ACME FISH EXPANSION

Chapter 11: Air Quality

A. INTRODUCTION

The potential for air quality impacts associated with the proposed Acme Fish Expansion project in the Greenpoint neighborhood of Brooklyn is assessed in this chapter. The Proposed Development would consist of a new and improved approximately 109,300 gsf Acme Smoked Fish processing facility, and approximately 545,000 gsf of commercial office and retail space (including parking/loading spaces).

The Proposed Actions would result in small increases in on-road traffic volumes which would not exceed the 2020~~14~~ *City Environmental Quality Review (CEQR) Technical Manual* carbon monoxide (CO) screening threshold of 170 peak-hour vehicle trips at any intersection in the study area. However, the incremental traffic volumes would exceed the particulate matter (PM) emission screening threshold discussed in Chapter 17, Sections 210 and 311 of the *CEQR Technical Manual*. Therefore, a quantified assessment of emissions from traffic generated by the Proposed Development was performed for PM. In addition, the Proposed Development would include a 150-space accessory parking garage; therefore, an analysis was conducted to evaluate potential future pollutant concentrations from the proposed parking garage.

The Proposed Development would include fossil fuel-fired heat and hot water systems, therefore, a stationary source analysis was conducted to evaluate the potential impact from these sources on air quality. Potential air quality and odor impacts from the future fish processing facility were also assessed.

As the Development Site is located within a manufacturing zoned district, potential effects of stationary source emissions from nearby existing industrial facilities on the Proposed Development were assessed. In addition, potential effects from existing nearby large and major sources of emissions on the Proposed Development were evaluated.

B. PRINCIPAL CONCLUSIONS

An analysis of air quality determined that the Proposed Actions would not result in significant adverse impacts related to mobile source or stationary source air quality.

The mobile source analyses determined that the Proposed Actions would not result in concentrations of particulate matter (PM) less than 10 microns in diameter (PM_{10} and $PM_{2.5}$) exceeding National Ambient Air Quality Standards (NAAQS), and incremental concentrations of $PM_{2.5}$ generated by the Proposed Actions would not exceed the City's *de minimis* criteria for $PM_{2.5}$.

Analysis of the emissions and dispersion of nitrogen dioxide (NO_2) and $PM_{2.5}$ from the heating and hot water systems of the Proposed Development indicate that these emissions would not result in a violation of NAAQS. In addition, the maximum predicted $PM_{2.5}$ incremental concentrations from the Proposed Development would be less than the applicable 24-hour and annual average City's *de minimis* criteria. To ensure that there would be no significant adverse impacts resulting from the Proposed Development due to heating and hot water system emissions, certain restrictions would be required through the mapping of an (E) Designation (E-585) for air quality.

An analysis of the cumulative impacts of existing industrial sources on the Proposed Development was performed. Maximum concentration levels at the Development Site were found to be below the air toxic guideline levels and health risk criteria established by regulatory agencies, and below National Ambient Air Quality Standards (NAAQS). Likewise, maximum concentrations of pollutant emissions from the proposed Acme Smoked Fish facility were determined to be below applicable thresholds and standards.

C. POLLUTANTS FOR ANALYSIS

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 CO are predominantly influenced by mobile source emissions. PM, volatile organic compounds (VOCs), and nitrogen oxides (nitric oxide [NO] and nitrogen dioxide [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 some sources utilizing non-road diesel such as large international marine 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. Ambient concentrations of CO, PM, NO_2, SO_2, ozone, and lead are regulated by the U.S. Environmental Protection Agency (EPA) under the Clean Air Act (CAA), and are referred to as criteria pollutants; emissions of VOCs, NO_x, and other precursors to criteria pollutants are also regulated by EPA.

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. CO concentrations can diminish rapidly over relatively short distances; elevated concentrations are usually limited to locations near crowded intersections, heavily traveled and congested roadways, parking lots, and garages. Consequently, CO concentrations must be analyzed on a local (microscale) basis.

The Proposed Actions would not result in an increase in vehicle trips higher than the *CEQR Technical Manual* screening threshold of 170 trips at any intersection in the study area. Therefore, a mobile source analysis is not warranted. However, the Proposed Development would include a parking garage. Therefore, an analysis was conducted to evaluate future CO concentrations with the operation of the parking facility assumed to be developed as a result of the Proposed Actions.

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 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 emissions of these pollutants from mobile sources related to the Proposed Actions was therefore not warranted.

In addition to being a precursor to the formation of ozone, NO_2 (one component of NO_x) is also a regulated pollutant. Since NO_2 is mostly formed from the transformation of NO in the atmosphere, it has mostly been of concern further downwind from large stationary sources, and not a local concern from mobile sources. (NO_x emissions from fuel combustion consist of approximately 90 percent NO and 10 percent NO_2 at the source.) With the promulgation of the 2010 1-hour average standard for NO_2, local sources such as vehicular emissions may be of greater concern. However, any increase in NO_2 associated with the Proposed Actions would be relatively small due to the very small increases in the number of vehicles. This increase would not be expected to significantly affect levels of NO_2 experienced near roadways.

Potential impacts on local NO_2 concentrations from the fuel combustion for the Proposed Development's heat and hot water systems were evaluated.

Lead

Airborne lead emissions are currently associated principally with industrial sources. Lead in gasoline has been banned under the CAA and would not be emitted from any other component of the Proposed Development. Therefore, an analysis of this pollutant 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 VOCs; 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) or from precursor gases reacting in the atmosphere to form secondary PM.

Gasoline-powered and diesel-powered vehicles, especially heavy-duty trucks and buses operating on diesel fuel, are a significant source of respirable PM, most of which is $PM_{2.5}$; PM concentrations may consequently be locally elevated near roadways. Since the traffic generated by the Proposed Actions would exceed the PM emission screening threshold discussed in Chapter 17, Sections 210 and 311 of the *CEQR Technical Manual*, a quantified assessment of emissions from traffic generated by the Proposed Actions was performed for PM and an analysis was conducted to evaluate future PM concentrations with the operation of the parking facility assumed to be developed as a result of the Proposed Actions.

An assessment of PM emissions from heat and hot water systems at the Proposed Development was conducted, following the *CEQR Technical Manual* and EPA guidance.

Sulfur Dioxide

SO_2 emissions are primarily associated with the combustion of sulfur-containing fuels (oil and coal). SO_2 is also of concern as a precursor to $PM_{2.5}$ and is regulated as a $PM_{2.5}$ precursor under the New Source Review permitting program for large sources. Due to the federal restrictions on the sulfur content in diesel fuel for on-road and non-road vehicles, no significant quantities are emitted from vehicular sources. Vehicular sources of SO_2 are not significant and therefore analysis of SO_2 from mobile and/or non-road sources was not warranted.

As part of the Proposed Actions, natural gas would be burned in heat and hot water systems of the Proposed Development. The sulfur content of natural gas is negligible; therefore, no analysis was undertaken to estimate the future levels of SO_2 with the Proposed Actions.

Noncriteria Pollutants

In addition to the criteria pollutants discussed above, noncriteria pollutants may be of concern. Noncriteria pollutants are emitted by a wide range of man-made and naturally occurring sources. These pollutants are sometimes referred to as hazardous air pollutants (HAP) and, when emitted from mobile sources, as Mobile Source Air Toxics (MSATs). Emissions of noncriteria pollutants from industries are regulated by EPA, as well as the New York State Department of Environmental Conservation (NYSDEC) and the New York City Department of Environmental Protection (DEP).

Federal ambient air quality standards do not exist for noncriteria pollutants; however, NYSDEC has issued standards for certain noncriteria compounds, including beryllium, gaseous fluorides, and hydrogen sulfide. DEC has also developed guideline concentrations for numerous noncriteria pollutants. The DEC guidance document DAR-1[1] contains a compilation of annual and short-term (1-hour) guideline concentrations for these compounds. The DEC guidance thresholds represent ambient levels that are considered safe for public exposure. EPA has also developed guidelines for assessing exposure to noncriteria pollutants. These exposure guidelines are used in health risk assessments to determine the potential effects to the public.

The area surrounding the Development Site contains existing manufacturing-zoned areas, which would remain in the future with the Proposed Actions. Therefore, an analysis to examine the potential for impacts to the Proposed Development from industrial emissions was performed. In addition, the Proposed Development would include a new and improved Acme Smoked Fish processing facility and

[1] NYSDEC. DAR-1 (Air Guide-1) AGC/SGC Tables, August 2016.

therefore an analysis to examine the potential for impacts on nearby sensitive receptors on the proposed commercial development, as well as on nearby existing and other proposed developments with sensitive receptors was performed.

D. AIR QUALITY REGULATIONS, STANDARDS, AND BENCHMARKS

National and State Air Quality Standards

As required by the CAA, primary and secondary NAAQS have been established for six major air pollutants: CO, NO_2, ozone, respirable 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 standards are generally either the same as the secondary standards or more restrictive. The NAAQS are presented in Table 11-1. The NAAQS for CO, annual NO_2, and 3-hour SO_2 have also been adopted as the ambient air quality standards for New York State, but are defined on a running 12-month basis rather than for calendar years only. New York State also has standards for total suspended particles, settleable particles, non-methane hydrocarbons, 24-hour and annual SO_2, and ozone which correspond to federal standards that have since been revoked or replaced, and for the noncriteria pollutants beryllium, fluoride, and hydrogen sulfide.

