G. Air Quality

1. Introduction

This chapter examines the potential for air quality impacts to result from the Proposed Action. It includes three separate air quality analyses: mobile sources, construction sources and industrial sources. The mobile source study examines the impacts on air quality from project induced traffic near local roadway intersections in the Glen Cove community. The construction source analysis provides a qualitative assessment of potential air quality impacts stemming from the construction activities at the project site. The construction analysis also includes a summary of useful mitigation measures to minimize air pollutant emissions during the construction period. The final analysis examines the potential affects of nearby industrial sources. Since the proposed project would introduce residential land uses near existing industrial facilities, this analysis examines the potential impacts of industrial air emissions on the future residents of the Glen Isle development. Any permits or registrations associated with stationary sources (e.g., heating systems) that may be required by New York State would be applied for prior to installation of any such system.

This chapter also includes a discussion of greenhouse gas (GHG) emission sources with the Proposed Action and features of the development that would result in a reduction of GHG emissions from the Proposed Action. The discussion was prepared with the New York State Department of Environmental Conservation (NYSDEC) policy document entitled *Assessing Energy Use and Greenhouse Gas Emissions in Environmental Impact Statements*, July 15, 2009 as a guide.

a) 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. Ambient concentrations of carbon monoxide (CO) are predominantly influenced by mobile source emissions. Particulate matter (PM), volatile organic compounds (VOCs), and nitrogen oxides (NO and NO_2, collectively referred to as NO_x) are emitted from both mobile and stationary sources. Fine PM is also formed when emissions of NO_x, sulfur oxides (SO_x), ammonia, organic compounds, and other gases react or condense in the atmosphere. Emissions of sulfur dioxide (SO_2) are associated mainly with stationary sources, and sources utilizing non-road diesel such as diesel trains, marine engines, and non-road vehicles (e.g., construction engines). On-road diesel vehicles currently contribute very little to SO_2 emissions since the sulfur content of on-road diesel fuel, which is federally regulated, is extremely low. Ozone is formed in the atmosphere by complex photochemical processes that include NO_x and VOCs.

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 urban areas, approximately 80 to 90 percent of CO emissions are from motor vehicles. Since CO is a reactive gas which does not persist in the atmosphere, CO concentrations can vary greatly over relatively short distances; elevated concentrations are usually limited to locations near busy intersections or heavily traveled and congested roadways. Consequently, a CO analysis must be performed on a local, or microscale, basis. The proposed actions would increase traffic volumes on streets near the project site and would result in local increases in CO levels. Therefore, a mobile source air quality analysis was performed for the project.

Nitrogen Oxides, VOCS and Ozone

NO_x are of principal concern because of their role, together with VOCs, 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 advected downwind, elevated ozone levels are often found many miles from sources of the precursor pollutants. The effects of NO_x and VOC emissions from all sources are therefore generally examined on a regional basis. The contribution of any action or project to regional emissions of these pollutants would include any added stationary or mobile source emissions; the change in regional mobile source emissions of these pollutants would be related to the total vehicle miles traveled added or subtracted on various roadway types throughout the New York metropolitan area, which is designated as a moderate non-attainment area for ozone by the U.S. Environmental Protection Agency (EPA). The proposed actions would not have a significant effect on the overall volume of vehicular travel in the metropolitan area; therefore, no measurable impact on regional NO_x emissions or on ozone levels is predicted. An analysis of project-related emissions of these pollutants from mobile sources was therefore not warranted.

The proposed project would not involve the addition of any new large stationary emission sources. Therefore, an analysis of potential local impacts on NO_2 concentrations was not warranted.

Respirable Particulate Matter —PM_{10} AND $PM_{2.5}$

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 naturally occurring VOC; 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. Naturally occurring PM is generally greater than 2.5 micrometers in diameter. 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. PM also acts as a substrate for the adsorption (accumulation of gases, liquids, or solutes on the surface of a solid or liquid) of other pollutants, often toxic and some likely carcinogenic compounds.
As described below, PM is regulated in two size categories: particles with an aerodynamic diameter of less than or equal to 2.5 micrometers ($PM_{2.5}$), and particles with an aerodynamic diameter of less than or equal to 10 micrometers (PM_{10}, which includes $PM_{2.5}$). $PM_{2.5}$ has the ability to reach the lower regions of the respiratory tract, delivering with it other compounds that adsorb to the surfaces of the particles, and is also extremely persistent in the atmosphere. $PM_{2.5}$ is mainly derived from combustion material that has volatilized and then condensed to form primary PM (often soon after the release from a source exhaust) or from precursor gases reacting in the atmosphere to form secondary PM.

The proposed project would not involve the addition of any new large stationary emission sources. The only stationary source of PM emissions would be from fuel combustion (i.e., natural gas) in the heating system boilers serving the proposed development (which is expected to add 2,203,750 square feet of development space spread across 56 acres). Emissions from these boilers would not be a significant source of PM_{10} or $PM_{2.5}$ and would not be expected to cause or contribute to new instances of PM_{10} or $PM_{2.5}$ violations. According to current NYSDEC policy regarding $PM_{2.5}$ impacts, facilities applying for permits or modifications under SEQRA would require a quantified analysis of $PM_{2.5}$ if the PM emissions were equal to or greater than 15 tons per year. The proposed project would not exceed 15 tons per year. (See supporting calculations in **Appendix Q**).

Diesel-powered vehicles, especially heavy duty trucks and buses, are a significant source of respirable PM, most of which is $PM_{2.5}$. PM concentrations may, consequently, be locally elevated near roadways with high volumes of heavy diesel powered vehicles. The proposed project would not result in any significant increases in truck traffic near the project site or in the region, and therefore, an analysis of potential impacts from PM was not warranted for mobile sources.

During the construction phase, heavy duty construction engines would be utilized to perform specific construction tasks. Because most of this equipment is usually diesel powered, PM emissions from engine operation may be a concern. Fugitive PM emissions may also be of concern during excavation activities. Therefore, a qualitative assessment of PM impacts on local air quality has been conducted for the construction period.

Sulfur Dioxide

SO_2 emissions are primarily associated with the combustion of sulfur-containing fuels (oil and coal). Monitored SO_2 concentrations in New York are lower than the national standards. Due to the federal restrictions on the sulfur content in diesel fuel for on-road vehicles, no significant quantities are emitted from vehicular sources. Vehicular sources of SO_2 are not significant and therefore, an analysis of SO_2 from mobile sources was not warranted. The proposed project would not involve the addition of any new stationary emission sources for SO_2. Therefore, an analysis of potential increases in SO_2 emissions was not warranted.

Greenhouse Gasses

Greenhouse Gasses (GHGs) are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb ~~and emit radiation at specific wavelengths within the spectrum of~~ infrared radiation (heat) emitted ~~by~~ from the Earth's surface, the atmosphere, and clouds. This property causes the general warming of the Earth's atmosphere, or the "greenhouse effect." ~~Unlike the criteria pollutants discussed above, GHGs do not have a direct impact on human health, but are expected to significantly affect the global climate system well into the future, and are therefore expected to indirectly impact human health and human and natural systems.~~

~~Water vapor, carbon dioxide (CO_2), nitrous oxide, methane, and ozone are the primary greenhouse gases in the Earth's atmosphere. Although water vapor is of great importance to global climate change, it is not directly of concern as an emitted pollutant since the miniscule quantities emitted from anthropogenic sources are of no consequence.~~

CO_2 is the primary pollutant of concern from anthropogenic sources. Although not the GHG with the strongest impact on global climate change for an equal quantity of gas, it is by far the most abundant and, therefore, the most influential GHG. CO_2 is emitted as a product of combustion (both natural and anthropogenic) including power production and heating systems, and internal combustion engines such as on-road vehicles and non-road engines; from some industrial processes such as the manufacture of cement, mineral production, metal production, and the use of petroleum-based products; from volcanic eruptions; and from the decay of organic matter. CO_2 is removed ("sequestered") from the lower atmosphere by natural processes such as photosynthesis and uptake by the oceans. CO_2 is included in any analysis of GHG emissions. CO_2 is the GHG that would be emitted in the greatest amount from the Proposed Action

Methane and nitrous oxide also play an important role since they have limited removal processes and a relatively high impact on global climate change as compared to an equal quantity of CO_2. Methane is emitted from agriculture, natural gas distribution, and landfills. Methane is also released from natural processes that include the decay of organic matter lacking sufficient oxygen, for example, in wetlands. Nitrous oxide is emitted from fertilizer use and fossil fuel burning. Natural processes in soils and the oceans also release nitrous oxide. ~~Emissions of these compounds, therefore, are included in GHG emissions analyses as appropriate.~~ Some methane and nitrous oxide emission would be emitted through combustion of fuels needed for the construction and operation of the proposed project. Some emissions of these compounds would also result from the management of solid waste and wastewater generated by the Proposed Action.

