

**A. INTRODUCTION**

Under the proposed action at the Hunts Point Water Pollution Control Plant (WPCP), the only new proposed sources with the potential to emit non-criteria pollutants are one new 500 kW emergency generator, three replacement waste gas burners and the carbon addition sources. However, the analysis considered non-criteria pollutant emissions from the entire plant. The remaining non-criteria pollutant emission sources are either being constructed under the Phase II Upgrade or are already existing at the plant, including six 2,000 kW emergency generators, five 750 horsepower (hp) boilers located in the main building, and two 400 hp boilers located in the dewatering building. The latest facility-wide air permit from the New York State Department of Environmental Conservation (NYSDEC) was issued in February, 2006. A detailed non-criteria pollutant modeling analysis was previously performed for the wastewater process and combustion sources in support of the air permit application that included Phase I, Phase II, and the waste gas burners for Phase III. The results of the non-criteria pollutant modeling analysis were discussed and presented in the Negative Declaration for the Phase II Upgrade.

For this Environmental Impact Statement (EIS), dispersion modeling was used to assess the impacts from non-criteria pollutants from the plant's fuel combustion sources and wastewater process sources, including the carbon addition sources. The earlier Phase II non-criteria pollutant analyses were updated for the proposed action with the latest flow projections, more recent meteorological data, building profile changes on site due to the proposed two egg-shaped digesters, the new 500 kW emergency generator, and the addition of either methanol or ethanol addition. Potential non-criteria pollutant impacts were determined for the combustion sources, wastewater process sources, and the sources associated with the carbon feed system.

Potential off-site impacts from the non-criteria pollutant emissions were determined and compared with the applicable NYSDEC Annual Guideline Concentration (AGC) and Short-term Guideline Concentration (SGC). Emissions were also compared to NYSDEC thresholds of 25 tons per year (TPY) of total volatile organic compounds (VOCs) or total hazardous air pollutants (HAPs) or 10 TPY of any individual HAP.

Between the issuance of the Draft EIS (DEIS) and Final EIS (FEIS), the analyses were updated to reflect that 10 out of 12 sludge thickeners would normally operate with the proposed action. In addition, an assessment of the potential changes in modeled non-criteria air concentrations with the proposed odor control for the primary effluents channels was also undertaken.

**B. POLLUTANTS FOR ANALYSIS****NON-CRITERIA AIR POLLUTANTS**

In addition to criteria pollutants, New York State also controls the ambient levels of air toxics from general process emission sources through the use of recommended guideline

concentrations in the New York Code, Rules and Regulations (6 NYCRR Part 212). These “non-criteria air pollutants” include carcinogens, as well as non-carcinogenic compounds and irritants. NYSDEC provides 1-hour and annual average guideline concentrations called Short-Term Guideline Concentrations (SGCs) and Annual Guideline Concentrations (AGCs) for these compounds and describes the methodology for assessing the impact due to air toxic emissions in *Air Guide-1: Guidelines for the Control of Toxic Air Contaminants* (DAR-1, NYSDEC, 1991). NYSDEC is currently in the process of revising its air regulations with respect to air toxics, and *Air Guide-1* is also scheduled for further revision; the current *Air Guide-1* was applied for the analysis of the proposed action.

The SGC and AGC values from *Air Guide-1* tables (*DAR-1 AGC/SGC Tables*) and additional NYSDEC guidance (December, 2003) were used in the analysis. The total non-criteria pollutant impacts from the multi-phase upgrade were compared to the SGC and AGCs.

It should be noted that SGCs and AGCs are guideline concentrations rather than standards because they have not undergone the rigorous regulatory scrutiny that would be afforded a proposed Federal or State ambient air quality standard. Annual guideline concentrations in particular, are developed to protect the public health from the effects associated with long-term continuous, exposure to a contaminant.

### STATE IMPLEMENTATION PLAN (SIP)

Chapter 8, “Criteria Air Pollutants,” discusses the New York State Implementation Plan (SIP). This plan includes multiple components that include establishing enforceable emission limitations and other types of control measures to meet the applicable standard by a certain date, and the necessary programs, regulations, and authority to provide for the enforcement of the control measures.

