were not analyzed. The modeling parameters were taken from engineering design documentation for the proposed engines. Table 3 details the inputs used in the model, including PM_{2.5} and NO₂ emission rates for the engines. To determine annual emission rates, the maximum operating scenario was used, assuming the proposed units would run for 8760 hours per year. Table 4

shows additional model inputs including stack height, exhaust flow, exhaust temperature, and UTM coordinates for the nine (9) emergency generators and the two (2) proposed Cogens at the facility. The nine (9) emergency generators are used solely for emergency purposes and are run for approximately one hour per month for routine testing. The emergency generators are included in the annual analysis and are excluded from the short-term analysis since they will not have a significant impact.⁴

Table 3 Air Model Emission Rate Inputs for 2 New Cogeneration Engines

Source	Status	Short Term		Annual	
		NOx	PM _{2.5}	NOx	PM _{2.5}
		g/s	g/s	g/s	g/s
5COMN	Existing	8.9744	0.4216	0.1065	0.0050
COGEN1	New	0.0774	0.0309	0.0774	0.0309
COGEN2	New	0.0774	0.0309	0.0774	0.0309
EMRM	Existing	2.68	0.0838	0.0318	0.0010
ADMIN1	Existing	3.6146	0.2541	0.0429	0.0030
ADMIN2	Existing	3.6146	0.2541	0.0429	0.0030
AMBUL	Existing	5.4218	0.3811	0.0644	0.0045

Table 4. Air Model Stack Parameters

Source ID	Status	Source Type	UTM X	UTM Y	Height	Temp.	Exhaust Flow	Stack Dia
			m	m	ft	F	ACFM	inch
5COMN	Existing	Point	586604	4510226	300	949	26,928	28.73
COGEN1	New	Point	586513	4510294	180	280	12,135	18
COGEN2	New	Point	586515	4510298	180	280	12,135	18
EMRM	Existing	Horizontal Point	586516	4510289	115	757	11,735	24
ADMIN1	Existing	Horizontal Point	586500	4510380	25	900	4,488	12
ADMIN2	Existing	Horizontal Point	586500	4510379	25	900	4,488	12
AMBUL	Existing	Horizontal Point	586484	4510391	95	901	6,525	12

***5COMN: Four identical Caterpillar C27 & Rudox RM900S, EMRM: Caterpillar 3512C, ADMIN1: Caterpillar D399, ADMIN2 Caterpillar D399, AMBUL: Cummins DFHD-5622268**

⁴ Emergency generators were not included in the annual PM_{2.5} analysis since PM_{2.5} impact only considered the incremental impact of the proposed project. The inclusion of the emergency generators in the modelling does not affect the outcome of the incremental impact analysis.

The USEPA-recommended AERMOD dispersion model is a steady-state plume model. The model incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, treatment of both surface and elevated sources, and both simple and complex terrain.

This modeling analysis was performed using the latest five-year meteorological data from LaGuardia Airport, the nearest representative National Weather Service Station, for the years 2013-2017 for PM_{2.5} and the years 2011-2015 for NO₂.⁵ Compliance with the 1-hour NO₂ NAAQS standards detailed in Table 2 is based on the multiyear average of the 98th percentile of the annual distribution of daily maximum 1-hour values not exceeding 100 ppb. The 8th-highest of the daily maximum 1-hour values across a year is an unbiased surrogate for the 98th-percentile. The AERMOD dispersion model incorporates the form of the 1-hour NO₂ NAAQS. Compliance with the 24-hr PM-2.5 NAAQS standards is based on the multiyear average of the 98th percentile of the annual distribution of daily maximum 24-hour values not exceeding 35 µg/m³. The 8th highest of the daily maximum 24-hour values across a year is an unbiased surrogate for the 98th percentile.

When analyzing air model data, the proposed model concentrations of pollutants must be added to background pollutant concentrations for the location to which the sources are being added. In this case, background concentrations for NO₂ from the USEPA Air Quality Monitoring Site at Queens College (Site ID 36-081-0124) were utilized. Background concentration was taken from 98th percentile daily maximum 1-hour values averaged over the years 2012 to 2016. For PM_{2.5}, background concentrations from the USEPA Air Quality Monitoring Site at PS-19 in Manhattan (Site ID 36-061-0128) were utilized as well.

A full network of receptors was included in the analysis, including surrounding buildings as well as a grid of flagpole receptors. Many building facades were not included as receptor locations in the analysis because they do not contain any HVAC air intakes and lack openable windows. In accordance with CEQR

⁵ Original modelling was completed with 2011-2015 meteorological data. Further analysis was completed for PM_{2.5} with updated 2013-2017 meteorological data. An exception was made to accept meteorological data from 2011-2015 for NO₂ and 2013-2017 for PM_{2.5} since the filtration commitments from the Hospital will result in all concentrations in affected areas being well below CEQR thresholds.

guidelines, air dispersion modeling receptors represent locations with openable windows and air intakes. Terrain elevations for the receptor grid were obtained using National Elevation Dataset (NED) files, pre-processing this data using the AERMAP program.

2.5.2 AIR MODEL RESULTS

The results of air modeling for NO₂ and PM_{2.5} are shown in Tables 5 and 6. The maximum predicted concentrations of NO₂, when added to background concentrations, were found to meet the NAAQS 1-hour 98th percentile NO₂ standard. Please see below for discussion regarding PM_{2.5} concentrations.

Table 5. NO₂ Modeling Results

NO₂ NAAQS

Averaging Period	Year	Source Group	Modeled Conc. w/ ARM2 (µg/m ³)	Background Conc. 2 (µg/m ³)	Total Ambient Conc. (µg/m ³)	NAAQS (µg/m ³)	Exceeds NAAQS?
1-Hour ¹	AVG	COGENS	57	110.64	167.93	188	No
		COGEN1	31	110.64	141.95	188	No
		COGEN2	31	110.64	141.51	188	No

1. Represents H8H of daily maximum values averaged over 5 years.

2. Background for Queens College (AQS Site ID 36-081-0124) from EPA Air-Data; Used average for years 2012 through 2016.

Averaging Period	Source Group	Year	Modeled Conc. w/ ARM2 (µg/m ³)	Background Conc. 2 (µg/m ³)	Total Ambient Conc. (µg/m ³)	NAAQS (µg/m ³)	Exceeds NAAQS?
Annual ¹	COGENS	2011	1.97	32.90	34.87	100	No
	COGENS	2012	1.93	32.90	34.83		No
	COGENS	2013	2.11	32.90	35.01		No
	COGENS	2014	1.64	32.90	34.54		No
	COGENS	2015	1.67	32.90	34.57		No
	COGENS	MAX	2.11	32.90	35.01		No
	ALL	2011	5.15	32.90	38.05	100	No
	ALL	2012	5.34	32.90	38.24		No
	ALL	2013	4.73	32.90	37.63		No
	ALL	2014	5.18	32.90	38.08		No
	ALL	2015	5.04	32.90	37.94		No
	ALL	MAX	5.34	32.90	38.24		No

1. Represents H1H of respective source groups

2. Background for Queens College (AQS Site ID 36-081-0124) from EPA Air-Data; Used maximum for years 2012 through 2016.

File Location of Modeling Files:

Table 6. PM_{2.5} Modeling Results

Annual PM_{2.5}- NAAQS

Averaging Period	Year	Source Group	Modeled Conc. (µg/m ³)	Background Conc. ² (µg/m ³)	Total Ambient Conc. (µg/m ³)	NAAQS (µg/m ³)	Exceeds NAAQS?
Annual ¹	AVG	COGENS	0.39	8.6	8.96	9	No

¹Represents H1H averaged over 5 years

²Since not available from DEP, used EPA database to download annual background data.

Annual PM_{2.5}- CEQR

Averaging Period	Year	Source Group	Modeled Conc. (µg/m ³)	Background Conc. (µg/m ³)	Total Ambient Conc. (µg/m ³)	CEQR Standard (µg/m ³)	Exceeds CEQR?
Annual ¹	AVG	COGENS	0.39	-	0.39	0.3	Yes

¹Represents H1H averaged over 5 years

24-hr PM_{2.5} CEQR

Averaging Period	Year	Source Group	Modeled Conc. (µg/m ³)	Background Conc. (µg/m ³)	Total Ambient Conc. (µg/m ³)	CEQR Standard (µg/m ³)	Exceeds CEQR?
24-Hour ¹	AVG	COGENS	2.23	-	2.2	4.5	No

¹Represents H1H of 24-hr results averaged over 5 years

Ambient PM_{2.5} Air Monitoring Site for Determining Background Concentrations

Averaging Period	Monitoring Station ^a	AQS Site ID	County	State	Background Concentration ^b	Metric
PM _{2.5} 24-hour	<i>PS 19</i>	36-061-0128	New York	NY	22.5	98th percentile averaged over the 5 years
PM _{2.5} Annual	<i>PS 19</i>	36-061-0128	New York	NY	8.6	averaged over the 5 years

a. Proposed station to use as background concentration is shown in ***bold italic font***

b. https://aqs.epa.gov/aqsweb/airdata/download_files.html

Background Concentrations (µg/m ³)						
2010	2011	2012	2013	2014	2015	
25.5	24.7	20.5	25	19.7	22.7	
9.43	9.42	8.5	8.34	7.69	8.09	

Data Counts (days per year) ^b						
2010	2011	2012	2013	2014	2015	
351	300	331	339	341	343	
351	300	331	333	341	343	

The PM_{2.5} Annual unrestricted modeling showed an exceedance of the CEQR *de minimis* with a modeled concentration of 0.39 µg/m³. The model indicated that exceedances occurred around the perimeter of the main “H-Building” of the Hospital, specifically on the 13th and 22nd floor where the main air intakes are located, and Air Handling Unit 2 located on the roof of the Emergency Room. In an effort to address the CEQR exceedances for PM_{2.5}, several facility operating conditions and procedures will be put into effect to ensure the continuous operation of the CHP system doesn’t affect sensitive receptors. Primarily, the purpose of the following mitigation measures is to ensure that all exterior locations where AERMOD predicted exceedances will have to pass through a filter with a minimum PM_{2.5} removal efficiency of exactly 23% to reduce PM_{2.5} levels to be below the exceedance conditions. The following is a breakdown of the steps and actions the Hospital will undertake to ensure compliance with the CEQR requirements:

The H-building currently has a variety of air filters installed on the 13th and 22nd floors. Table 7 details the specific types of filters the H-building has installed as well as all the specific sizes they use.

Table 7: List of Currently Installed Filters in Bellevue Main Hospital Building

Filter Type	Filter Dimensions (inches)				Meets necessary removal efficiency?
3 Ply Cube	12x24x10	12x24x15	24x24x10	24x24x15	NO
3 Ply Link	12x112	16x100	16x120	20x45	YES
	24x112	24x140	24x72	25x120	
3 Ply Panel	20x20				YES
33x65 Auto Roll	3x32-7/8"W				NO
45x65 Auto Roll	4x44-7/8"W				NO
57x65 Auto Roll	5x56-7/8"W				NO
Fiberglass Bag	24x24x22				YES
MERV 15 V-Bank	12x24x12	20x24x12	24x24x12		YES
MERV 9 MegaPleat	12x24x2		24x24x2		YES
Syn Pac E MERV-15	12x20x15	12x24x15	12x24x22	20x24x12	YES
	20x24x22	24x24x15	24x24x22		

Based on the Air Model results in Appendix F, the highest recorded PM_{2.5} concentrations will require a minimum PM_{2.5} removal efficiency of 23% across all air intakes to reach acceptable levels. To ensure continued compliance with the necessary standards, the plan is to upgrade all of H-building's non-compliant filters to ones that have a Minimum Efficiency Reporting Value (MERV) rating of at least 15, which corresponds to a PM_{2.5} removal efficiency of around 90%.⁶ All filters will be replaced on a consistent basis. Some of the filters already installed have the necessary MERV rating to comply with NAAQS and CEQR criteria. Of all the filters, the Cube and AutoRoll filters are the two types that do not officially list performance specifications that comply with the required PM_{2.5} removal rate. Additionally, Air Handling Unit 2 located on the roof of the Emergency Room of the facility is already equipped with a filtration system and fitted with a MERV-15 filter. The Hospital has committed to the installation of MERV-15 filters with 90% removal efficiency (see the unified commitment letter from Bellevue in Appendix J).

To keep track of the filter installations and maintenance, the Hospital will maintain a log of receipts for the filters installed in their main air intake equipment, and keep track of the lifespan of each filter, logging whenever they get changed. The information will be stored at the Hospital and will be made available to

⁶ [MERV Rating Chart: Understanding 1-20 MERV Rating \(For Filters\)](#)

send to the DEP upon request.

All openable windows at the facility are kept locked and are only opened during emergencies. The facilities team will keep a record book of whenever any of the windows need to be opened, and track what window was opened, why it was opened, and how long it was opened for. In a potential emergency if the window must be opened and the CHP system can't be turned off, this event must be logged into the record book, detailing the reasons why the window needed to be opened while the CHP system was subsequently operating.

To mitigate the impacts of this exceedance, restrictions were modeled. Limiting gym hours and separately limiting the operation of window AC units were modeled. All receptors affected by these restrictions will result in modelled concentrations below CEQR de minimis criteria. As a result, Bellevue committed to these restrictions in the combined commitment letter in Appendix J. Specifically, the gym area and roof of the H-Building will only be open between the hours of 5:00 AM and 5:00 PM. Additionally, the Hospital has committed to all window air conditioning units in the vicinity of the CHP system, specifically in Buildings C and D, using recirculated indoor air only so no outside air enters the building. These air conditioning units will only be operational between April 1 and November 15.

To best aid the DEP's efforts to ensure continued adherence to the enforcement actions described above, the Hospital will commit to providing the DEP with a copy of the record book on an annual basis, or as often as the DEP determines is appropriate. See Appendix J for the unified commitment letter from Bellevue pledging its commitment to meet the compliance requirements described above. This letter outlines the Hospital's commitment to ensuring all air handling units installed on the 13th and 22nd floors of the H-Building, and Air Intake 2 located on the roof of the Emergency Room that pull in outside air are equipped with at least a MERV-15 rated filtration system, providing a 90% or greater filtration efficiency. Additionally, the Hospital commits to replacing the filters on an annual basis to continue compliance with all relevant city and state air pollution regulations. The unified commitment letter in Appendix J, also

outlines the Hospital's commitment to maintain a log of installed filters and replacements. With all the restrictions included in the unified commitment letter, there is no significant impact at the affected receptors.

Under these conditions, and with the support of the engineering and facility staff, concentrations of PM_{2.5} will be below the NAAQS and CEQR standards, demonstrating that no potential significant adverse air quality impacts would result from the installation of the proposed CHP system.

2.6 GREENHOUSE GAS EMISSIONS

The calculation of operational energy consumption is the first step in a GHG assessment (refer 2021 CEQR Technical Manual, Chapter 18, "Greenhouse Gas Emissions and Climate Change" and see Section 2.4). Bellevue Hospital currently purchases both electricity and steam for lighting, Heating, Ventilation and Air Conditioning (HVAC) purposes from Con Edison. The purpose of the proposed CHP project is to generate electricity and steam using the proposed cogeneration engines making the hospital more energy efficient and less reliant on outside sources like Con Edison for heat and power. By using waste thermal energy to provide steam to the facility, the proposed CHP system would offset a significant amount of the electricity currently consumed on site thereby impacting the facility's overall GHG emissions.

Greenhouse gases (GHGs) are atmospheric gases that can absorb radiation, which causes a warming effect and generally leads to the phenomenon of global warming. Major GHGs to be analyzed as per the CEQR Technical Manual include carbon dioxide (CO₂), nitrous oxide (N₂O), and methane (CH₄). Other GHGs such as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), or sulfur hexafluoride (SF₆) are not emitted and therefore not relevant to the proposed CHP system. The contribution of greenhouse gases by a particular source or set of sources can be quantified in terms carbon dioxide equivalents (CO₂e). To calculate CO₂e, each potential GHG is given an emission factor called a Global Warming Potential (GWP). Global warming potentials are standard values that take into account the influence that a certain pollutant has on global warming. Table 8, from Chapter 18 of the CEQR Technical Manual, presents

global warming potentials for primary GHGs.

Table 8: Global Warming Potential for Primary Greenhouse Gases

Greenhouse Gas	Common sources	Global Warming Potential (GWP)
CO ₂ - Carbon Dioxide	Fossil fuel combustion, forest clearing, cement production	1
CH ₄ - Methane	Landfills, production and distribution of natural gas and petroleum, anaerobic digestion, rice cultivation, fossil fuel combustion	21
N ₂ O - Nitrous Oxide	Fossil fuel combustion, fertilizers, nylon production, manure	310
HFCs - Hydrofluorocarbons	Refrigeration gases, aluminum smelting, semiconductor manufacturing	140-11,700*
PFCs - Perfluorocarbons	Aluminum production, semiconductor manufacturing	6,500-9,200*
SF ₆ - Sulfur Hexafluoride	Electrical transmissions and distribution systems, circuit breakers, magnesium production	23,900
Note: Since the Second Assessment Report (SAR) was published in 1995, the IPCC has published updated GWP values in its Third Assessment Report (TAR) and Fourth Assessment Report (AR4) that reflect new information on atmospheric lifetimes of greenhouse gases and an improved calculation of the radiative forcing of CO₂. However, GWP values from the SAR are still used by international convention to maintain consistency in GHG reporting, including by the United States when reporting under the United Nations Framework Convention on Climate Change. * The GWPs of HFCs and PFCs vary depending on the specific compound emitted. A full list of these GWPs is available in Table ES-1 of the U.S. Environmental Protection Agency's <i>Inventory of Greenhouse Gas Emissions and Sinks: 1990-2008</i>, available at: Inventory-GHG 1990-2008.		

Under the Clean Air Act, the USEPA and New York State are required to regulate GHG emissions due to their harmful effects on the earth's climate. These agencies aim to reduce GHG emissions by 30% between 2020 and 2030. New York City has its own GHG reduction goals as part of its OneNYC initiative, with an aim to reduce GHG emissions citywide 30% below 2005 levels by the year 2025 and to become carbon neutral by 2050. As part of this effort and the Climate Mobilization Act of 2019, the city enacted Local Law 97. This law establishes emission limits and annual reporting requirements for large buildings exceeding 25,000 square feet. Bellevue Hospital is considered a "covered building" under Local Law 97, meaning it must comply with the law.

Annual emissions for each source were added together to arrive at the total GHG emissions (see Table 9). Based on the manufacturer's specifications of the Cogens, the proposed CHP system would generate a

total of 3,964 kW. In the With-Action (Cogen) Scenario, if the hospital uses 3,964 kW of generation from the proposed engines, then a 3,964 kW load will be taken off or displaced from the load on the grid. At maximum load, GHG emissions are significantly higher for a ConEd turbine versus the proposed Cogen engine. In the With-Action scenario, the annual consumption of electricity from the grid would reduce from 182,080,602 kBTU of energy in the No-Action scenario to 69,443,003 kBTU of energy in the With-Action scenario, for a total reduction in grid electricity usage of 61.9%. The With-Action scenario would also consist of a 110,125,894 kBTU reduction in steam consumption from ConEd (see Table 9).

Table 9: Total Annual GHG Emissions With-Action and No-Action

Usage	Local Law 97 GHG Factors 2024-2029 ¹	GHG Emissions With Action (Cogen)		GHG Emissions No Action (No Cogen)		Net Change in CO ₂ e ⁷
	CO ₂ Equivalent Tons/KBTU	Energy Usage KBTU/Year	CO ₂ e Release TPY	Energy Usage KBTU/Year	CO ₂ e Release TPY	
Electricity Purchased from Con Ed ²	0.000084689	69,443,003	5,881	182,080,602	15,420	-9,539
Steam Purchased from Con Ed ³	0.00004493	172,975,088	7,772	283,100,982	12,720	-4,948
Steam Avoided ⁴	0.00004493	-110,125,894	-4,948	-	-	-
Total Energy Consumption from Nine (9) Emergency Generators ⁵	0.00007421	1,193,500	89	1,193,500	89	0
Natural Gas Consumption with Cogen ⁶	0.00005311	264,090,874	14,026	0	0	14,026
Grid Displacement Credit ⁸	0.000084689	-	-9,539	-	-	-
Total			27,767		28,229	-461
					Percent Dec. in GHG:	1.63%

1. GHG Emission Factors from NYC Local Law 97 were utilized

2. Electricity consumption calculated from ConEd electricity bills. See Appendix G for calculation derivation.

3. Steam consumption calculated from ConEd steam bills. See Appendix G for calculation derivation.

4. Steam avoided calculated based projected recoverable thermal output of the CHP. See Appendix G for calculation derivation.

5. Energy consumption calculated from total annual fuel usage of all 9 generators; no change in gen usage in With Action Scenario

6. Theorized potential emissions of the Cogens based on manufacturer's fuel rate specifications and assumption that the CHP will run for 8,328 hours/year.

7. Negative values indicate a decrease in CO₂e emissions, positive values indicate an increase in CO₂e emissions.

8. Grid Displacement Credit calculated using NYC Local Law 97 Emission Factor. See Appendix G for calculation derivation.

9. Detailed calculations for Table 9 values found in Appendix G.

To reduce emissions of and from the CHP engines, the design includes the installation of a Selective Catalytic Reduction (SCR) and Oxidation Catalyst (OXICAT) urea system. This is the Best Available Control Technology (BACT) for reciprocating natural gas engines as regulated by EPA National Emission Standards for Hazardous Air Pollutants (NESHAPS) for reducing NO_x, CO, and Non-Methane & Non-Ethane Hydrocarbon (NMNEHC) emissions.

The “Electricity Purchased from ConEd” value in the No-Action scenario was calculated using the facility’s total electricity bills from ConEd in 2023 (see Appendix G). For the With-Action scenario, a grid displacement credit was calculated using the manufacturer provided electrical output of the Cogens and the NYC Local Law 97 Emission Factor for electricity from the grid. The “Electricity Purchased from ConEd” in the With-Action scenario was calculated by subtracting the grid displacement credit from the facility’s total 2023 ConEd electricity consumption (See Appendix G for detailed calculation derivations). The “Steam Purchased from ConEd” in the No-Action Scenario was calculated through the facility’s ConEd steam consumption totals during the year 2023 (See Appendix G). For the With-Action scenario, the “Steam Avoided” was calculated using manufacturer provided recoverable thermal output of the Cogens. This recoverable thermal output would be used by the facility in the With-Action scenario, therefore, reducing the facility’s demand for steam purchased from ConEd. The “Steam Purchased from ConEd” in the With-Action Scenario was calculated by subtracting the “Steam Avoided” from the facility’s total 2023 ConEd steam consumption (See Appendix G). The “Total Energy Consumption from Nine (9) Emergency Generators” for both the With-Action and the No-Action scenarios was calculated through the facility’s 2025 fuel consumption totals for their generators. This value does not change from scenario to scenario, as the emergency generators are not being rewired to power other portions of the hospital as a result of the addition of the Cogens, and as such was assumed to remain constant. The “Natural Gas Consumption with Cogen,” category under the No-Action scenario assumes the Cogen is not installed and is not contributing to the emissions. Under the With-Action scenario, the consumption values were calculated using the fuel rate from manufacturer’s specifications in the facility-wide emissions inventory calculations and assuming the Cogen will operate for 8,328 hours per year. The Natural Gas consumption was calculated using the input capacity of the Cogens assuming they will run 8,328 hours per year.

