FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE CATSKILL/DELAWARE UV FACILITY

4.10. AIR QUALITY

4.10.1. Introduction

This air quality section provides an assessment of the anticipated air quality impacts associated with the proposed Catskill/Delaware Ultraviolet Light Disinfection Facility (UV Facility) at the Eastview Site. The potential impacts from mobile and stationary sources relating to construction and operation of the proposed UV Facility were analyzed. Mobile sources included vehicular traffic on public roads. Stationary sources included the facility's boiler system used to supply heat and hot water and the emergency electric-generation system. The construction activity sources included engine exhaust from construction equipment and vehicles. Fugitive particulate (dust) sources included construction activities such as soil excavation and on-site vehicle travel. The methodology, the pollutants of concern, the applicable air quality standards, and the potential impact criteria are presented in Section 3.10, Data Collection and Impact Methodologies, Air Quality. Supporting documentation is included in Air Quality Appendix C. A chart showing the analysis framework for this section, and where information for the various analysis conditions can be found in the section, is shown in Flowchart 4.10-1. A discussion of the data, modeling scenarios, and the results of the air dispersion modeling performed for the mobile and stationary sources are presented in this section. Dispersion modeling was utilized to assess the effects of emissions from mobile and stationary sources; and operational and construction sources.

Mobile source dispersion modeling analyses were conducted for: (1) the Existing Conditions; (2) the Future Without the Project (2010 build/operational year, and the 2008 construction year); (3) Potential Project Impact scenarios (2010 build/operational year); and (4) Potential Construction Impacts (2008 Construction year). Since the Croton project could be constructed at the Eastview Site, the future conditions were examined both with and without the Croton project at the Eastview Site.

In addition, the Potential Construction Impact scenario with Croton in the year 2008 were analyzed for each of the four off-site parking alternatives: (1) parking at the Landmark at Eastview office park (Landmark property) – Option A; (2) parking at Westchester Community College (WCC) – Option B; (3) parking split between WCC and the Landmark property– Option C; and (4) parking between the Landmark property and the Home Depot parking lot – Option D. The highest potential impacts of the four alternatives were presented. The off-site parking alternatives include bus transport to and from the project site.

The analysis was also performed using time periods corresponding to peak project traffic hours for carbon monoxide (CO) for both 1-hour and 8-hour impacts (1-hour concentrations are multiplied by a persistence factor in order to derive 8-hour concentrations). The AM and PM peak project traffic hours were analyzed for air quality impacts. The time periods used were 6:30 AM to 7:30 AM and 3:30 PM to 4:30 PM. For particulate matter analyses, 24-hour automatic traffic recorder (ATR) data was included in the modeling analysis in order to determine 24-hour and annual impacts. Particulate matter emissions were generated assuming the use of ultra-low sulfur diesel (ULSD) for the construction of the proposed UV Facility.

The selection of intersections for analysis was performed in accordance with United States Environmental Protection Agency (USEPA) procedures (*Guideline for Modeling CO from Roadway Intersections, November, 1992).* The intersections having the worst for level of service (LOS) and the intersections with the highest traffic volumes (total volumes and project increment) were considered in selecting the intersections for detailed dispersion modeling analyses. Table 4.10-1 presents the four intersections selected for analysis. Figure 4.10-1 presents the intersections on an area map.

TABLE 4.10-1. INTERSECTIONS SELECTED FOR MOBILE SOURCE AIR QUALITY ANALYSIS

Intersection ID Number	Intersection Names
27, 30	Grasslands Road (Route 100C) at Sprain Brook Parkway
24	Route100C at Clearbrook Road/Walker Road
6	Route 100C at Bradhurst Avenue
19A	Route 100C at Saw Mill River Road (Route 9A)

Stationary source modeling was performed for the build year 2010 using design data for operation of the proposed UV Facility. The operating schedule of the boilers was assumed to be one boiler at 8,760 hours per year, another boiler at 6,552 hours per year (September through May) and one on standby. Exercising the emergency generators was modeled using the schedule of one hour per week per unit. Construction stationary source modeling was performed for the month of March 2006 for short-term impacts and the year 2006 for annual impacts. These time periods correspond to maximum emission levels produced by construction activities (i.e. most conservative cases). Construction activities were modeled using a work schedule of 7AM to 4PM.

4.10.2. Baseline Conditions

4.10.2.1. Existing Conditions

The New York State Department of Environmental Conservation (NYSDEC) monitors ambient air quality at a number of locations throughout New York State, including in Westchester County and the New York City Boroughs. Each of the NYSDEC air monitoring stations monitors one or several regulated air pollutants. The most recent year of available data from these monitoring stations is the calendar year 2002. Monitoring data from the air monitoring stations closest to the Eastview Site were used to characterize background air quality levels of criteria air pollutants. Figure 4.10-2 shows the locations of the ambient air quality monitoring stations.

Ambient air quality data on fine particulate matter, smaller than 2.5 microns ($PM_{2.5}$), for the Eastview Site were obtained from the Mamaroneck monitoring station, which is located approximately 11 miles to the south-southeast of the site. This is the nearest ambient air monitoring station to the Eastview Site.

The nearest monitoring station that monitors particulate matter smaller than 10 microns (PM_{10}) is IS 52, which is located 18.5 miles south-southwest of the Eastview Site at 681 Kelly Street in the

Bronx. Ambient air PM_{10} data for the Eastview Site were obtained from this station and were used as the background values for PM_{10}.

The closest monitoring station for Total Suspended Particulates (TSP) is located in the City of Mount Vernon, 12 miles to the south of the Eastview Site. Ambient air TSP data for the Eastview Site were obtained from this station. However, TSP is no longer federally regulated and TSP monitoring at Mount Vernon was discontinued after 1998.

The Botanical Gardens ambient air monitoring station in the Bronx, 15 miles to the south-southwest of the Eastview Site, is the nearest sulfur dioxide (SO_2), carbon monoxide (CO), and nitrogen dioxide (NO_2) monitoring station. The Water District Pumping Station Garage in White Plains, the closest of the ambient air monitoring stations to the Eastview Site at 3.5 miles to the east-southeast, conducts only ozone monitoring.

The latest monitoring data for lead were obtained from the Midtown Manhattan ambient air monitoring station (24 miles to the south-southwest of the Eastview Site). This monitoring station measured the ambient air concentrations of airborne lead until 1998. Since lead is no longer used as an additive in gasoline, the lead concentrations in ambient air have dropped to negligible. This has greatly reduced the need for ambient air monitoring for lead.

Table 4.10-2 presents the location of each monitoring station, and the year 2002 ambient air quality monitoring data representative of air quality in the vicinity of the Eastview Site for each criteria pollutant. A comparison of the monitored ambient levels in this table with the corresponding standards reveals that none of the Federal and State standards were exceeded, with the single exception of ozone. As discussed in Section 3.10, Data Collection and Impact Methodologies, Air Quality, the Eastview Site lies within a "severe" non-attainment area for ozone (O_3). The Eastview Site is located in an attainment area or unclassified area with respect to the other criteria pollutants.

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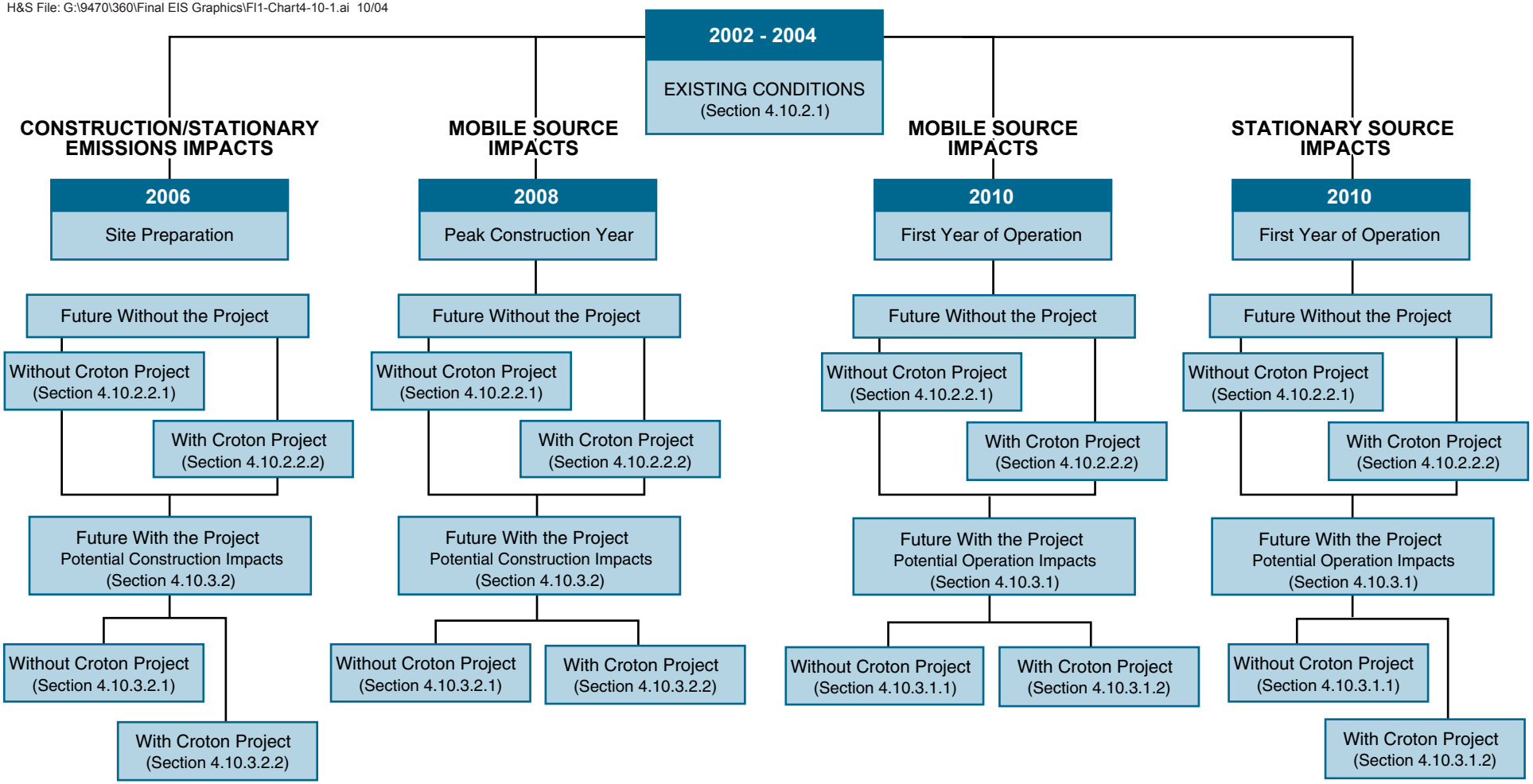


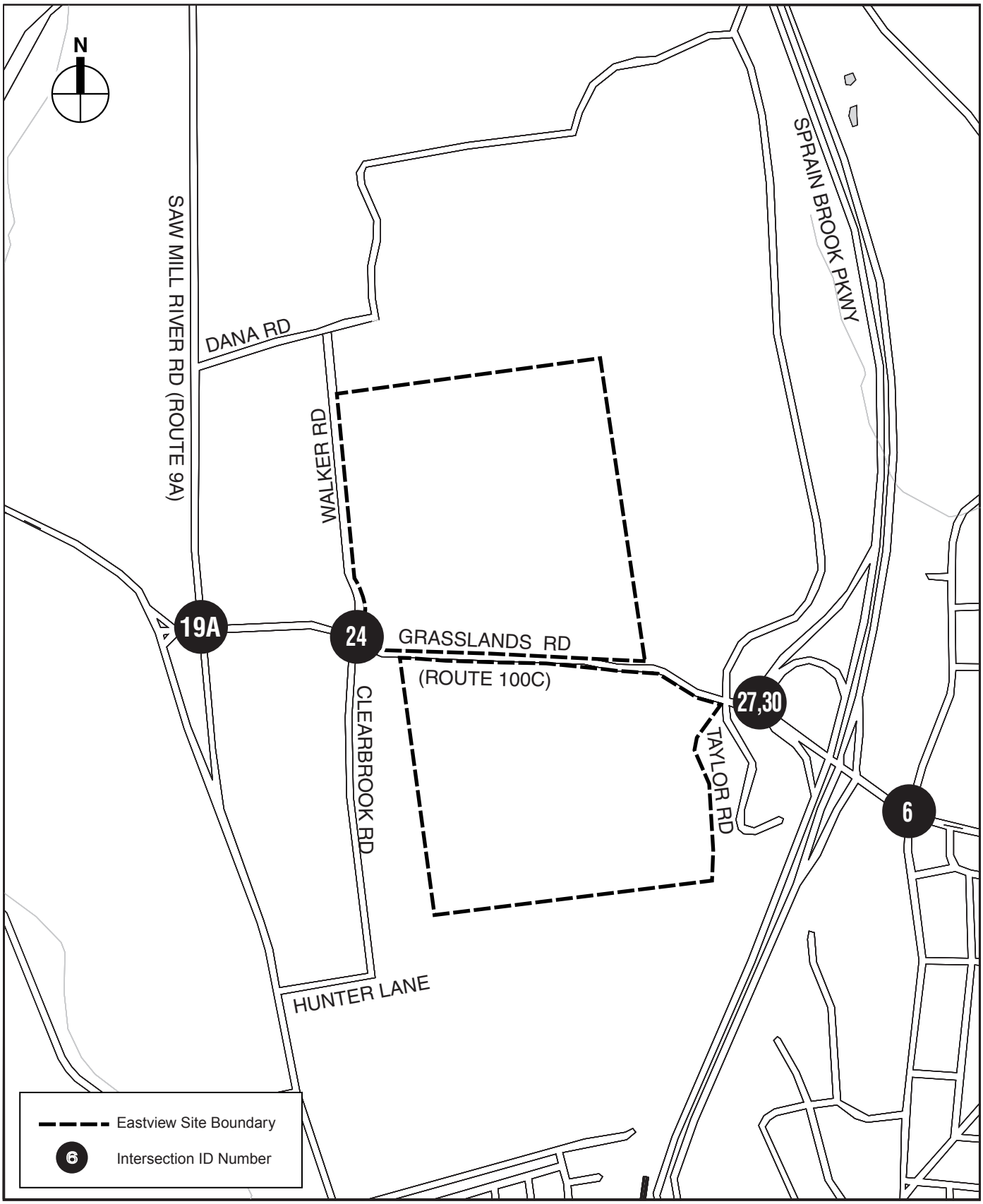
NOTES:

See Section 5.1.1, Kensico Reservoir Work Sites, for the 2006 Analysis of Filling the Aerators

Air Quality Framework of Analysis

Catskill/Delaware UV Facility

Flowchart 4.10-1



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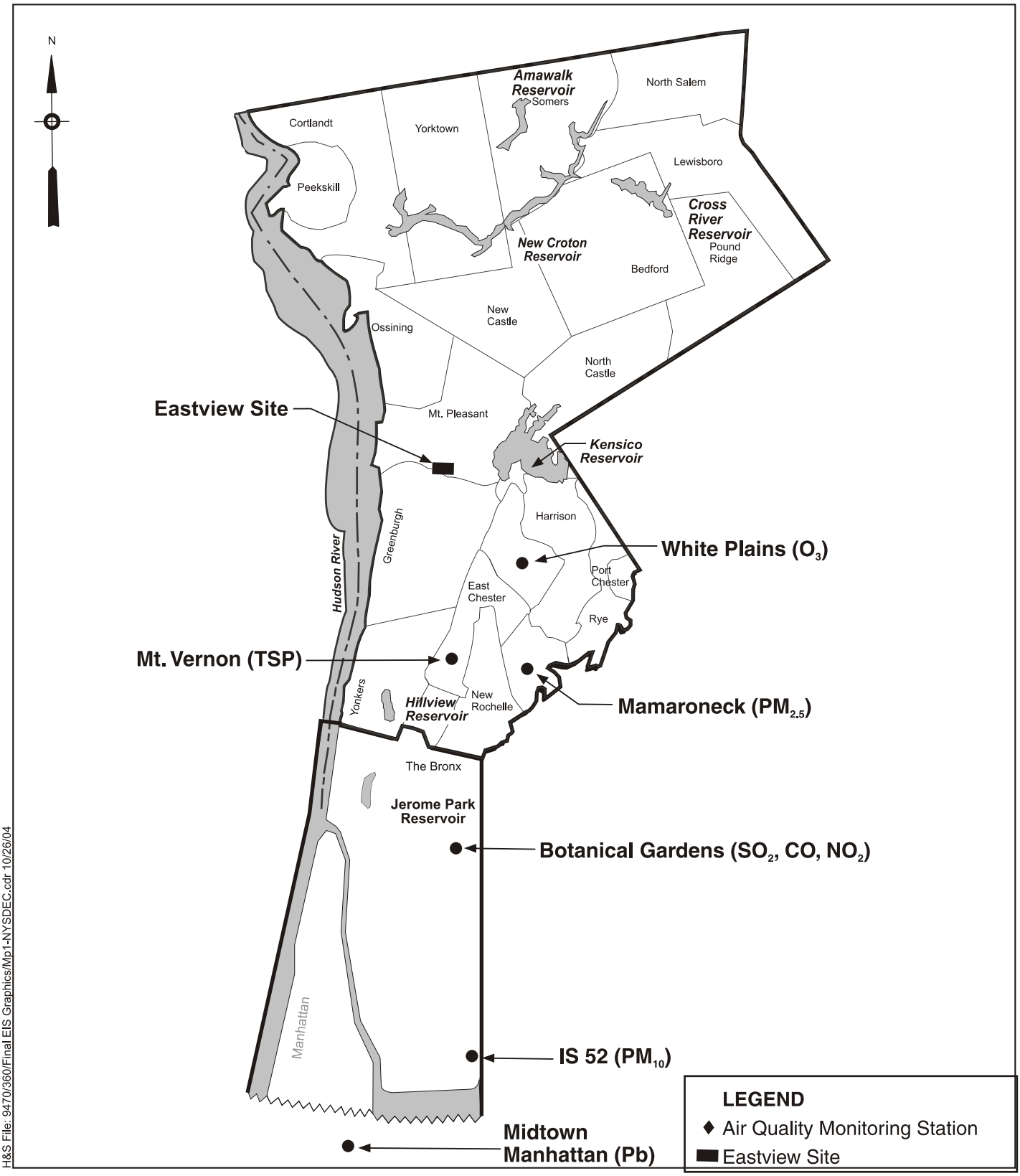
Analyzed Intersections
Air Quality Mobile Sources

Catskill/Delaware UV Facility

Figure 4.10-1



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Not To Scale

NYSDEC Ambient Air Monitoring Stations

Croton Water Treatment Plant

Figure 4.10-2

4.10.2.1.1. Background Data for Criteria Pollutants

The monitored background levels of the principal pollutants of concern for construction and stationary source air quality modeling analyses are SO_2, NO_2, CO and PM_{10} (criteria pollutants). Background air quality data is based on five years of available NYSDEC monitoring data, 1998 through 2002. The highest annual averages measured over the latest available five-year period were used to determine the annual average background levels NO_2. For SO_2, only three years of monitoring data were available for background. A period of three years is used for the PM_{10} background. Table 4.10-3 summarizes the background values for the Eastview Site.