Some other GHGs may also be of importance for certain processes, including certain hydrofluorocarbons (HFCs), used as refrigerants, foam blowers, and released as byproducts from the production of other HFCs; some perfluorocarbons (PFCs), produced as byproducts of traditional aluminum production, among other activities; and sulfur hexafluoride (SF_6), used as an electrical insulating fluid in power distribution equipment. The Proposed Action would not result in the use of, or processes that emit a significant amount of these GHGs.

b) Air Quality Standards

National and State Air Quality Standards

As required by the Clean Air Act (CAA), primary and secondary National Ambient Air Quality Standards (NAAQS) have been established for six major air pollutants: CO, NO_2, ozone, respirable particulate matter or PM (both $PM_{2.5}$ and PM_{10}), SO_2, and lead. The primary standards represent levels that are requisite to protect the public health, allowing an adequate margin of safety. 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. The primary and secondary standards are the same for NO_2, ozone, lead, and PM. There is no secondary standard for CO. The NAAQS are presented in **Table III.G–1.**

EPA has revised the NAAQS for PM, effective December 18, 2006. The revision included lowering the level of the 24-hour $PM_{2.5}$ standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ and retaining the level of the annual standard at 15 $\mu g/m^3$. The PM_{10} 24-hour average standard was retained and the annual average PM_{10} standard was revoked. EPA has also revised the 8-hour ozone standard, lowering it from 0.08 to 0.075 parts per million (ppm), effective in May 2008.

On October 15, 2008, EPA lowered the primary and secondary standards for lead to 0.15 $\mu g/m^3$. EPA revised the averaging time to a calendar month and the form of the standard to the second-highest monthly average across a 3-year span. The current lead NAAQS would remain in place for one year following the effective date of attainment designations for any new or revised NAAQS before being revoked, except in current non-attainment areas, where the existing NAAQS would not be revoked until the affected area submits, and EPA approves, an attainment demonstration for the revised lead NAAQS.

NAAQS Attainment Status and State Implementation Plans (SIP)

The CAA, as amended in 1990, defines non-attainment areas (NAA) as geographic regions that have been designated as not meeting one or more of the NAAQS. When an area is designated as non-attainment by EPA, the state is required to develop and implement a State Implementation Plan (SIP), which delineates how a state plans to achieve air quality that meets the NAAQS under the deadlines established by the CAA.

In 2002, EPA re-designated New York City as in 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.

Manhattan has been designated as a moderate NAA for PM_{10}. On December 17, 2004, EPA took final action designating the five New York City counties, Nassau, Suffolk, Rockland, Westchester, and Orange counties as a $PM_{2.5}$ non-attainment area under the CAA due to exceedance of the annual average standard. New York State has submitted a draft SIP to EPA, dated April 2008, designed to meet the annual average standard by April 8, 2010, which would be finalized after public review.

As described above, EPA has revised the 24-hour average $PM_{2.5}$ standard. In December 2008, EPA designated the New York City Metropolitan Area as nonattainment with the 2006 24-hour $PM_{2.5}$ NAAQS, effective in April 2009. The nonattainment area includes the same 10-county area EPA designated as nonattainment with the 1997 annual $PM_{2.5}$ NAAQS. By April 2012, New York will be required to submit a SIP demonstrating attainment with the 2006 24-hour standard by 2014 (EPA may grant attainment date extensions for up to five additional years).

Table III.G-1
National Ambient Air Quality Standards (NAAQS)

Pollutant	Primary		Secondary	
	ppm	µg/m³	ppm	µg/m³
Carbon Monoxide (CO)				
8-Hour Average (1)	9	10,000	None	
1-Hour Average (1)	35	40,000		
Lead				
Rolling 3-Month Average (5)	NA	0.15	NA	0.15
Nitrogen Dioxide (NO_2)				
Annual Average	0.053	100	0.053	100
Ozone (O_3)				
8-Hour Average (2)	0.075	150	0.075	150
Respirable Particulate Matter (PM_{10})				
24-Hour Average (1)	NA	150	NA	150

Fine Respirable Particulate Matter ($PM_{2.5}$)				
Average of 3 Annual Means	NA	15	NA	15
24-Hour Average (3,4)	NA	35	NA	35
Sulfur Dioxide (SO_2)				
Annual Arithmetic Mean	0.03	80	NA	NA
Maximum 24-Hour Average (1)	0.14	365	NA	NA
Maximum 3-Hour Average (1)	NA	NA	0.50	1,300

Notes: ppm – parts per million
$\mu g/m^3$ – micrograms per cubic meter
NA – not applicable

All annual periods refer to calendar year.
PM concentrations (including lead) are in $\mu g/m^3$ since ppm is a measure for gas concentrations.
Concentrations of all gaseous pollutants are defined in ppm and approximately equivalent concentrations in $\mu g/m^3$ are presented.

(1) Not to be exceeded more than once a year.
(2) 3-year average of the annual fourth highest daily maximum 8-hr average concentration. EPA has reduced these standards down from 0.08 ppm, effective May 27, 2008.
(3) Not to be exceeded by the annual 98th percentile when averaged over 3 years.
(4) EPA has lowered the NAAQS down from 65 $\mu g/m^3$, effective December 18, 2006.
(5) EPA has lowered the NAAQS down from 1.5 $\mu g/m^3$, effective January 12, 2009.

Source: 40 CFR Part 50: National Primary and Secondary Ambient Air Quality Standards.

Nassau, Rockland, Suffolk, Westchester, Lower Orange County Metropolitan Area (LOCMA), and the five New York City counties had been designated as a severe non-attainment area for ozone (1-hour average standard). In November 1998, New York State submitted its *Phase II Alternative Attainment Demonstration for Ozone*, which was finalized and approved by EPA effective March 6, 2002, addressing attainment of the 1-hour ozone NAAQS by 2007. These SIP revisions included additional emission reductions that EPA requested to demonstrate attainment of the standard, and an update of the SIP estimates using the latest versions of the mobile source emissions model, MOBILE6.2, and the nonroad emissions model, NONROAD—which have been updated to reflect current knowledge of engine emissions and the latest mobile and nonroad engine emissions regulations.

On April 15, 2004, EPA designated these same counties as moderate non-attainment for the 8-hour average ozone standard which became effective as of June 15, 2004 (LOCMA was moved to the Poughkeepsie moderate non-attainment area for 8-hour ozone). EPA revoked the 1-hour standard on June 15, 2005; however, the specific control measures for the 1-hour standard included in the SIP are 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. On February 8, 2008, NYSDEC submitted final revisions to a new SIP for ozone to EPA. NYSDEC has determined that achieving attainment for ozone before 2012 is unlikely, and has therefore made a request for a voluntary reclassification of the New York nonattainment area as “serious”.

In March 2008, EPA strengthened the 8–hour ozone standards. EPA expects designations to take effect no later than March 2010 unless there is insufficient information to make these designation decisions. In that case, EPA will issue designations no later than March 2011. SIPs will be due three years after the final designations are made.

