

## **Greenpoint-Williamsburg Rezoning EIS**

### **CHAPTER 18: AIR QUALITY**

---

#### **A. INTRODUCTION**

This chapter examines the potential for air quality impacts from the proposed action. Air quality impacts can be either direct or indirect. Direct impacts stem from emissions generated by stationary sources at a projected or potential development site, such as emissions from fuel burned on site for heating, ventilation, and air conditioning (HVAC) systems. Indirect impacts are defined as nearby existing stationary sources and the potential for emissions due to mobile sources/vehicles generated by the projected and potential developments.

The results discussed below show that the maximum predicted carbon monoxide (CO) and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) concentrations from mobile sources with the proposed action would be below the ambient air standards. In addition, the parking garage analysis determined that the parking facilities under the proposed action would not cause any significant adverse air quality impacts.

The stationary source screening analyses determined that there would be no potential significant adverse air quality impacts from HVAC systems at the projected and potential development sites. At several sites, an (E) designation would be mapped as part of the zoning proposed to ensure the developments would not result in any significant air quality impacts from HVAC emissions. In addition, large emissions sources associated with existing or proposed electric power generating facilities were analyzed for their potential impacts on the proposed action. The results of these analyses determined that the maximum concentrations of criteria pollutants at projected and potential development sites would be well below ambient air quality standards and, consequently, no significant adverse impacts are predicted for these sources on the proposed action. An analysis of the cumulative impacts of industrial sources on projected and potential development sites was performed. At most of the sites, the maximum concentration levels were below the guideline levels and health risk criteria established by regulatory agencies. However, at certain projected and potential development sites in the vicinity of existing industrial sources, concentrations of individual air toxic pollutants were found to result in potential significant impacts. Therefore, at these locations an (E) designation for air quality will be mapped as part of the zoning proposal.

#### **B. POLLUTANTS FOR ANALYSIS**

Ambient air quality is affected by air pollutants produced by both motor vehicles and stationary sources. Emissions from motor vehicles are referred to as mobile source emissions, while emissions from fixed facilities are referred to as stationary source emissions. Typically, ambient concentrations of CO and lead are predominantly influenced by mobile source emissions. Emissions of nitrogen oxides (NO and NO<sub>2</sub>, collectively referred to as NO<sub>x</sub>) come from both mobile and stationary sources. Emissions of sulfur dioxide (SO<sub>2</sub>) are associated mainly with stationary sources, but diesel-powered vehicles, primarily heavy duty trucks and buses, also contribute these emissions. Particulate matter (PM) is emitted from both stationary and mobile sources. Fine particulate matter is also formed when emissions of NO<sub>x</sub>, sulfur oxides (SO<sub>x</sub>), ammonia, organic compounds, and other gases react in the atmosphere. Ozone is formed in the atmosphere

by complex photochemical processes that include  $\text{NO}_x$  and volatile organic compounds (VOCs), emitted mainly from industrial processes and mobile sources.

## Carbon Monoxide

Carbon monoxide (CO), a colorless and odorless gas, is produced in the urban environment primarily by the incomplete combustion of gasoline and other fossil fuels. In New York City, approximately 80 to 90 percent of CO emissions are from motor vehicles. CO concentrations can vary greatly over relatively short distances. Elevated concentrations are usually limited to locations near crowded intersections along heavily traveled and congested roadways. Consequently, CO concentrations must be predicted on a localized, or microscale, basis. The proposed action would increase traffic volumes on streets within and surrounding the proposed action area and could result in localized increases in CO levels. Therefore, a mobile source analysis was conducted at critical intersections in the study area to evaluate future CO concentrations with and without the proposed action, and at projected and potential development sites along elevated roadways to determine future CO concentrations.

## Lead

Lead emissions in air are principally associated with industrial sources and motor vehicles that use gasoline containing lead additives. Most U.S. vehicles produced since 1975, and all produced after 1980, are designed to use unleaded fuel. As these newer vehicles have replaced the older ones, motor vehicle-related lead emissions have decreased. As a result, ambient concentrations of lead have declined significantly. Nationally, the average measured atmospheric lead level in 1985 was only about one-quarter the level in 1975.

In 1985, the U.S. Environmental Protection Agency (EPA) announced new rules drastically reducing the amount of lead permitted in leaded gasoline. The maximum allowable lead level in leaded gasoline was reduced from the previous limit of 1.1 to 0.5 grams per gallon effective July 1, 1985, and to 0.1 grams per gallon effective January 1, 1986. Monitoring results indicate that this action has been effective in significantly reducing atmospheric lead levels. Even at locations in the New York City area where traffic volumes are very high, atmospheric lead concentrations are far below the national standard of 1.5 micrograms per cubic meter (3-month average).

No significant sources of lead are associated with the proposed action, and, therefore, an analysis was not warranted.

## Nitrogen Oxides, Volatile Organic Compounds, and Ozone

Nitrogen oxides (nitrogen oxide [ $\text{NO}$ ] and nitrogen dioxide [ $\text{NO}_2$ ])—together  $\text{NO}_x$ ) are of principal concern because of their role, together with volatile organic compounds (VOC), as precursors in the formation of ozone. Ozone is formed through a series of reactions that take place in the atmosphere in the presence of sunlight. Because the reactions are slow, and occur as the pollutants are diffusing downwind, elevated ozone levels are often found many miles from sources of the precursor pollutants. The effects of  $\text{NO}_x$  emissions from mobile sources are therefore generally examined on a regional basis. The change in regional mobile source emissions of these pollutants is related to the total number of vehicle trips and the vehicle miles traveled throughout the New York metropolitan area. The proposed action would not have

a significant effect on the overall volume of vehicular travel in the metropolitan area; therefore, they would not have any measurable impact on regional  $\text{NO}_x$  emissions or on ozone levels. An analysis of project related impacts from mobile sources for these pollutants was therefore not warranted. There is a standard for average annual  $\text{NO}_2$  concentrations, which is normally examined only for fossil fuel energy sources. Potential impacts from the fuel to be burned for the proposed buildings' HVAC systems were evaluated.

### **Respirable Particulate Matter— $\text{PM}_{10}$ and $\text{PM}_{2.5}$**

Particulate matter (PM) is a broad class of air pollutants that includes discrete particles of a wide range of sizes and chemical compositions, as either liquid droplets (aerosols) or solids suspended in the atmosphere. The constituents of PM are both numerous and varied, and they are emitted from a wide variety of sources (both natural and anthropogenic). Natural sources include the condensed and reacted forms of natural organic vapors: salt particles resulting from the evaporation of sea spray; wind-borne pollen, fungi, molds, algae, yeasts, rusts, bacteria, and material from live and decaying plant and animal life; particles eroded from beaches, soil, and rock; and particles emitted from volcanic and geothermal eruptions and from forest fires. Major anthropogenic sources include the combustion of fossil fuels (e.g., vehicular exhaust, power generation, boilers, engines, and home heating), chemical, and manufacturing processes, all types of construction, agricultural activities, as well as wood-burning stoves and fireplaces. Particulate matter also acts as a substrate for the adsorption of other pollutants, often toxic and some likely carcinogenic compounds.

Fine particulate matter, or  $\text{PM}_{2.5}$ , are fine particles with an aerodynamic diameter of less than or equal to 2.5 micrometers. This smaller fraction of the particle size range has the ability to reach the lower regions of the respiratory tract, delivering with it other compounds that adsorbed to the surfaces of the particles, and is also extremely persistent in the atmosphere.  $\text{PM}_{2.5}$  is mainly derived from combustion material that has volatilized and then condensed to form primary particulate matter (often soon after the release from an exhaust pipe or stack) or from precursor gases reacting in the atmosphere to form secondary particulate matter. Diesel-powered vehicles, especially heavy duty trucks and buses, are a significant source of respirable PM; PM concentrations may, consequently, be locally elevated near roadways with high volumes of heavy diesel-powered vehicles.

An analysis was conducted to assess the worst case PM impacts due to the increased traffic associated with the proposed action. In addition,  $\text{PM}_{10}$  concentrations were determined at elevated receptor locations in close proximity to elevated roadways to determine whether impacts to future residents of the project are potentially significant at these locations.

With the proposed action, No. 2 fuel could be burned in HVAC systems. Therefore, potential future levels of  $\text{PM}_{10}$  were evaluated.

### **Sulfur Dioxide— $\text{SO}_2$**

$\text{SO}_2$  emissions are primarily associated with the combustion of sulfur containing fuels, primarily oil and coal. No significant quantities are emitted from mobile sources. Monitored  $\text{SO}_2$  concentrations in New York City are below the national standards. With the proposed action, No. 2 fuel could be burned in HVAC systems. Therefore, potential future levels of  $\text{SO}_2$  were evaluated.

## **Air Toxics**

In addition to the criteria pollutants discussed above, air toxics are of concern. Air toxics are emitted by a wide range of man-made and naturally occurring sources. Federal ambient air quality standards do not exist for non-criteria air toxics; however, the New York State Department of Environmental Conservation (NYSDEC) has issued standards for certain non-criteria compounds, including beryllium, gaseous fluorides, and hydrogen sulfide. NYSDEC has also developed guideline concentrations for numerous air toxic compounds. The NYSDEC guidance document DAR-1 (December 2003) contains a compilation of annual and short term (1-hour) guideline concentrations for these compounds. The NYSDEC guidance thresholds represent ambient levels that are considered safe for public exposure.

EPA has developed guidelines for assessing exposure to air toxics. These exposure guidelines are used in health risk assessments to determine the potential effects to the public.

## **C. AIR QUALITY STANDARDS**

### **National Ambient Air Quality Standards**

As required by the Clean Air Act and its amendments, primary and secondary National Ambient Air Quality Standards (NAAQS) have been established for six major air pollutants: CO, NO<sub>2</sub>, ozone, respirable particulate matter, SO<sub>2</sub>, and lead. (Hydrocarbon standards have been rescinded because these pollutants are primarily of concern only in their role as ozone precursors.) The primary standards protect the public health and represent levels at which there are no known significant effects on human health. The secondary standards are intended to protect the nation's welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation, and other aspects of the environment. For NO<sub>2</sub>, ozone, lead, and respirable particulate matter, the primary and secondary standards are the same; there is no secondary standard for CO. EPA promulgated additional NAAQS which became effective September 16, 1997: a new 8-hour standard for ozone, which will replace the existing 1-hour standard, and in addition to retaining the PM<sub>10</sub> standards, EPA adopted 24-hour and annual standards for PM<sub>2.5</sub>.

Table 18-1 shows the standards for these pollutants. These standards have also been adopted as the ambient air quality standards for the State of New York.

### **State Implementation Plan (SIP)**

The Clean Air Act, as amended in 1990 (CAA), defines non-attainment areas (NAAs) as geographic regions that have been designated as not meeting one or more of the NAAQS. When an area is designated a NAA by EPA, the state is required to develop and implement a State Implementation Plan (SIP), which is a state's plan on how it will meet the NAAQS under the deadlines established by the CAA.

EPA has recently re-designated New York City as attainment for CO. The CAA requires that a maintenance plan ensure continued compliance with the CO NAAQS for former non-attainment areas. New York City is also committed to implementing site-specific control measures throughout the city to reduce CO levels, should unanticipated localized growth result in elevated CO levels during the maintenance period.

**TABLE 18-1**  
**National and New York State Ambient Air Quality Standards**

Pollutant	Primary		Secondary	
	ppm	µg/m <sup>3</sup>	ppm	µg/m <sup>3</sup>
Carbon Monoxide (CO)				
Maximum 8–Hour Concentration <sup>1</sup>	9	10,000	None	
Maximum 1–Hour Concentration <sup>1</sup>	35	40,000		
Lead				
Maximum Arithmetic Mean Averaged Over 3 Consecutive Months	NA	1.5	NA	1.5
Nitrogen Dioxide (NO <sub>2</sub> )				
Annual Arithmetic Average	0.053	100	0.053	100
Ozone (O <sub>3</sub> )				
1–Hour Average <sup>2</sup>	0.12	235	0.12	235
8–Hour Average <sup>3</sup>	0.08	157	0.08	157
Total Suspended Particles (TSP)				
Annual Mean Rural Open Space Rural Residential Urban Residential Urban Industrial	NA	45 55 65 75	None	
Maximum 24–Hour Concentration	NA	250		
Respirable Particulate Matter (PM <sub>10</sub> )				
Average of 3 Annual Arithmetic Means	NA	50	NA	50
24–Hour Concentration <sup>1</sup>	NA	150	NA	150
Fine Respirable Particulate Matter (PM <sub>2.5</sub> )				
Average of 3 Annual Arithmetic Means	NA	15	NA	15
24–Hour Concentration <sup>4</sup>	NA	65	NA	65
Sulfur Dioxide (SO <sub>2</sub> )				
Annual Arithmetic Mean	0.03	80	NA	NA
Maximum 24–Hour Concentration <sup>1</sup>	0.14	365	NA	NA
Maximum 3–Hour Concentration <sup>1</sup>	NA	NA	0.50	1,300
<b>Notes:</b> ppm – parts per million µg/m <sup>3</sup> – micrograms per cubic meter NA – not applicable  Particulate matter concentrations are in µg/m <sup>3</sup> . Concentrations of all gaseous pollutants are defined in ppm — approximately equivalent concentrations in µg/m <sup>3</sup> are presented. TSP levels are regulated by a New York State Standard only. All other standards are National Ambient Air Quality Standards (NAAQS). <sup>1</sup> Not to be exceeded more than once a year. <sup>2</sup> Applies only to areas designated as Non Attainment. <sup>3</sup> Three–year average of the annual fourth highest daily maximum 8–hr average concentration. <sup>4</sup> Not to be exceeded by the 98th percentile averaged over 3 years. <b>Sources:</b> 40 CFR Part 50: National Primary and Secondary Ambient Air Quality Standards; 6 NYCRR Part 257: Air Quality Standards.				