Effective December 2015, EPA lowered the 2008 ozone NAAQS from 0.075 ppm to 0.070. EPA issued final area designations for the revised standard on April 30, 2018.

Federal ambient air quality standards do not exist for noncriteria pollutants; however, as mentioned above, DEC has issued standards for three noncriteria compounds. DEC has also developed a guidance document DAR-1 (August 2016), which contains a compilation of annual and short term (1-hour) guideline concentrations for numerous other noncriteria compounds. The DEC guidance thresholds represent ambient levels that are considered safe for public exposure.

NAAQS Attainment Status and State Implementation Plans

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, followed by a plan for maintaining attainment status once the area is in attainment.

In 2002, EPA re-designated New York City as in attainment for CO. Under the resulting maintenance plans, New York is 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. The second CO maintenance plan for the region was approved by EPA on May 30, 2014.

Manhattan had been designated as a moderate NAA for PM_{10}. EPA clarified on July 29, 2015 that the non-attainment designation only applied to the revoked annual standard.

TABLE 11-1
National Ambient Air Quality Standards (NAAQS)

Pollutant	Primary		Secondary	
	ppm	μg/m³	ppm	μg/m³
Carbon Monoxide (CO)				
8-Hour Average	9 (1)	10,000	None	
1-Hour Average	35 (1)	40,000		
Lead				
Rolling 3-Month Average	NA	0.15	NA	0.15
Nitrogen Dioxide (NO_2)				
1-Hour Average (2)	0.100	188	None	
Annual Average	0.053	100	0.053	100
Ozone (O_3)				
8-Hour Average (3)	0.070	140	0.070	140
Respirable Particulate Matter (PM_{10})				
24-Hour Average (1)	NA	150	NA	150
Fine Respirable Particulate Matter ($PM_{2.5}$)				
Annual Mean (4)	NA	12	NA	15
24-Hour Average (5)	NA	35	NA	35
Sulfur Dioxide (SO_2)				
1-Hour Average (6)	0.075	196	NA	NA
Maximum 3-Hour Average (1)	NA	NA	0.50	1,300

Notes:
ppm—parts per million (unit of measure for gases only)
μg/m³—micrograms per cubic meter (unit of measure for gases and particles, including lead)
NA—not applicable
All annual periods refer to calendar year.
Standards are defined in ppm. Approximately equivalent concentrations in μg/m³ are presented.
1 Not to be exceeded more than once a year.
2 3-year average of the annual 98th percentile daily maximum 1-hr average concentration.
3. 3-year average of the annual fourth-highest daily maximum 8-hr average concentration.
4. 3-year average of annual mean.
5. Not to be exceeded by the annual 98th percentile when averaged over 3 years.
6. 3-year average of the annual 99th percentile daily maximum 1-hr average concentration.
Source: 40 CFR Part 50: National Primary and Secondary Ambient Air Quality Standards.

The five New York City counties and Nassau, Suffolk, Rockland, Westchester, and Orange Counties had been designated as a $PM_{2.5}$ NAA (New York Portion of the New York–Northern New Jersey–Long Island, NY–NJ–CT NAA) since 2004 under the CAA due to exceedance of the 1997 annual average standard, and were also nonattainment with the 2006 24-hour $PM_{2.5}$ NAAQS since November 2009. The area was redesignated as in attainment for that standard effective April 18, 2014, and is now under a maintenance plan. EPA lowered the annual average primary standard to 12 μg/m³ effective March 2013. EPA designated the area as in attainment for the 12 μg/m³ NAAQS effective April 15, 2015.

Effective June 15, 2004, EPA designated Nassau, Rockland, Suffolk, Westchester, and the five New York City counties (NY portion of the New York–Northern New Jersey–Long Island, NY-NJ-CT, NAA) as a moderate non-attainment area for the 1997 8-hour average ozone standard. In March 2008 EPA strengthened the 8–hour ozone standards, but certain requirements remain in areas that were either nonattainment or maintenance areas for the 1997 ozone standard (‘anti-backsliding’). EPA designated the same NAA as a marginal NAA for the 2008 ozone NAAQS, effective July 20, 2012.

On April 11, 2016, as requested by New York State, EPA reclassified the area as a moderate NAA. On July 19, 2017 NYSDEC announced that the NYMA is not projected to meet the July 20, 2018 attainment deadline and NYSDEC therefore requested that EPA reclassify the NYMA to "serious" nonattainment. EPA reclassified the NYMA from “moderate” to “serious” NAA effective September 23, 2019, which imposes a new attainment deadline of July 20, 2021 (based on 2018-2020 monitored data). On April 30, 2018, EPA designated the same area as a moderate NAA for the revised 2015 ozone standard. SIP revisions are due by August 3, 2021.

New York City is currently in attainment of the annual-average NO_2 standard. EPA has designated the entire state of New York as “unclassifiable/attainment” of the 1-hour NO_2 standard effective February 29, 2012. Since additional monitoring is required for the 1-hour standard, areas will be reclassified once three years of monitoring data are available.

EPA has established a 1-hour SO_2 standard, replacing the former 24-hour and annual standards, effective August 23, 2010. In December 2017, EPA designate the entire State of New York as in attainment for this standard, with the exception of Monroe County which was designated “unclassifiable”.

Determining the Significance of Air Quality Impacts

The State Environmental Quality Review Act (SEQRA) regulations and the *CEQR Technical Manual* state that the significance of a predicted consequence of a project (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.[2] 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 11-1) would be deemed to have a potential significant adverse impact. Similarly, for non-criteria pollutants, predicted exceedance of the DAR-1 guideline concentrations would be considered a potential significant adverse impact.

In addition, to maintain concentrations lower than the NAAQS in attainment areas, or to ensure that concentrations would 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 the thresholds would be deemed to have a potential significant adverse impact, even in cases where violations of the NAAQS are not predicted.

CO De Minimis Criteria

New York City has developed *de minimis* criteria to assess the significance of the increase in CO concentrations that would result from the impact of proposed projects or actions on mobile sources, as set forth in the *CEQR Technical Manual*. These criteria set the minimum change in CO concentration that

[2] New York City. *CEQR Technical Manual*. Chapter 1, Section 222. March 2014; and SEQR Regulations. 6 NYCRR § 617.7

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 (i.e., No-Action) concentrations and the 8-hour standard, when No-Action concentrations are below 8.0 ppm.

$PM_{2.5}$ DE MINIMIS CRITERIA

New York City uses *de minimis* criteria to determine the potential for significant adverse $PM_{2.5}$ impacts under CEQR are as follows:

- Predicted increase of more than half the difference between the background concentration and the 24-hour standard;
- Annual average $PM_{2.5}$ concentration increments which are predicted to be greater than 0.1 µg/m^3 at ground level on a neighborhood scale (i.e., the annual increase in concentration representing the average over an area of approximately 1 square kilometer, centered on the location where the maximum ground-level impact is predicted for stationary sources; or at a distance from a roadway corridor similar to the minimum distance defined for locating neighborhood scale monitoring stations); or
- Annual average $PM_{2.5}$ concentration increments that are predicted to be greater than 0.3 µg/m^3 at a discrete receptor location (elevated or ground level).

Actions under CEQR predicted to increase $PM_{2.5}$ concentrations by more than the above *de minimis* criteria will be considered to have a potential significant adverse impact.

The above *de minimis* criteria have been used to evaluate the significance of predicted impacts of the Proposed Actions on $PM_{2.5}$ concentrations.

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, EPA and 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. The air toxic values are provided in Table 11-2 for the compounds affecting receptors located at the Proposed Development. The compounds listed are those emitted by existing sources of air toxics in the rezoning area.

In order to evaluate impacts of non-carcinogenic toxic air emissions, DAR-1 includes a methodology called the “hazard index” to characterize the cumulative risk from potential air toxic emissions. The hazard index is based on predicted annual concentrations and annual exposure limits. If the combined ratio of pollutant concentration divided by its respective annual exposure threshold for each of the toxic pollutants is found to be less than 2, no significant air quality impacts are predicted to occur due to these pollutant releases.

