19.0 AIR QUALITY

19. 1 INTRODUCTION

The Proposed Action would relocate MN ~~District Garages~~ 1, 2 and 5 Garages to one location. A salt shed would replace the existing MN 1 Garage. Truck refueling and washing operations would be integrated into the new MN 1/2/5 Garage building. The ground floor of the MN 1/2/5 Garage would accommodate UPS trucks (60,000 sq ft), which currently occupy the site. The MN 1/2/5 Garage would be enclosed, mechanically ventilated and would include a total net floor area of 427,250 sq ft. The refueling area would include natural ventilation with an opening approximately 27 to 30 ft in height by approximately 58 ft in width fronting West Street/Route 9A. A vapor recovery system would serve the gasoline and E85 Ethanol fuel pumps.

All DSNY diesel trucks in 2012 would be equipped with advanced pollution control equipment certified to USEPA Model Year 2007 standards for PM and oxides of nitrogen (NO_x) and would utilize ULSD fuel (15 ppm sulfur) with at least five percent renewable biodiesel content (B5). The majority of DSNY agency automobiles in 2012 would be low emission models such as gasoline/electric hybrids and models fueled by E85 Ethanol, pursuant to local law governing agency vehicle procurement. The MN 1/2/5 Garage would be heated with ~~natural gas or~~ steam. The use of high-sulfur No. 2 fuel oil for heating at the current MN 1 and MN 5 Garages would be discontinued. The salt shed would not be heated.

The Proposed Action would not increase the overall number of mobile sources of air pollutants, but would shift travel patterns for DSNY trucks and employee vehicles serving the respective districts. In addition, the Proposed Action would produce direct facility emissions from heating and on-site vehicle parking area ventilation at the garage. Therefore, an analysis of potential air impacts from mobile and stationary sources as well as construction activities was conducted, in accordance with the *CEQR Technical Manual* and supplemental interim agency guidance.

19.2 POLLUTANTS FOR ANALYSIS, REGULATIONS, STANDARDS AND METHODOLOGIES

In accordance with the *CEQR Technical Manual*, the Future No Build and Proposed Action's effects on air quality are determined by analyzing the applicable pollutants from mobile sources, stationary sources and construction activities. For this Project, vehicular movements *outside* the site on the affected roadway network are considered mobile-source, while vehicular movements *within* the garage are considered stationary source, due to the assumed rooftop vent (stationary point source).

The Future No Build and the Proposed Action include an enclosed parking area and building (utilized for office space). Based on Table 3Q-2 of the *CEQR Technical Manual*, pollutants of potential concern for enclosed parking areas, which would induce passenger vehicle and truck traffic, include localized carbon monoxide (CO) and PM. Pollutants of potential concern for buildings that require a boiler for heating and hot water systems include sulfur dioxide (SO_2) or nitrogen dioxide (NO_2), depending on fuel type. The Future No Build and Proposed Action have been assumed to utilize natural gas to power the heat and hot water systems, which is conservative, as the Garage would use steam based on updated facility designs.

In addition to federal mandates regarding more stringent air quality standards and source controls, New York City has adopted Local Law 39 of 2005 (Local Law 39/2005) and associated amendments (24-163.5). Local Law 39 requires ~~Best Available Retrofit Technology (~~BART~~)~~ (verified by USEPA or California Air Resources Board) on DSNY diesel trucks that predate the stringent 2007 USEPA Model Year standards. BART includes means and measures to reduce PM emissions at the highest classification

level for diesel emission control strategies, for a particular engine and application. This technology must also achieve the greatest reduction in emissions of NO_x at the required PM reduction, within a reasonable cost. In accordance with Local Law 39/2005, DSNY has selected Johnson Matthey catalyzed continuously regenerating trap (CCRT) particulate filter technology for its collection truck retrofits, which the USEPA has certified achieves 90 percent reduction in PM.

By 2012, DSNY heavy duty diesel trucks of Model Year 2007 or newer would meet stringent USEPA standards for PM and NO_x, while older trucks would be fitted with particulate filters certified to reduce particulate emissions by 90 percent or greater. In addition, DSNY would use low emission non-diesel vehicles, such as those fueled with Ethanol E85 or gasoline/electric hybrids. Conservatively, air pollutant concentration reductions from DSNY low emission non-diesel vehicles ~~and diesel particulate filter retrofits~~ were not taken into account in this air quality analysis.

Operations associated with the salt shed would generate minor amounts of air emissions on an infrequent basis. This would include the use of a front-loader to load trucks and to re-supply the facility. The front-loader would be equipped with a diesel particulate filter and use ULSD fuel. No further analysis is warranted for the salt shed.

Mobile Sources

A traffic study for the affected roadway network was performed for the analysis year of 2012, with and without the Proposed Action. The affected roadway network limits include West Street/Route 9A, Hudson Street, Clarkson Street and Canal Street. As discussed in Chapter 17 (Traffic and Parking), traffic was assigned to specific travel patterns that access the site. Since the Future No Build and Proposed Action would not significantly affect traffic conditions over a large area, a mesoscale or neighborhood analysis is not warranted. However, a microscale review was conducted to ensure that there is no detriment to localized air quality. Therefore, peak hour traffic volumes were reviewed at each intersection within the affected roadway network to determine whether a microscale mobile-source air quality analysis would be warranted for either CO or PM. The project-affected approach volumes (positive or negative) were added to calculate the "total net" increase or decrease at each intersection based on DSNY travel patterns. The NYCDEP's interim guidance supplementing the *CEQR Technical Manual* provided updated review criteria for $PM_{2.5}$ (fine inhalable particulate matter equal to or less than 2.5 micrometers).

Stationary Sources

Stationary-source contributions under the Future No Build condition and with the Proposed Action include the <u>assumed</u> parking area rooftop exhaust vent and heat and hot water systems. Vehicular emissions that occur within the site are addressed as a stationary source since the cumulative interior concentrations within the parking area would be dispersed through a rooftop vent.

Construction Activities

As per the *CEQR Technical Manual*, air quality impacts during construction would warrant a detailed analysis only for projects with long term construction schedules. Air quality, as it relates to construction of the Future No Build and Proposed Action, was reviewed.

19.2.1 Regulations and Standards

Criteria Pollutants

The federal Clean Air Act (CAA) as amended provides authority to the USEPA to regulate air quality and delegates responsibility to state and local governing bodies. This allows each state/local

government the opportunity to prevent and control air pollution at the source. The 1970 Clean Air Act Amendments (CAAA) required USEPA to establish ceilings for certain pollutants based upon the identifiable effects each pollutant may have on public health and welfare. USEPA set National Ambient Air Quality Standards (NAAQS) for CO, ozone (O_3), NO_2, lead, SO_2, coarse inhalable PM 10 micrometers and smaller (PM_{10}), and in 1997, a new particulate standard for fine inhalable PM 2.5 micrometers and smaller ($PM_{2.5}$). These standards are subject to revision from time to time in light of new scientific information. Standards set by USEPA and NYSDEC are shown in Table 19-1.