Nassau, Rockland, Suffolk, Westchester, and the five counties of New York City have been designated as severe non-attainment for the ozone 1-hour standard. In November 1998, New York State submitted its Phase II Alternative Attainment Demonstration for Ozone, which addressed attainment of the 1-hour ozone NAAQS by 2007, and has recently submitted revisions to the SIP. These SIP revisions included additional emission reductions that EPA requested to demonstrate attainment of the standard and to update the SIP estimates using a new EPA model to predict mobile source emissions, MOBILE6. On April 15, 2004, EPA designated these same counties as moderate non-attainment for the new 8-hour ozone standard, which became effective as of June 15, 2004. EPA will revoke the 1-hour standard in June 2005; however, the very specific control measures for the 1-hour standard included in the SIP will be required to stay in place until the 8-hour standard is attained. The discretionary emissions reductions in the SIP would also remain but could be revised or dropped based on modeling. A new SIP for ozone will be adopted by the state no later than June 15, 2007, with a target attainment deadline of June 15, 2010.

## Determining the Significance of Air Quality Impacts

Any action predicted to increase the concentration of a criteria air pollutant to a level that would exceed the concentrations defined by the NAAQS (see Table 18-1) would be deemed to have a potential significant adverse impact. In addition, in order to maintain concentrations lower than the NAAQS in attainment areas, or to ensure that concentrations will not be significantly increased in non-attainment areas, threshold levels have been defined for certain pollutants. Any action predicted to increase the concentrations of these pollutants above these thresholds would be deemed to have a potential significant adverse impact, even in cases where violations of the NAAQS are not predicted.

### *De Minimis Criteria Regarding CO Impacts*

New York City has developed criteria to assess the significance of the incremental increase in CO concentrations that would result from proposed projects or actions, as set forth in the *City Environmental Quality Review (CEQR) Technical Manual*. These criteria (known as *de minimis* criteria) set the minimum change in CO concentration that defines a significant environmental impact. Significant increases of CO concentrations in New York City are defined as: (1) an increase of 0.5 ppm or more in the maximum 8-hour average CO concentration at a location where the predicted No-Action 8-hour concentration is equal to or between 8 and 9 ppm; or (2) an increase of more than half the difference between baseline concentrations and the 8-hour standard, when No-Action concentrations are below 8.0 ppm.

### *Interim Guidance Criteria Regarding PM<sub>2.5</sub>*

New York State formally recommended that EPA designate the five boroughs of New York City as non-attainment for PM<sub>2.5</sub>. EPA has recommended that these areas, as well as Nassau, Rockland, Suffolk, Westchester, and Orange counties, should be designated as non-attainment. The remaining areas of the state would be designated as attainment. EPA will finalize the designations by 2005. Once non-attainment designations take effect, the state and local governments will have three years to develop implementation plans designed to meet the standards.

Although the PM<sub>2.5</sub> standard has not yet been fully implemented, NYSDEC has published a policy to provide interim direction for evaluating PM<sub>2.5</sub> impacts. This policy would apply only to facilities applying for permits or major permit modification under the State Environmental Quality Review Act (SEQRA) that emit 15 tons of PM<sub>10</sub> or more annually. The policy states that such a project will be deemed to have a potentially significant adverse impact if the project's maximum predicted impacts are predicted to increase PM<sub>2.5</sub> concentrations by more than 0.3 µg/m<sup>3</sup> averaged annually or more than 5 µg/m<sup>3</sup> on a

24-hour basis. Projects that exceed either the annual or the 24-hour threshold will be required to prepare an Environmental Impact Statement (EIS) to assess the severity of the impacts, to evaluate alternatives, and to employ reasonable and necessary mitigation measures to minimize the PM<sub>2.5</sub> impacts of the source to the maximum extent practicable.

The New York City Department of Environmental Protection (NYCDEP) is currently recommending interim guidance criteria for evaluating the potential PM<sub>2.5</sub> impacts from NYCDEP projects subject to CEQR. The interim guidance criteria currently employed by NYCDEP for determination of potential significant adverse impacts from PM<sub>2.5</sub> are as follows:

- Predicted 24-hour (daily) average increase in PM<sub>2.5</sub> concentrations greater than 5 µg/m<sup>3</sup> at a discrete location of public access, either at ground or elevated levels (microscale analysis);
- Predicted annual average increase in ground-level PM<sub>2.5</sub> concentrations greater than 0.1 µg/m<sup>3</sup> 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 impact is predicted for stationary sources; or at a distance from a roadway corridor similar to the minimum distance defined for locating background monitoring stations).

Actions under CEQR that would increase PM<sub>2.5</sub> concentrations more than the interim guidance criteria above will be considered to have potential significant adverse impacts. NYCDEP recommends that its actions subject to CEQR that fail the interim guidance criteria prepare an EIS and examine potential measures to reduce or eliminate such potential significant adverse impacts.

The above NYCDEP draft interim guidance criteria have been used for the purpose of evaluating the significance of predicted impacts of the proposed action on PM<sub>2.5</sub> concentrations from mobile sources, and determine the need to minimize particulate matter emissions from the proposed action.

### ***Non-Criteria Pollutant Thresholds***

Non-criteria, or toxic, air pollutants include a multitude of pollutants of ranging toxicity. No federal ambient air quality standards have been promulgated for toxic air pollutants. However, the EPA and the NYSDEC have issued guidelines that establish acceptable ambient levels for these pollutants based on human exposure.

The NYSDEC DAR-1 guidance document presents guideline concentrations in micrograms per cubic meter for the one-hour and annual average time periods for various air toxic compounds. These values are provided in Table 18-2 for the compounds affecting receptors located at projected and potential development sites. The compounds listed are those emitted by existing sources of air toxics in the project area.

In order to evaluate impacts of non-carcinogenic toxic air emissions, EPA developed a methodology called the “Hazard Index Approach.” The acute hazard index is based on short-term exposure, while the chronic non-carcinogenic hazard index is based on annual exposure limits. If the combined ratio of pollutant concentration divided by its respective short-term or annual exposure threshold for each of the toxic pollutants is found to be less than 1, no significant air quality impacts are predicted to occur due to these pollutant releases.

**TABLE 18-2**  
**Industrial Source Analysis: Relevant NYSDEC Air Guideline Concentrations**

Pollutant	CAS Number	SGC (µg/m <sup>3</sup> )	AGC (ug/m <sup>3</sup> )	Toxicity Rating
Formaldehyde	00050-00-0	30	0.06	High
Urea	00057-13-6	--	0.10	Moderate
Ethanol	00064-17-5	--	45,000	Low
Acetic Acid	00064-19-7	3,700	60	Not Rated
Methanol	00067-56-1	33,000	4,000	Moderate
Isopropyl Alcohol	00067-63-0	98,000	7,000	Moderate
Dimethyl Ketone (Acetone)	00067-64-1	180,000	28,000	Low
Propanol	00071-23-8	61,000	1,200	Not Rated
Butyl Alcohol, N-	00071-36-3	--	1,500	Low
Methyl Chloroform	00071-55-6	68,000	1,000	Low
Propane	00074-98-6	--	110,000	Low
Dichloromethane (Methylene Chloride)	00075-09-2	14,000	2	Moderate
Isobutyl Alcohol	00078-83-1	--	360	Not Rated
Methyl Ethyl Ketone	00078-93-3	59,000	5,000	Moderate
Trichloroethylene	00079-01-6	54,000	0.5	Moderate
Napthalene	00091-20-3	7,900	3	Moderate
Trimethylbenzene	00095-63-6	--	290	Not Rated
Isobutyl-Isobutyrate	00097-85-8	--	45,000	Low
Diethylaminoethanol	00100-37-8	--	23	Not Rated
Ethylene Glycol	00107-21-1	10,000	400	Not Rated
Methyl Propyl Ketone	00107-87-9	88,000	1,700	Not Rated
Ethoxypropanol 3-	00107-98-2	55,000	2,000	Low
Methyl Isobutyl Ketone	00108-10-1	31,000	3,000	Moderate
Isopropyl Acetate	00108-21-4	84,000	1,000	Not Rated
Methoxypropyl Acetate	00108-65-6	55,000	2,000	Low
Toluene	00108-88-3	37,000	400	Low
Propyl Acetate	00109-60-4	100,000	20,000	Low
Methylisoamylacetone	00110-12-3	--	560	Not Rated
Isobutyl Acetate	00110-19-0	--	17,000	Low
Methyl Amyl Ketone	00110-43-0	--	550	Not Rated
Cellosolve Acetate	00111-15-9	140	64	Moderate
Ethylenglycolmonobutyl	00111-76-2	14,000	13,000	Moderate
Butyl Carbitol	00112-34-5	670	360	Moderate
Diocetyl Phthalate	00117-81-7	--	0.420	Moderate
Triethylamine	00121-44-8	2,800	7	Not Rated
2-Propanol	00123-38-6	--	110	Not Rated
Diacetone Alcohol	00123-42-2	--	570	Moderate
Butyl Acetate	00123-86-4	95,000	17,000	Low
Tetrachloroethylene	00127-18-4	1,000	1	Moderate
Ethyl Acetate	00141-78-6	--	3,400	Moderate
N-Heptane	00142-82-5	210,000	3,900	Moderate
Ethylamine Hydrochloride	00557-66-4	--	--	Not Rated
N-Amyl Acetate	00628-63-7	53,000	630	Not Rated
Carbon Monoxide	00630-08-0	14,000	--	Not Rated
Ethyl-3-Ethoxy	00763-69-9	140	64	Moderate
Sodium Hydroxide	01310-73-2	200	--	Low
Xylene,M,O&P Mixt.	01330-20-7	4,300	100	Moderate
Ethylengly Monopr E	02807-30-9	370	200	Moderate
Dmamp Amino Alcohol	07005-47-2	--	--	Not Rated
Total Boron	07440-42-8	--	--	Not Rated
Sulfur Dioxide	07446-09-5	910	80	Not Rated
Iodine	07553-56-2	100	--	Low
Ammonia	07664-41-7	2,400	100	Low
Sulfuric Acid Mist	07664-93-9	120	1	Moderate
Nitric Acid Mist	07697-37-2	86	12	Moderate
Gasoline	08006-61-9	150,000	2,100	Not Rated
Naphtha (Coal Tar)	08030-30-6	--	3,800	Not Rated
Vm&P Naptha	08032-32-4	--	33,000	Low
Technical White Oil	08042-47-5	--	--	Not Rated
Stoddard Solvent	08052-41-3	--	1,300	Not Rated
Cellulos	09004-34-6	--	24	Not Rated
Cellulose Nitrate	09004-70-0	--	--	Not Rated
Nitrogen Dioxide	10102-44-0	--	100	Not Rated
Chromic Acid	11115-74-5	--	0.000045	High
Benzotriazole Uv Abs.	25973-55-1	--	--	Not Rated
Aldehydes	32791-31-4	--	0.1	Not Rated
Dip. Gly. Mono. Ether	34590-94-8	--	--	Not Rated
Mineral Spirits	64475-85-0	--	--	Not Rated
Mineral Spirits	64742-47-8	--	50	Not Rated
Vm&P Naptha	64742-48-9	--	--	Not Rated
Med. Sol. Aliph. Naptha	64742-88-7	--	--	Not Rated
Naptha Light Aliphatic	64742-89-8	--	--	Not Rated
Naptha Light	64742-95-6	--	3,800	Moderate
Hydrocarbon Misc.	68476-39-1	--	--	Not Rated
Hydrocarbons	68476-44-8	--	--	Not Rated
Hydrocarbons C1-3	68527-16-2	--	--	Not Rated
Oxo-Heptyl Acetate	90438-79-2	--	--	Not Rated
Particulates	NY075-00-0	380	50.0	Not Rated
Morpholine	NY099-42-0	--	--	Not Rated
Total Aromatic Hydro	NY439-00-0	--	--	Not Rated
Aliphatic Hydrocarb	NY550-00-0	--	--	Not Rated
Total Fluoride	NY780-00-0	5	0.067	Not Rated
Miscellaneous Organics	NY990-00-0	--	--	Not Rated
Total Organic Solvent	NY998-00-0	--	--	Not Rated



In addition, the EPA has developed unit risk factors for carcinogenic pollutants. The EPA considers an overall incremental cancer risk from a proposed action of less than 1-in-1 million to be insignificant. Using these factors, the potential cancer risk associated with each carcinogenic pollutant, as well as the total cancer risk of the releases of all of the carcinogenic toxic pollutants combined, can be estimated. If the total incremental cancer risk of all of the carcinogenic toxic pollutants combined is less than 1-in-1 million, no significant air quality impacts are predicted to occur due to these pollutant releases.