TABLE 11-2
Industrial Source Analysis:
Relevant NYSDEC Air Guideline Concentrations

Pollutant	CAS Number	SGC (µg/m³)	AGC (µg/m³)
Butyl Alcohol	00071-36-3	--	1,500
Dioctyl Phthalate	00117-81-7	--	0.42
Ethanol	00064-17-5	--	45,000
Ethylbenzene	00100-41-4	--	1,000
Isobutyl Acetate	00110-19-0	--	565
Isobutyl Alcohol	00078-83-1	--	360
Isobutyl Isobuyrate	00097-85-8	--	--
Methyl Ethyl Ketone	00078-93-3	13,000	5,000
Methyl Isobutyl Ketone	00108-10-1	31,000	3,000
Nepheline Syenite	37244-96-J	--	--
Nitrogen Oxides(1)	NY210-00-0	188	100
Petroleum Distillates	08002-05-9	--	--
Sulfur Dioxide	07446-09-5	196	--
Titanium Dioxide	13463-67-7	--	24
Toluene	00108-88-3	37,000	5,000
VMP Naptha	64742-89-8	--	3,200
Volatile Hydrocarbons	64742-95-6	--	100
Xylene	01330-20-7	22,000	100
Zinc Oxide	01314-13-2	380	4.8
$PM_{2.5}$(2)	NY075-02-5	35	12

Notes:
1 Conservatively assumed all nitrogen oxides as nitrogen dioxide.
2 NAAQS 24-hour average, and annual average.
Source: NYSDEC, DAR-1 AGC/SGC Tables, August 2016.

In addition, DEC characterizes risks of non-criteria carcinogenic pollutants. According to DAR-1, an overall incremental cancer risk from a proposed action of less than one-in-one million is considered to be insignificant. 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 one-in-one million, no significant air quality impacts are predicted to occur due to these pollutant releases. Alternatively, if refined air dispersion modeling is used to estimate the maximum concentrations of pollutants, a threshold of 10-in-one-million excess cancer risk for non-criteria carcinogenic compounds can be used.

E. METHODOLOGY FOR PREDICTING POLLUTANT CONCENTRATIONS

Mobile Source Analysis

Intersection Analysis

The prediction of vehicle-generated emissions and their dispersion in an urban environment incorporates meteorological phenomena, traffic conditions, and physical configuration. Air pollutant dispersion models mathematically simulate how traffic, meteorology, and physical configuration 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 since it is necessary to predict the reasonable worst-case condition, most dispersion analyses predict conservatively high concentrations of pollutants, particularly under adverse meteorological conditions.

The mobile source analyses for the Proposed Development employ models approved by the U.S. Environmental Protection Agency (EPA) that have 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 pollutant concentrations that could ensue from the proposed project.

VEHICLE EMISSIONS

Engine Emissions

Vehicular engine PM emission factors were computed using the EPA mobile source emissions model, MOVES2014b.[3] This emissions model is capable of calculating engine emission factors for various vehicle types, based on the fuel type (gasoline, diesel, or natural gas), meteorological conditions, vehicle speeds, vehicle age, roadway types, number of starts per day, engine soak time, and various other factors that influence emissions, such as inspection maintenance programs. The inputs and use of MOVES incorporate the most current guidance available from NYSDEC.

Vehicle classification data were based on field studies. Appropriate credits were used to accurately reflect the inspection and maintenance program.[4] County-specific hourly temperature and relative humidity data obtained from NYSDEC were used.

Road Dust

The contribution of re-entrained road dust to PM_{10} concentrations, as presented in the PM_{10} SIP, is considered to be significant; therefore, the PM_{10} estimates include both exhaust and road dust. $PM_{2.5}$ emission rates were determined with fugitive road dust to account for their impacts in local microscale analyses. However, fugitive road dust was not included in the neighborhood scale $PM_{2.5}$ microscale analyses, since DEP considers it to have an insignificant contribution on that scale. Road dust emission factors were calculated according to the latest procedure delineated by EPA[5] and the *CEQR Technical Manual*.

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 Actions (see Chapter 10, "Transportation"). Traffic data for the future without and with the Proposed Actions were employed in the respective air quality modeling scenarios. The weekday morning (7:30 to 8:30 AM), and evening (5:00 to 6:00 PM) peak periods were analyzed. These time periods were selected for the mobile

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[3] EPA. *Motor Vehicle Emission Simulator (MOVES): User Guide for MOVES2014a*. EPA420B15095. November 2015. MOVES2014 User Interface Reference Manual Appendix: MOVES2014b, August 2018.

[4] The inspection and maintenance programs require inspections of automobiles and light trucks to determine if pollutant emissions from each vehicle exhaust system are lower than emission standards. Vehicles failing the emissions test must undergo maintenance and pass a repeat test to be registered in New York State.

[5] EPA. *Compilations of Air Pollutant Emission Factors AP-42*. Fifth Edition, Volume I: Stationary Point and Area Sources, Ch. 13.2.1. NC. http://www.epa.gov/ttn/chief/ap42. January 2011.

source analysis because they produce the maximum anticipated project-generated traffic, and therefore have the greatest potential for significant air quality impacts. In addition to the weekday traffic periods, a Saturday traffic peak period was developed to account for lower No Build and Build weekend traffic volumes.

The peak morning, and evening period traffic volumes were used as a baseline for determining off-peak volumes. Off-peak traffic volumes in the future without the Proposed Actions, and off-peak increments from the Proposed Actions, were determined by adjusting the peak period volumes by the 24-hour distributions of actual vehicle counts collected at appropriate locations. For annual impacts, the average weekday 24-hour distribution was used to more accurately simulate traffic patterns over longer periods.

DISPERSION MODEL FOR MICROSCALE ANALYSES

The CAL3QHC model employs a Gaussian (normal distribution) dispersion assumption and includes an algorithm for estimating vehicular queue lengths at signalized intersections. CAL3QHC predicts emissions and dispersion of pollutants from idling 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, CAL3QCHR, which allows for the incorporation of hourly meteorological data into the modeling, instead of worst-case assumptions regarding meteorological parameters.

Maximum contributions from vehicular emissions to PM concentrations adjacent to the analysis site were calculated using the CAL3QHCR model Version 2.0.[6] This refined version of the model can utilize hourly traffic and meteorology data, and is therefore more appropriate for calculating the 24-hour and annual average concentrations required to address the timescales of the PM National Ambient Air Quality Standards (NAAQS).

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 direction in which pollutants are dispersed, and atmospheric stability accounts for the effects of vertical mixing in the atmosphere. These factors, therefore, influence the concentration at a particular prediction location (receptor).

For computation of PM concentrations, the CAL3QHCR model includes the modeling of hourly concentrations based on hourly traffic data and five years of monitored hourly meteorological data. The data consists of surface data collected at La Guardia Airport and upper air data collected at Brookhaven, New York for the period 2014–2018. All hours were modeled, and the highest predicted concentration for each averaging period is presented.

[6] USEPA. User’s Guide to CAL3QHC, A Modeling Methodology for Predicted Pollutant Concentrations Near Roadway Intersections. EPA454R92006.

ANALYSIS YEAR

The microscale analyses applied emission factors and traffic volumes for 20254, the year by which the Proposed Development is likely to be completed. The future analysis was undertaken both without the Proposed Actions (the No-Action condition) and with the Proposed Actions (the With-Action condition).

BACKGROUND CONCENTRATIONS

Background concentrations are those pollutant concentrations originating from distant sources that are not directly included in the modeling analysis, which directly accounts for vehicular emissions on the streets within 1,000 feet and in the line of sight of the analysis site. Background concentrations are added to modeling results to obtain total pollutant concentrations at an analysis site.

The background concentrations used in the mobile source analysis were based on concentrations recorded at a monitoring station representative of the Proposed Development's location and in the statistical format of the NAAQS (see Table 11-1). These represent the most recent 3-year average for 24-hour average $PM_{2.5}$, and the highest value from the three most recent years of data available for PM_{10}. The background concentrations are presented in Table 11-3.

TABLE 11-3
Maximum Background Pollutant Concentrations
for Mobile Source Analysis

Pollutant	Average Period	Location	Concentration	NAAQS
PM_{10}(1)	24-hour	Division Street	38 µg/m^3	150 µg/m^3
$PM_{2.5}$(2)	24-hour	JHS 126	17.2 µg/m^3	35 µg/m^3

Notes:
1 PM_{10} concentration represents the maximum second-highest monitored concentration from the most recent three years of data.
2 $PM_{2.5}$ concentration represents the average of the 98th percentile day from the most recent three years.
Source: New York State Air Quality Report Ambient Air Monitoring System, NYSDEC, 2016–2018.

ANALYSIS SITE

Intersections in the study area were reviewed for microscale analysis based on the *CEQR Technical Manual* guidance. The incremental traffic volumes for the AM and PM periods were reviewed and intersections with increments exceeding the PM volume thresholds were identified. Of those intersections, Meserole Avenue and Franklin Street was selected for microscale analysis because it is projected to have the largest incremental traffic volume. The potential impact from vehicle emissions of PM_{10} and $PM_{2.5}$ was analyzed at this site.

RECEPTOR PLACEMENT

Multiple receptors (i.e., precise locations at which concentrations are evaluated) were modeled at the selected site; receptors were placed along the approach and departure links and roadway segments at regularly spaced intervals. Receptors in the analysis model for predicting annual average neighborhood-scale $PM_{2.5}$ concentrations were placed at a distance of 15 meters, from the nearest moving lane at the analysis location, based on the *CEQR Technical Manual* procedure for neighborhood-scale corridor $PM_{2.5}$ modeling.