Table 19-1. U.S. Environmental Protection Agency
National and State Ambient Air Quality Standards

Pollutant	Averaging Period	New York	National Primary	National Secondary
Carbon Monoxide	1 hour 8 hour	35 ppm 9 ppm	35 ppm 9 ppm	- -
Ozone	1 hour 8 hour	0.12 ppm 0.075~~0.08~~ ppm	0.12 ppm 0.075~~0.08~~ ppm	0.12 ppm 0.075~~0.08~~ ppm
Nitrogen Dioxide	1 year	0.05 ppm	0.053 ppm	0.053 ppm
Lead	3 months	-	1.5 ug/m^3	1.5 ug/m^3
Sulfur Dioxide	3 hour 24 hour 1 year	0.50 ppm 0.14 ppm 0.03 ppm	- 0.14 ppm 0.03 ppm	0.5 ppm - -
Inhalable Particulates (PM_{10})	24 hour	-	150 ug/m^3	150 ug/m^3~~-~~
Fine Particulates ($PM_{2.5}$)	24 hour 1 year	- -	35 ug/m^3 15 ug/m^3	35 ug/m^3~~-~~ 15 ug/m^3
Hydrocarbons (non-methane) 6-9 AM	3-hour	0.24 ppm	-	-

Source: USEPA and NYSDEC, 2007.
ppm --parts per million; ug/m^3 – micrograms per cubic meter.
See 40 CFR Part 50 for additional notes.

NAAQS are of two types: primary and secondary. The primary standards define air quality levels intended to protect the public health including sensitive populations, such as asthmatics, children and the elderly, with an adequate margin of safety. The secondary standards define levels of air quality intended to protect the public welfare from any known or anticipated adverse effects of a pollutant (e.g. soiling, vegetation damage, material corrosion).

Each of these pollutants is monitored on a continuous basis throughout New York State by the NYSDEC. Monitoring data is used to determine compliance with state and federal air quality standards, provide an early warning system for pollutant concentrations, and track trends or changes in pollutant levels. Section 107 of the 1970 CAAA requires the USEPA and states throughout the country to identify those areas not meeting the NAAQS. An area which does not meet a standard is referred to as in "non-attainment". The MN 1/2/5 Garage and Salt Shed are located within New York County, which is in attainment for ozone (1-hour), NO_2, lead and SO_2 and in non-attainment for ozone (8-hour), $PM_{2.5}$ and PM_{10}.

Lead and Sulfur Dioxide

The Proposed Action would not introduce any significant sources of lead. Therefore, a lead analysis was not warranted. SO_2 emissions are primarily associated with the combustion of high-sulfur fuel such as oil and coal. As the Proposed Action would utilize ULSD fuel in DSNY trucks and natural gas or steam rather than fuel oil for facility heating, an SO_2 analysis was not warranted.

Carbon Monoxide (CO)

CO, a colorless and odorless gas, is produced in the urban environment mainly by the incomplete combustion of gasoline and other fossil fuels. Elevated levels of CO can affect the ability of the blood to carry oxygen and results in impaired cardiovascular, pulmonary and nervous systems. Since CO is a reactive gas that does not persist in the atmosphere, CO concentrations can vary greatly over relatively short distances. Elevated concentrations are generally limited to locations near crowded intersections, heavily traveled and congested roadways, parking lots and garages. Therefore, CO concentrations must be predicted on a local, or microscale basis. CO emissions are typically higher from gasoline engines than diesel engines, and are usually associated with idling vehicles at congested intersections and cold engine startup, before the oxidation catalyst has sufficiently warmed up.

New York County was previously designated as a non-attainment area for CO. After many years of CO levels measured below thresholds, USEPA re-designated New York County as an attainment area in 2004 (final designation). New York and the controlling Metropolitan Planning Organization (MPO) must continue with a Maintenance Plan which includes control measures, transportation conformity budgets, and a Contingency Plan to support the re-designation. Therefore, New York County is considered a maintenance area for CO.

The screening protocol for CO in the *CEQR Technical Manual* provides guidance that actions generating or diverting a peak hour volume of 100 vehicles or more on the affected roadway network would require a microscale mobile-source CO analysis utilizing the air dispersion model CAL3QHC. This screening level is conservative, as it does not take into account the reductions in CO that are achieved on DSNY trucks meeting USEPA 2007 standards and from local law retrofit requirements, or the fact that diesel engine CO emissions are much lower than from cold-start gasoline engines. DSNY's CCRT diesel particulate filter retrofits achieve a USEPA-certified 85 percent reduction in CO emissions (M.J. Bradley & Associates, October 2005). When CO levels are modeled, the *CEQR Technical Manual* also provides *de minimis* impact criteria based on the incremental change in 8-hour CO concentrations.

The traffic analysis (SectionChapter 17.4) performed for the 2012 Future No Build condition predicted a maximum increment of 36 vehicles (cars and trucks) at the intersection of Spring Street and Washington Street during the peak PM traffic hour. The maximum number of project-related vehicles (combination of city cars and trucks) is predicted at the Spring Street and Washington Street intersection under the 2012 WeekdaySaturday PM Proposed Action condition. A total of 80104 vehicles is predicted at the Washington Street approach.; however, Tthere is a reduction of 1226 vehicles at the Spring Street approach compared with the Future No Build condition., yielding a net total of 79 project-related vehicles at this intersection. As this is less than the CO screening level of 100 vehicles, a microscale mobile-source CO analysis is not warranted, and it can be concluded that future CO levels from mobile sources under the Future No Build and Proposed Action would not result in a significant adverse CO mobile source air quality impact.

Emissions related to vehicular operations, within the Future No Build and Proposed Action, are assumed to be mechanically ventilated through a rooftop vent. The ventilated air was assessed for its potential to affect ambient levels of CO at discrete receptors nearest the vent, based on a cumulative analysis of all floors.

The *CEQR Technical Manual* does not include a *de minimis* screening protocol for CO concentrations related to parking garages. Therefore, a CO analysis was performed utilizing the "Guidelines for Evaluating Air Quality from Parking Garages" from Appendix 1 of the *CEQR Technical Manual*. Based on the methodology established for a mechanically ventilated parking garage, the total interior CO concentration of the Future No Build and Proposed Action was calculated and dispersed from a rooftop vent. By determining the appropriate horizontal and vertical dispersion coefficients at the vent faces, CO concentrations were estimated at the closest residential air intake, assuming the concentration in the garage is equal to the concentration leaving the vent.