## **D. METHODOLOGY FOR PREDICTING POLLUTANT CONCENTRATIONS**

### **Mobile Source Analysis**

The prediction of motor vehicle generated CO and PM concentrations in an urban environment is characterized by meteorological phenomena, traffic conditions, and physical configurations. Air pollutant dispersion models mathematically simulate how traffic, meteorology, and geometry combine to affect pollutant concentrations. The mathematical expressions and formulations contained in the various models attempt to describe an extremely complex physical phenomenon as closely as possible. However, because all models contain simplifications and approximations of actual conditions and interactions and it is necessary to predict the reasonable worst case condition, most of these dispersion models predict conservatively high concentrations of pollutants, particularly under adverse meteorological conditions.

The mobile source analyses for the proposed action employ a model approved by EPA that has been widely used for evaluating air quality impacts of projects in New York City, other parts of New York State, and throughout the country. The modeling approach includes a series of conservative assumptions relating to meteorology, traffic, and background concentration levels resulting in a conservatively high estimate of expected CO and PM concentrations that could ensue from the proposed action. The assumptions used in the PM analysis were based on the latest PM<sub>2.5</sub> draft interim guidance developed by the NYCDEP.

#### ***Dispersion Model for Microscale Analyses***

To determine motor-vehicle-generated CO concentrations adjacent to streets near the proposed action area, the CAL3QHC model was applied. Maximum 1- and 8-hour CO concentrations were determined using EPA's CAL3QHC model Version 2.0.<sup>1</sup> The CAL3QHC model is based on the CALINE3 line source dispersion model, with an additional algorithm for estimating vehicular queue lengths at signalized intersections. The CALINE3 model employs a Gaussian (normal distribution) dispersion assumption. CAL3QHC predicts the dispersion of CO emissions from idling vehicles and moving vehicles. The queuing algorithm includes site-specific traffic parameters, such as signal timing and delay calculations (from the 2000 *Highway Capacity Manual* traffic forecasting model), saturation flow rate, vehicle arrival type, and signal actuation (i.e., pre-timed or actuated signal) characteristics to accurately predict the number of idling vehicles. The CAL3QHC model has been updated with an extended module, CAL3QHCR, which allows for the incorporation of hourly meteorological data into the modeling, instead of worst-case assumptions regarding meteorological parameters. This refined version of the model,

---

<sup>1</sup> *User's Guide to CAL3QHC, A Modeling Methodology for Predicted Pollutant Concentrations Near Roadway Intersections*, Office of Air Quality, Planning Standards, EPA, Research Triangle Park, North Carolina, Publication EPA-454/R-92-006.

CAL3QHCR, is employed if maximum predicted future CO concentrations are greater than the applicable ambient air quality standards or when *de minimis* thresholds are exceeded using the first-level CAL3QHC modeling.

To determine motor vehicle generated PM concentrations adjacent to streets near the proposed action area, the CAL3QHCR model was applied. This version of the model can utilize hourly traffic and meteorology data, and is therefore more appropriate for calculating 24-hour and annual average concentrations.

### ***Meteorology***

In general, the transport and concentration of pollutants from vehicular sources are influenced by three principal meteorological factors: wind direction, wind speed, and atmospheric stability. Wind direction influences the accumulation of pollutants at a particular receptor location, and atmospheric stability accounts for the effects of vertical mixing in the atmosphere.

#### **CAL3QHC**

CO calculations were performed using the CAL3QHC model. Wind direction was chosen to maximize pollutant concentrations at each of the prediction sites. In applying the CAL3QHC model, the wind angle was varied to determine the worst-case wind direction resulting in the maximum concentrations.

Following the recommendations of EPA in *Guidelines for Modeling Carbon Monoxide from Roadway Intersections*<sup>2</sup>, CO computations were performed using a wind speed of 1 meter per second, and stability class D. A neutral stability class was employed, and a persistence factor of 0.70 for the 8-hour period was selected. A surface roughness of 3.21 meters was chosen, and, in addition, a 52.5° Fahrenheit ambient temperature was assumed for the emissions computations. At each receptor location, the wind angle that maximized the pollutant concentrations was used in the analysis regardless of frequency of occurrence. These assumptions ensured that worst-case meteorology was used to estimate impacts.

#### **CAL3QHCR**

A Tier II analysis, which includes the modeling of hour-by-hour concentrations based on hourly traffic data and 5 years of monitored hourly meteorological data, was performed to predict maximum 24-hour and annual average PM levels. The analysis utilized monitored hourly meteorological data from LaGuardia Airport station in the years 1998–2002. All hours are modeled, and the highest resulting concentration for any averaging time is presented.

### ***Analysis Year***

The CO microscale analyses were performed for existing conditions and 2013, the year by which the proposed action sites are likely to be completed. The future analysis was performed both without the proposed action (the No-Action condition) and with the proposed action (the With-Action condition).

### ***Vehicle Emissions Data***

Vehicular CO and PM emissions were computed using the EPA-developed mobile source emissions model, MOBILE6.2. This is the most current, recently released emissions model capable of calculating

---

<sup>2</sup> *Guidelines for Modeling Carbon Monoxide from Roadway Intersections*, EPA Office of Air Quality Planning and Standards, Publication EPA-454/R-92-005.

engine emission factors for various vehicle types, based on the fuel (gas, diesel, or alternative technologies), meteorological conditions, vehicle speeds, roadway types, number of starts per day, and engine soak time, and various other factors that influence emissions, such as inspection maintenance programs. The inputs and use of MOBILE6.2 incorporates the most current guidance available from the NYCDEP.

Vehicle classification data were based on field studies and data obtained from other traffic studies. Emission estimates were based on guidance from NYSDEC and NYCDEP on the appropriate credits to be used in the MOBILE6.2 model to accurately reflect the inspection and maintenance program. The inspection and maintenance programs require inspections of automobiles and light trucks to determine if pollutant emissions from the vehicles' exhaust systems are below emission standards. Vehicles failing the emissions test must undergo maintenance and pass a repeat test to be registered in New York State.

Taxis are assumed to all be in hot stabilized mode (excluding any start emissions). The general categories of vehicle types for specific roadways were further categorized into subcategories based on their relative fleet-wide breakdown.<sup>3</sup>

An ambient temperature of 52.5° Fahrenheit was used. This temperature, calculated based on the latest guidance from EPA and NYSDEC, represents the average temperature measured at the Central Park meteorological station during the 10 highest 8-hour CO events measured at the East 34<sup>th</sup> Street NYSDEC monitoring station in 2000 through 2002.

#### Road Dust

##### *PM<sub>10</sub>*

Since the contribution of re-entrained road dust to PM<sub>10</sub> concentrations, as presented in the PM<sub>10</sub> SIP, is considered to be significant, the PM<sub>10</sub> estimates include both exhaust and road dust. Road dust emission factors were calculated according to the latest procedure delineated by EPA.<sup>4</sup>

##### *PM<sub>2.5</sub>*

EPA has recently proposed revisions to the transportation conformity rules to incorporate procedures for assessing the effects of PM<sub>2.5</sub> for future projects that may be subject to transportation conformity in PM<sub>2.5</sub> non-attainment areas.<sup>5</sup> Under these proposed revisions, fugitive road dust would be included in regional emissions and in local hotspot analyses only if it is identified as a significant contributor to PM<sub>2.5</sub> regional air quality. Although EPA has not yet made a determination as to whether any specific areas have a regional PM<sub>2.5</sub> issue with respect to road dust, it is unlikely that such a determination would be made for locations within the New York City metropolitan area. First, predicted impacts based on modeling emission inventories are significantly higher than actual measured concentrations of PM attributed to road dust. This is the case in New York City, where the primary component of measured PM<sub>2.5</sub> concentrations in the designated non-attainment area (Manhattan) was found to be due to diesel engine exhausts, rather than road dust. Second, while EPA has determined that areas that are not in attainment with the PM<sub>2.5</sub>

---

<sup>3</sup> The MOBILE6.2 emissions model utilizes 28 vehicle categories by size and fuel. Traffic counts and predictions are based on broader size categories, and then broken down according to the fleet-wide distribution of subcategories and fuel types (diesel, gasoline, or alternative).

<sup>4</sup> EPA, Compilations of Air Pollutant Emission Factors AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources, Draft Ch. 13.2.1, NC, <http://www.epa.gov/ttn/chief/ap42>, December 2003.

<sup>5</sup> 68 Fed Reg. 62690-62729, November 5, 2003.

standard have significant emissions of fugitive road dust, there is less evidence that this road dust is a contributor to  $PM_{2.5}$  concentrations.

Furthermore, in the event that EPA would require quantified analysis of  $PM_{2.5}$  at “hot-spot” (i.e., microscale receptor) locations, EPA would only require an assessment of the contribution from fugitive dust if those emissions were identified as regionally significant. This would first require preparation of a  $PM_{2.5}$  SIP by NYSDEC, an identification of specific hot-spot locations requiring quantified analysis for transportation conformity decisions, and a determination that inclusion of re-entrained road dust in the hot-spot analysis is warranted; designation of New York in regard to attainment of the  $PM_{2.5}$  NAAQS is expected in 2004. Since none of these criteria have been met, and since fugitive road dust is unlikely to be characterized as a regionally or locally significant contributor to  $PM_{2.5}$  concentrations, inclusion of fugitive road dust was not considered to be necessary for assessing  $PM_{2.5}$  impacts from the proposed action.

Despite the above, in accordance with the NYCDEP  $PM_{2.5}$  interim guidance criteria, emission rates were determined with fugitive road dust to account for their impacts on receptors near roadways (i.e., CO analysis receptor locations). However, fugitive road dust was not included in the neighborhood scale  $PM_{2.5}$  microscale analysis, since it is considered to be an insignificant contribution.

### ***Traffic Data***

Traffic data for the air quality analysis were derived from existing traffic counts, projected future growth in traffic, and other information developed as part of the traffic analysis for the proposed action (see Chapter 16, “Traffic and Parking”). Traffic data for the future without and with the proposed action were employed in the respective air quality modeling scenarios. The weekday AM (8 to 9 AM) and PM (5 to 6 PM) peak periods were subjected to microscale analysis. These time periods were selected for the mobile source analysis because they produce the maximum anticipated project-generated traffic and therefore have the greatest potential for significant air quality impacts.

For particulate matter, the peak AM and PM period traffic volumes were used as a baseline; traffic volumes for other hours due to No-Action traffic and the proposed action were determined by adjusting the peak period volumes by the 24-hour distributions of actual vehicle counts collected for the proposed action. 24-hour PM impacts were determined by using the 24-hour distribution associated with the highest total daily vehicle count; for annual impacts, average weekday and weekend 24-hour distributions were used to more accurately simulate traffic patterns over longer periods.

### ***Background Values***

Background concentrations are those pollutant concentrations not directly accounted for through the modeling analysis, which directly accounts for vehicle-generated emissions on the streets within 1,000 feet and line-of-sight of the receptor location. Background concentrations must be added to modeling results to obtain total pollutant concentrations at a study site.

The 8-hour average background concentration used in this analysis was 2.0 ppm for the 2013 predictions. This value, obtained from NYCDEP, is based on CO concentrations measured at NYSDEC monitoring stations and is adjusted to reflect the reduced vehicular emissions expected in the analysis year. For purposes of this adjustment, based on EPA guidance, it was assumed that 20 percent of the background value is caused by stationary source emissions that have remained relatively unchanged with time and that 80 percent of the background value is caused by mobile sources that decrease with time. This decrease reflects the increasing numbers of federally mandated lower-emission vehicles that are projected to enter

the vehicle fleet as older, higher-polluting vehicles are retired (i.e., vehicle turnover), and the continuing benefits of the New York State inspection and maintenance program.

The PM<sub>10</sub> annual and 24-hour background concentrations are based on the highest and second highest concentrations, respectively, measured over the most recent 3-year period at the nearest NYSDEC monitoring site. For the proposed action, the background concentrations for the annual and 24-hour periods are 22 µg/m<sup>3</sup> and 49 µg/m<sup>3</sup>, respectively. For PM<sub>2.5</sub>, background concentrations are not considered since impacts are determined on an incremental basis only.

### **Mobile Source Receptor Locations**

A total of eight receptor locations were selected for microscale analysis (see Table 18-3 and Figure 18-1).

**TABLE 18-3**  
**Mobile Source Receptor Locations**

Receptor Site	Location
1	McGuinness Boulevard at Green Street
2	McGuinness Boulevard at Greenpoint Avenue
3	Franklin Street at Green Street
4	Kent Avenue at North 7th Street
5	Franklin Street at Calyer Street
6	Humboldt Street/BQE Offramp at Meeker Avenue
7	South 5 <sup>th</sup> Street/Williamsburg Bridge Approach at Bedford Avenue
8	BQE Approach at Metropolitan Avenue

Sites 1 to 5 were analyzed for at-grade impacts at sidewalk receptors. The receptor sites at these intersections are computer simulations of sidewalk or roadside locations near intersections with continuous public access. Multiple receptor sites were modeled at each of these intersections (i.e., receptors were placed along the approach and departure links at spaced intervals). These receptor locations were selected because they are the locations in the proposed action area where the largest levels of project-generated traffic are expected, and, therefore, where the greatest air quality impacts and maximum changes in the concentrations would be expected. Each of these intersections was analyzed for CO. Two of the intersections (Sites 1 and 2) were analyzed for at-grade impacts of PM<sub>2.5</sub> and PM<sub>10</sub>. These sites are predicted to have the highest overall project-generated traffic.

Sites 6, 7, and 8 were selected for analysis of CO and PM<sub>10</sub> due to the proximity of projected and potential development sites to elevated roadways. Therefore, at these sites, receptors were placed on the proposed development sites at elevations near the roadway. In addition, at Site 6, the projected number of vehicles generated due to the proposed action would exceed the *CEQR Technical Manual* threshold of 100 vehicles; therefore, an analysis of at-grade CO impacts at sidewalk receptors was undertaken as well.