Parking Analysis

The commercial office/retail component of the Proposed Development would include up to 150 accessory parking spaces on the ground level. Emissions from vehicles using the parking garage could potentially affect ambient levels of CO and PM in the immediate vicinity in the With-Action Condition.

An analysis of the emissions from the outlet vent and their dispersion in the environment was performed, calculating pollutant levels in the surrounding area, using the methodology set forth in the *CEQR Technical Manual*. Emissions from vehicles entering, parking, and exiting the garage were estimated using the EPA MOVES mobile source emission model, as referenced in the *CEQR Technical Manual*. For all arriving and departing vehicles, an average speed of five miles per hour was conservatively assumed for travel within the parking garage. In addition, all departing vehicles were assumed to idle for one minute before proceeding to the exit. The concentrations of CO and PM within the garage were calculated assuming a minimum ventilation rate, based on New York City Building Code requirements, of one 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 eight-hour average period. (No exceedances of the one-hour standard would occur, and the eight-hour values are the most critical for impact assessment.)

To determine pollutant concentrations, the outlet vent was analyzed as a “virtual point source” using the methodology in EPA’s Workbook of Atmospheric Dispersion Estimates, AP-26. This methodology estimates CO and PM concentrations at various distances from an outlet vent by assuming that the concentration in the garage is equal to the concentration leaving the vent, and determining the appropriate initial horizontal and vertical dispersion coefficients at the vent faces.

The CO concentrations were determined for the time periods when overall garage usage would be the greatest, considering the hours when the greatest number of vehicles would exit the facility (PM concentrations were determined on a 24-hour and annual average basis). Traffic data for the parking garage analysis was derived from the trip generation analysis described in the Transportation Chapter of this DEIS. Background and on-street concentrations were added to the modeling results to obtain the total ambient levels for CO. The 24-hour average $PM_{2.5}$ background concentration was used to determine the *de minimis* criteria threshold.

Exhaust air from the proposed parking garage was assumed to be vented through a single outlet at a height of approximately 10 feet above the sidewalk, facing Gem Street. The closest receptors to the proposed vent location are the sidewalk receptors along Gem Street; therefore, “near” and “far” receptors were placed along the sidewalks at a pedestrian height of 6 feet and at distances of 7 feet and 49 feet, respectively, from the vent. A receptor was also modeled at the vent height, 10 feet from the vent, to conservatively assess the air quality impacts on the proposed project building window or other air intake location.

Stationary Sources

Stationary source analyses were conducted to evaluate potential impacts from the Proposed Development’s heat and hot water systems and emissions from the future new and improved Acme Smoked Fish processing facility. In addition, an assessment was conducted to determine the potential for impacts due to industrial activities within the study area on the Proposed Development.

Heat and Hot Water System Analysis

The Proposed Development includes building heat and hot water systems for the future Acme Fish Processing facility as well as the new commercial/office development.

DISPERSION MODELING

Since the two buildings comprising the Proposed Development would be adjacent to each other, refined dispersion modeling was undertaken. The potential for impacts was evaluated using the EPA/AMS AERMOD dispersion model. AERMOD is a state-of-the-art dispersion model, applicable to rural and urban areas, flat and complex terrain, surface and elevated releases, and multiple sources (including point, area, and volume sources). AERMOD is a steady-state plume model that incorporates current concepts about flow and dispersion in complex terrain, including updated treatments of the boundary layer theory, understanding of turbulence and dispersion, and includes handling of terrain interactions.

The AERMOD model calculates pollutant concentrations from one or more points (e.g., exhaust stacks) based on hourly meteorological data, and has the capability to calculate pollutant concentrations at locations where the plume from the exhaust stack is affected by the aerodynamic wakes and eddies (downwash) produced by nearby structures. The analysis of potential impacts from exhaust stacks assumed stack tip downwash, urban dispersion and surface roughness length, and elimination of calms. The model incorporates the Plume Rise Model Enhancements (PRIME) downwash algorithm, which is designed to predict impacts in the "cavity region" (i.e., the area around a structure which under certain conditions may affect an exhaust plume, causing a portion of the plume to become entrained in a recirculation region). The Building Profile Input Program for PRIME (BPIPRM) was used to determine the projected building dimensions inputs for modeling with the building downwash algorithm enabled. The modeling of downwash from sources accounts for all obstructions within a radius equal to five obstruction heights of the stack.

The analysis was prepared both with and without downwash in order to assess the worst-case impacts at elevated locations close to the height of the source, which would occur without downwash, as well as the worst-case impacts at lower elevations and ground level, which would occur with downwash, consistent with the *CEQR Technical Manual* guidance.

One-hour average NO_2 concentration increments associated with the Proposed Development's heat and hot water systems were estimated using AERMOD model's Plume Volume Molar Ratio Method (PVMRM) module to analyze chemical transformation within the model. The PVMRM module incorporates hourly background ozone concentrations to estimate NO_x transformation within the source plume. Ozone concentrations were taken from the NYSDEC Queens College monitoring station, which is the nearest ozone monitoring station that has complete five years of hourly data available (2014–2018). An initial NO_2 to NO_x ratio of 10 percent at the source exhaust stack was assumed, which is considered representative for boilers.

Five years of surface meteorological data collected at LaGuardia Airport (2014–2018) and concurrent upper air data collected at Brookhaven, New York were used in the analysis.

EMISSION RATES AND STACK PARAMETERS

The proposed Acme Smoked Fish facility would include natural gas-fired combustion equipment that would be used for space heating, process water, and fish processing. Domestic hot water uses would be supplied by electric water heaters. Annual emission rates for the space heating loads were calculated based on fuel consumption estimates using energy intensity estimates based on the type of development and size of the building as recommended in the *CEQR Technical Manual*, and applying emission factors for natural gas-fired boilers.[7] $PM_{2.5}$ emissions include both the filterable and condensable components. The short-term emission rates (24-hour and shorter) were calculated by scaling the annual emissions to account for a 100-day heating season. The NO_x emissions from the space heating boilers and process water heaters were calculated assuming the use of low NO_x burners (30 ppm). Note that the existing one diesel and two gas-fired generators which provide power to the existing Acme Smoked Fish facility would be eliminated with the Proposed Actions, since electric power would be provided by Con Edison.

The Proposed Development would include an emergency generator that would be used to provide emergency power for life safety systems and to support critical operations at the proposed Acme Smoked Fish processing facility (e.g., refrigeration equipment) in the event of a sudden loss of utility power. The proposed commercial development would also include one or more life safety generators. No generators would participate in a peak load management or similar program with the Proposed Actions.

For the process water heaters and fish processing equipment, it was assumed the units would operate eight hours per day, seven days per week, based on the anticipated operation. The equipment capacity was provided by the design team and is based on the current design for the new and improved Acme Smoked Fish processing facility. All of the exhausts were assumed to be exhausted through separate stacks which would be vented to a minimum height of three feet above the roof[8].

To calculate exhaust velocity, the fuel consumption of the analyzed heating and hot water systems was multiplied by EPA's fuel factor for natural gas,[9] providing the exhaust flow rate at standard temperature; the flow rate was then corrected for the exhaust temperature and exhaust velocity was calculated based on the stack diameter. The stack diameters for the proposed systems were based on the design information; however exhaust temperature were obtained from a survey of boiler exhaust data prepared and provided by New York City Department of Environmental Protection (DEP),[10] and were used to calculate the exhaust velocity.

The proposed commercial/office development would include five natural gas-fired space heating boilers, each rated at 2.5 million British thermal units per hour (MMBtu/hr), including a spare. Domestic hot water would be supplied by electric water heaters. Annual emission rates were calculated based on fuel consumption estimates using energy intensity estimates based on the type of development and size of the building as recommended in the *CEQR Technical Manual*, and applying emission factors for natural gas-fired boilers. The short-term emission rates were based on peak capacity assuming four boilers operating simultaneously.

Assumptions for stack diameter and exhaust temperature for the proposed systems were obtained from a survey of boiler exhaust data prepared and provided by New York City Department of Environmental Protection (DEP),[11] and were used to calculate the exhaust velocity.

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[7] EPA. Compilation of Air Pollutant Emission Factors AP-42. 5th Ed., V. I, Ch. 1.4. September, 1998.

[8] The stack heights for the commercial development are based on a building height that is slightly lower than the zoning envelope, which may result in more conservative estimates of air quality impacts on off-site receptors.

[9] EPA. *Standards of Performance for New Stationary Sources.* 40 CFR Chapter I Subchapter C Part 60. Appendix A-7, Table 19-2. 2013.

[10] DEP. *Boiler Database*. Personal communication from Mitchell Wimbish on August 11, 2017.

[11] DEP. *Boiler Database*. Personal communication from Mitchell Wimbish on August 11, 2017.

The emission rates and exhaust stack parameters used in the modeling analyses are presented in Table 11-4.