By then comparing the total tons of CO₂e released per year for the With-Action and the No-Action scenarios, a net change in CO₂e emissions was calculated. Ultimately, the proposed Cogen installation resulted in a net decrease of approximately 461 tons of CO₂e, for a roughly 1.63% decrease in facility-wide emissions. The only other emission sources at the facility are the nine (9) emergency generators which were considered in this analysis.

Calculations for the annual CO₂e for these engines are shown in Appendix G.

Chapter 18 of the CEQR Technical Manual lists the following considerations for evaluating whether the project is consistent with the city's GHG reduction goals:

- Pursue transit-oriented development;
- Generate clean, renewable power through replacement of inefficient power plants with state-of-the-art technology and expanding the use of clean distributed generation.
- Construct new resource- and energy-efficient buildings (including the use of sustainable construction materials and practices) and improve the efficiency of existing buildings.
- Encourage sustainable transportation through improving public transit, improving the efficiency of private vehicles, and decreasing the carbon intensity of fuels.

As shown in Table 9, with the installation of the proposed CHP system, the facility's total GHG emissions will decrease to 27,767 tons CO₂e/year. New York City has set emission limits by property type for the years 2024-2029. For hospitals (Building Code Classification I-2), the building emissions intensity limit designated by the NYC Department of Buildings is 0.02381 tons CO₂e/sf. Bellevue Hospital's gross square footage is approximately 2,124,441 sq. ft., giving the facility an emissions intensity limit of 50,583 tons CO₂e/year. In the With-Action Scenario, the facility reaches 54.9% of the 2024-2029 limits. In the No-Action Scenario, the facility reaches 55.8% of the 2024-2029 limits.

Emission limits for 2030-2034 (0.01193 tons CO₂e/sf) are reduced even further to 25,345 tons CO₂e/year. In the With-Action Scenario, the facility reaches 109.6% of the 2030-2034 limits. In the No-Action Scenario, the facility reaches 111.4% of the 2030-2034 limits. In both scenarios, additional measures will be required for LL97 compliance beginning in 2030.

Table 10: LL97 Emission Limits for Health Care in Future 10 Years

	LL97 Annual Emission Limit 2024-2029 (tCO₂e/sf)	LL97 Annual Emission Limit 2030-2034 (tCO₂e/sf)
Health Care	0.02381	0.01193

By generating their own power from the CHP system, the facility energy efficiency increases by reducing reliance on the less efficient electricity and heat supplied by Con Edison. The proposed CHP system would be fitted with state-of-the-art SCR/Oxidation Catalyst technologies with the aim of minimizing emissions as much as possible. The goal of this project is to make the entire facility energy efficient by producing electricity on site and using waste thermal energy to heat the property.

The proposed project does not impact either public transit or private vehicle use, and therefore those considerations are not relevant to this analysis.

2.7 NOISE ANALYSIS

According to the CEQR Technical Manual, a noise analysis is appropriate if an action would generate any mobile or stationary sources of noise or would introduce a new noise-sensitive use in an area with high ambient noise levels. The proposed project would not generate or reroute vehicular traffic, so an analysis of mobile sources of noise is not warranted. The mechanical systems for the proposed project have been designed to meet all applicable noise regulations, including the New York City Noise Control Code, specifically Subchapter 24.224. The Cogen engines will be in a sound-attenuating enclosure and equipped with silencers to avoid producing noise levels that would result in significant increases in ambient noise levels.

The proposed Cogen system would not constitute noise-sensitive uses. An acoustical study was performed at the outset of this project using SoundPLAN software and the calculation methodology outlined in ISO Standard 9613-2. The model evaluated sound pressure levels at seven receptor locations, including nearby streets, parking lots, roofs, and indoor spaces. According to the CEQR Technical Manual Chapter 19, Section 410 impact threshold, the project was evaluated against a clearly perceptible increase of 3 dBA and a significant impact of 5 dBA. Based on the SoundPLAN modeling results presented in Table 6, the maximum expected ambient sound level increase at any receptor is 3 dBA. Therefore, it is confirmed that the mechanical equipment introduced by the proposed action would not result in a significant adverse

noise impact. The full results and design considerations of this study are present in Appendix H. Design considerations were taken based on the recommendations of this study.

2.8 PUBLIC HEALTH

Although the Air Quality study determined the project would be above National Ambient Air Quality Standards (NAAQS), air quality will not be significantly impacted by this project through the use of filtration. The project will also not impact hazardous materials or noise, so further analysis on public health impacts is not required.

2.9 ENVIRONMENTAL JUSTICE SITING

The NYSDEC's online Disadvantaged Communities Assessment Tool (DACAT) was used to determine whether the project was within or near a Disadvantaged Community (DAC). The project is located within Census Tract 36061006200 and is designated as a DAC by the New York State Climate Justice Working Group (CJWG). See Figure 8 for the DAC map indicator of the project location.

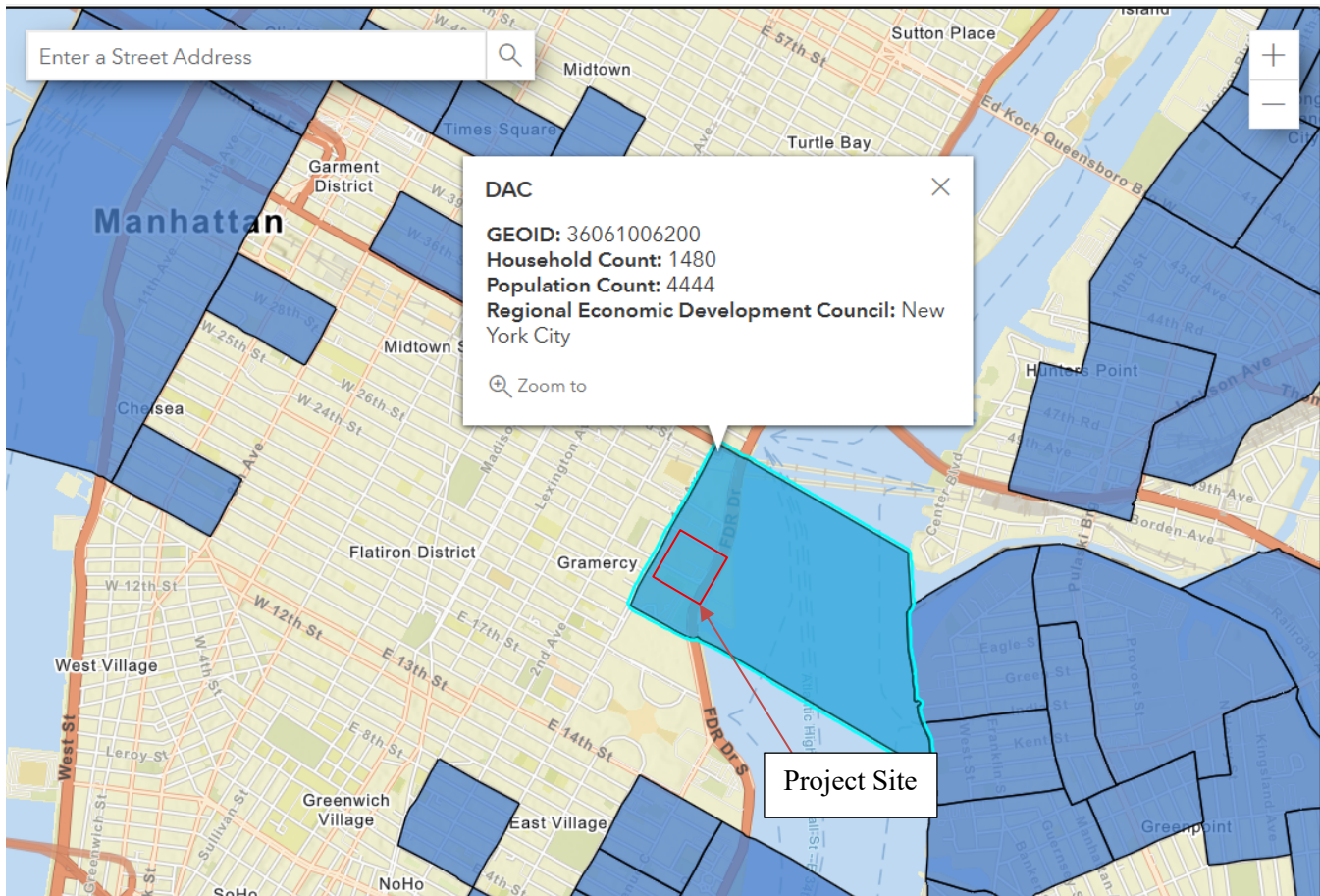


Figure 8: DAC Map and Corresponding Project Location.

The project would not involve any change in zoning or land use, or have a negative impact on the residential, commercial, or other facilities in the area. The effects of the project on zoning or land use would not result in any disproportionate burden to nearby DACs.

Regarding the potential effects of hazardous materials as a result of the proposed project, the facility was determined to have five (5) 15,000-gallon underground storage tanks on site. The project is for a natural gas fired CHP system, and no portions of the project involved manipulating, altering, or tying into any of the preexisting storage tanks. As such, there would be no disproportionate burden on nearby DACs due to hazardous materials.

The energy analysis portion of the project indicates that the CHP system will increase the Hospital's onsite natural gas consumption, improve the resilience of their energy system and ensure that critical healthcare infrastructure stays operating in the event of an emergency outage. The increased

resilience of the energy system to deal with emergency outages would not result in a disproportionate pollution burden to DACs.

The proposed project would not result in an increase in ambient NO₂ concentrations that exceed NAAQS standards or NYCDEP CEQR standards. It would not result in a disproportionate pollution burden for the nearby DACs, and thus not have an impact on the DAC. The proposed project indicated that exceedances in PM_{2.5} concentrations were observed near some air intakes at the Hospital. Filters capable of effectively capturing particles within the PM_{2.5} range will be installed at all identified air intakes around the facility. Due to the Hospital's measures to remain in compliance with all applicable air quality standards, no potential burdens on DACs were identified.

The increase in on-site generation of heat and electricity as a result of this project would not create a potential burden on DACs. The facility's natural gas consumption will increase due to the operation of the CHP system, but this increase is offset by the electricity and steam production of the CHP system as well as a grid displacement credit due to the electricity generation of the CHP. This project results in a facility-wide net decrease in Greenhouse Gas emissions.

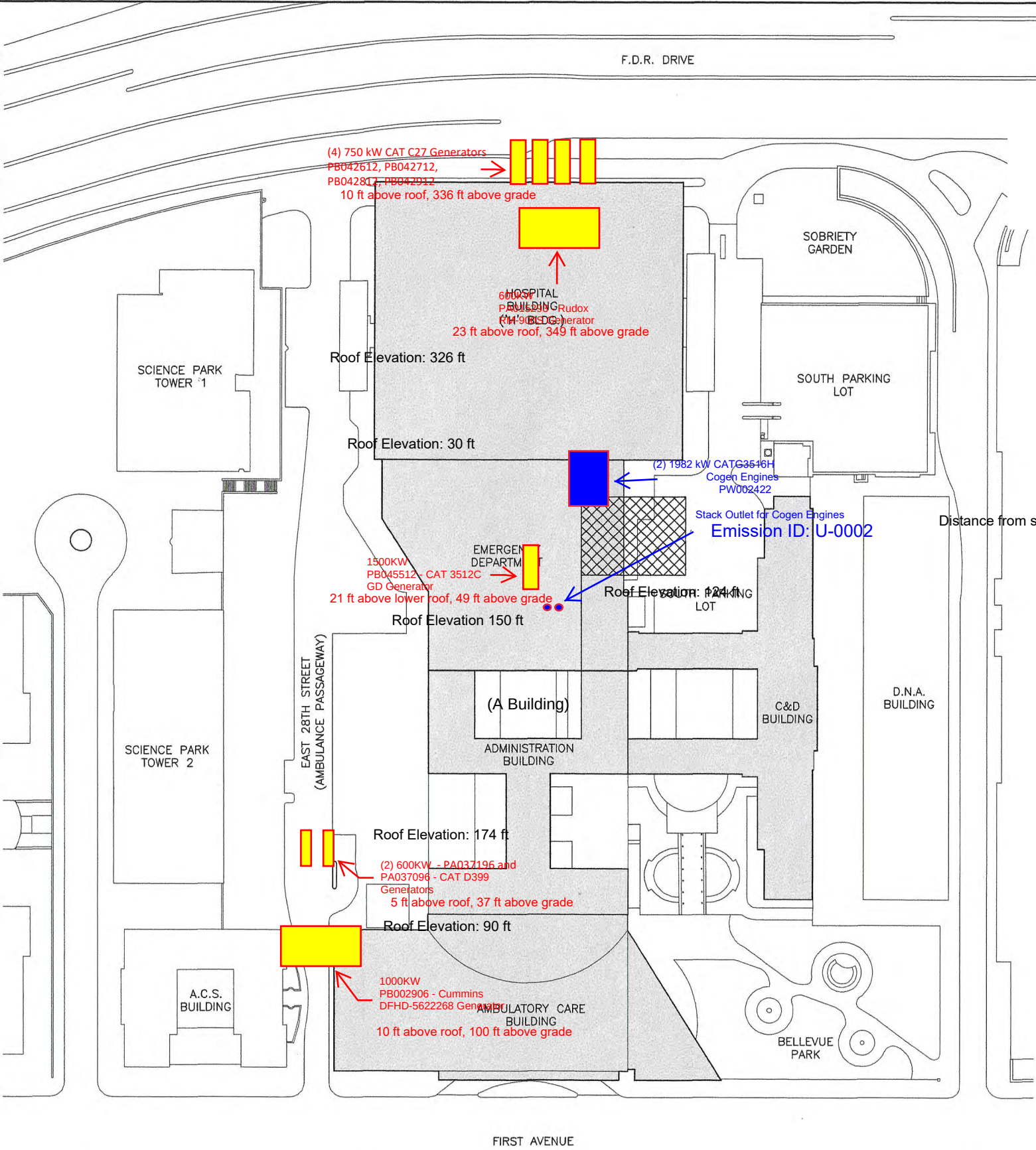
The noise study conducted found that the project would not result in any significant adverse noise impacts, presenting no adverse burden to the nearby DACs.

In conclusion, the proposed project would not result in adverse impacts or contribute to disproportionate pollution, noise, or disturbance burden on any DAC.

APPENDICES

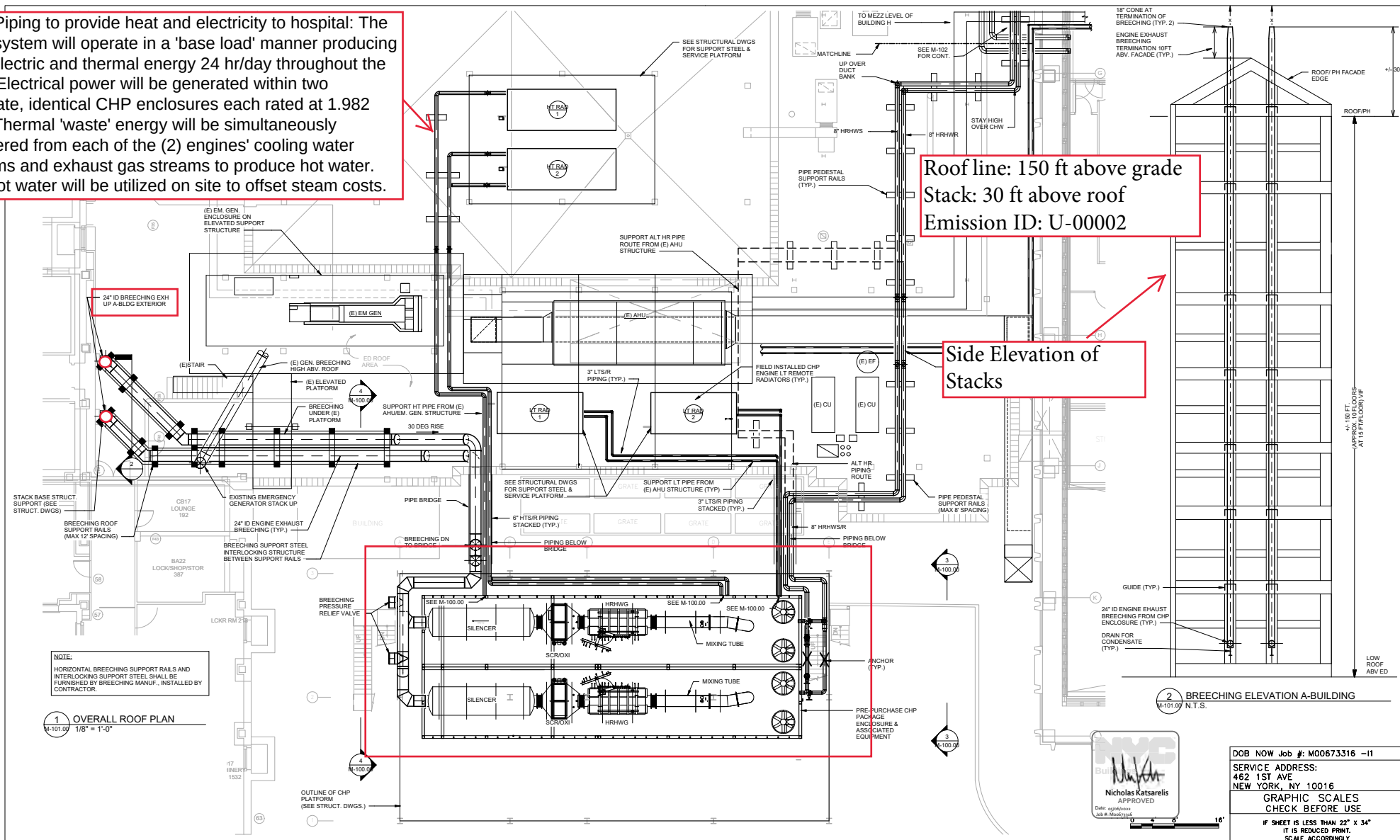
APPENDIX A: SITE PLAN SHOWING STACK ROUTING AND BUILDING LABELS

Building Zone: R8 (Map 8D)
Block: 962
Lot: 100



LEGEND	
Other generating equipment included on air permit	

CHP Piping to provide heat and electricity to hospital: The CHP system will operate in a 'base load' manner producing both electric and thermal energy 24 hr/day throughout the year. Electrical power will be generated within two separate, identical CHP enclosures each rated at 1.982 MW. Thermal 'waste' energy will be simultaneously recovered from each of the (2) engines' cooling water systems and exhaust gas streams to produce hot water. The hot water will be utilized on site to offset steam costs.



**APPENDIX B: WATERFRONT REVITALIZATION PROGRAM CONSISTENCY ASSESSMENT
FORM**

NEW YORK CITY WATERFRONT REVITALIZATION PROGRAM

Consistency Assessment Form

Proposed actions that are subject to CEQR, ULURP or other local, state or federal discretionary review procedures, and that are within New York City's Coastal Zone, must be reviewed and assessed for their consistency with the [New York City Waterfront Revitalization Program](#) (WRP) which has been approved as part of the State's Coastal Management Program.

This form is intended to assist an applicant in certifying that the proposed activity is consistent with the WRP. It should be completed when the local, state, or federal application is prepared. The completed form and accompanying information will be used by the New York State Department of State, the New York City Department of City Planning, or other city or state agencies in their review of the applicant's certification of consistency.

A. APPLICANT INFORMATION

Name of Applicant: New York City Health and Hospitals Corporation - Bellevue Hospital

Name of Applicant Representative: Yunjung Lee

Address: 462 1st Ave, New York, NY 10016

Telephone: 646-483-9480 Email: Yunjung.Lee@nychhc.org

Project site owner (if different than above): _____

B. PROPOSED ACTIVITY

If more space is needed, include as an attachment.

1. Brief description of activity

The hospital is proposing to install two new natural gas fired Combined Heat and Power (CHP) cogeneration engines, Caterpillar / G3516H, each with a 1982 kW rating in an existing open lot on its property. This project is being enabled by New York Power Authority (NYPA). The proposed CHP system would consist of two (2) 1982 kW (approximately 2 MW) natural gas fired engines anticipated to operate continuously to provide electrical and thermal energy to the facility 24 hours per day.

2. Purpose of activity

The primary goal of this project is to provide Bellevue Hospital with a 4MW CHP system capable of meeting two tasks:

- (i) Delivering on-site power to the facility on a 24 hour per day basis and in event of a grid outage
- (ii) Reducing energy costs and increasing energy efficiency for the facility.

The purpose of the CHP is to operate a 'base load' manner, meaning it will produce both electric and thermal energy 24-hours per day throughout the year to serve the minimum load of the hospital. Electrical power will be generated within two separated, identical CHP enclosures each rated at 2MW.

C. PROJECT LOCATION

Borough: Manhattan Tax Block/Lot(s): 962/100

Street Address: 462 1 Ave, New York, NY 10016

Name of water body (if located on the waterfront): East River

D. REQUIRED ACTIONS OR APPROVALS

Check all that apply.

City Actions/Approvals/Funding

City Planning Commission

☐ Yes ☒ No

- ☐ City Map Amendment
- ☐ Zoning Map Amendment
- ☐ Zoning Text Amendment
- ☐ Site Selection – Public Facility
- ☐ Housing Plan & Project
- ☐ Special Permit

- ☐ Zoning Certification
- ☐ Zoning Authorizations
- ☐ Acquisition – Real Property
- ☐ Disposition – Real Property
- ☐ Other, explain: _____

- ☐ Concession
- ☐ UDAAP
- ☐ Revocable Consent
- ☐ Franchise

(if appropriate, specify type: ☐ Modification ☐ Renewal ☐ other) Expiration Date: _____

Board of Standards and Appeals

☐ Yes ☒ No

- ☐ Variance (use)
- ☐ Variance (bulk)
- ☐ Special Permit

(if appropriate, specify type: ☐ Modification ☐ Renewal ☐ other) Expiration Date: _____

Other City Approvals

- ☐ Legislation
- ☐ Rulemaking
- ☐ Construction of Public Facilities
- ☐ 384 (b) (4) Approval
- ☐ Other, explain: _____

- ☐ Funding for Construction, specify: _____
- ☐ Policy or Plan, specify: _____
- ☐ Funding of Program, specify: _____
- ☒ Permits, specify: NYCDEP, NYCDOB

State Actions/Approvals/Funding

- ☒ State permit or license, specify Agency: NYSDEC Permit type and number: _____
- ☒ Funding for Construction, specify: NYPA
- ☐ Funding of a Program, specify: _____
- ☐ Other, explain: _____

Federal Actions/Approvals/Funding

- ☐ Federal permit or license, specify Agency: _____ Permit type and number: _____
- ☐ Funding for Construction, specify: _____
- ☐ Funding of a Program, specify: _____
- ☐ Other, explain: _____

Is this being reviewed in conjunction with a [Joint Application for Permits](#)?