Determining the Significance of Air Quality Impacts

The State Environmental Quality Review Act (SEQRA) regulations state that the significance of a likely consequence (i.e., whether it is material, substantial, large or important) should be assessed in connection with its setting (e.g., urban or rural), its probability of occurrence, its duration, its irreversibility, its geographic scope, its magnitude, and the number of people affected. In terms of the magnitude of air quality impacts, 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 III.G-1**) would be deemed to have a potential significant adverse impact.

In relation to odors, the New York State Ambient Air Quality Standard (NYSAAQS) for H_2S is 10 ppb. The primary objective of this standard is to prevent disagreeable odors[1]. There are no federal NAAQS for H_2S.

Greenhouse Gas Emissions

There is general consensus in the scientific community that the global climate is changing as a result of increased concentrations of GHG in the atmosphere. As a consequence, government policies have begun to address GHG emissions at global, national, and local levels. In 2009, Governor Paterson issued Executive Order No. 24, establishing a goal of reducing GHG emissions in New York by 80 percent, compared to 1990 levels, by 2050, and creating a Climate Action Council tasked with preparing a climate action plan outlining the policies required to attain the GHG reduction goal (that effort is currently under way[2]). The 2009 New York State Energy Plan,[3] outlines the state's energy goals and provides strategies and recommendations for meeting those goals. The state's goals include:

- Implementing programs to reduce electricity use by 15 percent below 2015 forecasts;
- Updating the energy code and enacting product efficiency standards;
- Reducing vehicle miles traveled by expanding alternative transportation options; and
- Implementing programs to increase the proportion of electricity generated from renewable resources to 30 percent of electricity demand by 2015.

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[1] 6NYCRR Chapter III Part 257 §257-10.2

[2] http://www.nyclimatechange.us/

[3] New York State, *2009 New York State Energy Plan*, December 2009.

NYSDEC has also published guidance on the analysis of GHG emissions for projects where GHG emissions or energy use have been identified as significant and where NYSDEC is the lead agency. Although there are many policies, laws, and regulations relevant to energy consumption and GHG emissions, to date, there are no specific benchmarks or regulations applicable to GHG emissions levels or impacts from proposed projects which are applicable to environmental impact analysis. The New York State Department of Environmental Conservation (NYSDEC) and other State, federal, and local agencies are actively developing methodologies to assess the impact of climate change on proposed actions, and the impact of proposed actions on GHG emissions. Currently, however, with the exception of those developed for projects undertaken by the New York State Department of Transportation, there are no mandated federal or New York State methodologies or criteria for assessing the significance of GHGs generated due to the construction and operation of a proposed project.

The general approach beginning to emerge is that since GHG emissions impact global climate collectively, from all sources, there is no impact threshold for GHGs, and therefore projects should disclose potential emissions, and assess the various practicable options available for reducing such emissions.

Therefore, the GHG analysis included in This chapter includes an overview of the sources of GHG emissions that would be associated with the construction and operation of the project, and potential measures that could reduce those emissions.

c) Methodology for Predicting Pollutant Concentrations

Provided below is a detailed discussion of the technical approach used to determine air quality impacts for the mobile, construction, and industrial source analyses.

Mobile Source Air Quality Screening Analysis

An assessment of the potential air quality effects of CO emissions that would result from vehicles coming to and departing from the proposed project site was performed following the procedures outlined in the New York State Department of Transportation (NYSDOT) *Environmental Procedures Manual (EPM),* January 2001. The study area includes 19 intersections for the CO microscale analysis. The screening procedure described below utilized data from the traffic analysis for the 2016 analysis year.

CO Screening Criteria

Screening criteria described in the *EPM* were employed to determine whether the proposed project requires a detailed air quality analysis at the intersections in the study area. Before undertaking a detailed micro-scale modeling analysis of CO concentrations at the study area intersections, the screening criteria first determine whether the action would increase traffic volumes or implement any other changes (e.g. changes in speed, roadway width, sidewalk locations, or traffic signals) to the extent whereby significant increases in air pollutant concentrations could be expected. The following multi-step procedure is provided in the EPM to determine if there is the potential for CO impacts from the proposed project:

- **Level of Service (LOS) Screening:** If the build condition LOS is A, B, or C, no air quality analysis is required. Intersections operating at LOS D or worse, would proceed to a Capture Criteria Screening.

- **Capture Criteria Screening:** If the build condition LOS is at D, E, or F, then the following Capture Criteria should be applied at each intersection or corridor to determine if further air quality analysis may be warranted:
  - a 10 percent or more reduction in the distance between source and receptor (e.g., street or highway widening); or
  - a 10 percent or more increase in traffic volume on affected roadways for the build year; or
  - a 10 percent or more increase in vehicle emissions for the build year using emission factors provided in the *EPM*; or
  - any increase in the number of queued lanes for the build year (this applies to intersections); it is not expected that intersections in the build condition controlled by stop signs would require an air quality analysis; or
  - a 20 percent reduction in speed when build average speeds are below 30 miles per hour (mph).

If the project does not meet any of the above criteria, a micro-scale modeling analysis is not required and the analysis is complete. If the project is located within a half mile of any intersections evaluated in the CO SIP Attainment Demonstration, (as identified in the NYSDOT *EPM*'s Chapter 1.1, Table 2 by county), more stringent screening criteria are applied at project-affected intersections. If any one of the above criteria is met in addition to the LOS Screening, then the analysis would proceed to a Volume Threshold Screening for the applicable intersections.

- **Volume Threshold Screening:** If the Capture Criteria Screening is not met, then traffic volume thresholds will determine whether a micro-scale modeling analysis is required to quantify impacts. Threshold volumes are presented in Chapter 1.1 of the NYSDOT *EPM*. The thresholds were developed using conservative meteorological assumptions and are tied to area specific emission factors (in this case Nassau County) which include area specific vehicle speeds and vehicle distributions. The emission factors are derived from USEPA's MOBILE6.2 model.

  This final screening step compares the peak hour approach volumes with threshold volumes determined from the appropriate EPM vehicle threshold table. Here, that table is Table 3c, which corresponds to signalized intersections. Each study location's highest approach volume would need to exceed the corresponding threshold volume for the location to be a candidate for a micro-scale analysis during that peak hour. Below the threshold traffic volume, it is very unlikely that the location would violate the NAAQS for CO. The CO emission factors are listed in tables on the NYSDOT Environmental ~~Analysis~~ Science Bureau (E~~A~~SB) website. Locations in Nassau County use Table EF1.

To determine the appropriate volume threshold, the following steps were taken:

1) The locations are signalized intersections – use Table 3c (in Appendix Q)
2) The involved roadways were classified as urban arterials (Functional class 14/16) and urban locals (Functional class 17/19)
3) The intersections were located in Nassau County, NYSDOT Region 10
4) The highest approach (e.g., eastbound, northbound) volumes were determined
5) The approaches' average travel speeds were established using either the speed limit (when known) or "25 mph"
6) The "Emission Factors" (EF) were determined using Table EF1 for the year 2016 (Note: for emission factors that fall in between an interval, the upper bound emission factor was used.) All Emission Factors are in terms of "grams of CO per mile," except the idle factors, which are in terms of "grams of CO per hour."
7) The volume thresholds were determined from Table 3c.

For each intersection approach, the minimum required approach volume is 3,800 vehicles per hour, which corresponds to a Queue Emission Factor of 100 grams per hour and a Free Flow Emission Factor of 10 grams per mile. Since none of the intersection approaches will have 3,800 vehicles per hour or more, no intersections require microscale CO analysis.

Both the Capture Criteria and Volume Threshold Screening were developed by NYSDOT to be conservative air quality estimates based on worst-case assumptions. The *EPM* states that if the project-related traffic volumes are below the volume threshold criteria, then a micro-scale air quality analysis is unnecessary even if the other Capture Criteria are met for a location with LOS D or worse, since a violation of the NAAQS would be extremely unlikely.