TABLE 11-4
Exhaust Stack Parameters and Emission Rates

	Acme Fish Processing Facility						Office Building
Parameter	**Space Heating Boilers**	**RTU unit**	**Process Water Heater**	**Gas-fired heaters (Loading Zone)**	**Gas-fired Cooking & Smoking Ovens**	**Gas-fired heaters(3)**	**Boilers**
Building Size (gsf)	109,300						545,000
Capacity (MMBtu/hr) (per unit)	2.0	0.78	1.5	0.075	0.70	0.075	2.5
Number of Units	3	1	2	3	5	9	5(4)
Stack Height (ft)	70.0(5)	83.0	69.0	69.0	69.0	80.0	200.5
Stack Diameter (ft)	0.83(2)	0.33(2)	0.50(2)	0.33(2)	1.17(2)	0.33(2)	2.0(1)
Number of Stacks	3	1	2	3	1	1	4
Exhaust Flow (acfm)	529.15	207.6	367.0	19.8	2350.0	178.6	661.4
Exhaust Velocity (fpm)	970	2,379	1,869	227	2,198	2,046	210.5
Exhaust Temperature (F)(1)	307.8	307.8	250.0	307.8	130.0	307.8	307.8
Emission Rate Per Unit (grams/second)							
NO_2 (1-hour average)	0.003(7)	0.003	0.007(7)	0.001	0.043	0.0083	0.031
NO_2 (Annual average)	0.001(7)	0.002	0.002(6) (7)	0.0003	0.014(6)	0.0023	0.009
$PM_{2.5}$ (24-hour average)	0.001	0.0002	0.001	0.0001	0.003	0.0006	0.0023
$PM_{2.5}$ (Annual average)	0.0001	0.0001	0.0005(6)	0.00002	0.001(6)	0.0002	0.0007

Notes:

1 Stack parameter assumptions are based on boiler specifications for similar sized systems from boiler air permit information provided by DEP.

2 Stack diameter based on design information.

3 The nine gas-fired heaters are modeled as an area source.

4 The five boilers include a spare boiler for backup.

5 Based on the design information the stacks are located four (4) feet above the roof.

6 The annual emission rates are based on units operating 8 hours per day and seven days per year.

7 Emission rate based on 30 ppm low NO_x burners.

BACKGROUND CONCENTRATIONS

To estimate the maximum expected pollutant concentration at a given location (receptor), the predicted impacts must be added to a background value that accounts for existing pollutant concentrations from other sources that are not directly accounted for in the model (see Table 11-5). The background levels are based on concentrations monitored at the nearest NYSDEC ambient air monitoring stations over the most recent 5-year period for which data are available (2014–2018), with the exception of PM_{10}, which is based on 3 years of data, consistent with current DEP guidance (2016–2018). For the 24-hour PM_{10} concentration, the highest second-highest measured value over the specified period was used.

TABLE 11-5
Maximum Background Pollutant Concentrations for Heating and Hot Water System Analysis

Pollutant	Average Period	Location	Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
NO_2	1-hour	Queens College, Queens	(1)	188
	Annual	Queens College, Queens	32.3	100
$PM_{2.5}$	24-hour	JHS 126, Brooklyn	17.2	35
PM_{10}	24-hour	Division Street, Manhattan	38	150

Note:
[1] The 1-hour NO_2 background concentration is not presented in the table since the AERMOD model determines the total 98th percentile 1-hour NO_2 concentration at each receptor.
Source: New York State Air Quality Report Ambient Air Monitoring System, NYSDEC, 2014–2018.

Total 1-hour NO_2 concentrations were refined following a more detailed approach (EPA "Tier 3"). The methodology used to determine the total 1-hour NO_2 concentrations was based on adding the monitored background to modeled concentrations, as follows: hourly modeled concentrations from the project's heat and hot water sources were first added to the seasonal hourly background monitored concentrations; then the highest combined daily 1 hour NO_2 concentration was determined at each location and the 98th percentile daily 1-hour maximum concentration for each modeled year was calculated within the AERMOD model; finally the 98th percentile concentrations were averaged over the latest five years.

$PM_{2.5}$ impacts are assessed on an incremental basis and compared with the $PM_{2.5}$ *de minimis* criteria. The $PM_{2.5}$ 24-hour average background concentration of 17.2 µg/m3 from the JHS 126 ambient monitoring station was used to establish the *de minimis* value of 8.9 µg/m3 (based on the 98th percentile concentration, averaged over the years 2016–2018).

RECEPTOR PLACEMENT

Discrete receptors (i.e., locations at which concentrations are calculated) were modeled along existing and proposed-building façades to represent potentially sensitive locations such as operable windows and intake vents. Rows of receptors at spaced intervals on the modeled buildings were analyzed at multiple elevations.

Industrial Source Analysis

ANALYSIS OF POTENTIAL IMPACTS FROM EXISTING USES

Potential process and manufacturing sources located within a radius of 400 feet of the Proposed Development were evaluated. DEP's Bureau of Environmental Compliance (BEC) files were examined to determine if there are permits for any industrial facilities that are identified. A review of federal and state permits also was conducted. A request was made to BEC and NYSDEC for information regarding the release of air pollutants from these potential sources within the entire study area. The DEP and NYSDEC air permit data provided was compiled into a database of source locations, air emission rates, and other data pertinent to determining source impacts. A comprehensive search was also performed to identify NYSDEC Title V permits and permits listed in the EPA Envirofacts database.

A field survey was performed on October 10, 2019 to confirm the operational status of the sites identified in the permit search, and to identify any additional sites have sources of emissions that would warrant an analysis. Overall, eight facilities were identified as having emissions, several of which had multiple air permits associated with it. These facilities and their associated permit identification numbers are presented in Table 11-6. No unpermitted facilities were observed.

TABLE 11-6
Industrial Sources within 400 Feet of the Development Site

Name of Business	Address	Type of Business	Permit ID(s)
Celtic Woodworking Corp.	108 Dobbin Street	Woodworking	PA073290 PA073390
W. H. Christian & Sons Inc.	22 Franklin Street	Commercial Laundry	PB033501 PA000977
W. H. Christian & Sons Inc.	211 Banker Street	Commercial Laundry	PA000877
Budd Woodwork Inc.	54 Franklin Street	Woodworking	PA025190 PB002302
Scheel Corporation	38 Franklin Street	Wax Processing	PA114788 PB016407
Gabriel's Collision Center	38 Norman Avenue	Auto Body Shop	PB045012
Daedalus Design & Production	233 Banker Street	Fabrication	PB007211
Overlook Woods	152 Banker Street	Woodworking	PW007816

There was one permitted autobody shop, Gabriel’s Collision Center, located at 38 Norman Ave. For this facility, the solvent emissions were not speciated into individual air toxic compounds in the permit. However, a permitted autobody facility that uses the same type of paint, and which has listed individual air toxic compounds in the air permit, was used as a basis to estimate the speciated solvent emissions. The solid and solvent usage for the analyzed autobody shop was calculated using information in the permit and this was multiplied by the weight percentage for each air toxic to estimate the maximum emission rate for the air toxics, by source.

Refined Dispersion Analysis

After compiling the information on facilities with manufacturing or process operations in the study area, maximum potential pollutant concentrations from the different sources were evaluated using the EPA AERMOD refined dispersion model. The AERMOD model was run using the same assumptions and options as described earlier for the refined modeling of heating and hot water systems.

Predicted worst-case impacts on the projected and potential development sites were compared with the short-term guideline concentrations (SGCs) and annual guideline concentrations (AGCs) recommended in NYSDEC’s DAR-1 AGC/SGC Tables. These guidelines present the airborne concentrations that are applied as a screening threshold to determine if the future uses of the Proposed Development could be significantly impacted by nearby sources of air pollution.

To assess the effects of multiple sources emitting the same pollutants, cumulative source impacts were determined.

Discrete receptors (i.e., locations at which concentrations were calculated) were placed on the Proposed Development. The receptor network consisted of receptors located at spaced intervals along the sides of the Development Site from the ground floor to the upper level.

Emission rates and stack parameters, obtained from the DEP permits, were input into the AERMOD dispersion model. To evaluate air quality impacts of $PM_{2.5}$ from auto body paint spray booths, the permitted emissions, which were reported as total solids, were converted to $PM_{2.5}$ emissions based on the estimated fraction of $PM_{2.5}$ present in the exhaust[12]. For sources that were from woodworking or furniture painting spray booths, all reported particulate emissions were conservatively assumed to be $PM_{2.5}$. The pollutants and emission rates for each permitted facility are presented in Table 11-7.