For areas within New York State that do not meet National Ambient Air Quality Standards (NAAQS), additional regulations apply with the goal of bringing these areas into compliance with the NAAQS. These regulations are described in 6 NYCRR Part 231, “New Source Review in Non-attainment Areas.”

With respect to VOCs and HAPs, in the New York City metropolitan area, a major facility is defined as:

- Having the potential to emit 25 TPY or more of VOCs, or introducing a “significant net emissions increase” of 25 TPY; or
- Having the potential to emit 10 TPY of any individual HAP or 25 TPY of any combination of HAPs that are listed, pursuant to section 112 (b) of the 1990 Clean Air Act Amendments.

These regulations could apply to municipal wastewater treatment plants because these types of facilities have boilers and engines that have the potential to emit significant amounts of nitrogen oxides and other air contaminants. To determine whether the Hunts Point WPCP would be categorized as a “major facility” based on VOC and HAP emissions, the total emissions of VOCs and HAPs were estimated.

Based on estimated emissions from TOXCHEM+ modeling (more information on TOXCHEM+ is discussed later in this chapter) for the chemical addition, a regulatory analysis was also performed to determine whether the facility would be subject to additional federal and state regulations. Depending on which chemical is emitted (methanol or ethanol), there are a number of different regulations that may apply, with implications on the future permitting and control requirements for the WPCP, as discussed below.

Methanol and ethanol are VOCs and methanol is also considered a HAP.

*EPA 40 CFR PART 63 - POTW MACT STANDARDS - APPLICABLE TO THE PLANT FOR METHANOL ADDITION*

The Publicly Owned Treatment Work (POTW) Maximum Achievable Control Technology (MACT) standards would apply if individual HAP emissions from the WPCP exceed 10 tons per year, or if the total HAP emissions exceed 25 tons per year. Methanol is a regulated HAP, so if emissions exceed 10 tons per year, the WPCP would be subject to the MACT standards. If a source modification is considered a “reconstruction” then it would be required to meet the control requirements for new POTWs, including the possible addition of covers. Per the EPA definition of reconstruction, i.e., greater than 50 percent of the capital cost required to construct a comparable new source, it would likely not be regulated as a new source, so no new control requirements would be required. However, even if regulated as an existing POTW, the facility would still be subject to MACT, which triggers a Title V permit for the plant. Ethanol is not a HAP, so using this chemical would avoid any potential MACT applicability.

*EPA 40 CFR 60 SUBPART KB AND NYSDEC PART 229 - APPLICABLE TO THE PLANT FOR ADDITION OF EITHER METHANOL OR ETHANOL*

The chemical storage tanks may be subject to EPA 40 CFR 60 Subpart Kb and NYSDEC Part 229, depending on the type and size of the tanks and the vapor pressure of the chemical stored. In addition, if the facility's process source VOC emissions are > 25 tpy (either due to the new process or the total facility emissions with the new process), the Part 229 applicability thresholds are lowered. If subject to Part 229, the tanks would be required to be included in the NYSDEC facility permit.

*NYSDEC PART 212 RACT REQUIREMENTS - APPLICABLE TO THE PLANT FOR ADDITION OF EITHER METHANOL OR ETHANOL*

If the plant's total VOC emissions are greater than 25 tons per year, the reasonably available control technology (RACT) provisions of Part 212 would be required to be met. Methanol and ethanol are considered highly volatile. The default requirements for RACT specify an 81 percent control or demonstration of why such control is unachievable. A RACT analysis would need to be performed for every VOC emitting process at the WPCP that emits VOCs greater than 3 lbs/hour. An exemption would also apply if actual VOC process emissions were less than 15 pounds per day uncontrolled (approximately 2.7 tons per year).

*NYSDEC PART 201-6 TITLE V PERMITTING - APPLICABLE TO THE PLANT FOR ADDITION OF EITHER METHANOL OR ETHANOL*

If the total plant VOC emissions exceed 25 tons per year, a facility Title V permit would be necessary. In addition, if individual HAP emissions exceed 10 tons per year or if the total HAP emissions exceed 25 tons per year, a Title V permit would be necessary.

