FINAL SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE CROTON PROJECT AT THE EASTVIEW SITE

5.11. AIR QUALITY

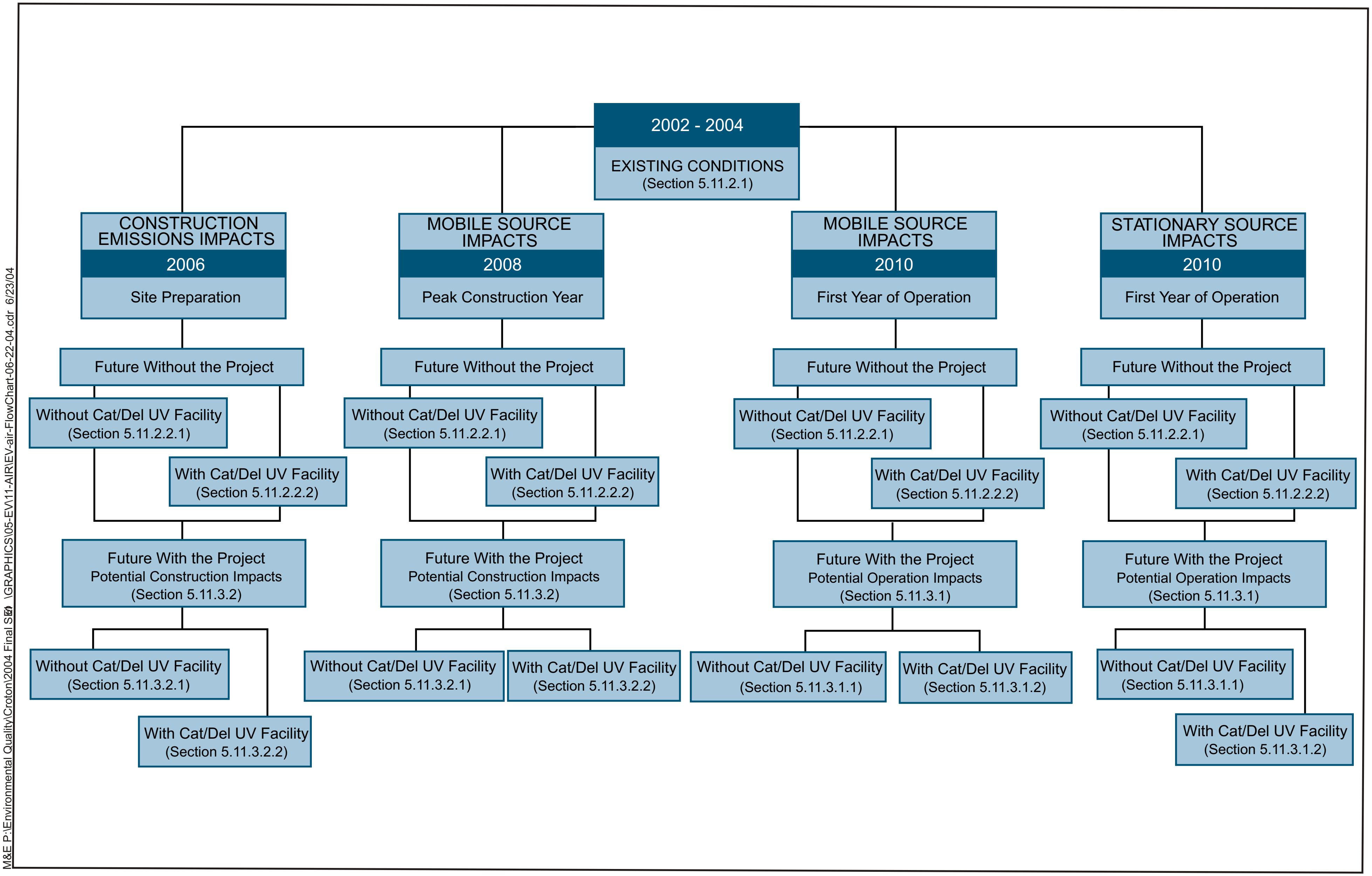
5.11.1. Introduction

This air quality section assesses the anticipated air quality impacts associated with the proposed Croton Water Treatment Plant (Croton project) at the Eastview Site. The potential impacts from mobile and stationary from construction and operation of the proposed Croton project are presented. Mobile sources included vehicular traffic on public streets and roads. Stationary sources included the proposed Croton project's boiler system used to supply heat and hot water and the emergency electric-generation system. The stationary sources of construction activities included exhaust from construction equipment and vehicles. Fugitive particulate (dust) sources included land clearing and excavation activities, and on-site vehicle travel associated with construction activities. The methodology, as well as the pollutants of concern, the applicable air quality standards, and the potential impact criteria, are presented in the Section 4.11, Data Collection and Impact Methodologies, Air Quality. 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 5.11-1.

The methodology and results of the air dispersion modeling performed for the mobile and stationary sources are presented. Dispersion modeling was utilized to assess the effects of: (1) emissions from mobile sources; (2) emissions from stationary operational sources; and (3) emissions from construction sources. Mobile source dispersion modeling analyses were conducted for Future Without the Project and Potential Project Impacts scenarios. Project mobile source increments were determined by subtracting the Future Without the Project scenario from Potential Project Impact scenarios (i.e., Build – No Build = Project Increments). The peak project impact year from either construction or operations was used, in order to be conservative.

The criteria air pollutants of concern include carbon monoxide, particulate matter less than 10 micron in aerodynamic diameter, sulfur dioxide, and nitrogen dioxide. Impacts of toxic air contaminants from stationary combustion sources were also considered. Potential project impacts were compared to the applicable standards or guidelines to evaluate whether such predicted impacts would be considered potentially significant.

In addition to these analyses for the criteria pollutants and toxic air contaminants, an air quality analysis was performed to evaluate the potential impacts of particulate matter less than 2.5 micron in aerodynamic diameter ($PM_{2.5}$). A microscale analysis was conducted for 24-hour $PM_{2.5}$ impacts. A neighborhood analysis was conducted for annual $PM_{2.5}$ impacts.



Air Quality Framework of Analysis

Flowchart 5.11-1

5.11.2. Baseline Conditions

5.11.2.1. 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 for calendar year 2002. Monitoring data from the air monitoring stations closest to the water treatment plant site were used to characterize background air quality levels of criteria air pollutants.

Figure 5.11-1 shows the locations of the ambient air quality monitoring stations.

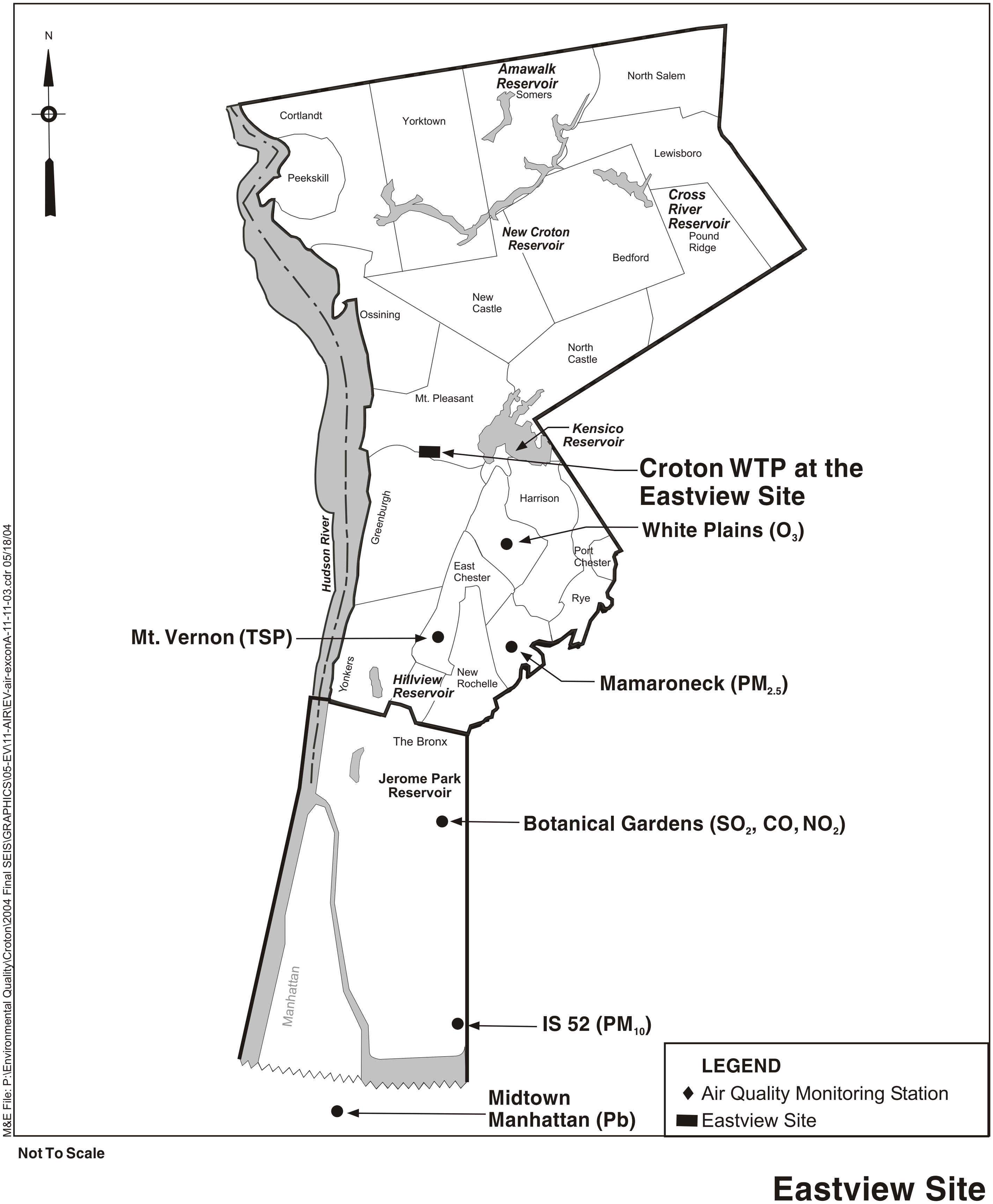
Mamaroneck, 11 miles to the south-southeast, is the nearest particulate matter smaller than 2.5 microns ($PM_{2.5}$) ambient air monitoring station to the water treatment plant site. Ambient air $PM_{2.5}$ data for the water treatment plant site were obtained from Mamaroneck.

IS 52, located 18.5 miles south-southwest of the water treatment plant site, is the nearest particulate matter smaller than 10 microns (PM_{10}) ambient air monitoring station to the water treatment plant site. Ambient air PM_{10} data for the water treatment plant site were obtained from the IS 52 station, located at 681 Kelly Street, Bronx, NY, were used as the background values for PM_{10}.