Receptors in the annual PM<sub>2.5</sub> neighborhood scale models were placed at a minimum distance of 15 meters, or at a distance of 1 meter per 1,000 daily vehicle miles traveled on the roadway, from the nearest moving lane, based on the NYCDEP procedure for neighborhood scale corridor PM<sub>2.5</sub> modeling. For the localized PM<sub>2.5</sub> analysis, the 24-hour average microscale model was run with the same receptor placement adjacent to roadways that were used in the PM<sub>10</sub> mobile source modeling analysis.

9.10.04



**Legend**

— Proposed Action Area Boundary

① Air Quality Receptor Location

0 1000 2000 FEET  
SCALE

## Parking Facility Analysis

The proposed action would include parking facilities to account for the new parking demand and supply. Emissions from vehicles using the parking areas could potentially affect ambient levels of CO at the project intersections analyzed in the future With-Action conditions. Of the parking associated with the projected development sites, the prototypical parking garage at Sites 3, 56, and 199 were analyzed (see Table 18-4). These sites have the greatest potential parking demand and, therefore, the highest potential air quality impact. The analysis was undertaken using the methodology set forth in the *CEQR Technical Manual*, applying modeling techniques to the vent structures and calculating pollutant levels at various distances from the vents.

**TABLE 18-4**  
**Parking Garage – Analyzed Sites**

Garage Site	No. of Spaces	Block/Lot No.
Site 3A	553	2502/1
Site 3B	553	2510/1
Site 56A	430	2556/1
Site 56B	430	2564/1
Site 199A	364	2324/1
Site 199B	364	2332/1
<b>Notes:</b> For each site the parking was assumed to be divided into two separate garages since the development site covers two blocks. Each garage was analyzed assuming two levels of parking.		

Emissions from vehicles entering, parking, and exiting the garages were estimated using the EPA-developed MOBILE6.2 mobile source emission model and an ambient temperature of 52.5° F. This temperature, calculated based on the latest guidance from the EPA, NYSDEC, and NYCDEP, represents the average temperature measured at the Central Park meteorological station during the 10 highest 8-hour CO events measured at the East 34<sup>th</sup> Street NYSDEC monitoring station in 2000 through 2002. For all arriving and departing vehicles, an average speed of 5 miles per hour was conservatively assumed for travel within the parking garage. In addition, all departing vehicles were assumed to idle for 1 minute before proceeding to the exit. The concentration of CO within the garage was calculated assuming a minimum ventilation rate, based on New York City Building Code requirements, of 1 cubic foot per minute of fresh air per gross square foot of garage area. To determine compliance with the NAAQS, CO concentrations were determined for the maximum 8-hour average period. (No exceedances of the 1-hour values would occur, and the 8-hour values are the most critical for impact assessment.)

To determine pollutant levels in the vicinity of the vents, the exhaust from the parking garage was analyzed as a “virtual point source” using the methodology in EPA’s *Workbook of Atmospheric Dispersion Estimates*, AP-26. This methodology estimates CO concentrations at various distances from the vents by assuming that the concentration in the garage is equal to the concentration leaving the exhaust, and determining the appropriate initial horizontal and vertical dispersion coefficients at the vent faces. Background and on-street CO concentrations were then added to the modeling results to obtain the total ambient levels. The on-street CO concentration was determined using the methodology in Air Quality Appendix 1 of the *CEQR Technical Manual*, utilizing traffic volumes from the traffic survey conducted for this project.

Since the EIS analyzes a worst-case development scenario and not specific development proposals, there are no specific garage designs upon which the modeling of emissions could be based. Therefore, worst-case assumptions were made regarding the design of the garages' mechanical ventilation systems. The exhaust from each of the parking garages was assumed to be vented through a single exhaust with a height of 12 feet. The vent was assumed to exhaust directly onto the street, and a "near" receptor was placed along the sidewalks at a pedestrian height of 6 feet and at a distance of 5 feet from the vent. A "far" receptor was placed directly across the street from the assumed vent location, also at a pedestrian height of 6 feet. An 8-hour persistence factor of 0.7 was used to account for meteorological variability over the average 8-hour period.

## Stationary Source Analysis

A stationary source analysis was conducted to evaluate potential impacts from the proposed action's HVAC systems. In addition, an assessment was conducted to determine the potential for impacts due to industrial activities within the re-zoning area, and from any large emission sources.

### *HVAC Source Analysis*

#### Individual Sources

A screening analysis was performed to assess air quality impacts associated with emissions from the HVAC system of each projected development site. The methodology described in the *CEQR Technical Manual* was used for the analysis and considered impacts on sensitive uses (both existing residential development as well as other residential developments under construction). The CEQR screening analysis methodology determines the threshold of development size below which the action would not have a significant adverse impact. The screening procedures utilize information regarding the type of fuel to be used, the maximum development size, and the HVAC exhaust stack height to evaluate whether a significant adverse impact is likely. Based on the distance from the proposed development to the nearest building of similar or greater height, if the maximum development size is greater than the threshold size in the *CEQR Technical Manual*, there is the potential for significant air quality impacts, and a refined dispersion modeling analysis would be required. Otherwise, the source passes the screening analysis, and no further analysis is required.

Each projected development site was evaluated with nearby projected residential developments of similar or greater height analyzed as a potential receptor. The maximum development floor areas of the proposed sites from the reasonable worst-case development scenario were used as input for the screening analysis. It was assumed that either natural gas or No. 2 fuel oil would be used in the HVAC systems, and that the stacks would be installed 3 feet above roof height (as per the *CEQR Technical Manual*). For buildings with different tier configurations (provided in the conceptual design), the analysis assumed that the HVAC stack would be installed on the highest tier. If a source did not pass any of the screening analyses (oil or gas) using the *CEQR Technical Manual* procedures, the ISC3 atmospheric dispersion model would be applied.

#### Cumulative Impacts from HVAC Sources

As discussed above, a conservative impact assessment using CEQR screening procedures for individual HVAC sources was performed. In addition to the individual source analysis, groups or "clusters" of HVAC sources with similar stack heights were analyzed, in order to address the cumulative impacts of multiple sources.



This analysis was performed using the EPA SCREEN3 Model (version 96043). The SCREEN3 model is a screening version of the ISC3 model, and is used for determining maximum concentrations from a single source using predefined meteorological conditions.

The proposed action area was analyzed to determine cluster selection and cumulative impacts on nearby buildings of a similar or greater height. The clusters were each modeled as an area source. A total of 13 clusters were selected for analysis. The location and development sites associated with each cluster is presented in Figure 18-2.

#### Background Concentrations

To estimate the maximum expected pollutant concentration at a given receptor, the calculated impact from each cluster development must be added to a background value that accounts for existing pollutant concentrations from other sources (see Table 18-5).

**TABLE 18-5**  
**Background Pollutant Concentrations**

Pollutants	Averaging Period	Monitoring Station	Background Concentration (µg/m³)	Ambient Standard (µg/m³)
NO <sub>2</sub>	Annual	PS59, Manhattan	71	100
SO <sub>2</sub>	3 hour	PS59, Manhattan	191	1,300
	24 hour		120	365
	Annual		34	80
PM <sub>10</sub>	24 Hour	IS52, Bronx and Mabel Dean, Manhattan	49	150
	Annual		22	50
<b>Sources:</b> 2000-2002 Annual New York State Air Quality Report Ambient Air Monitoring System, NYSDEC.				

Measured background concentrations by NYSDEC were added to the predicted contributions from local sources to determine the maximum predicted total pollutant concentrations associated with each scenario. The highest concentration over the most recent three years of monitoring (2000 to 2002) was used. Data from the following NYSDEC monitors were used: Mabel Dean in Manhattan (PM<sub>10</sub> from 2000 to 2001) and IS52 in the Bronx (PM<sub>10</sub> in 2002); and PS59 in Manhattan (NO<sub>2</sub>, and SO<sub>2</sub>).

#### **Industrial Sources**

Pollutants emitted from the exhaust vents of existing permitted industrial facilities were examined to identify potential adverse impacts on future residents.

To assess and estimate the potential effects on the proposed action from existing industrial operations in the surrounding area, an analysis investigation was conducted. All industrial air pollutant emission sources within 400 feet of the proposed action area boundaries and within the proposed action area were considered for inclusion in the air quality impact analyses. These boundaries were used to identify the extent of the study area for determining air quality impacts associated with the proposed action.

Information regarding the release of air pollutants from existing combustion and industrial sources was obtained from the NYCDEP's Bureau of Environmental Compliance (BEC) records. The information provided was compiled into a database of source locations, air emission rates, and other pertinent data in order to determine source impacts. The information was based on the most current air permit data available from the NYCDEP.



Figure 18-2

A comprehensive search was also performed to identify NYSDEC Title V permits and permits listed in the EPA Envirofacts database.<sup>6</sup> Facilities that appeared in the Envirofacts database but did not also possess a NYCDEP certificate to operate were cross-referenced against the NYSDEC's Air Guide-1 software emissions database, which presents a statewide compilation of permit data for toxic air pollutants, to obtain emissions data and stack parameters.

Field surveys were conducted in March, August, and September 2004, to determine the operating status of permitted industries and identify any potential industrial sites not included in the permit databases. The results of the field survey were compared against DCP data sources.

In certain areas within the proposed action area, the proposed mixed-use provisions would allow existing industrial businesses; therefore, these sources were included in the analysis since they could remain in the future. In addition, potential development sites with existing permitted industries were assumed to remain undeveloped in the With-Action Scenario.

The industrial source analysis was conducted using the Industrial Source Complex Short Term (ISC3) dispersion model developed by EPA, and described in *User's Guide for the Industrial Source Complex (ISC3) Dispersion Models* (EPA-454/B-95-003a). The ISC3 model calculates pollutant concentrations from one or more points (e.g., exhaust stacks) based on hourly meteorological data. Computations with the ISC3 model to determine impacts from exhaust stacks were made assuming stack tip downwash, buoyancy-induced dispersion, gradual plume rise, urban dispersion coefficients and wind profile exponents, no collapsing of stable stability classes, and elimination of calms. Since the highest impacts are predicted to occur on elevated (flagpole) receptors, the ISC3 model was run without downwash. The meteorological data set consisted of the latest five years of concurrent meteorological data that are available: surface data collected at LaGuardia Airport (1998–2002) and upper air data collected at Brookhaven, Suffolk County, New York.

Predicted worst-case impacts were compared with the short-term guideline concentrations (SGCs) and annual guideline concentrations (AGCs) recommended in the *NYSDEC's DAR-1 AGC/SGC Tables*.<sup>7</sup> These guideline concentrations present the airborne concentrations which are applied as a screening threshold to determine if the future residents of the proposed action sites could be significantly impacted from nearby sources of air pollution.

A number of permitted sources were also located at projected and potential development sites. With the exception of Site 55, the analysis assumed that industrial sources would not continue at projected development sites in the With-Action condition, since a developed site would not continue to be a source of industrial emissions. However, since the proposed mixed-use provisions would allow existing industrial businesses within the proposed Greenpoint-Williamsburg rezoning area to remain, at potential development sites, existing emissions sources could operate in the future and were, therefore, included in the analysis. However, this also assumes that the proposed rezoning would result in the redevelopment of these potential development sites. Therefore, in cases where concentrations were predicted to exceed an SGC or AGC at potential development sites with industrial source permits, an air quality analysis was performed to determine if the source of the impact was the industrial source permit that currently exists on that potential development site. If the source of the impact was on the development site, these sites were also not considered to have impacts, since a potential development site could not be both developed with residential uses and continue to have industrial operations.

---

<sup>6</sup> [http://oaspub.epa.gov/enviro/ef\\_home2.air](http://oaspub.epa.gov/enviro/ef_home2.air)

<sup>7</sup> NYSDEC Division of Air Resources, December 22, 2003.

In addition, after conducting the modeling analysis, the results at a number of other projected and potential development sites indicated exceedances of SGCs and/or AGCs. Therefore, a more detailed review of the permit information was conducted for certain sources. This review disclosed that, in certain cases, emission controls were in place at certain industrial operations or the calculated emissions were checked and found to result in emission factors that were substantially reduced.

Potential cumulative impacts were evaluated based on EPA's Hazard Index Approach for non-carcinogenic compounds and EPA's Unit Risk Factors for carcinogenic compounds. Both methods are based on equations that use EPA health risk information at referenced concentrations for individual compounds to determine the level of health risk posed by an expected ambient concentration of these compounds at a sensitive receptor. For non-carcinogenic compounds, EPA considers a concentration-to-reference dose level ratio of less than 1 to be acceptable. For carcinogenic compounds, the EPA unit risk factors represent the concentration at which an excess cancer risk of 1-in-1 million is predicted. In cases where an EPA reference dose or unit risk factor does not exist, the NYSDEC AGC was used.