The closest residential site is the Urban Glass House (330 Spring Street), located in the southeast quadrant of the Spring Street and Washington Avenue intersection. The building is approximately 120 ft high and it is assumed that it has a rooftop air intake vent. The distance between the two vents (garage and Urban Glass House) was conservatively assumed as the distance between the nearest corners of each building (129.25 ft).

An enclosed parking garage would require mechanical ventilation to limit pollutant concentrations to levels below Occupational Safety and Health Administration (OSHA) standards. The analysis assumes one air exchange per hour. This assumption is conservative, as the garage is proposed to have a higher air exchange capability, notably for the mechanics area (four air exchanges per hour required) and is being designed overall to achieve six air exchanges per hour.

Under the Future No Build condition, UPS would operate in an open-air, ground-level lot, similar to the existing condition. A commercial building would be constructed above part of the lot, maintaining the open-air features of the UPS staging lot. An intermediate level for office parking was assumed on the second floor of the commercial building. The height of the commercial building is projected to be 165 ft. The area of the intermediate parking level is estimated to be 48,636 sq ft and the mean travel distance was calculated based on 2/3 of the total distance a vehicle would travel from the entrance of the intermediate level to the last parking space.

It was assumed that only light-duty gasoline vehicles (LDGV) would access the parking level under the Future No Build condition. All peak hour traffic volumes traveling to/from the site were assumed to enter/exit the parking area to/from one location (along Washington Street). It was assumed that all exiting vehicles operate with cold engines and all entering vehicles operate with hot-stabilized engines. Therefore, the composite emission factors used for the Future No Build condition were 70.80 g/hour (cold idle), 20.25 g/mile (cold 5 mph) and 11.08 g/mile (hot 5 mph).

The Proposed Action garage would include a ground floor (designated for UPS trailers), a small vehicle parking level and three DSNY truck parking levels ~~(one for each DSNY District)~~. ~~The overall height of the new MN 1/2/5 Garage is estimated between 140 and 150 ft.~~ For this analysis, the height of MN 1/2/5 Garage was conservatively assumed to be 140 ft. The ground floor of the garage consists of UPS operations and a refueling station for DSNY trucks and City vehicles. DSNY trucks and City vehicles would access the MN 1/2/5 Garage through ground floor entrance/exit ramps located along West Street/Route 9A and Washington Street. The DSNY small vehicle parking level (located directly above the ground floor) would be accessed through a separate entrance/exit ramp along Washington Street. DSNY trucks associated with MN 1 would utilize some of the third and fourth~~second~~ floors, trucks associated with MN 5 would utilize portions of the fourth~~third~~ floor and trucks associated with MN 2 would utilize the fifth~~fourth~~ floor of the new garage. Since UPS and DSNY operations are independent of one another, this analysis incorporates only the DSNY small vehicle level and three DSNY truck parking levels.

The emission factors calculated for each floor include all vehicular activity occurring on that floor. All vehicles, except those bound for the small vehicle level, travel through the DSNY portion of the

ground floor. As trucks (and City cars) travel upward within the parking garage, MN 5 and MN 2 vehicles pass through the third vehicle~~MN 1~~ floor and MN 2 vehicles continue through the MN 1/MN 5 level to reach their parking location.

Composite emission factors per floor were developed for peak traffic hours based on specific volumes within individual vehicular classes and their respective emission factors. The composite emission factors were calculated based on the predicted number of vehicles in specific weight classes on each floor. Collection, recycling, basket and "other" trucks return empty weighing between 33,001 and 60,000 pounds (HDDV8A). Relay and other trucks were assumed to return full, weighing 60,001 pounds or more (HDDV8B). Due to lower emissions rates associated with vehicles in the HDDV8B classification, the analysis was conservatively performed utilizing HDDV8A emissions factors. City/employee cars (LDGV) associated with DSNY operations are a specific vehicular class, and are not dependent on weight. No credit was taken for the proportion of light and medium duty vehicles that would be Partial Zero Emission Vehicles (PZEV) such as gas-electric hybrid cars that would constitute most of the DSNY light duty fleet by the end of 2012, pursuant to local law.

It was also been assumed that all exiting vehicles operate with cold engines and all entering vehicles operate with hot-stabilized engines. Under the Proposed Action, composite 1-hour emission factors were based on the hourly period with the maximum number of departing (cold start) LDGV. Table 19-2 includes the composite (LDGV and HDDV8A) MOBILE6.2 emission factors for the Proposed Action based on vehicles entering and exiting the MN 1/2/5 Garage for the 1-hour and 8-hour time periods.

Table 19-2. Composite Emission Factors Within MN 1/2/5 Garage

Floor	Averaging Period	Cold Idling Emission Rate (g/hour) Factor	Cold 5 mph Emission Rate (g/mile) Factor	Hot 5 mph Emission Rate (g/mile) Factor
Ground Floor	1-Hour	33.24	10.06	7.52
Small Vehicle Floor	1-Hour	70.80	20.25	11.08
2nd Floor (MN 1 Trucks)	1-Hour	31.57	9.61	7.37
3rd Floor (MN 5 Trucks)	1-Hour	33.42	10.11	7.54
4th Floor (MN 2 Trucks)	1-Hour	36.19	10.86	7.80
Ground Floor	8-Hour	29.51	9.05	7.17
Small Vehicle Floor	8-Hour	70.80	20.25	11.08
2nd Floor (MN 1 Trucks)	8-Hour	29.51	9.05	7.17
3rd Floor (MN 5 Trucks)	8-Hour	29.65	9.09	7.18
4th Floor (MN 2 Trucks)	8-Hour	29.70	9.10	7.19

Background CO levels were ~~calculated~~ based on the highest monitored value over the most recent period of five years.~~an average of 2nd highest maximum 1-hour and 8-hour concentrations from 2002 to 2006.~~ The data were obtained from USEPA at the closest Manhattan CO monitoring site, which is 288 East 57th Street. Table 19-3 details the CO background utilized for the analysis.

Table 19-3. Background CO Levels

Monitoring Location: 288 East 57th Street		
Year	**1-Hour Background(1)**	**8-Hour Background(2)**
2002	3.2	2.2
2003	4.0	2.5
2004	2.6	2.1
2005	2.2	1.6
2006	2.3	1.7
Highest Value	**4.0**	**2.5**

(1) 1-hour background achieved~~calculated~~ by taking second highest maximum concentration of the year~~over most recent five year period~~.
(2) 8-hour background achieved~~calculated~~ by taking second highest maximum concentration of the year~~over most recent five year period~~.
Source**:** http://www.epa.gov/air/data/monvals.html?st~NY~New%20York

The composite emission factors and total volumes entering and exiting the garage (maximum 1-hour and average 8-hour) along with the mean travel distance and the total square footage on each floor were utilized to calculate the maximum 1-hour and average 8-hour CO concentrations, respectively. The concentrations on each floor were totaled and the CO background concentrations were added to determine the total CO concentrations (1-hour and 8-hour) within the parking garage.