*NYSDEC PART 231 NON-ATTAINMENT NEW SOURCE REVIEW - APPLICABLE TO THE PLANT FOR ADDITION OF EITHER METHANOL OR ETHANOL*

If the total emissions from the chemical addition exceeds 25 tons per year of VOCs, the plant would be subject to the non-attainment new source review regulations. In addition to triggering a Title V permit, this would require the process to meet Lowest Achievable Emission Rate

(LAER) for VOCs, which would likely be interpreted as covers with add-on carbon adsorbers. In addition, VOC emission offsets would need to be secured that exceed the facility's emission potential at an offset ratio of 1.3 to 1.

### C. METHODOLOGY

To predict the estimates of non-criteria air pollutant emissions from the combustion exhausts and wastewater process sources, emission estimates were developed for the proposed action. Emissions from the process sources were estimated using the general fate model, TOXCHEM+, with the use of influent data collected at Hunts Point WPCP and pilot test data at the 26th Ward WPCP. For processes that are covered and odor controlled using carbon adsorbers (the primary influent channel, the screenings in the main building, and the centrifuge in the dewatering building), it was conservatively assumed that for non-criteria pollutants, the emissions would not be reduced by the odor control systems. Therefore, no reduction in non-criteria pollutant emissions due to the carbon adsorbers was made. Emissions from the plant's combustion sources were determined with the use of emission factors used in Phases I and II air quality assessment and from emission factors from similarly sized and fueled units at other wastewater treatment plants.

#### MODEL SELECTION

The non-criteria pollutant emissions from the Hunts Point WPCP were modeled using the Industrial Source Complex Short-term (ISCST3) model. The ISCST3 model (also employed in the assessment of criteria pollutant impacts, discussed in Chapter 8, "Criteria Air Pollutants") was selected because it can predict air quality impacts from facilities with multiple area sources (e.g., open wastewater tanks) and point sources (e.g., combustion source exhaust stacks) in either urban or rural settings. In addition, the ISCST3 model can produce results for multiple averaging times, including 1-hour and annual impacts for comparison with the Short-term Guidance Concentrations (SGCs) and Annual Guidance Concentrations (AGCs), respectively. The modeling was performed with the latest version of the ISCST3 model, version 02035.

The ISCST3 model has the capability of calculating pollutant concentrations at locations where the plume from the exhaust is affected by aerodynamic wakes and eddies (downwash) produced by nearby structures. Computations with the ISCST3 model to determine impacts from the Hunts Point WPCP were made assuming stack tip downwash, buoyancy induced dispersion, gradual plume rise, urban dispersion coefficients, wind profile exponents (with and without downwash), and elimination of calms.

EPA's Building Profile Input Program (BPIP) program, which is described in the *User's Guide to the Building Profile Input Program*, EPA, Research Triangle Park, North Carolina, was used to determine the projected building dimensions for the ISCST3 modeling with the building downwash algorithm enabled.

Since the ISCST3 model will not predict impacts within the cavity wake region that is created behind buildings and other structures, combustion source impacts within this area were estimated using the ISCPRIME model. The ISCPRIME model is a modification of the ISC model that can predict impacts within the cavity wake region. The highest (worst-case) of the two model predicted impacts, ISCST3 or ISCPRIME, was used for the comparison to the guideline concentrations.

The EPA's building profile program for ISC Plume Rise Model Enhancement (PRIME), BPIP/PRIME, was used in conjunction with that model. Modeling of downwash accounted for all obstructions within a radius equal to five obstruction heights of each stack. The modeling assumptions, methodology, and preparation of basic input data are similar to those described in Chapter 8, "Criteria Air Pollutants," and Chapter 10, "Odors."

### **METEOROLOGICAL DATA**

The five-year meteorological data set was the same as used in the air quality and odor analyses for the proposed action. The meteorological data set consisted of five years of concurrent meteorological data: surface data collected at LaGuardia Airport (2000 to 2004) and concurrent upper air data collected at Brookhaven, New York.