☐ Yes

☒ No

E. LOCATION QUESTIONS

1. Does the project require a waterfront site? ☐ Yes ☒ No
2. Would the action result in a physical alteration to a waterfront site, including land along the shoreline, land under water or coastal waters? ☐ Yes ☒ No
3. Is the project located on publicly owned land or receiving public assistance? ☐ Yes ☒ No
4. Is the project located within a FEMA 1% annual chance floodplain? (6.2) ☒ Yes ☐ No
5. Is the project located within a FEMA 0.2% annual chance floodplain? (6.2) ☒ Yes ☐ No
6. Is the project located adjacent to or within a special area designation? See [Maps – Part III](#) of the NYC WRP. If so, check appropriate boxes below and evaluate policies noted in parentheses as part of WRP Policy Assessment (Section F).
 - ☐ Significant Maritime and Industrial Area (SMIA) (2.1)
 - ☐ Special Natural Waterfront Area (SNWA) (4.1)
 - ☐ Priority Maritime Activity Zone (PMAZ) (3.5)
 - ☐ Recognized Ecological Complex (REC) (4.4)
 - ☐ West Shore Ecologically Sensitive Maritime and Industrial Area (ESMIA) (2.2, 4.2)

F. WRP POLICY ASSESSMENT

Review the project or action for consistency with the WRP policies. For each policy, check Promote, Hinder or Not Applicable (N/A). For more information about consistency review process and determination, see **Part I** of the [NYC Waterfront Revitalization Program](#). When assessing each policy, review the full policy language, including all sub-policies, contained within **Part II** of the WRP. The relevance of each applicable policy may vary depending upon the project type and where it is located (i.e. if it is located within one of the special area designations).

For those policies checked Promote or Hinder, provide a written statement on a separate page that assesses the effects of the proposed activity on the relevant policies or standards. If the project or action promotes a policy, explain how the action would be consistent with the goals of the policy. If it hinders a policy, consideration should be given toward any practical means of altering or modifying the project to eliminate the hindrance. Policies that would be advanced by the project should be balanced against those that would be hindered by the project. If reasonable modifications to eliminate the hindrance are not possible, consideration should be given as to whether the hindrance is of such a degree as to be substantial, and if so, those adverse effects should be mitigated to the extent practicable.

		Promote	Hinder	N/A
I	Support and facilitate commercial and residential redevelopment in areas well-suited to such development.	☐	☐	☒
1.1	Encourage commercial and residential redevelopment in appropriate Coastal Zone areas.	☐	☐	☒
1.2	Encourage non-industrial development with uses and design features that enliven the waterfront and attract the public.	☐	☐	☒
1.3	Encourage redevelopment in the Coastal Zone where public facilities and infrastructure are adequate or will be developed.	☐	☐	☒
1.4	In areas adjacent to SMIA's, ensure new residential development maximizes compatibility with existing adjacent maritime and industrial uses.	☐	☐	☒
1.5	Integrate consideration of climate change and sea level rise into the planning and design of waterfront residential and commercial development, pursuant to WRP Policy 6.2.	☐	☐	☒

		Promote	Hinder	N/A
2	Support water-dependent and industrial uses in New York City coastal areas that are well-suited to their continued operation.	☐	☐	☒
2.1	Promote water-dependent and industrial uses in Significant Maritime and Industrial Areas.	☐	☐	☒
2.2	Encourage a compatible relationship between working waterfront uses, upland development and natural resources within the Ecologically Sensitive Maritime and Industrial Area.	☐	☐	☒
2.3	Encourage working waterfront uses at appropriate sites outside the Significant Maritime and Industrial Areas or Ecologically Sensitive Maritime Industrial Area.	☐	☐	☒
2.4	Provide infrastructure improvements necessary to support working waterfront uses.	☐	☐	☒
2.5	Incorporate consideration of climate change and sea level rise into the planning and design of waterfront industrial development and infrastructure, pursuant to WRP Policy 6.2.	☐	☐	☒
3	Promote use of New York City's waterways for commercial and recreational boating and water-dependent transportation.	☐	☐	☒
3.1.	Support and encourage in-water recreational activities in suitable locations.	☐	☐	☒
3.2	Support and encourage recreational, educational and commercial boating in New York City's maritime centers.	☐	☐	☒
3.3	Minimize conflicts between recreational boating and commercial ship operations.	☐	☐	☒
3.4	Minimize impact of commercial and recreational boating activities on the aquatic environment and surrounding land and water uses.	☐	☐	☒
3.5	In Priority Marine Activity Zones, support the ongoing maintenance of maritime infrastructure for water-dependent uses.	☐	☐	☒
4	Protect and restore the quality and function of ecological systems within the New York City coastal area.	☐	☐	☒
4.1	Protect and restore the ecological quality and component habitats and resources within the Special Natural Waterfront Areas.	☐	☐	☒
4.2	Protect and restore the ecological quality and component habitats and resources within the Ecologically Sensitive Maritime and Industrial Area.	☐	☐	☒
4.3	Protect designated Significant Coastal Fish and Wildlife Habitats.	☐	☐	☒
4.4	Identify, remediate and restore ecological functions within Recognized Ecological Complexes.	☐	☐	☒
4.5	Protect and restore tidal and freshwater wetlands.	☐	☐	☒
4.6	In addition to wetlands, seek opportunities to create a mosaic of habitats with high ecological value and function that provide environmental and societal benefits. Restoration should strive to incorporate multiple habitat characteristics to achieve the greatest ecological benefit at a single location.	☐	☐	☒
4.7	Protect vulnerable plant, fish and wildlife species, and rare ecological communities. Design and develop land and water uses to maximize their integration or compatibility with the identified ecological community.	☐	☐	☒
4.8	Maintain and protect living aquatic resources.	☐	☐	☒

		Promote	Hinder	N/A
5	Protect and improve water quality in the New York City coastal area.	☒	☐	☐
5.1	Manage direct or indirect discharges to waterbodies.	☐	☐	☒
5.2	Protect the quality of New York City's waters by managing activities that generate nonpoint source pollution.	☒	☐	☐
5.3	Protect water quality when excavating or placing fill in navigable waters and in or near marshes, estuaries, tidal marshes, and wetlands.	☒	☐	☐
5.4	Protect the quality and quantity of groundwater, streams, and the sources of water for wetlands.	☐	☐	☒
5.5	Protect and improve water quality through cost-effective grey-infrastructure and in-water ecological strategies.	☐	☐	☒
6	Minimize loss of life, structures, infrastructure, and natural resources caused by flooding and erosion, and increase resilience to future conditions created by climate change.	☒	☐	☐
6.1	Minimize losses from flooding and erosion by employing non-structural and structural management measures appropriate to the site, the use of the property to be protected, and the surrounding area.	☒	☐	☐
6.2	Integrate consideration of the latest New York City projections of climate change and sea level rise (as published in <i>New York City Panel on Climate Change 2015 Report, Chapter 2: Sea Level Rise and Coastal Storms</i>) into the planning and design of projects in the city's Coastal Zone.	☒	☐	☐
6.3	Direct public funding for flood prevention or erosion control measures to those locations where the investment will yield significant public benefit.	☐	☐	☒
6.4	Protect and preserve non-renewable sources of sand for beach nourishment.	☐	☐	☒
7	Minimize environmental degradation and negative impacts on public health from solid waste, toxic pollutants, hazardous materials, and industrial materials that may pose risks to the environment and public health and safety.	☐	☐	☒
7.1	Manage solid waste material, hazardous wastes, toxic pollutants, substances hazardous to the environment, and the unenclosed storage of industrial materials to protect public health, control pollution and prevent degradation of coastal ecosystems.	☐	☐	☒
7.2	Prevent and remediate discharge of petroleum products.	☐	☐	☒
7.3	Transport solid waste and hazardous materials and site solid and hazardous waste facilities in a manner that minimizes potential degradation of coastal resources.	☐	☐	☒
8	Provide public access to, from, and along New York City's coastal waters.	☐	☐	☒
8.1	Preserve, protect, maintain, and enhance physical, visual and recreational access to the waterfront.	☐	☐	☒
8.2	Incorporate public access into new public and private development where compatible with proposed land use and coastal location.	☐	☐	☒
8.3	Provide visual access to the waterfront where physically practical.	☐	☐	☒
8.4	Preserve and develop waterfront open space and recreation on publicly owned land at suitable locations.	☐	☐	☒

		Promote	Hinder	N/A
8.5	Preserve the public interest in and use of lands and waters held in public trust by the State and City.	☐	☐	☒
8.6	Design waterfront public spaces to encourage the waterfront's identity and encourage stewardship.	☐	☐	☒
9	Protect scenic resources that contribute to the visual quality of the New York City coastal area.	☐	☐	☒
9.1	Protect and improve visual quality associated with New York City's urban context and the historic and working waterfront.	☐	☐	☒
9.2	Protect and enhance scenic values associated with natural resources.	☐	☐	☒
10	Protect, preserve, and enhance resources significant to the historical, archaeological, architectural, and cultural legacy of the New York City coastal area.	☐	☐	☒
10.1	Retain and preserve historic resources, and enhance resources significant to the coastal culture of New York City.	☐	☐	☒
10.2	Protect and preserve archaeological resources and artifacts.	☐	☐	☒

G. CERTIFICATION

The applicant or agent must certify that the proposed activity is consistent with New York City's approved Local Waterfront Revitalization Program, pursuant to New York State's Coastal Management Program. If this certification cannot be made, the proposed activity shall not be undertaken. If this certification can be made, complete this Section.

"The proposed activity complies with New York State's approved Coastal Management Program as expressed in New York City's approved Local Waterfront Revitalization Program, pursuant to New York State's Coastal Management Program, and will be conducted in a manner consistent with such program."

Applicant/Agent's Name: Yunjung Lee

Address: 461 1st Ave, New York, NY 10016

Telephone: 646-483-9480

Email: Yunjung.Lee@nychhc.org

Applicant/Agent's Signature: _____

Date: 9/11/2024

Submission Requirements

For all actions requiring City Planning Commission approval, materials should be submitted to the Department of City Planning.

For local actions not requiring City Planning Commission review, the applicant or agent shall submit materials to the Lead Agency responsible for environmental review. A copy should also be sent to the Department of City Planning.

For State actions or funding, the Lead Agency responsible for environmental review should transmit its WRP consistency assessment to the Department of City Planning.

For Federal direct actions, funding, or permits applications, including Joint Applicants for Permits, the applicant or agent shall also submit a copy of this completed form along with his/her application to the [NYS Department of State Office of Planning and Development](#) and other relevant state and federal agencies. A copy of the application should be provided to the NYC Department of City Planning.

The Department of City Planning is also available for consultation and advisement regarding WRP consistency procedural matters.

New York City Department of City Planning

Waterfront and Open Space Division
120 Broadway, 31st Floor
New York, New York 10271
212-720-3696
wrp@planning.nyc.gov
www.nyc.gov/wrp

New York State Department of State

Office of Planning and Development
Suite 1010
One Commerce Place, 99 Washington Avenue
Albany, New York 12231-0001
518-474-6000
www.dos.ny.gov/opd/programs/consistency

Applicant Checklist

- ☐ Copy of original signed NYC Consistency Assessment Form
- ☐ Attachment with consistency assessment statements for all relevant policies
- ☐ For Joint Applications for Permits, one (1) copy of the complete application package
- ☐ Environmental Review documents
- ☐ Drawings (plans, sections, elevations), surveys, photographs, maps, or other information or materials which would support the certification of consistency and are not included in other documents submitted. All drawings should be clearly labeled and at a scale that is legible.
- ☐ Policy 6.2 Flood Elevation worksheet, if applicable. For guidance on applicability, refer to the WRP Policy 6.2 Guidance document available at www.nyc.gov/wrp

Bellevue Hospital- WRP Policy 6.2 Analysis for 4 MW Combined Heat and Power System

Please see below for each response to the Detailed Methodology section of the WRP 6.2 Guidance Document. Please also see below the required appendices for this analysis.

1a) Identification of Current and Future Flood Elevations

The project features of concern for this Policy 6.2 analysis are the Combined Heat and Power (CHP) system itself as well as the CHP switchgear enclosure. The CHP system is located 34.5 feet above the NAVD88 sea level. The CHP switchgear enclosure is located 14.5 feet above the NAVD88 sea level. The attached drawings indicating the project features and their corresponding elevation set a datum elevation at 9.5 feet above sea level, referencing the NAVD88.

1b) Identification of Project Features Below Elevation of 1% Floodplain and Effects of Flooding on Said Project Features

The elevation of the CHP system itself is 34.5 ft ASL (relative to the NAVD88), above the elevation of all 1% flood elevation and sea level rise scenarios. The elevation of the CHP system switchgears is about 14.5 ft ASL, relative to the NAVD88. It would be below the elevation of the 1% floodplain for the high for the 2080s, and the high and high-mid for the 2100s.

If the switchgears were inundated with flooding, they would potentially be damaged and could also potentially stop working. If this were to happen, the CHP system might not be able to effectively route power from the station to various locations throughout the hospital. Long-term, large-scale flooding of the area could potentially permanently destroy the switchgears, resulting in a complete replacement of that equipment. Nothing is stored in or around the CHP system that will wash out to the surrounding area if flooding occurs. The system is primarily run automatically, so nobody needs to be directly stationed at the CHP system to operate it. With that said, in the event of a flood or storm event, it is not likely that individuals would be present at the location, so the possibility of potentially injuring themselves or losing their lives is slim to none.

1c) Identification of Project Features Below Elevation of Mean Higher High Water Floodplain and Effects of Flooding on Said Project Features

No features of the project are located below the elevation of the MHHW under any sea level rise scenario. Please see the answers under 1(b) for a description of how flooding would impact the project.

1d) Description of Additional Coastal Hazards, Project Coastal Zone Classification

The project is located within the Coastal AE Zone. The project's proximity to the East River does introduce the potential to encounter some waves, provided there is a substantially massive storm surge directed straight onto the east side of Manhattan.

The project does not contain any materials or substances that, if made insecure from wind, water, or debris, would result in a threat to public health or the environment.

2a) Description of Protection Measures from Project and Adaptive Measures Implemented to Increase Project Resiliency to Withstand Sea Level Rise- 1% Floodplain

The CHP system switch gear enclosures are in between the two primary buildings of Bellevue Hospital- The AB building adjacent to First Avenue, and H building, a 25+ story building facing the East River. The H building, although it won't protect the project from a serious flooding event, it should theoretically protect the project from experiencing wave inundation should a storm of sufficient caliber roll up the east coast of Manhattan. The surrounding buildings should dampen the force of wave action enough to where it will take a sustained flooding event with a constant 15+ foot storm surge to potentially damage the project.

There are no planned adaptive measures to protect the feature from flooding in the future. The lack of planned adaptive measures is principally because the elevation of the CHP system itself was designed to be above the 0.2% high 2100s flood elevation. In an effort to prevent short-circuiting, the facility could potentially opt to turn the CHP system off in the event of a severe storm event as well. Additionally, the switchgear enclosures could potentially be sealed and waterproofed to eliminate it as a potential flood concern.

2b) Description of Protection Measures from Project and Adaptive Measures Implemented to Increase Project Resiliency to Withstand Sea Level Rise- Mean Higher High Water Floodplain

No features of the project were identified that would be submerged by any Mean Higher High Water floodplain scenario.

2c) Additional Project Protection Measures Against Coastal Hazards- Waves, Wind, Debris

The hospital plans on incorporating a community floodwall with integrated flood gates to form a protective boundary from 25th street to 30th street in Manhattan.¹ Additionally, the project will be surrounded by much taller buildings than the height of the project. This should result in a drastic decrease in the potential for the project to experience high winds. Should the project potentially be struck by debris falling from an adjacent building during a high wind event, the entire CHP engine system is protected by an enclosure.

2d) Effect of Project on Flood Protection Measures of Adjacent Sites

The project would not have any effect on the flood protection of adjacent sites.

3) Assessment of Project Consistency with WRP Policy 6.2

The CHP system switchgears would only experience damage from flooding in the 1% 2080s high and the 1% 2100s high and high-mid sea level rise projections. With the project's 20-year lifespan set to end by 2046, the potential flooding scenarios of concern occur during time periods that are at least 30+ years after. All other potential flooding scenarios do not reach an elevation that would result in water flooding the switchgear housings. Additionally, it is difficult to tell if the floodwall the hospital states it's implementing will provide sufficient protection to prevent equipment damage in the event of a worst-case scenario. However, following the end of the project's lifespan, consideration should be made to implement further flood protection measures to the equipment if the plan is that the equipment will be replaced with something of comparable capacity and output. Considerations may include raising the overall height of the CHP system switchgears to be above the potential worst case scenario flood elevation, sealing and waterproofing the switchgear enclosure, or working with the city and surrounding community to finalize the implementation of the floodwall.

¹ [NYCHHC Bellevue Flood Barrier Plans](#)

Department of City Planning- Consistency Determination Email (WRP # 24-010)

From: [Amber Tamayo \(DCP\)](#)
To: [Chris Farrington](#)
Cc: [Michael Marrella \(DCP\)](#); [Estesen, Terrell](#); [Tenzing, Karma](#)
Subject: Consistency Determination - WRP # 24-010
Date: Thursday, August 14, 2025 10:21:25 AM

[External Email]

Good afternoon,

We have completed the review of the project as described below for consistency with the policies and intent of the New York City Waterfront Revitalization Program (WRP).

NYCHHC Bellevue Hospital Power Generation (23DEP032M): The purpose of this application is renew the current state facilitate air permit for the hospital and install new power generation equipment.

Based on the information submitted, the Climate & Sustainability Planning Division, on behalf of the New York City Coastal Commission, having reviewed the waterfront aspect of this action, hereby concurs that the actions will not substantially hinder the achievement of any Waterfront Revitalization Program (WRP) policy.

This determination is only applicable to the information received and the current proposal. Any additional information or project modifications would require an independent consistency review.

For your records, this project has been assigned WRP # 24-010. If there are any questions regarding this review, please contact me.

Thank you,

Amber

Amber Tamayo

Senior Planner • Climate and Sustainability Planning
(She/Her)

NYC Department of City Planning

212-720-3448 (O)

120 Broadway, 31st Floor, New York, NY 10271

atamayo@planning.nyc.gov

[Visit our website](#) | [Twitter](#) | [Instagram](#) | [NYC Comprehensive Waterfront Plan](#)

**APPENDIX C: OFFICE OF PARKS, RECREATION AND HISTORIC PRESERVATION LETTER OF
NO ADVERSE IMPACT**



**Parks, Recreation,
and Historic Preservation**

ANDREW M. CUOMO
Governor

ERIK KULLESEID
Commissioner

February 25, 2020

Sarah Salem
Associate Cultural Resources Specialist
New York Power Authority
123 Main Street-5E
White Plains, NY 10601

Re: NYPA
Bellevue Hospital Combined Heat and Power Gas Engines
462 1st Ave, New York, NY 10016
20PR00628

Dear Ms. Salem:

Thank you for requesting the comments of the Division for Historic Preservation of the Office of Parks, Recreation and Historic Preservation (OPRHP). We have reviewed the submitted materials in accordance with the New York State Historic Preservation Act of 1980 (section 14.09 of the New York Parks, Recreation and Historic Preservation Law). These comments are those of the Division for Historic Preservation and relate only to Historic/Cultural resources. They do not include potential environmental impacts to New York State Parkland that may be involved in or near your project. Such impacts must be considered as part of the environmental review of the project pursuant to the State Environmental Quality Review Act (New York Environmental Conservation Law Article 8) and its implementing regulations (6NYCRR Part 617).

We note that the Administration Building and Buildings C and D of the Bellevue Hospital complex are eligible for listing in the State and National Registers of Historic Places. We have reviewed the project description and supporting documentation that was provided to our office on January 29th, 2020. Based upon our review, it is OPRHP's opinion that the proposed work will have No Adverse Impact on historic resources.

If additional information or correspondence is required regarding this project it should be provided via our Cultural Resource Information System (CRIS) at <https://cris.parks.ny.gov/>. Once on the CRIS site, you can log in as a guest and choose "submit" at the very top menu. Next choose "submit new information for an existing project" at the very bottom of the page. You will need this project number and your e-mail address. If you have any questions, I can be reached at (518) 268-2182.

Sincerely,

Olivia Brazee
Historic Site Restoration Coordinator
olivia.brazee@parks.ny.gov

via e-mail only

cc: Robert Panepinto, NYPA

Division for Historic Preservation

P.O. Box 189, Waterford, New York 12188-0189 • (518) 237-8643 • parks.ny.gov

APPENDIX D: NO EFFECT DETERMINATION LETTER FROM LPC

ENVIRONMENTAL REVIEW

Project number: LA-CEQR-M (DEPARTMENT OF ENVIRONMENTAL PROTECTION)
Project: BELLEVUE HOSPITAL CHP FACILITY
Address: 462 1 AVENUE BBL: 1009620100
Date Received: 2/21/2024

☐ **No architectural significance**

☒ **No archaeological significance**

☐ **Designated New York City Landmark or Within Designated Historic District**

☐ **Listed on National Register of Historic Places**

☒ **Appears to be eligible for National Register Listing UNDETERMINED, check with SHPO**

☐ **May be archaeologically significant; requesting additional materials**

Comments:

The site is not LPC designated or eligible, however, please check with the SHPO regarding impacts from this undertaking. LPC has no concerns.

Cc: 20PR00628, SHPO



2/21/2024

SIGNATURE
Gina Santucci, Environmental Review Coordinator

DATE

File Name: 34802_FSO_GS_02212024.docx

APPENDIX E: ENERGY MODEL



ENGINEERING

ENERGY SERVICES

Letter of Transmittal

To:	James Rostkowski
	Dynamic US, Inc.

Date:	3/27/2023
PWI Project # :	20112
Attention:	Energy Calculations
RE:	Bellevue Hospital CHP

We are Sending You:

☒ **Attached** ☐ **Under separate cover via _____ the following items:**
☐ **Specifications** ☐ **Samples**
☐ **Shop Drawings** ☐ **Change Order**
☐ **Copy of Letter** ☐ **Plans**
☐ **Prints** ☒ **Other – Field Report**

COPIES	DATE	NO.	DESCRIPTION
1	03/27/2023	1	Calculation Narrative
1	03/27/2023	1	Calculations

These are Transmitted as Checked Below:

☒ **For Approval** ☐ **Rejected** ☐ **Other: _____**
☒ **For Your Use** ☐ **Revise & Resubmit** ☐ **Other: _____**
☐ **As Requested** ☐ **Submit & Spec'd Item**
☐ **For Review & Comment** ☐ **Resubmit _____ Copies for Approval**
☐ **Reviewed** ☐ **Resubmit _____ Copies for Distribution**
☐ **Reviewed As Noted** ☐ **Return _____ Corrected Prints**

Comments: Attached are the energy calculations, and a narrative explaining the calculations.