Traffic Data

The air quality analysis utilized traffic data (and other relevant information developed as part of the traffic analysis) for the proposed action as presented in **Section III.F** *Transportation*. Weekday AM, Weekday PM and Saturday Midday peak hour periods were used for the analysis. These time periods were selected because they produce the maximum anticipated project-generated traffic and therefore have the greatest potential for significant air quality impacts.

Construction Source Air Quality Analysis

An assessment of the potential air quality affects from the construction program for the proposed project was performed using an in-depth qualitative review of potential air emissions generated by construction activities. This assessment looked at the various construction tasks (e.g., excavations, foundations, etc.) that would occur and the type equipment (excavators, cranes, etc.) that would likely be present to determine pollutants of concern. The relative significance of various emission sources was discussed and potential mitigation measures were suggested for specific construction activities.

Industrial Source Air Quality Analysis

An assessment of the potential air quality affects from nearby industrial sources on sensitive receptors created by the project (i.e., residential housing, open spaces used by the public) was performed using an in-depth qualitative review of potential air emissions emitted by industrial activities in the area. Facilities selected for inclusion in the analysis, included large emission sources out to a distance of 1,000 feet and minor emission sources out to a distance of 400 feet from the boundary of the project site. A field survey was conducted to identify these facilities.

Greenhouse Gas Emissions

Although the contribution of any single project to climate change is infinitesimal, the combined GHG emissions from all human activity have a severe adverse impact on global climate. While the increments of criteria pollutants and toxic air emissions are assessed in the context of health-based standards and local impacts, there are no established thresholds for assessing the significance of a project's contribution to climate change. Nonetheless, prudent planning dictates that all sectors address GHG emissions by identifying GHG sources and practicable means to reduce them. ~~As described above, this section does not include any quantified analysis of GHG emissions, and no specific methodologies were used for that subsection. A~~ Therefore, a qualitative discussion of GHG emissions sources is included in **Section III.G.3**, *Potential Impacts of the Proposed Action* while features of the Proposed Action and specific measures that would be implemented to reduce GHG emissions are discussed in **Section III.G.4,** *Greenhouse Gas Reduction Measures*.

2. Existing Conditions

Existing Monitored Air Quality Conditions (2007)

Monitored ambient air concentrations of CO, SO_2, particulate matter, NO_2, lead, and ozone from representative monitoring stations for the project area are presented in **Table III.G-2** for the year 2007. These values are the most recent monitored data that have been made available by NYSDEC for nearby monitoring stations.

Table III.G-2
Representative Monitored Ambient Air Quality Data

Pollutants	Location	Units	Period	Concentrations		
				Mean	Highest	Second Highest
CO	Queens College 2	ppm	8-hour	-	2.8	2.0
			1-hour	-	3.4	3.1
SO2	Eisenhower Park	µg/m3	Annual	10.6	-	-
			24-hour	-	45.2	42.6
			3-hour	-	103.8	85.1
Respirable Particulates (PM10)	PS 219	µg/m3	Annual	20	-	-
			24-hour	-	53	48
Respirable Particulates (PM2.5)	Hempstead	µg/m3	Annual	11.1	-	-
			24-hour	-	38.3	30.3
NO2	Eisenhower Park	µg/m3	Annual	34.4	-	-
Lead	JHS 12	µg/m3	3-month	-	0.02	0.02
O3	Babylon	ppm	1-hour	-	0.106	0.105

Source: 2008 Annual New York State Air Quality Report, NYSDEC.
Note: Attainment status of pollutants are discussed in Section 1b.

Probable Impacts Without the Proposed Action

Minimal growth and development within the project area is expected to occur in the future condition without the proposed development by the 2016 build out year. As a result, the future condition without the proposed development would likely be similar to existing conditions.

For a discussion of potential GHG emissions without the Proposed Action, see **Section III.G.3**, *Potential Impacts of the Proposed Action*, below.

3. Potential Impacts

Provided below is a summary of results for the mobile source, construction source and industrial source air quality analyses, and a qualitative discussion of project-related greenhouse gas emissions.

a) Mobile Source Air Quality Screening Results

The area roadway intersections were reviewed based on NYSDOT's *EPM* criteria (available on the DOT's website at www.nysdot.gov) for determining locations that may warrant a CO micro-scale air quality analysis. The screening analysis examined the LOS and projected volume increases by intersection approach. As described below, the results of the screening analysis show that none of the intersections affected by the project would require a detailed micro-scale air quality modeling analysis. Input data relevant to the screening analyses presented below (e.g., intersection LOS, traffic volumes) are provided in Appendix Q Mobile Source Air Quality Back-up.

LOS Screening Analysis

Results of the traffic analysis performed for the 2016 build year condition, for the AM/PM/Saturday MD peak periods were reviewed at each of the study area intersections to determine the potential need for a micro-scale air quality analysis. The LOS screening criteria were first applied to identify those intersections with an approach LOS D or worse. Based on the review of the 19 intersections analyzed in the traffic analysis, the following ~~seven~~ five intersections (presented in **Table III.G-3**) were projected to operate at a LOS D or worse on approaches for the AM, PM or Saturday MD peak traffic periods:

Table III.G-3
LOS Screening Results

Intersection	**Proposed Option**			**Alternative 2**		
	AM	**PM**	**SAT**	**AM**	**PM**	**SAT**
~~Glen Cove Avenue and Glen Head Road~~	~~---~~	~~---~~	~~D~~	---	---	---
Glen Cove Road/Route 107 Split	D	~~D~~	---	D	---	---
Glen Cove Road and Glen Head Road	D	~~E~~D	~~F~~E	D	D	E
~~Route 107 and Glen Head Road~~	~~F~~	~~F~~	---	F	F	---
Glen Cove Rd and Back Rd/Mary Ln	---	D	---	---	D	---
Dickson St and Herb Hill/Garvies Pt Rd	F	F	F	F	F	F
Northern Blvd (Rt. 25) and Glen Cove Rd	F	F	F	F	F	F

Capture Criteria Screening Analysis

Further screening on the intersections identified in the LOS Screening analysis was conducted using the capture criteria methodology described above in **Section III.G.1** (except for the intersection of Dickson St and Herb Hill/Garvies Pt Rd which is controlled by a stop sign and is a roundabout in future). This screening indicated that for all of the above intersections presented in **Table III.G-3**, one of the listed capture criteria would be met; a 10 percent or more increase in traffic volume on affected roadways for the build year (see Appendix Q for a summary of percent volume increase). Therefore, a Volume Threshold Screening analysis was conducted for each of the ~~seven~~ four intersections.

Volume Threshold Screening

Since one of the capture criteria listed above was triggered, a Volume Threshold Screening analysis was conducted to further determine the need for a micro-scale air quality modeling analysis. The volume thresholds (provided in Table 3c of the NYSDOT *EPM*) establish traffic approach volumes for each analysis intersection below which a violation of the NAAQS for CO is extremely unlikely. This method uses project area specific emissions data (expressed in grams per mile for free flow traffic and grams per hour for queues) to determine corresponding vehicle thresholds. **Table III.G-4** presents the results of the Volume Thresholds Screening analysis (with back-up data provided in Appendix Q). For intersections where approach volumes are equal to or less than the applicable thresholds, a micro-scale air quality analysis is not required.

Table III.G-4
Volume Threshold Screening Results

Intersection	**Volume Threshold (veh/hr)**	**Volume Exceeded?**	
		Proposed Option	**Alternative 2**
~~Glen Cove Avenue and Glen Head Road~~	~~3,800~~	~~No~~	
Glen Cove Road/Route 107 Split	3,800	No	No
Glen Cove Road and Glen Head Road	3,800	No	No
~~Route 107 and Glen Head Road~~	~~3,800~~	~~No~~	
Glen Cove Rd and Back Rd/Mary Lane	3,800	No	No
~~Dickson St and Herb Hill/Garvies Pt Rd~~	~~3,800~~	~~No~~	
Northern Blvd (Rt25) and Glen Cove Rd	3,800	No	No

Based on the Volume Threshold Screening, the project-related traffic volumes at all ~~seven~~ four intersections presented above would be below the volume threshold criteria. Therefore, a detailed CO micro-scale air quality modeling analysis was not warranted.

b) Construction Analysis

Although they are temporary, construction projects can have a noticeable effect on surrounding communities. During construction of the proposed project, work activities and engine emissions from on-site equipment could have the potential to impact local air quality. Therefore, an assessment of the potential for air pollution from construction, based on construction activities and schedules, are discussed below along with methods that may be employed to minimize or eliminate the affects of construction activities on air quality.