The background levels used for the mobile source air quality analysis include CO and PM_{10}. The PM_{10} values from Table 4.10-3 are used as background in mobile analyses. However, the CO background for mobile sources was based on the values provided in the NYCDEP memorandum issued on March 10, 1998.

TABLE 4.10-2. AIR QUALITY MONITORING DATA FOR YEAR 2002[a]

Pollutant	Monitoring Station	Averaging Period[b]	Ambient Standard	Measured Concentration	
				Highest	2nd Highest
Sulfur Dioxide, µg/m^3 (ppm)	Botanical Gardens 200th Street & SE Blvd., Bronx	Annual	80 (0.03)	23 (0.009)	- -
		24 hour	365 (0.14)	112 (0.043)	97 (0.037)
		3 hour	1,300 (0.50)	154 (0.059)	146 (0.056)
Carbon Monoxide, µg/m^3 (ppm)	Botanical Gardens 200th Street & SE Blvd., Bronx	8 hour	10,000 (9.0)	3,315 (2.9)	2,400 (2.1)
		1 hour	40,000 (35)	4,915 (4.3)	4,229 (3.7)
Ozone[c], µg/m^3 (ppm)	Water District Pumping Station Garage, Orchard Street, White Plains	1 hour	235 (0.12)	306 (0.156)	260 (0.133)
Nitrogen Dioxide, µg/m^3 (ppm)	Botanical Gardens 200th Street & SE Blvd., Bronx	Annual	100 (0.053)	53 (0.028)	- -
Lead[d] (µg/m^3)	Midtown Madison Avenue (47th – 48th Streets), Manhattan	3 month	1.5	0.13	0.12
Total Suspended Particulates[e] (µg/m^3)	Mt. Vernon 260 South Sixth Ave. Mt. Vernon, NY	Annual	75	33	- -
		24-hour	250	78	76

TABLE 4.10-2. AIR QUALITY MONITORING DATA FOR YEAR 2002[a]

Pollutant	Monitoring Station	Averaging Period[b]	Ambient Standard	Measured Concentration	
				Highest	2nd Highest
Inhalable Particulates, PM_{10} ($\mu g/m^3$)	IS 52 681 Kelly Street Bronx, NY	Annual	50	21	- -
		24 hour	150	91[f]	45
Respirable Particulates, $PM_{2.5}$ ($\mu g/m^3$)	Mamaroneck, NY Thruway, Exit 9 Service Area.	Annual	15	11.8	- -
		24-hour	65	33.1	33.0

Notes:

a. Source: NYSDEC. 2002. Annual New York State Air Quality Report, Ambient Air Monitoring System. New York, NY.

b. Generally, the ambient standards for averaging periods of 24 hours or less may not be exceeded more than once per year. Therefore, measured second highest concentrations are included for these averaging times.

c. The 1-hour ozone standard is not to be exceeded more than an average of one day per year based on the last three years. The 8-hour ozone standards were not adopted until July 1997.

d. Monitoring for lead was discontinued after 1998.

e. The 24-hour NYS standard is 250 $\mu g/m^3$. TSP is no longer a federally regulated pollutant. TSP data is for 1998; monitoring was discontinued after 12/31/1998.

f. The highest value of 91$\mu g/m^3$ exceeds the second highest value by more than 100 percent and is not considered statistically representative. It is not used to estimate the background levels.

Abbreviations:

ppm = parts per million

$\mu g/m^3$=micrograms per cubic meter

1 ppm nitrogen dioxide = 1,880 $\mu g/m^3$

1 ppm sulfur dioxide = 2,610 $\mu g/m^3$

TABLE 4.10-3. SUMMARY OF THE SELECTED AMBIENT AIR MONITORING DATA FOR BACKGROUND POLLUTANT CONCENTRATIONS

Pollutant		Monitoring Station	1998	1999	2000	2001	2002
SO_2	3-hour	Botanical Gardens	--	--	162 µg/m³ (0.062 ppm)	**183** µg/m³ (**0.070** ppm)	146 µg/m³ (0.056 ppm)
	24 hours		--	--	99 µg/m³ (0.038 ppm)	**120** µg/m³ (**0.046** ppm)	97 µg/m³ (0.037 ppm)
	Annual		--	--	*23 µg/m³ (0.009 ppm)	**26** µg/m³ (**0.010** ppm)	23 µg/m³ (0.009 ppm)
NO_2	Annual	Botanical Gardens	56 µg/m³ (0.030 ppm)	54 µg/m³ (0.029 ppm)	54 µg/m³ (0.029 ppm)	**58** µg/m³ (**0.031** ppm)	53 µg/m³ (0.028 ppm)
CO	1-hour	Botanical Gardens	5,372 µg/m³ (4.7 ppm)	6,515 µg/m³ (5.7 ppm)	**6,858** µg/m³ (**6.0** ppm)	5601 µg/m³ (4.9 ppm)	4,229 µg/m³ (3.7 ppm)
	8- hours		3,658 µg/m³ (3.2 ppm)	**4,572** µg/m³ (**4.0** ppm)	4,001 µg/m³ (3.5 ppm)	3,086 µg/m³ (2.7 ppm)	2,400 µg/m³ (2.1 ppm)
PM_{10}	24 hours	IS 52	--	22.0 µg/m³	45.0 µg/m³	42.0 µg/m³	**45.0**** µg/m³
	Annual		--	16.0 µg/m³	21.0 µg/m³	21.0 µg/m³	**21.0**** µg/m³

Notes:
-- /denotes air sampling did not occur or monitoring data is not available.
Bold denotes highest value (maximum 2nd high for 1-hr, 3-hr, 8-hr, and 24-hr data) in last 5 years.
* denotes annual means is based on data captured is less than 75 percent for calendar year 2000.
** The highest value of 91µg/m³ exceeds the second highest value by more than 100 percent and is not considered statistically representative. It is not used to estimate the background levels.

Source: NYSDEC, Air Quality Reports for Calendar Years 1998 to 2002.

4.10.2.1.2. Mobile Sources

CO emissions from motor vehicles can have localized or microscale effects on ambient air quality. A quantified analysis of the CO concentrations from on-street vehicular traffic was presented for the baseline condition. The analysis was performed for the 1-hour and 8-hour averaging period. Particulate matter was modeled for scenarios involving increased levels of truck traffic over *CEQR Technical Manual* thresholds.

Traffic monitoring was conducted to obtain information on traffic volume, delay time and vehicle classification. Data gathered from the traffic monitoring was processed using the Highway Capacity Manual methodology and HCS2000 software (Section 3.9, Data Collection and Impact Methodologies, Traffic and Transportation, and Section 4.9, Traffic and Transportation). As previously described, the intersections having the worst LOS and the intersections with the highest traffic volumes (total volumes and project increment) were considered in selecting the four intersections for detailed dispersion modeling analyses. CO concentrations were modeled at these locations based on the patterns and existing traffic volumes for the baseline condition.

As indicated in Table 4.10-4, the predicted 1-hour and 8-hour concentrations of CO, including background, are below the corresponding ambient air quality standard for each intersection.

TABLE 4.10-4. PREDICTED 1-HOUR AND 8-HOUR CO CONCENTRATIONS IN THE 2003 BASELINE CONDITION (ppm)

Intersection	Averaging Period	Ambient AQ Background	Model Results		Total Modeled Conc.[a]		Standard
			AM	PM	AM	PM	
Baseline Condition 2003							
Route 100C at Sprain Brook Parkway Interchange	1- hour	5.7	3.5	4.0	9.2	9.7	35
	8- hour	2.1	2.5	2.8	4.6	4.9	9
Route 100C at Clearbrook Road/Walker Road	1- hour	5.7	1.0	2.1	6.7	7.8	35
	8-hour	2.1	0.7	1.5	2.8	3.6	9
Route 100C at Bradhurst Avenue	1-hour	5.7	3.2	2.9	8.9	8.6	35
	8-hour	2.1	2.2	2.0	4.3	4.1	9
Route 100C at Route 9A	1-hour	5.7	1.2	1.3	6.9	7.0	35
	8-hour	2.1	0.8	0.9	2.9	3.0	9

Notes:
a. Total Predicted Concentration = Ambient AQ Background + Model Results.

4.10.2.1.3. Stationary Sources

Currently, there are no stationary sources at the project site.

4.10.2.2. Future Without the Project

Mobile source dispersion modeling analyses were conducted for the Future Without the Project using the 2010 build/operational year, with and without the Croton project. The mobile source analyses for the construction year 2008 with and without the Croton project are also presented in this section, to establish the levels of emissions: (1) without the construction of either project; and (2) from the construction of the Croton project alone on the Eastview Site.

In the Future Without the Project and without the Croton project at the Eastview Site, with respect to stationary emission sources, air quality is anticipated to be similar to that discussed in the section on existing conditions. No quantified analysis was performed for this scenario. However, in the Future Without the Project with the Croton project at the Eastview Site, the results of the analysis for the Croton project are presented.

4.10.2.2.1. Without Croton Project at Eastview Site

Operational Year 2010.

Mobile Sources. For the Future Without the Project, a mobile source air quality analysis was conducted for the scenario without the Croton project at the Eastview Site for the build year of 2010 (CO only). For CO, concentrations, impacts were determined for the 1-hour and 8-hour averaging times. Particulate matter analyses were not conducted because in the build year 2010, all intersections would be under the CEQR diesel truck trip threshold for fine particulate matter.

Carbon Monoxide. As indicated in Table 4.10-5, the predicted concentrations of CO for the build year 2010 are below the corresponding ambient air quality standards. Both 1-hour and 8-hour averaging periods for each modeled intersection are in compliance with the standards.

TABLE 4.10-5. PREDICTED 1-HOUR AND 8-HOUR CO CONCENTRATIONS IN THE FUTURE WITHOUT THE PROJECT – WITHOUT CROTON PROJECT AT EASTVIEW SITE, BUILD YEAR 2010 (ppm)

Intersection	Averaging Period	Ambient AQ Background	Model Results		Total Modeled Conc.[a]		Standard
			AM	PM	AM	PM	
Build Year 2010							
Route 100C at Sprain Brook Parkway Interchange	1- hour	5.9	2.3	2.5	8.2	8.4	35
	8- hour	2.0	1.6	1.8	3.6	3.8	9
Route 100C at Clearbrook Road/Walker Road	1- hour	5.9	0.7	1.5	6.6	7.4	35
	8-hour	2.0	0.5	1.1	2.5	3.1	9
Route 100C at Bradhurst Avenue	1-hour	5.9	1.9	2.6	7.8	8.5	35
	8-hour	2.0	1.3	1.8	3.3	3.8	9

Notes:
a. Total Predicted Concentration = Ambient AQ Background + Model Results.

Stationary Source Impacts. In the Future Without the Project and without the Croton project at the Eastview Site, with respect to stationary operational emission sources, air quality is anticipated to be similar to the existing conditions.

Construction Year 2008.

Mobile Sources. For the Future Without the Project, a mobile source air quality analysis was conducted for the scenario without the Croton project at the Eastview Site for the peak construction year, 2008. Localized pollutant concentrations from the mobile sources were analyzed for CO, PM_{10} and $PM_{2.5}$. For CO, impacts were determined for the 1-hour and 8-hour averaging times. Impacts were determined for the 24-hour and annual averaging times for PM_{10} and $PM_{2.5}$.

Carbon Monoxide. As indicated in Table 4.10-6, the predicted concentrations of CO for the peak construction year 2008 are below the corresponding ambient air quality standards. Both 1-hour and 8-hour averaging periods for each modeled intersection are in compliance with the standards.

TABLE 4.10-6. PREDICTED 1-HOUR AND 8-HOUR CO CONCENTRATIONS IN THE FUTURE WITHOUT THE PROJECT – WITHOUT CROTON PROJECT AT EASTVIEW SITE, PEAK CONSTRUCTION YEAR 2008 (ppm)

Intersection	Averaging Period	Ambient AQ Background	Model Results		Total Modeled Conc.[a]		Standard
			AM	PM	AM	PM	
Peak Traffic Year 2008							
Route 100C at Sprain Brook Parkway Interchange	1- hour	5.9	2.3	2.7	8.2	8.6	35
	8- hour	2.0	1.6	1.9	3.6	3.9	9
Route 100C at Clearbrook Road/Walker Road	1- hour	5.9	0.8	1.6	6.7	7.5	35
	8-hour	2.0	0.6	1.1	2.6	3.1	9
Route 100C at Bradhurst Avenue	1-hour	5.9	2.1	2.4	8.0	8.3	35
	8-hour	2.0	1.5	1.7	3.5	3.7	9
Route 100C at Route 9A	1-hour	5.9	0.9	1.1	6.8	7.0	35
	8-hour	2.0	0.6	0.8	2.6	2.8	9

Notes:
a. Total Predicted Concentration = Ambient AQ Background + Model Results.

Particulate Matter (PM_{10}). As indicated in Table 4.10-7, the predicted concentrations of PM_{10} for the construction year 2008 are below the corresponding ambient air quality standards. Both the 24-hour and annual averaging periods for each modeled intersection are in compliance with the standard.

TABLE 4.10-7. PREDICTED 24-HOUR AND ANNUAL PM_{10} CONCENTRATIONS IN THE FUTURE WITHOUT THE PROJECT – WITHOUT CROTON PROJECT AT EASTVIEW SITE, PEAK CONSTRUCTION YEAR 2008 ($\mu g/m^3$)

Intersection	Averaging Period	Ambient AQ Background	Model Results	Total Modeled Conc.[a]	Standard
Peak Traffic Year 2008					
Route 100C at Sprain Brook Parkway Interchange	24 hour	45	35	80	150
	Annual	21	13	34	50
Route 100C at Clearbrook Road/Walker Road	24 hour	45	32	77	150
	Annual	21	11	32	50
Route 100C at Bradhurst Avenue	24 hour	45	44	89	150
	Annual	21	14	35	50
Route 100C at Route 9A	24 hour	45	27	72	150
	Annual	21	9	30	50

Notes:
a. Total Predicted Concentration = Ambient AQ Background + Model Results.

Fine Particulate Matter ($PM_{2.5}$). The modeled concentrations of $PM_{2.5}$ are presented in Table 4.10-8. These concentrations represent the effect of traveling vehicles on the roadways near the analyzed intersections. Because background concentrations have not been established for $PM_{2.5}$, there are no comparisons to ambient air quality standards.

TABLE 4.10-8. PREDICTED 24-HOUR AND ANNUAL $PM_{2.5}$ CONCENTRATIONS IN THE FUTURE WITHOUT THE PROJECT – WITHOUT CROTON PROJECT AT EASTVIEW SITE
PEAK CONSTRUCTION YEAR 2008 ($\mu g/m^3$)

Intersection	Averaging Time	Total Modeled Conc.
Peak Traffic Year 2008		
Route 100C at Sprain Brook Parkway Interchange	24-hour	5.96
	Annual	0.28
Route 100C at Clearbrook Road/Walker Road	24-hour	5.52
	Annual	0.22
Route 100C at Bradhurst Avenue	24-hour	7.67
	Annual	0.29
Route 100C at Route 9A	24-hour	4.59
	Annual	0.17

4.10.2.2.2. With Croton Project at Eastview Site

Operational Year 2010

Mobile Sources. For the Future Without the Project, a mobile source air quality analysis was conducted for the scenario with the Croton project at the Eastview Site for the build year 2010 (CO only). Concentrations were determined for the 1-hour and 8-hour averaging times for CO. Particulate Matter analyses were not conducted because in the build year 2010, all intersections are under the CEQR diesel truck trip threshold for fine particulate matter.

Carbon Monoxide. As indicated in Table 4.10-9, the predicted concentrations of CO for the build year 2010 are below the ambient air quality standards. Both the 1-hour and 8-hour averaging periods for each modeled intersection are in compliance with the standard.

TABLE 4.10-9. PREDICTED 1-HOUR AND 8-HOUR CO CONCENTRATIONS IN THE FUTURE WITHOUT THE PROJECT– WITH CROTON PROJECT AT EASTVIEW SITE,BUILD YEAR 2010 (ppm)

Intersection	Averaging Period	Ambient AQ Background	Model Results		Total Modeled Conc.[a]		Standard
			AM	PM	AM	PM	
Build Year 2010							
Route 100C at Sprain Brook Parkway Interchange	1-hour	5.9	2.3	2.5	8.2	8.4	35
	8-hour	2.0	1.6	1.8	3.6	3.8	9
Route 100C at Clearbrook Road/Walker Road	1-hour	5.9	0.7	1.5	6.6	7.4	35
	8-hour	2.0	0.5	1.1	2.5	3.1	9
Route 100C at Bradhurst Avenue	1-hour	5.9	1.9	2.6	7.8	8.5	35
	8-hour	2.0	1.3	1.8	3.3	3.8	9

Notes:
a. Total Predicted Concentration = Ambient AQ Background + Model Results.
Source: Croton Water Treatment Plant Final Supplemental EIS, June 2004.

Stationary Sources. Operation of the Croton project in the year 2010 would emit regulated air pollutants. This section identifies the operations that have the potential to emit regulated air pollutants, and examines each potential stationary emission source. Stationary sources with the potential to emit regulated air pollutants include boilers utilizing interruptible natural gas, and emergency diesel generators. Small quantities of various materials may occasionally be exhausted from the laboratory hood. Table 4.10-10 summarizes the emission sources at the Croton project.

TABLE 4.10-10. CROTON PROJECT: EMISSION SOURCES

Source	Boilers	Emergency Generators
Fuel	Natural Gas/Diesel	Diesel
Number of Units	3	2
Operating Units	2	2 on standby
Rating	16.75 MMBtu/hr	1,500 KW
Stack Height	75 feet	75 feet
Stack Diameter	36 inches	16 inches
Flow Rate	2,893 acfm[a]	13,217 acfm
Temperature	350 ºF	878 ºF

Notes:
a. acfm: actual cubic feet per minute
Source: Croton Water Treatment Plant Final Supplemental EIS, June 2004.