The cumulative 8-hour CO concentration within the garage was then dispersed via the rooftop vent to the rooftop air intake vent on the Urban Glass House (a distance of 129.25 ft). Utilizing the 8-hour emission factor, concentration, background level and an approved persistence factor, an 8-hour CO concentration was calculated. No credit was taken for CO emissions from the No Build commercial building, which is conservative. Results are detailed in Sections~~Chapter~~ 19.4 (Future No Build) and 19.5 (Future Build).

Nitrogen Oxides, VOCs and Ozone

NO_x are of concern because of their role, together with Volatile Organic Compounds (VOCs), as precursors in the formation of ozone. Naturally occurring ozone in the upper atmosphere protects the population from harmful ultraviolet rays. By contrast, ground-level ozone can cause serious adverse health effects by damaging cells that line our airways. Therefore, ozone can aggravate respiratory disease and cause people to be more susceptible to respiratory infections. Ground-level ozone is created when NO_x and VOCs react in the presence of sunlight and heat. Because the reactions are slow, and occur as the pollutants travel downwind, elevated ozone levels are often found many miles from the source of the precursor pollutants. The effects of NO_x and VOC emissions from all sources are therefore analyzed on a regional basis.

The incomplete combustion of fossil fuel, power plants and other sources of combustion constitute the primary sources of NO_x. The nearest ozone monitoring station to the project study area is located in Bayonne, New Jersey (Hudson County). To determine attainment, an average is calculated over a three-year period based on the 4th highest daily 8-hour maximum concentration. Ozone monitoring data (1-hr and 8-hr), three-year averages and respective standards are included in Table 19-4. The three-year average of 8-hour ozone concentrations at the Bayonne monitoring station is 0.085 ppm, which exceeds the 2008 NAAQS (0.075~~0.08~~ ppm).

Table 19-4. Ozone Monitoring Data (Bayonne 2004 to 2006)

Year	1-Hour Concentration[(1)] (ppm)	8-Hour Concentration[(2)] (ppm)
2004	0.113	0.079
2005	0.120	0.091
2006	0.100	0.086
3-Year Average	0.111	0.085
Standard	0.12	0.075~~0.08~~

(1) 2nd highest daily maximum
(2) 4th highest daily maximum
Source: http://www.epa.gov/air/data/monvals.html?st~NY~New%20York

In recent years documented ozone levels have been decreasing. Substantial reductions have already been achieved through reductions in ozone precursors from power plants to the west of New York City, reducing intrastate and interstate ozone transport. At present, 30 New York counties do not meet the current 8-hour ozone standard, including New York County, which is considered a moderate non-attainment area for ozone by USEPA. The most recent New York State Implementation Plan (NYSIP) designed to achieve compliance with the ozone NAAQS included 2002 baseline emission inventory and indicated ozone attainment may be achieved by 2009. USEPA requires ozone attainment by April 15, 2010. The 2006 NYSIP for ozone (8-hour NAAQS) is projected to reduce VOC emissions in the New York metropolitan area by 295 tons per ozone season day from 2002 baseline emissions of 1217 tons to 922 tons in 2012. For NO_x, projected decreases are 207 tons per ozone season day, from 2002 baseline emissions of 762 tons to 555 in 2012. In 2008~~2007~~, USEPA ~~proposed~~ lowered~~lowering~~ the primary and secondary 8-hour ozone standard~~s~~ to 0.075 ppm. ~~A final decision regarding this proposed revision is expected in March 2008.~~

The Proposed Action would result in a reduction in DSNY collection truck vehicle miles traveled of approximately 3,677~~5,600~~ annually, compared to the Future No Build condition. Also as noted above, pursuant to Local Law 39/2005 DSNY diesel trucks are required to have BART that also achieves reductions in NO_x at a reasonable cost. By 2010, all new DSNY heavy duty truck diesel truck purchases will be required to meet the more stringent USEPA 2010 NO_x standards of 0.2 grams per brake horsepower hour (g/bph-hr) of NO_x, compared to 6 g for 1990 trucks, 5 g for 1991-97 trucks, 4 g for 1998-2003 trucks, and 2.5 g for 2004 to 2006 trucks. Therefore, an analysis of project-related emissions of these pollutants from mobile sources is not warranted, and it can be concluded that no measurable adverse impact would result from the Proposed Action with respect to mobile source NO_x emissions or ozone levels.

Nitrogen Dioxide – Stationary Source

The analysis performed for the Future No Build and Proposed Action conditions assume a heat and hot water system for all uses except the UPS Staging Lot. It has been further assumed that UPS will not heat or cool the staging area under the Future No Build and Proposed Action. Therefore, a stationary source NO_x analysis was performed based on information available for the Proposed Action. The *CEQR Technical Manual* provides guidance related to projects that propose different fuel types to power heat and hot water systems. The need to perform an air quality analysis is based on fuel type, stack height, area of the building and the minimum distance from the source and the nearest discrete receptor.

Screening for heat and hot water system air emissions was initially based on Figure 3Q-10 of the *CEQR Technical Manual Appendices*. Assuming a maximum development of 427,250 sq ft, the site is screened based on fuel type, the estimated stack height and distance from the nearest building of similar

or greater height. The Proposed Action was assumed to include a natural gas powered heat and hot water system and a stack located at the rooftop, 140 ft high. No credit was taken for emissions from the commercial building under the Future No Build condition, which is conservative. The closest building of similar or greater height is more than 400 ft away based on a garage rooftop assumed to be 140 ft high. Based on Figure 3Q-10, there is no potential for significant air quality impact from the heat and hot water system. With the updated project design of a lower roof (approximately 115 ft) and the use of steam rather than natural gas, there would be no emissions from the building's heat and hot water system. As per the *CEQR Technical Manual*, a stationary source analysis for stack emissions was not warranted and therefore any resultant emissions would not significantly impact receptors.

Particulate Matter (PM)

PM is the mixture of solid particles and liquid droplets found in the air. Small respirable particulates are not filtered by the nose and throat as larger particulates are, and can reach deep in the lungs causing lung disease. Respirable PM can irritate the membranes of the respiratory system and therefore affect sensitive groups such as the elderly, individuals with cardiopulmonary disease such as asthma, and children. PM also acts as a substrate for the adsorption of other pollutants, often toxic and some likely carcinogenic compounds. PM is created by a wide variety of natural sources and by fossil fuel combustion sources such as boilers, home heating, motor vehicles and power generation, as well as chemical reactions in the atmosphere.