Mount Vernon, 12 miles to the south, is the nearest Total Suspended Particulates (TSP) ambient air monitoring station to the water treatment plant site. Ambient air TSP data for the water treatment plant site were obtained from Mount Vernon. TSP is no longer federally regulated; 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 water treatment plant 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 water treatment plant site at 3.5 miles to the east-southeast, conducts ozone monitoring.

The latest monitoring data for lead is obtained from the Midtown Manhattan ambient air monitoring station (24 miles to the south-southwest of the water treatment plant 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 ratios. This has greatly reduced the need for ambient air monitoring for lead.



Not To Scale

Eastview Site
NYSDEC Ambient Air Monitoring Stations

Table 5.11-1 summarizes the location of the monitoring stations, list of criteria pollutants, and year 2002 ambient air quality monitoring data representative of air quality in the vicinity of the water treatment plant site. A comparison of the monitored ambient levels in this table with the corresponding standards reveals that none, with the exception of ozone, of the Federal and State standards were exceeded. As discussed in Section 4.11, Data Collection and Impact Methodologies, Air Quality, the water treatment plant site lies within a "severe" non-attainment area for ozone (O_3). The site alternative is located in an attainment area or unclassified area with respect to the other criteria pollutants.

Background Data for Criteria Pollutants. The monitored background levels of the principal pollutants of concern for construction, mobile and stationary source air quality modeling analysis are SO_2, NO_2, CO and PM_{10}. Background air quality data is based on the most recent five years of available NYSDEC monitoring data, 1998 through 2002. The highest annual averages measured over the latest available 5-year period were used to determine the annual average background levels for (i.e., CO and NO_2). For SO_2, only three years of monitoring data were available for background. Three years is used for the PM_{10} and $PM_{2.5}$ background. For averaging times shorter than one year (e.g., 1-hour, 3-hour, 8-hour and 24-hour periods), the background values for three pollutants (i.e., CO, SO_2 and PM_{10}) are the values collected for at least a three-year period. Table 5.11-2 summarizes the background values for the water treatment plant site.

TABLE 5.11-1. AIR QUALITY MONITORING DATA FOR YEAR 2002[1]

Pollutant	Monitoring Station	Averaging Period[2]	Ambient Standard	Measured Conc.	
				Highest	2nd Highest
Sulfur Dioxide, μg/m³ (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/m³ (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[3], μg/m³ (ppm)	Water District Pumping Station Garage, Orchard Street, White Plains	1 hour	235 (0.12)	306 (0.156)	260 (0.133)
Nitrogen Dioxide, μg/m³ (ppm)	Botanical Gardens, 200th Street & SE Blvd., Bronx	Annual	100 (0.053)	53 (0.028)	- -
Lead[4] μg/m³	Midtown Madison Avenue (47th – 48th Streets), Manhattan	3 month	1.5	0.13	0.12
Total Suspended Particulates[5] μg/m³	Mt. Vernon 260 South Sixth Ave. Mt. Vernon, NY	Annual	75	33	- -
		24-hour	250	78	76

TABLE 5.11-1. AIR QUALITY MONITORING DATA FOR YEAR 2002[1]

Pollutant	Monitoring Station	Averaging Period[2]	Ambient Standard	Measured Conc.	
				Highest	2nd Highest
Inhalable Particulates, PM_{10} µg/m³	I.S. 52 681 Kelly Street Bronx, NY	Annual	50	21	- -
		24 hour	150	91[6]	45
Respirable Particulates, $PM_{2.5}$ µg/m³	Mamaroneck, NY Thruway Exit 9 Service Area	Annual	15	11.8	- -
		24-hour	65	33.1	33.0

Notes:
[1] Source: New York State Department of Environmental Conservation. 2002. Annual New York State Air Quality Report, Ambient Air Monitoring System. New York, NY.
[2] 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.
[3] 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.
[4] Monitoring for lead was discontinued after 1998.
[5] The 24-hour NYS standard is 250 µg/m³. TSP is no longer a federally regulated pollutant. TSP data is for 1998; monitoring was discontinued after 12/31/1998.
[6] The highest value of 91µg/m³ exceeds the second highest value by more than 100 percent and is not considered statistically representative. It is shown as reported, but it is not used in this analyses.

Abbreviations:
ppm = parts per million
µg/m³=micrograms per cubic meter
1 ppm nitrogen dioxide = 1,880 µg/m³
1 ppm sulfur dioxide = 2,610 µg/m³

TABLE 5.11-2. SUMMARY OF THE SELECTED AMBIENT AIR MONITORING DATA FOR BACKGROUND POLLUTANT CONCENTRATION.

Pollutant		Monitoring Station	1998	1999	2000	2001	2002
SO_2	3-hour	Botanical Garden	--	--	162 µg/m^3 (0.062 ppm)	**183** µg/m^3 (**0.070** ppm)	146 µg/m^3 (0.056 ppm)
	24 hours		--	--	99 µg/m^3 (0.038 ppm)	**120** µg/m^3 (**0.046** ppm)	97 µg/m^3 (0.037 ppm)
	Annual		--	--	*23 µg/m^3 (0.009 ppm)	**26** µg/m^3 (**0.010** ppm)	23 µg/m^3 (0.009 ppm)
NO_2	Annual	Botanical Garden	56 µg/m^3 (0.030 ppm)	54 µg/m^3 (0.029 ppm)	54 µg/m^3 (0.029 ppm)	**58** µg/m^3 (**0.031** ppm)	53 µg/m^3 (0.028 ppm)
CO	1-hour	Botanical Garden	5372 µg/m^3 (4.7 ppm)	6515 µg/m^3 (5.7 ppm)	**6858** µg/m^3 (**6.0** ppm)	5601 µg/m^3 (4.9 ppm)	4,229 µg/m^3 (3.7 ppm)
	8- hours		3658 µg/m^3 (3.2 ppm)	**4572** µg/m^3 (**4.0** ppm)	4001 µg/m^3 (3.5 ppm)	3,086 µg/m^3 (2.7 ppm)	2,400 µg/m^3 (2.1 ppm)
PM_{10}	24 hours	IS 52	--	22.0 µg/m^3	45.0 µg/m^3	42.0 µg/m^3	**45.0** µg/m^3
	Annual		--	16.0 µg/m^3	21.0 µg/m^3	21.0 µg/m^3	**21.0** µg/m^3

Note:
-- denotes air sampling did not occur or monitoring data is not available.
Bold Text denotes highest value (maximum 2nd high for 1-hr, 3-hr, 8-hr, and 24-hr data) in last 5 years.
* denotes data captured is less than 75 percent.
Source:
State of New York Department of Environmental Conservation, Air Quality Reports for Calendar Years 1998 to 2002.

5.11.2.1.1. Mobile Sources

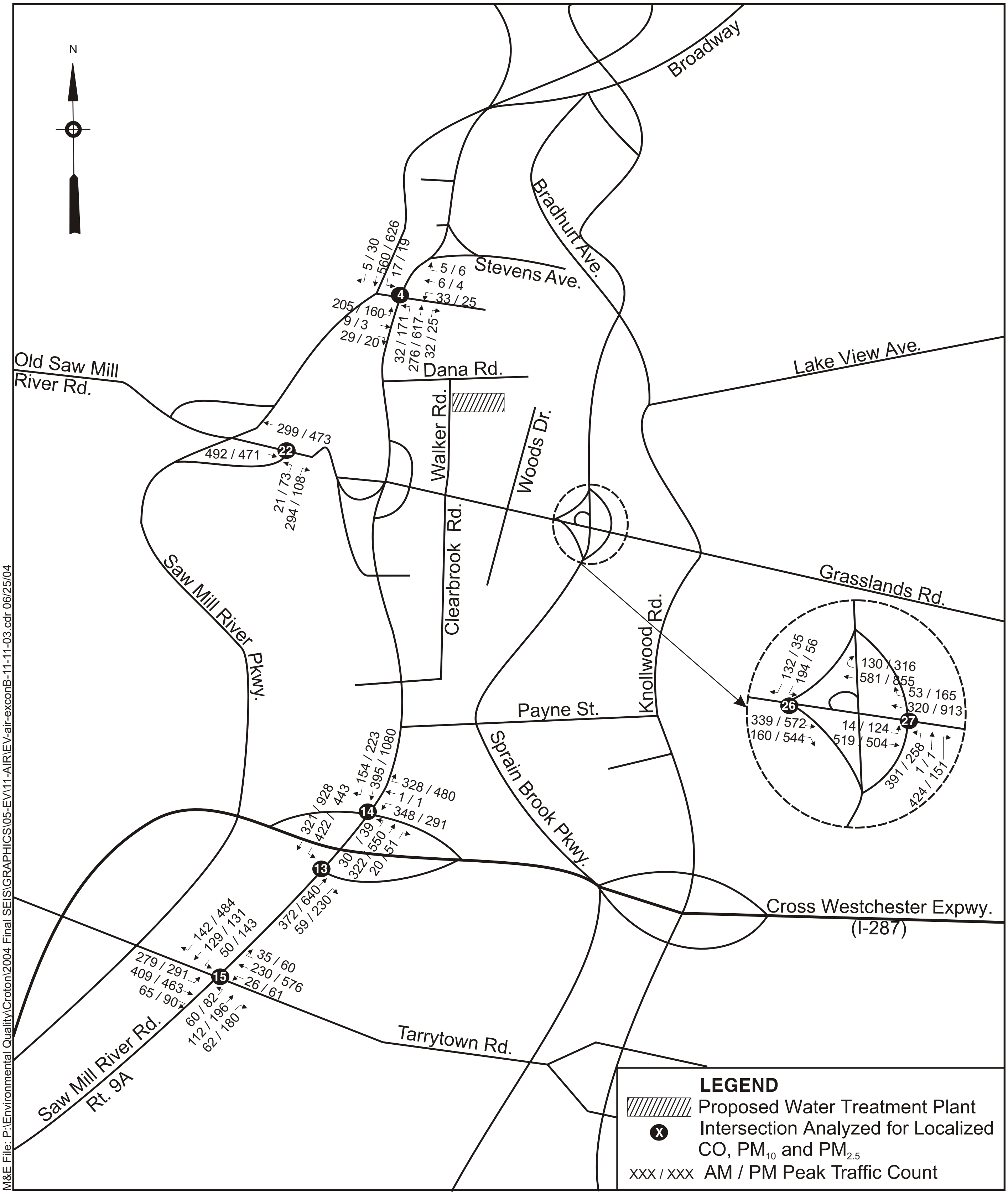
Air quality impacts from motor vehicles can have localized or microscale effects on ambient air quality for CO and PM_{10}. For $PM_{2.5}$, short-term (24 hours) impacts, a microscale analysis was conducted, and for annual (long-term) impacts, a neighborhood analysis was deemed more representative. Therefore, a quantified analysis of the potential CO, PM_{10} and $PM_{2.5}$ impacts from the sources most likely to affect the communities (on-street vehicular traffic) was performed.