Boiler System. The boiler system for the Croton project would provide heat and hot water. The system would consist of three boilers, each rated at approximately 16.75 million British Thermal Units per hour (MMBtu/hr) fuel input. Up to two boilers would be operational with the other boiler as a standby unit. Boiler emissions are shown in Table 4.10-11.

TABLE 4.10-11. CROTON PROJECT: BOILER EMISSIONS [a]

Fuel In Use	Pounds per Hour (each boiler)			
	NO_x	CO	SO_2	PM[c]
Fuel Oil (peak load)[b]	4.18	1.17	6.4	0.336[d]
Natural Gas (peak load)	2.01	2.51	0.02	0.17
Annual Average Emission Rate	1.12	1.19	0.52	0.08
Annual Average Emissions for All Boilers (tons per year)	8.5	9.1	4.0	0.61

Notes:

a. Emission rates are calculated from manufacturer's data. For the months of December through March, the higher emission rate (fuel oil or natural gas) was applied to determine short-term impacts. For the remaining months, emission rate of natural gas was applied. For annual average impacts, the boilers were assumed to operate for two months on oil and 10 months on natural gas.

b. For No. 2 fuel oil it was assumed that the sulfur content was equal to 0.37 percent.

c. Short-term PM emission rates from fuel oil were based on the maximum daily heat demand of 26.8 MMBTU/hr or 2 boilers operating at 80% of the capacity.

d. $PM_{2.5}$ emissions for fuel oil are 42% of total PM or 0.14 lbs/hr (see AP-42, Table 1.3-7).

Source: Croton Water Treatment Plant Final Supplemental EIS, June 2004.

Emergency Generators. Two 1500 kilowatt (KW), or 2,220 horsepower (HP) diesel fuel-fired emergency generators would provide emergency power for the Croton project. One would serve as the duty generator and the other would be back-up. The emergency generators would only operate in the event of a utility power failure, and for "exercising" to keep them in good working order. Each diesel generator would be exercised approximately one hour per week.

Criteria Pollutant ISCST3 Modeling. The potential affects of the boiler system and the emergency generator emissions were analyzed using the USEPA's Industrial Source Complex Short Term, Version 3 dated 02035 (ISCST3) model (User's Guide, USEPA, 1995d) as described in Section 3.10, Data Collection and Impact Methodologies, Air Quality.

Dispersion modeling was conducted to compare concentrations of pollutants at offsite receptors with applicable ambient air quality standards. Table 4.10-12 compares the total concentrations of each pollutant at the maximum offsite receptor with applicable standards.

TABLE 4.10-12. MODELING RESULTS FOR ALL CRITERIA POLLUTANT SOURCES IN THE FUTURE WITHOUT THE PROJECT–WITH CROTON PROJECT AT EASTVIEW SITE

Pollutant	Averaging Time	All Sources µg/m^3	Background µg/m^3	Total µg/m^3	National & State Standards µg/m^3
Sulfur Dioxide	3-hours	9.81	183	193	1300
Sulfur Dioxide	24-hours	154.2	120	274	365
Sulfur Dioxide	Annual	1.3	26	27	80
Nitrogen Dioxide	Annual	2.9	58	61	100
Carbon Monoxide	1-hour	342.4	6,858	7,200	40,000
Carbon Monoxide	8-hours	126.3	4,572	4,698	10,000
PM_{10}	24-hours	8.2	45	53	150
PM_{10}	Annual	0.24	21	21	50

Source: Croton Water Treatment Plant Final Supplemental EIS, June 2004.

Off-site concentrations from the emissions of all Croton project sources are predicted to be in compliance with applicable ambient air quality standards.

Toxic Air Contaminants (TAC). Table 4.10-13 compares the total concentrations of each TAC at the maximum off-site receptor with applicable guideline concentrations.

TABLE 4.10-13. TOTAL CONCENTRATIONS OF TACS FROM BOILERS AND GENERATORS (MG/M^3) IN THE FUTURE WITHOUT THE PROJECT–WITH CROTON PROJECT AT EASTVIEW SITE

Pollutant	1-hr Impact[2]	SGC[a]	Annual Impact[b]	AGC[a]
Benzene	1.94E-02	1300	1.80E-04	0.13
Toluene	7.07E-02	37000	4.62E-04	400
Xylene	6.64E-04	4300	3.19E-06	700
Ethylbenzene	5.21E-03	54,000	2.96E-05	1,000
11.1 Trichloroethane	2.41E-03	NL	1.16E-05	NL
Formaldehyde	8.29E-01	30	7.10E-03	0.06
Acrolein	N/A	NL	N/A	0.02
Naphthalene	1.45E-02	7900	9.38E-05	3
Acenaphthylene	1.97E-04	NL	1.23E-06	0.02
Acenaphthene	3.19E-04	NL	1.70E-06	0.02
Phenanthrene	9.69E-04	NL	6.21E-06	0.02
Anthracene	3.87E-05	NL	2.97E-07	0.02
Fluoranthene	1.35E-04	NL	8.49E-07	0.02
Pyrene	1.23E-04	NL	8.48E-07	0.02
Benz(a)anthracene	5.50E-05	NL	3.40E-07	0.02

TABLE 4.10-13. TOTAL CONCENTRATIONS OF TACS FROM BOILERS AND GENERATORS (MG/M^3) IN THE FUTURE WITHOUT THE PROJECT–WITH CROTON PROJECT AT EASTVIEW SITE

Pollutant	1-hr Impact[2]	SGC[a]	Annual Impact[b]	AGC[a]
Chrysene	5.71E-05	NL	3.72E-07	0.02
Fluorene	4.67E-05	NL	3.20E-07	NL
Benzo(b)fluoranthene	3.89E-05	NL	2.75E-07	0.02
Benzo(k)fluoranthene	2.01E-05	NL	1.63E-07	0.02
Benzo(a)pyrene	7.13E-06	NL	7.32E-08	0.02
Indeno(1,2,3-cd)pyrene	3.11E-05	NL	2.21E-07	0.02
Dibenz(a,h)anthracene	2.47E-05	NL	1.68E-07	0.02
Benzo(g,h,i)perylene	3.53E-05	NL	2.24E-07	0.02
2-Methylnaphthalene	3.43E-05	NL	8.22E-07	0.02
3-Methylchloranthrene	2.57E-06	NL	6.16E-08	0.02
7,12-Dimethylbenz(a)anthracene	2.28E-05	NL	5.48E-07	0.02
Dichlorobenzene	1.71E-03	NL	4.11E-05	0.09
Butane	3.00E+00	NL	7.19E-02	45,000
Pentane	3.71E+00	NL	8.90E-02	4,200
Propane	2.28E+00	NL	5.48E-02	110,000
Hexane	2.57E+00	NL	6.16E-02	200
Arsenic	5.83E-03	NL	3.48E-05	0.00023
Beryllium	4.37E-03	NL	2.14E-05	0.00042
Cadmium	4.37E-03	NL	5.87E-05	0.0005
Chromium	4.37E-03	NL	6.89E-05	1.2
Cobalt	1.20E-04	NL	2.88E-06	0.005
Manganese	8.75E-03	NL	5.50E-05	0.05
Mercury	4.37E-03	1.8	2.99E-05	0.3
Nickel	4.37E-03	6	9.29E-05	0.004
Selenium	2.19E-02	NL	1.06E-04	20
Lead	1.31E-02	NL	8.01E-05	0.75
Barium	6.28E-03	NL	1.51E-04	1.2
Copper	8.75E-03	100	7.11E-05	0.02
Molybdenum	1.57E-03	NL	3.77E-05	12
Vanadium	3.28E-03	NL	7.88E-05	0.2
Zinc	4.14E-02	NL	1.02E-03	50

Notes: Currently, USEPA is investigating acrolein sampling methods. Until such time that methods are developed and test data for acrolein for gas-fired boilers are available, acrolein impacts cannot be quantified.

a. NL represents "Not Listed."

b. Maximum concentrations from the boilers and generators were calculated separately. The combined concentrations presented above were conservatively generated by adding together the separate boiler and generator's maximum concentrations. In addition, the generators were assumed to operate simultaneously

Maximum predicted 1-hour and annual concentrations of TACs are lower than the NYSDEC's short-term guideline concentrations (SGCs) and annual guideline concentration (AGCs) for each pollutant.

Fine Particulate Matter ($PM_{2.5}$). Dispersion modeling was performed (for Year 2010) to assess the effects of the particulate matter emitted from the Croton project sources on ambient $PM_{2.5}$ concentrations in the defined study areas. Since the interim guidance criteria for $PM_{2.5}$ are based on incremental changes for both localized and neighborhood scale assessments, the modeling was performed to estimate the $PM_{2.5}$ concentrations without the proposed project. See Table 4.10-14.

TABLE 4.10-14. MODELING RESULTS FOR ALL EASTVIEW $PM_{2.5}$ POLLUTANT SOURCES ($\mu g/m^3$) IN THE FUTURE WITHOUT THE PROJECT–WITH CROTON PROJECT AT EASTVIEW SITE

Pollutant	Total Modeled Conc.[1]
$PM_{2.5}$ 24-Hour	4.12
$PM_{2.5}$ Annual (Discrete)	0.21
$PM_{2.5}$ Annual (Neighborhood)	0.07

Source: Croton Water Treatment Plant Final Supplemental EIS, June 2004.

Construction Year 2008

Mobile Sources. The maximum number of construction-related vehicle traffic from the Croton project is scheduled to occur in the construction year 2008

The Final EIS presents the projected air quality impacts for each of the four parking options that were analyzed as part of the 2008 traffic impact assessment. In the Draft EIS, the maximum predicted air quality impacts among the four parking options were reported in this section. For the Final EIS, this additional detail on air quality computations is also included in Section 4.21, Combined Impacts, and Section 6, Mitigation of Potential Significant or Temporary Adverse Impacts. In addition, in Section 5, Off-Site Facilities, comparable details are reported for each of the alternative trucking routes for transporting excavated material to the Catskill and Delaware Aerators (see Section 5). As shown in all of these additional air quality tables (below and in the other sections referenced above), the maximum predicted air quality impacts and concentrations in the Final EIS are comparable to those reported in the Draft EIS. In addition, the air quality impacts and concentrations reported in these additional detailed tables are almost identical among the various options analyzed.

Carbon Monoxide. As indicated in Tables 4.10-15 to 4.10-18, the predicted concentrations of CO for the construction year 2008, are below the corresponding ambient air quality standards. Both 1-hour and 8-hour averaging periods for each modeled intersection are in compliance with the standards.

TABLE 4.10-15. PREDICTED 1-HOUR AND 8-HOUR CO CONCENTRATIONS IN THE FUTURE WITHOUT THE PROJECT – WITH CROTON PROJECT AT EASTVIEW SITE PEAK CONSTRUCTION TRAFFIC YEAR 2008 (ppm)
LANDMARK PARKING (OPTION A)

Intersection	Averaging Period	Ambient AQ Background	Model Results		Total Modeled Conc.[a]		Standard
			AM	PM	AM	PM	
Route 100C at Sprain Brook Parkway Interchange	1-hour	5.9	2.4	2.8	8.3	8.7	35
	8-hour	2.0	1.7	2.0	3.7	4.0	9
Route 100C at Clearbrook Road/Walker Road	1-hour	5.9	1.0	1.9	6.9	7.8	35
	8-hour	2.0	0.7	1.3	2.7	3.3	9
Route 100C at Bradhurst Avenue	1-hour	5.9	2.1	2.4	8.0	8.3	35
	8-hour	2.0	1.5	1.7	3.5	3.7	9
Route 100C at Route 9A	1-hour	5.9	1.1	1.5	7.0	7.4	35
	8-hour	2.0	0.8	1.1	2.8	3.1	9

Notes: a. Total Predicted Concentration = Ambient AQ Background + Model Results.

TABLE 4.10-16. PREDICTED 1-HOUR AND 8-HOUR CO CONCENTRATIONS IN THE FUTURE WITHOUT THE PROJECT – WITH CROTON PROJECT AT EASTVIEW SITE PEAK CONSTRUCTION TRAFFIC YEAR 2008 (ppm)
WCC PARKING (OPTION B)

Intersection	Averaging Period	Ambient AQ Background	Model Results		Total Modeled Conc.[a]		Standard
			AM	PM	AM	PM	
Route 100C at Sprain Brook Parkway Interchange	1-hour	5.9	2.8	3.4	8.7	9.3	35
	8-hour	2.0	2.0	2.4	4.0	4.4	9
Route 100C at Clearbrook Road/Walker Road	1-hour	5.9	1.0	1.9	6.9	7.8	35
	8-hour	2.0	0.7	1.3	2.7	3.3	9
Route 100C at Bradhurst Avenue	1-hour	5.9	2.4	3.9	8.3	9.8	35
	8-hour	2.0	1.7	2.7	3.7	4.7	9
Route 100C at Route 9A	1-hour	5.9	0.9	1.1	6.8	7.0	35
	8-hour	2.0	0.6	0.8	2.6	2.8	9

Notes: a. Total Predicted Concentration = Ambient AQ Background + Model Results.

TABLE 4.10-17. PREDICTED 1-HOUR AND 8-HOUR CO CONCENTRATIONS IN THE FUTURE WITHOUT THE PROJECT – WITH CROTON PROJECT AT EASTVIEW SITE PEAK CONSTRUCTION TRAFFIC YEAR 2008 (ppm) LANDMARK AND WCC SPLIT PARKING (OPTION C)

Intersection	Averaging Period	Ambient AQ Background	Model Results		Total Modeled Conc.[a]		Standard
			AM	PM	AM	PM	
Route 100C at Sprain Brook Parkway Interchange	1-hour	5.9	2.4	3.1	8.3	9.0	35
	8-hour	2.0	1.7	2.2	3.7	4.2	9
Route 100C at Clearbrook Road/Walker Road	1-hour	5.9	0.9	1.9	6.8	7.8	35
	8-hour	2.0	0.6	1.3	2.6	3.3	9
Route 100C at Bradhurst Avenue	1-hour	5.9	2.3	3.5	8.2	9.4	35
	8-hour	2.0	1.6	2.5	3.6	4.5	9
Route 100C at Route 9A	1-hour	5.9	1.0	1.3	6.9	7.2	35
	8-hour	2.0	0.7	0.9	2.7	2.9	9

Notes: a. Total Predicted Concentration = Ambient AQ Background + Model Results.

TABLE 4.10-18. PREDICTED 1-HOUR AND 8-HOUR CO CONCENTRATIONS IN THE FUTURE WITHOUT THE PROJECT – WITH CROTON PROJECT AT EASTVIEW SITE PEAK CONSTRUCTION TRAFFIC YEAR 2008 (ppm) LANDMARK AND HOME DEPOT PARKING (OPTION D)

Intersection	Averaging Period	Ambient AQ Background	Model Results		Total Modeled Conc.[a]		Standard
			AM	PM	AM	PM	
Route 100C at Sprain Brook Parkway Interchange	1-hour	5.9	2.4	2.8	8.3	8.7	35
	8-hour	2.0	1.7	2.0	3.7	4.0	9
Route 100C at Clearbrook Road/Walker Road	1-hour	5.9	1.0	1.9	6.9	7.8	35
	8-hour	2.0	0.7	1.3	2.7	3.3	9
Route 100C at Bradhurst Avenue	1-hour	5.9	2.1	2.4	8.0	8.3	35
	8-hour	2.0	1.5	1.7	3.5	3.7	9
Route 100C at Route 9A	1-hour	5.9	1.1	1.5	7.0	7.4	35
	8-hour	2.0	0.7	1.1	2.8	3.1	9

Notes: a. Total Predicted Concentration = Ambient AQ Background + Model Results.

Particulate Matter (PM_{10}). The predicted concentrations of PM_{10} for the construction year 2008 are shown in Tables 4.10-19 to 4.10-22. Both the 24-hour and annual averaging periods for each modeled intersection are in compliance with the corresponding ambient air quality standards.

TABLE 4.10-19. PREDICTED 24-HOUR AND ANNUAL PM_{10} CONCENTRATIONS IN THE FUTURE WITHOUT THE PROJECT – WITH CROTON AT EASTVIEW SITE, PEAK CONSTRUCTION TRAFFIC YEAR 2008 (µg/m3) LANDMARK PARKING (OPTION A)

Intersection	Averaging Period	Ambient AQ Background	Model Results	Total Modeled Conc.[a]	Standard
PEAK CONSTRUCTION TRAFFIC YEAR 2008					
Route 100C at Sprain Brook Parkway Interchange	24 hour	45	36	81	150
	Annual	21	13	34	50
Route 100C at Clearbrook Road/Walker Road	24 hour	45	33	78	150
	Annual	21	12	33	50
Route 100C at Bradhurst Avenue	24 hour	45	45	90	150
	Annual	21	14	35	50
Route 100C at Route 9A	24 hour	45	28	73	150
	Annual	21	10	31	50

Notes: a. Total Predicted Concentration = Ambient AQ Background + Model Results..

TABLE 4.10-20. PREDICTED 24-HOUR AND ANNUAL PM_{10} CONCENTRATIONS IN THE FUTURE WITHOUT THE PROJECT – WITH CROTON AT EASTVIEW SITE, PEAK CONSTRUCTION TRAFFIC YEAR 2008 (µg/m3) WCC PARKING (OPTION B)

Intersection	Averaging Period	Ambient AQ Background	Model Results	Total Modeled Conc.[a]	Standard
PEAK CONSTRUCTION TRAFFIC YEAR 2008					
Route 100C at Sprain Brook Parkway Interchange	24 hour	45	36	81	150
	Annual	21	13	34	50
Route 100C at Clearbrook Road/Walker Road	24 hour	45	32	78	150
	Annual	21	12	33	50
Route 100C at Bradhurst Avenue	24 hour	45	45	90	150
	Annual	21	14	35	50
Route 100C at Route 9A	24 hour	45	27	72	150
	Annual	21	9	30	50

Notes: a. Total Predicted Concentration = Ambient AQ Background + Model Results..