PM is monitored and measured according to its size. (New York State has an outdated standard for Total Suspended Particulates (TSP) but it is no longer enforced.) PM_{10} refers to "coarse" inhalable particulates equal to or less than 10 micrometers in diameter. New York County is a moderate non-attainment area for PM_{10}. The closest PM_{10} monitoring station to the Proposed Action site is at 350 Canal Street. To determine 24-hour PM_{10} attainment, an average is calculated based on the maximum~~99th percentile~~ 24-hour concentration (ug/m^3) for the past three years. PM_{10} monitoring data (24-hr), three-year averages and respective standards are presented in Table 19-5. The three-year average of PM_{10} concentrations (24-hr) does not exceed the standards.

Table 19-5. PM_{10} Monitoring Data (350 Canal Street, 2004 to 2006)

Year	24-Hour Concentration[(1)] (ug/m^3)
2004	57
2005	60
2006	59
3-Year Average	58.7
Standard	150

[(1)] Maximum~~99th percentile~~ concentration
Source: United States Environmental Protection Agency, "Reduced Frequency Distribution Report."

$PM_{2.5}$ refers to "fine" respirable particles less than or equal to 2.5 micrometers in diameter. Due to the serious health effects associated with fine respirable particulate matter, USEPA and NYSDEC began monitoring $PM_{2.5}$ in 1999. New York County, as well as many other New York Counties (Orange, Westchester, Bronx, Queens, Kings, Richmond, Nassau and Suffolk) and much of New Jersey are in non-attainment for $PM_{2.5}$. The nearest $PM_{2.5}$ monitoring station to the site is located at 350 Canal Street (Manhattan, New York County). To determine 24-hour $PM_{2.5}$ attainment, an average is calculated based

on the 98th percentile, 24-hour concentration (ug/m^3) over the past three years. $PM_{2.5}$ monitoring data (24-hr and Annual Mean), three-year averages and respective standards are shown in Table 19-6. The three-year average of 24-hour $PM_{2.5}$ concentration is 38.3 ug/m^3, which exceeds the new standard of 35 ug/m^3.

Table 19-6. $PM_{2.5}$ Monitoring Data (350 Canal Street, 2004 to 2006)

Year	24-hour Concentration[(1)] (ug/m^3)	Annual Mean Concentration (ug/m^3)
2004	39	14.5
2005	40	15.7
2006	36	12.8
3-Year Average	38.3	14.3
Standard	35	15

(1) 98th percentile concentration
Source: http://www.epa.gov/air/data/monvals.html?st~NY~New%20York

New York State is required to prepare and submit a SIP to USEPA in 2008 to achieve compliance with the annual $PM_{2.5}$ standard by 2010. USEPA will make attainment determinations for the new 24-hour $PM_{2.5}$ standard in April 2010; $PM_{2.5}$ SIPs would be due by April 2013, and would be designed to meet the 24-hour $PM_{2.5}$ standard by April 2015, although this may be extended in some cases up to April 2020. Federal measures to address $PM_{2.5}$ include requiring ULSD fuel for on-road diesels starting in 2006, and requiring new heavy duty diesel trucks to meet stringent PM standards of 0.01g/bph-hr starting with the 2007 Model Year. New off-road diesels, locomotives and marine diesels are also required to achieve reductions in PM and utilize ULSD fuel over the coming decade.

NYSDEC has a draft policy to provide interim guidance on evaluating $PM_{2.5}$ impacts. This draft policy would apply only to facilities with the potential to emit 15 tons of PM_{10} or more annually. Such a facility would be deemed to have a significant adverse impact if the maximum impacts are predicted to increase $PM_{2.5}$ concentrations by more than 0.3 ~~u~~g/m^3 averaged annually or more than 5 ~~u~~g/m^3 on a 24-hour basis. The Proposed Action would not be subject to the NYSDEC draft policy as the facility emissions would be well under the 15 ton per year threshold.

The *CEQR Technical Manual* addresses PM, but not $PM_{2.5}$ specifically. USEPA has issued rules for analyzing $PM_{2.5}$ impacts in non-attainment areas, effective July 15, 2008, but they only apply to projects with the potential to emit at least 10 tons of direct $PM_{2.5}$ per year, which would not include the current project.~~is in the process of formulating a significance threshold for the analysis of $PM_{2.5}$ impacts from a project, but has not finalized rulemaking for this purpose.~~ NYCDEP has developed an interim guidance for evaluating potential $PM_{2.5}$ impacts, and recently revised its guidance (July 2007) to take into consideration the reduction in USEPA's 24-hour standard from 65 ug/m^3 to 35 ug/m^3 (December 2006). NYCDEP's current guidance would find a significant adverse $PM_{2.5}$ impact based on a predicted 24-hour maximum~~average~~ $PM_{2.5}$ incremental increase of 5 ug/m^3 or greater at a discrete receptor location. $PM_{2.5}$ concentration increments predicted to be greater than 2 ug/m^3, but no greater than 5 ug/m^3, at a discrete receptor location could be considered a significant adverse impact on air quality based on the magnitude, frequency, duration, location, and size of the area of the predicted concentrations.

With the recommended 5 ug/m^3 significance level for 24-hour maximum~~average~~ concentrations, NYCDEP utilized USEPA's previous emissions model PART5 to determine that a project resulting in 21 or fewer HDDV trips in the peak hour at any location would produce 0.6111g/mile each for a total of 12.8 g/mile and thus remain below the significance level and result in insignificant $PM_{2.5}$ impacts, based on

2002 registrations of diesel trucks in New York State. Using NYCDEP's latest guidance of a potential significant impact with an increment of 2 ug/m^3, the screening level is reduced for heavy duty diesel trucks to 5.1 g/mile (12.8g/mile x 2 / 5 = 5.1 g/mile). As older diesel trucks in the state are replaced with newer, cleaner vehicles, the number of diesel trucks - based on the state composite of truck registrations - required to produce NYCDEP's $PM_{2.5}$ screening threshold of 5.1 g/mile, will increase. Therefore, utilizing the Build Year (2012) composite HDDV8A emission factor of 0.1583 g/mile calculated by the USEPA emissions model MOBILE6.2, 32 HDDVs would be equivalent to the 5.1 g/mile that NYCDEP recommends for $PM_{2.5}$ screening (5.1 g/mile / 0.1583 g/mile = 32 HDDV).