TABLE 11-7
Industrial Source Analysis
Modeled Emission Rates

Facility	Description of Process	DEP Permit ID	Pollutant	Hourly Emissions (lb/hr)[1]	Annual Emissions (lb/yr)
Celtic Woodworking Corp	Woodworking	PA073290	Toluene	1.98	1,980
			Isobutyl Acetate	1.21	1,210
			Dioctyl Phthalate	0.23	230
			Isobutyl Isobutyrate	0.18	180
			Isobutyl Alcohol	0.37	370
			VMP Naptha	0.08	80
Celtic Woodworking Corp	Woodworking	PA073390	Particulates	0.003[3]	2
W.H. Christian & Sons Inc.	Laundry Drying	PB033501	Lint	0.0007[3]	3.2
W.H. Christian & Sons Inc.	Laundry Drying	PA000977	Particulates	0.0001[3]	0.5
			Sulfur Oxides	0.0002	0.5
			Nitrogen Oxides	0.055	110.6
W.H. Christian & Sons Inc.	Laundry Drying	PA000877	Particulates	0.0007[3]	3.2
Budd Woodwork Inc.	Woodworking	PA025190	Particulates	0.0017[3]	8
			Methyl Isobutyl Ketone	1.5	1,200
			Ethanol	0.06	48
			Butyl Alcohol	0.15	120
			Xylene, M,O,&P	0.58	464
Budd Woodwork Inc.	Woodworking	PB002302	Wood Particles	0.0033[3]	16
Scheel Corporation	Metal Processing	PA114788	Particulates	0.0038[3]	18
			Sulfur Oxides	0.001	1.2
			Nitrogen Oxides	0.26	316
			Volatile Hydrocarbons	0.60	720
Scheel Corporation	Metal Processing	PB016407	$PM_{2.5}$	0.00005[3]	830.5
Gabriel's Collision Center	Auto Body Spray Booth	PB045012	Solids	0.003[2]	0.65
			Solvents	0.50	248
			Xylene	1.64	4,264
			Ethylbenzene	0.20	511.7
			Methyl Ethyl Ketone	0.11	287.8
			Toluene	0.03	74.6
Daedalus Design & Production	Wood/Metal Painting	PB007211	Nepheline Syenite	2.48	594
			Titanium Dioxide	1.49	356.4
			Zinc Oxide	0.50	118.8
			Petroleum Distillates	0.08	19.9
Matthew Fairbank Designs	Woodworking	PW007816	Particulates	0.19[3]	88.8

Notes:
1 Emissions for particulate matter were modeled over a 24-hour averaging period.
2 Particulate matter for auto body paint spray booths assumes 28.6% of total particulate matter is PM2.5 (EPA. Compilations of Air Pollutant Emission Factors AP-42. Appendix B-1, Table 4.2.2.8. https://www3.epa.gov/ttn/chief/ap42/appendix/appb-1.pdf. October 1986.).
3 Particulate matter emissions from all woodworking and non-auto body paint spray booths were conservatively assumed to be $PM_{2.5}$.

12 EPA. *Compilations of Air Pollutant Emission Factors AP-42*. Fifth Edition, Volume I: Stationary Point and Area Sources, Appendix B.1. https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors. October 1986.

Health Risk Assessment

Potential cumulative impacts were evaluated based on the Hazard Index Approach for non-carcinogenic compounds as described in NYSDEC's DAR-1 guidance document. Hazard quotients are calculated by dividing the maximum modeled concentration of each pollutant by its respective AGC. The quotients are then summed together to calculate a multi-contaminant hazard index for each sensitive receptor. The maximum hazard index indicates the worst-case scenario for potential impacts from non-carcinogenic pollutants. For non-carcinogenic compounds, NYSDEC's DAR-1 considers a cumulative hazard index of less than 2.0 to be acceptable. There were no carcinogenic compounds associated with the identified facilities; therefore, no analysis of these compounds was required.

ANALYSIS OF POTENTIAL IMPACTS FROM FUTURE USES

Pollutants Emissions

Potential air quality impacts from process uses associated with the Acme Fish Expansion project were evaluated. Currently, Acme Smoked Fish operates fish smoking and drying ovens for smoking and curing of fish products. In the future with the Proposed Actions, the ovens would be fitted with state-of-the-art controls to minimize pollutant emissions, visible smoke and odors from the facility.

Since the final design has not been completed for the proposed fish processing activities, estimates of emissions were made based on available DEP permit information for a different facility (Banner Smoked Fish) with similar process equipment. Currently, design information is not available regarding the exact control system that will be procured for the fish smoking operation. Based on currently available technology, it is expected that the design would include state-of-the-art emission controls, similar to equipment used at another Acme Smoked Fish processing facility elsewhere in the US. This design is more advanced than the system employed at the existing Acme facility, which uses an afterburner. However, in the absence of specific performance information on the future control system, the analysis for the proposed project was conservatively performed assuming the use of an afterburner. The analysis was based on the same number of smoke generators as currently planned for the new and improved Acme Smoked Fish processing facility. The permit for fish smoking operation lists particulates as the contaminant and does not provide emissions estimates for specific air toxic compounds. The Banner Smoked Fish permit has the same number of smoke generators and contains emission data for individual air toxic compounds. Based on the similarity in process (fish smoking) the number of ovens, and control technology, it was considered reasonably representative for the purpose of estimating potential pollutant concentrations, using conservative assumptions. Pollutants included in that permit were included in the analysis. The emissions are based on the use of five industrial smoke houses for cooking of fish and flavoring with wood chips. This is considered conservative since the proposed Acme Smoked Fish facility would be equipped with state-of-the-art emission controls, which are more effective than the controls currently in use at the facility, and as represented in the analysis presented herein. The modeled emission rates are provided in Table 11-8.

The maximum potential pollutant concentrations were evaluated using the EPA AERMOD refined dispersion model. The AERMOD model was run using the same assumptions and options as described earlier for the refined modeling of heating and hot water systems. Predicted worst-case impacts were compared with the short-term guideline concentrations (SGCs) and annual guideline concentrations (AGCs) recommended in NYSDEC's DAR-1 AGC/SGC Tables.

TABLE 11-8
Acme Fish Process Sources
Modeled Emission Rates

Pollutant	CAS Number	Peak Hourly Emissions (g/s)	Annual Emissions (g/s)[1]
Particulates	NY075-00-0	0.00006	0.00002
Aldehyde	NY390-00-0	0.00003	0.00001
Carbon Monoxide	00630-08-0	0.00004	0.00001
Hydrocarbons	NY495-00-0	0.00011	0.00004
Organic Acid	00064-18-6	0.00008	0.00003
Nitrogen Oxides[2]	10102-03-1	0.00139	0.00046

Notes:
1 The annual emission rates are based on units operating 8 hours per day and 7 days per week.
2 Conservatively assumed all nitrogen oxides as nitrogen dioxide.

To assess the cumulative impacts of $PM_{2.5}$ and NO_2, the emissions of these pollutants from the process sources were also included in the heating and hot water system analysis.

Odors

Currently, Acme Smoked Fish operates ovens for smoking and curing of fish. The smoking ovens are equipped with afterburners for control of particulate matter and organic compounds, which also removes odorous compounds from the exhaust gas. The proposed Acme Smoked Fish facility would utilize state-of-the-art multistage exhaust air cleaning systems to eliminate smoke and odors from the fish smoking operations. This system would include a wet electrostatic precipitator for control of smoke particles and aerosols, a gas washer to remove gaseous phase compounds, and a carbon absorber for further control of gaseous compounds. Furthermore, the proposed facility would be operated continuously under negative pressure, and vehicle bays for loading and unloading trucks would be closed at all times except when vehicles are entering or leaving the facility.

Odors are regulated by NYSDEC, which prohibits the release of odors that would have an objectionable effect. With these measures in place, odors, which are currently not a nuisance issue in the area, would not result in significant adverse impacts.

Additional Sources

The *CEQR Technical Manual* requires an analysis of projects that may result in a significant adverse impact due to certain types of new uses located near a “large” or “major” emissions source. Major sources are defined as those located at facilities that have a Title V or Prevention of Significant Deterioration air permit, while large sources are defined as those located at facilities that require a State Facility Permit. To assess the potential effects of these existing sources on the Development, a review of existing permitted facilities was conducted. Sources of information reviewed included the EPA’s Envirofacts database, and the NYSDEC Title V and State Facility Permit websites. No facilities with a State Facility, Title V, or PSD Permit within the 1,000-foot study area around the Development Site were identified. Therefore, no analysis of the potential impacts of large or major sources of emissions on the project was required.

F. EXISTING CONDITIONS

Concentrations of all criteria pollutants at NYSDEC air quality monitoring stations nearest the study area are presented in Table 11-9. All data statistical forms and averaging periods are consistent with the definitions of the NAAQS. It should be noted that these values are somewhat different than the background concentrations presented in Tables 11-3 and 11-5, above, since the data presented in Table 11-9 are based on the most current data, compared with background concentrations used for modeling purposes, which are based on several years of monitoring data.

These existing concentrations are based on recent published measurements, averaged according to the NAAQS (e.g., $PM_{2.5}$ concentrations are averaged over the 3 years); the background concentrations are the highest values in past years and are used as a conservative estimate of the highest background concentrations for future conditions.

There were no monitored violations of the NAAQS for the pollutants at these sites in 2018, with the exception of ozone.