TABLE 4.10-21. PREDICTED 24-HOUR AND ANNUAL PM_{10} CONCENTRATIONS IN THE FUTURE WITHOUT THE PROJECT – WITH CROTON AT EASTVIEW SITE, PEAK CONSTRUCTION TRAFFIC YEAR 2008 (µg/m3) LANDMARK AND WCC SPLIT PARKING (OPTION C)

Intersection	Averaging Period	Ambient AQ Background	Model Results	Total Modeled Conc.[a]	Standard
PEAK CONSTRUCTION TRAFFIC YEAR 2008					
Route 100C at Sprain Brook Parkway Interchange	24 hour	45	36	81	150
	Annual	21	13	34	50
Route 100C at Clearbrook Road/Walker Road	24 hour	45	33	78	150
	Annual	21	12	33	50
Route 100C at Bradhurst Avenue	24 hour	45	45	90	150
	Annual	21	14	35	50
Route 100C at Route 9A	24 hour	45	28	73	150
	Annual	21	10	31	50

Notes: a. Total Predicted Concentration = Ambient AQ Background + Model Results.
Source: Croton Water Treatment Plant Final Supplemental EIS, June 2004.

TABLE 4.10-22. PREDICTED 24-HOUR AND ANNUAL PM_{10} CONCENTRATIONS IN THE FUTURE WITHOUT THE PROJECT – WITH CROTON AT EASTVIEW SITE, PEAK CONSTRUCTION TRAFFIC YEAR 2008 (µg/m^3) LANDMARK AND HOME DEPOT PARKING (OPTION D)

Intersection	Averaging Period	Ambient AQ Background	Model Results	Total Modeled Conc.[a]	Standard
PEAK CONSTRUCTION TRAFFIC YEAR 2008					
Route 100C at Sprain Brook Parkway Interchange	24 hour	45	36	81	150
	Annual	21	13	34	50
Route 100C at Clearbrook Road/Walker Road	24 hour	45	33	78	150
	Annual	21	12	33	50
Route 100C at Bradhurst Avenue	24 hour	45	45	90	150
	Annual	21	14	35	50
Route 100C at Route 9A	24 hour	45	28	73	150
	Annual	21	10	31	50

Notes: a. Total Predicted Concentration = Ambient AQ Background + Model Results.
Source: Croton Water Treatment Plant Final Supplemental EIS, June 2004.

Fine Particulate Matter ($PM_{2.5}$). The modeled concentrations of $PM_{2.5}$ are presented in Table 4.10-23 to 4.10-26. These concentrations represent the effect of traveling vehicles on the roadways near the analyzed intersections. Because background concentrations have not been established for $PM_{2.5}$, there are no comparisons to ambient air quality standards.

TABLE 4.10-23. PREDICTED 24-HOUR AND ANNUAL $PM_{2.5}$ CONCENTRATIONS IN THE FUTURE WITHOUT THE PROJECT – WITH CROTON PROJECT AT EASTVIEW SITE, PEAK CONSTRUCTION TRAFFIC YEAR 2008 ($\mu G/M^3$) LANDMARK PARKING (OPTION A)

Intersection	Averaging Time	Total Modeled Conc.
Route 100C at Sprain Brook Parkway Interchange	24-hour	6.01
	Annual	0.28
Route 100C at Clearbrook Road/Walker Road	24-hour	5.63
	Annual	0.22
Route 100C at Bradhurst Avenue	24-hour	7.70
	Annual	0.29
Route 100C at Route 9A	24-hour	4.66
	Annual	0.17

TABLE 4.10-24. PREDICTED 24-HOUR AND ANNUAL $PM_{2.5}$ CONCENTRATIONS IN THE FUTURE WITHOUT THE PROJECT – WITH CROTON PROJECT AT EASTVIEW SITE, PEAK CONSTRUCTION TRAFFIC YEAR 2008 ($\mu G/M^3$) WCC PARKING (OPTION B)

Intersection	Averaging Time	Total Modeled Conc.
Route 100C at Sprain Brook Parkway Interchange	24-hour	6.02
	Annual	0.29
Route 100C at Clearbrook Road/Walker Road	24-hour	5.56
	Annual	0.22
Route 100C at Bradhurst Avenue	24-hour	7.79
	Annual	0.30
Route 100C at Route 9A	24-hour	4.59
	Annual	0.17

TABLE 4.10-25. PREDICTED 24-HOUR AND ANNUAL PM2.5 CONCENTRATIONS IN THE FUTURE WITHOUT THE PROJECT – WITH CROTON PROJECT AT EASTVIEW SITE, PEAK CONSTRUCTION TRAFFIC YEAR 2008 (μG/M3) LANDMARK AND WCC SPLIT PARKING (OPTION C)

Intersection	Averaging Time	Total Modeled Conc.
Route 100C at Sprain Brook Parkway Interchange	24-hour	6.02
	Annual	0.29
Route 100C at Clearbrook Road/Walker Road	24-hour	5.61
	Annual	0.22
Route 100C at Bradhurst Avenue	24-hour	7.75
	Annual	0.30
Route 100C at Route 9A	24-hour	4.64
	Annual	0.17

TABLE 4.10-26. PREDICTED 24-HOUR AND ANNUAL PM2.5 CONCENTRATIONS IN THE FUTURE WITHOUT THE PROJECT – WITH CROTON PROJECT AT EASTVIEW SITE, PEAK CONSTRUCTION TRAFFIC YEAR 2008 (μG/M3) LANDMARK AND HOME DEPOT PARKING (OPTION D)

Intersection	Averaging Time	Total Modeled Conc.
Route 100C at Sprain Brook Parkway Interchange	24-hour	6.02
	Annual	0.29
Route 100C at Clearbrook Road/Walker Road	24-hour	5.63
	Annual	0.22
Route 100C at Bradhurst Avenue	24-hour	7.70
	Annual	0.29
Route 100C at Route 9A	24-hour	4.66
	Annual	0.17

Construction Equipment Sources.

On-Site Activities. Possible effects on local air quality during construction at the Eastview Site include:

- Engine emissions generated by on-site construction equipment and dump trucks,
- Fugitive dust emissions generated by soil excavation and other construction activities,
- Fugitive dusts emissions generated by construction trucks traveling on paved and unpaved roads.

The potential affects of construction emissions of the criteria pollutants (CO, SO_2, NO_2 PM_{10} and $PM_{2.5}$) emissions were evaluated for the peak construction month of April 2006 and the construction year of 2006 (the projected period of maximum activity).

On-Site Construction Equipment. An analysis of the potential for air quality impacts from on-site construction equipment used by the Croton project was performed for its peak construction period. The analyses address combustion emissions from stationary on-site equipment, such as cranes, and fugitive dust emissions from mobile equipment, such as backhoes. A complete list of on-site equipment is provided below in Table 4.10-27.

TABLE 4.10-27. CROTON PROJECT: ON-SITE CONSTRUCTION EQUIPMENT FOR PEAK CONSTRUCTION MONTH OF APRIL 2006

Equipment Type	Quantity On-Site	Mobile or Stationary
Cranes	One	Stationary
Backhoes	One	Mobile
Loaders	Nineteen	Mobile
Rock Drills	Seven	Stationary
Rock Crusher	One	Stationary
Pile Drivers	Two	Stationary
Air Compressors	Five	Stationary
Concrete Vibrators	Two	Stationary
Concrete Floor Finishers	Two	Stationary
Trucks/Heavy Vehicles[a]	Twelve	Mobile

Notes: a. Quantity on-site in any one hour for 8 hour work shift period.

Emission factors for NO_X, CO, PM_{10}, $PM_{2.5}$, and SO_2 from the combustion of fuel for on-site construction equipment (excluding heavy duty diesel trucks) were developed using the Final USEPA NONROAD Emissions Model Version 2.2d (May 2003). The model is based on source inventory data accumulated for specific categories of off road equipment. Data provided in the output files from the NONROAD model were used to derive (i.e., back-calculated from regional emission estimates) these emission factors for each type of equipment that is anticipated to be present on-site during construction activities for the Croton project. Emission rates of NO_X, CO and PM (SO_2 emissions were negligible) from combustion of fuel for on-site heavy-duty diesel trucks were developed using the USEPA MOBILE6.2 emissions model. Emission factors associated with fugitive dust emissions from mobile equipment were developed using equations presented in USEPA's *AP-42, A Compilation of Air Pollution Emission Factors.*

ISCST3 Dispersion Modeling. A dispersion modeling analysis was performed to estimate ambient concentrations of air pollutants associated with emissions produced by on-site construction activities from the Croton project at the Eastview Site. The modeling analysis was conducted using the ISCST3 dispersion model and was performed in accordance with USEPA and NYCDEP guidance regarding the use of dispersion models for regulatory purposes. The predicted ambient concentrations of criteria pollutants have been used to demonstrate compliance with applicable impact criteria. The methodology for determining construction equipment emissions and predicted concentrations of criteria pollutants is presented in Appendix C.

The maximum predicted concentrations from on-site construction sources occurred at receptors along the perimeter of the facility, as anticipated. This is true for all averaging periods, both short-term and annual and for all pollutants modeled in the analysis. The predicted maximum off-site concentrations from on-site construction sources are presented in Table 4.10-28. The table also presents the predicted maximum concentrations from the construction sources and the background concentrations corresponding to the averaging periods.

TABLE 4.10-28. FUTURE WITHOUT THE PROJECT: RESULTS OF DISPERSION ANALYSIS FOR CONSTRUCTION ACTIVITIES – WITH CROTON PROJECT

Modeled Pollutant	Averaging Period	Units	Maximum Modeled Conc.		Background Conc. $\mu g/m^3$	Total Concentration		Ambient Air Quality Standards
			All Modeled Receptors[a]	All Sensitive Receptors		All Modeled Receptors[a]	All Sensitive Receptors	
NO_2	Annual	$\mu g/m^3$	2.51	1.42	58	60.5	59.4	100
SO_2	3-Hour	$\mu g/m^3$	0.47	0.30	183	183.5	183.3	1,300
	24-Hour	$\mu g/m^3$	0.107	0.06	120	120.1	120.1	365
	Annual	$\mu g/m^3$	0.004	0.002	26	26	26	80
CO	1-Hour	$\mu g/m^3$	583	306	6,858	7,441	7,164	40,000
	8-Hour	$\mu g/m^3$	137.6	87	4,572	4,709	4,659	10,000
PM_{10}	24-Hour	$\mu g/m^3$	26.6	14.46	45	71.6	59.5	150
	Annual	$\mu g/m^3$	1.5	0.85	21	22.5	21.9	50

Notes: a. Includes fenceline receptors. NO_X emissions are based on a NO_2 to NO_X ratio of 59%
Source: Croton Water Treatment Plant Final Supplemental EIS, June 2004.

The results of construction modeling show that the analyzed pollutants would be in compliance with the applicable ambient standards (NAAQS).

Fine Particulate Matter ($PM_{2.5}$). For the $PM_{2.5}$ incremental analysis, the maximum concentrations were calculated for nearby institutional and sensitive uses for comparison with draft interim guidance criteria. The predicted maximum off-site concentrations from on-site construction sources are presented in Table 4.10-29.

TABLE 4.10-29. FUTURE WITHOUT THE PROJECT: PREDICTED $PM_{2.5}$ CONCENTRATIONS FOR CONSTRUCTION ACTIVITIES–WITH CROTON PROJECT

Modeled Pollutant	Averaging Period	Units	Maximum Predicted Concentration		Interim Guidance
			All Modeled Receptors[a]	All Sensitive Receptors	
$PM_{2.5}$	24-Hours	$\mu g/m^3$	8.75	5.49	5[b]
	Annual (Discrete)	$\mu g/m^3$	0.39	0.22	0.3[b]
	Annual (Neighborhood)	$\mu g/m^3$	0.05	N/A	0.1[c]

Notes: a. Includes fenceline receptors.
b. Values for a discrete location.
c. Values for a neighborhood analysis
Source: Croton Water Treatment Plant Final Supplemental EIS, June 2004.

The air quality modeling analysis determined that the highest predicted 24-hour $PM_{2.5}$ concentrations would be 5.49 $\mu g/m^3$ at the Westchester County Department of Laboratories and Research building (County Laboratory). The highest predicted annual increase was equal to 0.22 $\mu g/m^3$. The annual predicted incremental impact of $PM_{2.5}$ is 0.05 $\mu g/m^3$ for the neighborhood scale analysis.

While the highest $PM_{2.5}$ concentration was predicted at the County Laboratory, the maximum predicted 24-hour concentration at sensitive public locations would be substantially lower. For example, the highest predicted concentration in the 24-hour average $PM_{2.5}$ concentrations at the nearest sensitive use to the planned construction activities (the Juvenile Detention Center) was 2.91 $\mu g/m^3$.

In addition, the maximum 24-hour incremental $PM_{2.5}$ concentration that was computed for the construction activities, which is reported above, is based on the estimates for the month with the greatest anticipated particulate matter emissions (April 2006). This result represents the greatest predicted $PM_{2.5}$ level for any 24-hour period. For other construction time periods, the actual emissions would be substantially lower.

4.10.3. Potential Impacts

4.10.3.1. Potential Project Impacts

A quantified analysis of the potential CO impacts from on-street vehicular traffic was performed for the Future With the Project. Mobile source dispersion modeling analyses were conducted for the Future With the Project using the 2010 build/operational year, with and without the Croton project. Particulate matter was not conducted because in the build year 2010, all intersections would be under the CEQR diesel truck trip threshold for fine particulate matter.

A quantified analysis was also performed for stationary sources. The stationary source modeling was performed for the build year 2010, when the proposed UV Facility is operational with boilers and emergency generators.

4.10.3.1.1. Without Croton Project at Eastview Site

Mobile Sources. For the Future With the Project, a mobile source air quality analysis was conducted for the scenario without the Croton project at the Eastview Site for the build year of 2010 (CO only). Concentrations were determined for the 1-hour and 8-hour averaging times for CO. As noted above, particulate matter analyses were not conducted because in the build year 2010, all intersections would be under the CEQR diesel truck trip threshold.

Carbon Monoxide. As indicated in Table 4.10-30, the predicted concentrations of CO for the build year 2010 are below the corresponding ambient air quality standards. Both the 1-hour and 8-hour averaging periods for each modeled intersection are in compliance with the standards.

TABLE 4.10-30. PREDICTED 1-HOUR AND 8-HOUR CO CONCENTRATIONS IN THE FUTURE WITH THE PROJECT– WITHOUT CROTON PROJECT AT EASTVIEW SITE, BUILD YEAR 2010 (ppm)

Intersection	Averaging Period	Ambient AQ Background	Model Results		Total Modeled Conc.[a]		Standard
			AM	PM	AM	PM	
Build Year 2010							
Route 100C at Sprain Brook Parkway Interchange	1-hour	5.9	2.3	2.5	8.2	8.4	35
	8-hour	2.0	1.6	1.8	3.6	3.8	9
Route 100C at Clearbrook Road/Walker Road	1-hour	5.9	0.7	1.5	6.6	7.4	35
	8-hour	2.0	0.5	1.1	2.5	3.1	9
Route 100C at Bradhurst Avenue	1-hour	5.9	1.9	2.6	7.8	8.5	35
	8-hour	2.0	1.3	1.8	3.3	3.8	9

Notes: a. Total Predicted Concentration = Ambient AQ Background + Model Results.

In addition, the CEQR *de minimis* criteria were calculated for the 8-hour period, as described in Section 3.10, Data Collection and Impact Methodologies, Air Quality. As indicated in Table 4.10-31, the CEQR *de minimis* criteria for the 8-hour period were not exceeded. Therefore, the proposed project would have no significant CO impacts in the Future With the Project and without the Croton project at the Eastview Site.

TABLE 4.10-31. 8-HOUR CO CONCENTRATIONS AND CEQR *DE MINIMIS* CRITERIA FUTURE WITHOUT CROTON PROJECT AT EASTVIEW SITE, BUILD YEAR 2010

Intersection	Averaging Period	No Build Conc.[a]		Build Conc. WCC AND LANDMARK SPLIT PARKING (OPTION C)[a]		Project Increment[b]		De Minimis Criteria[c]	
		AM	PM	AM	PM	AM	PM	AM	PM
Build Year 2010									
Route 100C at Sprain Brook Parkway Interchange	8-hour	3.6	3.8	3.6	3.8	0.0	0.0	2.7	2.6
Route 100C at Clearbrook Road/Walker Road	8-hour	2.5	3.1	2.5	3.1	0.0	0.0	3.2	2.9
Route 100C at Bradhurst Avenue	8-hour	3.3	3.8	3.3	3.8	0.0	0.0	2.8	2.6

Notes:
a. Includes Background. No build is without the UV Facility or Croton project (i.e., Pure No build). Build represents project traffic and no build.
b. The project increment is defined as the project build value minus the no build value. The project increment is below the *de minimis* criteria.
c. See Section 3.10, Data Collection and Impact Methodologies, Air Quality, for details on how this value is calculated.

Stationary Sources. This section identifies the operations that have the potential to emit regulated air pollutants and examines each potential stationary emission source. Stationary sources with the potential to emit regulated air pollutants include natural gas-fired boilers and emergency diesel generators. Table 4.10-32 summarizes the emission sources at the proposed facility.

TABLE 4.10-32. PROPOSED UV FACILITY: EMISSION SOURCES

Source	Boilers	Emergency Generators
Fuel	Natural Gas/Diesel	Diesel
Number of Units	3	4
Operating Units	2	4 on standby[a]
Rating	400 HP	1,500 KW
Stack Height	55 feet	35 feet
Stack Diameter	36 inches	16 inches
Flow Rate	2,893 acfm	10,254 acfm
Temperature	350 ºF	785 ºF

Notes: a. Under normal operating conditions, the generators would be exercised once per week.

The stationary source analysis evaluated the impacts of the following criteria pollutants; $PM_{2.5}$, PM_{10}, SO_2, CO and NO_2. In addition, some regulated hazardous air pollutants (HAP) and toxic air contaminants (TAC) were included in the analysis. HAPs are regulated by USEPA. TACs are regulated by NYSDEC and include HAPs.

The emission of nitrogen compounds from combustion units are usually expressed as total nitrogen oxides or NO_x. For the project area, the ambient air ratio of NO_2 to NO_x is 0.59. This

ratio was used to determine NO_2 impacts from emission rates of NO_x (i.e., NO_2 is 59 % of total NO_x).

Boiler System. The boiler system for the proposed project would provide heat and hot water. The system would consist of three duel fuel (natural gas and No. 2 fuel oil) boilers, each rated at approximately 16.75 MMBtu/hr. Up to two boilers would be operational at any one time, with the other boiler as a standby unit. One boiler is anticipated to operate at 8,760 hours per year and another boiler at 6,552 hours per year (September through May). Emission factors were obtained from manufacturers' data. Boiler emissions and operating schedule are shown in Table 4.10-33.