A more refined analysis based on the actual DSNY fleet in 2012 rather than the default composite state truck registration values used by MOBILE6.2 yields a screening level of 180 HDDV8A for mobile source $PM_{2.5}$ (Appendix D). DSNY collection trucks have a useful service life of seven years. As noted above, under Local Law 39/2005, by July 1, 2012 the entire DSNY fleet must either meet USEPA 2007 Model Year HDDV standards of 0.01 g/bhp-hr for particulates, or be fitted with BART that achieve a certified reduction of 90% or more (i.e., of the 1998 to 2006 standards of 0.1 g/bhp-hr, which would likewise yield 0.01 g/bhp-hr). Due to fleet turnover, by 2012, 71 percent of DSNY's collection trucks would be 2007 year or newer, while 29 percent would have BART retrofits, achieving a particulate emission level equivalent to that of the 2007 Model Year.

The Proposed Action would eliminate the use of high-sulfur No. 2 fuel oil for heating at the current MN 1 and MN 2 Garages, and add natural gas or steam-powered heating at the MN 1/2/5 Garage. The MN 2 Garage currently uses natural gas, and thus would not switch to a cleaner fuel under the Proposed Action. Heating oil has considerable higher air emissions per BTU than natural gas, and therefore the proposed change to natural gas or steam for District Garages 1 and 5 would be beneficial to City air quality.

19.2.2 Non-Criteria Pollutants

Hazardous air pollutants (HAPs), or toxic air pollutants, are not criteria pollutants considered to be of nationwide importance, but are recognized by USEPA as chemicals that can cause serious human health effects and harm the environment. Over 188 HAPs have been identified including those that cause cancer, neurological, respiratory and reproductive effects. HAPs are mainly caused by man-made sources, such as mobile sources (cars, trucks, construction equipment), stationary sources (factories, refineries, power plants), as well as indoor sources (certain building materials, cleaning solvents). Natural source HAPs are caused by volcanic eruptions and forest fires. USEPA is currently working with state, local and tribal governments to reduce air toxic releases of 188 pollutants to the environment. USEPA separates HAPs into four emission types; major industrial sources, area and natural sources, on-road mobile sources and non-road mobile sources. USEPA, New York State and New York City have been active in establishing regulations to reduce HAPs.

USEPA has recognized the need to evaluate HAPs, including mobile-source air toxics (MSATs). Although existing studies and on-going research to better characterize health impacts are currently under review by USEPA, no established USEPA procedure to quantify and mitigate MSAT emissions has been developed. A study was conducted by the Federal Highway Administration (FHWA), which compared hypothetical emission impacts for a sample highway project. The study was based on the product of a composite MSAT emission factor produced by USEPA's MOBILE6.2 mobile emission model per roadway link and the vehicle miles of travel (VMT). Based on the study results, MSATs were predicted to decrease substantially over the next 25 years due to implementation of the USEPA's new programs for fuel and mobile source vehicle engine emission standards. FHWA recognizes that MSATs will decline, unless VMT more than double by 2020 (FHWA, February 2006).

The *2005 Final Environmental Impact Statement for the New York City Comprehensive Solid Waste Management Plan* (2005 SWMP FEIS) considered the potential impact from HAPs from diesel engines, including DSNY trucks, without taking credit for the diesel emission reductions mandated by Local Law 39 of 2005 or subsequent federal law for such trucks, or the reductions subsequently mandated or proposed on new marine diesels and locomotives under USEPA regulations. At issue were up to 122 DSNY collection trucks per hour at the various transfer facilities under review, plus on site-diesel equipment such as front loaders and diesel tug or locomotive emissions at the facility, as applicable. Such emissions would be considerably higher than emissions from DSNY's diesel trucks associated with the MN 1/2/5 Garage Proposed Action. The following text from the 2005 SWMP FEIS (pp. 3-74 through 3-77) is relevant for the consideration of HAPs associated with diesel vehicles:

> Small quantities of a wide range of the non-criteria air pollutants known as toxic air pollutants that are emitted from diesel-fueled vehicles are also of concern. These pollutants can be grouped into two categories: carcinogenic air pollutants and non-carcinogenic air pollutants. Carcinogenic pollutants in diesel exhaust emissions include formaldehyde; benzene; benxo(p)pyrene; 1,3 butadiene and acetaldehyde. Non carcinogenic pollutants include toluene, xylenes, acrolein and various polycyclic aromatic hydrocarbons. No federal standards have been promulgated for toxic air pollutants; however, NYSDEC has established acceptable ambient levels for these pollutants based on human exposure criteria in the *Guidelines for the Control of Toxic Ambient Air Contaminants*. In this document, NYSDEC outlines short-term guideline concentrations (SGCs) and annual guideline concentrations (AGCs). Estimated concentrations of toxic pollutants were compared with these values.
>
> USEPA has developed approaches that can be used to assess the potential impacts associated with carcinogenic and non-carcinogenic air pollutant releases. USEPA's "Hazard Index Approach" together with NYSDEC guidelines, were used to assess the potential impacts associated with chronic and acute risk from the release of non-carcinogenic toxic air pollutants from each Proposed Plan Facility and Alternate Facility, as applicable. The potential impacts of non-carcinogenic air pollutant releases from on-site operating diesel-powered equipment, collection vehicles and tugboats were assessed as follows:
>
> - Ratios of the maximum estimated pollutant concentration, divided by its respective health-related NYSDEC guideline values (SGCs and/or AGCs) were estimated for each applicable non-carcinogenic toxic pollutant;
> - Short-term (1-hour) ratios were developed to assess the potential for acute risk exposure, and annual ratios were developed to assess the potential for chronic risk exposures;
> - The short-term and annual ratios for each of these pollutants were summed to obtain the total short-term and annual ratios of all pollutants combined;
> - The total short-term and annual ratios were compared with a hazard index of 1; and
> - If the total ratios were found to be less than 1, then no significant air quality impacts would occur due to these non-carcinogenic pollutant increases.
>
> NYSDEC cancer risk thresholds, which are based on USEPA's IRIS database, were used to analyze the potential impact of carcinogenic air pollutants from each Proposed Plan

facility and Alternative Facility, as applicable. The potential cancer risk associated with each pollutant was estimated, and the total incremental cancer risk associated with the release of all the carcinogenic toxic pollutants was estimated, by summing the risk associated with each of the carcinogenic pollutants on a receptor-by-receptor basis.

USEPA considers that an overall incremental cancer risk from a proposed action of less than one-in-one million is not significant. If the total combined incremental cancer risk of all of the carcinogenic toxic pollutants at the sensitive receptor locations was less than one-in-one million, cancer-related air quality impacts were determined to be insignificant.