Copy To: Kevin Santella, Eric Nash

Signed:

New Jersey Office
10 Melrose Avenue, Suite 430
Cherry Hill, NJ 08003
215-241-9112 (f)

Pennsylvania Office
One Jenkintown Station
115 West Avenue, Suite 300
Jenkintown, PA 19046
215-241-9114 (f)

215-241-9100 (p)
www.pwius.com



ES-GSN-0934 – NYC H+H Bellevue Hospital CHP Plant Project

3/27/2023

I personally reviewed the energy cost and savings analysis for this project and determined that they are correct and have been performed in accordance with the NYPA Energy Savings Handbook (latest version).

I further certify that assumptions and operating conditions on which calculations were based have been reviewed and approved by the owner. Any deviations of the calculations from the Energy Savings Handbook have been approved by NYPA using its deviation justification procedure. This certification does not guarantee the estimated project savings yielded from the calculations.

Additionally, these calculations conform to the energy code of the authority having jurisdiction.

Signed by: 	
Name: Bradley Bathgate, PE	
Title: Principal	
Company: PWI Engineering	

Purchased fuel savings for the subject project are as follows.

Total Savings:	32,543,466	kWh			
	3,850	Ave kW/Mon			
		Gal Oil (#)			
	(2,926,970)	Therm Gas			
	74,427	MLbs District Steam, Water, condensate, and sewer savings			

Total MMBtu Equivalent: 92,718

MMBtu Equivalent with a 68.3% HHV Efficiency

Total CO2 Equivalent: TBD

Metric Tons CO2 Equivalent (Efficiency of district steam and electric production are unknown)

Measure		Life (Years)	Fuel / Energy Savings		Cost Savings		
#	Name		Value	Units	Energy	Maint.	Total
1	CHP System (No escalation or catastrophic replacement)	20	650,869,320	kWh	\$74,755,800	\$7,673,200	\$67,082,600
			3,850	Ave kW/Mon			
				Gal Oil (#)			
			58,539,400	Therm Gas			
			1,488,540	MLbs District Steam, Water, condensate, and sewer savings			
2				kWh			
				Ave kW/Mon			
				Gal Oil (#)			
				Therm Gas			
				Other- List			
3				kWh			
				Ave kW/Mon			
				Gal Oil (#)			
				Therm Gas			
				Other- List			
4				kWh			
				Ave kW/Mon			
				Gal Oil (#)			
				Therm Gas			
				Other- List			

GENERAL PROJECT INFORMATION

Installation of CHP system with a total nominal operating electrical capacity of 4MW base load. The system shall consist of two (2) nominal 2MW, 13.8kV natural gas, reciprocating engine generators. The CHP plant shall incorporate heat exchanger equipment capable of generating hot water from the engines' exhaust streams as well as from the engine's cooling water circuits for use on the site. The plant shall operate in parallel with the existing electric utility (Con Edison) at full load as much as possible throughout the year, in a net-metering manner. Upon loss of electrical utility power, the CHP system shall automatically disconnect from parallel operation and power down allowing the existing emergency generators to operate as they currently do. The CHP system shall be 'black-start' capable to allow the Hospital to supplement the existing emergency generators during an extended utility outage where fuel supplies may become unavailable or limited in nature.

This system will also provide all hot water piping, pumps, and components required to utilize hot water generated with the cogeneration system throughout the H-building including, but not limited to: distribution piping & risers to/from the 13th floor of the H-Building and the cogeneration system, (4) heat exchangers to interconnect the (3) heat exchangers to interconnect in the designated re-heat systems, as well as a domestic hot water preheat system to utilize the CHP Plant's thermal energy throughout the year.

FACILITY DESCRIPTION

The CHP Plant will be constructed on new steel dunnage to elevate it above the Design Flood Elevation that has resulted from Superstorm Sandy. All electrical and mechanical equipment will be able to be operated and maintained at its constructed elevation. Electrical switchgear connecting it to the utility and the generators are located on the first floor of dunnage, while the CHP enclosure and equipment are housed in an outdoor acoustical enclosure on the second story of dunnage. Acoustically treated radiator will be mounted on the roof of the existing Emergency Department, and heat recovery piping will be routed through the hospital to the 13th floor.

MEASURE DESCRIPTION

Existing energy data was taken from existing electrical billing data from Con Edison; existing steam bills from Con Edison; Hot Water Metering Data from the proposed heat recovery points. All of this was provided to Dynamic US, Inc from Guth De Conzo. Future energy production was taken from submittal data for fuel usage and net output of the cogeneration system for electrical and thermal data. The resulting future usage for the site took the existing energy data less the future production. Due to the fact that district steam is the energy that is primarily being saved, assumptions were made for quenching the steam resulting in a reduction of water, sewer, and condensate discharge savings.

EXISTING AND FUTURE EQUIPMENT DESCRIPTIONS

The existing electric utility is Con Edison, providing six networked services to the H-Building, and four networked services to the Emergency Department. These services are nominally 13.8 KV and stepped down to 480V at each service. These services will remain, but provide less electricity to the hospital via net-metering. The future generators to be installed are two nominal 2 MW natural gas engines that will

produce 13.8 KV Electricity and feed the services which serve the hospital, therefore reducing the amount of electricity consumed by Con Edison, via the net-metering tariff. In the event of a long term electrical outage, the distribution of the hospital and CHP system can be separated from the Con Ed distribution.

The existing heating from the hospital comes from district energy steam, which is then converted to hot water at multiple points on the 13th floor. On the new Caterpillar Reciprocating Engine Generators, heat is recovered from the engine block and then the engine exhaust, and is exchanged mediums from engine glycol to hot water. This hot water is pumped up to the 13th floor and reduces the amount of steam consumed at three steam to hot water exchangers for reheat loops, and preheats the domestic water prior to entering the domestic hot water heater.

Calculation Narrative

a) Base Thermal Load

The following equation is used to estimate the facility's base thermal load that could be met by the CHP system:

$$\text{Base Thermal Load } \left(\frac{\text{BTU}}{\text{Year}} \right) = \text{FuelUse}_{\text{Base}} \times \text{Fuel}_{\text{HV}} \times \eta_{\text{Sys}}$$

Since the thermal load information is supplied via the Con Ed steam system, this equation will be modified so that Base Thermal Load = Delivered steam (lbs) x Enthalpy of steam (BTU/lb)

b) Estimated Thermal Load Served by CHP System

The following equation is used to estimate the portion of the existing base thermal load that can be met by the CHP system:

$$\text{Annual CHP Thermal Output } \left(\frac{\text{BTU}}{\text{Year}} \right) = \text{CHPThermal}_{\text{out}} \times \text{CF} \times 8,760 \frac{\text{hours}}{\text{Year}}$$

The data available to Dynamic is the monthly steam billing by Con Edison. This will be averaged for all hours of the billing period. This will provide hours where actual is more and hours where actual is less than what is modeled. The model will tabulate the actual usable thermal output for the year. The CF has no impact here as the hours not run are already taken into consideration in the model.

c) Remaining Thermal Load Provided by Existing System

The following equation is used to calculate the thermal load that must be met by the existing system once the CHP system is installed:

$$\text{Remaining Thermal Load } \left(\frac{\text{BTU}}{\text{Year}} \right) = \text{Base Thermal Load } \left(\frac{\text{BTU}}{\text{Year}} \right) - \text{Annual CHP Thermal Output } \left(\frac{\text{BTU}}{\text{Year}} \right)$$

With the hourly model determining the CHP thermal output in the above equation, this calculation can be made against the total BTU of steam as billed and recorded in item a) above.

d) New Annual Fuel Use

$$\text{New Annual Fuel Use } \left(\frac{\text{BTU}}{\text{Year}} \right) = \left(\text{CHPFuel}_{\text{In}} \times \text{CF} \times 8,760 \frac{\text{Hours}}{\text{Year}} \right) + \frac{\text{Remaining Thermal Load}}{\eta_{\text{Sys}}}$$

Again, since Con Ed is supplying steam and not natural gas, the fuel use will only be for the CHP system. The resultant reduction will be displayed in reduced steam purchases, therefore, this equation will not be used and will be represented as CHP fuel in and new Steam requirements.

Calculation Narrative

e) Net Increase or Decrease in Annual Fuel Use

The following equation is used to determine the net increase or decrease in annual fuel use following the installation of the CHP system:

$$\Delta \text{Annual Fuel Use} \left(\frac{\text{BTU}}{\text{Year}} \right) = \text{FuelUse}_{\text{Base}} \times \text{Fuel}_{\text{HV}} - \text{New Annual Fuel Use} \left(\frac{\text{BTU}}{\text{Year}} \right)$$

This equation is not necessary. Annual fuel use will be CHP Fuel_{in}

f) Electricity Savings for Participant

The following equation is used to determine the net decrease in electricity purchased by the participant from the utility following installation of the CHP system:

$$\text{Participant Energy Savings} \left(\frac{\text{kWh}}{\text{Year}} \right) = \left[(\text{CHPElec}_{\text{Out}} - \text{CHPElec}_{\text{Aux}}) \times \text{CF} \times 8,760 \frac{\text{Hours}}{\text{Year}} \right] + \text{CHPElec}_{\text{Offset}}$$

Agreed

g) Peak Demand Savings for Participant

The following equation is used to calculate the peak demand savings from the CHP system for the participant. The participant's coincidence factor (PCF) for demand reduction will vary depending on anticipated operating profiles.

$$\text{Participant Monthly Demand Reduction (kW)} = (\text{CHPElec}_{\text{Out}} - \text{CHPElec}_{\text{Aux}}) \times \text{PCF}$$

The model calculates the base demand and new demand inclusive of the CF. All demand windows of the tariff are calculated per month. This equation is not necessary.

2.19.5 Calculation of Participant Cost Savings

Cost savings for the participant are based on the difference in total costs before and after CHP system installation. The following equation is used to calculate participant

cost savings for electricity and fuel. Operations and maintenance costs, and capital costs are not included:

$$\text{Estimated Cost Savings} \left(\frac{\$}{\text{Year}} \right) = \left[\text{Participant Energy Savings} \left(\frac{\text{kWh}}{\text{Year}} \right) \times \text{Rate}_{\text{Energy}} \right] + \left[\Delta \text{Annual Fuel Use} \left(\frac{\text{BTU}}{\text{Year}} \right) \times \text{Rate}_{\text{Fuel}} \right]$$

Calculation Narrative

Again, the model calculates all values on a 15 minute basis. The totals for the months, demand periods, are applied to the electrical and gas tariffs. The reduction in steam from the base case is applied to the steam tariff. These are all subtracted from the base electric and steam to determine the yearly utility savings. In addition, the Con Ed Reliability Program credit is determined.

Model Methodology

1. Base Case
 - a. Electric – NYPA Rate ST-110 SC91 TOD / Con Ed PASNY Rate II
 - b. Steam – Con Ed Rate II (over 20,000 Mlb tier)
2. CHP Case
 - a. Electric – Con Ed PASNY Rate IV single party offset + electric commodity (calculated from 1a above)
 - b. Steam – Con Ed Rate II (for reduced steam due to CHP thermal)
 - c. Gas – Con Ed Rider H <5MW and transportation gas commodity
 - d. Reliability Credit per Con Ed PASNY rate IV
3. All kwh generated by CHP will be delivered as offset to ED and H services based on their ratio of the total use for that interval (per Rate IV tariff)
4. All demands will be calculated per 30 minute window
5. Service intervals have been taken into account in model in a conservative estimate of 432 hours. (168 hr twice a year for maintenance and 24 hours four times a year for plug changes)
6. Unplanned outages are estimated at 63 hours per year.
7. Total house available are 8260 = 94%
8. In addition to the utility savings described in the Handbook, we have calculated water and sewer savings due to the 8.7 million gallons of condensate reduction and quenching water required.

Economical Summary

Bellevue CHP Summary Economics

	Without CHP	With CHP
Electricity	\$ 6,063,287	\$ 2,177,981
Natural Gas (for CHP)	N/A	\$ 1,652,742
Steam savings	N/A	\$ (1,434,233)
Condensate Discharge Savings	N/A	\$ (49,539)
Water/Sewer savings	N/A	\$ (21,455)
Utility Subtotal	\$ 6,063,287	\$ 2,325,497
Utility Savings	\$3,737,790	
O&M Cost		\$ 383,660
CHP Savings Total	\$3,354,130	

Model Inputs

Prime mover (2) Caterpillar 2MW 3516H	
Gas cost (\$/MMBTU)	\$3.25
Electricity cost Per Tariff	
Outages Per schedule. Not representative of years with major or minor overhauls	
Condensate discharge cost (\$/CCF)	\$6.34
Water and Sewer cost (\$/CCF)	\$10.99
Heat recovery utilization	83%
Parasitic load (kW)	150.0
Net usable kw	3850
Hourly fuel input (MMBTU)	34.62
Hourly thermal output (MMBTU)	11.37
As-is Electrical Tariff Con Ed PASNY Rate II / ST-110 SC91 TOD	
CHP Electrical Tariff Con Ed PASNY Rate IV (kwh commodity based on ST-110 SC91)	
Steam Tariff Con Ed SC2 Rate II (over 20000 Mlb tier)	
CHP Gas Tariff CHP Gas Rider H <5MW	

Without CHP

ED Building						H Building						
NYPA Rate ST-110 SC91 TOD						NYPA Rate ST-110 SC91 TOD						
8.72		0.04686	0.02884	0.03868	0.029		8.72		0.04686	0.02884	0.03868	0.029
Demand	Sum Pk	Sum Offpk	Win Pk	Win Offpk		Demand	Sum Pk	Sum Offpk	Win Pk	Win Offpk		
\$ 7,291	\$ -	\$ -	\$ 10,564	\$ 6,301	Jan	\$ 44,228	\$ -	\$ -	\$ 61,399	\$ 36,326		
\$ 7,894	\$ -	\$ -	\$ 10,193	\$ 6,049	Feb	\$ 37,810	\$ -	\$ -	\$ 55,808	\$ 33,750		
\$ 7,534	\$ -	\$ -	\$ 10,475	\$ 6,773	Mar	\$ 36,310	\$ -	\$ -	\$ 58,224	\$ 37,350		
\$ 22,217	\$ -	\$ -	\$ 22,304	\$ 11,842	Apr	\$ 39,972	\$ -	\$ -	\$ 58,459	\$ 35,393		
\$ 33,125	\$ -	\$ -	\$ 24,444	\$ 15,535	May	\$ 51,518	\$ -	\$ -	\$ 67,806	\$ 42,972		
\$ 31,317	\$ 29,412	\$ 61,031	\$ -	\$ -	Jun	\$ 52,460	\$ 96,513	\$ 47,736	\$ -	\$ -		
\$ 34,314	\$ 47,879	\$ 78,671	\$ -	\$ -	Jul	\$ 57,831	\$ 111,074	\$ 54,249	\$ -	\$ -		
\$ 42,166	\$ 43,438	\$ 75,171	\$ -	\$ -	Aug	\$ 56,331	\$ 107,931	\$ 52,787	\$ -	\$ -		
\$ 31,501	\$ 34,704	\$ 68,388	\$ -	\$ -	Sep	\$ 56,366	\$ 95,197	\$ 51,086	\$ -	\$ -		
\$ 29,349	\$ -	\$ -	\$ 29,040	\$ 16,190	Oct	\$ 55,773	\$ -	\$ -	\$ 73,680	\$ 42,321		
\$ 27,474	\$ -	\$ -	\$ 14,625	\$ 8,352	Nov	\$ 48,658	\$ -	\$ -	\$ 60,663	\$ 36,219		
\$ 8,287	\$ -	\$ -	\$ 10,604	\$ 6,837	Dec	\$ 38,647	\$ -	\$ -	\$ 59,862	\$ 38,342		
\$ 282,469	\$ 155,432	\$ 283,260	\$ 132,249	\$ 77,879		\$ 575,904	\$ 410,714	\$ 205,858	\$ 495,900	\$ 302,674		
Subtotal				\$ 931,289		Subtotal				\$1,991,050		
CON ED PASNY RATE II						CON ED PASNY RATE II						
JJAS			Other			JJAS			Other			
8a-6p	8a-10p	all hours	8a-10p	all hours		8a-6p	8a-10p	all hours	8a-10p	all hours		
\$ 7.58	\$ 22.30	\$ 20.58	\$ 13.52	\$ 4.84		\$ 7.58	\$ 22.30	\$ 20.58	\$ 13.52	\$ 4.84		
			\$ 11,305	\$ 4,047	Jan				\$ 68,573	\$ 24,548		
			\$ 12,239	\$ 4,382	Feb				\$ 58,623	\$ 20,986		
			\$ 11,681	\$ 4,182	Mar				\$ 56,297	\$ 20,154		
			\$ 34,447	\$ 12,332	Apr				\$ 61,976	\$ 22,187		
			\$ 51,359	\$ 18,386	May				\$ 79,876	\$ 28,595		
\$ 27,223	\$ 80,087	\$ 73,910			Jun	\$ 45,601	\$ 134,157	\$ 123,809				
\$ 29,828	\$ 87,751	\$ 80,983			Jul	\$ 50,271	\$ 147,894	\$ 136,487				
\$ 36,653	\$ 107,832	\$ 99,515			Aug	\$ 48,967	\$ 144,058	\$ 132,947				
\$ 27,383	\$ 80,558	\$ 74,345			Sep	\$ 48,997	\$ 144,147	\$ 133,029				
			\$ 45,505	\$ 16,290	Oct				\$ 86,474	\$ 30,957		
			\$ 42,598	\$ 15,249	Nov				\$ 75,442	\$ 27,007		
			\$ 12,849	\$ 4,600	Dec				\$ 59,921	\$ 21,451		
\$ 121,086	\$ 356,229	\$ 328,753	\$ 221,983	\$ 79,467		\$ 193,836	\$ 570,256	\$ 526,272	\$ 547,181	\$ 195,884		
Subtotal				\$ 1,107,519		Subtotal				\$2,033,429		
TOTAL ED				\$ 2,038,808		TOTAL H				\$4,024,479		

Total cost ED+H \$ 6,063,287

With CHP

ED BUILDING - With CHP

CON ED PASNY RATE IV

kwh cost

0.03699077

	9.06	0.504	1.2137	0.6754				
	Demand							
cust chg	contract	Sum 1	Sum 2	Other	Delivery Total	kWh	Commodity	Total Cost
\$ 575	\$ 43,810	\$ -	\$ -	\$ 6,454	\$ 50,839	70,785	\$ 2,618	\$ 53,457
\$ 575	\$ 43,810	\$ -	\$ -	\$ 5,754	\$ 50,139	74,376	\$ 2,751	\$ 52,890
\$ 575	\$ 43,810	\$ -	\$ -	\$ 7,294	\$ 51,679	97,291	\$ 3,599	\$ 55,278
\$ 575	\$ 43,810	\$ -	\$ -	\$ 10,437	\$ 54,822	280,918	\$ 10,391	\$ 65,213
\$ 575	\$ 43,810	\$ -	\$ -	\$ 14,705	\$ 59,090	448,976	\$ 16,608	\$ 75,698
\$ 575	\$ 43,810	\$ 14,412	\$ 34,707	\$ -	\$ 93,504	494,819	\$ 18,304	\$ 111,807
\$ 575	\$ 43,810	\$ 20,772	\$ 50,070	\$ -	\$ 115,226	847,324	\$ 31,343	\$ 146,569
\$ 575	\$ 43,810	\$ 19,792	\$ 48,150	\$ -	\$ 112,327	922,564	\$ 34,126	\$ 146,453
\$ 575	\$ 43,810	\$ 16,021	\$ 38,776	\$ -	\$ 99,182	649,570	\$ 24,028	\$ 123,210
\$ 575	\$ 43,810	\$ -	\$ -	\$ 23,260	\$ 67,645	724,628	\$ 26,805	\$ 94,449
\$ 575	\$ 43,810	\$ -	\$ -	\$ 8,320	\$ 52,705	170,470	\$ 6,306	\$ 59,010
\$ 575	\$ 43,810	\$ -	\$ -	\$ 5,806	\$ 50,190	77,468	\$ 2,866	\$ 53,056
\$6,897	\$ 525,718	\$ 70,998	\$ 171,702	\$82,031	\$ 857,345	4,859,189	\$ 179,745	\$1,037,090

H BUILDING - With CHP

CON ED PASNY RATE IV

kwh cost

0.03699077

	9.06	0.504	1.2137	0.6754				
	Demand							
cust chg	contract	Sum 1	Sum 2	Other	Delivery Total	kWh	Commodity	Total Cost
\$ 575	\$ 60,086	\$ -	\$ -	\$ 6,454	\$ 67,115	417,271	\$ 15,435	\$ 82,550
\$ 575	\$ 60,086	\$ -	\$ -	\$ 5,754	\$ 66,415	420,379	\$ 15,550	\$ 81,965
\$ 575	\$ 60,086	\$ -	\$ -	\$ 7,294	\$ 67,955	553,472	\$ 20,473	\$ 88,428
\$ 575	\$ 60,086	\$ -	\$ -	\$ 10,437	\$ 71,098	663,861	\$ 24,557	\$ 95,655
\$ 575	\$ 60,086	\$ -	\$ -	\$ 14,705	\$ 75,366	1,182,398	\$ 43,738	\$ 119,104
\$ 575	\$ 60,086	\$ 14,412	\$ 34,707	\$ -	\$ 109,780	1,548,243	\$ 57,271	\$ 167,050
\$ 575	\$ 60,086	\$ 20,772	\$ 50,070	\$ -	\$ 131,502	2,247,064	\$ 83,121	\$ 214,623
\$ 575	\$ 60,086	\$ 19,792	\$ 48,150	\$ -	\$ 128,603	2,143,101	\$ 79,275	\$ 207,878
\$ 575	\$ 60,086	\$ 16,021	\$ 38,776	\$ -	\$ 115,458	1,721,800	\$ 63,691	\$ 179,149
\$ 575	\$ 60,086	\$ -	\$ -	\$ 23,260	\$ 83,921	1,732,375	\$ 64,082	\$ 148,003
\$ 575	\$ 60,086	\$ -	\$ -	\$ 8,320	\$ 68,981	631,271	\$ 23,351	\$ 92,332
\$ 575	\$ 60,086	\$ -	\$ -	\$ 5,806	\$ 66,466	439,595	\$ 16,261	\$ 82,727
\$6,897	\$ 721,031	\$ 70,998	\$ 171,702	\$82,031	\$ 1,052,658	13,700,829	\$ 506,804	\$1,559,463

Reliability Credit - With CHP

CHP	3850 kW
CD rate	\$ 9.06 \$/kW
Savings	\$ 34,881 \$/mo
Savings/yr	\$ 418,572 \$/yr

W/CHP \$ 2,177,981 Total cost

Gas and Steam Usage with CHP

Con Ed Steam Savings

Reduced (Mlbs)	\$/Mlb	Cost reduced
(6,503)	23.101	\$ (150,221)
(5,913)	23.101	\$ (136,597)
(6,056)	23.101	\$ (139,901)
(6,338)	27.541	\$ (174,548)
(6,336)	13.883	\$ (87,956)
(6,311)	13.883	\$ (87,620)
(6,547)	13.883	\$ (90,889)
(6,336)	13.883	\$ (87,956)
(6,338)	13.883	\$ (87,987)
(5,068)	13.883	\$ (70,359)
(6,133)	27.541	\$ (168,911)
(6,549)	23.101	\$ (151,288)

Steam Savings \$ (1,434,233)

Con Ed Rider H <5MW Gas Costs

MMBTU	Cust chg	Rate (¢/therm)	Cost	Commodity (\$/MMBTU)	Commodity Cost (\$)
25,573	\$ 600.67	26.33	\$ 67,335	\$ 3.25	\$ 83,114
23,254	\$ 600.67	26.33	\$ 61,228	\$ 3.25	\$ 75,576
23,817	\$ 600.67	26.33	\$ 62,709	\$ 3.25	\$ 77,404
24,924	\$ 600.67	26.33	\$ 65,626	\$ 3.25	\$ 81,004
24,916	\$ 600.67	21.07	\$ 52,497	\$ 3.25	\$ 80,976
24,821	\$ 600.67	21.07	\$ 52,297	\$ 3.25	\$ 80,667
25,747	\$ 600.67	21.07	\$ 54,248	\$ 3.25	\$ 83,676
24,916	\$ 600.67	21.07	\$ 52,497	\$ 3.25	\$ 80,976
24,924	\$ 600.67	21.07	\$ 52,516	\$ 3.25	\$ 81,004
19,931	\$ 600.67	21.07	\$ 41,994	\$ 3.25	\$ 64,775
24,120	\$ 600.67	26.33	\$ 63,507	\$ 3.25	\$ 78,389
25,755	\$ 600.67	26.33	\$ 67,813	\$ 3.25	\$ 83,704

\$ 7,208.04

\$ 694,268

\$ 951,266

Total Gas Cost \$ 1,652,742

CHP Outage Schedule

OUTAGE SCHEDULE

1	4/1/19 12:00 AM	4/8/19 12:00 AM	168	bi-annual
2	10/15/19 12:00 AM	10/22/19 12:00 AM	168	bi-annual
3	2/10/20 12:00 AM	2/11/20 12:00 AM	24	plugs
4	5/10/20 12:00 AM	5/11/20 12:00 AM	24	plugs
5	8/8/19 12:00 AM	8/9/19 12:00 AM	24	plugs
6	11/10/19 12:00 AM	11/11/19 12:00 AM	24	plugs
7	1/8/20 10:00 AM	1/8/20 3:00 PM	5	unplanned
8	3/3/20 9:00 AM	3/5/20 4:00 PM	55	unplanned
9	6/6/20 11:00 AM	6/6/20 2:00 PM	3	unplanned
10			0	unplanned
11			0	unplanned
12			0	unplanned
13			0	unplanned
14			0	unplanned
15			0	unplanned
16			0	unplanned
17			0	unplanned
18			0	unplanned
19			0	unplanned
20			0	unplanned
Operating outage hours			495	
Operating hours			8265	

APPENDIX F: AIR QUALITY DISPERSION MODEL RESULTS



December 15, 2021

Ms. Alexa Ruscitto
Guth DeConzo Construction Management, Inc.
1983 Marcus Avenue
Lake Success, NY 11042

RE: Bellevue Air Monitoring Modeling Results

DYNAMIC US

2900 Westchester Ave
#207
Purchase, NY 10577
914-312-2400 Tel
914-251-0269 Fax

1169 Longwood Ave
Bronx NY 10474
212-755-4477 Tel

dynamicusinc.com

Dear Ms. Ruscitto:

With respect to the Air Modeling Results performed by SNSEnvironmental, attached are the results with certain conditions for passing.