### ***Additional Sources***

The *CEQR Technical Manual* requires an assessment of any actions that could result in the location of residential developments within 1,000 feet of a large emission source (e.g., a power plant) or within 400 feet of commercial, institutional, or large-scale residential developments where the proposed structure would be of a height similar to or greater than the height of an existing emission stack. To assess the potential effects of these existing sources on the proposed action, a review of existing permitted facilities was conducted. Within the 1,000 foot area around the proposed action area, "major" combustion-related facilities as well as proposed electrical generating facilities were considered. This included all existing facilities subject to federal Prevention of Significant Deterioration (PSD) regulations, existing electrical generating facilities, and proposed major electrical generating facilities and peaking facilities. Within the 400-foot study area boundary, other sources such as those permitted under NYSDEC's Title V program were considered. Sources of information reviewed included the following:

- Combustion permits provided by NYCDEP;
- Emissions source databases provided by NYSDEC for all sources located within the study impact areas. The data was compiled by NYSDEC from the NYSDEC Source Management System (SMS) and Air Facility System (AFS) inventories;
- The EPA's Envirofacts database; and
- The NYSDEC Title V permit Web site.

The only existing electrical generating facility with a potential to impact air quality in and around the project area is the North 1<sup>st</sup> Street power plant operated by the New York Power Authority (NYPA). Therefore, this facility was selected for analysis. The analysis was performed using the ISC3 model using the assumptions and procedures described above.

## **E. EXISTING CONDITIONS**

### **Existing Monitored Air Quality Conditions (2002)**

Monitored concentrations of CO, SO<sub>2</sub>, NO<sub>2</sub>, lead, and ozone ambient air quality data for the area are shown in Table 18-6. These values are the most recent monitored data available that have been published

by NYSDEC for these locations. There were no monitored violations of the NAAQS for the pollutants at these sites or any other in New York City in 2002 (with the exception of ozone, which is a regional pollutant).

**TABLE 18-6**  
**Representative Monitored Ambient Air Quality Data**

Pollutant	Location	Units	Period	Concentrations			Number of Exceedances of Federal Standard	
				Mean	Highest	Second Highest	Primary	Secondary
CO	PS 59	ppm	8-hour	—	3.3	3.2	0	—
			1-hour	—	2.4	2.2	0	—
SO <sub>2</sub>	PS 59	ppm	Annual	0.012	—	—	0	—
			24-hour	—	0.043	0.036	0	—
			3-hour	—	0.063	0.060	—	0
Respirable Particulate (PM <sub>10</sub> )	IS 52	µg/m <sup>3</sup>	Annual	21	—	—	0	0
			24-hour	—	91	45	0	0
NO <sub>2</sub>	PS 59	ppm	Annual	0.038	—	—	0	0
Lead	Susan Wagner	µg/m <sup>3</sup>	3-month	—	0.01	0.01	0	—
O <sub>3</sub>	Queens College	ppm	1-hour	—	0.141	0.127	0	2

**Source:** NYSDEC—2002 Annual New York State Air Quality Report, Ambient Air Monitoring System, July 2003.

### Predicted Existing Pollutant Concentrations in the Proposed Action Area

As noted previously, receptors were placed at multiple sidewalk locations next to the intersections under analysis. The receptor with the highest predicted CO concentrations was used to represent these intersection sites for the existing conditions. CO concentrations were calculated for each receptor location, at each intersection, for each peak period specified above.

Table 18-7 shows the maximum predicted existing (2004) CO 8-hour average concentrations at these intersections. (No 1-hour values are shown since predicted values are much lower than the standard.) At all receptor sites, the maximum predicted 8-hour average concentrations are within the national standard of 9 ppm.

**TABLE 18-7**  
**Maximum Predicted Existing 8-Hour Average**  
**Carbon Monoxide Concentrations for 2004 (parts per million)**

Receptor Site	Location	Time Period	8-Hour
1	McGuinness Boulevard at Green Street	PM	5.0
2	McGuinness Boulevard at Greenpoint Avenue	PM	5.6
3	Franklin Street at Green Street	PM	2.6
4	Kent Avenue at North 7th Street	PM	2.7
5	Franklin Street at Calyer Street	PM	2.9
6	Humboldt Street/BQE Offramp at Meeker Avenue	PM	4.8
<b>National Ambient Air Quality Standards—8-hour: 9 ppm.</b>			

## F. FUTURE NO-ACTION CONDITIONS (NO-BUILD SCENARIO)

### Mobile Sources

#### CO

CO concentrations without the proposed action were determined for the 2013 analysis year using the methodology previously described. Table 18-8 presents the future maximum predicted 8-hour average CO concentrations at the analysis intersections without the proposed action (i.e., 2013 No-Action values). The values shown are the highest predicted concentrations for the receptor locations for any of the time periods analyzed. (Note that as indicated in Section D, “Methodology for Predicting Pollutant Concentrations,” at Site 7 and 8, development sites were analyzed due to their proximity to elevated roadway sources.)

**TABLE 18-8**  
**Maximum Future No-Action Predicted 8-Hour Average**  
**Carbon Monoxide Concentrations for 2013 (parts per million)**

Receptor Site	Location	Time Period	8-Hour Concentration (ppm)
1	McGuinness Boulevard at Green Street	PM	3.5
2	McGuinness Boulevard at Greenpoint Avenue	PM	3.8
3	Franklin Street at Green Street	PM	2.3
4	Kent Avenue at North 7th Street	PM	2.4
5	Franklin Street at Calyer Street	PM	2.5
6	Humboldt Street/BQE Offramp at Meeker Avenue	PM	5.0
<b>National Ambient Air Quality Standards—8-hour: 9 ppm.</b>			

Compared with the values shown in Table 18-7 for Sites 1 to 5, predicted No-Action values are lower than under existing conditions. The decrease in CO concentrations primarily reflects the increasing proportion of newer vehicles with more effective pollution controls, as well as the continuing benefits of the New York State inspection and maintenance program.

#### PM

PM concentrations without the proposed action were determined for the 2013 analysis year using the methodology previously described. Table 18-9 presents the future maximum predicted 24-hour and annual average PM<sub>10</sub> concentrations at the analysis intersections without the proposed action (i.e., 2013 No-Action values). The values shown are the highest predicted concentrations for the receptor locations for any of the time periods analyzed. Note that PM<sub>2.5</sub> concentrations without the proposed action are not presented since impacts are assessed on an incremental basis.

**TABLE 18-9**  
**Maximum Future No-Action Predicted 24-Hour and**  
**Annual PM<sub>10</sub> Concentrations for 2013 (µg/m<sup>3</sup>)**

Receptor Site	Location	24-Hour Concentration (µg/m <sup>3</sup> )	Annual Average Concentration (µg/m <sup>3</sup> )
1	McGuinness Boulevard at Green Street	81.10	34.42
2	McGuinness Boulevard at Greenpoint Avenue	82.54	36.15
<b>National Ambient Air Quality Standards</b> 24-hour: 150 µg/m <sup>3</sup> . Annual average: 50 µg/m <sup>3</sup> .			

## Stationary Sources

In the future without the proposed action, the existing Greenpoint and Williamsburg districts would remain. Industrial uses would be anticipated to be comparable to the With Action condition, and fewer commercial and residential uses would be developed as compared to the With Action condition.

## G. SCENARIO A: FUTURE WITH-ACTION CONDITIONS (BUILD SCENARIO)

### Mobile Sources

#### CO

CO concentrations with the proposed action were determined for the 2013 analysis year using the methodology previously described. Table 18-10 shows the future maximum predicted 8-hour average CO concentration with the proposed action at the six intersections studied. (No 1-hour values are shown since no exceedances of the standard would occur and the *de minimis* criteria are only applicable to 8-hour concentrations. Therefore, the 8-hour values are the most critical for impact assessment.) The values shown are the highest predicted concentrations for any of time periods analyzed. The results indicate that the proposed action would not result in any violations of the CO standard or any significant adverse impacts at the receptor locations. In addition, the analysis shows that the proposed action would not result in any CO impacts as defined by the *CEQR Technical Manual*, which includes no exceedances of National Ambient Air Quality Standards (NAAQS), nor would there be any increases in CO concentrations that are more than half the difference between the No-Action concentrations and the CO standard. As shown in Table 18-10, the maximum increase is 0.3 ppm, with a No-Action concentration of 3.5 ppm. Thus, the increase is well below half the difference between the No-Action concentration and the 9 ppm standard, and does not exceed the CO *de minimis* criteria.

**TABLE 18-10**  
**Maximum Predicted 8-hour**  
**Average Carbon Monoxide Concentrations for 2013 (parts per million)**

Receptor Site	Location	Time Period	8-hour Concentration (ppm)	
			No Action	With Action
1	McGuinness Boulevard at Green Street	PM	3.5	3.8
2	McGuinness Boulevard at Greenpoint Avenue	PM	3.8	3.9
3	Franklin Street at Green Street	PM	2.3	2.4
4	Kent Avenue at North 7th Street	PM	2.4	2.4
5	Franklin Street at Calyer Street	PM	2.5	2.5
6	Humboldt Street/BQE Offramp at Meeker Avenue	PM	5.0	5.0
<b>National Ambient Air Quality Standards—8-hour: 9 ppm.</b>				

As described above under “Methodology,” CO analyses were also undertaken at three elevated receptors to determine if there would be any CO impacts at these locations (e.g., the upper floors of projected and potential development sites that would be located near major traffic corridors such as the Brooklyn-

Queens Expressway or Williamsburg Bridge approach). The maximum predicted 1-hour and 8-hour average CO concentrations on “worst-case” development sites at elevated receptors are presented in Table 18-11. The results show that future CO concentrations at development sites situated near elevated roadways are well below the standards. For example, the maximum predicted concentration was 4.7 ppm for the 8-hour analysis and the standard is 9 ppm.

**TABLE 18-11**  
**Maximum Predicted 1-Hour and 8-Hour Carbon**  
**Monoxide Concentrations on Development Sites for 2013 (parts per million)**

Receptor Site	Location	Time Period	1-Hour	8-Hour
6	Humboldt Street/BQE Offramp at Meeker Avenue	AM	9.7	4.6
		PM	9.8	4.7
7	South 5th Street/Williamsburg Bridge Approach at Bedford Avenue	AM	7.1	2.8
		PM	7.2	2.8
8	BQE Approach at Metropolitan Avenue	AM	7.3	2.9
		PM	7.2	2.8
National Ambient Air Quality Standards: 1-hour: 35 ppm. 8-hour: 9 ppm.				

### PM

PM concentrations with the proposed action were determined for the 2013 analysis year using the methodology previously described. Tables 18-12 and 18-13 show the future maximum predicted 24-hour average PM<sub>10</sub> concentrations with the proposed action for intersection and elevated receptor sites, respectively. Maximum annual average PM<sub>10</sub> concentrations with the proposed action at the intersections studied are presented in Table 18-14, while Table 18-15 presents the maximum concentrations predicted at development sites. The values shown are the highest predicted concentrations for any of the time periods analyzed. The results indicate that the proposed action would not result in any violations of the PM<sub>10</sub> standard or any significant adverse impacts at any of the receptor locations analyzed.

**TABLE 18-12**  
**Maximum Predicted**  
**24-Hour Average PM<sub>10</sub> Concentrations for 2013 at Intersections (µg/m<sup>3</sup>)**

Receptor Site	Location	24-Hour Concentration (µg/m <sup>3</sup> ) <sup>1</sup>	
		No-Action	With-Action
1	McGuinness Boulevard at Green Street	81.10	84.16
2	McGuinness Boulevard at Greenpoint Avenue	82.54	84.24
<b>National Ambient Air Quality Standards—24-hour: 150 µg/m<sup>3</sup>.</b>			

**TABLE 18-13**  
**Maximum Predicted**  
**24-Hour Average PM<sub>10</sub> Concentrations on Development Sites for 2013 (µg/m<sup>3</sup>)**

Receptor Site	Location	24-Hour Concentration (µg/m <sup>3</sup> ) <sup>1</sup>
6	Humboldt Street/BQE Offramp at Meeker Avenue	113.83
7	South 5th Street/Williamsburg Bridge Approach at Bedford Avenue	63.67
8	BQE Approach at Metropolitan Avenue	53.7
<b>National Ambient Air Quality Standards—24-hour: 150 µg/m<sup>3</sup>.</b>		



**TABLE 18-14**  
**Maximum Predicted**  
**Annual Average PM<sub>10</sub> Concentrations for 2013 (µg/m<sup>3</sup>)**

Receptor Site	Location	Annual Concentration (µg/m <sup>3</sup> ) <sup>1</sup>	
		No-Action	With-Action
1	McGuinness Boulevard at Green Street	34.42	35.43
2	McGuinness Boulevard at Greenpoint Avenue	36.15	36.80
<b>National Ambient Air Quality Standards</b> —Annual Average: 50 µg/m <sup>3</sup> .			

**TABLE 18-15**  
**Maximum Build Predicted**  
**Annual Average PM<sub>10</sub> Concentrations on Development Site for 2013 (µg/m<sup>3</sup>)**

Receptor Site	Location	Annual Concentration (µg/m <sup>3</sup> ) <sup>1</sup>
		With-Action
6	Humboldt Street/BQE Offramp at Meeker Avenue	46.78
7	South 5th Street/Williamsburg Bridge Approach at Bedford Avenue	27.53
8	BQE Approach at Metropolitan Avenue	24.35
<b>National Ambient Air Quality Standards</b> —Annual Average: 50 µg/m <sup>3</sup> .		

The purpose of the mobile source PM<sub>2.5</sub> analysis was to determine the maximum predicted incremental impacts, so that they could be compared to the interim guidance criteria that would determine the potential significance of the project's impacts. Based on this analysis the maximum predicted neighborhood-scale annual average and localized 24-hour average PM<sub>2.5</sub> incremental concentrations are presented in Table 18-16. The results show that the predicted annual and daily (24-hour) PM<sub>2.5</sub> increments are below the interim guidance criteria, and therefore the proposed action would not result in significant PM<sub>2.5</sub> impacts at the analyzed receptor locations.