TABLE 4.10-33. PROPOSED UV FACILITY: BOILER EMISSIONS[A]

Fuel In Use	Average Pounds per Hour (each boiler)			
	NO_x	CO	SO_2	PM[c,d]
Fuel Oil[b]	4.18	1.17	6.4	0.33/ 0.14
Natural Gas	2.01	2.51	0.02	0.17
Annual Average Emission Rate	1.54	1.63	0.70	0.13/0.11
Annual Average Emissions for All Boilers (tons per year)	11.8	12.5	5.4	0.98/0.84

Notes:

a. Emission rates are calculated from manufacturer's data. For the months of December through March, the higher emission rate (fuel oil or natural gas) was applied to determine short-term impacts. For the remaining months, emission rate of natural gas was applied. For annual average impacts, the boilers were assumed to operate for two months on oil and 10 months on natural gas.

b. For No. 2 fuel oil it was assumed that the sulfur content was equal to 0.37 percent.

c. Short-term PM emission rates from fuel oil for each boiler were based on the maximum daily heat demand of 26.8 MMBTU/hr or 2 boilers operating at 80% of the capacity.

d. $PM_{2.5}$ emissions for fuel oil are 42 % of total PM (0.33 lbs/hr) or 0.14 lbs/hr (see AP-42, Table 1.3-7).

Boiler impacts may also result in emissions of relatively small amounts of TACs. Emissions factors for TACs have been developed for various combustion sources, and are compiled in the USEPA document *AP-42, Compilation of Air Pollutant Emission Factors, Fifth Edition, Volume 1: Stationary Point and Area Sources.* In that document, Tables 1.4-3 and 1.4-4, "Emission Factors from Speciated Organic Compounds from Natural Gas Combustion" and "Emission Factors for Metals from Natural Gas Combustion," respectively, provide emission factors used to estimate TACs from the proposed UV Facility's boilers. Fuel oil emission factors for TACs were obtained from Tables 1.3-9 and 1.3-10. Annual emissions are based on all three boilers operating a total of 15,312 hours in a year. TAC emissions, based on AP-42 emission factors and an estimated gas consumption rate of 16,400 cubic feet per hour and fuel oil consumption rate of 120 gallons per hour, are shown in Table 4.10-34.

TABLE 4.10-34. PROPOSED UV FACILITY: TAC EMISSIONS FROM BOILERS

Pollutant	Natural Gas Emission Factor	Natural Gas Emission Rate	Fuel Oil Emission Factor	Fuel Oil Emission Rate	Annual Emission Rate
	lb/MMscf	Lbs/hr	lbs/10^3 gals	lbs/hr	Tons/yr
Benzene	2.10E-03	3.44E-05	2.14E-04	2.57E-05	2.46E-04
Toluene	3.40E-03	5.58E-05	6.20E-03	7.44E-04	1.41E-03
Ethylbenzene	N/A	N/A	6.36E-05	7.63E-06	1.1E-05
Xylene	N/A	N/A	1.09E-04	1.31E-05	1.88E-05
1,1,1 Trichloroethane	N/A	N/A	2.31E-04	2.77E-05	3.99E-05
Formaldehyde	7.50E-02	1.23E-03	3.30E-02	3.96E-03	1.32E-02
Fluorene	2.80E-06	4.59E-08	4.47E06	5.36E-07	1.05E-06
Naphthalene	6.10E-04	1.00E-05	1.13E-03	1.36E-04	2.56E-04
Acenaphthylene	1.80E-06	2.95E-08	2.53E-07	3.04E-08	2.23E-07
Acenaphthene	1.80E-06	2.95E-08	2.11E-05	2.53E-06	3.83E-06
Phenanthrene	1.70E-05	2.79E-07	1.05E-05	1.26E-06	3.51E-06
Anthracene	2.40E-06	3.94E-08	1.22E-06	1.46E-07	4.5E-07
Fluoranthene	3.00E-06	4.92E-08	4.84E-06	5.81E-07	1.13E-06
Pyrene	5.00E-06	8.20E-08	4.25E-06	5.10E-07	1.23E-06
Benz(a)anthracene	1.80E-06	2.95E-08	4.01E-06	4.81E-07	8.72E-07
Chrysene	1.80E-06	2.95E-08	2.38E-06	2.86E-07	5.9E-07
Benzo(b)fluoranthene	1.80E-06	2.95E-08	1.48E-06	1.78E-07	4.35E-07
Benzo(k)fluoranthene	1.80E-06	2.95E-08	1.48E-06	1.78E-07	4.35E-07
Benzo(a)pyrene	1.20E-06	1.97E-08	N/A	N/A	1.19E-07
Indeno(1,2,3-cd)pyrene	1.80E-06	2.95E-08	2.14E-06	2.57E-07	5.49E-07
Dibenz(a,h)anthracene	1.20E-06	1.97E-08	1.67E-06	2.00E-07	4.08E-07
Benzo(g,h,i)perylene	1.20E-06	1.97E-08	2.26E-06	2.71E-07	5.1E-07
2-Methylnaphthalene	2.40E-05	3.94E-07	N/A	N/A	2.39E-06
3-Methylchloranthrene	1.80E-06	2.95E-08	N/A	N/A	1.79E-07
7,12-Dimethylbenz(a)anthracene	1.60E-05	2.62E-07	N/A	N/A	1.5E-06
Dichlorobenzene	1.20E-03	1.97E-05	N/A	N/A	1.49E-04
Butane	2.10E+00	3.44E-02	N/A	N/A	2.09E-01
Pentane	2.60E+00	4.26E-02	N/A	N/A	2.59E-01
Propane	1.60E+00	2.62E-02	N/A	N/A	1.59E-01
Hexane	1.8	2.95E-02	N/A	N/A	1.79E-01
Metals	**lb/MMscf**	**lb/hr**	**lb/10^{12}BTU**	**lbs/hr**	**Tons/yr**
Arsenic	2.00E-04	3.28E-06	4	6.70E-05	1.16E-04
Beryllium	1.20E-05	1.97E-07	3	5.03E-05	7.36E-05
Cadmium	1.10E-03	1.80E-05	3	5.03E-05	1.82E-04
Chromium	1.40E-03	2.30E-05	3	5.03E-05	2.12E-04
Cobalt	8.40E-05	1.38E-06	N/A	N/A	8.36E-06

TABLE 4.10-34. PROPOSED UV FACILITY: TAC EMISSIONS FROM BOILERS

Pollutant	Natural Gas Emission Factor	Natural Gas Emission Rate	Fuel Oil Emission Factor	Fuel Oil Emission Rate	Annual Emission Rate
	lb/MMscf	Lbs/hr	lbs/10^3 gals	lbs/hr	Tons/yr
Manganese	3.80E-04	6.23E-06	6	1.01E-04	1.83E-04
Mercury	2.60E-04	4.26E-06	3	5.03E-05	9.82E-05
Nickel	2.10E-03	3.44E-05	3	5.03E-05	2.81E-04
Selenium	2.40E-05	3.94E-07	15	2.51E-04	3.64E-04
Lead	5.00E-04	8.20E-06	9	1.51E-04	2.67E-04
Barium	4.40E-03	7.22E-05	N/A	N/A	4.38E-04
Copper	8.50E-04	1.39E-05	6	1.01E-04	2.29E-04
Molybdenum	1.10E-03	1.80E-05	N/A	N/A	1.09E-04
Vanadium	2.30E-03	3.77E-05	N/A	N/A	2.29E-04
Zinc	2.90E-02	4.76E-04	4	6.70E-05	2.98E-03

Emergency Generators. Four 1,500-kilowatt (KW) diesel fuel-fired emergency generators would provide emergency power for the proposed facility. The emergency generators would only operate in the event of a utility power failure, and for "exercising" to keep them in good working order. Each diesel generator would be exercised approximately one hour per week. Table 4.10-35 shows the estimated emissions from the generators, each operating for one hour per week, 52 weeks per year.

TABLE 4.10-35. PROPOSED UV FACILITY: EMERGENCY DIESEL GENERATOR EMISSIONS[1]

Pollutant	Engine Emission Rate		
	Per Engine lbs/hr	Per Engine hrs / yr	All Four Engines tons/ year
NO_x	19.0	52	2.0
CO	10.9	52	1.1
PM	1.0	52	0.1
SO_2	6.0	52	0.6

Notes: Emission rates of NO_x, CO and PM are based on manufacturer's data for Caterpillar model 3512 B at 75% load (the anticipated load during exercise). SO_2 emission rates are based on Table 3.4-1 of USEPA AP-42 and a sulfur content of 0.37% (sulfur in fuel limit, Table 2, sub-part 225-1).

Diesel combustion may also result in emissions of relatively small amounts of TACs. Emissions factors for TACs from large diesel engines are compiled in AP-42, Tables 3.4-3 and 3.4-4, "Speciated Organic Compounds Emission Factors for Large Uncontrolled Stationary Diesel Engines" and "PAH Emission Factors for Large Uncontrolled Stationary Diesel Engines," respectively. These two tabulations provide the emission factors used to estimate TACs from the emergency diesel generators. Annual emissions are based on each engine generator operating one hour per week, every week of the year. TAC emissions, based on AP-42 emission factors and an estimated rating of 15 MMBtu/hr, are shown in Table 4.10-36.

TABLE 4.10-36. PROPOSED UV FACILITY: EMERGENCY DIESEL GENERATOR TAC EMISSIONS

Pollutant	Diesel Fuel Emission Factor lb/MMBtu	Emission Rate lbs/hr	Annual Emission Rate Tons/yr
Benzene	7.76E-04	1.16E-02	1.21E-03
Toluene	2.81E-04	4.22E-03	4.38E-04
Xylenes	1.93E-04	2.90E-03	3.01E-04
Propylene	2.79E-03	4.19E-02	4.35E-03
Formaldehyde	7.89E-05	1.18E-03	1.23E-04
Acetaldehyde	2.52E-05	3.78E-04	3.93E-05
Naphthalene	1.30E-04	1.95E-03	2.03E-04
Acenaphthylene	9.23E-06	1.38E-04	1.44E-05
Acenaphthene	4.68E-06	7.02E-05	7.30E-06
Phenanthrene	4.08E-05	6.12E-04	6.36E-05
Anthracene	1.23E-06	1.85E-05	1.92E-06
Fluoranthene	4.03E-06	6.05E-05	6.29E-06
Pyrene	3.71E-06	5.57E-05	5.79E-06
Benzo(a)anthracene	6.22E-07	9.33E-06	9.70E-07
Chrysene	1.53E-06	2.30E-05	2.39E-06
Benzo(b)fluoranthene	1.11E-06	1.67E-05	1.73E-06
Benzo(k)fluoranthene	2.18E-07	3.27E-06	3.40E-07
Benzo(a)pyrene	2.57E-07	3.86E-06	4.01E-07
Indeno(1,2,3-cd)pyrene	4.14E-07	6.21E-06	6.46E-07
Dibenz(a,h)anthracene	3.46E-07	5.19E-06	5.40E-07
Benzo(g,h,l)perylene	5.56E-07	8.34E-06	8.67E-07

Operating Emissions Summary. Criteria pollutants are emitted from the boilers and the emergency generators at the plant. Total facility emissions, shown in Table 4.10-37, are below the major source threshold.

Total emissions of each criteria pollutant would be less than the major source threshold for that pollutant. The proposed project would not be classified as a major source for any criteria pollutant.

TABLE 4.10-37. PROPOSED UV FACILITY: CRITERIA POLLUTANT EMISSIONS SUMMARY

Pollutant	Boilers tons/yr	Generators tons/yr	Total tons/yr	National & State Major Source Threshold tons/yr
NO_2	11.8	2.0	13.8	25
CO	12.5	1.1	13.6	100
$PM_{10}/PM_{2.5}$	0.98/0.84	0.1	1.08/0.94	100
SO_2	5.4	0.6	6.0	100

Combustion sources also emit trace quantities of HAPs and TACs. A "major source" of Title III HAPs, as defined by USEPA, is one where 10 tons of any single regulated HAP or 25 tons of total HAPs are emitted in one year. The proposed facility would not be classified as a major source for HAPs. Table 4.10-38 summarizes potentially toxic emissions from combustion sources at the proposed UV Facility.

TABLE 4.10-38. PROPOSED UV FACILITY: TOTAL TAC EMISSIONS FROM COMBUSTION SOURCES

Pollutant	Boilers tons/yr	Generators tons/yr	Total Annual tons/yr
Total TACs	0.83	6.77E-03	0.83

Criteria Pollutant ISCST3 Modeling. The potential impacts of the boiler system, emergency generators and fuel cells emissions were analyzed using the USEPA's Industrial Source Complex Short Term, Version 3 dated 02035 (ISCST3) model (User's Guide, USEPA, 1995d) as described in Section 3.10, Data Collection and Impact Methodologies, Air Quality.

ISCST3 was used to predict maximum pollutant concentrations at designated receptors. Three sets of receptors were generated for the analysis; fenceline, Cartesian grid and sensitive land uses. The fenceline receptors were placed at approximately 25 meter intervals along the property boundary. The Cartesian grid receptors extend out to approximately ½ km in all directions from the site. Sensitive receptors include the Juvenile Detention Center, the Penitentiary, the County Laboratory, the Blythedale Children's Hospital, Westchester Medical Center, the Geriatric Institute and other nearby educational and institutional facilities. Terrain elevations were incorporated into the receptor grid. Receptors were set at 1.8 meters above the terrain, at the breathing level of a standing adult.

Dispersion modeling was conducted to compare predicted concentrations of pollutants at off-site receptors with applicable ambient air quality standards. Table 4.10-39 shows the comparison of maximum predicted off-site concentrations (including background) of criteria pollutants with the applicable standards.

TABLE 4.10-39. PROPOSED UV FACILITY: MODELING RESULTS FOR ALL EASTVIEW CRITERIA POLLUTANT SOURCES (MG/M^3)

Pollutant	Averaging Time	Modeled Conc. All Sources	Background Conc.	Total Conc.	Ambient Air Quality Standards
NO_2	Annual	1.24	58	59	100
CO	1-hour	1,152	6858	8,010	40,000
	8-hour	119	4,572	4,691	10,000
PM_{10}	24-hour	4.2	45	49	150
	Annual	0.16	21	21	50
SO_2	3-hour	294	183	477	1300
	24-hour	74	120	194	365
	Annual	0.87	26	27	80

Notes: The emergency generators were conservatively assumed to operate simultaneously.

As indicated in the tables, maximum predicted off-site concentrations from the emissions of all proposed UV Facility sources are below applicable ambient air quality standards. Since the maximum predicted concentrations from all combustion emission sources at the Eastview Site are in compliance with the standards, the impacts are not considered significant.

Toxic Air Contaminants. Table 4.10-40 shows a comparison of the total predicted off-site concentrations of each TAC with applicable guideline concentrations.

TABLE 4.10-40. PROPOSED UV FACILITY: COMBINED CONCENTRATIONS OF TACS FROM BOILERS AND GENERATORS (MG/M^3)

Pollutant	Maximum 1-hr Conc.[b]	NYSDEC SGC[a]	Maximum Annual Conc.[b]	NYSDEC AGC[a]
Benzene (HAP)	8.01E-02	1300	4.90E-04	0.13
Toluene (HAP)	9.90E-02	37000	3.38E-02	400
Xylenes (HAP)	2.04E-02	4300	1.16E-04	700
Ethylbenzene	7.30E-04	54,000	1.29E-06	1,000
1,1,1 Trichloroethane	2.65E-03	NL	4.69E-06	NL
Formaldehyde (HAP)	3.87E-01	30	1.76E-03	0.06
Fluorene	5.13E-05	NL	1.29E-07	NL
Naphthalene (HAP)	2.58E-02	7900	1.08E-04	3
Acenaphthylene (HAP)	9.17E-04	NL	5.46E-06	0.02
Acenaphthene (HAP)	7.06E-04	NL	3.20E-06	0.02
Phenanthrene (HAP)	4.16E-03	NL	2.44E-05	0.02
Anthracene (HAP)	1.36E-04	NL	7.81E-07	0.02
Fluoranthene (HAP)	4.55E-04	NL	2.51E-06	0.02
Pyrene (HAP)	4.16E-04	NL	2.34E-06	0.02
Benzo(a)anthracene (HAP)	1.08E-04	NL	4.72E-07	0.02

TABLE 4.10-40. PROPOSED UV FACILITY: COMBINED CONCENTRATIONS OF TACS FROM BOILERS AND GENERATORS (MG/M^3)

Pollutant	Maximum 1-hr Conc.[b]	NYSDEC SGC[a]	Maximum Annual Conc.[b]	NYSDEC AGC[a]
Chrysene (HAP)	1.79E-04	NL	9.73E-07	0.02
Benzo(b)fluoranthene (HAP)	1.04E-02	NL	5.73E-05	0.02
Benzo(k)fluoranthene (HAP)	2.07E-03	NL	1.13E-05	0.02
Benzo(a)pyrene (HAP)	2.42E-03	NL	1.32E-05	0.02
Indeno(1,2,3-cd)pyrene (HAP)	3.91E-03	NL	2.14E-05	0.02
Dibenz(a,h)anthracene (HAP)	3.27E-03	NL	1.79E-05	0.02
Benzo(g,h,i)perylene (HAP)	5.26E-03	NL	2.87E-05	0.02
2-Methylnaphthalene (HAP)	3.76E-05	NL	3.33E-07	0.02
3-Methylchloranthrene (HAP)	2.82E-06	NL	2.50E-08	0.02
7,12-Dimethylbenz(a)anthracene (HAP)	2.51E-05	NL	2.22E-07	0.02
Dichlorobenzene (HAP)	1.88E-03	NL	1.66E-05	0.09
Butane	3.29E+00	NL	2.91E-02	45000
Pentane	4.08E+00	NL	3.60E-02	4200
Propane	2.51E+00	NL	2.22E-02	110000
Hexane (HAP)	2.82E+00	NL	2.50E-02	200
Arsenic (HAP)	6.41E-03	NL	5.83E-03	0.00023
Beryllium (HAP)	4.81E-03	1	2.14E-05	0.00042
Cadmium (HAP)	4.81E-03	NL	2.37E-05	0.0005
Chromium (HAP)	4.81E-03	NL	2.79E-05	1.2
Cobalt (HAP)	1.32E-04	NL	1.16E-06	0.005
Manganese (HAP)	9.61E-03	NL	2.23E-05	0.05
Mercury (HAP)	4.81E-03	1.8	1.21E-05	0.3
Nickel (HAP)	4.81E-03	6	3.76E-03	0.004
Selenium (HAP)	2.40E-02	NL	4.28E-05	20
Lead (HAP)	1.44E-02	NL	3.24E-05	0.75
Barium	6.90E-03	NL	6.28E-03	1.2
Copper	9.61E-03	100	2.88E-05	0.02
Molybdenum	1.73E-03	NL	1.52E-05	12
Vanadium	3.61E-03	NL	3.19E-05	0.2
Zinc	4.55E-02	NL	4.13E-04	50

Notes:

Currently, USEPA is investigating acrolein sampling methods. Until such time that methods are developed and test data for acrolein for gas-fired boilers are available, acrolein impacts cannot be quantified.

a. NL represents "Not Listed."

b. Maximum concentrations from the boilers and generators were calculated separately. The combined concentrations presented above were conservatively generated by adding together the separate boiler and generator's maximum concentrations. In addition, the generators were assumed to operate simultaneously.