### **RECEPTOR NETWORK**

The receptor network developed for the criteria air pollutant and odor analyses for the proposed action was used. One 2,000- by 1,500-meter Cartesian receptor grid was utilized extending from the center of the plant with 100-meter grid spacing. Discrete receptors were placed at 25 meter intervals except in the location around the construction area. For this portion of the fence line, receptors were placed at 10 foot (3.05 meter) intervals (similar to the fence line used for the analysis in Chapter 17, "Construction"). The northern fence line is at the Viele Avenue lot line and the waterfront fence line is at the location of natural shoreline, moved from the bulkhead line. Discrete receptors were also placed at several locations at residences in the vicinity of the Hunts Point WPCP, within Barretto Point Park, at the 1.2 acre parcel that would be transferred to New York City Department of Parks & Recreation (NYCDPR) for inclusion in the Barretto Point Park, and at Tiffany Street Pier. Additional receptors were also placed north of the facility up to 3 kilometers (km) away (a little less than 2 miles), at locations such as residences, schools, and churches. All receptors are referenced to Universal Transverse Mercator (UTM) coordinates.

### **SCREENING ANALYSIS**

Given the total number of contaminants of concern (73 in all) a conservative screening analysis was first employed. Using this approach, the sources were modeled in ISCST3/ISCPRIME with a unitized emission rate (1 gram/sec for stacks and 1 gram/sec-m<sup>2</sup> for area sources) over the five years of meteorological data. The maximum 1-hour and annual off-site impacts (based on the unitary emission input) from each source of non-criteria pollutant emissions at the plant at various receptor locations from the five years of modeling were then tabulated and the maximums for each source were added. Since the location of the maximum impacts of the individual sources would be at different locations throughout the plant, combining the maximum impacts is very conservative. Compounds with maximum impacts below either the SGC or AGC using this approach would meet these criteria. For compounds that indicated to have the potential for an exceedance of an SGC or an AGC from this conservative analysis, refined modeling was conducted to determine more accurate impact predictions (see discussions below).

### **REFINED ANALYSIS**

In the refined pollutant-specific modeling analysis, each source was modeled at its pollutant-specific emission rate (maximum hourly and/or annual average) and the maximum 1-hour and annual average impacts were compared with the SGC and AGC, respectively.

## D. EXISTING BACKGROUND CONCENTRATIONS

Background for such non-criteria air pollutants as VOCs is defined as the ambient level of a contaminant that can be expected to be present, excluding the facility's contribution and that of adjacent sources. Naturally occurring and anthropogenic activities contribute to background levels. Compared with the abundant amount of monitored data and knowledge of the various sources of criteria air pollutants that are discussed in Chapter 8, "Criteria Air Pollutants," there are very limited data and source information for the almost 2,000 non-criteria air contaminants emitted in New York State. The procedures that are outlined in NYSDEC's *Air Guide-1* suggest using a background level of zero for the analysis of non-criteria air pollutants, unless representative monitoring data are available for the compounds under consideration. Background levels of zero were assumed for all volatile non-criteria air pollutants for this analysis.

An examination of the available monitoring data in New York City for the compounds identified above for the combustion-related and wastewater process-related emissions and a determination of the suitability of the limited monitoring data to locations near the Hunts Point WPCP was performed. There are several sources of monitored trace non-criteria air pollutant levels in New York City. The sources of information that have been reviewed to obtain background levels included:

- NYSDEC's Toxics Air Monitoring System (TAMS);
- NYCDEP's monitoring database; and
- EPA's National Scale Air Toxics Assessment (NATA) and Cumulative Exposure Project (CEP)