Traffic monitoring was conducted in 2002 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 4.11, Data Collection and Impact Methodologies and Section 5.9, Traffic and Transportation Analysis). The intersections with the worst level of service (LOS), the highest total traffic volumes and highest number of induced traffic were considered in selecting the worst intersection for detailed dispersion modeling analysis (Figure 5.11-2). Five of the intersections considered are presented in Table 5.11-3.

A mobile source analysis of the worst intersection (No. 26/27, Grasslands Road (Rt. 100C) and Sprain Brook Parkway NB/SB Ramps) was conducted for CO, PM_{10} and $PM_{2.5}$ for the Potential Project Impact / Future Without the Project (Build/No Build) scenarios. Impacts were modeled at this location based on the predicted traffic volumes and patterns forecast for the year 2008 construction scenario. If the worst intersection complies with the standard and *de minimis* values, it was assumed that other intersections would also comply with the impact criteria.

TABLE 5.11-3. INTERSECTIONS CONSIDERED FOR EASTVIEW SITE

Intersection Number	Top Ranking	Intersection Name		AM Peak Hour			PM Peak Hour			Project-related Construction Peak Hour	
				Volume vph	Delay seconds	LOS Total	Volume vph	Delay seconds	LOS Total	Cars vph	Trucks vph
15	1	Saw Mill River Road (Rt. 9A) and Tarrytown White Plains Rd. (Rt. 119)		3160	58.5	E	3300	243.6	F	83	6
13 / 14	2	Saw Mill River Road (Rt. 9A) and Cross Westchester Exp. (I-287) WB / EB Ramps	WB	2883	745.7	F	2753	515.4	F	83	6
			EB	1836	18.2	C	2481	231.1	F	83	6
26 / 27	3	Grasslands Road (Rt. 100C) and Sprain Brook Parkway NB / SB Ramp	NB	2323	22.2	C	1909	15.5	B	306	2
			SB	2859	261.5	F	2460	311.8	F	185	0
4	4	Broadway (Rt. 9A) and Saw Mill River Pkwy Ramps To Mid Westchester Exec. Park		3138	33.6	C	2266	83.7	F	27	2
22	5	Old Saw Mill River Road and Saw Mill River Parkway NB Off / On Ramps		1982	664.3	F	1781	19.2	C	116	0



Not To Scale

Eastview Site Intersections Considered for Air Quality Mobile Source Analysis

Croton Water Treatment Plant

Figure 5.11-2

5.11.2.1.2. Stationary Sources

Currently there are no stationary sources at the project site.

5.11.2.2. Future Without the Project

The Future Without the Project mobile source analysis was conducted for the anticipated peak construction traffic year, 2008. In 2008 construction related traffic would be anticipated to be at the maximum, and would be greater than for operations of the project or any other construction year. Therefore, Future Without Project mobile source impacts are analyzed for year 2008. For the stationary sources the construction impacts were analyzed for 2006, whereas operational stationary sources were analyzed for 2010, the planned first year of operation.

For each of the analyzed years, two scenarios are assessed: one in which the NYCDEP Catskill Delaware Ultraviolet Light Disinfection Facility (Cat/Del UV Facility) is not included on the Eastview Site and another in which the Cat/Del UV Facility is included in the site analysis. The Cat/Del UV Facility would be located in the southeastern area of the Mount Pleasant parcel. It should be noted that the Eastview Site is the only location under consideration for the Cat/Del UV Facility. This scenario is being carried because the Cat/Del UV Facility has not yet received its necessary approvals from the Towns of Mount Pleasant or Greenburgh or other approval entities.

Two additional NYCDEP projects (a Police Precinct and possibly an Administration Building[1]) could be located on the Eastview Site. The Administration Building is less certain and the Eastview Site is one of several properties currently being evaluated as a possible site for that particular building. In addition to these projects, NYCDEP's Kensico-City Tunnel (KCT) may be under construction at the Eastview Site starting in 2009. The generic impacts associated with the KCT are discussed in Section 3.8.2, Treated Water Conveyance Alternatives. All of these NYCDEP projects are included in the analysis for this Final SEIS to the extent to which information is available. The location and size of these projects have not been determined for the Administration Building and for the KCT. The Police Precinct may be located in the southwest corner of the Mount Pleasant parcel, but its size has not been determined. They are all separate actions from the proposed project and will undergo their own independent environmental reviews.

5.11.2.2.1. Without Cat/Del UV Facility at Eastview Site

Mobile Sources. In the Future Without the Project, a mobile source air quality analysis was conducted for the anticipated peak year of construction activities (2008). The year 2008 was chosen because it is the period when the highest volumes of construction related trucks and vehicles are anticipated. Maximum predicted increases in $PM_{2.5}$ concentrations during other years from construction related traffic are anticipated to be lower than those calculated for 2008. Project induced traffic from operation would be less than the screening criteria, so the Future

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[1] This depends on the results of a siting evaluation which is currently ongoing. The siting decision will be evaluated and discussed as part of a separate independent environmental review.

Without the Project without the Cat/Del UV Facility scenario for project operation was not analyzed. The methodology for the localized pollutant analysis is discussed in Section 4.11, Data Collection and Impact Methodologies. Localized pollutant impacts from the vehicles were analyzed for the 8-hour CO concentrations, and 24-hour and annual PM_{10} concentrations.

The analysis for each pollutant involved a two-step process. First, the pollutant emission rate was determined, and then the dispersion model was run using the calculated emission rate. MOBILE6.2 emission factors and projected traffic volumes for 2008 were used as inputs to the CAL3QHC and CAL3QHCR dispersion models, along with the local vehicle fleet classifications from the 2002 traffic study. Future CO, $PM_{2.5}$ and PM_{10} pollutant levels without the project were estimated for the selected intersection.

Carbon Monoxide. To determine motor-vehicle-generated Carbon Monoxide (CO) concentrations adjacent to the streets near the proposed Croton project, the CAL3QHC model was applied. Maximum 1- and 8-hour CO concentrations were determined using USEPA's CAL3QHC model version 2 (*User's Guide to CAL3QHC, A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections*, Office of Air Quality, Planning Standards, USEPA, Research Triangle Park, North Carolina). CO impacts from traffic were predicted using a two step methodology. First, emission factors were calculated using data from the traffic study. A dispersion model then used these emission factors to calculate downwind CO impacts.

The CAL3QHC model predicted 1-hour CO impacts from traffic. To ensure that the maximum impacts were captured, impacts were calculated for a range of meteorological conditions and wind directions. Following USEPA guidelines (*Guideline for Modeling Carbon Monoxide from Roadway Intersections, USEPA-454/R-92-005*, 1992) the persistence factor of 0.7 was used to convert the results from 1-hour averaging time periods to 8-hour averaging time periods, consistent with the standard. Background CO concentration levels were added to the predicted impacts and compared with the standard.

The results of CAL3QHC dispersion modeling (i.e., the resultant 1-hour value was adjusted to 8-hour averaging times) were added to the predicted background concentrations, and then compared to the 8-hour ambient air quality standard for CO. Table 5.11-4 shows the results of CO modeling for years 2008.

TABLE 5.11-4. PREDICTED CO 1-HOUR AND 8-HOUR CONCENTRATIONS FOR THE FUTURE WITHOUT THE PROJECT WITHOUT UV FACILTY CONDITIONS PEAK YEAR 2008 (PPM)

Intersection	Averaging Time	Ambient AQ Background[1]	Model Result		Total Predicted Conc.[1]		Standard
			AM	PM	AM	PM	
Peak Traffic Year 2008							
Grasslands Road (Rt. 100C) and 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

Note:
[1] Total Predicted Concentration = Ambient AQ Background + Model Results.

Particulate Matter (PM_{10}). PM_{10} impacts from traffic were determined using the 2-model methodology similar to that used for CO. Emission factors were calculated using data from the traffic study and the MOBILE6.2 emissions model.

MOBILE6.2 emission factors, projected 24-hour traffic volumes and five years of hourly meteorological data were used as inputs to the CAL3QHCR dispersion model to estimate impacts to the nearby intersection. Background PM_{10} concentrations from the nearest air quality monitoring station, which is IS 52, were added to the predicted impacts. Table 5.11-5 presents the PM_{10} results for 2008. The 24-hour PM_{10} standard is 150 $\mu g/m^3$ and the annual standard is 50 $\mu g/m^3$. No exceedances of the 24-hour or annual PM_{10} standards were predicted.

TABLE 5.11-5. PREDICTED PM10 24-HOUR AND ANNUAL CONCENTRATIONS DURING FUTURE WIHTOUT THE PROJECT WITHOUT UV FACILTY CONDITIONS PEAK YEAR 2008 (µG/M3)

Intersection	Averaging Time	Ambient AQ Background[2]	Model Result	Total Predicted Conc.[1]	Standard
Peak Traffic Year 2008					
Grasslands Road (Rt. 100C) and Sprain Brook Parkway Interchange	24-Hour	45	35	80	150
	Annual	21	13	34	50

Note:
[1] Total Predicted Concentration = Ambient AQ Background + Model Results.

Fine Particulate Matter Analysis. Although USEPA currently does not offer specific guidance for modeling $PM_{2.5}$ impacts from mobile sources, the methodology described below was developed based on existing USEPA approved methods for other mobile source modeling that are discussed in the *CEQR Technical Manual*, USEPA documents describing the general approach to $PM_{2.5}$ regulation, USEPA $PM_{2.5}$ monitoring station location guidance[2] and the working guidance currently still under development by NYCDEP and NYSDEC. The general approach is to predict the highest concentrations anticipated that would represent a neighborhood scale exposure level.

Vehicular $PM_{2.5}$ emission factors for the 2008 were derived using the MOBILE6.2 emissions model. For the microscale analysis sources of particulate included running exhaust, brake and tire wear, and road dust. Only running exhaust was included for the neighborhood analysis.

The CAL3QHCR model was used to predict $PM_{2.5}$ concentrations at receptor locations. Maximum daily and annual average concentrations were calculated by the model using five years of hourly meteorological data. Receptors for the annual, neighborhood scale model 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.

To determine the predicted $PM_{2.5}$ increment from project mobile sources, the net differences in the predicted $PM_{2.5}$ results were obtained by subtracting the model results of the Future Without the Project 2008 scenario from the results of the Project Construction Impact 2008 scenario. Table 5.11-6 presents the $PM_{2.5}$ modeled concentrations for the Future without the Project scenario for the years 2008.