As indicated in the table, maximum predicted 1-hour and annual concentrations of TACs are lower than NYSDEC's corresponding SGCs and AGCs for each pollutant. Therefore, TAC and HAP impacts from combustion sources at the proposed UV Facility are predicted to be insignificant.

Fine Particulate Matter ($PM_{2.5}$). Dispersion modeling was performed (for Year 2010) to assess the impacts of the particulate matter emitted from the proposed project sources on ambient $PM_{2.5}$ concentrations in the defined study areas. Since the interim guidance criteria for $PM_{2.5}$ are based on incremental changes for both localized and neighborhood scale assessments, the modeling was performed to estimate maximum predicted changes in $PM_{2.5}$ concentrations that could be compared to these criteria.

Dispersion modeling was conducted to compare concentrations of $PM_{2.5}$ at off-site receptors with applicable interim guideline *de minimis* concentrations. Table 4.10-41 compares the combined 24-hour and annual concentrations of $PM_{2.5}$ at the maximum off-site receptor with the interim *de minimis* guideline concentrations.

TABLE 4.10-41. PROPOSED UV FACILITY: MODELING RESULTS FOR ALL EASTVIEW $PM_{2.5}$ POLLUTANT SOURCES (MG/M^3)

Pollutant	Total Modeled Conc.[a]	Interim Guidance Criteria	Promulgated Standard
$PM_{2.5}$ 24-Hour	2.82	5.0	65
$PM_{2.5}$ Annual (Discrete)	0.14	0.3	15
$PM_{2.5}$ Annual (Neighborhood)	0.05	0.1	15

Notes: a. Total combined concentration of boilers and emergency generators.

A significant impact would occur if maximum project impacts exceeded the *de minimis* threshold of 5.0 $\mu g/m^3$ for 24 hours, or 0.3 $\mu g/m^3$, the microscale annual maximum threshold, or 0.1 $\mu g/m^3$, the annual neighborhood scale threshold. The maximum project 24-hour and annual impacts are below (this analysis would be refined with less conservative assumptions) the interim *de minimis* thresholds of 5.0 and 0.3 $\mu g/m^3$, respectively. A neighborhood analysis was conducted that showed the average $PM_{2.5}$ impacts from the project to be lower than 0.1 $\mu g/m^3$. In reviewing the results of modeling for the neighborhood analysis it was concluded that mobile source and project stationary source impacts do not overlap. $PM_{2.5}$ impacts from the proposed project are predicted to be insignificant.

4.10.3.1.2. With Croton Project at Eastview Site

Mobile Sources. For the Future With the Project, a mobile source air quality analysis was conducted for the scenario with the Croton project at the Eastview Site for the build year 2010 (CO only). Concentrations were determined for the 1-hour and 8-hour averaging times for CO. Particulate Matter analyses were not conducted because in the build year 2010, all intersections are under the CEQR diesel truck trip threshold for fine particulate matter. In this section, the incremental concentrations of the UV Facility, where applicable, for the Future With

the Project and with the Croton project are compared to the Future Without the Project and with the Croton project.

Carbon Monoxide. As indicated in Table 4.10-42, the predicted concentrations of CO for the build year 2010 are below the ambient air quality standards. Both the 1-hour and 8-hour averaging periods for each modeled intersection are in compliance with the standard. In addition, the CEQR *de minimis* criteria were calculated for the 8-hour period as described in Section 3.10, Data Collection and Impact Methodologies, Air Quality. As indicated in Table 4.10-43, the CEQR *de minimis* criteria were not exceeded. Therefore, the proposed project would have no significant impacts in the Future With the Project, with the Croton project at the Eastview Site.

TABLE 4.10-42. PREDICTED 1-HOUR AND 8-HOUR CO CONCENTRATIONS IN THE FUTURE WITHOUT THE PROJECT– WITH CROTON PROJECT AT EASTVIEW SITE, BUILD YEAR 2010 (ppm)

Intersection	Averaging Period	Ambient AQ Background	Model Results		Total Modeled Conc.[a]		Standard
			AM	PM	AM	PM	
Build Year 2010							
Route 100C at Sprain Brook Parkway Interchange	1-hour	5.9	2.3	2.5	8.2	8.4	35
	8-hour	2.0	1.6	1.8	3.6	3.8	9
Route 100C at Clearbrook Road/Walker Road	1-hour	5.9	0.8	1.5	6.7	7.4	35
	8-hour	2.0	0.6	1.1	2.6	3.1	9
Route 100C at Bradhurst Avenue	1-hour	5.9	1.9	2.6	7.8	8.5	35
	8-hour	2.0	1.3	1.8	3.3	3.8	9

Notes:
a. Total Predicted Concentration = Ambient AQ Background + Model Results.
Source: Croton Water Treatment Plant Final Supplemental EIS, June 2004.

TABLE 4.10-43. 8-HOUR CO CONCENTRATIONS AND CEQR *DE MINIMIS* CRITERIA FUTURE WITH THE PROJECT, WITH CROTON PROJECT AT EASTVIEW SITE, BUILD YEAR 2010

Intersection	Averaging Period	No Build Conc.[a]		Build Conc.[a]		Project Increment		*De minimis* Criteria[c]	
		AM	PM	AM	PM	AM	PM	AM	PM
Build Year 2010									
Route 100C at Sprain Brook Parkway Interchange	8-hour	3.6	3.8	3.6	3.8	0.0	0.0	2.7	2.6
Route 100C at Clearbrook Rd/Walker Rd	8-hour	2.5	3.1	2.6	3.1	0.1	0.0	3.2	2.9
Route 100C at Bradhurst Avenue	8-hour	3.3	3.8	3.3	3.8	0.0	0.0	2.8	2.6

Notes:
[a] Includes Background. No build is without the UV Facility with the Croton Project. Build represents project traffic and no build.
[b] The project increment is defined as the project build value minus the no build value. The project increment is below the *de minimis* criteria.
[c] See Section 3.10, Data Collection and Impact Methodologies, Air Quality, for details on how this value is calculated.

Stationary Sources. Stationary sources with the potential to emit regulated air pollutants include natural gas-fired boilers and emergency diesel generators identified in the previous section. For details on emissions from these stationary sources, please see Section 4.10.3.1.1, Potential Project Impacts Without Croton project at Eastview Site. In this section, the incremental concentrations of the UV Facility, where applicable, for the Future With the Project and with the Croton project are compared to the Future Without the Project and with the Croton project.

The sources from the proposed UV Facility and the Croton project were modeled as a multiple-source modeling scenario and the results are presented and shown in Table 4.10-44. As indicated in the table, maximum predicted off-site concentrations from the combined emissions of all UV Facility sources and Croton project sources are below applicable ambient air quality standards.

TABLE 4.10-44. MODELING RESULTS OF CRITERIA POLLUTANTS WITH SOURCES IN THE FUTURE WITH THE PROJECT AND WITH THE CROTON PROJECT

Pollutant	Averaging Time	Modeled Conc. All Sources µg/m^3	Background Conc. Mg/m^3	Total Conc. µg/m^3	Ambient Air Quality Standards µg/m^3
NO_2	Annual	3.8	58	62	100
CO	1-hour	1,152	6,858	8,010	40,000
	8-hour	126	4,572	4,698	10,000
PM_{10}	24-hour	8.2	45	53	150
	Annual	0.53	21	22	50
SO_2	3-hour	362	183	545	1,300
	24-hours	155	120	275	365
	Annual	2.9	26	29	80

Toxic Air Contaminants In the Future With the Project with the Croton project the modeled UV Facility incremental off-site concentrations of each TAC would remain the same as in the Future With the Project and without the Croton project at the Eastview Site. For the predicted incremental off-site concentrations of each TAC associate with the UV Facility, including a comparison to applicable guideline concentrations, see Table 4.10-45.

Fine Particulate Matter ($PM_{2.5}$). Dispersion modeling was performed to assess the incremental impacts of the particulate matter emitted from the proposed project sources on ambient $PM_{2.5}$ concentrations within the defined study areas. Since the interim guidance criteria for $PM_{2.5}$ are based on incremental changes for both localized and neighborhood scale assessments, the modeling was performed to estimate maximum modeled changes in $PM_{2.5}$ concentrations that could be compared to these criteria.

Dispersion modeling was conducted to compare concentrations of $PM_{2.5}$ at off-site receptors with applicable interim guidance criteria concentrations. Table 4.10-45 compares the maximum UV Facility incremental concentrations of the combined 24-hour and annual $PM_{2.5}$ impacts at the off-site receptor with the interim guidance criteria concentrations.

TABLE 4.10-45: UV FACILITY: PREDICTED PM2.5 INCREMENTAL CONCENTRATIONS OF THE UV FACILITY EMISSION SOURCES IN THE FUTURE WITH THE PROJECT WITH THE CROTON PROJECT

Pollutant	Total Modeled Conc.[a] µg/m^3	Interim Guidance Criteria µg/m^3
$PM_{2.5}$ 24-Hour	2.82	5.0
$PM_{2.5}$ Annual (Discrete)	0.14	0.3
$PM_{2.5}$ Annual (Neighborhood)	0.05	0.1

Notes:
a. Total combined concentration of boilers and emergency generators.

As indicated in the tables, maximum predicted off-site concentrations from the incremental emissions of all UV Facility sources in the Future With the Project with the Croton project sources are below the interim guidance criteria.

Since the maximum predicted concentrations from all combustion emission sources at the Eastview Site are in compliance with the standards/guidance, the impacts are not considered significant. For a comparison of the Future With the Project, with the Croton project, to the Future Without the Project without Croton (the "pure" No Build condition), see Section 4.21, Combined Impacts.

4.10.3.2. Potential Construction Impacts

4.10.3.2.1. Without Croton Project at Eastview Site

Mobile Sources. For the Future With the Project, a mobile source air quality analysis was conducted for the scenario without the Croton project at the Eastview Site for the peak construction traffic year, 2008. Localized pollutant impacts from the vehicles queuing at the selected intersections were analyzed for CO, PM_{10} and $PM_{2.5}$. Concentrations were determined for the 1-hour and 8-hour averaging times for CO. Concentrations were determined for the 24-hour and annual averaging times for PM_{10} and $PM_{2.5}$.

Carbon Monoxide. As indicated in Table 4.10-46, the predicted concentrations of CO for the peak year for construction-related traffic (2008) are below the corresponding ambient air quality standards. Both the 1-hour and 8-hour averaging periods for each modeled intersection are in compliance with the standards.

TABLE 4.10-46. PREDICTED 1-HOUR AND 8-HOUR CO CONCENTRATIONS IN THE FUTURE WITH THE PROJECT– WITHOUT CROTON PROJECT AT EASTVIEW SITE PEAK TRAFFIC YEAR 2008 (ppm)

Intersection	Averaging Period	Ambient AQ Background	Model Results		Total Modeled Conc.[a]		Standard
			AM	PM	AM	PM	
Peak Traffic Year 2008							
Route 100C at Sprain Brook Parkway Interchange	1-hour	5.9	2.4	2.8	8.3	8.7	35
	8-hour	2.0	1.7	2.0	3.7	4.0	9
Route 100C at Clearbrook Road/Walker Road	1-hour	5.9	0.9	1.8	6.8	7.7	35
	8-hour	2.0	0.6	1.3	2.6	3.3	9
Route 100C at Bradhurst Avenue	1-hour	5.9	2.1	2.4	8.0	8.3	35
	8-hour	2.0	1.5	1.7	3.5	3.7	9
Route 100C at Route 9A	1-hour	5.9	0.9	1.2	6.8	7.1	35
	8-hour	2.0	0.6	0.8	2.6	2.8	9

Notes: a. Ambient AQ Background + Model Results = Total Predicted Concentration.

In addition, the CEQR *de minimis* criteria were calculated for the 8-hour period as described in Section 3.10, Data Collection and Impact Methodologies, Air Quality. As indicated in Table 4.10-47, the CEQR *de minimis* criteria for the 8-hour period would not be exceeded. Therefore, the proposed project would not result in significant CO impacts in the Future With the Project and without the Croton project at the Eastview Site.

TABLE 4.10-47. 8-HOUR CO CONCENTRATIONS AND CEQR DE MINIMIS CRITERIA IN THE FUTURE WITH THE PROJECT – WITHOUT CROTON PROJECT AT EASTVIEW SITE, PEAK TRAFFIC YEAR 2008 (ppm)

Intersection	Averaging Period	No Build Conc.[a]		Build Conc.[a]		Project Increment[b]		*De Minimis* Criteria[c]	
		AM	PM	AM	PM	AM	PM	AM	PM
Peak Traffic Year 2008									
Route 100C at Sprain Brook Parkway Interchange	8-hour	3.6	3.9	3.7	4.0	0.1	0.1	2.7	2.5
Route 100C at Clearbrook Road/Walker Road	8-hour	2.6	3.1	2.6	3.3	0.0	0.2	3.2	2.9
Route 100C at Bradhurst Avenue	8-hour	3.5	3.7	3.5	3.7	0.0	0.0	2.7	2.6
Route 100C at Route 9A	8-hour	2.6	2.8	2.6	2.8	0.0	0.0	3.2	3.1

Notes: [a] Includes Background. No build is without the UV Facility or Croton project (i.e., Pure No build). Build represents project traffic and no build.

[b] The project increment is defined as the project build value minus the no build value. The project increment is below the *de minimis* criteria.

[c] See Section 3.10, Data Collection and Impact Methodologies, Air Quality for details on how this value is calculated.

Particulate Matter (PM_{10}). As indicated in Tables 4.10-48, the predicted concentrations of PM_{10}, for the construction year 2008, are below the corresponding ambient air quality standards. Both the 24-hour and annual averaging periods for each modeled intersection are in compliance with the standard. Therefore, it can be concluded that there would be no significant impacts for PM_{10} in the Future With the Project and without the Croton project at the Eastview Site.

TABLE 4.10-48. PREDICTED 24-HOUR AND ANNUAL PM_{10} CONCENTRATIONS IN THE FUTURE WITH THE PROJECT – WITHOUT CROTON PROJECT AT EASTVIEW SITE, PEAK TRAFFIC YEAR 2008 ($\mu g/m^3$)

Intersection	Averaging Period	Ambient AQ Background	Model Results	Total Modeled Conc.[a]	Standard
Peak Traffic Year 2008					
Route 100C at Sprain Brook Parkway Interchange	24 hour	45	36	81	150
	Annual	21	13	34	50
Route 100C at	24 hour	45	33	78	150

TABLE 4.10-48. PREDICTED 24-HOUR AND ANNUAL PM_{10} CONCENTRATIONS IN THE FUTURE WITH THE PROJECT – WITHOUT CROTON PROJECT AT EASTVIEW SITE, PEAK TRAFFIC YEAR 2008 ($\mu g/m^3$)

Intersection	Averaging Period	Ambient AQ Background	Model Results	Total Modeled Conc.[a]	Standard
Peak Traffic Year 2008					
Clearbrook Road/Walker Road	Annual	21	12	33	50
Route 100C at Bradhurst Avenue	24 hour	45	45	90	150
	Annual	21	14	35	50
Route 100C at Route 9A	24 hour	45	27	72	150
	Annual	21	9	30	50

Notes: a. Total Predicted Concentration = Ambient AQ Background + Model Results.

Fine Particulate Matter ($PM_{2.5}$). To predict concentrations that would represent a neighborhood scale, receptors for the annual, neighborhood scale modeling were located at a distance of 15 meters (49 feet) from the roadways. The microscale analysis for 24-hour averaging periods was run with the same receptors used in the CO models.

As indicated in Table 4.10-49, the predicted concentrations of $PM_{2.5}$, for the construction year 2008 are below the corresponding ambient air quality interim guidance levels. Therefore, the proposed project would not have significant $PM_{2.5}$ impacts in the Future With the Project and without the Croton project at the Eastview Site.

TABLE 4.10-49. PREDICTED 24-HOUR AND ANNUAL $PM_{2.5}$ CONCENTRATIONS IN THE FUTURE WITH THE PROJECT – WITHOUT CROTON PROJECT AT EASTVIEW SITE, PEAK TRAFFIC YEAR 2008 ($\mu G/M^3$)

Intersection	Averaging Time	Modeled Conc.[a]		Project Increment[b]	Interim Guidance
		With Project	Without Project		
Peak Traffic Year 2008					
Route 100C at Sprain Brook Parkway Interchange	24-hour	6.00	5.96	0.04	5
	Annual	0.28	0.28	0.00	0.1
Route 100C at Clearbrook Road/Walker Road	24-hour	5.59	5.52	0.07	5
	Annual	0.22	0.22	0.00	0.1
Route 100C at Bradhurst Avenue	24-hour	7.70	7.67	0.03	5
	Annual	0.29	0.29	0.00	0.1
Route 100C at Route 9A	24-hour	4.6	4.59	0.01	5
	Annual	0.17	0.17	0.00	0.1

Notes:
a. Annual impacts are for neighborhood receptors.
b. The increment was calculated by subtracting $PM_{2.5}$ concentrations for the Future Without the Project without Croton from the $PM_{2.5}$ concentrations for the Future With the Project without Croton.

Construction Equipment Sources.

On-Site Activities. Possible effects on local air quality during construction at the project sites include:

- Engine emissions generated by on-site construction equipment and dump trucks,
- Fugitive dust emissions generated by soil excavation and other construction activities,
- Fugitive dusts emissions generated by construction trucks traveling on paved and unpaved roads.