The construction program is expected to occur over a seven year period. The completion date would be in the year 2016. Under ordinary conditions, construction activities would take place Monday through Friday, 7:00 AM to 3:30 PM. Specific details regarding construction activities (e.g., demolition and site clearance, excavation/foundation tasks, structural framing, and interior work) and construction program schedules are provided in **Section III.O,** *Construction Impacts.*

Construction Equipment

Typical equipment used for tasks such as demolition, excavation, and building foundations would include excavators, bulldozers, backhoes, front-end loaders, tractors, graders, cranes, drills, and concrete pumping trucks. Dump trucks would remove any excavated material and construction debris, or would deliver fill materials to the site. Concrete trucks would arrive at the site with pre-mixed concrete and delivery trucks would bring other building materials. Cranes, compressors, hoists, bending machines and welding machines would later be used during the structural framing period. During facade and roof construction, hoists and cranes would continue to be used and trucks would remain in use for material supply and construction waste removal.

Effects on Air Quality

The two main sources of air pollution at a construction site are diesel engine emissions and fugitive dusts. In general, most construction engines are diesel-powered, and produce relatively high levels of nitrogen oxides (NO_X) and particulate matter (PM). Although diesel engines emit much lower levels of carbon monoxide (CO) than gasoline engines, the stationary nature of construction emissions and the large quantity of engines could also lead to increased CO concentrations. Sulfur oxides (SO_x) emitted from diesel engines would likely be negligible since ultra-low-sulfur diesel (ULSD) fuel is now easily available and can be used in almost any diesel engine. Therefore, the pollutants of concern for the construction period are NO_2, CO, fine particles with an aerodynamic diameter of less than or equal to 10 micrometers (PM_{10}), and fine particles with an aerodynamic diameter of less than or equal to 2.5 micrometers ($PM_{2.5}$).

Construction activities also generate various levels of fugitive dust. An active construction project might include a wide variety of tasks that could generate or re-suspend fugitive dust on-site. Some of the more common activities are: excavating; dumping and grading of earthen materials; loading or drop operations that transfer materials (e.g., debris, soil and fill) to and from dump trucks; demolition or deconstruction of existing structures or surfaces; and, on-site travel across paved or unpaved roads/surfaces that cause particulate matter to become airborne.

Construction vehicle-related pollution can be more accurately quantified once the excavation volumes (and corresponding numbers of excavating vehicles) are known. However, it is anticipated that the construction air quality mitigation measures will minimize the chance for PM or CO pollution stemming from the construction site. In addition, it is projected that the volumes of construction-related vehicles (heavy machines as well as commuter vehicles) will not change the results of the CO Screening Analysis performed in Section III.G.

The quantity of air pollutants emitted during the construction period would likely vary by location and over time. This is because equipment types and activities associated with each distinct construction task would be different. With regards to the effects on air quality, the excavation task is generally going to emit the highest level of air pollutants during the construction program. This would be especially true for particulate matter since excavation activities have the greatest potential to generate fugitive dusts, as described above. The intensity of excavation would be a controlling factor for the emission levels. High intensity excavation would require greater amounts of equipment onsite, which would increase emissions from diesel engines. Higher excavation rates would also produce more fugitive dusts per unit time (i.e., increase daily emissions). The number of dump trucks needed for transporting excavated materials and delivery of fill would increase with intensity. Any increase of vehicles traveling onsite would produce greater amounts of road dust. In addition, excavation occurs at ground level. Air pollutant emissions released at ground level do not disperse as easily with distance as elevated emissions, and nearby sensitive receptors are more likely to be located at ground level.

Air emissions relating to tasks other than excavation would be most affected by the amount of heavy equipment being used onsite and the engine size (i.e., horsepower) of each unit. The number of delivery trucks entering the site would also affect emission levels. Queuing of heavy vehicles such as concrete delivery trucks may be a concern during the foundations task. In some cases, elevated equipment during structural tasks would be of concern if nearby sensitive receptors were located at a similar height. However, in general these other tasks are less of a concern than the excavation periods.

Although the air emission sources described above would increase the ambient level of some pollutants in the immediate area surrounding the various construction sites (blocks), it is not expected that the intensity or duration of the construction activities would increase those pollutants by amounts that would be considered significant. In most cases, heavy equipment would operate intermittently over the course of a day, and over the course of the construction period. The active construction area would also move from one block to the next as construction progresses throughout the re-development area. As for excavation activities, each block would likely be excavated during different time periods according to the construction schedule (i.e., multiple blocks would not be excavated simultaneously).

As stated above, particulate matter is an important concern during construction periods, especially for fugitive dust. However, much of the fugitive dusts generated by construction activities consist of relatively large-size particles, which typically settle out within a short distance of the source. The majority of development areas for the Glen Isle project are not situated adjacent to existing residential neighborhoods and therefore, fugitive dusts would be less likely to affect sensitive receptors. Finally, the affects of construction activities on air quality can be significantly curtailed by following the mitigation measures described below.

In addition, as detailed in **Section III.B.4.b,** “Site Management Plan”, this brownfield site has been subject to remediation work. Any further intrusive work that would possibly disturb soils with residual contamination, including construction activity, will be performed in compliance with the Site Management Plan and its associated Soils Management Plan, which includes a series of measures to control dust (also see **Section III.A.3** “Mitigation” for soils and sediment controls). Construction work must also be conducted in accordance with the procedures defined in the Health and Safety Plan (conforming with

OSHA) and the Community Air Monitoring Program (conforming with DER-10) prepared for the site as outlined in the Site Management Plan. Also, in accordance with the Community Air Monitoring Program, air monitoring will be carried out between work areas and the site perimeter to prevent exposure downwind of the site. More information regarding the probability of contaminants to become airborne, mitigation to prevent the airborne release of contaminants, and action levels that may trigger additional responses will be included during the site plan approval phase.

c) Industrial Sources

A survey of nearby permitted industrial sources was conducted to determine if there is a potential for air quality impacts on sensitive receptors created by the project (i.e., residential housing, open spaces used by the public). The survey included large emission sources out to a distance of 1,000 feet and minor emission sources out to a distance of 400 feet from the boundary of the project site. An in-depth qualitative review of the potential air emissions emitted by these sources is provided and is based on the type of industrial activities occurring at each facility. The assessment included a characterization of the industrial processes and the types of odors and/or air pollutants that could be generated by each facility under normal operation. The location of each facility with respect to sensitive receptors within the project boundaries as well as the potential for cumulative affects between sources is also discussed along with any potential mitigation measures.

A field visit conducted on November 13, 2008 verified the existence of four notable industrial land uses in close proximity to the project on the south side of Glen Cove Creek along Morris Avenue. These include the Glen Cove wastewater treatment plant (WWTP), a city owned maintenance garage, a solid waste transfer station, and the Rason Asphalt Plant. Two other notable industrial land uses were also identified during the field visit. They include Konica Graphics located at 71 Charles Street and Nassau Ready Mix located at 47 Herb Hill Road.

As indicated above, six notable industrial land uses were identified during the site visit. However, the Konica Graphics facility is no longer in operation; although it should be noted that the site contains VOC's as chemicals of concern, and that there is no data (as of yet) for the completion of clean-up. Therefore, a detailed qualitative assessment was conducted for the remaining five sites. The potential for air quality impacts from these industrial land uses is provided below.