With these conditions in place, the Model passes the PM2.5 requirements. With your approval, SNS Environmental can submit to the DEP. Please see attached email from Neeraj indicating this and please inform Dynamic of the next step.

If I can be of further assistance, please do not hesitate to call. Thank you.

Very truly yours,

Peter Marzziotti

Peter Marzziotti, P.E.
Sr. Project Executive
Dynamic US, Inc.

cc: file

Peter Marzziotti

From: Neeraj Kumar <neeraj@snsenviro.com>
Sent: Friday, December 10, 2021 9:13 PM
To: Peter Marzziotti
Cc: kevin; Marek Kunicki; Alexa Ruscitto; Jesse M. Zahn
Subject: RE: Bellevue Air Monitoring
Attachments: 20211210_HRP_Model Results_Draft.xlsx

Good evening All,

We calculated the impact of running the cogens for 8760 hrs/yr (increase from previously modeled 8000 hrs). The model still passes. The conditions for passing remain same (see below) except that the minimum PM filter efficiency has gone up to 23% (from 15% previously).

Conditions for passing:

1. April 1 through November 15 restriction (admin and CD building windows/ac-units)
2. 8760 hrs/yr max operation
3. A minimum of 15% particulate filtration applied on all air intakes (15% control level required)
4. H-Building gym area/roof restricted to 5am-5pm (operating hours)

In order to minimize the modeling effort, we had to run individual restrictions separately. You will notice this in the attached impact maps. When it is time to submit to DEP, we will put together a cleaner file. We can discuss the details next week. Let me know. Thank you.

Neeraj Kumar, P.E.
Principal Consultant
Cell # 832-298-9518
neeraj@snsenviro.com

From: Peter Marzziotti <PMarzziotti@DynamicUSInc.com>
Sent: Wednesday, December 8, 2021 1:04 PM
To: Neeraj Kumar <neeraj@snsenviro.com>
Cc: kevin <kevin@dylanassociates.com>; Marek Kunicki <MKunicki@DynamicUSInc.com>; Alexa Ruscitto <aruscitto@guthdeconzo.com>; Jesse M. Zahn <jesse.zahn@hrpassociates.com>
Subject: RE: Bellevue Air Monitoring

Neeraj:

It appears we would like to use 8760 hrs instead of 8,000 like I mentioned. This was my fault. Can you please re-run the modeling for this amount of time but keeping all the other constraints. Thanks!



Peter Marzziotti, P.E.
Sr. Project Executive

**Bellevue
20211203**

NO₂ NAAQS

Averaging Period	Year	Source Group	Modeled Conc. w/ ARM2 (µg/m ³)	Background Conc. ² (µg/m ³)	Total Ambient Conc. (µg/m ³)	NAAQS (µg/m ³)	Exceeds NAAQS?
1-Hour ¹	AVG	COGENS	57	58.84	116.13	188	No
		COGEN1	31	58.84	90.15	188	No
		COGEN2	31	58.84	89.71	188	No

1. Represents H8H of daily maximum values averaged over 5 years.

2. Background for Queens College (AQS Site ID 36-081-0124) from EPA Air-Data; Used average for years 2012 through 2016.

Averaging Period	Source Group	Year	Modeled Conc. w/ ARM2 (µg/m ³)	Background Conc. ² (µg/m ³)	Total Ambient Conc. (µg/m ³)	NAAQS (µg/m ³)	Exceeds NAAQS?
Annual ¹	COGENS	2011	1.97	17.50	19.47	100	No
	COGENS	2012	1.93	17.50	19.43		No
	COGENS	2013	2.11	17.50	19.61		No
	COGENS	2014	1.64	17.50	19.14		No
	COGENS	2015	1.67	17.50	19.17		No
	COGENS	MAX	2.11	17.50	19.61		No
	ALL	2011	5.15	17.50	22.65	100	No
	ALL	2012	5.34	17.50	22.84		No
	ALL	2013	4.73	17.50	22.23		No
	ALL	2014	5.18	17.50	22.68		No
	ALL	2015	5.04	17.50	22.54		No
	ALL	MAX	5.34	17.50	22.84		No

1. Represents H1H of respective source groups

2. Background for Queens College (AQS Site ID 36-081-0124) from EPA Air-Data; Used maximum for years 2012 through 2016.

File Location of Modeling Files:

Annual PM2.5- NAAQS

Averaging Period	Year	Source Group	Modeled Conc. (µg/m ³)	Background Conc. ² (µg/m ³)	Total Ambient Conc. (µg/m ³)	NAAQS (µg/m ³)	Exceeds NAAQS?
Annual ¹	AVG	COGENS	0.39	8.6	8.96	9	No

¹Represents H1H averaged over 5 years

²Since not available from DEP, used EPA database to download annual background data.

24-hr PM2.5 CEQR

Averaging Period	Year	Source Group	Modeled Conc. (µg/m ³)	Background Conc. (µg/m ³)	Total Ambient Conc. (µg/m ³)	CEQR Standard (µg/m ³)	Exceeds CEQR?
24-Hour ¹	AVG	COGENS	2.23	-	2.2	4.5	No

¹Represents H1H of 24-hr results averaged over 5 years

Annual PM2.5- CEQR

Averaging Period	Year	Source Group	Modeled Conc. (µg/m ³)	Background Conc. (µg/m ³)	Total Ambient Conc. (µg/m ³)	CEQR Standard (µg/m ³)	Exceeds CEQR?
Annual ¹	AVG	COGENS	0.39	-	0.39	0.3	Yes

¹Represents H1H averaged over 5 years

Ambient PM2.5 Air Monitoring Site for Determining Background Concentrations

Pollutant	Averaging period	Monitoring Station ^a	AQS Site ID	County	State	Background Concentration ^b	Metric
PM2.5	24-hour	Queens College	36-81-124	Queens	NY	22.5	98th percentile averaged over the 5 years
PM2.5	Annual	Queens College	36-81-124	Queens	NY	8.6	Annual average, averaged over the 5 years

a. Proposed station to use as background concentration is shown in **bold italic font**

b. https://aqs.epa.gov/aqsweb/airdata/download_files.html

Background Concentrations (µg/m ³)						
2010	2011	2012	2013	2014	2015	
25.5	24.7	20.5	25	19.7	22.7	
9.43	9.42	8.5	8.34	7.69	8.09	

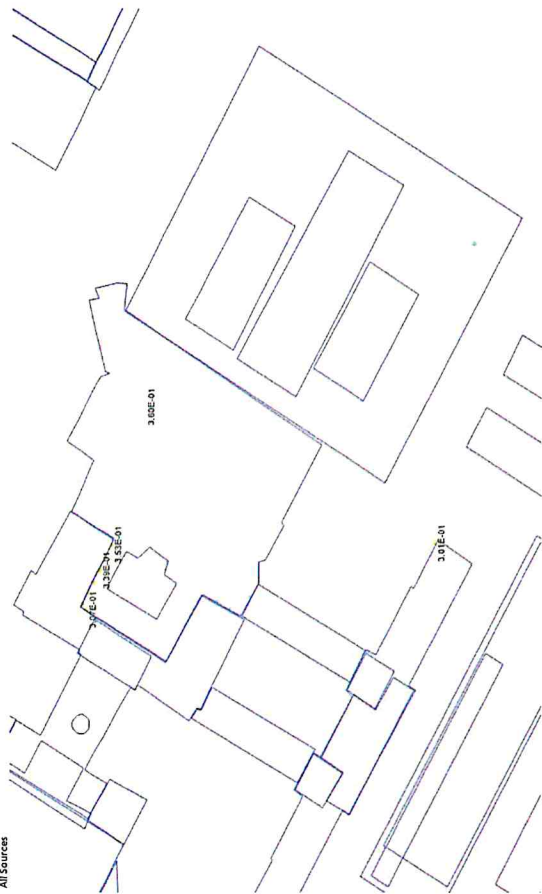
Data Counts (days per year) ^b						
2010	2011	2012	2013	2014	2015	
351	300	331	339	341	343	
351	300	331	333	341	343	

PM2.5 Annual, Impacts > 0.3 $\mu\text{g}/\text{m}^3$
April 1 through November 15 restriction (Focus on Admin Building Results)

Cogens Only (all below 0.3 $\mu\text{g}/\text{m}^3$ threshold)



All Sources



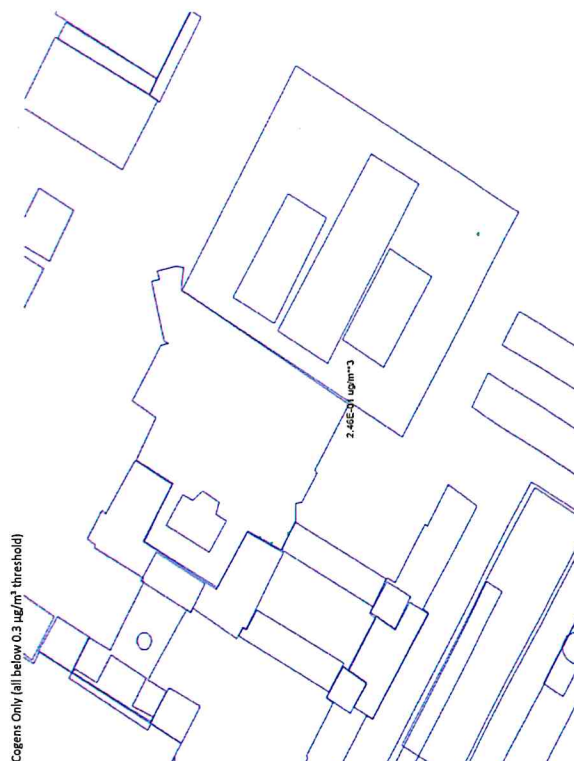
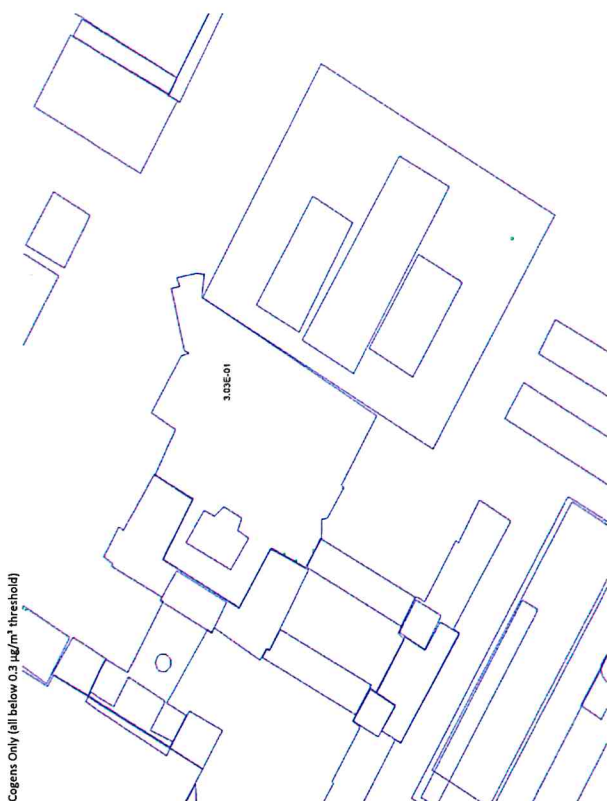
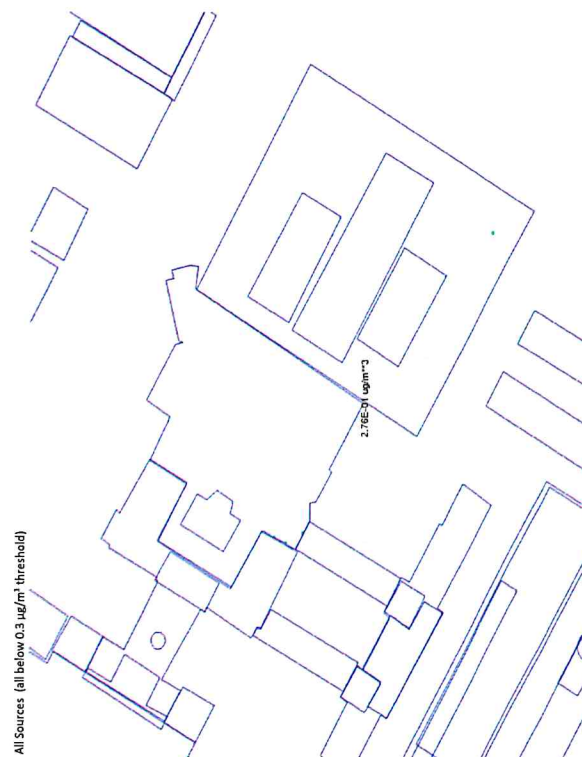
PM2.5 Annual, Impacts > 0.3 $\mu\text{g}/\text{m}^3$
5am-5pm operation (Roof Gym Focus)

Cogens Only (all below 0.3 $\mu\text{g}/\text{m}^3$ threshold)



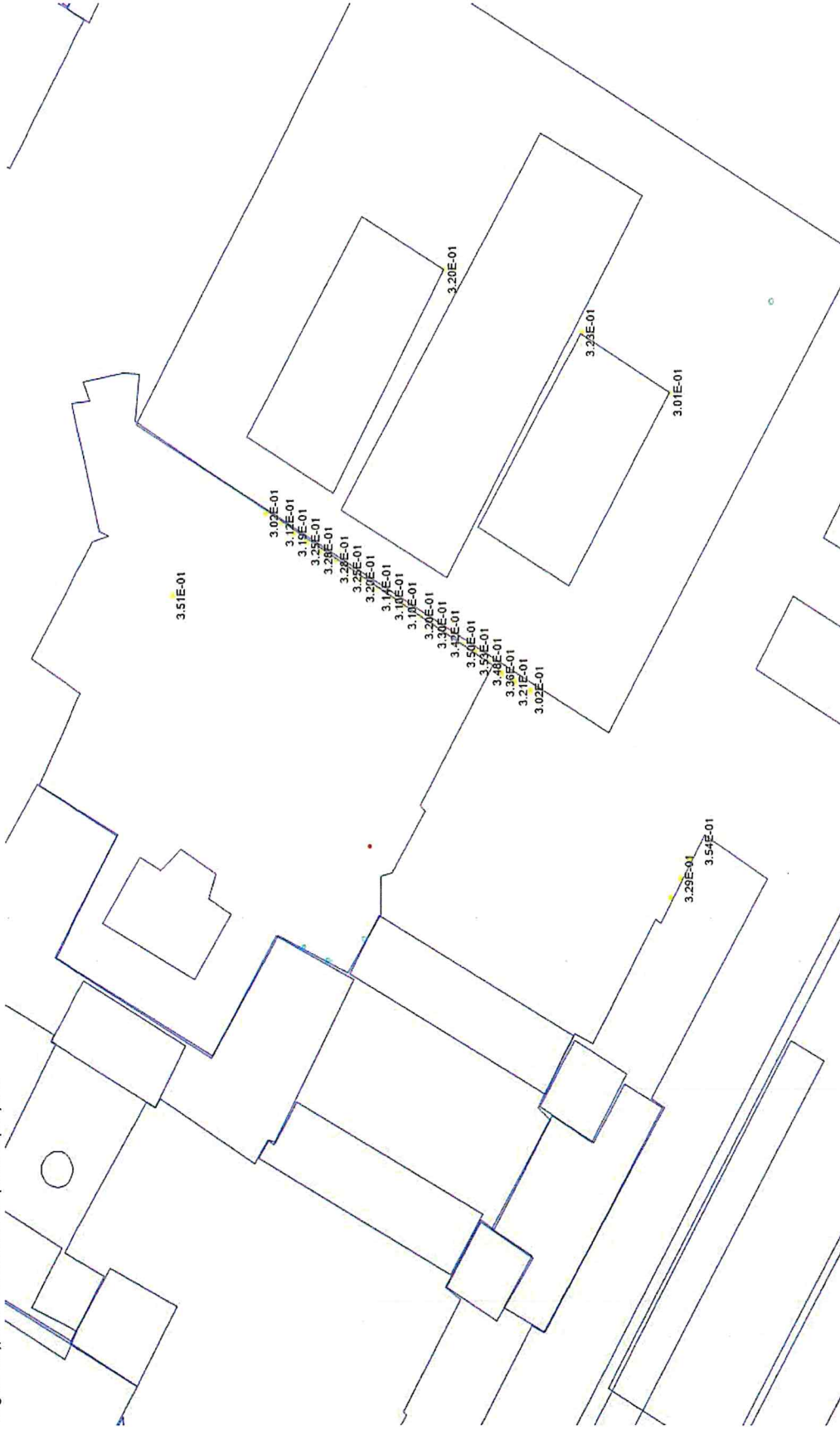
All Sources (all below 0.3 $\mu\text{g}/\text{m}^3$ threshold)



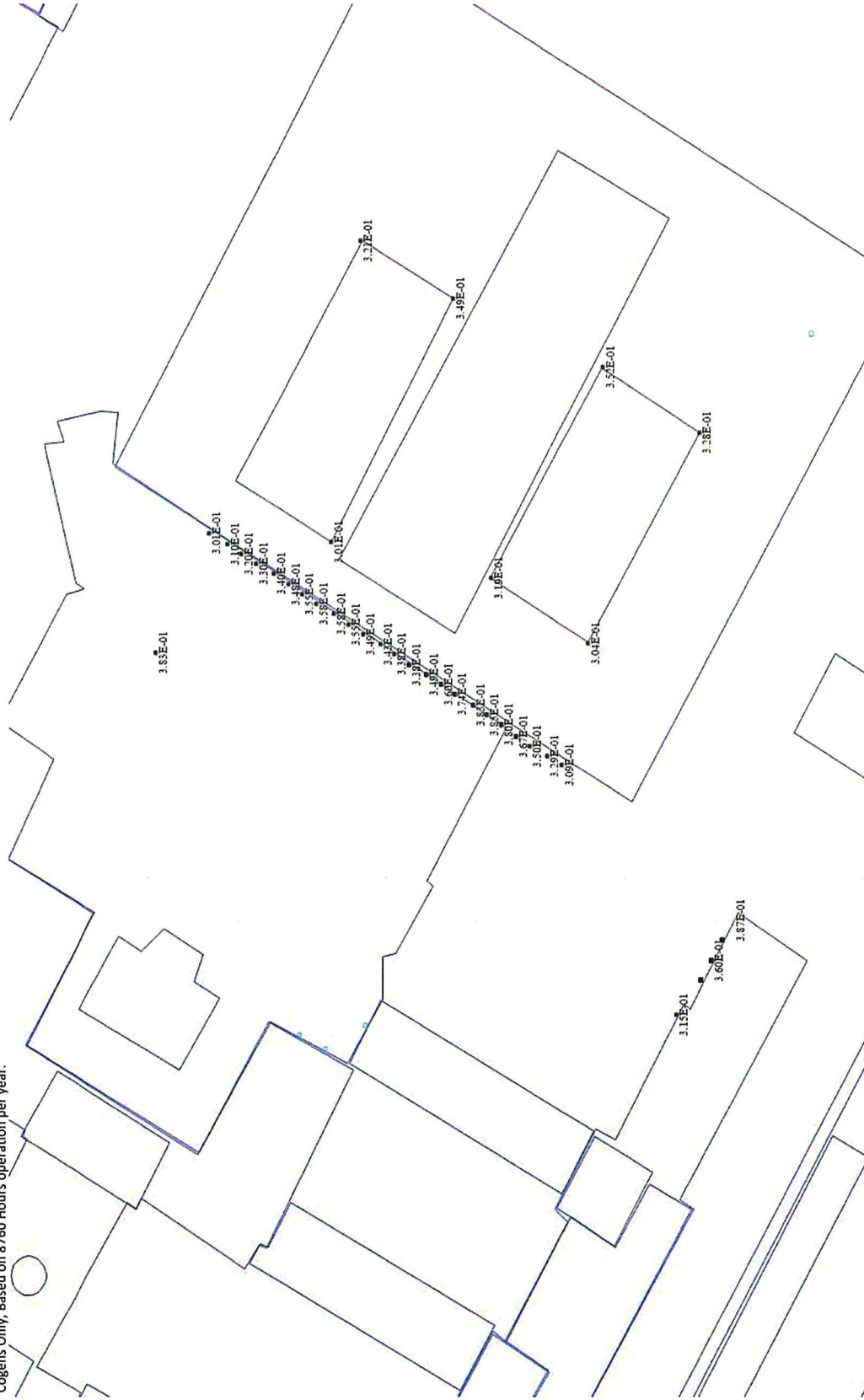


PM 2.5 Annual, Impacts > 0.3 µg/m3

Cogens Only, Based on 8000 Hours operation per year.