**TABLE 18-16**  
**Maximum Predicted Incremental 24-Hour and**  
**Annual Average PM<sub>2.5</sub> Concentrations for 2013 (µg/m<sup>3</sup>)**

Receptor Site	Location	Neighborhood Scale Analysis Annual Increment	Localized Analysis 24-Hour Increment
1	McGuinness Boulevard at Green Street	0.005	0.38
2	McGuinness Boulevard at Greenpoint Avenue	0.002	0.23
<b>PM<sub>2.5</sub> Interim Guidance Criteria:</b> Annual Average (Neighborhood Scale)—0.1 µg/m <sup>3</sup> 24-Hour (Localized)—5.0 µg/m <sup>3</sup> .			

## Parking Facilities

Based on the methodology previously discussed, the maximum overall predicted future CO concentrations, including ambient background levels and on-site traffic, at sidewalk receptor locations, would be 8.5 ppm and 3.0 ppm for the 1- and 8-hour periods, respectively. The maximum 1- and 8-hour contribution from the parking garages would be 2.5 ppm and 1.0 ppm, respectively. The maximum

concentrations were predicted at Site 3A (553 spaces). The values are the highest predicted concentrations for any time period analyzed. These maximum predicted CO levels are below the applicable CO standards, and therefore, no significant adverse impacts from the proposed action's parking facilities are expected.

## Stationary Sources

### *HVAC Sources*

An analysis of HVAC source emissions was conducted. A screening analysis for individual sites and a cumulative analysis was conducted, to ensure there were no significant impacts from projected and potential development sites.

### *HVAC Source Screening*

The screening analysis was performed to determine whether impacts from projected development sites could potentially impact other projected development sites or existing buildings. The analysis was performed assuming both natural gas and No. 2 fuel oil as the HVAC systems' fuel types. A total of 55 development sites were analyzed using the screening methodology.

The majority of the development sites were determined to pass the HVAC screening analysis using No. 2 fuel oil (i.e., the minimum distance from the source to the receptor is greater than the minimum distance specified in the *CEQR Technical Manual* HVAC screening figure). Four of the sites did not meet the minimum distance specified in *CEQR Technical Manual* using No. 2 fuel oil. A more refined analysis using natural gas was performed. In three of these cases, the use of natural gas did not meet the screening criteria either. At these sites, if minimum distances are increased from the most conservative distance (building line to building line) no significant adverse impacts are predicted.

Therefore, to preclude the potential for significant adverse air quality impacts on other projected developments from the HVAC emissions, an (E) designation would be incorporated into the rezoning proposal for each of the affected sites. The text of the (E) designations is as follows:

Block 2565, Lot 1 (Projected Development, Site 60)

Any new residential and/or commercial development on the above-referenced property must use natural gas as the type of fuel for HVAC systems.

Block 2570, Lot 36 (Projected Development, Site 56c)

Any new residential and/or commercial development on the above-referenced property must ensure that the heating, ventilating and air conditioning stack(s) is located at least 78 feet from the lot line facing West Street and parallel with Oak Street, to avoid any potential significant air quality impacts.

Block 2721, Lot 11 (Projected Development, Site 105)

Any new residential and/or commercial development on the above-referenced property must ensure that the heating, ventilating and air conditioning stack(s) is located at least 100 feet from the lot line facing Richardson Street and parallel with Union Avenue, to avoid any potential significant air quality impacts.

Block 2332, Lot 1 (Projected Development, Site 199b)

Any new residential and/or commercial development on the above-referenced property must ensure that the heating, ventilating and air conditioning stack(s) is located at least 100 feet from the lot line facing Kent Avenue and parallel with North 6<sup>th</sup> Street, to avoid any potential significant air quality impacts.

***Cumulative Impacts from HVAC Sources***

Thirteen HVAC site clusters (HVAC sources in close proximity with similar stack heights) were identified and a quantitative analysis was performed to determine their potential impact. The total floor area of the individual sites was summarized and a single representative stack was placed in the approximate geographic center of the cluster (see Figure 18-2). The thirteen clusters consisted of the following projected and potential development sites:

- Potential Development Sites 1 and 2 – comprising a total floor area of 557,058 square feet with a stack height at 150 feet;
- Projected Development Site 3, and Potential Development Sites 3.1 and 3.2 – comprising a total floor area of 4,093,235 square feet with a stack height of 350 feet;
- Potential Development Sites 34, 41 and 44 – comprising a total floor area of 1,394,013 square feet with a stack height of 250 feet;
- Projected Development Site 56 and Potential Development Site 62 – comprising a total floor area of 3,335,237 square feet with a stack height of 350 feet;
- Projected Development Site 199 and Potential Development Site 222 – comprising a total floor area of 1,594,965 square feet with a stack height of 350 feet;
- Projected Development Sites 57 and 60 and Potential Development Sites 58, 59 and 61 – comprising a total floor area of 480,366 square feet with a stack height of 70 feet;
- Potential Development Sites 4, 5, 7, 8 and 17 – comprising a total floor area of 405,000 square feet with a stack height of 70 feet;
- Projected Development Sites 125, 130, 148 and 149 and Potential Development Sites 126, 127, 128, 129, 146, 147, 150, 151, 152 and 153 – comprising a total floor area of 862,142 square feet with a stack height of 70 feet;
- Projected Development Site 235 and Potential Development Sites 214, 223, 246, 247, 248, 255, 256, 257, 258, 292 and 293 – comprising a total floor area of 871,647 square feet with a stack height of 70 feet;
- Projected Development Site 98 and Potential Development Sites 97, 99, 118 and 120 – comprising a total floor area of 342,680 square feet with a stack height of 70 feet;
- Projected Development Site 218 and Potential Development Site 189, 209 and 210 – comprising a total floor area of 167,971 square feet with a stack height of 50 feet;
- Potential Development Sites 280, 287, 288, 307 and 309 – comprising a total floor area of 120,854 square feet with a stack height of 55 feet; and
- Potential Development Sites 74, 75, 76, 77, 84, 85, 86, 87, 88 and 89 – comprising a total floor area of 291,654 square feet with a stack height of 70 feet.

The results of the analysis, presented in Table 18-17, determined that maximum impacts from clusters, when added to background concentrations, were substantially below ambient air quality standards.

***Air Toxics Analysis From Industrial Sources***

As discussed above, a study was conducted to identify manufacturing and industrial uses within 400 feet of the projected and potential developments. NYCDEP-BEC, NYSDEC, and EPA permit records were used to identify existing sources of industrial emissions. A total of 96 permitted facilities (consisting of

192 sources) were identified and analyzed within 400 feet of at least one development site. The information from these permits (emission rates, stack parameters, etc.) was input to the ISC3 model.

**Table 18-17**  
**HVAC Dispersion Modeling Analysis**  
**Maximum Predicted Pollutant Concentrations from HVAC Clusters**

Pollutant	Averaging Period	Background Concentration (ug/m <sup>3</sup> )	Predicted Concentration (ug/m <sup>3</sup> )	Total Predicted Concentration (ug/m <sup>3</sup> )	Ambient Standard (ug/m <sup>3</sup> )
<b>Cluster 1</b>					
Nitrogen Dioxide (NO <sub>2</sub> )	Annual	71	3.8	74.8	100
Sulfur Dioxide (SO <sub>2</sub> )	3-hour	191	421.5	612.5	1,300
	24-hour	120	187.3	307.3	365
	Annual	34	10.3	44.3	80
Inhalable Particulates (PM <sub>10</sub> )	24-hour	49	21.8	70.8	150
	Annual	22	1.2	23.2	50
<b>Cluster 2</b>					
Nitrogen Dioxide (NO <sub>2</sub> )	Annual	71	2.2	73.2	100
Sulfur Dioxide (SO <sub>2</sub> )	3-hour	191	244.6	435.6	1,300
	24-hour	120	108.7	228.7	365
	Annual	34	6.0	40.0	80
Inhalable Particulates (PM <sub>10</sub> )	24-hour	49	12.6	61.6	150
	Annual	22	0.7	22.7	50
<b>Cluster 3</b>					
Nitrogen Dioxide (NO <sub>2</sub> )	Annual	71	2.5	73.5	100
Sulfur Dioxide (SO <sub>2</sub> )	3-hour	191	274.7	465.7	1,300
	24-hour	120	122.1	242.1	365
	Annual	34	6.7	40.7	80
Inhalable Particulates (PM <sub>10</sub> )	24-hour	49	14.2	61.2	150
	Annual	22	0.8	22.8	50
<b>Cluster 4</b>					
Nitrogen Dioxide (NO <sub>2</sub> )	Annual	71	1.8	72.8	100
Sulfur Dioxide (SO <sub>2</sub> )	3-hour	191	199.3	390.3	1,300
	24-hour	120	88.6	208.6	365
	Annual	34	4.9	38.9	80
Inhalable Particulates (PM <sub>10</sub> )	24-hour	49	10.3	59.3	150
	Annual	22	0.6	22.6	50
<b>Cluster 5</b>					
Nitrogen Dioxide (NO <sub>2</sub> )	Annual	71	0.9	71.9	100
Sulfur Dioxide (SO <sub>2</sub> )	3-hour	191	95.3	286.3	1,300
	24-hour	120	42.4	162.4	365
	Annual	34	2.3	36.3	80
Inhalable Particulates (PM <sub>10</sub> )	24-hour	49	4.9	83.9	150
	Annual	22	0.3	22.3	50
<b>Cluster 6</b>					
Nitrogen Dioxide (NO <sub>2</sub> )	Annual	71	4.8	75.8	100
Sulfur Dioxide (SO <sub>2</sub> )	3-hour	191	531.3	722.3	1,300
	24-hour	120	236.1	356.1	365
	Annual	34	12.9	46.9	80
Inhalable Particulates (PM <sub>10</sub> )	24-hour	49	27.4	76.4	150
	Annual	22	1.5	23.5	50

**Table 18-17 (cont'd)****HVAC Dispersion Modeling Analysis****Maximum Predicted Pollutant Concentrations from HVAC Clusters**

<b>Pollutant</b>	<b>Averaging Period</b>	<b>Background Concentration (ug/m<sup>3</sup>)</b>	<b>Predicted Concentration (ug/m<sup>3</sup>)</b>	<b>Total Predicted Concentration (ug/m<sup>3</sup>)</b>	<b>Ambient Standard (ug/m<sup>3</sup>)</b>
<b>Cluster 7</b>					
Nitrogen Dioxide (NO <sub>2</sub> )	Annual	71	3.5	74.5	100
Sulfur Dioxide (SO <sub>2</sub> )	3-hour	191	383.7	574.7	1,300
	24-hour	120	170.5	290.5	365
	Annual	34	9.3	43.3	80
Inhalable Particulates (PM <sub>10</sub> )	24-hour	49	19.8	68.8	150
	Annual	22	1.1	23.1	50
<b>Cluster 8</b>					
Nitrogen Dioxide (NO <sub>2</sub> )	Annual	71	1.1	72.1	100
Sulfur Dioxide (SO <sub>2</sub> )	3-hour	191	118.0	309.0	1,300
	24-hour	120	52.4	172.4	365
	Annual	34	2.9	36.9	80
Inhalable Particulates (PM <sub>10</sub> )	24-hour	49	6.1	55.1	150
	Annual	22	0.3	22.3	50
<b>Cluster 9</b>					
Nitrogen Dioxide (NO <sub>2</sub> )	Annual	71	4.4	75.4	100
Sulfur Dioxide (SO <sub>2</sub> )	3-hour	191	482.7	673.7	1,300
	24-hour	120	214.5	334.5	365
	Annual	34	11.8	45.8	80
Inhalable Particulates (PM <sub>10</sub> )	24-hour	49	24.9	73.9	150
	Annual	22	1.4	23.4	50
<b>Cluster 10</b>					
Nitrogen Dioxide (NO <sub>2</sub> )	Annual	71	0.5	71.5	100
Sulfur Dioxide (SO <sub>2</sub> )	3-hour	191	60.6	251.6	1,300
	24-hour	120	26.9	146.9	365
	Annual	34	1.5	35.5	80
Inhalable Particulates (PM <sub>10</sub> )	24-hour	49	3.1	52.1	150
	Annual	22	0.2	22.2	50
<b>Cluster 11</b>					
Nitrogen Dioxide (NO <sub>2</sub> )	Annual	71	3.7	74.7	100
Sulfur Dioxide (SO <sub>2</sub> )	3-hour	191	409.7	600.7	1,300
	24-hour	120	182.1	302.1	365
	Annual	34	10.0	44.0	80
Inhalable Particulates (PM <sub>10</sub> )	24-hour	49	21.2	70.2	150
	Annual	22	1.2	23.2	50
<b>Cluster 12</b>					
Nitrogen Dioxide (NO <sub>2</sub> )	Annual	71	1.1	72.1	100
Sulfur Dioxide (SO <sub>2</sub> )	3-hour	191	123.1	314.1	1,300
	24-hour	120	54.7	174.7	365
	Annual	34	3.0	37.0	80
Inhalable Particulates (PM <sub>10</sub> )	24-hour	49	6.4	55.4	150
	Annual	22	0.3	22.3	50

**Table 18-17 (cont'd)**  
**HVAC Dispersion Modeling Analysis**  
**Maximum Predicted Pollutant Concentrations from HVAC Clusters**

Pollutant	Averaging Period	Background Concentration (ug/m <sup>3</sup> )	Predicted Concentration (ug/m <sup>3</sup> )	Total Predicted Concentration (ug/m <sup>3</sup> )	Ambient Standard (ug/m <sup>3</sup> )
<b>Cluster 13</b>					
Nitrogen Dioxide (NO <sub>2</sub> )	Annual	71	1.5	72.5	100
Sulfur Dioxide (SO <sub>2</sub> )	3-hour	191	161.2	352.2	1,300
	24-hour	120	71.6	191.6	365
	Annual	34	3.9	37.9	80
Inhalable Particulates (PM <sub>10</sub> )	24-hour	49	8.3	57.3	150
	Annual	22	0.5	22.5	50

As shown in Table 18-18, following the (E) designation text, using the modeling approach outlined above, the SGC or AGC is predicted to be exceeded for particulate matter, dioctyl phthalate, formaldehyde, and chromic acid. Exceedances of the SGC for particulate matter are predicted at three potential development sites, while the SGC for formaldehyde is predicted to be exceeded at one projected development site.