Glen Cove Wastewater Treatment Plant

Glen Cove Wastewater Treatment Plant (WWTP) is a facility that receives and processes community sanitary sewage. It is operated by Severn Trent Environmental Services and owned by Nassau County. The design capacity of the plant is 5.5 million gallons per day (MGD) and currently has average throughput of approximately 3.8 MGD. The facility is located on the south side of Glen Cove Creek (along Morris Avenue) directly opposite a narrow stretch of open space that's part of the proposed Glen Isle development and adjacent to an existing marina. The closest receptor of the proposed project would be the proposed hotel on Block C at a distance of approximately 450 feet.

The main concern with the Glen Cove WWTP, from an air quality standpoint, is the potential for release of unpleasant odors from the facility operations and their affect on the Glen Isle development (wastewater treatment plants are not a significant source of particulate matter). Odors from WWTP's are mostly associated with compounds such as hydrogen sulfide, ammonia, carbon disulfide, dimethyl sulfide and dimethyl disulfide, and with compound groups such as mercaptans and amines. However, hydrogen sulfide (H_2S) is considered to be the most prevalent malodorous gas. H_2S also has a very unique, unpleasant, and discernable odor character (similar to rotten eggs) and a very low odor recognition threshold. Consequently, the concentration of H_2S in air is often used as an indication of odor impacts when analyzing odor sources.

Odor studies that focus on H_2S can be conducted by direct monitoring of H_2S in the ambient air of surrounding neighborhoods or by modeling H_2S emissions generated by the wastewater processes at the WWTP. The task of quantifying and modeling H_2S emission rates can be complicated and is dependent (among other things) on the size, throughput, sources of influent sewage, and types of processes onsite. Therefore, odor modeling studies of this type are more often performed for larger WWTP's like those in New York City where the likelyhood of odor impacts is greater. The City has fourteen plants that range in size from 40 to 310 MGD, eclipsing the size of the Glen Cove WWTP. It is currently unknown, and unlikely because of its small size, that any modeling studies of odor impacts have been performed for the Glen Cove WWTP.

Because of the small size and current level of throughput (3.8MGD) for the Glen Cove WWTP, it is less likely that this plant would contribute to ambient H_2S concentrations that would adversely affect the Glen Isle development. However, if sufficient amounts of H_2S are emitted by the Glen Cove WWTP, the prevalence of odors would be most affected by meteorological conditions. Light winds and temperature inversions would be the most likely conditions that would contribute to an odor episode. This is due to the fact that minimal atmospheric dispersion of the H_2S would occur under these conditions. Early morning hours are more likely to see such conditions than other times of the day. H_2S concentrations and potential odors would also be more confined to ground level, since the plant sources are at ground level and H_2S is heavier than air.

Glen Cove Maintenance Garage

The Glen Cove Maintenance Garage is owned by the Nassau County Department of Public Works. Its location is directly opposite Block I of the proposed Glen Isle development on the south side of Glen Cove Creek. However, this type of industrial use is inconsistent with the City's vision for the waterfront, as expressed in the current Glen Cove Master Plan, which recommends the expansion of recreational uses and the eventual relocation of industrial uses. Block I of the development includes boat slips along the Glen Isle Creek, open space along the waterfront and condominium units further back from the water.

An Air Facility Registration certificate for the maintenance facility indicates that the garage has one air emission source; a 60 kilowatt diesel powered generator. Generators such as this are usually used for emergency purposes only, except for a limited number of hours per year for engine maintenance. A 60 kilowatt generator (80.5 horsepower) is also a very small unit and is considered an exempt source with respect to air permitting by New York State Department of Environmental Conservation. As such, this generator would not produce very much air emissions even when in operation.

Estimates of air emissions produced by this type of source can be developed using emission factors obtained from the USEPA. The EPA compendium for emission factors is AP-42[4]. Criteria pollutant emission factors for diesel powered generators are provided in Section 3.3 of AP-42. These emission factors, in pounds per horsepower-hour, are presented in Table III-G-5. For an 80.5 horsepower engine, the estimated hourly emissions for nitrogen oxides would be 2.5 pounds per hour. Even if the unit were to operate a full 500 hours per year, it would only amount to 0.625 tons per year of nitrogen oxide emissions.

Table III.G-5
Diesel Industrial Engine Emission Factors

Site Activity	Emission Factor (lbs/ hp-hr)
Nitrogen oxides	0.031
Carbon monoxide	0.00668
particulate matter (PM_{10})	0.0022
sulfur oxides	0.00205

Because of the size and limited operation of this unit, it is not expected that emissions generated by this source would cause or contribute to ambient pollutant levels at the proposed Glen Isle development site that would exceed the NAAQS for particulate matter or any other criteria pollutant. Therefore it is not believed that any adverse air quality impacts would occur.

Solid Waste Transfer Station

The Glen Cove Transfer Station is owned by the Nassau County Department of Public Works. The facility is located on the south side of Glen Cove Creek (along

[4] EPA, *Compilation of Air Pollutant Emission Factors Ap-42, Fifth Edition, Volume I: Stationary Point and Area Sources,* January 1995 (with updates).

Morris Avenue) directly opposite a narrow stretch of open space on the project site. It is also adjacent to the Glen Cove WWTP. The closest residential area of the proposed project would be Block I at a distance of approximately 700 feet.

Solid waste transfer stations are used to transfer municipal solid waste from trash collection vehicles to a more efficient means of transportation. Collection trucks from local communities dump their loads onto the floor of the transfer station where it is sometimes sorted by station workers. In most cases, the waste is compacted and sometimes baled before being loaded into other vehicles for shipment to its final destination. Although these activities tend to generate some dust, they occur indoors and should not be a significant issue with respect to particulate matter. However, there may be some concerns about odors. The decay of solid waste (especially food waste) generates odors that could be released during the transfer process. Summertime is of most concern, because waste decay rates increase with temperature. Since activities are indoors, the pathway for odors is through truck entrances and exits or out the building ventilation fans.

Although some transfer stations may be a source of odors, there are several easy to implement operating procedures that could be used to substantially reduce the potential for generating odors. These steps include; "first in, first out" waste handling in order to minimize the storage time of the waste; water misting and deodorizing on the floor; no waste stored overnight; good housing-keeping onsite that includes regular sweeping, and washing of the floor and waste handling equipment.

Nassau Ready Mix

Nassau Ready Mix is an industrial facility located at 47 Herb Hill Road in Glen Cove. It is immediately adjacent to Block I and located on Block J of the proposed Glen Isle development site. Block I of the development includes boat slips along the Glen Cove Creek, open space along the waterfront and condominium units further back from the water.

Nassau Ready Mix is a concrete batching plant. These facilities receive and store raw materials such as cement, sand, and coarse aggregate for use in manufacturing concrete. Typically, the cement is transferred to elevated storage silos pneumatically or by bucket elevator while sand and coarse aggregate are transferred to elevated bins or to belt conveyors. All the materials are then fed by gravity to hoppers which combine the materials in their desired amounts. The materials are then dropped into concrete trucks and mixed with water to produce the final product.

The primary pollutant of concern for concrete batching plants is particulate matter, because of the dust generating activities common to these facilities (although some metallic compound emissions may be associated with the cement products). Most plants include one stack which is used to vent particulate emissions caused by transferring cement to the silo. This type of air emission source (a point source) is controlled using a fabric filter or baghouse. Air emissions depend mostly on throughput amounts and the control efficiency of the filter. The loading and unloading of sand and aggregate materials are considered fugitive type emissions which are released during transfer activities involving heavy equipment such as dump trucks or front end loaders. These types of emissions can occur across the area of the site at stockpile locations or at the silo where different products are mixed together. Air emissions for these activities depend on throughput amounts too, but also depend on the moisture content of the materials being handled. Additional dust generating activities also include road dusts generated by vehicles traveling onsite and wind erosion from storage piles. Road dust emissions depend on the number trucks entering and exiting the site, and on the distances traveled to and from areas of activity. Particulate emissions coming off the surface of stockpiles would depend on the wind speed and moisture content of stockpiled materials.