TABLE 11-9
Representative Monitored Ambient Air Quality Data

Pollutant	Location	Units	Averaging Period	Concentration	NAAQS
CO	Queens College, Queens	ppm	1-hour	1.7	35
			8-hour	1.2	9
SO_2	Queens College, Queens	µg/m³	1-hour	14.8	196
PM_{10}	Division Street, Manhattan	µg/m³	24-hour	38	150
$PM_{2.5}$	JHS 126, Brooklyn	µg/m³	Annual	7.7	12
			24-hour	17.2	35
NO_2	Queens College, Queens	µg/m³	Annual	27.2	100
			1-hour	105.8	188
Lead	IS 52, Bronx	µg/m³	3-month	0.0033	0.15
Ozone	Queens College, Queens	ppm	8-hour	0.074	0.070

Notes:
The CO and, PM_{10} concentrations for short-term averages are the second-highest from the most recent year with available data.
$PM_{2.5}$ annual concentrations are the average of 2016–2018 annual concentrations, and the 24-hour concentration is the average of the annual 98th percentiles in the same period.
8-Hour average ozone concentrations are the average of the fourth-highest-daily values from 2016 to 2018.
SO_2 1-hour and NO_2 1-hour concentrations are the average of the 99th percentile and 98th percentile, respectively, of the highest daily 1-hour maximum from 2016 to 2018.
Source: New York State Air Quality Report Ambient Air Monitoring System, NYSDEC, 2014–2018.

G. THE FUTURE WITHOUT THE PROPOSED ACTIONS (NO-ACTION CONDITION)

Mobile Sources

PM_{10} concentrations in the No-Action condition were determined by using the methodology previously described. The predicted future PM_{10} 24-hour concentration, including the background concentration, at the analyzed intersection in the No-Action condition, is presented in Table 11-10. The value shown is the highest predicted concentration for the receptor locations. As shown in the table, No-Action condition concentrations are predicted to be well below the PM_{10} NAAQS.

TABLE 11-10
Maximum Predicted 24-Hour Average PM_{10} No-Action Concentration (µg/m³)

Analysis Site	Location	Concentration
1	Meserole Avenue and Franklin Street	~~54.3~~55.8
Notes: NAAQS—24-Hour average 150 µg/m³. Concentration includes a background concentration of 38.0 µg/m³.		

$PM_{2.5}$ concentrations for the No-Action condition are not presented, since impacts are assessed on an incremental basis.

Stationary Sources

Under future conditions without the Proposed Actions, the existing M3-1 zoning would remain and the Proposed Development would not be constructed. The No-Action scenario assumes that vacated buildings would be re-occupied by a mix of eating/drinking/entertainment establishments, creative office and warehouse uses. Lot 125, which currently accommodates parking and open storage, would be redeveloped with a new 3-story commercial building with distillery, office, dance studio and restaurant uses. Overall, in the No-Action condition, emissions in the area from heating and hot water systems, and industrial uses, would be similar to existing conditions.

H. THE FUTURE WITH THE PROPOSED ACTIONS (WITH-ACTION CONDITION)

The Proposed Actions would result in increased mobile source emissions in the immediate vicinity of the Development Site, and they have the potential to affect the surrounding community with emissions from the proposed buildings' heating, hot water and process systems. The following sections describe the results of the studies performed to analyze the potential impacts on the surrounding community from these sources for the 202~~4~~5 analysis year.

Mobile Sources

Intersection Analysis

PM_{10} concentrations in the With-Action condition were determined by using the methodology previously described. Table 11-11 presents the predicted PM_{10} 24-hour concentrations at the analyzed intersection in the With-Action condition. The values shown are the highest predicted concentrations for the modeled receptor locations and include background concentrations.

TABLE 11-11
Maximum Predicted 24-Hour Average PM_{10} With-Action Concentrations (µg/m³)

Analysis Site	Location	No-Action	With-Action
1	Meserole Avenue and Franklin Street	~~54.3~~55.8	~~57.8~~59.6
Notes: NAAQS—24-Hour average 150 µg/m³. Concentrations include a background concentration of 38.0 µg/m³.			

Maximum projected localized 24-hour average and neighborhood-scale annual average With Action and incremental $PM_{2.5}$ concentrations are presented in Tables 11-12 and 11-13, respectively.

TABLE 11-12
Maximum Predicted 24-Hour Average $PM_{2.5}$ With Action and Incremental Concentrations (µg/m³)

Analysis Site	Location	No-Action	With-Action	Increment	*De Minimis* Criterion
1	Meserole Avenue and Franklin Street	~~21.6~~22.2	~~22.5~~23.1	0.~~84~~87	8.9

Notes:
NAAQS—24-Hour average 35 µg/m³.
No Action and With Action concentrations presented include a background concentration of 17.2 µg/m3.
$PM_{2.5}$ *de minimis* criteria—24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 µg/m3.

TABLE 11-13
Maximum Predicted Annual Average $PM_{2.5}$ With Action and Incremental Concentrations (µg/m³)

Analysis Site	Location	No-Action	With-Action	Increment	*De Minimis* Criterion
1	Meserole Avenue and Franklin Street	8.~~06~~08	8.~~12~~13	0.~~06~~05	0.1

Notes:
NAAQS—annual average 12 µg/m³.
No Action and With Action concentrations presented include a background concentration of 7.7 µg/m3.
$PM_{2.5}$ *de minimis* criteria— annual (neighborhood scale), 0.1 µg/m³

The results demonstrate that the annual and daily (24-hour) average $PM_{2.5}$ increments are projected to be below the *de minimis* criteria and total concentrations are below the NAAQS. Therefore, there would be no potential for significant adverse impacts on air quality from vehicle trips generated by the Proposed Actions.

Parking Analysis

Based on the methodology previously described, the maximum predicted 8-hour average CO and 24-hour and annual $PM_{2.5}$ concentrations from the proposed parking garage were analyzed, assuming a near side sidewalk receptor on the same side of the street (seven feet) as the parking garage, and a far side sidewalk receptor on the opposite side of the street from the parking garage. The total CO impacts included both background CO levels and contributions from traffic on adjacent roadways (for the far side receptor only). There was also a receptor placed on the façade of the proposed building above the parking garage. All values are the highest predicted concentrations at any time period analyzed.

The maximum predicted 8-hour average CO concentration of all the receptors modeled is 1.~~61~~ 63 ppm, at a receptor on the building facade. This value includes a projected concentration of 0.~~21~~ 23 ppm from emissions within the parking garage, and a background level of 1.4 ppm. The maximum predicted concentration is substantially lower than the applicable standard of 9 ppm and the *de minimis* CO criteria.

The maximum predicted 24-hour and annual average $PM_{2.5}$ increments are 0.~~71~~ 68 µg/m³ and 0.~~118~~ 114 µg/m³, respectively, which were modeled at a receptor on the building facade. The maximum predicted $PM_{2.5}$ increments are well below the respective $PM_{2.5}$ *de minimis* criteria of 8.9 µg/m³ for the 24-hour average concentration and 0.3 µg/m³ for the annual concentration. Therefore, the proposed parking garage would not result in any significant adverse air quality impacts.

Stationary Sources

Heat and Hot Water System Analysis

Tables 11-14 and 11-15 present the maximum predicted concentrations from combustion systems of the Proposed Developments (including the future Acme Smoked Fish process sources) at off-site and project receptors, respectively. The maximum predicted NO_2 concentrations were added to the maximum ambient background concentration and compared with the NAAQS, while $PM_{2.5}$ concentrations were compared with the $PM_{2.5}$ *de minimis* criteria. As shown in the tables, maximum predicted concentrations are below the NAAQS and $PM_{2.5}$ *de minimis* criteria. Therefore, the Proposed Actions would not result in a significant impact due to combustion sources.

TABLE 11-14
Maximum Modeled Pollutant Concentrations from Stationary Sources
Off-Site Receptors (μg/m³)

Pollutant	Averaging Period	Maximum Modeled Impact	Background	Total Concentration	Criterion
NO_2	1-hour	(1)	(1)	148.3	188(1)
	Annual	1.24	32.3	33.5	100
$PM_{2.5}$	24-hour	1.83	N/A	1.83	8.9(2)
	Annual	0.10	N/A	0.10	0.3(3)

Notes:
N/A—Not Applicable.
1 The 1-hour NO_2 concentration presented represents the maximum of the total 98th percentile 1-hour NO_2 concentration predicted at any receptor using seasonal-hourly background concentrations.
2 $PM_{2.5}$ *de minimis* criterion—24-hour average, not to exceed more than half the difference between the background concentration (17.2 μg/m³) and the 24-hour standard of 35 μg/m³.
3 $PM_{2.5}$ *de minimis* criterion—annual (discrete receptor), 0.3 μg/m³.