Cogens Only, Based on 8760 Hours operation per year.



X	Y	8000 hour Conc (µg/m³)	% Control to lower to 0.3 µg/m³	8760 hour Conc (µg/m³)²	% Control to lower to 0.3 µg/m³²
586529.6	4510237	0.35406	15%	0.387696	23%
586555.5	4510272	0.35291	15%	0.386436	22%
586529.6	4510237	0.3511	15%	0.384455	22%
586563.2	4510318	0.35084	14%	0.38417	22%
586556.7	4510274	0.35048	14%	0.383776	22%
586554.2	4510270	0.34789	14%	0.38094	21%
586529.6	4510237	0.34334	13%	0.375957	20%
586527.1	4510239	0.34276	12%	0.375322	20%
586558	4510276	0.34244	12%	0.374972	20%
586527.1	4510239	0.3399	12%	0.372191	19%
586552.7	4510268	0.33573	11%	0.367624	18%
586527.1	4510239	0.3324	10%	0.363978	18%
586529.6	4510237	0.33148	9%	0.362971	17%
586559.3	4510278	0.32975	9%	0.361076	17%
586524.5	4510240	0.32944	9%	0.360737	17%
586569.4	4510296	0.32798	9%	0.359138	16%
586568.1	4510293	0.3277	8%	0.358832	16%
586524.5	4510240	0.32669	8%	0.357726	16%
586570.7	4510298	0.32517	8%	0.356061	16%
586566.9	4510291	0.32504	8%	0.355919	16%
586599.2	4510256	0.32279	7%	0.353455	15%
586527.1	4510239	0.32093	7%	0.351418	15%
586551.5	4510266	0.3207	6%	0.351167	15%
586565.6	4510289	0.32004	6%	0.350444	14%
586560.5	4510280	0.31977	6%	0.350148	14%
586607.9	4510277	0.31964	6%	0.350006	14%
586524.5	4510240	0.31948	6%	0.349831	14%
586571.9	4510300	0.31898	6%	0.349283	14%
586529.6	4510237	0.3165	5%	0.346568	13%
586522	4510242	0.31579	5%	0.34579	13%
586564.3	4510287	0.31415	5%	0.343994	13%
586522	4510242	0.31316	4%	0.34291	13%
586573.2	4510302	0.3115	4%	0.341093	12%
586563.1	4510285	0.3097	3%	0.339122	12%
586561.8	4510283	0.30969	3%	0.339111	12%
586524.5	4510240	0.30847	3%	0.337775	11%
586527.1	4510239	0.30646	2%	0.335574	11%
586522	4510242	0.30626	2%	0.335355	11%
586574.5	4510304	0.30243	1%	0.331161	9%
586550.3	4510263	0.30167	1%	0.330329	9%
586591	4510242	0.3008	0%	0.329376	9%
586529.6	4510237	0.29971	-	0.328182	9%
586522	4510242	0.29572	-	0.323813	7%
586524.5	4510240	0.29457	-	0.322554	7%
586615.2	4510290	0.29433	-	0.322291	7%
586575.7	4510306	0.29347	-	0.32135	7%
586572.7	4510271	0.29232	-	0.32009	6%
586527.1	4510239	0.29026	-	0.317835	6%
586517.6	4510245	0.28877	-	0.316203	5%
586517.6	4510245	0.28637	-	0.313575	4%
586577	4510308	0.28436	-	0.311374	4%
586549.1	4510261	0.28342	-	0.310345	3%
586522	4510242	0.28242	-	0.30925	3%
586529.6	4510237	0.28238	-	0.309206	3%
586558	4510276	0.28207	-	0.308867	3%
586556.7	4510274	0.2819	-	0.308681	3%
586559.3	4510278	0.28118	-	0.307892	3%
586555.5	4510272	0.28111	-	0.307815	3%
586517.6	4510245	0.28007	-	0.306677	2%
586554.2	4510270	0.27937	-	0.30591	2%
586524.5	4510240	0.27901	-	0.305516	2%
586560.5	4510280	0.2788	-	0.305286	2%
586564.5	4510258	0.27825	-	0.304684	2%
586552.7	4510268	0.27622	-	0.302461	1%
586578.3	4510311	0.27598	-	0.302198	1%
586577.2	4510294	0.27551	-	0.301683	1%
586561.8	4510283	0.27525	-	0.301399	0%
586527.1	4510239	0.27356	-	0.299548	-
586527.1	4510239	0.27356	-	0.299548	-
586551.5	4510266	0.27324	-	0.299198	-
586563.1	4510285	0.27313	-	0.299077	-
586547.9	4510259	0.27255	-	0.298442	-
586564.3	4510287	0.2715	-	0.297293	-
586517.6	4510245	0.27046	-	0.296154	-
586565.6	4510289	0.26963	-	0.295245	-

586579.5	4510313	0.2687 -	0.294227 -
586550.3	4510263	0.26831 -	0.293799 -
586522	4510242	0.26754 -	0.292956 -
586514	4510247	0.26732 -	0.292715 -
586566.9	4510291	0.26706 -	0.292431 -
586529.6	4510237	0.26576 -	0.291007 -
586546.7	4510257	0.26531 -	0.290514 -
586514	4510247	0.2651 -	0.290285 -
586568.1	4510293	0.26426 -	0.289365 -
586524.5	4510240	0.26299 -	0.287974 -
586524.5	4510240	0.26299 -	0.287974 -
586549.1	4510261	0.26215 -	0.287054 -
586580.8	4510315	0.26174 -	0.286605 -
586569.4	4510296	0.26171 -	0.286572 -
586545.5	4510255	0.26123 -	0.286047 -
586514	4510247	0.25929 -	0.283923 -
586570.7	4510298	0.25909 -	0.283704 -
586544.3	4510252	0.25858 -	0.283145 -
586517.6	4510245	0.25835 -	0.282893 -
586547.9	4510259	0.25675 -	0.281141 -
586582.1	4510317	0.25592 -	0.280232 -
586571.9	4510300	0.25573 -	0.280024 -
586584.9	4510307	0.25309 -	0.277134 -
586573.2	4510302	0.25261 -	0.276608 -
586522	4510242	0.25226 -	0.276225 -
586522	4510242	0.25226 -	0.276225 -
586546.7	4510257	0.25147 -	0.27536 -
586514	4510247	0.25041 -	0.274199 -
586583.3	4510319	0.25023 -	0.274002 -
586510.6	4510249	0.24949 -	0.273192 -
586574.5	4510304	0.24897 -	0.272622 -
586545.5	4510255	0.24753 -	0.271045 -
586510.6	4510249	0.24742 -	0.270925 -
586539.8	4510322	0.24731 -	0.270804 -
586575.7	4510306	0.24528 -	0.268582 -
586584.6	4510321	0.24508 -	0.268363 -
586517.6	4510245	0.24483 -	0.268089 -
586544.3	4510252	0.24441 -	0.267629 -
586509.9	4510222	0.24366 -	0.266808 -
586510.6	4510249	0.24201 -	0.265001 -
586577	4510308	0.24121 -	0.264125 -
586587.9	4510324	0.23988 -	0.262669 -
586514	4510247	0.23924 -	0.261968 -
586578.3	4510311	0.23714 -	0.259668 -
586519	4510285	0.23422 -	0.256471 -
586507.2	4510251	0.2342 -	0.256449 -
586510.6	4510249	0.23376 -	0.255967 -
586579.5	4510313	0.23324 -	0.255398 -
586517.3	4510282	0.23251 -	0.254598 -
586519	4510285	0.23229 -	0.254358 -
586507.2	4510251	0.23226 -	0.254325 -
586517.6	4510245	0.23104 -	0.252989 -
586517.3	4510282	0.23059 -	0.252496 -
586580.8	4510315	0.22906 -	0.250821 -
586515.5	4510278	0.22731 -	0.248904 -
586519	4510285	0.22723 -	0.248817 -
586507.2	4510251	0.22718 -	0.248762 -
586514	4510247	0.2268 -	0.248346 -
586517.3	4510282	0.22557 -	0.246999 -
586515.5	4510278	0.22543 -	0.246846 -
586582.1	4510317	0.22524 -	0.246638 -
586510.6	4510249	0.22337 -	0.24459 -
586513.8	4510275	0.22255 -	0.243692 -
586583.3	4510319	0.22127 -	0.242291 -
586504.2	4510253	0.22121 -	0.242225 -
586512.1	4510272	0.22075 -	0.241721 -
586513.8	4510275	0.22071 -	0.241677 -
586515.5	4510278	0.22051 -	0.241458 -
586511.2	4510270	0.21949 -	0.240342 -
586519	4510285	0.21948 -	0.240331 -
586507.2	4510251	0.21943 -	0.240276 -
586504.2	4510253	0.21938 -	0.240221 -
586512.1	4510272	0.21892 -	0.239717 -
586517.6	4510245	0.21822 -	0.238951 -
586517.3	4510282	0.21786 -	0.238557 -
586511.2	4510270	0.21767 -	0.238349 -
586584.6	4510321	0.21733 -	0.237976 -
586513.8	4510275	0.21589 -	0.2364 -
586510.1	4510269	0.21534 -	0.235797 -
586504.2	4510253	0.21459 -	0.234976 -

586514	4510247	0.21418 -	0.234527 -
586512.1	4510272	0.21413 -	0.234472 -
586510.1	4510269	0.21356 -	0.233848 -
586515.5	4510278	0.21296 -	0.233191 -
586511.2	4510270	0.21291 -	0.233136 -
586587.9	4510324	0.21271 -	0.232917 -
586502.6	4510255	0.21257 -	0.232764 -
586506.5	4510262	0.21232 -	0.23249 -
586508.2	4510265	0.21205 -	0.232195 -
586510.6	4510249	0.21183 -	0.231954 -
586504.5	4510258	0.21134 -	0.231417 -
586502.6	4510255	0.21081 -	0.230837 -
586506.5	4510262	0.21056 -	0.230563 -
586508.2	4510265	0.21029 -	0.230268 -
586507.2	4510251	0.20968 -	0.2296 -
586519	4510285	0.20962 -	0.229534 -
586504.5	4510258	0.20959 -	0.229501 -
586510.1	4510269	0.20888 -	0.228724 -
586513.8	4510275	0.20849 -	0.228297 -
586517.3	4510282	0.20806 -	0.227826 -
586504.2	4510253	0.20727 -	0.226961 -
586512.1	4510272	0.20679 -	0.226435 -
586525.6	4510199	0.20631 -	0.225909 -
586502.6	4510255	0.2062 -	0.225789 -
586506.5	4510262	0.20596 -	0.225526 -
586508.2	4510265	0.20569 -	0.225231 -
586511.2	4510270	0.20561 -	0.225143 -
586504.5	4510258	0.20501 -	0.224486 -
586515.5	4510278	0.20337 -	0.22269 -
586514	4510247	0.20267 -	0.221924 -
586529.1	4510327	0.2022 -	0.221409 -
586510.1	4510269	0.20172 -	0.220883 -
586529.1	4510327	0.20057 -	0.219624 -
586510.6	4510249	0.20018 -	0.219197 -
586502.6	4510255	0.19917 -	0.218091 -
586513.8	4510275	0.1991 -	0.218015 -
586506.5	4510262	0.1989 -	0.217796 -
586507.2	4510251	0.19883 -	0.217719 -
586508.2	4510265	0.19864 -	0.217511 -
586519	4510285	0.19843 -	0.217281 -
586504.2	4510253	0.19806 -	0.216876 -
586504.5	4510258	0.198 -	0.21681 -
586512.1	4510272	0.19747 -	0.21623 -
586517.3	4510282	0.19694 -	0.215649 -
586511.2	4510270	0.19635 -	0.215003 -
586529.1	4510327	0.1963 -	0.214949 -
586510.1	4510269	0.19264 -	0.210941 -
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586515.8	4510303	0.1919 -	0.210131 -
586515.8	4510303	0.19034 -	0.208422 -
586502.6	4510255	0.19032 -	0.2084 -
586506.5	4510262	0.18998 -	0.208028 -
586529.1	4510327	0.18976 -	0.207787 -
586508.2	4510265	0.18971 -	0.207732 -
586510.6	4510249	0.18969 -	0.207711 -
586504.5	4510258	0.18916 -	0.20713 -
586513.8	4510275	0.18846 -	0.206364 -
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586504.2	4510253	0.1878 -	0.205641 -
586525.7	4510329	0.1877 -	0.205532 -
586509.4	4510289	0.18758 -	0.2054 -
586512.1	4510272	0.18693 -	0.204688 -
586519	4510285	0.18666 -	0.204393 -
586508	4510286	0.18626 -	0.203955 -
586515.8	4510303	0.18625 -	0.203944 -
586525.7	4510329	0.18619 -	0.203878 -
586509.4	4510289	0.18605 -	0.203725 -
586511.2	4510270	0.18589 -	0.20355 -
586517.3	4510282	0.18525 -	0.202849 -
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586509.1	4510291	0.18416 -	0.201655 -
586506.5	4510283	0.18315 -	0.200549 -
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586525.7	4510329	0.18224 -	0.199553 -
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586515.5	4510278	0.18109 -	0.198294 -
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586511.2	4510270	0.17498 -	0.191603 -
586494.6	4510262	0.17459 -	0.191176 -
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586494.6	4510262	0.17315 -	0.189599 -
586497.9	4510268	0.17314 -	0.189588 -
586503.2	4510278	0.1728 -	0.189216 -
586496.3	4510265	0.17264 -	0.189041 -
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586515.8	4510303	0.17199 -	0.188329 -
586519.9	4510332	0.1719 -	0.188231 -
586510.1	4510269	0.17175 -	0.188066 -
586497.9	4510268	0.17171 -	0.188022 -
586506.5	4510283	0.17166 -	0.187968 -
586499.7	4510271	0.17147 -	0.18776 -
586496.3	4510265	0.17122 -	0.187486 -
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586499.7	4510271	0.17006 -	0.186216 -
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586496.3	4510265	0.1675 -	0.183413 -
586491.5	4510261	0.16707 -	0.182942 -
586519.9	4510332	0.16691 -	0.182766 -
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586499.7	4510271	0.16636 -	0.182164 -
586491.5	4510261	0.1657 -	0.181442 -
586517.4	4510334	0.16557 -	0.181299 -
586506.8	4510292	0.16528 -	0.180982 -
586509.1	4510291	0.16493 -	0.180598 -
586513.1	4510305	0.16461 -	0.180248 -
586517.4	4510334	0.16425 -	0.179854 -
586506.5	4510283	0.16398 -	0.179558 -
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586529.1	4510327	0.16231 -	0.177729 -
586497.9	4510268	0.16226 -	0.177675 -
586491.5	4510261	0.16212 -	0.177521 -
586496.3	4510265	0.1618 -	0.177171 -
586519.9	4510332	0.16137 -	0.1767 -
586504.2	4510293	0.16113 -	0.176437 -
586522.8	4510331	0.1611 -	0.176405 -
586517.4	4510334	0.16078 -	0.176054 -

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586504.2	4510293	0.15982 -	0.175003 -
586525.7	4510329	0.1598 -	0.174981 -
586506.8	4510292	0.1597 -	0.174872 -
586489.6	4510262	0.15958 -	0.17474 -
586509.4	4510289	0.15905 -	0.17416 -
586489.6	4510262	0.15828 -	0.173317 -
586508	4510286	0.15791 -	0.172911 -
586491.5	4510261	0.15666 -	0.171543 -
586504.2	4510293	0.15639 -	0.171247 -
586494.6	4510262	0.15639 -	0.171247 -
586509.1	4510291	0.15617 -	0.171006 -
586503.2	4510278	0.15598 -	0.170798 -
586504.8	4510281	0.15561 -	0.170393 -
586501.7	4510275	0.15552 -	0.170294 -
586517.4	4510334	0.15546 -	0.170229 -
586506.5	4510283	0.15525 -	0.169999 -
586514.5	4510335	0.15511 -	0.169845 -
586497.9	4510268	0.15502 -	0.169747 -
586489.6	4510262	0.15488 -	0.169594 -
586496.3	4510265	0.1546 -	0.169287 -
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586519.9	4510332	0.15435 -	0.169013 -
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586499.7	4510271	0.15351 -	0.168093 -
586515.8	4510303	0.15333 -	0.167896 -
586522.8	4510331	0.15282 -	0.167338 -
586506.8	4510292	0.15259 -	0.167086 -
586510.4	4510307	0.1524 -	0.166878 -
586487.3	4510264	0.1518 -	0.166221 -
586513	4510334	0.15148 -	0.165871 -
586510.4	4510307	0.15117 -	0.165531 -
586504.2	4510293	0.15111 -	0.165465 -
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586487.3	4510264	0.15057 -	0.164874 -
586525.8	4510335	0.1503 -	0.164579 -
586513	4510334	0.15027 -	0.164546 -
586491.5	4510261	0.14985 -	0.164086 -
586489.6	4510262	0.14972 -	0.163943 -
586509.4	4510289	0.14964 -	0.163856 -
586517.4	4510334	0.14871 -	0.162837 -
586508	4510286	0.14857 -	0.162684 -
586511.1	4510331	0.14838 -	0.162476 -
586494.6	4510262	0.1483 -	0.162389 -
586510.4	4510307	0.14796 -	0.162016 -
586513.1	4510305	0.1477 -	0.161732 -
586503.2	4510278	0.14769 -	0.161721 -
586506.4	4510273	0.14766 -	0.161688 -
586487.3	4510264	0.14738 -	0.161381 -
586504.8	4510281	0.14734 -	0.161337 -
586501.7	4510275	0.14727 -	0.161261 -
586511.1	4510331	0.1472 -	0.161184 -
586513	4510334	0.14712 -	0.161096 -
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586497.9	4510268	0.14689 -	0.160845 -
586496.3	4510265	0.14654 -	0.160461 -
586519.9	4510332	0.14644 -	0.160352 -
586506.5	4510283	0.14608 -	0.159958 -
586514.5	4510335	0.14574 -	0.159585 -
586517.6	4510345	0.14551 -	0.159333 -
586499.7	4510271	0.14541 -	0.159224 -
586507.5	4510308	0.14528 -	0.159082 -
586485.3	4510265	0.14477 -	0.158523 -
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586504.2	4510293	0.1444 -	0.158118 -
586522.8	4510331	0.14424 -	0.157943 -
586507.5	4510308	0.14411 -	0.1578 -
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586485.3	4510265	0.14361 -	0.157253 -
586489.6	4510262	0.14335 -	0.156968 -
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586501.9	4510294	0.14286 -	0.156432 -
586487.3	4510264	0.1426 -	0.156147 -
586509.4	4510328	0.14256 -	0.156103 -
586491.5	4510261	0.1424 -	0.155928 -
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586501.9	4510294	0.1417 -	0.155162 -
586509.4	4510328	0.14143 -	0.154866 -

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586511.1	4510331	0.13939 -	0.152632 -
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586501.9	4510294	0.13867 -	0.151844 -
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586487.3	4510264	0.13693 -	0.149938 -
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586491.5	4510261	0.13522 -	0.148066 -
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586501.2	4510313	0.12928 -	0.141562 -
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586482.5	4510276	0.11026 -	0.120735 -
586495.2	4510298	0.11004 -	0.120494 -
586478.6	4510269	0.10955 -	0.119957 -
586487.4	4510285	0.10945 -	0.119848 -
586503.9	4510318	0.10876 -	0.119092 -
586493.7	4510297	0.10876 -	0.119092 -
586484.1	4510280	0.10859 -	0.118906 -
586506.7	4510323	0.10849 -	0.118797 -
586493.7	4510297	0.10789 -	0.11814 -
586497.4	4510297	0.10781 -	0.118052 -
586495.2	4510298	0.10772 -	0.117953 -
586479.2	4510270	0.1077 -	0.117932 -
586478.6	4510269	0.10762 -	0.117844 -
586480.8	4510273	0.10752 -	0.117734 -

586499.5	4510296	0.1072 -	0.117384 -
586487.4	4510285	0.10714 -	0.117318 -
586492.5	4510295	0.10708 -	0.117253 -
586478.6	4510269	0.10685 -	0.117001 -
586485.9	4510283	0.10663 -	0.11676 -
586492.5	4510295	0.10623 -	0.116322 -
586502.6	4510316	0.10609 -	0.116169 -
586482.5	4510276	0.10573 -	0.115774 -
586493.7	4510297	0.10563 -	0.115665 -
586505.4	4510321	0.10562 -	0.115654 -
586501.7	4510312	0.10555 -	0.115577 -
586479.2	4510270	0.10505 -	0.11503 -
586479.2	4510270	0.10472 -	0.114668 -
586501.2	4510313	0.10453 -	0.11446 -
586495.2	4510298	0.10416 -	0.114055 -
586492.5	4510295	0.104 -	0.11388 -
586484.1	4510280	0.10397 -	0.113847 -
586480.8	4510273	0.10376 -	0.113617 -
586489.4	4510289	0.10364 -	0.113486 -
586487.4	4510285	0.10358 -	0.11342 -
586497.4	4510297	0.10311 -	0.112905 -
586489.4	4510289	0.10282 -	0.112588 -
586480.8	4510273	0.10278 -	0.112544 -
586503.9	4510318	0.10258 -	0.112325 -
586493.7	4510297	0.10214 -	0.111843 -
586485.9	4510283	0.10201 -	0.111701 -
586499.5	4510296	0.10163 -	0.111285 -
586482.5	4510276	0.10135 -	0.110978 -
586491	4510292	0.10075 -	0.110321 -
586489.4	4510289	0.10066 -	0.110223 -
586492.5	4510295	0.10057 -	0.110124 -
586502.6	4510316	0.10001 -	0.109511 -
586491	4510292	0.09995 -	0.109445 -
586495.2	4510298	0.09963 -	0.109095 -
586484.1	4510280	0.09915 -	0.108569 -
586487.4	4510285	0.09908 -	0.108493 -
586482.5	4510276	0.09907 -	0.108482 -
586491	4510292	0.09785 -	0.107146 -
586497.4	4510297	0.09776 -	0.107047 -
586493.7	4510297	0.0977 -	0.106982 -
586489.4	4510289	0.09734 -	0.106587 -
586485.9	4510283	0.09694 -	0.106149 -
586492.5	4510295	0.0962 -	0.105339 -
586499.5	4510296	0.09575 -	0.104846 -
586484.1	4510280	0.09564 -	0.104726 -
586491	4510292	0.09463 -	0.10362 -
586495.2	4510298	0.09447 -	0.103445 -
586487.4	4510285	0.09404 -	0.102974 -
586489.4	4510289	0.09312 -	0.101966 -
586493.7	4510297	0.09265 -	0.101452 -
586485.9	4510283	0.09243 -	0.101211 -
586497.4	4510297	0.09212 -	0.100871 -
586492.5	4510295	0.09124 -	0.099908 -
586491	4510292	0.09054 -	0.099141 -
586487.4	4510285	0.08911 -	0.097575 -
586495.2	4510298	0.08904 -	0.097499 -
586489.4	4510289	0.08834 -	0.096732 -
586493.7	4510297	0.08734 -	0.095637 -
586492.5	4510295	0.08603 -	0.094203 -
586491	4510292	0.08589 -	0.09405 -
586489.4	4510289	0.08342 -	0.091345 -
586501.9	4510297	0.08165 -	0.089407 -
586491	4510292	0.08103 -	0.088728 -

APPENDIX G: CO2 EQUIVALENT AND GHG CALCULATIONS

Appendix G1:

Usage	Local Law 97 GHG Factors 2024-2029 ¹	GHG Emissions With Action (Cogen)		GHG Emissions No Action (No Cogen)		Net Change in CO ₂ e ⁷
	CO ₂ Equivalent Tons/KBTU	Energy Usage KBTU/Year	CO ₂ e Release TPY	Energy Usage KBTU/Year	CO ₂ e Release TPY	
Electricity Purchased from Con Ed ²	0.000084689	69,443,003	5,881	182,080,602	15,420	-9,539
Steam Purchased from Con Ed ³	0.00004493	172,975,088	7,772	283,100,982	12,720	-4,948
Steam Avoided ⁴	0.00004493	-110,125,894	-4,948	-	-	-
Total Energy Consumption from Nine (9) Emergency Generators ⁵	0.00007421	1,193,500	89	1,193,500	89	0
Natural Gas Consumption with Cogen ⁶	0.00005311	264,090,874	14,026	0	0	14,026
Grid Displacement Credit ⁸	0.000084689	-	-9,539	-	-	-
Total			27,767		28,229	-461
					Percent Dec. in GHG:	1.63%

1. GHG Emission Factors from NYC Local Law 97 were utilized

2. Electricity consumption calculated from ConEd electricity bills. See Appendix G for calculation derivation.

3. Steam consumption calculated from ConEd steam bills. See Appendix G for calculation derivation.

4. Steam avoided calculated based projected recoverable thermal output of the CHP. See Appendix G for calculation derivation.