Estimates of particulate matter emitted by concrete batching plants can be made using USEPA emission factors for the processes described above. Section 11.12 of AP-42 includes emission factors for sand and aggregate transfer, cement unloading to storage silos, weigh hopper loading and truck loading. **Table III.G-6** below, presents the PM_{10} emission factors for these activities in pounds per ton of material processed at a concrete batching plant.

Table III.G-6
Concrete Batching Plant PM_{10} Emission Factors

Site Activity	Emission Factor (lbs/ton)
Aggregate Transfer	0.0033
Sand Transfer	0.00099
Cement Unloading	0.00099 (controlled by fabric filter)
Supplementary Cementitious Materials Unloading	0.0089 (controlled by fabric filter)
Weigh Hopper Loading	0.0024
Concrete Truck Loading	0.0568 (controlled)

Estimates of PM_{10} emissions from road dust can be found in AP-42 Sections 13.2.1 and 13.2.2 for paved and unpaved roads, respectively. Dust generated by wind erosion of stockpiles can be found in AP-42 Section 13.2.5.

The air emission sources described above would have an affect on the ambient level of particulate matter in the immediate area surrounding the Nassau Ready Mix Concrete Batching facility, especially at locations bordering the fenceline of this industrial facility. Since the facility is not expected to be in operation concurrently with the occupancy of Block I of the Glen Isle development, it will not be a concern to future residents in this area. The plant may be operational during time that buildings on Blocks A, B and or C may be occupied and may be a concern to those residents. But again, it is expected that if the facility is used for construction in a portion of the project, the impact would be for a finite period of time and will not affect the long term air quality at the project site. The extent to which residents would be affected would depend on the daily output of the facility. However, the concrete production rate for this facility is not known. The facility does have a NYSDEC registration certificate which would indicate that the source is not viewed as a major source by the state. In addition, the facility would eventually be redeveloped as part of the proposed projects and the concrete batching operations would cease.

As with any source of fugitive dust, increasing the moisture content of transferred materials is an easy and inexpensive way to provide potential mitigation measures. Control efficiencies may vary by source but the implementation of an enhanced watering program at the facility could significantly reduce fugitive dusts from roads and transfer activities. In addition, much of the fugitive dusts generated by concrete batching activities consist of relatively large-size particles, which typically settle out within a short distance of the source.

Rason Asphalt Plant

The Rason Asphalt Plant is a hot mix asphalt facility. It is located directly opposite Block I on the south side of Glen Cove Creek. However, this type of industrial use is inconsistent with the City's vision for the waterfront, as expressed in the current Glen Cove Master Plan, which recommends the expansion of recreational uses and the eventual relocation of industrial uses. Block I of the development includes boat slips along the Glen Cove Creek, open space along the waterfront and condominium units further back from the water.

A hot mix asphalt plant manufactures paving materials using a mixture of fine and course aggregates and liquid asphalt. There are several different methods a facility could use to create the mixtures but all facilities would include the same raw materials for manufacturing their product. As with concrete batching plants, a hot mix asphalt plant would emit particulate matter from material handling activities, road dusts generated by vehicles traveling onsite and wind erosion from storage piles. However, these facilities also emit organic vapors and aerosols associated with the process application and storage of heated liquid asphalt. These vapors and aerosols include some compounds classified as hazardous air pollutants (HAPS) by the USEPA and some compounds which could be a potential source of odors. Air emission levels depend upon the temperature of the asphalt and the production capacity of the facility. Air emissions can also occur during the transfer of hot mix asphalt products to dump trucks or other hauling containers.

Hot mix asphalt plants also include combustion sources onsite. The manufacturing process will generally use gas or oil fired heaters and dryers for heating liquid asphalt and drying the final product mix. The by-products of combustion include nitrogen oxides, carbon monoxide, particulate matter and sulfur oxides. Air emission levels would depend upon the rated size of the combustion unit.

The air emission sources described above would have an affect on air quality in the immediate area surrounding the Rason Asphalt Plant, especially at locations closest to this industrial facility. Therefore, it may be a concern to future residents of the proposed project. The extent to which residents would be affected would depend on the daily output of the facility. However, the asphalt production rate for this facility is not known. The facility does have a NYSDEC registration certificate which would indicate that the source is not viewed as a major air emission source by the state. The NYSDEC certificate indicates that the facility must be operated in accordance with all applicable federal and state air pollution control laws and regulations. It is also noted that this type of industrial use is inconsistent with the City's vision for the waterfront as expressed in its Master Plan and GPURP, which recommends the expansion of the recreation and the eventual relocation of industrial uses such as the asphalt plant.

As described above, the recently approved City of Glen Cove Master Plan recommends the removal of existing PM sources in the waterfront area (e.g., the Rason Asphalt Plant.) It is therefore anticipated that when this development is complete, instances of PM pollution being imposed on the proposed residences or hotel rooms will be minimized such that significant impacts would be unlikely.

d) ~~Project Related~~ Greenhouse Gas Emissions With The Proposed Action

~~While the contribution of any single project to climate change is infinitesimal, the combined GHG emissions from all human activity have a severe adverse impact on global climate. The nature of the impact dictates that all sectors address GHG emissions by identifying GHG sources and practicable means to reduce them. Therefore, this chapter does not identify specific contributions of the Proposed Action to climate impacts, but rather addresses the GHG emissions associated with the Proposed Action.~~

Although there would be GHG emissions associated with the construction and operation of the project, as described below, those do not necessarily indicate an increase in GHG emissions overall, since it is assumed that future residents of the proposed project would live someplace, regardless of the Proposed Action, and therefore would cause some emissions from construction of their homes, heating and cooling, and transportation. Indeed, for some components, it is likely that emissions from the proposed project would be lower as a result of design efficiencies and more current "green" building systems and materials, which will be included in the project. Nonetheless, this section discusses the emissions sources associated with the proposed project and the measures to reduce those emissions.

~~Project Related~~ Greenhouse Gas Emissions with the Proposed Action

The impact of GHGs emitted in the troposphere is the same regardless of where they are emitted. ~~Therefore, GHGs considered include emissions resulting directly from~~ The proposed project would emit GHG emissions directly, ~~such as~~ through on-site fuel consumption for heating or construction equipment, as well as indirectly ~~emissions~~, ~~such as emissions from~~ through project-generated vehicle trips and electricity consumption. The project would ~~emissions would~~ also ~~include~~ result in emissions "upstream" and "downstream" from the project in time, such as emissions associated with the production and disposal of materials used for construction, materials sent to landfill and recycling, and wastewater treatment of the project's effluent.

The GHG emissions associated with the construction of the proposed project, energy consumption during project operation (both on-site fuel use and electricity), and transportation would be the largest components of project-related GHG emissions. These are also the components for which project decisions can affect the most meaningful emissions savings. The project will be designed to be energy efficient, with the goal of reaching standards set forth in the ENERGY STAR and USGBC LEED programs. The reduced energy demand for the project will therefore have a positive effect on the reduce tion of GHG emissions.

Without the project, it is assumed that comparable development would occur elsewhere in the region. Although higher efficiency can be achieved in a more urbanized setting, if residents are seeking to live outside of the city, it is assumed that the impact on GHG emissions could be similar, and, in the case of single family homes, would be greater. As an example, the Energy Information Administration, Office of Energy Markets and End Use presents in its 2005 residential energy consumption survey that the average consumption of electricity (per household) for a single family detached household is 13,159 kWh, while the consumption is 9,240 for a single family attached household and 7,460 kWh for apartment units (2-4 unit size). Greenhouse gas GHG emissions related to energy production for the proposed project would therefore be lower than those from a comparable number of single-family units. In addition, the compact, mixed-use, and transit-oriented nature of the project, as well as its proximity to downtown, is anticipated to reduce the amount of vehicle miles traveled compared to households within a conventional low-density single family home and commercial strip development pattern. This would therefore result in fewer mobile source greenhouse gas GHG emissions.