Based on the types of pollutants associated with the Proposed Plan facilities and Alternative Facilities, as applicable, 16 toxic compounds that have been identified as emissions from diesel equipment and that have emission factors developed by USEPA were considered in this analysis, along with their respective NYSDEC guideline values, where were revised in 2000. [NYSDEC Division of Air Resources-1(DAR-1) AGC/SGC Tables, July 12, 2000]. The emission factors used for each of the toxic compounds were obtained from USEPA's AP-42 Compilation of Air Pollutant Emission Factors, Table 3.3-2 Speciated Organic Compound Emission Factors for Uncontrolled Diesel Engines, revised in October 1996.

The 2005 SWMP FEIS concluded that at no facility would the combined diesel emissions result in a significant adverse impact to air quality, or exceed the one-in-one million incremental cancer risk (refer to e.g., pp. 4-119 to 4-120, Table 4.15-4: Highest Estimated Non-Cancer Hazard Index and Cancer Risk of Toxic Air Pollutants from On-Site Emissions – Hamilton Avenue Converted MTS).

The MN 1/2/5 Garage and Salt Shed would result in only 2225 peak hour diesel truck trips and highly controlled emissions that are well below the levels reviewed at each facility in the 2005 SWMP FEIS. In addition, the Proposed Action would result in an annual total reduction for DSNY trucks of approximately 3,6775,600 VMT. Therefore, combining the new USEPA programs for fuel and mobile-source vehicle engine emission standards, local clean emission requirements for DSNY's truck and small vehicle fleet, and a reduction in project-related VMTs, it can be concluded that the Proposed Action would not cause a significant adverse impact on air quality from HAPs.

19.3 FUTURE WITHOUT THE PROPOSED ACTION (FUTURE NO BUILD)

The Future No Build condition assumes a commercial development (347,250 sq ft) would share the site with UPS staging operations (80,000 sq ft) on an open air lot by 2012. The commercial building would be approximately 165 ft high. It was assumed that parking for vehicles associated with the commercial development would be included within the building on an intermediate parking level. Conservatively, one rooftop vent was assumed at 165 ft high. DSNY garage operations for Manhattan Districts 1, 2 and 5 would remain as at present. Air quality impacts under the Future No Build condition were assessed utilizing available information and reasonable assumptions pertaining to mobile sources, stationary sources and construction activities. Appendix D contains the supportive data assumed within the air quality analysis.

$PM_{2.5}$

A microscale mobile-source $PM_{2.5}$ analysis was not necessary since the Future No Build condition results in fewer than 32 HDDV trips on the affected roadway network based on the traffic analysis (SectionChapter 17.4). The maximum number of 11 net HDDV is estimated at the intersection of Route 9A and Clarkson Street during the peak AM traffic hour. Therefore, future $PM_{2.5}$ levels as a result

of mobile sources are not predicted to have a significant adverse impact under the Future No Build condition.

It is estimated that all trucks associated with this Future No Build condition would be delivery trucks and would not access the intermediate, second floor parking level (UPS truck staging on the site would not represent a new source). As a result, no stationary source $PM_{2.5}$ analysis would be required to assess air quality impacts from the parking level vent. Therefore, it can be concluded that $PM_{2.5}$ levels in the Future No Build condition would not significantly impact discrete receptors.

Carbon Monoxide (CO)

The Future No Build condition would not generate more than 100 vehicle trips at any intersection in the peak hour, and therefore a detailed mobile-source CO analysis was not warranted and no significant CO impacts from mobile sources would occur. A dispersion analysis was conducted for CO inside the commercial building parking level and from the commercial building's rooftop vent. A maximum 1-hour CO concentration of 4.4 ppm and an 8-hour concentration of 2.7 ppm, including background concentrations of 4.0 ppm and 2.5 ppm, respectively, was predicted. OSHA has established an average 8-hour standard of 50 ppm. The interior 8-hour CO concentration does not exceed the OSHA standard, assuming one air exchange per hour. The analysis estimated a peak 8-hour CO concentration of 2.5 ppm at the closest discrete receptor (Urban Glass House, 330 Spring Street). As shown in Table 19-7, the 8-hour concentration predicted for the Future No Build condition would not exceed the CO NAAQS. Therefore, future CO levels as a result of stationary sources are not expected to result in a significant adverse air quality impact.

Table 19-7. Predicted Maximum Future No Build CO Concentrations

Receptor	8-Hour Concentration (CO) (ppm)	8-Hour NAAQS (CO) (ppm)
330 Spring Street	2.5~~1.8~~	9

Nitrogen Dioxide (NO_2)

Screening for heat and hot water system and/or boiler emissions was based on Figure 3Q-10 of the *CEQR Technical Manual Appendices*. Assuming a development area of 347,250 sq ft, the site is screened based on the fuel type, estimated stack height and distance from the nearest building of similar or greater height. A natural gas powered heat and hot water system for the commercial development above the UPS Staging Lot is conservatively assumed to vent at 165 ft in the Future No Build condition. The closest building of similar or greater height is more than 400 ft away. Based on Figure 3Q-10, there is no potential for significant NO_2 impact from the heat and hot water systems and/or boiler vents.

Construction Activities

Under the Future No Build condition it is assumed that the commercial building would not require an extended construction period and that dust control measures would be employed in accordance with applicable regulations. Demolition would not be required. Off-road construction diesel equipment would be subject to Local Law 77 of 2003 which requires Best Available Technology to control air emissions only from City-sponsored construction projects. Under the *CEQR Technical Manual*, a detailed analysis of construction period air impacts is not warranted, and no significant air quality impacts are expected due to Future No Build construction activities.

19.4 FUTURE WITH THE PROPOSED ACTION (FUTURE BUILD)

To assess air quality impacts from the Proposed Action, available information pertaining to mobile sources, stationary sources and construction activities was reviewed. Screening of $PM_{2.5}$ and of CO from mobile sources has been discussed in the Methodology section. Appendix D contains the technical data from the air quality analyses (MOBILE 6.2 input/output for CO; composite emission factor spreadsheets; CO vent analyses).

$PM_{2.5}$

Potential $PM_{2.5}$ impacts were conservatively screened based on 32 HDDV8A. The maximum net number of 22~~25~~ project-related HDDV trucks in the peak hour is predicted at the intersection of West Street/Route 9A and Houston~~Clarkson~~ Street under the 2012 Saturday AM Proposed Action condition. Therefore, future $PM_{2.5}$ impacts resulting from mobile sources are not expected. By way of comparison the increment of 22~~25~~ peak hour DSNY collection trucks each meeting PM standards of 0.01 g/bhp-hr would produce total PM emissions well below the levels produced by the current MN 1 Garage truck fleet of 15 collection vehicles in 2006. Each such truck has a PM emission rate of 0.1 g/bhp-hr as per USEPA standards for 1998 to 2006 Model Year diesels.