TABLE 5.11-6. PREDICTED $PM_{2.5}$ 24-HOUR AND ANNUAL CONCENTRATIONS FOR THE FUTURE WITHOUT THE PROJECT WITHOUT UV FACILTY PEAK YEAR 2008 (μg/m^3)

Intersection	Averaging Time	Model Result
Peak Traffic Year 2008		
Grasslands Road (Rt. 100C) and Sprain Brook Parkway Interchange	24-Hour	5.96
	Annual	0.28

Stationary Sources. In Future Without the Project years 2006 and 2010, the concentrations of stationary source-related pollutants PM_{10}, $PM_{2.5}$, SO_2, CO and NO_2, are assumed to remain at the same levels as determined for the existing conditions. Newly promulgated diesel exhaust regulations are anticipated to reduce future ambient concentrations of fine particulate, including $PM_{2.5}$, but the effects are not quantified.

[2] *Guidance for Network Design and Optimum Site Exposure for $PM_{2.5}$ and PM_{10}*; EPA-454/R-99-022

Two additional NYCDEP projects (a Police Precinct and possibly an Administration Building[3]) could be located on the Eastview Site. The Administration Building is less certain and the Eastview Site is one of several properties currently being evaluated as a possible site for that particular building. In addition to these projects, NYCDEP's Kensico-City Tunnel (KCT) may be under construction at the Eastview Site starting in 2009. The generic impacts associated with the KCT are discussed in Section 3.8.2, Treated Water Conveyance Alternatives. All of these NYCDEP projects are included in the analysis for this Final SEIS to the extent to which information is available. The location and size of these projects have not been determined for the Administration Building and for the KCT. The Police Precinct may be located in the southwest corner of the Mount Pleasant parcel, but its size has not been determined. They are all separate actions from the proposed project and will undergo their own independent environmental reviews.

5.11.2.2.2. With Cat/Del UV Facility at Eastview Site

Mobile Sources. In the Future Without the Project With Cat/Del UV Facility, 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. Particulate matter analyses were not conducted in the build year 2010, because all intersections are under the CEQR screening threshold for PM.

Carbon Monoxide. As indicated in Table 5.11-7, 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 5.11-7. PREDICTED CO 1-HOUR AND 8-HOUR CONCENTRATIONS IN THE FUTURE WITHOUT THE PROJECT WITH UV FACILTY BUILD YEAR 2010 (PPM)

Intersection	Averaging Period	Ambient AQ Background	Model Result		Total Predicted Conc.[1]		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

Notes:
[1] Total Predicted Concentration = Ambient AQ Background + Model Results.

Stationary Sources. This section identifies the operations that have the potential to emit regulated air pollutants for the Cat/Del UV Facility, and examines each potential stationary

[3] This depends on the results of a siting evaluation which is currently ongoing. The siting decision will be evaluated and discussed as part of a separate independent environmental review.

emission source. Stationary sources with the potential to emit regulated air pollutants include boilers utilizing interruptible natural gas and emergency diesel generators. Table 5.11-8 summarizes the emission sources at the Cat/Del UV Facility.

TABLE 5.11.8. CAT/DEL UV FACILITY: EMISSION SOURCES

Source	**Boilers**	**Emergency Generators**
Fuel	Natural Gas/ Diesel	Diesel
Number of Units	3	4
Operating Units	2	4 on standby
Rating	16.75 MMBtu/hr	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

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.

NO_x is formed during combustion. Some NO_x is NO_2, a regulated criteria pollutant. Atmospheric reactions can also convert NO_x to NO_2. For the project area, the ratio of NO_2 to NO_x is 0.59.

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 manufacturer's data. Boiler emissions and operating schedule are shown in Table 5.11-9.

TABLE 5.11-9. CAT/DEL UV FACILITY: BOILER EMISSIONS[1]

Fuel In Use	**Average Pounds per Hour (each boiler)**			
	NO_2	**CO**	**SO_2**	**PM[3]**
Fuel Oil[2]	4.18	1.17	6.4	0.14
Natural Gas	2.01	2.51	0.02	0.17
Annual Average Emission Rate	1.54	1.63	0.70	0.11
Annual Average Emissions for All Boilers (tons per year)	11.8	12.5	5.4	0.84

TABLE 5.11-9. CAT/DEL UV FACILITY: BOILER EMISSIONS[1]

Fuel In Use	Average Pounds per Hour (each boiler)			
	NO_2	CO	SO_2	PM[3]

Notes:
[1] 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
[2] For No. 2 fuel oil it was assumed that the sulfur content was equal to 0.37 percent
[3] 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.
[4] $PM_{2.5}$ emissions for fuel oil are 42 % of total PM or 0.14 lbs/hr (see AP-42, Table 1.3-7)

Combustion of natural gas and fuel oil 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 "Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume 1: Stationary Point and Area Sources." Sections 1.3, "Fuel Oil Combustion" and 1.4, "Natural Gas Combustion," provide emission factors used to estimate TACs from the Eastview Croton project boilers. 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 are shown in Table 5.11-10.

TABLE 5.11-10. CAT/DEL UV FACILITY BOILER TAC EMISSIONS

Pollutant	Natural Gas Emission Factor	Emission Rate	Fuel Oil Emission Factor	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
Flourene	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

TABLE 5.11-10. CAT/DEL UV FACILITY BOILER TAC EMISSIONS

Pollutant	Natural Gas Emission Factor	Emission Rate	Fuel Oil Emission Factor	Emission Rate	Annual Emission Rate
	lb/MMScf	**lbs/hr**	**lbs/10^3 gals**	**lbs/hr**	**Tons/yr**
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	1.19E-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**	**lbs/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
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 1500 kilowatt (KW), or 2,220 horsepower (HP) diesel fuel-fired emergency generators would provide emergency power for the Cat/Del UV 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. Only one generator would be exercised at a time. During an emergency only one generator would be operated at a time. Table 5.11-11 shows the estimated emissions from the generators, each operating for one hour per week, 52 weeks per year.

TABLE 5.11-11. CAT/DEL 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

Note:
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 are shown in Table 5.11-12.

TABLE 5.11-12. CAT/DEL 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 generators at the Cat/Del UV Facility. Total facility emissions, shown in Table 5.11-13, 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 plant would not be classified as a major source for any criteria pollutant.

TABLE 5.11-13. CAT/DEL 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}	0.8	0.1	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 is one where 10 tons of any single regulated HAP or 25 tons of total HAPs are emitted in one year. The proposed plant is not a major source for HAPs. Table 5.11-14 summarizes potentially toxic emissions from combustion sources at the proposed plant.

TABLE 5.11-14. CAT/DEL UV FACILITY TOTAL TOXIC AIR CONTAMINANT EMISSIONS FROM COMBUSTION SOURCES AT THE EASTVIEW SITE

Pollutant	Boilers tons/yr	Generators tons/yr	Total Annual tons/yr
Total TACs	0.83	6.77E-03	0.84

Criteria Pollutant ISCST3 Modeling. The potential impacts of the boiler system and emergency generators 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 3.11, 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 facility, the penitentiary, the Westchester County Medical Laboratories and Research building, the Blythedale Children's Hospital, Westchester County Hospital, 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 5.11-15 shows the comparison of maximum predicted off-site concentrations (including background) of criteria pollutants with the applicable standards.

TABLE 5.11-15. CAT/DEL UV FACILITY: MODELING RESULTS FOR ALL EASTVIEW CRITERIA POLLUTANT SOURCES

Pollutant	Averaging Time	Predicted Conc. All Sources $\mu g/m^3$	Background Conc. $\mu g/m^3$	Total Conc. $\mu g/m^3$	Ambient Air Quality Standards $\mu g/m^3$
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

Note:
The emergency generators were conservatively assumed to operate simultaneously

Toxic Air Contaminant Modeling. Table 5.11-16 shows a comparison of the total predicted off-site concentrations of each toxic air pollutant with applicable guideline concentrations.

TABLE 5.11-16. CAT/DEL UV FACILITY: COMBINED CONCENTRATIONS OF TACS FROM BOILERS AND GENERATORS

Pollutant	Maximum 1-hr Conc.[2] $\mu g/m^3$	NYSDEC SGC[1] $\mu g/m^3$	Maximum Annual Conc.[2] $\mu g/m^3$	NYSDEC AGC[1] $\mu g/m^3$
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 5.11-16. CAT/DEL UV FACILITY: COMBINED CONCENTRATIONS OF TACS FROM BOILERS AND GENERATORS

Pollutant	Maximum 1-hr Conc.[2] µg/m³	NYSDEC SGC[1] µg/m³	Maximum Annual Conc.[2] µg/m³	NYSDEC AGC[1] µg/m³
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.

[1]. NL represents "Not Listed."

[2]. 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 the corresponding SGCs and AGCs for each pollutant. Therefore, TAC and HAP impacts from combustion sources at the proposed Cat/Del UV Facility are predicted to be insignificant.

Fine Particulate Matter Analysis. 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. The modeling was performed to estimate the changes in $PM_{2.5}$ concentrations due to the Cat/Del UV Facility.

Dispersion modeling was conducted to compare concentrations of $PM_{2.5}$ at off-site receptors with applicable interim guideline *de minimis* concentrations. Table 5.11-17 presents the combined 24-hour and annual concentrations of $PM_{2.5}$ at the maximum off-site receptor.

TABLE 5.11-17. CAT/DEL UV FACILITY: MODELING RESULTS FOR CAT/DEL UV FACILITY $PM_{2.5}$ POLLUTANT SOURCES

Pollutant	Total Predicted Conc.[1] µg/m³	Interim Guidance Criteria µg/m³	Promulgated Standard µg/m³
$PM_{2.5}$ 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:
[1] Total combined concentration of boilers and emergency generators

Cat/Del UV Facility Construction Emission Sources

Mobile Sources. In the Future Without the Project , a mobile source air quality analysis was conducted for the scenario with the Cat/Del UV Facility at Eastview for the constructions 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 5.11-18, 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 5.11-18. PREDICTED CO 1-HOUR AND 8-HOUR CONCENTRATIONS IN THE FUTURE WITHOUT THE PROJECT– WITH CAT/DEL UV FACILITY PEAK YEAR 2008 (PPM)

Intersection	Averaging Period	Ambient AQ Background	Model Result		Total Predicted Conc.[1]		Standard
			AM	PM	AM	PM	
Peak Traffic Year 2008							
Route 100C at Sprain Brook Parkway Interchange	1-hour	5.9	2.8	3.0	8.7	8.9	35
	8-hour	2.0	2.0	2.1	4.0	4.1	9

Notes:
[1]Ambient AQ Background + Model Results = Total Predicted Concentration.