The methodology described in Section 3.10, Data Collection and Impact Methodologies, Air Quality, was followed to predict the anticipated construction-related impacts associated with the proposed project. The potential impact of construction emissions in terms of the criteria pollutants (CO, SO_2, NO_2 and PM_{10}) and fine particulate ($PM_{2.5}$) emissions were evaluated for the peak construction year of 2006 (the period of maximum projected construction emissions).

Fugitive dust emissions from construction operations can occur from excavation, hauling, dumping, grading, compacting, wind erosion, and traffic over unpaved and paved surfaces. Actual quantities of emissions depend on the extent and nature of the construction activities, the type of equipment employed, the physical characteristics of the underlying soil, the speed at which the construction vehicles are operated, and the type of fugitive dust control methods employed. Most of the fugitive dust generated by construction activities consists of relatively large-size particles that are anticipated to settle within short distance from the construction site and that would not significantly affect nearby receptors.

Approximately 865,000 cubic yards (cy) of soil and rock would be removed during the construction of the proposed UV Facility. It is estimated that the majority of the excavated material would be removed in 2006. A summary of construction activities is provided below.

Overburden and debris removal. Six excavators, two backhoes and two scrapers would be used to remove overburden and debris. Fugitive emissions of criteria pollutants and fine particulates were based on the maximum anticipated soil transfer rates, the number of equipment hours and the USEPA's Non-road Engine and Vehicle Study and AP-42 emission factors.

Overburden and debris load-out to trucks. It is anticipated that six 25 cubic yard trucks would be used to transfer soils from the excavation area to the stockpiling area. Soil/debris would be transported from the stockpile area to off-site facilities using 16 cubic yard trucks.

Rock Drilling. The Eastview Site is mostly filled with the combination of rock and soil materials. Rock drilling and blasting would occur at this site.

Rock Load-out to Trucks. After the rock materials are drilled and blasted, the rock material would be transported to the on-site rock crusher. From there the material would be loaded onto 16 cubic yard trucks.

Road Dust. Each heavy duty dump-truck vehicle would travel approximately 150 feet into the construction areas unloaded and then travel the same distance out loaded. In order to limit fugitive dust from truck travel, main on-site roads would be paved, and would be maintained by hourly water flushing and sweeping. A control efficiency of 50 percent was assumed for water flushing and sweeping. The speed would be limited to 5 mph for all on-site construction trucks. The AP-42 emission factor (in lb/VMT) is based on the silt loading and average vehicle weight. The average vehicle weight was based on the assumption that half of the travel distance would be with a full load and half would be with no load (empty).

On-site Construction Equipment Emissions. An analysis of the potential for air quality impacts from on-site construction equipment at the Eastview Site was performed for the peak construction year of 2006, and peak month of March 2006 for short-term impacts. The analyses address combustion emissions from stationary on-site equipment, such as cranes, and fugitive dust emissions from mobile equipment, such as backhoes. A complete list of on-site equipment is provided in Appendix C.

Emission factors for NO_X, CO, PM_{10}, $PM_{2.5}$, and SO_2 from the combustion of fuel for on-site construction equipment (excluding delivery trucks/heavy vehicles) were developed using the USEPA NONROAD Emissions Model Version 2.2d (May 2003). The model is based on source inventory data accumulated for specific categories of off road equipment. Data provided in the output files from the NONROAD model were used to derive (i.e., back-calculated from regional emission estimates) these emission factors for each type of equipment that is anticipated to be present on-site during construction activities. Emission rates of NO_X and CO (SO_2 emissions were negligible) from combustion of fuel for on-site delivery trucks/heavy vehicles were developed using the USEPA MOBILE6.2 emissions model. Emission factors associated with fugitive dust emissions from mobile equipment were developed using equations presented in USEPA's *AP-42, A Compilation of Air Pollution Emission Factors.*

ISCST3 Dispersion Modeling. A dispersion modeling analysis was performed to estimate ambient concentrations of air pollutants associated with emissions produced by on-site construction activities at the Eastview Site. The modeling analysis was conducted using the ISCST3 dispersion model and was performed in accordance with USEPA and NYCDEP guidance regarding the use of dispersion models for regulatory purposes. The predicted ambient concentrations of criteria pollutants have been used to demonstrate compliance with applicable air quality standards and interim guidance values. The methodology for determining construction equipment emissions of criteria pollutants is presented in Appendix C.

Maximum predicted concentrations from on-site construction sources occurred at receptors along the perimeter of the facility, as anticipated. This is true for all averaging periods, both short-term and annual and for all pollutants modeled in the analysis. The maximum predicted off-site concentrations from on-site construction sources are presented in Table 4.10-50. The background levels were obtained from the NYSDEC monitoring data.

TABLE 4.10-50. PROPOSED UV FACILITY: RESULTS OF DISPERSION ANALYSIS FOR CONSTRUCTION ACTIVITIES WITHOUT THE CROTON PROJECT AT EASTVIEW SITE

Modeled Pollutant	Averaging Period	Units	Maximum Modeled Conc.		Background Conc. µg/m^3	Total Concentration		Ambient Air Quality Standards
			All Modeled Receptors[a]	All Sensitive Receptors		All Modeled Receptors[a]	All Sensitive Receptors	
NO_2	Annual	µg/m^3	4.63	2.34	58	62.6	60.3	100
SO_2	3-Hour	µg/m^3	0.36	0.31	183	183.4	183.3	1,300
	24-Hour	µg/m^3	0.11	0.059	120	120.1	120.2	365
	Annual	µg/m^3	0.007	0.004	26	26.0	26.0	80
CO	1-Hour	µg/m^3	389.3	308.5	6858	7,247	7,167	40,000
	8-Hour	µg/m^3	103.9	78.5	4,572	4,676	4,651	10,000
PM_{10}	24-Hour	µg/m^3	15.49	12.25	45	60.5	57.3	150
	Annual	µg/m^3	0.94	0.80	21	21.9	21.8	50

Notes: a. Includes fenceline receptors. NO_X emissions are based on a NO_2 to NO_X ratio of 59%.

As indicated in Table 4.10-50, the maximum predicted concentrations (including background) of each criteria pollutant for each averaging period are below the corresponding air-quality standards. Therefore, the construction of the proposed project would not result in significant impacts of the pollutants.

Fine Particulate Matter ($PM_{2.5}$). For the $PM_{2.5}$ incremental impact analysis, the maximum impacts were modeled for comparison with interim guidance criteria. The maximum predicted off-site concentrations from on-site construction sources are presented in Table 4.10-51. As indicated in the table, the maximum predicted concentrations of $PM_{2.5}$ at any sensitive receptor for the 24-hour and annual averaging periods are below the interim guidance value. Therefore, it can be concluded that there would be no significant $PM_{2.5}$ impacts from the construction of the proposed UV Facility at the Eastview Site.

TABLE 4.10-51. PROPOSED UVFACILITY: PREDICTED $PM_{2.5}$ CONCENTRATIONS FOR CONSTRUCTION ACTIVITIES–WITHOUT THE CROTON PROJECT AT EASTVIEW SITE

Modeled Pollutant	Averaging Period	Units	Maximum Predicted Concentration		Interim Guidance[d]
			All Modeled Receptors[a]	All Sensitive Receptors	
$PM_{2.5}$	24-Hours	$\mu g/m^3$	6.54	3.58	5[b]
	Annual (Discrete)	$\mu g/m^3$	0.39	0.20	0.3[b]
	Annual(Neighborhood)	$\mu g/m^3$	0.07	N/A	0.1[c]

Notes:
a. Includes fenceline receptors.
b. Values for a discrete location.
c. Values for a neighborhood analysis.
d. The increment was calculated by subtracting $PM_{2.5}$ concentrations for the Future Without the Project and without the Croton project from the $PM_{2.5}$ concentrations for the Future With the Project and without the Croton project.

The NAAQS for $PM_{2.5}$ is not presented in Table 4.10-51. This is because NYSDEC and the USEPA have not made compliance determinations with respect to the NAAQS for $PM_{2.5}$. NYCDEP is employing interim guidance criteria for evaluating the significance of potential $PM_{2.5}$ concentrations from NYCDEP projects under environmental review. The interim guidance criteria for determining the potential for significant adverse impacts from $PM_{2.5}$ are as follows:

- Predicted incremental impacts of $PM_{2.5}$ greater than 5 $\mu g/m^3$ averaged over a 24-hour (daily) period at a discrete location of public access, either at ground or elevated levels (microscale analysis); or
- Predicted incremental ground-level impacts of $PM_{2.5}$ greater than 0.1 $\mu g/m^3$ on an annual average neighborhood-scale basis (i.e., the computed annual concentration averaged over receptors placed over a one kilometer by one kilometer grid, centered around the location where the maximum impact is predicted).

- In addition, NYSDEC consider incremental impacts of $PM_{2.5}$ greater than 0.3 $\mu g/m^3$ from stationary sources at any discrete ground-level or elevated locations as having potential for a significant impact.

The air quality modeling analysis determined that the highest predicted increase in the 24 hour $PM_{2.5}$ concentrations to be 3.58 $\mu g/m^3$ at the County Laboratory. The highest predicted annual increase was equal to 0.20$\mu g/m^3$. The annual predicted incremental impact of $PM_{2.5}$ is 0.07 $\mu g/m^3$ for the neighborhood scale analysis, which is less than the NYCDEP interim guidance of 0.1 $\mu g/m^3$. Therefore, no adverse air quality impacts are anticipated for $PM_{2.5}$.

4.10.3.2.2. With Croton Project at Eastview Site

Mobile Sources. For the Future With the Project, a mobile source air quality analysis was conducted for the scenario with the Croton project at the Eastview Site for the peak construction traffic year, 2008. Localized pollutant impacts from the vehicles queuing at the selected intersections were analyzed for CO, PM_{10} and $PM_{2.5}$. Concentrations were determined for the 1-hour and 8-hour averaging times for CO. Concentrations were determined for the 24-hour and annual averaging times for PM_{10} and $PM_{2.5}$. In this section, the incremental concentrations of the UV Facility, where applicable, for the Future With the Project and with the Croton project are compared to the Future Without the Project and with the Croton project.

Carbon Monoxide. As indicated in Tables 4.10-52 to 4.10-55, the predicted concentrations of CO for the peak construction traffic year 2008 for each separate parking option are below the ambient air quality standards. Both the 1-hour and 8-hour averaging periods for each modeled intersection are in compliance with the standard. In addition, the CEQR *de minimis* criteria were calculated for the 8-hour period as described in Section 3.10, Data Collection and Impact Methodologies, Air Quality. As indicated in Tables 4.10-56 to 4.10-59, the CEQR *de minimis* criteria for each separate parking option were not exceeded. Therefore, the proposed project would have no significant impacts in the Future With the Project, with the Croton project at the Eastview Site.

TABLE 4.10-52. PREDICTED 1-HOUR AND 8-HOUR CO CONCENTRATIONS IN THE FUTURE WITH THE PROJECT– WITH CROTON PROJECT AT EASTVIEW SITE PEAK TRAFFIC YEAR 2008 (ppm) LANDMARK PARKING (OPTION A)

Intersection	Averaging Period	Ambient AQ Background	Model Results		Total Modeled Conc.[a]		Standard
			AM	PM	AM	PM	
Peak Traffic Year 2008							
Route 100C at Sprain Brook Parkway Interchange	1-hour	5.9	2.5	3.0	8.4	8.9	35
	8-hour	2.0	1.8	2.1	3.8	4.1	9
Route 100C at Clearbrook Road/Walker Road	1-hour	5.9	1.1	2.3	7.0	8.2	35
	8-hour	2.0	0.8	1.6	2.8	3.6	9
Route 100C at Bradhurst Avenue	1-hour	5.9	2.1	2.5	8.0	8.4	35
	8-hour	2.0	1.5	1.8	3.5	3.8	9
Route 100C at Route 9A	1-hour	5.9	1.2	1.8	7.1	7.7	35
	8-hour	2.0	0.8	1.3	2.8	3.3	9

Notes: a. Ambient AQ Background + Model Results = Total Predicted Concentration.

TABLE 4.10-53. PREDICTED 1-HOUR AND 8-HOUR CO CONCENTRATIONS IN THE FUTURE WITH THE PROJECT– WITH CROTON PROJECT AT EASTVIEW SITE PEAK TRAFFIC YEAR 2008 (ppm) WCC PARKING (OPTION B)

Intersection	Averaging Period	Ambient AQ Background	Model Results		Total Modeled Conc.[a]		Standard
			AM	PM	AM	PM	
Peak Traffic Year 2008							
Route 100C at Sprain Brook Parkway Interchange	1-hour	5.9	3.0	3.7	8.9	9.6	35
	8-hour	2.0	2.1	2.6	4.1	4.6	9
Route 100C at Clearbrook Road/Walker Road	1-hour	5.9	1.1	2.3	7.0	8.2	35
	8-hour	2.0	0.8	1.6	2.8	3.6	9
Route 100C at Bradhurst Avenue	1-hour	5.9	2.6	4.2	8.5	10.1	35
	8-hour	2.0	1.8	2.9	3.8	4.9	9
Route 100C at Route 9A	1-hour	5.9	0.9	1.2	6.8	7.1	35
	8-hour	2.0	0.6	0.8	2.6	2.7	9

Notes: a. Ambient AQ Background + Model Results = Total Predicted Concentration.

TABLE 4.10-54. PREDICTED 1-HOUR AND 8-HOUR CO CONCENTRATIONS IN THE FUTURE WITH THE PROJECT– WITH CROTON PROJECT AT EASTVIEW SITE PEAK TRAFFIC YEAR 2008 (ppm) WCC AND LANDMARK SPLIT PARKING (OPTION C)

Intersection	Averaging Period	Ambient AQ Background	Model Results		Total Modeled Conc.[a]		Standard
			AM	PM	AM	PM	
Peak Traffic Year 2008							
Route 100C at Sprain Brook Parkway Interchange	1-hour	5.9	2.8	3.4	8.7	9.3	35
	8-hour	2.0	2.0	2.4	4.0	4.4	9
Route 100C at Clearbrook Road/Walker Road	1-hour	5.9	0.9	2.1	6.8	8.0	35
	8-hour	2.0	0.6	1.5	2.6	3.5	9
Route 100C at Bradhurst Avenue	1-hour	5.9	2.4	3.8	8.3	9.7	35
	8-hour	2.0	1.7	2.7	3.7	4.7	9
Route 100C at Route 9A	1-hour	5.9	1.1	1.5	7.0	7.4	35
	8-hour	2.0	0.8	1.1	2.8	3.1	9

Notes: a. Ambient AQ Background + Model Results = Total Predicted Concentration.

TABLE 4.10-55. PREDICTED 1-HOUR AND 8-HOUR CO CONCENTRATIONS IN THE FUTURE WITH THE PROJECT– WITH CROTON PROJECT AT EASTVIEW SITE PEAK TRAFFIC YEAR 2008 (ppm) PARKING AT LANDMARK AND HOME DEPOT (OPTION D)

Intersection	Averaging Period	Ambient AQ Background	Model Results		Total Modeled Conc.[a]		Standard
			AM	PM	AM	PM	
Peak Traffic Year 2008							
Route 100C at Sprain Brook Parkway Interchange	1-hour	5.9	2.5	3.0	8.4	8.9	35
	8-hour	2.0	1.8	2.1	3.8	4.1	9
Route 100C at Clearbrook Road/Walker Road	1-hour	5.9	1.1	2.0	7.0	7.9	35
	8-hour	2.0	0.8	1.4	2.8	3.4	9
Route 100C at Bradhurst Avenue	1-hour	5.9	2.1	2.5	8.0	8.4	35
	8-hour	2.0	1.5	1.8	3.5	3.8	9
Route 100C at Route 9A	1-hour	5.9	1.1	1.5	7.0	7.4	35
	8-hour	2.0	0.8	1.1	2.8	3.1	9

Notes: a. Ambient AQ Background + Model Results = Total Predicted Concentration.

TABLE 4.10-56. 8-HOUR CO CONCENTRATIONS AND CEQR DE MINIMIS CRITERIA FUTURE WITH THE PROJECT – WITH CROTON PROJECT AT EASTVIEW SITE PEAK TRAFFIC YEAR 2008 LANDMARK PARKING (OPTION A)

Intersection	Averaging Period	No Build Conc.[a]		BUILD CONC.[A]		Project Increment [b]		*De Minimis* Criteria[c]	
		AM	PM	AM	PM	AM	PM	AM	PM
Peak Traffic Year 2008									
Route 100C at Sprain Brook Parkway Interchange	8-hour	3.7	4.0	3.8	4.1	0.1	0.1	2.6	2.5
Route 100C at Clearbrook Road/Walker Road	8-hour	2.7	3.3	2.8	3.6	0.1	0.3	3.1	2.8
Route 100C at Bradhurst Avenue	8-hour	3.5	3.7	3.5	3.8	0.0	0.1	2.8	2.7
Route 100C at Route 9A	8-hour	2.8	3.1	2.8	3.3	0.0	0.2	3.1	2.9

Notes: [a] Includes Background. No build is without the UV Facility and with the Croton project
[b] the project increment is defined as the project build value minus the no build value. The project increment is below the *de minimus* criteria.
[c] See Section 3.10, Data Collection and Impact Methodologies, Air Quality for details on how this value is calculated.

TABLE 4.10-57. 8-HOUR CO CONCENTRATIONS AND CEQR *DE MINIMIS* CRITERIA FUTURE WITH THE PROJECT – WITH CROTON PROJECT AT EASTVIEW SITE WCC PARKING (OPTION B)

Intersection	Averaging Period	No Build Conc.[a]		Build Conc.[a]		Project Increment [b]		*De Minimis* Criteria[c]	
		AM	PM	AM	PM	AM	PM	AM	PM
Peak Traffic Year 2008									
Route 100C at Sprain Brook Parkway Interchange	8-hour	4.0	4.4	4.1	4.6	0.1	0.2	2.5	2.3
Route 100C at Clearbrook Road/Walker Road	8-hour	2.7	3.3	2.8	3.6	0.1	0.3	3.2	2.8
Route 100C at Bradhurst Avenue	8-hour	3.7	4.7	3.8	4.9	0.1	0.2	2.6	2.2
Route 100C at Route 9A	8-hour	2.6	2.8	2.6	2.8	0.0	0.0	3.2	3.1

Notes: [a] Includes Background. No build is without the UV Facility and with the Croton project.
[b] The project increment is defined as the project build value minus the no build value. The project increment is below the *de minimus* criteria.
[c] See Section 3.10, Data Collection and Impact Methodologies, Air Quality, for details on how this value is calculated.