5. Energy consumption calculated from total annual fuel usage of all 9 generators; no change in gen usage in With Action Scenario

6. Theorized potential emissions of the Cogens based on manufacturer's fuel rate specifications and assumption that the CHP will run for 8,328 hours/year.

7. Negative values indicate a decrease in CO₂e emissions, positive values indicate an increase in CO₂e emissions.

8. Grid Displacement Credit calculated using NYC Local Law 97 Emission Factor. See Appendix G for calculation derivation.

9. Detailed calculations for Table 9 values found in Appendix G.

Month-Year	Electricity Consumption from ConEd		Steam Consumption from ConEd (Mlbs)		Diesel Consumption from Generators (gallons)	
	kWh	kBTU	Mlbs	kBTU	Gallons	kBTU
Jan-23	3,745,600	12,779,987	25,451	30,388,494	489	68949
Feb-23	3,815,200	13,017,462	23,662	28,252,428	463	65283
Mar-23	3,641,600	12,425,139	23,487	28,043,478	511	72051
Apr-23	3,716,000	12,678,992	12,017	14,348,298	301	42441
May-23	4,294,400	14,652,493	14,248	17,012,112	487	68667
Jun-23	4,960,800	16,926,250	19,052	22,748,088	277	39057
Jul-23	5,352,800	18,263,754	16,916	20,197,704	6,138	865458
Aug-23	5,918,400	20,193,581	17,712	21,148,128	110	15510
Sep-23	5,533,600	18,880,643	18,491	22,078,254	404	56964
Oct-23	4,393,291	14,989,909	21,986	26,251,284	598	84318
Nov-23	3,849,544	13,134,644	17,247	20,592,918	145	20445
Dec-23	4,143,537	14,137,748	26,834	32,039,796	11,925	1681425
Totals	53,364,772	182,080,602	237,103	283,100,982	21,848	3,080,568

9 Emergency Generators Diesel fuel usage (gal/yr) ¹	Diesel fuel Heating Value BTU/gal	Energy Consumption (kBTU/year)	Local Law 97 GHG Factors 2024-2029 (tons CO ₂ e/kBTU)	Annual GHG Emissions (Tons CO ₂ e)
8,525	140,000	1,193,500	0.00007421	88.6

1. Calculated from Bellevue Hospital's 2025 total Diesel usage

Appendix G2: Table 9 Calculation Derivations

Derivation of Electricity Purchased from Con Ed (182,080,602 kBTU/yr)

$$\text{Electricity Purchased} = \text{Electricity Purchased} \left(\frac{\text{kWh}}{\text{year}} \right) \times 3.412 \frac{\text{kBTU}}{\text{kWh}}$$

$$\text{Electricity Purchased} = 53,364,772 \frac{\text{kWh}}{\text{year}} \times 3.412 \frac{\text{kBTU}}{\text{kWh}} = \mathbf{182,080,602 \frac{kBTU}{year}}$$

Where:

- *Electricity Purchased = 53,364,772 kWh for the year 2023 = data provided by Bellevue Hospital and summarized in Appendix G.*

1 kWh of electricity = 3.412 kBTU

Derivation of Steam Purchased from Con Ed (283,100,982 kBTU/yr)

$$\text{Steam Purchased} = \text{Steam Purchased} \left(\frac{\text{Mlbs}}{\text{year}} \right) \times 1,194 \frac{\text{kBTU}}{\text{Mlbs}}$$

$$\text{Steam Purchased} = 237,103 \frac{\text{Mlbs}}{\text{year}} \times 1,194 \frac{\text{kBTU}}{\text{Mlbs}} = \mathbf{283,100,982 \frac{kBTU}{year}}$$

Where:

- *Steam Purchased = 237,103 Mlbs for the year 2023 = data provided by Bellevue Hospital and summarized in Appendix G.*
- *1 Mlb of steam = 1,194 kBTU*

Derivation of Steam Avoided (110,125,894 kBTU/yr)

$$\text{Steam Avoided} = \text{Recoverable Thermal Output}$$

$$\begin{aligned}\text{Recoverable Thermal Output} & \left(\frac{\text{MMBTU}}{\text{hr}} \right) \\ &= \text{Total Heat Input} \left(\frac{\text{MMBTU}}{\text{hr}} \right) \times \text{Thermal Efficiency (\%)} \\ &= 31.71 \frac{\text{MMBTU}}{\text{hr}} \times 41.7 \% = 13.22 \frac{\text{MMBTU}}{\text{hr}}\end{aligned}$$

$$\begin{aligned}\text{Recoverable Thermal Output} & \left(\frac{\text{kBTU}}{\text{year}} \right) \\ &= \text{Recoverable Thermal Output} \left(\frac{\text{MMBTU}}{\text{hr}} \right) \times 8,328 \frac{\text{hrs}}{\text{year}} \times 1,000 \frac{\text{kBTU}}{\text{MMBTU}} \\ &= 13.22 \frac{\text{MMBTU}}{\text{hr}} \times 8,328 \frac{\text{hrs}}{\text{year}} \times 1,000 \frac{\text{kBTU}}{\text{MMBTU}} = \mathbf{110,125,894 \frac{kBTU}{year}}\end{aligned}$$

Where:

- $\text{Total Heat Input} \frac{\text{MMBTU}}{\text{hr}} = 2 \times \frac{\text{Fuel Rate (scfm)} \times 60 \frac{\text{min}}{\text{hr}} \times 905 \frac{\text{BTU}}{\text{scf}}}{10^6 \frac{\text{BTU}}{\text{MMBTU}}} =$
 $2 \times \frac{292 \text{ scfm} \times 60 \frac{\text{min}}{\text{hr}} \times 905 \frac{\text{BTU}}{\text{scf}}}{10^6 \frac{\text{BTU}}{\text{MMBTU}}} = 2 \times 15.86 \frac{\text{MMBTU}}{\text{hr}} = 31.71 \frac{\text{MMBTU}}{\text{hr}}$
- Thermal Efficiency = 41.7% (from manufacturer specifications)
- Low Heat Value of natural gas = 905 BTU/scf (from manufacturer specifications)
- Fuel Rate = 292 scfm per unit (from manufacturer specifications)
- CHP expected annual hours of operation = 8,328 hrs/year

Derivation of Energy Consumption from Nine Emergency Generators (1,193,500 kBTU/yr)

$$\begin{aligned} & \text{Energy Consumption from Nine Emergency Generators } \left(\frac{\text{kBTU}}{\text{year}} \right) \\ &= \text{Emergency Generators Diesel Fuel Usage } \left(\frac{\text{gal}}{\text{year}} \right) \times \text{Diesel Fuel Heating Value } \left(\frac{\text{BTU}}{\text{gal}} \right) \times \frac{\text{kBTU}}{1,000 \text{ BTU}} \\ &= 8,525 \frac{\text{gal}}{\text{year}} \times 140,000 \frac{\text{BTU}}{\text{gal}} \times \frac{\text{kBTU}}{1,000 \text{ BTU}} = \mathbf{1,193,500 \frac{\text{kBTU}}{\text{year}}} \end{aligned}$$

Where:

- Emergency Generators Diesel Fuel Usage = 8,525 gal/year for the year 2025 = data provided by Bellevue Hospital and summarized in Appendix G.
- Diesel Fuel Heating Value = 140,000 BTU/gal
- 1 kBTU = 1,000 BTU

Derivation of Natural Gas Consumption with Cogen (264,090,874 kBTU/yr)

$$\begin{aligned} & \text{Natural Gas Consumption with Cogen } \left(\frac{\text{kBTU}}{\text{year}} \right) \\ &= 2 \times \text{Fuel Rate (scfm)} \times \frac{60 \text{ min}}{\text{hr}} \times 8,328 \frac{\text{hrs}}{\text{year}} \times 905 \frac{\text{BTU}}{\text{scf}} \times \frac{\text{kBTU}}{1,000 \text{ BTU}} \\ &= 2 \times 292 \text{ scfm} \times \frac{60 \text{ min}}{\text{hr}} \times 8,328 \frac{\text{hrs}}{\text{year}} \times 905 \frac{\text{BTU}}{\text{scf}} \times \frac{\text{kBTU}}{1,000 \text{ BTU}} \\ &= \mathbf{264,090,874 \frac{\text{kBTU}}{\text{year}}} \end{aligned}$$

Where:

- Fuel Rate = 292 scfm (from manufacturer specifications)
- CHP expected annual hours of operation = 8,328 hrs/year
- Low Heat Value of natural gas = 905 BTU/scf (from manufacturer specifications)
- 1 hour = 60 minutes
- 1 kBTU = 1,000 BTU

Derivation of Grid Displacement Credit (9,539 tons CO₂e/year)

$$\begin{aligned}\text{Grid Displacement Credit} \left(\frac{\text{tons CO}_2\text{e}}{\text{year}} \right) &= 2 \times \text{Electrical Output (kW)} \times 8,328 \frac{\text{hrs}}{\text{year}} \times \text{Local Law 97 Emission Factor} \frac{\text{tons CO}_2\text{e}}{\text{kWh}} \\ &= 2 \times 1,982 \text{ kW} \times 8,328 \frac{\text{hrs}}{\text{year}} \times 0.000288962 \frac{\text{tons CO}_2\text{e}}{\text{kWh}} = \mathbf{9,539 \frac{\text{tons CO}_2\text{e}}{\text{year}}}\end{aligned}$$

Where:

- *Electrical Output of CHP = 1,982 kW (from manufacturer specifications)*
- *CHP expected annual hours of operation = 8,328 hrs/year*
- *NYC Local Law 97 Emission Factor for Electricity from the grid = 0.000288962 tons CO₂e/kWh*
- *1 ton = 2,000 lbs*

APPENDIX H: ACOUSTIC STUDY

16 April 2024

Mr. Bradley E. Bathgate, P.E.
PWI Engineering
One Jenkintown Station
115 West Avenue, Suite 300
Jenkintown, Pennsylvania 19046
bbathgate@pwius.com

Re: Acoustical Evaluation of CHP Equipment
Bellevue Hospital
New York, New York
LSG&A File 2021035

Dear Mr. Bathgate:

As requested, Lewis S. Goodfriend & Associates (LSG&A) has performed an acoustical evaluation of the sound pressure levels associated with the mechanical equipment for the new CHP plant at Bellevue Hospital in New York, New York. This letter summarizes the project design goal, baseline sound level measurements, and a description of the noise control measures for this project.

1.0 PROJECT DESIGN GOAL

LSG&A understands that the project design goal is a maximum ambient sound level increase of 6 dB(A) due to the proposed CHP equipment.

2.0 BASELINE SOUND LEVEL MEASUREMENTS

On Friday, 2 April 2021, Michael Dick of LSG&A visited the site during daytime hours to measure the baseline sound pressure levels at the nearest property lines to the proposed equipment area, as well as on the roof and inside the hospital. Figures 1 through 3, at the end of this letter, show the approximate locations used for the baseline measurements. The measurements were performed during typical operation of the hospital's existing mechanical equipment. Sound sources that contributed to the outdoor sound pressure levels during these measurements included HVAC equipment, traffic, wildlife, and pedestrians. The meteorological conditions during the measurements, between 9:25 A.M. and 11:03 A.M., included a temperature of approximately 32 degrees Fahrenheit, a relative humidity of 40 percent, and wind with speeds of 0 to 16 mph from the northwest.

3.0 NOISE CONTROL MEASURES

LSG&A understands that the two (2) Caterpillar G3516H gas engines each have the following A-weighted full load sound power levels:

Table 1 – One-Third Octave Band Sound Power Levels [dB re: 10⁻¹² W] for Proposed CHP Engine, Bellevue Hospital, New York, New York.											
	One-Third Octave Band Center Frequency (Hz)										
	100	125	160	200	250	315	400	500	630	800	1k
Mechanical Lw, dB	89.1	88.5	93.6	94.9	95.7	99.9	100.2	102.8	103.3	104	102.5
Exhaust Lw, dB	99	102.7	108	109.8	106.2	109.2	110.4	112.2	113.5	112.4	112.9
	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	dB(A)
Mechanical Lw, dB	104.3	105.3	104.7	105.0	106.1	109.0	115.5	121.5	103.9	102.3	122.8
Exhaust Lw, dB	113.7	113.8	115	115.9	115.6	114.1	112.1	115.6	109	105.4	125.5

The proposed CHP engines will be housed in an acoustical enclosure to the south of the emergency department building. LSG&A understands the following noise control measures were utilized for the CHP system in order to meet the applicable limits of the noise regulation and project design goal.

3.1 Combustion Exhaust

LSG&A understands that the combustion exhaust includes a Boulden Energy Systems Model 60213-EXT-24-EI Extreme Grade exhaust silencer with the following insertion loss values:

Table 2 – Octave Band Dynamic Insertion Loss (DIL) for Exhaust Silencer, Bellevue Hospital, New York, New York.								
	Octave Band Center Frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
Exhaust Silencer DIL, dB	21	28.5	34.5	38	35	35.5	36	37

3.2 Air Intake

LSG&A understands that Semco Model ST2505 silencers are installed in the air intake openings with the following minimum insertion loss values:

Table 3 – Octave Band Dynamic Insertion Loss (DIL) for Enclosure Air Intake Silencers, Bellevue Hospital, New York, New York.								
	Octave Band Center Frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
Enclosure Air Intake Silencer DIL, dB	5	9	20	35	39	41	33	19

3.3 Discharge Air

LSG&A understands that Semco Model RLF1000 silencers are installed in the air discharge openings with the following minimum insertion loss values:

Table 4 – Octave Band Dynamic Insertion Loss (DIL) for Discharge Air Silencers, Bellevue Hospital, New York, New York.								
	Octave Band Center Frequency (Hz)							
	63	125	250	500	1000	2000	4000	8000
Air Discharge Silencer DIL, dB	6	13	22	31	27	24	24	19

3.4 CHP Enclosure

LSG&A understands the CHP enclosure provides a maximum sound pressure level of 65 dB(A) at 25 feet in any direction with the equipment operating at full load and provides the following insertion losses:

Table 5 – One-Third Octave Band Insertion Loss (IL) for Proposed Enclosure, Bellevue Hospital, New York, New York.										
	One-Third Octave Band Center Frequency (Hz)									
	100	125	160	200	250	315	400	500	630	800
Enclosure IL, dB	15	17	19	21	23	25	27	29	31	32
	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k
Enclosure IL, dB	34	36	38	39	40	39	40	41	43	46

3.5 Radiators

LSG&A understands that the two (2) high temperature radiators have a sound power level of 83 dB(A) per fan with 8 fans per radiator, and the two (2) low temperature radiators will each have a sound power level of 90 dB(A).

3.6 Interior Treatment

LSG&A understands that the interior surfaces of the enclosure will be acoustically absorptive, and will consist of perforated metal over insulation.

3.7 Vibration Isolation

LSG&A understands the CHP engines are installed on spring isolators with a minimum 2 inch static deflection. LSG&A recommends that the remote radiators also be installed on spring isolators.

4.0 EVALUATION AND RESULTS

To calculate the sound pressure levels at the evaluation locations, an acoustical model was developed that considered the propagation of sound over distance, the shielding and reflection of sound due to buildings and barriers, the effect of topography, and the effect of air absorption. The modeling was performed using SoundPLAN software and the calculation methodology outlined in ISO Standard 9613-2.

Table 6, below, summarizes the measured L_{eq}^1 A-weighted baseline sound levels, the expected sound levels due to the proposed CHP equipment with the above noise control measures at the baseline measurement locations, and the expected total sound levels.

Table 6 – Measured Baseline and Expected Sound Levels, Bellevue Hospital, New York, New York, 2 April 2021.					
Location	Description	Sound Level, dB(A)			
		Measured L_{eq}	Expected	Total	Increase
1 (Outdoor)	FDR Drive	71	49	71	0
2 (Outdoor)	South Parking lot	64	46	64	0
3 (Outdoor)	East 28 th Street	66	41	66	0
4 (Outdoor)	Emergency Room Roof	75	60	75	0
5 (Outdoor)	Library Roof	66	57	66	1
6 (Indoor)	Exam Room ED-10	43	43	46	3
7 (Indoor)	Conference Room 1W1	42	36	43	1
Limit		-	-	-	6

The results of the evaluation indicate that with the noise control options described above, the operation of the new equipment is expected to meet the project design goal at the evaluation locations.

¹ The L_{eq} is the continuous equivalent sound level that, if constant over a stated measurement period, would contain the same sound energy as the actual monitored sound that is fluctuating in level over the measurement period.

I trust that this information is sufficient for your present needs. Please call if you have any questions regarding this letter.

Very truly yours,

LEWIS S. GOODFRIEND & ASSOCIATES



Jack A. Zybura, INCE Bd. Cert.
Associate Principal

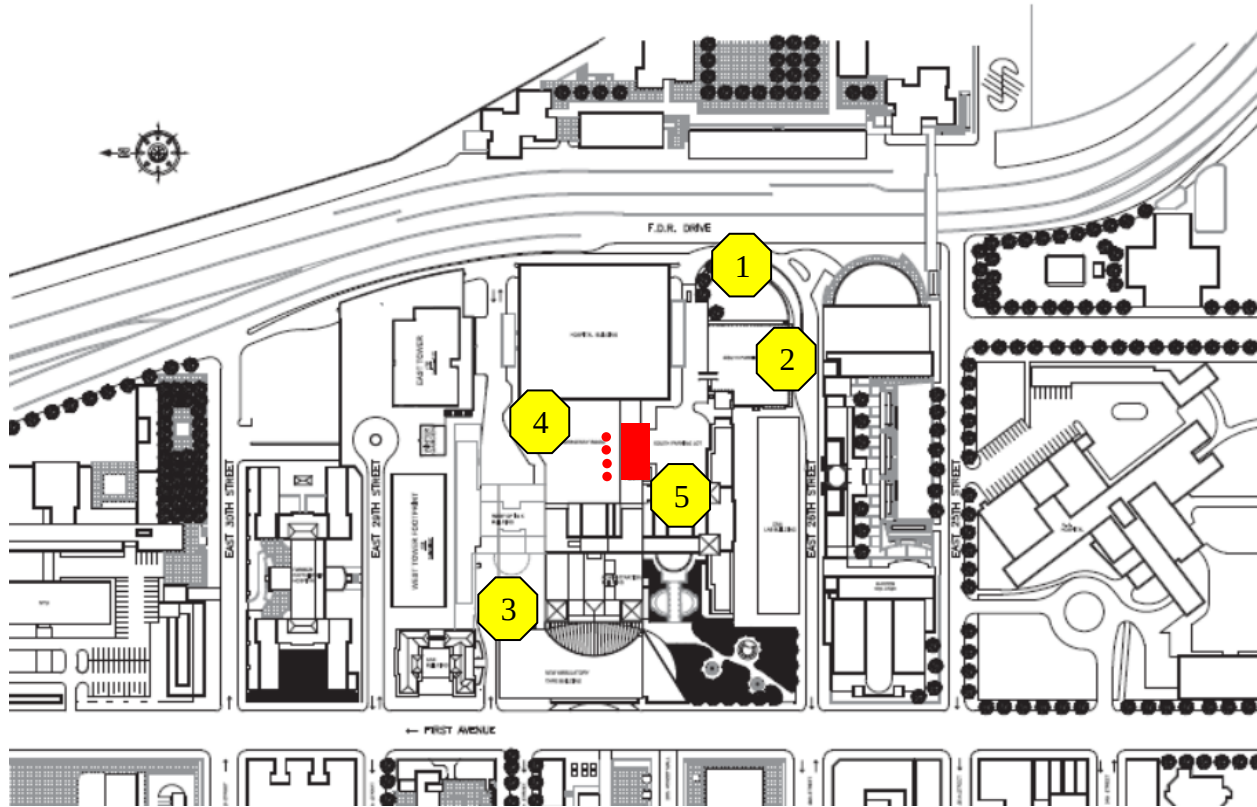


Michael J. Dick, INCE Bd. Cert.
Project Manger

MJD:jaz
Enclosures

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Figure 1 – Site Plan Showing the Location of the Proposed CHP Equipment and the Evaluation Locations, Bellevue Hospital, New York, New York.