Particulate Matter (PM_{10}). As indicated in Table 5.11-19, 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 5.11-19. PREDICTED PM10 24-HOUR AND ANNUAL CONCENTRATIONS IN FUTURE WITHOUT THE PROJECT– WITH CAT/DEL UV FACILITY PEAK YEAR 2008 (µG/M3)

Intersection	Averaging Period	Ambient AQ Background	Model Result	Total Predicted Conc.[1]	Standard
Peak Traffic Year 2008					
Route 100C at Sprain Brook Parkway Interchange	24 hour	45	35.68	80.68	150
	Annual	21	12.82	33.82	50

Notes:
[1] Total Predicted Concentration = Ambient AQ Background + Model Results.

Fine Particulate Matter Analysis. 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.

TABLE 5.11-20. PREDICTED PM2.5 24-HOUR AND ANNUAL CONCENTRATIONS FUTURE WITHOUT THE PROJECT– WITH CAT/DEL UV FACILITY PEAK YEAR 2008 (μG/M3)

Intersection	Averaging Time	Predicted Conc.[1] With Project
Route 100C at Sprain Brook Parkway Interchange	24-hour	6.01
	Annual	0.28

Notes:
[1] Annual impacts are for neighborhood receptors.

Construction Equipment Sources.

Maximum predicted concentrations from on-site construction sources of the Cat/Del UV Facility 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 5.11-21. The background levels were obtained from the NYSDEC monitoring data.

TABLE 5.11-21. CAT/DEL UV FACILITY: RESULTS OF DISPERSION ANALYSIS FOR CONSTRUCTION ACTIVITIES

Modeled Pollutant	Averaging Period	Units	Maximum Predicted Conc. All Receptors[2]	Background Conc. $\mu g/m^3$	Total Conc. All Receptors[2]	Ambient Air Quality Standards
NO_2 [1]	Annual	$\mu g/m^3$	4.63	58	63	100
SO_2	3-Hour	$\mu g/m^3$	0.36	183	183	1,300
	24-Hour	$\mu g/m^3$	0.11	120	120	365
	Annual	$\mu g/m^3$	0.007	26	26	80
CO	1-Hour	$\mu g/m^3$	389.3	6858	7,247	40,000
	8-Hour	$\mu g/m^3$	103.9	4,572	4,676	10,000
PM_{10}	24-Hour	$\mu g/m^3$	15.49	45	61	150
	Annual	$\mu g/m^3$	0.94	21	22	50

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

Fine Particulate Matter Analysis**.** 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 5.11-22.

TABLE 5.11-22. CAT/DEL UV FACILITY: PREDICTED $PM_{2.5}$ CONCENTRATIONS

Modeled Pollutant	Averaging Period	Units	Maximum Predicted Concentration		Interim Guidance
			All Receptors[1]	Sensitive Receptors	
$PM_{2.5}$	24-Hours	µg/m^3	6.54	3.58	5
	Annual (Discrete)	µg/m^3	0.39	0.20	0.3
	Annual (Neighborhood)	µg/m^3	0.07	N/A	0.1

Notes:
[1] Includes fenceline receptors

The air quality modeling analysis determined that the highest predicted increase in the 24 hour $PM_{2.5}$ concentrations for a sensitive receptor to be 3.58 µg/m^3 at the Westchester County Laboratories and Research building. The highest predicted annual increase at a sensitive receptor was equal to 0.20µg/m^3. The annual predicted incremental impact of $PM_{2.5}$ is 0.07 µg/m^3 for the neighborhood scale analysis.

5.11.3. Potential Impacts

The potential impacts from project and construction activities are represented for the two scenarios described in the Future Without the Project: With the Croton project alone, and With the Croton project in addition to the Cat/Del UV Facility. The impacts of the construction and operation of the UV Disinfection Facility are also described in the Draft EIS for that project issued by NYCDEP June 1, 2004.

There are insufficient details with the Police Precinct, Administration Building, and the KCT to conduct a meaningful assessment, and their effects are not quantified. Further discussion on the KCT is provided in Section 3.8.2, Treated Water Conveyance Alternatives.

5.11.3.1. Potential Project Impacts

The air quality study of the proposed plant evaluated the potential project impacts from mobile and stationary sources of emissions. Mobile sources included vehicular traffic on the street system and within the on-site parking facilities. Stationary sources included the plant's boiler system and the emergency electric-generation system.

5.11.3.1.1. Without Cat/Del UV Facility at Eastview Site

Mobile Sources. The anticipated year of operation of the project is 2010. However, no significant mobile source impacts are anticipated from operation of the plant, as projected traffic volumes (44 auto and 4 truck trips) are lower than mobile source screening thresholds. Thus a detailed analysis of mobile source impacts was not conducted for project operation.

Stationary Sources. Operations at the water treatment plant site, during 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 natural gas-fired boilers and emergency diesel generators. Small quantities of various chemical compounds may occasionally be exhausted from the laboratory hood. Table 5.11-23 summarizes the emission sources at the proposed plant.

TABLE 5.11-23. CROTON PROJECT EMISSION SOURCES

Source	**Boilers**	**Emergency Generators**
Fuel	Natural Gas	Diesel
Number of Units	3	2
Operating Units	2	0[1]
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	13,217 acfm
Temperature	350 ºF	878 ºF

Notes: [1] In an emergency only, one emergency generator would operate. Under normal operating conditions, the generators would be exercised once per week.

The stationary source analysis evaluated the impacts of $PM_{2.5}$, PM_{10}, SO_2, CO and NO_x emitted by the project's combustion sources, the heating and hot water boiler system, and the emergency generators. Combustion by-products may include some regulated hazardous air pollutants (HAP) and toxic air contaminants (TAC). HAPs are regulated by USEPA Title III of the Clean Air Act Amendments of 1990. 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).

As part of the stationary source analysis, the potential impact of regulated substances emitted in small concentrations from the laboratory hoods was evaluated. The potential for odors from the treatment process and residuals handling was also addressed.

Boiler System. The boiler system for the proposed 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 at any one time, with the other boiler as a standby unit. Emission factors were obtained from manufacturer's data. Boiler emissions are shown in Table 5.11-24.

TABLE 5.11-24. 16.75 MMBtu/HR: BOILER EMISSIONS[1]

Fuel In Use	Pounds per Hour (each boiler)			
	NO_2	CO	SO_2	PM[3]
Fuel Oil (peak load)[2]	4.18	1.17	6.4	0.336[4]
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:
[1] 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.
[2] For No. 2 fuel oil it was assumed that the sulfur content was equal to 0.37 percent
[3] 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.
[4] $PM_{2.5}$ emissions for fuel oil are 42 % of total PM or 0.14 lbs/hr (see AP-42, Table 1.3-7)

Combustion of natural gas and fuel oil 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 "Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume 1: Stationary Point and Area Sources." Sections 1.3, "Fuel Oil Combustion" and 1.4, "Natural Gas Combustion," provide emission factors used to estimate TACs from the Eastview Croton project boilers. 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, are shown in Table 5.11-25.

TABLE 5.11-25. BOILER TAC EMISSIONS

Pollutant	Natural Gas Emission Factor	Emission Rate	Fuel Oil Emission Factor	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
Flourene	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

TABLE 5.11-25. BOILER TAC EMISSIONS

Pollutant	Natural Gas Emission Factor	Emission Rate	Fuel Oil Emission Factor	Emission Rate	Annual Emission Rate
	lb/MMScf	lbs/hr	lbs/10^3 gals	lbs/hr	Tons/yr
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	1.19E-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**	**lbs/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
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

TABLE 5.11-25. BOILER TAC EMISSIONS

Pollutant	Natural Gas Emission Factor	Emission Rate	Fuel Oil Emission Factor	Emission Rate	Annual Emission Rate
	lb/MMScf	lbs/hr	$lbs/10^3$ gals	lbs/hr	Tons/yr
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. Two 1500 kilowatt (KW), or 2,220 horsepower (HP) diesel fuel-fired emergency generators would provide emergency power for the Eastview 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. Only one generator would be exercised at a time. During an emergency only one generator would be operated at a time. Table 5.11-26 shows the estimated emissions from the generators, each operating for one hour per week, 52 weeks per year.

TABLE 5.11-26. EMERGENCY DIESEL GENERATOR EMISSIONS[1]

Pollutant	Engine Emission Rate		
	Per Engine(lbs/hr)	Per Engine(hrs /yr)	All Two Engines (Tons/ Year
NO_x	19.0	52	1.0
CO	10.9	52	0.6
PM	1.0	52	0.05
SO_2	6.0	52	0.3

Note:
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, are shown in Table 5.11-27.

TABLE 5.11-27. 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	1.21E-02	6.27E-04
Toluene	2.81E-04	4.37E-03	2.27E-04
Xylenes	1.93E-04	3.00E-03	1.56E-04
Propylene	2.79E-03	4.34E-02	2.25E-03
Formaldehyde	7.89E-05	1.23E-03	6.38E-05
Acetaldehyde	2.52E-05	3.92E-04	2.04E-05
Naphthalene	1.30E-04	2.02E-03	1.05E-04
Acenaphthylene	9.23E-06	1.43E-04	7.46E-06
Acenaphthene	4.68E-06	7.27E-05	3.78E-06
Phenanthrene	4.08E-05	6.34E-04	3.30E-05
Anthracene	1.23E-06	1.91E-05	9.94E-07
Fluoranthene	4.03E-06	6.26E-05	3.26E-06
Pyrene	3.71E-06	5.77E-05	3.00E-06
Benzo(a)anthracene	6.22E-07	9.67E-06	5.03E-07
Chrysene	1.53E-06	2.38E-05	1.24E-06
Benzo(b)fluoranthene	1.11E-06	1.72E-05	8.97E-07
Benzo(k)fluoranthene	2.18E-07	3.39E-06	1.76E-07
Benzo(a)pyrene	2.57E-07	3.99E-06	2.08E-07
Indeno(1,2,3-cd)pyrene	4.14E-07	6.43E-06	3.35E-07
Dibenz(a,h)anthracene	3.46E-07	5.38E-06	2.80E-07
Benzo(g,h,l)perylene	5.56E-07	8.64E-06	4.49E-07

Operating Emissions Summary. Criteria pollutants are emitted from the boilers and the generators at the proposed plant. Total facility emissions, shown in Table 5.11-28, 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 plant would not be classified as a major source for any criteria pollutant.

TABLE 5.11-28. CRITERIA POLLUTANT EMISSIONS SUMMARY

Pollutant	Boilers tons/yr	Generators tons/yr	Total tons/yr	National & State Major Source Threshold tons/yr
NO_2	8.5	2.0	10.5	25
CO	9.15	1.1	10.2	100
PM_{10}	0.6	0.1	0.7	100
SO_2	4.0	0.6	4.6	100

Combustion sources also emit trace quantities of HAPs and TACs. A major source of Title III HAPs is one where 10 tons of any single regulated HAP or 25 tons of total HAPs are emitted in one year. The proposed plant is not a major source for HAPs. Table 5.11-29 summarizes potentially toxic emissions from combustion sources at the proposed plant.