**Table 18-18**  
**Projected and Potential Development Sites Exceeding an SGC or AGC**

Site	Block	Lot	Pollutants
<b>Projected Development Sites</b>			
230	2344	26	Dioctyl phthalate (AGC), formaldehyde (SGC and AGC)
<b>Potential Development Sites</b>			
52	2556	55, 57, 58	Dioctyl phthalate (AGC)
54	2557	7	Particulate matter (SGC), dioctyl phthalate (AGC)
64	2571	18	Dioctyl phthalate (AGC)
69	2644	43	Dioctyl phthalate (AGC)
84	2714	33	Dioctyl phthalate (AGC) and formaldehyde (AGC)
85	2714	13	Formaldehyde (AGC)
115	2723	29, 30	Particulate matter (SGC)
116	2723	33, 36	Particulate matter (SGC)
154	2736	20, 23	Dioctyl phthalate (AGC)

Exceedances of the AGC for dioctyl phthalate are predicted at one projected development site and six potential development sites, while the AGC for formaldehyde is predicted to be exceeded at one projected development site and two potential development sites, and the AGC for chromic acid is predicted to be exceeded at three potential development sites. Exceedances of the above SGCs and AGCs are predicted at the projected and potential development sites summarized in Table 18-18.

Although the AGC for chromic acid is predicted to be exceeded at one projected and three potential development sites, impacts are less than 10 times higher than the AGC. NYSDEC guidance interprets impacts of less than 10 times higher than the AGC for carcinogenic compounds that have a risk-based

threshold (which includes chromic acid) as allowable, as long as best available control technology (BACT) is in place. Therefore, the impacts of chromic acid at these development sites are not considered significant.

To preclude the potential for significant adverse industrial source air quality impacts an (E) designation for air quality will be incorporated into the rezoning proposal. The text of the (E) designation is as follows:

Block 2344, Lot 26:

- If the dioctyl phthalate and formaldehyde emissions affecting this property continue, any new residential and/or commercial development, enlargement, or change of use on the above-referenced property must either: have inoperable windows and may not include air intakes; or, must incorporate alternative design features and technologies approved by NYCDEP.

Block 2556, Lots 55, 57 and 58:

- If the dioctyl phthalate emissions affecting this property continue, any new residential and/or commercial development, enlargement, or change of use on the above-referenced property must either: have inoperable windows and may not include air intakes; or, must incorporate alternative design features and technologies approved by NYCDEP.

Block 2557, Lot 7:

- If the particulate matter and dioctyl phthalate emissions affecting this property continue, any new residential and/or commercial development, enlargement, or change of use on the above-referenced property must either: have inoperable windows and may not include air intakes; or, must incorporate alternative design features and technologies approved by NYCDEP.

Block 2571, Lot 18:

- If the dioctyl phthalate emissions affecting this property continue, any new residential and/or commercial development, enlargement, or change of use on the above-referenced property must either: have inoperable windows and may not include air intakes; or, must incorporate alternative design features and technologies approved by NYCDEP.

Block 2644, Lot 43:

- If the dioctyl phthalate emissions affecting this property continue, any new residential and/or commercial development, enlargement, or change of use on the above-referenced property must either: have inoperable windows and may not include air intakes; or, must incorporate alternative design features and technologies approved by NYCDEP.

Block 2714, Lot 33:

- If the dioctyl phthalate and formaldehyde emissions affecting this property continue, any new residential and/or commercial development, enlargement, or change of use on the above-referenced property must either: have inoperable windows and may not include air intakes; or, must incorporate alternative design features and technologies approved by NYCDEP.

Block 2714, Lot 13:

- If the formaldehyde emissions affecting this property continue, any new residential and/or commercial development, enlargement, or change of use on the above-referenced property must either: have inoperable windows and may not include air intakes; or, must incorporate alternative design features and technologies approved by NYCDEP.

Block 2723, Lots 29 and 30; Block 2723, Lots 33 and 36:

- If the particulate matter emissions affecting these properties continue, any new residential and/or commercial development, enlargement, or change of use on the above-referenced properties must either: have inoperable windows and may not include air intakes; or, must incorporate alternative design features and technologies approved by NYCDEP.

Block 2736, Lots 20 and 23:

- If the dioctyl phthalate emissions affecting this property continue, any new residential and/or commercial development, enlargement, or change of use on the above-referenced property must either: have inoperable windows and may not include air intakes; or, must incorporate alternative design features and technologies approved by NYCDEP.

The procedures to be followed for satisfaction of the (E) designation shall require that the fee owner(s) of the lot which is restricted by this (E) designation demonstrate that the requirements of the (E) designation have been satisfied or that the restrictions of the (E) designation are no longer necessary due to a change in conditions. To demonstrate that the requirements of the (E) designation are no longer necessary due to a change in conditions, the fee owner(s) of the lot restricted by the (E) designation will be required to prepare a written report to be submitted to NYCDEP indicating that the impact identified for the lot would no longer occur. Examples of the types of changes in conditions which would no longer necessitate the (E) designation would be that the emissions at the source, or exposure pathways to the affected lot, have been eliminated or reduced to below impact levels. Upon request, NYCDEP will provide guidelines and criteria for performing the technical analyses to be used to demonstrate that the requirements of the (E) designation are no longer necessary. If it is determined by the NYCDEP that the requirements of the (E) designation have been satisfied or are no longer necessary, the NYCDEP shall issue a Notice of Satisfaction for the lot. The procedures set forth in Section 11-15 of the Zoning Resolution with respect to the satisfaction of requirements and removal of (E) designation shall apply.

Table 18-19 presents the maximum impacts at the projected and potential development sites. The table also lists the SGC and AGC for each toxic air pollutant.

Cumulative impacts were also determined for combined effects of different toxic air pollutants. Table 18-20 presents the results of the assessment of cumulative carcinogenic and non-carcinogenic effects on the proposed action. For non-carcinogenic compounds, EPA's Hazard Index Approach resulted in a calculated value of 0.43. This value is below the significance threshold of 1.0 established by USEPA. For carcinogenic compounds, the maximum total estimated cancer risk is 9.84 per million.

The maximum hazard index and total cancer risk were determined by a refined modeling approach using the ISC3 model for each pollutant identified as a possible or likely carcinogen. Concentrations at each receptor were averaged over the five meteorological years for which impacts were modeled (1998-2002). While the maximum cancer risk is above the level considered by USEPA to be significant (1 per million), several things must be kept in mind: 1) the concentrations are compared against EPA unit risk factors and NYSDEC AGCs, each of which was developed by these agencies based on a factor of safety above which health effects may potentially occur; 2) the exceedance of a 1 per million threshold occurs at few receptor locations, (i.e., at modeled locations at potential development sites 66, 67, 68, 88, and 231; and 3) the health risk analysis is based upon a lifetime exposure at the predicted concentrations at a single location, which is a very conservative approach. Therefore, based upon the cumulative air toxics analysis, the proposed action would not result in a significant cancer risk.

The procedures used to estimate maximum potential impacts from industrial sources showed that their operations would not result in any predicted violations of the NAAQS or any exceedances of the



**TABLE 18-19**  
**Maximum Predicted Impacts on Projected and Potential Development Sites from Industrial Sources**

Pollutant	CAS Number	ISC3 Model Cumulative Short Term Impact ( $\mu\text{g}/\text{m}^3$ )	SGC ( $\mu\text{g}/\text{m}^3$ )	ISC3 Model Cumulative Annual Impact ( $\mu\text{g}/\text{m}^3$ )	AGC ( $\mu\text{g}/\text{m}^3$ )
Formaldehyde	00050-00-0	15	30	0.05	0.06
Urea	00057-13-6	0.1	--	0.0002	0.10
Ethanol	00064-17-5	11,375	--	72.3	45,000
Acetic Acid	00064-19-7	2	3,700	0.006	60
Methanol	00067-56-1	12,208	33,000	21.3	4,000
Isopropyl Alcohol	00067-63-0	5,030	98,000	90.1	7,000
Dimethyl Ketone (Acetone)	00067-64-1	12,574	180,000	39.4	28,000
Propanol	00071-23-8	11,875	61,000	49.6	1,200
Butyl Alcohol, N-	00071-36-3	1,720	--	14.3	1,500
Methyl Chloroform	00071-55-6	51	68,000	0.4	1,000
Propane	00074-98-6	9	--	0.001	110,000
Dichloromethane (Methylene Chloride)	00075-09-2	2,708	14,000	0.6	2
Isobutyl Alcohol	00078-83-1	3,479	--	25.5	360
Methyl Ethyl Ketone	00078-93-3	20,883	59,000	122.4	5,000
Trichloroethylene	00079-01-6	158	54,000	0.4	0.5
Naphthalene	00091-20-3	93	7,900	0.1	3
Trimethylbenzene	00095-63-6	7	--	0.02	290
Isobutyl-Isobutyrate	00097-85-8	2,205	--	11.6	45,000
Diethylaminoethanol	00100-37-8	46	--	1.5	23
Ethylene Glycol	00107-21-1	5	10,000	0.02	400
Methyl Propyl Ketone	00107-87-9	2,386	88,000	5.6	1,700
Ethoxypropanol 3-	00107-98-2	1,221	55,000	38.7	2,000
Methyl Isobutyl Ketone	00108-10-1	17,883	31,000	120.6	3,000
Isopropyl Acetate	00108-21-4	558	84,000	3.6	1,000
Methoxypropyl Acetate	00108-65-6	758	55,000	3.8	2,000
Toluene	00108-88-3	7,721	37,000	31.6	400
Propyl Acetate	00109-60-4	3,309	100,000	21.0	20,000
Methylisoamylacetone	00110-12-3	1,099	--	17.8	560
Isobutyl Acetate	00110-19-0	3,539	--	40.2	17,000
Methyl Amyl Ketone	00110-43-0	2,446	--	10.7	550
Cellosolve Acetate	00111-15-9	58	140	8.2	64
Ethylenglycolmonobuty	00111-76-2	2,515	14,000	7.8	13,000
Butyl Carbitol	00112-34-5	304	670	0.7	360
Diethyl Phthalate	00117-81-7	90	--	0.418	0.420
Triethylamine	00121-44-8	1	2,800	0.0007	7
2-Propanol	00123-38-6	3	--	0.0004	110
Diacetone Alcohol	00123-42-2	79	--	0.5	570
Butyl Acetate	00123-86-4	7,544	95,000	23.6	17,000
Tetrachloroethylene	00127-18-4	0.3	1,000	0.3	1
Ethyl Acetate	00141-78-6	1,098	--	6.1	3,400
N-Heptane	00142-82-5	2,885	210,000	18.3	3,900
Ethylamine Hydrochloride	00557-66-4	0.1	--	0.0002	--
N-Amyl Acetate	00628-63-7	13	53,000	0.04	630
Carbon Monoxide	00630-08-0	4,506	14,000	44.4	--
Ethyl-3-Ethoxy	00763-69-9	6	140	0.002	64
Sodium Hydroxide	01310-73-2	7	200	0.009	--
Xylene,M,O&P Mixt.	01330-20-7	2,030	4,300	10.5	100
Ethylengly Monopr E	02807-30-9	16	370	0.01	200
Dmamp Amino Alcohol	07005-47-2	26	--	0.8	--
Total Boron	07440-42-8	0.1	--	0.0002	--
Sulfur Dioxide	07446-09-5	7	910	0.04	80
Iodine	07553-56-2	8	100	0.004	--
Ammonia	07664-41-7	178	2,400	5.7	100
Sulfuric Acid Mist	07664-93-9	2	120	0.007	1
Nitric Acid Mist	07697-37-2	9	86	0.0008	12
Gasoline	08006-61-9	1,365	150,000	19.8	2,100
Naphtha (Coal Tar)	08030-30-6	5,549	--	9.7	3,800
Vm&P Naptha	08032-32-4	66	--	0.3	33,000
Technical White Oil	08042-47-5	1	--	0.0008	--
Stoddard Solvent	08052-41-3	22,236	--	327.8	1,300
Cellulose	09004-34-6	69	--	0.4	24
Cellulose Nitrate	09004-70-0	233	--	1.0	--
Nitrogen Dioxide	10102-44-0	240	--	30.6	100
Chromic Acid (1)	11115-74-5	--	--	0.00039	0.000045
Benzotriazole Uv Abs.	25973-55-1	0.2	--	0.00006	--
Aldehydes	32791-31-4	1	--	0.0007	0.1
Dip. Gly. Mono. Ether	34590-94-8	143	--	0.1	--
Mineral Spirits	64475-85-0	1,165	--	2.0	--
Mineral Spirits	64742-47-8	11	--	0.03	50
Vm&P Naptha	64742-48-9	69	--	0.2	--
Med. Sol. Aliph. Naptha	64742-88-7	1,479	--	5.3	--
Naptha Light Aliphatic	64742-89-8	999	--	1.7	--
Naptha Light	64742-95-6	512	--	0.9	3,800
Hydrocarbon Misc.	68476-39-1	124	--	0.3	--
Hydrocarbons	68476-44-8	449	--	4.4	--
Hydrocarbons C1-3	68527-16-2	9,533	--	68.1	--
Oxo-Heptyl Acetate	90438-79-2	21	--	0.003	--
Particulates	NY075-00-0	359	380	12.8	50.0
Morpholine	NY099-42-0	2,927	--	0.0002	--
Total Aromatic Hydro	NY439-00-0	45	--	0.2	--
Aliphatic Hydrocarb	NY550-00-0	26	--	0.03	--
Total Fluoride	NY780-00-0	0.1	5	0.0002	0.067
Miscellaneous Organics	NY990-00-0	133	--	78.9	--
Total Organic Solvent	NY998-00-0	24,871	--	48.9	--

**Notes:**

<sup>(1)</sup> Concentration exceeds AGC, but is less than 10 in a million risk (i.e., 10 times the AGC threshold); therefore, impacts not considered significant.