TABLE 4.10-58. 8-HOUR CO CONCENTRATIONS AND CEQR DE MINIMIS CRITERIA FUTURE WITH THE PROJECT – WITH CROTON PROJECT AT EASTVIEW SITE WCC AND LANDMARK SPLIT PARKING (OPTION C)

Intersection	Averaging Period	No Build Conc.[a]		Build Conc.[a]		Project Increment[b]		*De Minimis* Criteria[c]	
		AM	PM	AM	PM	AM	PM	AM	PM
Peak Traffic Year 2008									
Route 100C at Sprain Brook Parkway Interchange	8-hour	3.7	4.2	4.0	4.0	0.3	0.2	2.6	2.4
Route 100C at Clearbrook Road/Walker Road	8-hour	2.6	3.3	2.6	3.5	0.0	0.2	3.2	2.8
Route 100C at Bradhurst Avenue	8-hour	3.6	4.5	3.7	4.7	0.1	0.2	2.7	2.2
Route 100C at Route 9A	8-hour	2.7	2.9	2.8	3.1	0.1	0.2	3.1	3.0

Notes: [a] Includes Background. No build is without the UV Facility and with the Croton project.
[b] The project increment is defined as the project build value minus the no build value. The project increment is below the *de minimus* criteria.
[c] See Section 3.10, Data Collection and Impact Methodologies, Air Quality, for details on how this value is calculated.

TABLE 4.10-59. 8-HOUR CO CONCENTRATIONS AND CEQR DE MINIMIS CRITERIA FUTURE WITH THE PROJECT – WITH CROTON PROJECT AT EASTVIEW SITE LANDMARK AND HOME DEPOT PARKING (OPTION D)

Intersection	Averaging Period	No Build Conc.[a]		Build Conc.[a]		Project Increment[b]		*De Minimis* Criteria[c]	
		AM	PM	AM	PM	AM	PM	AM	PM
Peak Traffic Year 2008									
Route 100C at Sprain Brook Parkway Interchange	8-hour	3.7	4.0	3.8	4.1	0.1	0.1	2.6	2.5
Route 100C at Clearbrook Road/Walker Road	8-hour	2.7	3.3	2.8	3.4	0.1	0.1	3.1	2.8
Route 100C at Bradhurst Avenue	8-hour	3.5	3.7	3.5	3.8	0.0	0.1	2.7	2.6
Route 100C at Route 9A	8-hour	2.8	3.1	2.8	3.1	0.0	0.0	3.1	2.9

Notes: [a] Includes Background. No build is without the UV Facility and with the Croton project.
[b] The project increment is defined as the project build value minus the no build value. The project increment is below the *de minimus* criteria.
[c] See Section 3.10, Data Collection and Impact Methodologies, Air Quality, for details on how this value is calculated.

Particulate Matter (PM_{10}). As indicated in Tables 4.10-60 to 4.10-63, the predicted concentrations of $PM_{10,}$ for the construction year 2008 for each separate parking option are below the corresponding ambient air quality standards. Both the 24-hour and annual averaging periods for each modeled intersection are in compliance with the standard. Therefore, it can be concluded that there would be no significant impacts for PM_{10} in the Future With the Project and with the Croton project at the Eastview Site.

TABLE 4.10-60. PREDICTED 24-HOUR AND ANNUAL PM_{10} CONCENTRATIONS IN THE FUTURE WITH THE PROJECT – WITH CROTON PROJECT AT EASTVIEW SITE PEAK TRAFFIC YEAR 2008 (µg/m^3) LANDMARK PARKING (OPTION A)

Intersection	Averaging Period	Ambient AQ Background	Model Results	Total Modeled Conc.[a]	Standard
Peak Traffic Year 2008					
Route 100C at Sprain Brook Parkway Interchange	24 hour	45	36	81	150
	Annual	21	13	34	50
Route 100C at Clearbrook Road/Walker Road	24 hour	45	33	78	150
	Annual	21	12	33	50
Route 100C at Bradhurst Avenue	24 hour	45	45	90	150
	Annual	21	14	35	50
Route 100C at Route 9A	24 hour	45	28	73	150
	Annual	21	10	31	50

Notes: a. Total Predicted Concentration = Ambient AQ Background + Model Results.

TABLE 4.10-61. PREDICTED 24-HOUR AND ANNUAL PM_{10} CONCENTRATIONS IN THE FUTURE WITH THE PROJECT – WITH CROTON PROJECT AT EASTVIEW SITE PEAK TRAFFIC YEAR 2008 (µg/m^3) WCC PARKING (OPTION B)

Intersection	Averaging Period	Ambient AQ Background	Model Results	Total Modeled Conc.[a]	Standard
Peak Traffic Year 2008					
Route 100C at Sprain Brook Parkway Interchange	24 hour	45	36	81	150
	Annual	21	13	34	50
Route 100C at Clearbrook Road/Walker Road	24 hour	45	33	78	150
	Annual	21	12	33	50
Route 100C at Bradhurst Avenue	24 hour	45	45	90	150
	Annual	21	15	36	50
Route 100C at Route 9A	24 hour	45	27	72	150
	Annual	21	9	30	50

Notes: a. Total Predicted Concentration = Ambient AQ Background + Model Results.

TABLE 4.10-62. PREDICTED 24-HOUR AND ANNUAL PM_{10} CONCENTRATIONS IN THE FUTURE WITH THE PROJECT – WITH CROTON PROJECT AT EASTVIEW SITE PEAK TRAFFIC YEAR 2008 (µg/m^3) WCC AND LANDMARK SPLIT PARKING (OPTION C)

Intersection	Averaging Period	Ambient AQ Background	Model Results	Total Modeled Conc.[a]	Standard
Peak Traffic Year 2008					
Route 100C at Sprain Brook Parkway Interchange	24 hour	45	36	81	150
	Annual	21	13	34	50
Route 100C at Clearbrook Road/Walker Road	24 hour	45	33	78	150
	Annual	21	12	33	50
Route 100C at Bradhurst Avenue	24 hour	45	45	90	150
	Annual	21	14	35	50
Route 100C at Route 9A	24 hour	45	28	73	150
	Annual	21	10	31	50

Notes: a. Total Predicted Concentration = Ambient AQ Background + Model Results.

TABLE 4.10-63. PREDICTED 24-HOUR AND ANNUAL PM_{10} CONCENTRATIONS IN THE FUTURE WITH THE PROJECT – WITH CROTON PROJECT AT EASTVIEW SITE PEAK TRAFFIC YEAR 2008 (µg/m^3) LANDMARK AND HOME DEPOT PARKING (OPTION D)

Intersection	Averaging Period	Ambient AQ Background	Model Results	Total Modeled Conc.[a]	Standard
Peak Traffic Year 2008					
Route 100C at Sprain Brook Parkway Interchange	24 hour	45	36	81	150
	Annual	21	13	34	50
Route 100C at Clearbrook Road/Walker Road	24 hour	45	33	78	150
	Annual	21	12	33	50
Route 100C at Bradhurst Avenue	24 hour	45	45	90	150
	Annual	21	14	35	50
Route 100C at Route 9A	24 hour	45	28	73	150
	Annual	21	10	31	50

Notes: a. Total Predicted Concentration = Ambient AQ Background + Model Results.

Fine Particulate Matter ($PM_{2.5}$). As indicated in Tables 4.10-64 to 4.10-67, the predicted incremental concentrations of $PM_{2.5}$ for the construction year 2008 for each parking option are below the corresponding interim guidance values. Therefore, the proposed project would not have significant $PM_{2.5}$ impacts in the Future With the Project with the Croton project at the Eastview Site.

TABLE 4.10-64. PREDICTED 24-HOUR AND ANNUAL $PM_{2.5}$ CONCENTRATIONS IN THE FUTURE WITH THE PROJECT WITH CROTON PROJECT AT EASTVIEW SITE PEAK TRAFFIC YEAR 2008 (µg/m^3) LANDMARK PARKING (OPTION A)

Intersection	Averaging Time	Predicted Conc.[a]		Project Increment[b]	Interim Guidance
		With Project	Without Project		
Peak Traffic Year 2008					
Grasslands Road (Rt. 100C) at Sprain Brook Parkway Interchange	24-hour	6.07	6.01	0.06	5
	Annual	0.29	0.28	0.01	0.1
Grasslands Road (Rt. 100C) at Clearbrook Rd/Walker Rd	24-hour	5.69	5.63	0.06	5
	Annual	0.22	0.22	0.0	0.1
Grasslands Road (Rt. 100C) at Bradhurst Avenue	24-hour	7.74	7.70	0.04	5
	Annual	0.30	0.29	0.01	0.1
Grasslands Road (Rt. 100C) at Sawmill River Road (Rt. 9A)	24-hour	4.70	4.66	0.04	5
	Annual	0.18	0.17	0.01	0.1

Notes:
a. Annual impacts are for neighborhood receptors.
b. The increment was calculated by subtracting $PM_{2.5}$ concentrations for the Future Without the Project and with the Croton project from the $PM_{2.5}$ concentrations for the Future With the Project and with the Croton project.

TABLE 4.10-65. PREDICTED 24-HOUR AND ANNUAL $PM_{2.5}$ CONCENTRATIONS IN THE FUTURE WITH THE PROJECT – WITH CROTON PROJECT AT EASTVIEW SITE PEAK TRAFFIC YEAR 2008 (µg/m^3) WCC PARKING (OPTION B)

Intersection	Averaging Time	Predicted Conc.[a]		Project Increment[b]	Interim Guidance
		With Project	Without Project		
Peak Traffic Year 2008					
Grasslands Road (Rt. 100C) at Sprain Brook Parkway Interchange	24-hour	6.07	6.02	0.05	5
	Annual	0.29	0.29	0.00	0.1
Grasslands Road (Rt. 100C) at Clearbrook Rd/Walker Rd	24-hour	5.62	5.56	0.06	5
	Annual	0.22	0.22	0.0	0.1
Grasslands Road (Rt. 100C) at Bradhurst Avenue	24-hour	7.87	7.79	0.08	5
	Annual	0.31	0.30	0.01	0.1
Grasslands Road (Rt.	24-hour	4.6	4.6	0.0	5

TABLE 4.10-65. PREDICTED 24-HOUR AND ANNUAL $PM_{2.5}$ CONCENTRATIONS IN THE FUTURE WITH THE PROJECT – WITH CROTON PROJECT AT EASTVIEW SITE
PEAK TRAFFIC YEAR 2008 (µg/m^3) WCC PARKING (OPTION B)

Intersection	Averaging Time	Predicted Conc.[a]		Project Increment[b]	Interim Guidance
		With Project	Without Project		
Peak Traffic Year 2008					
100C) at Sawmill River Road (Rt. 9A)	Annual	0.17	0.17	0.0	0.1

Notes:
a. Annual impacts are for neighborhood receptors.
b. The increment was calculated by subtracting $PM_{2.5}$ concentrations for the Future Without the Project and with the Croton project from the $PM_{2.5}$ concentrations for the Future With the Project and with the Croton project.

TABLE 4.10-66. PREDICTED 24-HOUR AND ANNUAL $PM_{2.5}$ CONCENTRATIONS IN THE FUTURE WITH THE PROJECT – WITH CROTON PROJECT AT EASTVIEW
PEAK TRAFFIC YEAR 2008 (µg/m^3)
WCC AND LANDMARK SPLIT PARKING (OPTION C)

Intersection	Averaging Time	Predicted Conc.[a]		Project Increment[b]	Interim Guidance
		With Project	Without Project		
Peak Traffic Year 2008					
Grasslands Road (Rt. 100C) at Sprain Brook Parkway Interchange	24-hour	6.07	6.02	0.05	5
	Annual	0.29	0.29	0.0	0.1
Grasslands Road (Rt. 100C) at Clearbrook Rd/Walker Rd	24-hour	5.67	5.61	0.06	5
	Annual	0.23	0.22	0.0	0.1
Grasslands Road (Rt. 100C) at Bradhurst Avenue	24-hour	7.81	7.78	0.06	5
	Annual	0.30	0.30	0.0	0.1
Grasslands Road (Rt. 100C) at Sawmill River Road (Rt. 9A)	24-hour	4.67	4.64	0.03	5
	Annual	0.17	0.17	0.00	0.1

Notes:
a. Annual impacts are for neighborhood receptors.
b. The increment was calculated by subtracting $PM_{2.5}$ concentrations for the Future Without the Project and with the Croton project from the $PM_{2.5}$ concentrations for the Future With the Project and with the Croton project.

TABLE 4.10-67. PREDICTED 24-HOUR AND ANNUAL $PM_{2.5}$ CONCENTRATIONS IN THE FUTURE WITH THE PROJECT – WITH CROTON PROJECT AT EASTVIEW PEAK TRAFFIC YEAR 2008 (µg/m^3) LANDMARK AND HOME DEPOT PARKING (OPTION D)

Intersection	Averaging Time	Predicted Conc.[a]		Project Increment[b]	Interim Guidance
		With Project	Without Project		
Peak Traffic Year 2008					
Grasslands Road (Rt. 100C) at Sprain Brook Parkway Interchange	24-hour	6.07	6.01	0.06	5
	Annual	0.29	0.28	0.01	0.1
Grasslands Road (Rt. 100C) at Clearbrook Rd/Walker Rd	24-hour	5.66	5.63	0.03	5
	Annual	0.22	0.22	0.0	0.1
Grasslands Road (Rt. 100C) at Bradhurst Avenue	24-hour	7.74	7.70	0.04	5
	Annual	0.30	0.29	0.01	0.1
Grasslands Road (Rt. 100C) at Sawmill River Road (Rt. 9A)	24-hour	4.66	4.66	0.00	5
	Annual	0.17	0.17	0.00	0.1

Notes:
a. Annual impacts are for neighborhood receptors.
b. The increment was calculated by subtracting $PM_{2.5}$ concentrations for the Future Without the Project and with the Croton project from the $PM_{2.5}$ concentrations for the Future With the Project and with the Croton project.

Construction Equipment Sources.

The source descriptions and emission rates are the same as those described previously for each source included in the individual construction analyses for the Croton project and proposed UV Facility. The sources were combined into a single multiple source modeling scenario and the results are presented below in Tables 4.10-68 and 4.10-69.

TABLE 4.10-68. UV FACILITY: RESULTS OF DISPERSION ANALYSIS FOR CONSTRUCTION ACTIVITIES – WITH CROTON PROJECT

Modeled Pollutant	Avg. Period	Units	Maximum Predicted Conc.		Back ground Conc. µg/m^3	Total Concentration		Ambient Air Quality Standards
			All Modeled Receptors[a]	All Sensitive Receptors		All Modeled Receptors[a]	All Sensitive Receptors	
NO_2	Annual	µg/m^3	5.26	4.60	58	63.4	62.6	100
SO_2	3-Hour	µg/m^3	0.53	0.45	183	183.5	183.5	1,300
	24-Hour	µg/m^3	0.13	0.08	120	12.8	120	365
	Annual	µg/m^3	0.01	0.007	26	2.6	26	80

TABLE 4.10-68. UV FACILITY: RESULTS OF DISPERSION ANALYSIS FOR CONSTRUCTION ACTIVITIES – WITH CROTON PROJECT

Modeled Pollutant	Avg. Period	Units	Maximum Predicted Conc.		Back ground Conc. µg/m^3	Total Concentration		Ambient Air Quality Standards
			All Modeled Receptors[a]	All Sensitive Receptors		All Modeled Receptors[a]	All Sensitive Receptors	
CO	1-Hour	µg/m^3	931	615	6,858	7,789	7,473	40,000
	8-Hour	µg/m^3	239	162	4,572	4,811	4,734	10,000
PM_{10}	24-Hour	µg/m^3	31.4	20.9	45	76	66	150
	Annual	µg/m^3	2.08	1.11	21	23	22	50

Notes: [a] Includes fenceline receptors. NO_X emissions are based on a NO_2 to NO_X ratio of 59%

As indicated in Table 4.10-68, the maximum predicted concentrations, (including background) of each criteria pollutant are below the corresponding air quality standards.

TABLE 4.10-69. UV FACILITY: PREDICTED $PM_{2.5}$ INCREMENTAL OF THE UV FACILITY CONSTRUCTION EQUIPMENT IN THE FUTURE WITH THE PROJECT WITH THE CROTON PROJECT

Modeled Pollutant	Averaging Period	Units	Maximum Predicted Concentration		Interim Guidance[d]
			All Modeled Receptors[a]	Sensitive Receptors	
$PM_{2.5}$	24-Hours	µg/m^3	6.09	0.96	5[b]
	Annual (Discrete)	µg/m^3	0.38	0.34	0.3[b]

Notes:
a. Includes fenceline receptors.
b. Values for a discrete location.
c. Values for a neighborhood analysis. This value is a conservative overestimate of the increment since it is equal to the total combined impact for $PM_{2.5}$.
d. The increment was calculated by subtracting $PM_{2.5}$ concentrations for the Future Without the Project and with the Croton project from the $PM_{2.5}$ concentrations for the Future With the Project and with the Croton project.

As indicated in Table 4.10-69, the predicted UV Facility incremental concentrations of $PM_{2.5}$ for the construction year 2008 are below the corresponding interim guidance values.

The NAAQS for $PM_{2.5}$ is not presented in Table 4.10-69. This is because NYSDEC and the USEPA have not made compliance determinations with respect to the NAAQS for $PM_{2.5}$. NYCDEP is employing interim guidance criteria for evaluating the significance of potential $PM_{2.5}$ concentrations from NYCDEP projects under environmental review. The interim guidance criteria for determining the potential for significant adverse impacts from $PM_{2.5}$ are as follows:

- Predicted incremental impacts of $PM_{2.5}$ greater than 5 $\mu g/m^3$ averaged over a 24-hour (daily) period at a discrete location of public access, either at ground or elevated levels (microscale analysis); or
- Predicted incremental ground-level impacts of $PM_{2.5}$ greater than 0.1 $\mu g/m^3$ on an annual average neighborhood-scale basis (i.e., the computed annual concentration averaged over receptors placed over a one kilometer by one kilometer grid, centered around the location where the maximum impact is predicted).
- In addition, NYSDEC consider incremental impacts of $PM_{2.5}$ greater than 0.3 $\mu g/m^3$ from stationary sources at any discrete ground-level or elevated locations as having potential for a significant impact.

For a comparison of the potential construction impacts from both NYCDEP projects to the "pure" No Build or Future Without the Project without Croton project, see Section 4.21, Combined Impacts.