TABLE 5.11-29. TOTAL TOXIC AIR CONTAMINANT EMISSIONS FROM COMBUSTION SOURCES AT THE EASTVIEW SITE

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 and, emergency generators were analyzed using the USEPA's Industrial Source Complex Short Term, Version 3 dated 02035 (ISCST3) model (*User's Guide*, USEPA, 1995d). ISCST3 is a refined computerized dispersion model that calculates impacts at receptors from multiple point, area and volume sources. ISCST3 uses historical hourly meteorological data. Meteorological data from La Guardia Airport, with upper air data from Brookhaven, for years 1998 through 2002, were used.

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.

Locations of sensitive receptors in the vicinity of the proposed project were also included. Sensitive receptors include the Hammond House, the juvenile detention facility, the penitentiary and the NY Medical Laboratory. Figure 5.11-3 shows the proposed plant, the boiler exhaust location, the property line and the locations of sensitive receptors.

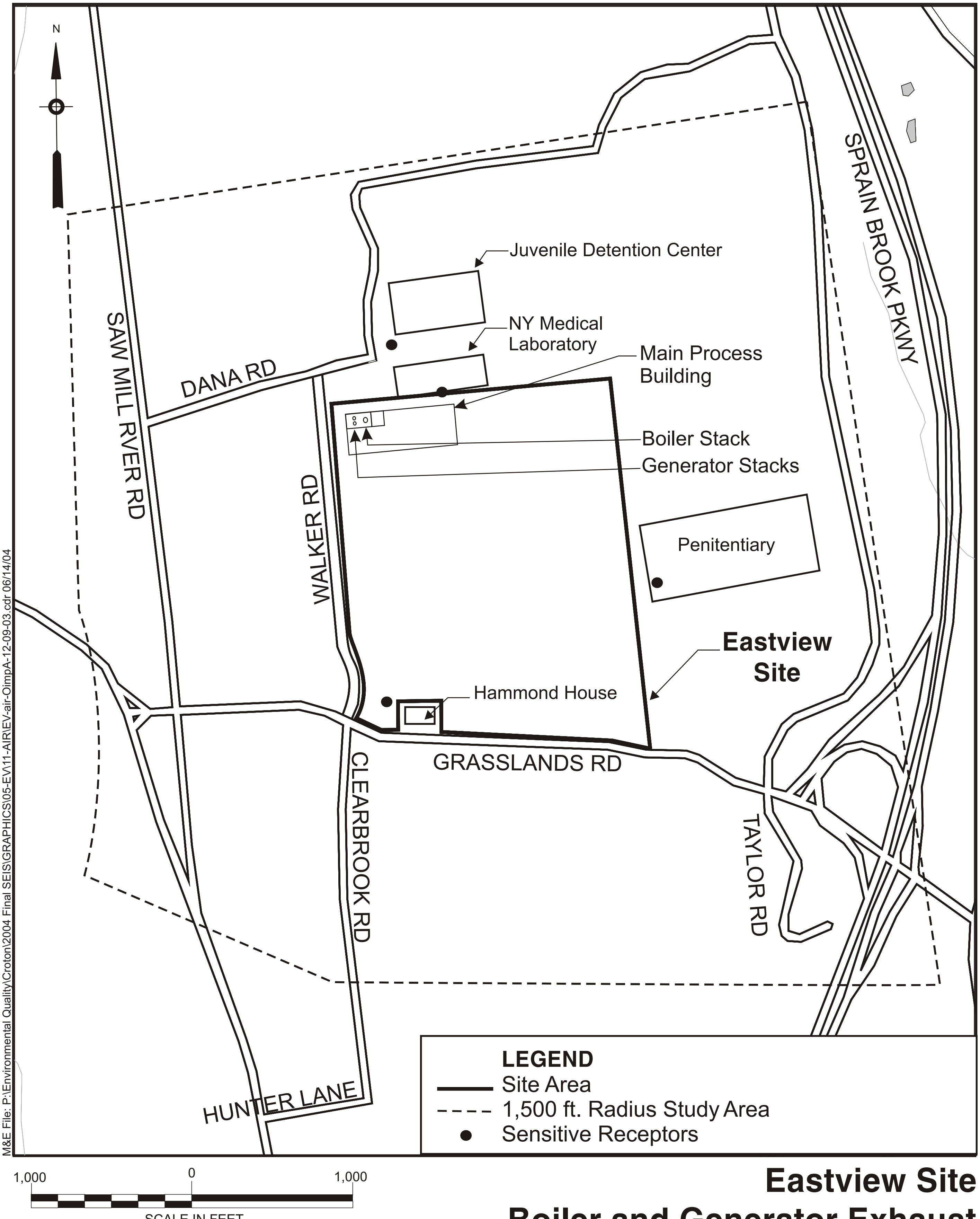
The stack heights of the boilers and the emergency generators are lower than USEPA Good Engineering Practice (GEP) guidelines. Therefore building downwash was considered. The USEPA Building Profile Input Program (BPIP) was used to calculate building cross-sections for wind directions at 10 degree intervals. The cross-sections were included in the ISCST3 model input file and the building downwash option was selected.

In accordance with procedures described in USEPA's "Guideline on Air Quality Models," the Auer procedure was used to determine Urban/Rural classification. Based on examination of Planning Department maps for an approximately 3 kilometer radius around the site, urban classification is appropriate for this site.

The background pollutant concentrations were obtained from the NYSDEC monitoring data. Background air quality data is based on the most recent five years of NYSDEC monitoring data, 1998 through 2002. Annual background values are from the year with the highest annual concentration. For averaging times shorter than one year, the background value is the highest second-high value for the five years. Where five contiguous years of recent monitoring data are not available, a minimum of three years were used. Table 5.11-2 summarizes the existing monitoring data for the water treatment plant site.

It was assumed equipment would operate at maximum capacity for the averaging periods regulated for each pollutant. Two boilers were assumed operating at full capacity for up to nine months per year, with only one boiler operating during the warmer summer months.

Each emergency generator is assumed to be exercised at full capacity for one hour per week. Both generators would not be exercised at the same time.



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Eastview Site Boiler and Generator Exhaust Locations, and Sensitive Receptors

Croton Water Treatment Plant

Figure 5.11-3

Dispersion modeling was conducted to compare concentrations of pollutants at offsite receptors with applicable ambient air quality standards. Table 5.11-30 compares the combined concentrations of each pollutant at the maximum offsite receptor with applicable standards.

TABLE 5.11-30. MODELING RESULTS FOR ALL EASTVIEW CROTON PROJECT CRITERIA POLLUTANT SOURCES

Pollutant	Averaging Time	All Sources μg/m³	Background μg/m³	Total μg/m³	National[1] & State[2] Standards μg/m³
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
PM10	24-hours	8.2	45	53	150
PM10	Annual	0.24	21	21	50

Notes:
[1] HOCFR 5.0
[2] 6NYCRR Part 257- Air Quality Standards

Off-site concentrations from the combined emissions of all facility sources are predicted to be in compliance with applicable ambient air quality standards. Impacts from all combustion emission sources at the water treatment plant site are not significant.

Toxic Air Contaminant Modeling. Locations of sensitive receptors in the vicinity of the proposed project were also included. Sensitive receptors include the Hammond House, the juvenile detention facility, the penitentiary and the NY Medical Laboratory. Figure 5.11-3 shows the proposed plant, the boiler exhaust location, the property line and the locations of sensitive receptors. Table 5.11-31 compares the combined concentrations of each pollutant at the maximum off-site receptor with applicable guideline concentrations.

TABLE 5.11-31. COMBINED CONCENTRATIONS OF TACS FROM BOILERS AND GENERATORS (μg/m³)

Pollutant	1-hr Impact[2] μg/m³	SGC[1] μg/m³	Annual Impact[2] μg/m³	AGC[1] μg/m³
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
Naphthalene	1.45E-02	7900	9.38E-05	3
Acenaphthylene	1.97E-04	NL	1.23E-06	0.02

TABLE 5.11-31. COMBINED CONCENTRATIONS OF TACS FROM BOILERS AND GENERATORS (μg/m^3)

Pollutant	1-hr Impact[2] μg/m^3	SGC[1] μg/m^3	Annual Impact[2] μg/m^3	AGC[1] μg/m^3
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
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

TABLE 5.11-31. COMBINED CONCENTRATIONS OF TACS FROM BOILERS AND GENERATORS (μg/m³)

Pollutant	1-hr Impact[2] μg/m³	SGC[1] μg/m³	Annual Impact[2] μg/m³	AGC[1] μg/m³

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.
[1] NL represents "Not Listed."
[2] 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 1-hour and annual concentrations of TACs are lower than the corresponding SGCs and AGCs for each pollutant. TAC and HAP impacts from combustion sources at the Eastview Croton project are predicted to be insignificant.

Laboratory Hoods. Limited process control water testing would be conducted in a small on-site laboratory. Volatile chemicals would be used under a laboratory hood exhausted through a stack on the roof. Normal laboratory operations are not anticipated to have a significant impact on ambient air quality. Accidental spills of any consequence would not be likely to occur due to the small quantities of chemicals to be used for testing.

The potential impacts from the laboratory hoods were assessed. Sulfuric acid would be used for alkalinity testing. Each test would require approximately 25 milliliters (ml) of relatively dilute (0.02 Normal) sulfuric acid. Tests would be performed under a laboratory hood that would be exhausted through a stack on the roof at 100 cfm. If the full amount of sulfuric acid were to spill and be allowed to evaporate (not be cleaned up), and the entire volume were to evaporate within one hour, the highest 1-hour off-site concentration, based on SCREEN3 model results would be 0.008 μg/m³. The New York State Short-term Guideline Concentration (SGC) is 120 μg/m³. Thus, impacts from an accidental release of sulfuric acid via the laboratory hood would be lower that the State SGC and, therefore, insignificant.

Odors. The potential for odors from the treatment process and the installation of odor control technologies and design are addresses in Section 5.1, Introduction and Proposed Project Description. No specific odor-producing substances have been identified at the proposed plant as there would be no residual handling facility. The residuals from the treatment process would be dewatered on-site.

Fine Particulate Matter Analysis. Dispersion modeling was performed (for Year 2010) to assess the effects 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. See Table 5.11-32.

TABLE 5.11-32. MODELING RESULTS FOR ALL EASTVIEW $PM_{2.5}$ POLLUTANT SOURCES

Pollutant	Total Predicted Conc.[1] $\mu g/m^3$	Interim Guidance Criteria $\mu g/m^3$	Promulgated Standard $\mu g/m^3$
$PM_{2.5}$ 24-Hour	4.12	5.0	65
$PM_{2.5}$ Annual (Discrete)	0.21	0.3	15
$PM_{2.5}$ Annual (Neighborhood)	0.07	0.1	15

Note:
This data has been updated since the issuance of the Croton DSEIS in December 2003

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 $\mu g/m^3$ microscale annual maximum threshold, or 0.1 $\mu g/m^3$ annual neighborhood scale threshold. The maximum project 24-hour and annual impacts are below 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.