**TABLE 18-20**  
**Estimated Maximum Cancer Risk and Hazard Index**

Pollutant	CAS Number	ISC3-Model Estimated Pollutant Concentration (ug/m <sup>3</sup> )	AGC (ug/m <sup>3</sup> )	Concentration to AGC Pollutant Ratio
<b>Carcinogenic Compounds</b>				
Formaldehyde	00050-00-0	1.36E-10	0.06	2.27E-09
Dichloromethane (Methylene Chloride)	00075-09-2	2.02E-08	2.1	9.62E-09
Trichloroethylene	00079-01-6	6.49E-11	0.5	1.30E-10
Diethyl Phthalate	00117-81-7	2.12E-08	0.42	5.04E-08
Tetrachloroethylene	00127-18-4	2.60E-10	1.0	2.60E-10
Chromic Acid*Obsolet	11115-74-5	4.40E-10	0.000045	9.78E-06
<b>Total Estimated Cancer Risk<sup>(1)</sup></b>				<b>9.84E-06</b>
<b>Cancer Risk Threshold Value</b>				<b>1.00E-06</b>
Pollutant	CAS Number	ISCLT-Model Estimated Pollutant Concentration (ug/m <sup>3</sup> )	AGC (ug/m <sup>3</sup> )	Concentration to AGC Pollutant Ratio
<b>Non-Carcinogenic Compounds</b>				
Urea	00057-13-6	1.05E-05	0.10	1.05E-04
Ethanol	00064-17-5	5.68E+00	45,000	1.26E-04
Acetic Acid	00064-19-7	1.27E-04	60	2.12E-06
Methanol	00067-56-1	1.25E-02	4,000	3.14E-06
Isopropyl Alcohol	00067-63-0	1.98E+01	7,000	2.83E-03
Dimethyl Ketone (Acetone)	00067-64-1	3.80E-02	28,000	1.36E-06
Propanol	00071-23-8	1.39E-01	1,200	1.16E-04
Butyl Alcohol, N-	00071-36-3	1.30E+01	1,500	8.66E-03
Methyl Chloroform	00071-55-6	4.21E-05	1,000	4.21E-08
Propane	00074-98-6	2.77E-05	110,000	2.52E-10
Isobutyl Alcohol	00078-83-1	5.59E+00	360	1.55E-02
Methyl Ethyl Ketone	00078-93-3	1.31E+01	5,000 <sup>(1)</sup>	2.61E-03
Napthalene	00091-20-3	9.08E-03	3.0 <sup>(1)</sup>	3.03E-03
Trimethylbenzene	00095-63-6	8.33E-05	290	2.87E-07
Isobutyl-Isobutyrate	00097-85-8	1.16E+01	45,000	2.58E-04
Diethylaminoethanol	00100-37-8	7.64E-04	23	3.32E-05
Ethylene Glycol	00107-21-1	1.48E-04	400	3.69E-07
Methyl Propyl Ketone	00107-87-9	5.57E+00	1,700	3.28E-03
Ethoxypropanol 3-	00107-98-2	2.19E-02	2,000	1.09E-05
Methyl Isobutyl Ketone	00108-10-1	1.00E-01	3,000 <sup>(1)</sup>	3.34E-05
Isopropyl Acetate	00108-21-4	7.47E-04	1,000	7.47E-07
Methoxypropyl Acetate	00108-65-6	7.78E-03	2,000	3.89E-06
Toluene	00108-88-3	3.16E+01	400 <sup>(1)</sup>	7.89E-02
Propyl Acetate	00109-60-4	1.82E-02	20,000	9.10E-07
Methylisoamylacetone	00110-12-3	7.98E-03	560	1.42E-05
Isobutyl Acetate	00110-19-0	1.36E-02	17,000	8.01E-07
Methyl Amyl Ketone	00110-43-0	9.52E-04	550	1.73E-06
Cellosolve Acetate	00111-15-9	1.68E-03	64	2.62E-05
Ethylenglycolmonobuty	00111-76-2	6.50E+00	13,000 <sup>(1)</sup>	5.00E-04
Butyl Carbitol	00112-34-5	7.85E-04	360	2.18E-06
Triethylamine	00121-44-8	1.31E-07	7.0 <sup>(1)</sup>	1.87E-08
2-Propanol	00123-38-6	8.30E-06	110	7.55E-08
Diacetone Alcohol	00123-42-2	7.93E-04	570	1.39E-06
Butyl Acetate	00123-86-4	4.94E-02	17,000	2.91E-06
Ethyl Acetate	00141-78-6	3.38E-03	3,400	9.94E-07
N-Heptane	00142-82-5	1.62E-02	3,900	4.14E-06
N-Amyl Acetate	00628-63-7	5.68E-05	630	9.02E-08
Ethyl-3-Ethoxy	00763-69-9	1.83E-04	64	2.86E-06
Xylene,M,O&P Mixt.	01330-20-7	5.62E+00	100 <sup>(1)</sup>	5.62E-02
Ethylengly Monopr E	02807-30-9	3.63E-04	200	1.81E-06
Sulfur Dioxide	07446-09-5	7.97E-04	80	9.96E-06
Ammonia	07664-41-7	2.98E-03	100 <sup>(1)</sup>	2.98E-05
Sulfuric Acid Mist	07664-93-9	6.17E-05	1.0	6.17E-05
Nitric Acid Mist	07697-37-2	1.41E-05	12	1.18E-06
Gasoline	08006-61-9	1.60E-01	2,100	7.63E-05
Naphtha (Coal Tar)	08030-30-6	6.86E-03	3,800	1.81E-06
Vm&P Naptha	08032-32-4	2.94E-03	33,000	8.89E-08
Stoddard Solvent	08052-41-3	2.39E-02	1,300	1.84E-05
Cellulos	09004-34-6	3.62E-04	24	1.51E-05
Nitrogen Dioxide	10102-44-0	2.32E-01	100	2.32E-03
Aldehydes	32791-31-4	1.92E-05	0.1	1.92E-04
Mineral Spirits	64742-47-8	4.87E-05	50	9.74E-07
Naptha Light	64742-95-6	5.48E-03	3,800	1.44E-06
Particulates	NY075-00-0	1.28E+01	50	2.56E-01
Total Fluoride*	NY780-00-0	1.05E-05	0.067	1.57E-04
<b>Total Hazard Index</b>				<b>4.31E-01</b>
<b>Hazard Index Threshold Value</b>				<b>1.00E+00</b>

**Notes**

<sup>1</sup> Rfc Values (ug/m<sup>3</sup>) established by the EPA's Inhalation Risk Information System (IRIS) were used instead of the AGC.

recommended SGC or AGC. Therefore, based on the data available on the surrounding industrial uses, development resulting from the proposed action would not experience significant air quality impacts from these facilities.

### ***Additional Sources***

Potential stationary source impacts on the project from the NYPA North 1st Street facility were determined using the methodology previously described. The estimated concentrations from the modeling were added to the background concentrations to estimate total air quality concentrations at the proposed development sites. The results of this analysis are presented in Table 18-21.

**TABLE 18-21**  
**Maximum Predicted Pollutant Concentrations**  
**from the NYPA North 1<sup>st</sup> Street Facility**

<b>Pollutants</b>	<b>Averaging Period</b>	<b>Background Concentration (ug/m<sup>3</sup>)</b>	<b>Maximum Predicted Concentration (ug/m<sup>3</sup>)</b>	<b>Total Predicted Concentration (ug/m<sup>3</sup>)</b>	<b>Ambient Standard (ug/m<sup>3</sup>)</b>
Nitrogen Dioxide (NO <sub>2</sub> )	Annual	71	1.3	72.3	100
Sulfur Dioxide (SO <sub>2</sub> )	3-hour	191	10.6	201.6	1,300
	24-hour	120	3.2	123.2	365
	Annual	34	0.26	34.3	80
Inhalable Particulates (PM <sub>10</sub> )	24-hour	49	9.3	58.3	150
	Annual	22	0.76	22.8	50
Carbon Monoxide (CO)	1-hour	4,686	398.1	5,084.1	40,000
	8-hour	3,200	191.7	3,391.7	10,000

As shown in the table, the predicted pollutant concentrations for all of the pollutant time averaging periods are well below their respective standards. Therefore, no significant air quality impacts would occur on the proposed action.

## **H. SCENARIO B: FUTURE WITH-ACTION CONDITIONS (BUILD SCENARIO)**

Under this scenario, it is assumed that the proposed TransGas Energy (TGE) facility would be constructed under No-Action conditions, and would remain in the future with the proposed action. The facility would be located at the existing Bayside Oil Terminal at North 12<sup>th</sup> Street and Kent Avenue. The TGE facility would have a capacity of approximately 1,100 megawatts and consist of four Siemens Westinghouse W501F combustion turbines, four heat recovery system generators, two auxiliary boilers, and additional equipment. Due to the proximity of this facility to proposed development sites, an analysis was conducted to determine the potential effects its potential effect on future development sites associated with the proposed action.

The analysis was conducted using the ISC3 model. Source information was obtained from the *TransGas Energy Facility Article X Application* (Revised, March 2003). Table 18-22 presents the results of the analysis.

**TABLE 18-22**  
**Maximum Predicted Pollutant Concentrations from the TransGas Energy Facility**

Pollutants	Averaging Period	Background Concentration (ug/m <sup>3</sup> )	Maximum Predicted Concentration (ug/m <sup>3</sup> )	Total Predicted Concentration (ug/m <sup>3</sup> )	Ambient Standard (ug/m <sup>3</sup> )
Nitrogen Dioxide (NO <sub>2</sub> )	Annual	71	6.8	77.8	100
Sulfur Dioxide (SO <sub>2</sub> )	3-hour	191	90.7	280.7	1,300
	24-hour	120	41.5	161.5	365
	Annual	34	4.4	38.4	80
Inhalable Particulates (PM <sub>10</sub> )	24-hour	49	47.7	96.7	150
	Annual	22	4.9	26.9	50
Carbon Monoxide (CO)	1-hour	4,686	46.2	4,732.2	40,000
	8-hour	3,200	24.2	3,224.2	10,000

As shown in the table, the predicted pollutant concentrations for all of the pollutant time averaging periods are well below their respective standards. Therefore, no significant air quality impacts would occur on the proposed action.

## I. CONCLUSION

The results of the analyses presented in this chapter demonstrate that CO and PM<sub>10</sub> concentrations due to the proposed action would not result in any violations of NAAQS or any adverse air quality impacts. It was also determined that CO impacts would not exceed CEQR *de minimis* impacts. An analysis of the incremental impacts of PM<sub>2.5</sub> from mobile sources was conducted, which determined that maximum impacts are below the City's interim guideline thresholds.

Prototypical parking facilities were analyzed which found that impacts, when added to background CO concentrations and on-street CO contributions, are well below the NAAQS.

A screening analysis of the emissions from HVAC sources at projected development sites determined that with exception of four sites, no violations of air quality standards are predicted. For the four sites which did not meet the screening criteria, (E) designations will be included in the text of the rezoning proposal to restrict fuel type to be used, or the location of the stack discharge. The cumulative HVAC impact analysis demonstrated that the impact of HVAC clusters, when added to background concentrations, would not result in an exceedance of NAAQS.

The air toxics analysis determined that at most projected and potential development sites, maximum short-term and annual average concentrations of individual compounds would be below NYSDEC SGCs and AGCs, and that the cumulative health risk associated with industries in the project action area are below EPA criteria. At a total of one projected and nine potential development sites, an (E) designation for air quality will be incorporated in the text of the rezoning proposal to ensure that no significant impacts at these sites would occur. The health risk assessment determined that although cumulative impacts at several sites would exceed the EPA's risk screening criteria for carcinogenic compounds, the levels are not considered significant.

Therefore, the air quality impact analysis presented above confirms that the proposed action would not result in any predicted potential significant adverse air quality impacts.