Commercial developments tend to generate similar amounts of greenhouse gases GHG independent of their layout. It is their location and associated vehicle emissions based on travel distances, (i.e., the proximity to neighboring residences,) which can reduce greenhouse gas GHG emissions associated with a mixed-use commercial development as opposed to a typical strip development. Therefore, with the close proximity between of commercial and residential spaces, and with the lower greenhouse gas GHG emissions for this development as opposed to a typical single-family development, the overall proposed development will reduce greenhouse gas GHG emissions compared to a typical single family home and commercial strip development pattern.

4. Mitigation Measures

As stated above, construction activity has the potential to adversely affect air quality as a result of diesel emissions. In order to minimize adverse affects on air quality, the following components will be implemented as part of the construction program to the extent feasible:

- Diesel Equipment Reduction - Elements of the construction plan would minimize the use of diesel engines and instead use electric engines to the extent practicable. Construction contracts will encourage the use of electric engines where practicable and ensure the distribution of power connections throughout the area as needed. Access to grid power would be most beneficial by eliminating the need for diesel powered generators,

- Clean Fuel - ULSD would be required for diesel engines throughout the construction program. If fuel blends included bio-diesel, further reduction of PM emissions would be possible.
- Idle Time Restrictions - The construction specifications will include the restriction of on-site vehicle idle time to three minutes for all vehicles that are not using the engine to operate a loading, unloading, or processing device (e.g., concrete mixing trucks),
- Planning – Some emission sources (e.g., concrete trucks and pumps, cranes, large generators) will be located as far as possible from residential buildings and public spaces, to the extent practicable,
- Utilization of Tier 1 or Newer Equipment - The construction specifications will encourage the use of Tier 1[5] or later construction equipment for nonroad diesel engines greater than 50 hp. The more recent the "Tier," the cleaner the engine for all criteria pollutants, including fine PM. Therefore, restricting site access to newer equipment with lower engine-out PM emission values would significantly reduce adverse affects on air quality from diesel engines.

Construction also has the potential to adversely affect air quality as a result of activities that generate fugitive dust. In order to minimize adverse affects on air quality, the following components will also be implemented as part of the construction program to the extent feasible:

- Planning - Fugitive dust control plans will be required as part of contract specifications,
- Watering - Truck routes and exposed excavation areas will be watered as needed,
- Cleaning - Truck exit areas will be established for washing off the wheels of all trucks that exit the construction sites, and include drive off pads,
- Stabilization - In cases where truck routes will remain in the same place for an extended period, the routes would be stabilized, covered with gravel, or temporarily paved to avoid the re-suspension of road dust.
- Truck Covers – Dust covers for dump trucks will be required.

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[5] The first federal regulations for new nonroad diesel engines were adopted in 1994, and signed by EPA into regulation in a 1998 Final Rulemaking. The 1998 regulation introduces Tier 1 emissions standards for all equipment 50 hp and greater and phases in the increasingly stringent Tier 2 and Tier 3 standards for equipment manufactured in 2000 through 2008. The Tier 1 through 3 standards regulate the EPA criteria pollutants, including particulate matter (PM), hydrocarbons (HC), oxides of nitrogen (NO_x) and carbon monoxide (CO). Prior to 1998, emissions from nonroad diesel engines were unregulated. These engines are typically referred to as Tier 0.

Greenhouse Gas Reduction Measures

The Proposed Action includes measures that would reduce the carbon footprint of the project, and other design measures ~~will be considered as the design progresses~~ that have the potential to receive credits under the USGBC LEED rating system will be considered as the design progresses. Measures currently incorporated include:

- Project Location:
  - Transit Oriented Development: the proposed project will be located near the proposed Glen Cove Ferry Terminal, enabling commuters traveling between the project and New York City or other potential destinations along the Long Island Sound to travel via ferry, and thereby reducing the need for ~~rather than~~ single occupancy vehicle trips. The proposed action would not only enable the residents of the project to use the ferry, but by bringing a critical mass of commuters and new public activity on the waterfront, would encourage expanded usage of the ferry by other area residents and visitors. The project will also provide shuttle bus connections to LIRR service, further reducing the number of single-occupancy vehicle trips.
  - Previously, the project site was primarily industrial. Transforming the site to mixed use would not require any deforestation and would enable some sequestration through planting of trees as part of the project landscaping.
- Project Design:
  - The project will include a mix of residential, commercial, hospitality, entertainment and recreational uses, and provide~~s~~ pedestrian and bicycle linkages throughout the site and to the downtown. ~~This type of mixed-use character can~~ The mix of uses and availability of pedestrian and bicycle paths would ~~provide for a~~ reduce ~~tion in~~ vehicle trips.
  - The proposed project includes multifamily residential units. Compared with otherwise comparable households living in single-family detached units, households living in multifamily units consume 54 percent less energy for space heating and 26 percent less energy for space cooling.[6]
- Energy Systems and Appliances: The proposed project is expected to utilize very efficient heating, ventilation, and air conditioning (HVAC) systems, surpassing the new ASHRAE 90.1-2007 standard. This is expected to result in significant energy savings. In general, the intent is for the mechanical systems to be the most efficient available in the marketplace at the time of construction. The systems will include the following:
  - Heat and hot water systems will likely be fueled by natural gas, which is cleaner burning and emits less GHG. ~~more energy efficient.~~

[6] Ewing, Reid, and Fang Rong. 2008. The Impact of Urban Form on U.S. Residential Energy Use. *Housing Policy Debate*, V19, Issue 1.

- Based upon technology available today, the townhouses could be heated by condensing furnaces that will be 96% efficient. For air-conditioning, the furnaces could be equipped with direct expansion coil and air-cooled condensing units. The air-conditioning units are rated at 18.5 SEER (the minimum for Energy Star rating is 13). The use of energy recovery ventilators (ERV) in the HVAC systems is also being considered to further improve the efficiency of the systems.
- Domestic water heaters could be of the condensing type with thermal efficiency of over 90%.
- All refrigerators, dishwashers, clothes washers, and clothes dryers will be Energy Star compliant.
- The heating system for the hotel rooms will include individual controls, offering the flexibility to turn off the heat when a room is unoccupied, resulting in fuel and energy savings.
- Conference rooms, hallways, and other common areas' heating and air-conditioning will be accomplished by packaged rooftop units or split systems. The energy efficiency ratio (EER) of these units will be in the range of 11.0 to 14.5 depending on the size and capacity (11 is the minimum required to meet Energy Star requirements).
- The majority of lighting in the hotel common areas will be fluorescent lamps with electronic ballasts, and compact fluorescent lamps (CFL). Hotel guest bedrooms will be illuminated with compact fluorescent lamps (CFL) where practicable.

Additional measures that ~~can be investigated~~ would be considered as the project design progresses could include:

- Energy Efficiency:
  - Building Envelope—choose energy efficient components such as glazing, insulation, and roofing materials.
  - Design building orientation to maximize natural lighting and passive solar energy.
  - Utilize energy efficient lighting and/or Energy Star certified appliances for all project components.
  - Optimize outdoor lighting to meet but not exceed lighting needs.
  - Utilize photo and/or motion sensors to control lighting where practicable.

- Renewable Energy:
  - Install ground source heat pumps.
  - Install solar water heating.
  - Install building integrated solar or wind power generation.
  - Encourage the purchase of renewable power.

- Energy Efficient Vehicles:
  - Provide priority or cheaper parking for energy efficient vehicles.
  - Provide electric charging stations for electric vehicles.

- Sequestration: maximize tree planting within the areas available for open space in a manner consistent with the intended use.
- Construction:
  - Optimize building design to minimize the quantity of cement and iron/steel.
  - Use locally produced or extracted materials.
  - Utilize recycled construction materials and/or materials with recycled content.
  - Use recovered wood or wood that is certified in accordance with the Sustainable Forestry Initiative or the Forestry Stewardship Council's Principles and Criteria.
  - Use fly ash in the cement mixture, replacing cement, to the extent practicable.