5.11.3.1.2. With Cat/Del UV Facility at Eastview Site

For a comparison of the Future With the Project with the Cat/Del UV Facility, see Section 5.21, Combined Impacts.

5.11.3.2. Potential Construction Impacts

5.11.3.2.1. On-site Activities.

Possible effects on local air quality during construction at the project sites include:

- Fugitive dust and other emissions from land-clearing operations and excavation,
- Air emissions from on-site construction equipment, and
- Mobile source emissions from construction workers' private vehicles and construction trucks.

The methodology described in Section 4.11, Data Collection and Impact Methodologies, Air Quality, was followed to predict the anticipated construction-related mobile source air quality impacts associated with the proposed Croton project. The potential effects of the proposed action on CO and particulate matter concentrations were analyzed. Microscale analyses were performed for the mobile source construction analysis year, the projected period of greatest worker activity.

The construction activities analysis for the peak construction year, 2006, the projected period of greatest quantities of construction equipment usage, evaluated 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. 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 reception nearby.

Approximately 653,000 cubic yards (cy) of soil and rock would be removed during the construction of the Eastview facility. It is estimated that approximately 10 and 58 percent of the excavated material would be removed in 2005 and 2006, respectively. The remaining 32 percent of the excavated material would be removed in 2008. Heavy construction grading and excavation activities would occur during the peak year 2006. These excavation and grading activities would be primarily for the Main Process building, the pump stations and the residuals/chemical buildings, to remove approximately 378,740 cy of material.

According to the groundwater information for the Eastview Site, it is estimated that there is about 10 to 13 feet of material above the groundwater table. With the consideration of the capillary rise of water, it is assumed that the deep soil above the groundwater line would be sufficiently moist to suppress dust emissions when it is excavated. The soil material from the surface to a depth of 7 feet may be dry and is assumed to be susceptible to creating fugitive dust emissions during excavation. In calculating the volume of excavated soil materials, the amount of dry soil material was determined by multiplying the size of the individual building footprint areas by a depth of 7 feet. A 5-foot construction easement was added to the perimeter of the individual Croton project building footprint area to account for the actual surface area of the construction activities. Table 5.11-33 presents the estimated amount of dry and wet soil material to be excavated from the Eastview Site.

TABLE 5.11-33. ESTIMATED AMOUNT OF EXCAVATED DRY AND WET SOIL (TONS)

Excavation Activities	Dry Soil	Wet Soil	Total
Site Preparation	12,600	18,400	31,000
Main Process Building	91,800	262,200	354,000
Connection to Shaft No. 19	0	254,000	254,000

Note:
Conversion of 378,740cy = 639,000 tons

Overburden and Debris Removal. One grader and up to four backhoes or loaders would be used to remove overburden and debris. This activity would be anticipated to last about eight months and involve the removal of approximately 378,740 yd^3 of material. Emissions of criteria pollutants and fine particulates were based on 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. A maximum of 192-20yd^3 truck trips per day were anticipated for hauling 378,740 yd^3 of overburden offsite. Emissions of criteria pollutants and fine particulates were based on the number of tons of overburden and debris loaded into barge and AP-42 emission factors.

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. Also, there would be drilling and blasting activities underground during the tunnel excavation from the water treatment plant site to the New Croton Aqueduct (NCA). All emissions from the tunnel drilling and blasting activities would be contained underground inside the tunnels.

Rock Load-Out to Trucks. After the rock materials are drilled and blasted, the rock material would be transported off-site. This activity would be anticipated to last about six months in concurrent with overburden and drilling activities, and involve the removal of approximately 6,400 yd^3 of rock material.

Gravel Stockpiling. Approximately 30,000 yd^3 of gravel would be stockpile onsite for backfill construction materials. Emissions of criteria pollutants and fine particulates were quantified based on the number of tons of materials stockpile via crane for backfill use. A maximum of 580 yd^3 would be stockpile onsite in a single day, which would require the use of a crane. Emission factors from AP-42 were applied.

Road Dust. Each delivery haul truck and heavy vehicle would travel approximately 150 feet into the construction pit loaded and the same distance unloaded (roundtrip). In order to limit fugitive dust from truck travel, on-site roads would be paved, and would be maintained by hourly water flushing and sweeping. The truck route into the construction area would be paved. The AP-42 emission factor (in lb/VMT) is based on the silt loading and average vehicle weight. The silt content was assumed to be 6.9 percent, based on the USEPA's default value listed for a construction site. The computations of fugitive emissions were performed with loaded and unloaded weights of the delivery haul trucks. The speed would be limited to 5 mph for all on-site construction trucks. The average vehicle weight was based on the weight of delivery haul trucks (50 tons loaded/16 tons empty), rock trucks (60 tons loaded/16 tons empty), and "other" trucks (25 tons loaded/8 tons empty), assuming half of the travel distance would be with a full load and half would be with no load (empty). Water flushing and sweeping would provide a control efficiency of approximately 50 percent.

Construction Vehicles On-Site Parking. At the Eastview Site, parking spaces would be available for construction workers for the Croton alone scenario. The speed and idle would be limited to 5 mph and 3 minutes for all vehicles, respectively.

5.11.3.2.2. On-Site Construction Equipment.

An analysis of the potential for air quality impacts from on-site construction equipment at the proposed water treatment plant site was performed for the peak construction year of 2006. 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 5.11-34.

TABLE 5.11-34. ON-SITE CONSTRUCTION EQUIPMENT FOR PEAK 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[1]	Twelve	Mobile

Note:

[1] 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 delivery trucks/heavy vehicles) were developed using the Draft 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, PM 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."

5.11.3.2.3. Without Cat/Del UV Facility at Eastview Site

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 proposed water treatment plant 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 thresholds.

The background levels were obtained from the NYSDEC monitoring data. Background air quality data are based on the most recent five years of NYSDEC monitoring data, 1998 through 2002. Annual background values are from the year with the highest annual concentration. For averaging times shorter than one year, the background value is the highest second-high value for the five years. Where five contiguous years of recent monitoring data are not available, a minimum of three years was used. Table 5.11-2 summarizes the monitoring data for the Eastview Croton project. 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 5.11-35. The predicted maximum combined concentrations from the construction sources and the maximum ambient air background concentrations are also presented in the table.

TABLE 5.11-35. RESULTS OF DISPERSION ANALYSIS FOR CONSTRUCTION ACTIVITIES – CRITERIA POLLUTANTS

Modeled Pollutant	Averaging Period	Units	Maximum Predicted Conc.	Background Conc. μg/m^3	Total Predicted Conc.	Ambient Air Quality Standards
			All Receptors[1]		All Receptors[1]	
NO_2	Annual	μg/m^3	2.51	58	61	100
SO_2	3-Hour	μg/m^3	0.47	183	184	1,300
	24-Hour	μg/m^3	0.107	120	120	365
	Annual	μg/m^3	0.004	26	26	80
CO	1-Hour	μg/m^3	583	6,858	7,441	40,000
	8-Hour	μg/m^3	137.6	4,572	4,709	10,000
PM_{10}	24-Hour	μg/m^3	26.6	45	72	150
	Annual	μg/m^3	1.5	21	23	50

Notes:
NO_X emissions are based on a NO_2 to NO_X ratio of 0.59 or 59% NO_2
[1] Includes fenceline receptors

To determine project impacts, the results of construction impacts from modeling and background (predicted impacts added to background are shown in the column titled “Total” in Table 5.11-36) were compared to the applicable ambient standards (NAAQS). A significant impact would occur if a standard would be exceeded as a result of the project. Based on the modeling results, no significant impacts are predicted from construction activities.

Fine Particulate Matter Analysis. For the $PM_{2.5}$ incremental impact analysis, the maximum impacts 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 5.11-36.

TABLE 5.11-36. RESULTS OF DISPERSION ANALYSIS FOR CONSTRUCTION ACTIVITIES - $PM_{2.5}$

Modeled Pollutant	Averaging Period	Units	Maximum Predicted Concentration		Interim Guidance
			All Receptors[1]	Sensitive Receptors	
$PM_{2.5}$	24-Hours	$\mu g/m^3$	8.75	5.49	5
	Annual (Discrete)	$\mu g/m^3$	0.39	0.22	0.3
	Annual (Neighborhood)	$\mu g/m^3$	0.05	N/A	0.1

Notes:
[1] Includes fenceline receptors

The NAAQS are not presented in Table 5.11-35. 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 modeling analysis calculates the highest predicted increase in the 24-hour $PM_{2.5}$ concentrations as 8.75 $\mu g/m^3$ at the fence line and 5.49 $\mu g/m^3$ at the Westchester County Laboratories and Research Building. While the highest incremental $PM_{2.5}$ concentration occurred at the fence line was higher than the interim guidance criteria for the localized 24-hour impacts (i.e.,5 $\mu g/m^3$), the maximum predicted incremental 24-hour concentration at sensitive public locations would be significantly lower. In addition, the 24-hour $PM_{2.5}$ concentration from construction for the proposed project was based on the month (April 2006) when the maximum short-term emissions would be anticipated; therefore, the actual increase in $PM_{2.5}$ concentration is anticipated to be lower than the predicted values for the rest of the construction period. Furthermore, the predicted 24-hour construction concentration would last, at the Research Building, for only nine months during the site preparation phase of the construction. For the remainder of the construction period, the emissions would be at least 30% lower.

The highest predicted annual increases were 0.69 $\mu g/m^3$ at the fence line and 0.22 $\mu g/m^3$ at the Westchester County Laboratories and Research Building. While the highest annual concentration was slightly higher than the NYSDEC criteria of 0.3 $\mu g/m^3$ at the fence line, the concentration at the Westchester County Laboratories and Research Building would be lower than the interim guidance criteria.

The annual $PM_{2.5}$ concentrations decrease quickly with distance relative to the construction site. On a neighborhood scale basis, the predicted incremental impact of $PM_{2.5}$ would be 0.05 $\mu g/m^3$, which is below the NYCDEP interim guidance.

Based on the above, the impact from the construction of the project on $PM_{2.5}$ was not considered significant.

Total $PM_{2.5}$ Impacts. In order to address the potential issue of combined air quality concentrations from the on-site construction activities totaled with the off-site mobile sources, it was conservatively assumed that maximum impacts for both on-site and off-site sources occurred simultaneously. Concentrations of $PM_{2.5}$ from the construction activities (that were calculated adjacent to the off-street location of concern) were then combined with the concentrations due to the offsite sources. The highest predicted 24-hour concentration from the combined effects was less than that concentration projected at the nearest sensitive use that is described above, and less than the interim guidance criteria of 5 ug/m^3.