All Locations Approximate
Not To Scale

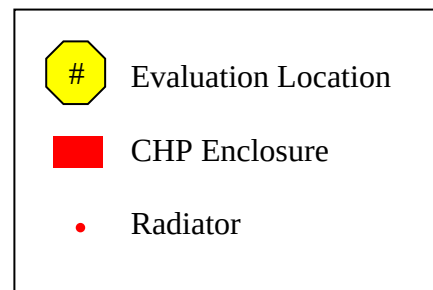
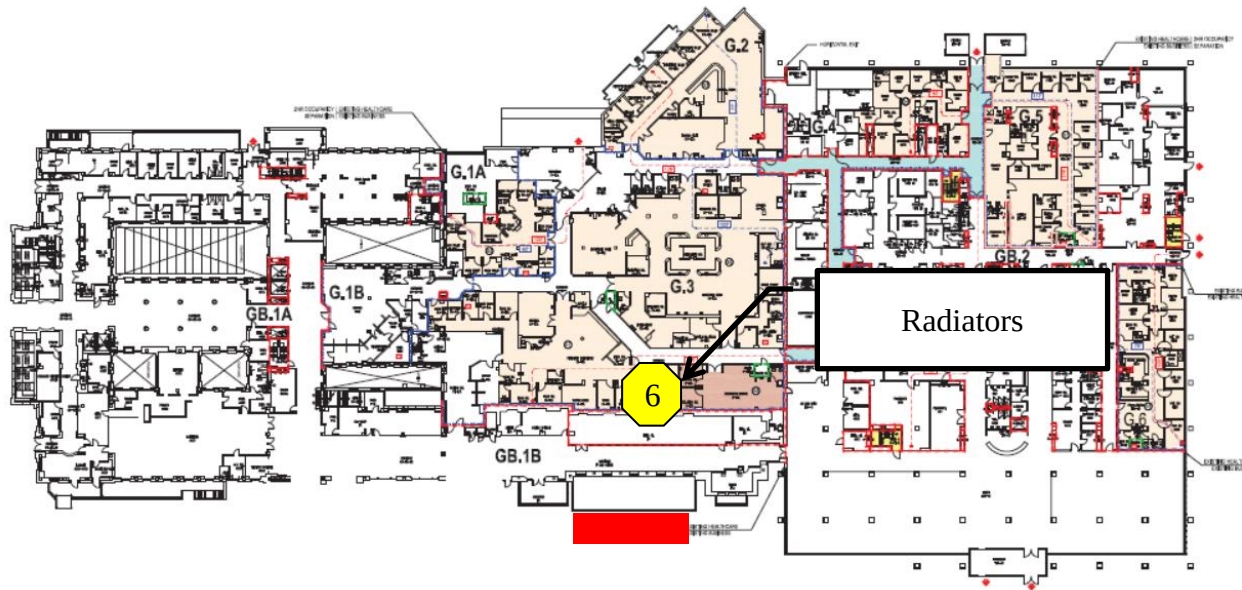


Figure 2 – Floor Plan Showing the Location of the Proposed CHP Equipment and Baseline Sound Level Measurement Location 6, Bellevue Hospital, New York, New York.



All Locations Approximate
Not To Scale

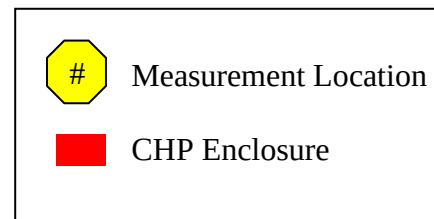
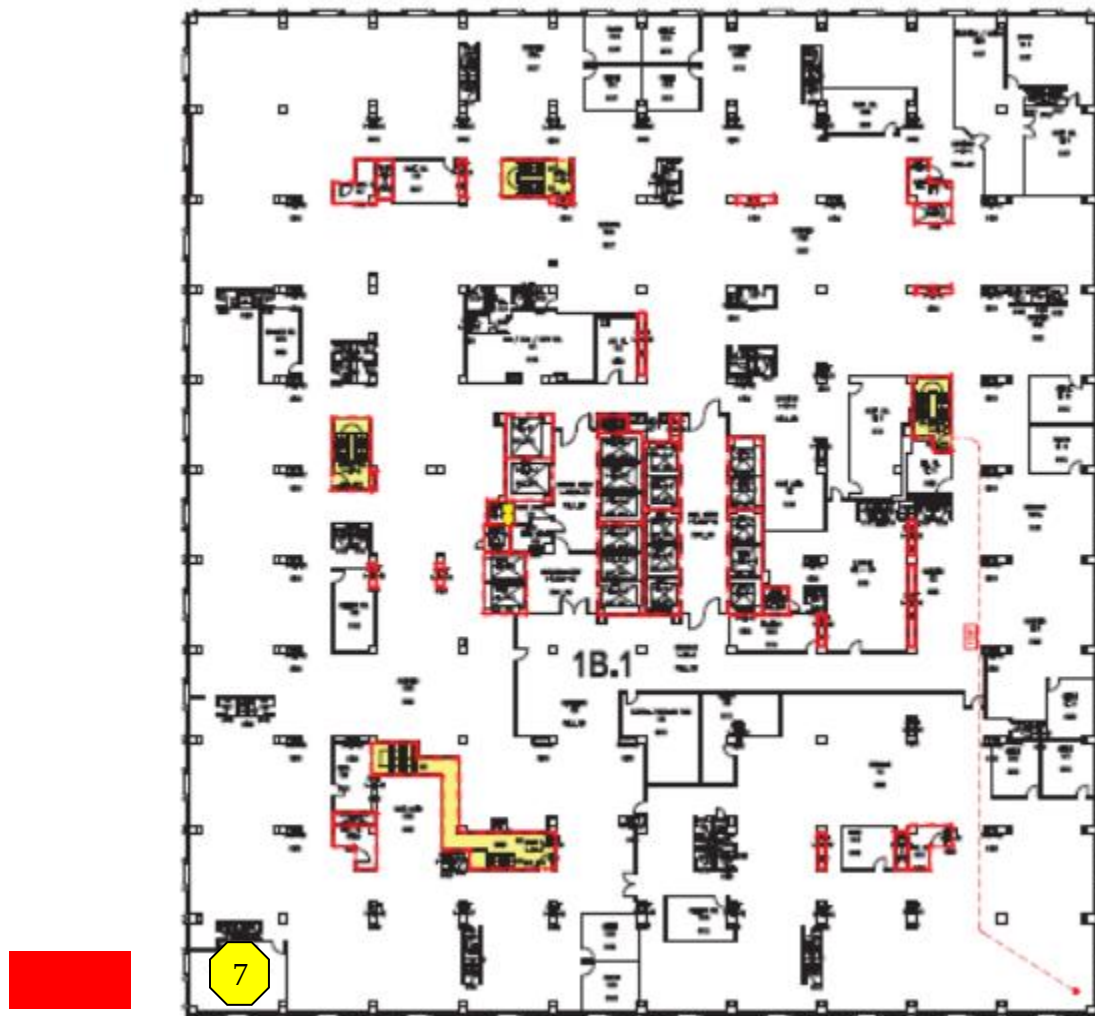


Figure 3 – Floor Plan Showing the Location of the Proposed CHP Equipment and the Baseline Sound Level Measurement Location 7, Bellevue Hospital, New York, New York.



All Locations Approximate
Not To Scale



Measurement Location



CHP Enclosure

APPENDIX I: FACILITY-WIDE EMISSIONS INVENTORY

EXHIBIT 1
NYCHH - Bellevue Hospital
462 First Ave, New York, NY 10016

MAXIMUM POTENTIAL AND ACTUAL FUEL OIL AND NATURAL GAS CONSUMPTION OF 2 COGENS & 9 GENERATORS

	NO. 2 FUEL OIL/DIESEL									NATURAL GAS		
	#	MANUFACTURER/MODEL	SERIAL #	LOCATION	RATING [kw]	MAX HEAT INPUT [million BTU/hr]	MAX HOURLY CAPACITY [GPH]	ACTUAL ANNUAL USAGE [GPY]	MAX POTENTIAL ANNUAL USAGE [GPY]	MAX HOURLY CAPACITY [CFH]	ACTUAL ANNUAL USAGE [CFY]	MAX POTENTIAL ANNUAL USAGE [CFY]
COGENS	1	Caterpillar G3516H		Main Building	1,982	17.87	-	-	-	17,520	145,906,560	153,475,200
	2	Caterpillar G3516H		Main Building	1,982	17.87	-	-	-	17,520	145,906,560	153,475,200
		BOILER TOTALS			3,964	35.74	-	-	-	35,040	2.92E+08	3.07E+08
GENERATORS	1	Caterpillar C27	AFN03262	13th Floor/Main Building	750	2.55	18.2	947	9,107	-	-	-
	2	Caterpillar C27	AFN03263	13th Floor/Main Building	750	2.55	18.21	947	9,107	-	-	-
	3	Caterpillar C27	AFN03264	13th Floor/Main Building	750	2.55	18.2	947	9,107	-	-	-
	4	Caterpillar C27	AFN03265	13th Floor/Main Building	750	2.55	18.2	947	9,107	-	-	-
	5	Caterpillar 3512C	G4W00628	Basement	1,500	5.10	36.4	1,894	18,214	-	-	-
	6	Cummins DFHD-5622268	E030505867	Roof	1,000	3.40	24.3	1,263	12,143	-	-	-
	7	Caterpillar D399	35B262	Ground	600	2.04	14.6	758	7,286	-	-	-
	8	Caterpillar D399	35B263	Ground	600	2.04	14.6	758	7,286	-	-	-
	9	MTU 16V4000 DS2000	95030504782	Generator Housing	2,000	6.80	48.6	2,526	24,286	-	-	-
		GENERATOR TOTALS			8,700	29.58	211.29	10,987	105,643	-	-	-

Reference Values

Fuel	Heating Value	
No. 2 Fuel Oil/Diesel	140,000	BTU/gal
Natural Gas	905	BTU/cu. Ft.

NOTES

1. Cogen hourly fuel rate obtained from manufacturer's specifications.
2. Cogen hours of operation not limited by permit conditions
3. Maximum Annual Capacity for cogens = Maximum Hourly Capacity x 8760 hrs/yr
4. Maximum Annual Capacity for generators = Maximum Hourly Capacity (GPH) x Maximum number of operating hours per year (500 hr/yr)
5. Actual generator usage calculated based on actual estimated hours of operation (52 hrs for emergency testing)
6. Ratings in kW for generators and chillers provided by facility. 1 kW = 1.25 kVA = 1.34 HP
7. Max Hourly Capacity comes from Manufacturer's specification
8. Max heat input for cogens is calculated according to manufacturer's spec; Max Hourly capacity* HV of NG/10⁶

EXHIBIT 2
NYCHH - Bellevue Hospital
462 First Ave, New York, NY 10016

ESTIMATION OF EMISSIONS OF REGULATED AIR CONTAMINANTS FROM 2 COGENS

			Actual Annual Emission Rate		Potential Annual Emission Rate			
Hazardous Air Pollutants	Pollutant	Natural Gas Emission Factor [lb/ MM BTU]	Hourly Emission Rate [lb/hr]	[lb/y]	[tpy]	[lb/y]	[tpy]	
	Acetaldehyde	8.36E-03	0.27	2,207.80	1.10	2,322.33	1.16	
	Acrolein	5.14E-03	0.16	1,357.43	0.68	1,427.84	0.71	
	Benzene	4.40E-04	0.01	116.20	0.06	122.23	0.06	
	Formaldehyde	5.28E-02	1.67	13,944.00	6.97	14,667.32	7.33	
	Total Poly Aromatic Hydrocarbons	2.69E-05	8.53E-04	7.10	3.55E-03	7.47	3.74E-03	
	Toulene	4.80E-04	0.02	126.76	0.06	133.34	0.07	
	Xylene	1.84E-04	0.01	48.59	0.02	51.11	0.03	
Total:				8.90	Total:		9.37	
Criteria Pollutants								
	Carbon Monoxide, g/bHP-hr	0.27	7.54	62,764.85	31.38	66,020.67	33.01	
	Nitrogen Oxides, g/bHP-hr	0.07	2.01	16,760.16	8.38	17,629.56	8.81	
	Particulates	9.99E-03	0.32	2,638.27	1.32	2,775.12	1.39	
	Sulfur Dioxide	5.88E-04	0.02	155.29	0.08	163.34	0.08	
	VOC, g/bHP-hr	0.10	2.81	23,368.19	11.68	24,580.37	12.29	
Total:				52.84	Total:		55.58	
GHG Emissions								
	Carbon Dioxide (CO2)	116.98	3,709.58	30,893,350.39	15,446.68	32,495,887.30	16,247.94	
	Methane (CH4)	2.20E-03	0.07	581.00	0.29	611.14	0.31	
	Nitrous Oxide (N2O)	2.20E-04	0.01	58.10	0.03	61.11	0.03	
CO2 Equivalents	Total:				15,447	Total:		16,248
					15,510			16,318

Reference Values and Tables

Table 3 - Natural Gas Consumption Values (EXHIBIT 1)		
35,040	CFH	max hourly consumption
291,813,120	CFY	actual annual consumption
306,950,400	CFY	max annual consumption

NOTES

\1 U.S. EPA Air Pollution Engineering Manual (AP-42), dated 4/93, Chapter 3.2, table 3.2.1, downloaded from SCRAM BBS.

Emission factors for CO & VOC are from Manufacturer specs; for Nitrous oxide-reference value from 40 CFR 98 Table c-2

Emission factor for Methane-40 CFR 98 Table C-2 ;Carbon Dioxide-40 CFR 98 Table C-1

\2 Annual Emission Rate (lb/yr) = Emission Factor (lb/million BTU) x Fuel Consumption (BTU/yr).

\3 Total Emission Rate (ton/yr) = Annual Emission Rate (lb/yr) / 2000 (lb/ton).

EXHIBIT 3
NYCHHC - Bellevue Hospital
462 First Ave, New York, NY 10016

ESTIMATION OF EMISSIONS OF REGULATED AIR CONTAMINANTS FROM 9 LARGE EMERGENCY GENERATORS

		Actual Annual Emission Rate			Potential Annual Emission Rate			
Hazardous Air Pollutants	Pollutant	Diesel Emission Factor [lb/ MM BTU]	Hourly Emission Rate [lb/hr]	[lb/y]	[tpy]	[lb/y]	[tpy]	
	Acetaldehyde	2.52E-05	7.45E-04	3.88E-02	1.94E-05	0.37	1.86E-04	
	Acrolein	7.88E-06	2.33E-04	1.21E-02	6.06E-06	0.12	5.83E-05	
	Benzene	7.76E-04	2.30E-02	1.19	5.97E-04	11.48	5.74E-03	
	Formaldehyde	7.89E-05	2.33E-03	0.12	6.07E-05	1.17	5.83E-04	
	Propylene	2.79E-03	8.25E-02	4.29	2.15E-03	41.26	2.06E-02	
	Total Poly Aromatic Hydrocarbons	2.12E-04	6.27E-03	0.33	1.63E-04	3.14	1.57E-03	
	Toulene	2.81E-04	8.31E-03	0.43	2.16E-04	4.16	2.08E-03	
	Xylene	1.93E-04	5.71E-03	0.30	1.48E-04	2.85	1.43E-03	
	Total:				3.36E-03	Total:		0.03
Criteria Pollutants								
	Carbon Monoxide	0.85	25.14	1,307.44	0.65	12,571.50	6.29	
	Nitrogen Oxides	3.20	94.66	4,922.11	2.46	47,328.00	23.66	
	Particulates	0.07	2.06	107.21	0.05	1,030.86	0.52	
	Sulfur Dioxide	1.52E-03	0.04	2.33	1.17E-03	22.41	0.01	
	VOC	0.09	2.66	138.43	0.07	1,331.10	0.67	
Total:				3.24	Total:		31.14	
GHG Emissions								
	Carbon Dioxide (CO2)	165.00	4,880.70	253,796.40	126.90	2,440,350.00	1,220.18	
	Methane (CH4)	6.60E-03	0.20	10.15	0.01	97.61	0.05	
	Nitrous Oxide (N2O)	1.30E-03	0.04	2.00	1.00E-03	19.23	0.01	
CO2 Equivalents	Total:				126.90	Total:		1,220
					126.94			1,224

Reference Values and Tables

Table 3 - Natural Gass Consumption Values (EXHIBIT 1)		
211	GPH	max hourly consumption
10,987	GPY	actual annual consumption
105,643	GPY	max annual cconsumption

NOTES

\1 U.S. EPA Air Pollution Engineering Manual (AP-42), dated 4/93, Chapter 3.4, tables 3.4.1-3.4.5, downloaded from SCRAM BBS.

Emission Factors are for generators sized ABOVE 600 HP (447 KW) -

\2 Annual Emission Rate (lb/yr) = Emission Factor (lb/million BTU) x Fuel Consumption (BTU/yr).

BTU/yr calculated per POTENTIAL annual fuel consumption hours limit:500 hours

\3 Total Emission Rate (ton/yr) = Annual Emission Rate (lb/yr) / 2000 (lb/ton).

EXHIBIT 4
NYCHHC - Bellevue Hospital
462 First Ave, New York, NY 10016

ESTIMATION OF EMISSIONS FROM 2 COGENS & 9 EMERGENCY GENERATORS

Annual Cogen Emissions
[tpy]

Annual Generator Emissions
[tpy]

Total Annual Emissions
[tpy]

**Hazardous
Air
Pollutants**

Pollutant	Actual	Potential	Actual	Potential	Actual	Potential
1,1, 2 - Trichloroethane	N/A	N/A	N/A	N/A	0.00	0.00
1,1,2,2- Tetrachloroethane	N/A	N/A	N/A	N/A	0.00	0.00
1,3-Butadiene	N/A	N/A	N/A	N/A	0.00	0.00
1,3-Dichloropropene	N/A	N/A	N/A	N/A	0.00	0.00
Acetaldehyde	1.10	1.16	1.94E-05	1.86E-04	1.10	1.16
Acrolein	0.68	0.71	6.06E-06	5.83E-05	0.68	0.71
Arsenic	N/A	N/A	N/A	N/A	0.00	0.00
Benzene	0.06	0.06	5.97E-04	0.01	0.06	0.07
Beryllium	N/A	N/A	N/A	N/A	0.00	0.00
Cadmium	N/A	N/A	N/A	N/A	0.00	0.00
Carbon Tetrachloride	N/A	N/A	N/A	N/A	0.00	0.00
Chlorobenzene	N/A	N/A	N/A	N/A	0.00	0.00
Chloroform	N/A	N/A	N/A	N/A	0.00	0.00
Chromium	N/A	N/A	N/A	N/A	0.00	0.00
Ethylbenzene	N/A	N/A	N/A	N/A	0.00	0.00
Ethylene dibromide	N/A	N/A	N/A	N/A	0.00	0.00
Formaldehyde	6.97	7.33	6.07E-05	5.83E-04	6.97	7.33
Lead	N/A	N/A	N/A	N/A	0.00	0.00
Manganese	N/A	N/A	N/A	N/A	0.00	0.00
Mercury	N/A	N/A	N/A	N/A	0.00	0.00
Methanol	N/A	N/A	N/A	N/A	0.00	0.00
Methylene Chloride	N/A	N/A	N/A	N/A	0.00	0.00
Napthalene	N/A	N/A	N/A	N/A	0.00	0.00
Nickel	N/A	N/A	N/A	N/A	0.00	0.00
PAH	3.55E-03	3.74E-03	N/A	N/A	3.55E-03	3.74E-03
Propylene	N/A	N/A	2.15E-03	0.02	2.15E-03	0.02
Styrene	N/A	N/A	N/A	N/A	0.00	0.00
Total Poly Aromatic Hydrocarbons	3.55E-03	3.74E-03	1.63E-04	1.57E-03	3.72E-03	0.01
Toulene	0.06	0.07	2.16E-04	2.08E-03	0.06	0.07
Vinyl Chloride	N/A	N/A	N/A	N/A	0.00	0.00
Xylene	0.02	0.03	1.48E-04	1.43E-03	0.02	0.03
Total [tpy]	8.91	9.37	3.36E-03	0.03	8.91	9.40

**Criteria
Pollutants**

Carbon Monoxide	31.38	33.01	0.65	6.29	32.04	39.30
Nitrogen Oxides	8.38	8.81	2.46	23.66	10.84	32.48
PM (Condensable)	N/A	N/A	N/A	N/A	0.00	0.00
PM (Filterable)	1.32	1.39	0.05	0.52	1.37	1.90
Sulfur Dioxide (0.15% sulfur)	0.08	0.08	1.17E-03	0.01	0.08	0.09
Volatile Organic Compounds (VOCs)	11.68	12.29	0.07	0.67	11.75	12.96
Total [tpy]	52.84	55.58	3.24	31.14	56.08	86.73

**GHG
Emissions**

Carbon Dioxide (CO2)	15,446.68	16,247.94	126.90	1,220.18	15,573.57	17,468.12
Methane (CH4)	0.29	0.31	0.01	0.05	0.30	0.35
Nitrous Oxide (N2O)	0.03	0.03	1.00E-03	0.01	0.03	0.04
Totals [tpy]	15,447	16,248	126.90	1,220	15,574	17,469
CO2e [tpy]	15,510	16,318	126.94	1,224	15,636	17,541

APPENDIX J: BELLEVUE UNIFIED COMMITMENT LETTER

Deputy Commissioner
New York City Department of Environmental Protection
Bureau of Environmental Compliance
59-17, Junction Boulevard
Flushing, New York 11373

Date: 7/30/2026

Re: CEQR Commitments 23DEP032M
Bellevue Hospital Cogeneration
DEP Permit PW002422

As the responsible official of NYCHHC/ Bellevue Hospital located at 462 First Avenue, New York, NY, I attest that Bellevue Hospital hereby commits to the following requirements under Negative Declaration for the City Environmental Quality Review of the cogeneration air permit (23DEP032M).

The below measures are included in the air modeling report titled "Environmental Assessment Statement CEQR# 23DEP032M" dated August 2023.

- AHU 2 located on the ED Roof and all outside air handling units serving the 13th and 22nd floors of the H-Building are equipped with a minimum MERV-15 filtration system, providing at least 90% filtration efficiency for particles between 1.0 and 3.0 microns in diameter. These filters are replaced on an annual basis, or more frequently as required, to maintain compliance and filtration effectiveness. Bellevue Hospital maintains records of filter installations and replacements and will provide such documentation upon request.
- The gym area and roof of the H-Building will only be open between the hours of 5:00am and 5:00pm
- All window A/C units in the vicinity of the CHP system, specifically the C&D Building on floors 1-3 and 5-7 (No A/C units exist on the 4th floor of C&D Building) will recirculate indoor air only so no outside air enters the building and will only be operational between April 1 and November 15.
- All openable windows are kept locked and only opened during emergencies .
- The Bellevue Hospital Cogeneration Project will have a minimal impact on the number of parking spaces in the South Parking Lot. Bellevue Hospital will offset any lost parking spaces by providing additional parking in nearby hospital-owned areas, including available open spaces outside of the cogeneration plant upon project completion.

It must be noted that Bellevue Hospital has a fully staffed Engineering and Maintenance department which on a daily basis address and maintain all building systems, which include all Electrical, Mechanical, and HVAC systems. To provide the best medical services to City and its Patients; Bellevue is routinely inspected by various City, State and Federal agencies to ensure all systems are properly maintained, cleaned, and operating properly. Additionally, Bellevue Hospital maintains a fully stocked filter shop to ensure all filters are replaced on a consistent basis.

Regards,



Yunjung Lee
Director of Capital Design &
Construction , NYCHHC/Bellevue.