Potential $PM_{2.5}$ impacts resulting from the garage vents were reviewed. On the peak day (Summer Saturday), there would be an average of 8.58 HDDV8A truck trips per hour within the building over a 24 hour period (206/24). Based on updated facility designs, there would be a set of vents for each of the seven truck bays on each floor along the West Street wall, for a total of approximately 40 vents distributed over a façade approximately 110 ft high by 410 ft wide, with each garage floor having a row of such vents. Air purging systems would also be employed for mechanics' areas. All DSNY diesel trucks in 2012 will be equipped with advanced pollution control equipment certified to USEPA Model Year 2007 standards for particulate matter. In view of the foregoing, it can be concluded that the garage vents would not result in a $PM_{2.5}$ incremental impact of 2.0 ug/m at any discrete receptor. ~~Potential $PM_{2.5}$ impacts resulting from the garage rooftop vent were reviewed. The maximum HDDV8A volume of 44 occurs Saturday morning from 6 to 7 AM. Considering all DSNY diesel trucks in 2012 will be equipped with advanced pollution control equipment certified to USEPA Model Year 2007 standards, an emission factor specific to 2012 HDDV8A vehicles with 2007 compliant controls (0.0285 g/mile) was calculated. The peak hour increment of 44 HDDV8A trucks would be 44 * 0.0285 g/mile = 1.254 g/mile, which is well below the screening threshold of 5.1 g/mile. Since the 5.1 g/mile screening threshold was established based on the impact guidance of 2.0 ug/m^3, it can be concluded that the garage rooftop vent would not result in a $PM_{2.5}$ incremental impact of 2.0 ug/m^3. Refer to Appendix D for a more detailed discussion.~~

Carbon Monoxide (CO)

An analysis was performed to estimate CO levels as a result of the MN 1/2/5 Garage at the closest discrete receptor. A maximum 1-hour interior CO concentration of 9.0 ppm and an eight-hour concentration of 3.8 ppm, including background concentrations of 4.0 ppm and 2.5 ppm, respectively, was predicted. OSHA has established an average 8-hour interior standard of 50 ppm. The interior 8-hour CO concentration does not exceed the OSHA standard, assuming one air exchange per hour. DSNY proposes to use CO air monitors within the MN 1/2/5 Garage to ensure that interior CO levels do not exceed applicable standards.

The interior CO concentrations were modeled and dispersed from a rooftop vent and estimated at the nearest residential air intake vent. No credit was taken from CO emissions from the commercial building in the Future No Build condition. The resulting conservative analysis predicted an 8-hour average peak CO concentration of 2.6 ppm which is below the 8-hour NAAQS of 9 ppm (Table 19-8).

Therefore, CO levels associated with the rooftop exhaust vent for the Proposed Action are not predicted to impact discrete receptors.

Table 19-8. Predicted Proposed Action CO Concentration Due to Parking Garage Vent

Receptor	8-Hour Concentration (CO) (ppm)	8-Hour NAAQS (CO) (ppm)
330 Spring Street	2.61~~.9~~	9

Construction Activities

Construction of the MN 1/2/5 Garage and Salt Shed is expected to take approximately three years. Since construction of the Proposed Action would not be considered long-term, a detailed construction period air quality analysis is not warranted, pursuant to the *CEQR Technical Manual*. Off-road diesel construction equipment would be required to have BART and use ULSD fuel to minimize air emissions, pursuant to Local Law 77 of 2003. Dust control measures would be employed during demolition of the existing MN 1 Garage and during construction on the two sites in accordance with local regulations. Therefore, it can be concluded that construction of the MN 1/2/5 Garage and Salt Shed would not significantly impact air quality.

19.5 ODOR

The Proposed Action would increase the number of DSNY waste collection trucks along certain road segments, with transitory odor impacts, and would involve the parking of waste collection vehicles in the garage. Of all the vehicles stored there, it is estimated that a maximum of 25~~12~~ collection vehicles would be parked in the garage with a full load of refuse. These vehicles would remain there for no longer than one shift – about eight hours or less. Therefore, there is a potential for odors from these vehicles in the garage. The Proposed Action would result in DSNY trucks currently stored on local streets and on Gansevoort/Pier 52 being stored inside the new garage building.

Prior studies on the estimation of odor impacts were done by DSNY in Appendix J of the 2005 SWMP FEIS. Odors from twelve, full standard 25 cubic yard DSNY collection vehicles were measured from an area of about 38,709 cubic meters (218 ft x 33 ft x 19 ft). Sampling was performed in the heat of the summer months (July and August) when waste decomposition is expected to be at its peak. The analytical technique used was an "odor panel" evaluation in which a group of people (odor panel) quantifies the odor concentrations, odor intensity and odor persistence. The sample analysis was conducted by a laboratory in accordance with established protocols and standards set by the ASTM. Emission factors were conservatively estimated for the modeling of odors. The studies found that sample odor levels were low and within the range of indoor and outdoor background levels as well as the detection limit of 4 detection threshold (DT) values (or odor units [OU]). Truck odors, including the indoor background, had DTs (OUs) of 5 and 6 (six samples); one sample had a DT (OU) of 7.

Under laboratory conditions the concentration of an odor that is just detectable (i.e., at the detection threshold) is described as having a DT (OU) concentration of 1. An average person in a laboratory setting could just barely detect that there was something different about a sample that contained a concentration of 1 DT (OU) compared to clean, filtered background air. However, an odor concentration at 1 DT (OU) would not likely be detected in outdoor air within the City which, based on measurements taken during the 2005 SWMP FEIS study, had on the order of a 5 DT (OU) concentration even without local source impacts (Appendix J, 2005 SWMP FEIS). The addition of 1 DT (OU) to the measured City air would probably not make a detectable difference to an average observer. The 2005 SWMP FEIS study indicates that an added impact of 5 DT (OU) would begin to be detected by an

average observer. An added impact of 10 DT would be a more likely value that would be recognized and found objectionable by an average observer.

The odor study results were supported by sampling staff observations that most of the 12 collection vehicles sampled had very little or no perceived odors when walking by the vehicles. Odors from the worst-smelling truck could only be detected within four to five ft of the vehicle's hopper where refuse had accumulated and was visible and exposed to the open air.

Based on the results of the 2005 FEIS SWMP odor study, it can be concluded that the temporary storage of relay collection trucks with refuse inside the MN 1/2/5 Garage would not result in significant odor impacts outside the garage. Likewise, the addition of a limited number of DSNY collection trucks to certain road segments would not result in significant adverse odor impacts.