Mobile Sources.

A mobile source air quality analysis of the potential construction activities was conducted for 2008, the year of maximum anticipated construction traffic for the Eastview Site. The methodology for the localized pollutant analysis at intersections is the same as discussed under the Methodology section. Localized pollutant impacts from the vehicles queuing at the intersections were analyzed for the 8-hour CO concentrations and 24-hour and annual PM_{10} concentrations. The same set of receptor locations used in the analysis of the Future Without the Project was used for the project impact scenario. The worst intersection was analyzed.

Carbon Monoxide. CO Emission factors are projected to decrease in succeeding future years; whereas, traffic volumes would increase. The results of CAL3QHC dispersion modeling (i.e., the resultant 1-hour value was adjusted to 8-hour averaging times) were added to the predicted background concentrations, and then compared to the 8-hour ambient air quality standard for CO. Table 5.11-37 shows the results of CO modeling for year 2008. As indicated in the table, the total predicted concentrations are below the applicable air quality standards.

TABLE 5.11-37. PREDICTED CARBON MONOXIDE 1-HOUR AND 8-HOUR CONCENTRATIONS DURING CONSTRUCTION (ppm)

Intersection	Averaging Time	Ambient AQ Background	Model Result		Total Predicted Conc.		Standard
			AM	PM	AM	PM	
Peak Year 2008							
Grasslands Road (Rt. 100C) and 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

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

In addition, the CEQR *de minimis* values were calculated for the 8-hour period. As indicated in Table 5.11-38, the CEQR *de minimis* values for the 8-hour period were not exceeded. Therefore, the proposed project would have no significant impacts for CO in the Future Without the Project and Without Cat/Del UV Facility at the Eastview Site.

TABLE 5.11-38. 8-HOUR CONCENTRATIONS AND CEQR DE MINIMIS VALUES1 FUTURE WITH THE PROJECT PEAK YEAR 2008 (PPM)

Intersection	Averaging Period	No Build Conc.[1]		Build Conc.[1]		Project Increment[2]		*De Minimis Criteria*	
		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	2.6

Notes:
[1] Includes background
[2] The increment between the no-build and the build concentrations are 0.1 ppm and 0.1 ppm for the AM and PM periods respectively. These values are below the *de minimis* criteria.

PM10. For the localized PM_{10} levels, MOBILE6.2 emission factors, projected traffic volumes, and five years of hourly meteorological data were used as inputs to the CAL3QHCR dispersion model to estimate future PM_{10} levels from traffic in the vicinity of the project. The background 24-hour and annual PM_{10} levels, assumed the same as existing, were added to the 24-hour and annual concentrations, respectively. Table 5.11-39 presents the PM_{10} results for year 2008. As indicated in the table, the total predicted concentrations are below the applicable air quality standards.

TABLE 5.11-39. PREDICTED 24-HOUR AND ANNUAL PM_{10} CONCENTRATIONS FROM CONSTRUCTION ($\mu g/m^3$)

Intersection	Averaging Time	Ambient AQ Background[2]	Modeled Result	Total Predicted Conc.[1]	Standard
Peak Year 2008					
Grasslands Road (Rt. 100C) and Sprain Brook Parkway Interchange	24-Hour	45	36	81	150
	Annual	21	13	34	50

Notes:
[1] Ambient AQ Background + Model Results = Total Predicted Concentration.
[2] For the purpose of estimating emissions for the projected year 2008, the future background PM_{10} concentration is assumed to be the same as the current available data from the IS 52 ambient air monitoring station for year 2000, highest and second high 24-hour and highest annual values.

Fine Particulate Matter Analysis. For the Future With the Project (Build) scenario, localized $PM_{2.5}$ levels, MOBILE6.2 emission factors, projected traffic volumes, and five years of hourly meteorological data were used as inputs to the CAL3QHC dispersion model to estimate future $PM_{2.5}$ increments from construction traffic for the proposed project. Neighborhood receptors were added and were located 15 meters from each intersection.

$PM_{2.5}$ impacts from project mobile sources were obtained by subtracting the model results of the Future Without the Project (No Build) scenario from the results of the Future With the Project (Build) scenario. The interim mobile source guidance criteria are *de minimis* values of 5.0 $\mu g/m^3$ for 24-hours and 0.1 $\mu g/m^3$ for annual neighborhood scale concentrations. Tables 5.11-40 presents the $PM_{2.5}$ results for year 2008.

TABLE 5.11-40. PREDICTED 24-HOUR AND ANNUAL $PM_{2.5}$ CONCENTRATIONS DURING CONSTRUCTION ($\mu g/m^3$)

Intersection	Averaging Time	Build Results	No Build Results	Project Increments	Interim Criteria
Peak Traffic Year 2008					
Grasslands Road (Rt. 100C) and Sprain Brook Parkway Interchange	24-hour	6.07	5.96	0.05	5.0
	Annual	0.29	0.28	0.00	0.1

Summary. The mobile source $PM_{2.5}$ analysis determined the maximum predicted incremental impacts and compared them with the interim guidance criteria. Predicted increments were determined by subtracting the Future Without the Project scenario results from the Future With the Project scenario. The maximum predicted 24-hour $PM_{2.5}$ incremental concentrations, presented in Table 5.11-35, are below the interim guideline criteria concentration of 5.0 µg/m^3 and the annual maximum $PM_{2.5}$ interim guideline criteria concentration of 0.1 µg/m^3.

5.11.3.2.4. With Cat/Del UV Facility at Eastview Site

For a comparison of the Future With the Project with the Cat/Del UV Facility, see Section 5.21, Combined Impacts

5.11.3.2.5. Control of Construction Emissions

Construction activities would involve the excavation and transport of soil and rock. Activities would take place within a pit sheltered from the wind. Trucks leaving the site with soil or rocks would be covered, and all loose soil and dirt on the trucks would be washed prior to allowing the trucks to travel on public roads. Construction roads would be paved. Watering would further control dust emissions. No excavation activities would be permitted during periods of high winds.

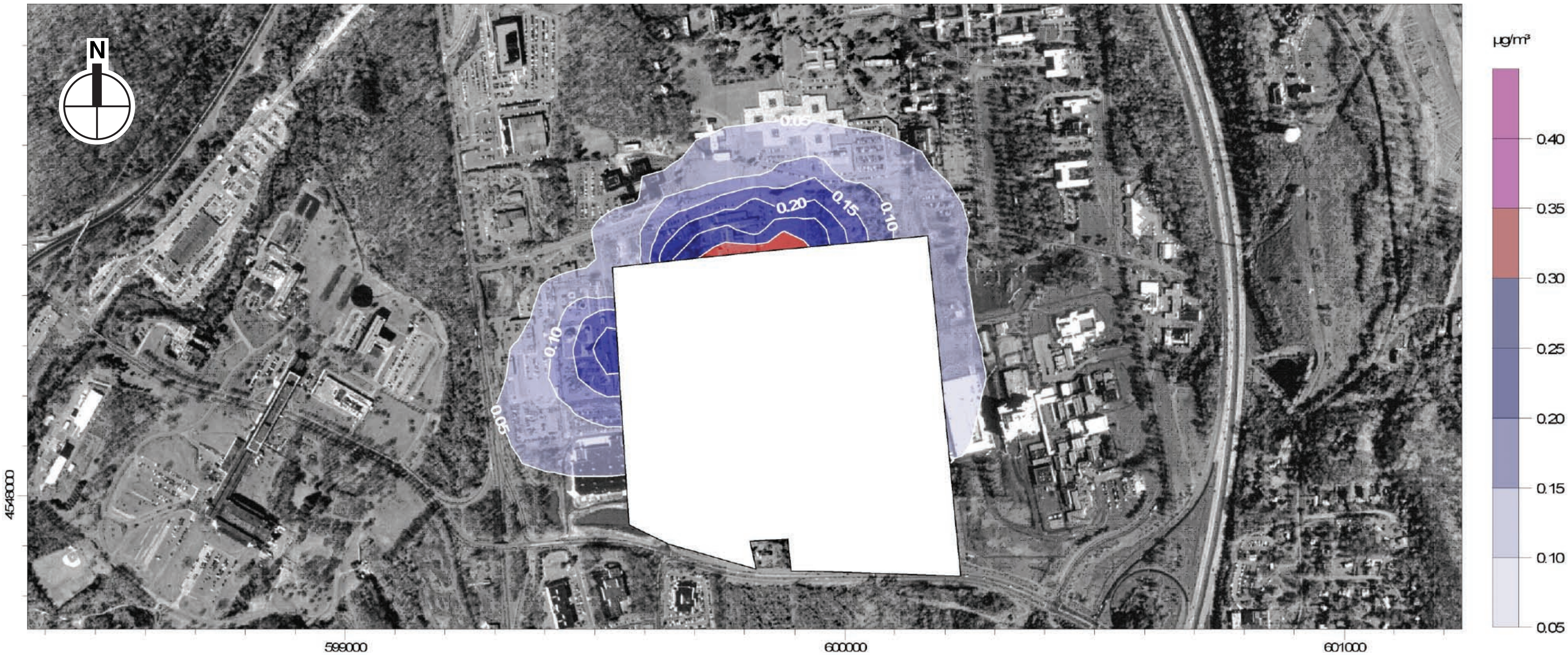
During construction at the project site, all appropriate fugitive dust control—including watering of exposed areas and using dust covers for trucks—would be employed. These measures include satisfying Section 1402.2-9.11 of the New York City Air Pollution Code. To prevent fugitive dust from construction and demolition activities from becoming airborne, the following measures would be implemented:

- Use of water or chemicals to control dust in the demolition of existing buildings or structures, construction operations, and during the clearing and grading of land;
- Application of water or suitable chemicals to dirt paths, materials, stockpiles, and other surfaces that can generate airborne dust over extended periods, or plastic covering of stockpiled materials;
- Covering open-body trucks transporting materials likely to generate to airborne dust at all times when in motion; and
- Prompt removal of earth or other material from paved streets, where it has been deposited by trucking or earth-moving equipment, erosion by water, or other means.

Diesel construction equipment would be maintained in proper operating condition, including tuned up and supplied with the correct fuel. Mufflers, exhaust equipment, and other operational components of construction equipment would be maintained in accordance with manufacturer's specifications.

Like construction equipment, trucks would be maintained in proper working condition in accordance with manufacturer's specifications. Trucks would be required to turn off their engines and not idle onsite for more than three minutes. In addition, the trucks would limit their speeds to a maximum of 5 mph while they are traveling within the construction site.

6.30.04



Croton Water Treatment Plant

$PM_{2.5}$ Annual Construction Isopleth for Eastview Site

Figure 5.11-4