TABLE 11-15
Maximum Modeled Pollutant Concentrations from Stationary Sources
On the Proposed Development (μg/m³)

Pollutant	Averaging Period	Maximum Modeled Impact	Background	Total Concentration	Criterion
NO_2	1-hour	(1)	(1)	179.6	188(1)
	Annual	1.66	32.3	34.0	100
$PM_{2.5}$	24-hour	5.05	N/A	5.05	8.9(2)
	Annual	0.24	N/A	0.24	0.3(3)

Notes:
N/A—Not Applicable.
1 The 1-hour NO_2 concentration presented represents the maximum of the total 98th percentile 1-hour NO_2 concentration predicted at any receptor using seasonal-hourly background concentrations.
2 $PM_{2.5}$ *de minimis* criterion—24-hour average, not to exceed more than half the difference between the background concentration (17.2 μg/m³) and the 24-hour standard of 35 μg/m³.
3 $PM_{2.5}$ *de minimis* criterion—annual (discrete receptor), 0.3 μg/m³.

To ensure that there are no potential significant adverse impacts of $PM_{2.5}$ or NO_2 from Proposed Development's combustion systems, certain restrictions would be required as part of the Proposed Actions through Air Quality (E) Designations (E-585) that would be placed on the Proposed Development. These restrictions were assumed in the analysis leading to the projected values in Tables 11-13 and 11-

14, and would avoid the potential for significant air quality impacts from stationary sources modeled in the analysis. To the extent permitted under Section 11-15 of the Zoning Resolution, the requirements of the (E) Designations may be modified, or determined to be unnecessary, based on new information or technology, additional facts, or updated standards that are relevant at the time each development site is ultimately developed.

The restrictions of the (E) Designation would be as follows:

Acme Smoked Fish Facility (Block 2615, Lot 6)

Space Heating Boilers and Process Water Heaters: **Any new development on the above-referenced property must utilize only natural gas in the space heating boilers and process water heaters, and be fitted with low NO_x (30 ppm) burners.**

Commercial/Office Development (Block 2615, Lots 1, 19, 21, 25, 50, 125)

To preclude potential for significant adverse air quality impacts from the proposed fossil fuel fired combustion sources at Acme Smoked Fish Facility, no operable windows or air intakes on the eastern façade of the proposed Commercial/Office building would be permitted between a height of 75 feet and 95 feet above grade.

With these restrictions in place, there would not be any adverse air quality impacts due to the Proposed Development's combustion and process sources.

Industrial Sources

IMPACTS OF EXISTING INDUSTRIAL USES ON THE PROPOSED DEVELOPMENT

Table 11-16 presents the maximum potential modeled short-term and long-term impacts of the analyzed industrial sources on toxic air pollutant concentrations on the Development Site. The table also lists the SGC and AGC for each toxic air pollutant.

The AERMOD analysis determined that emissions of air toxic compounds from existing industries in the area would not result in any potential significant adverse air quality impacts on the Proposed Development.

Health Risk Assessment

Cumulative impacts were also determined for the combined effects of multiple air contaminants in accordance with the approach described in the "Methodology for Predicting Pollutant Concentrations" section of this chapter. Using the predicted concentrations of each pollutant, the maximum hazard index was calculated for each affected receptor associated with the Proposed Actions (none of the analyzed air toxic compounds were identified as potential carcinogens; therefore, the unit risk analysis was not performed). The hazard index approach was used to determine the effects of multiple non-carcinogenic compounds.

Table 11-17 presents the results of the assessment of cumulative non-carcinogenic effects on the Proposed Actions. The estimated pollutant concentrations and the concentration to AGC pollutant ratios presented in the table represent the values at the receptor location where the maximum cumulative results were predicted, and consequently are in most cases different than the overall maximum values presented in Table 11-16. As shown in Table 11-17, the maximum hazard index at an individual receptor location is less than 2.0, the level considered by NYSDEC's DAR-1 to be significant. Therefore, based upon the cumulative air toxics analysis, the Proposed Actions would not result in a significant hazard.

TABLE 11-16
Maximum Predicted Pollutant Concentration Increments (µg/m^3)

Pollutant	CAS No.	1-Hour Average (µg/m^3)	SGC (µg/m^3)(1)	Annual Average (µg/m^3)	AGC (µg/m^3)(1)
Butyl Alcohol	00071-36-3	19	--	0.042	1,500
Dioctyl Phthalate	00117-81-7	35	--	0.091	0.42
Ethanol	00064-17-5	7	--	0.017	45,000
Ethylbenzene	00100-41-4	11	--	0.066	1,000
Isobutyl Acetate	00110-19-0	179	--	0.47	565
Isobutyl Alcohol	00078-83-1	56	--	0.15	360
Isobutyl Isobuyrate	00097-85-8	27	--	0.072	--
Methyl Ethyl Ketone	00078-93-3	6	13,000	0.037	5,000
Methyl Isobutyl Ketone	00108-10-1	187	31,000	0.42	3,000
Nepheline Syenite	37244-96-J	1,347	--	1.90	--
Nitrogen Oxides(5)	NY210-00-0	165(3)	188(6)	32.63(3)	100(6)
Petroleum Distillates	08002-05-9	43	--	0.065	--
Sulfur Dioxide	07446-09-5	15(3)	196	0.0014	--
Titanium Dioxide	13463-67-7	825	--	1.14	24
Toluene	13463-67-7	298	37,000	0.77	5,000
VMP Naptha	64742-89-8	12	--	0.033	3,200
Volatile Hydrocarbons	64742-95-6	136	--	0.35	100
Xylene	01330-20-7	91	22,000	0.57	100
Zinc Oxide	01314-13-2	269	380	0.38	4.8
$PM_{2.5}$ (2)	NY075-02-5	19.5(3)	35(4)	7.9(3)	12(4)

Sources:
[1] NYSDEC Division of Air Resources. *DAR-1 AGS/SGC Tables.* August 2016.
[2] Conservatively assumes all non-autobody shop particulate emissions are $PM_{2.5}$.
[3] Includes background concentration.
[4] NAAQS 24-hour average, and annual average.
[5] Conservatively assumes all NO_x emissions are NO_2
[6] The NAAQS for NO_2 was used, and conservatively assumes that 100 percent of NO_x is NO_2.

IMPACTS FROM FUTURE USES

Table 11-18 presents the maximum potential modeled short-term and long-term impacts of the analyzed future industrial sources on toxic air pollutant concentrations. The table also lists the SGC and AGC for each toxic air pollutant.

The AERMOD analysis determined that emissions of air toxic compounds from process sources associated with the Acme Smoked Fish expansion would not result in any potential significant adverse air quality impacts on the proposed Commercial/Office building on the Development Site or in the surrounding area.

TABLE 11-17
Estimated Maximum Hazard Index

Pollutant	CAS Number	Estimated Pollutant Concentration (µg/m^3)	AGC (µg/m^3)	Concentration to AGC Pollutant Ratio
Non-Carcinogenic Compounds				
Butyl Alcohol	00071-36-3	0.017	1,500	1.16E-05
Dioctyl Phthalate	00117-81-7	0.088	0.42	0.21
Ethanol	00064-17-5	0.007	45,000	1.56E-07
Ethylbenzene	00100-41-4	0.024	1,000	2.38E-05
Isobutyl Acetate	00110-19-0	0.452	565	8.00E-04
Isobutyl Alcohol	00078-83-1	0.141	360	3.91E-04
Methyl Ethyl Ketone	00078-93-3	0.013	5,000	2.64E-06
Methyl Isobutyl Ketone	00108-10-1	0.174	3,000	5.78E-05
Titanium Dioxide	13463-67-7	0.157	24	6.55E-03
Toluene	13463-67-7	0.746	5,000	1.49E-04
VMP Naptha	64742-89-8	0.032	3,200	9.97E-06
Volatile Hydrocarbons	64742-95-6	0.115	100	1.15E-03
Xylene	01330-20-7	0.253	100	0.003
Zinc Oxide	01314-13-2	0.052	4.8	0.011
			Total Hazard Index	0.23
			Hazard Index Threshold Value	2.0

Source: DEC, DAR-1, August 2016.

TABLE 11-18
Maximum Predicted Pollutant Concentration (µg/m^3)

Pollutant	CAS No.	1-Hour Average (µg/m^3)	SGC (µg/m^3)[1]	Annual Average (µg/m^3)	AGC (µg/m^3)[1]
Particulates[2]	NY075-00-0	17.2[3]	35[4]	7.71[3]	12[4]
Aldehyde[5]	NY390-00-0	0.19	30	0.002	0.06
Carbon Monoxide	00630-08-0	0.25	40,000	0.003	--
Hydrocarbons[6]	NY495-00-0	0.74	98,000	0.010	7,000
Organic Acid[7]	00064-18-6	0.49	3,700	0.006	60
Nitrogen Oxides[8]	10102-03-1	114.0[3]	188[9]	32.4[3]	100[9]

Sources:
[1] NYSDEC Division of Air Resources. *DAR-1 AGS/SGC Tables.* August 2016.
[2] Modeled as $PM_{2.5}$.
[3] Includes background concentration.
[4] NAAQS 24-hour average, and annual average.
[5] Modeled as Formaldehyde.
[6] Modeled as Isopropyl Alcohol.
[7] Modeled as Acetic Acid.
[8] Conservatively assumes all NO_x emissions are NO_2.
[9] The NAAQS for NO_2 was used, and conservatively assumes that 100 percent of NO_x is NO_2.