NYSDEC began a Toxics Air Monitoring System (TAMS) in 1985 to monitor air quality related to toxics in urban, industrial, residential, and rural areas. The network monitors the air concentrations of selected non-criteria pollutants at several locations around the state on a monthly, quarterly, and annual average basis. The monitored values are reported in NYSDEC's Annual New York State Air Quality Report Ambient Air Monitoring System. Monitored data is available from this report through calendar year 2004. The network monitored 17 toxic contaminants from 1990 to 1994 and 19 non-criteria pollutants from 1995 to 1998. Beginning in 1999, a new method capable of detecting and monitoring over 90 compounds was instituted. This method is based on EPA's TO-15 method. There were a total of 39 compounds included in 1999, 44 compounds in 2000-2003, and 35 compounds in 2004. For the Hunts Point WPCP, the TAMS site nearest the plant is at IS52. However, there is only data available for 2003 for this site. The next closest site is College Point, which has data from 1999 through 2004. Other sites that have monitored values include the New York Botanical Gardens (1999-2004), PS59 (2002-2004), Queensborough (1999 and 2000), PS219 (2001-2004), Canal St. PO (2002), Eastern District Highschool (1990-1998), and PS274 (2000-2004).

NYCDEP has also started monitoring non-criteria pollutant compounds in ambient air at four sites in Staten Island and two sites in upper Manhattan. In Manhattan, NYCDEP operates a network of ambient air monitors at the North River WPCP. These monitoring sites, operated within the plant and at several locations within the surrounding community, are not representative nor within the vicinity of the Hunts Point WPCP.

Information on reported non-criteria air pollutants of concern from the National Scale Air Toxics Assessment (NATA) and the Cumulative Exposure Project (CEP) was reviewed. The results of the National Scale Air Toxics Assessment (EPA, 2002), which is based on 1996 emissions data, were used to develop an understanding of the quality of air and its possible effect on human health nationwide. The assessment looked at 33 air pollutants (a subset of the Clean Air Act's

list of 188 air toxics). Specifically, the assessment consisted of four steps that produced nationwide estimates of:

- The release of these pollutants into the air from various sources;
- The concentration of these compounds in the air;
- The exposure of populations to this air; and
- The risk of both cancer and non-cancer health effects resulting from this exposure.

The emissions inventory and modeling methodologies in the National Scale Assessment are used to estimate long-term outdoor concentrations of air toxics attributable to 1996 anthropogenic emissions, within 50 kilometers (a little over 30 miles) of each source.

To estimate the outdoor concentrations, the background concentrations monitored in the EPA Cumulative Exposure Project (CEP) study (EPA, 1999) were employed. These background concentrations were represented by the concentrations measured at “clean air locations” remote from the impact of local anthropogenic sources. As such, they do not represent typical urban background levels. Background concentrations were identified from published journal articles, reports, and books. The background locations were characterized as rural/remote, hemispheric baseline, remote ocean, global background, etc., denoting contributions from only natural sources or long-range transport.

Table 9-1 shows the background concentrations of the compounds of concern for Hunts Point presented in the NATA and CEP studies.

**Table 9-1  
National-Scale Air Toxics Annual Average Background  
Concentration Estimates**

Compound	Background Concentration (µg/m <sup>3</sup> )
Benzene	0.48
Bis(2-ethylhexyl)phthalate	1.6
Carbon tetrachloride	0.27
Chloroform	0.083
Dibutyl phthalate	0.0010
Ethylene dichloride (1,2 dichloroethane)	0.061
Formaldehyde	0.25
Mercury compounds	0.0015
Methylene chloride	0.15
Perchloroethylene (tetrachloroethylene)	0.14
Trichloroethylene	0.081
<b>Source:</b> Technology Transfer Network - National Air Toxics Assessment, Background Concentration Estimates: <a href="http://www.epa.gov/ttn/atw/nata/haptbl.html">http://www.epa.gov/ttn/atw/nata/haptbl.html</a>	

The background levels for a number of these compounds (benzene, carbon tetrachloride, chloroform, 1,2 dichloroethane, and formaldehyde) are representative of background levels in the northern hemisphere. These background levels are all higher than their respective NYSDEC AGCs.

Of the volatile compounds monitored at the College Point monitoring station in 2004, twelve compounds (vinylchloride, 1,3-butadiene, 1,1-dichloroethene, chloroform, 1,2-dichloroethane, benzene, carbon tetrachloride, bromodichloromethane, cis-1,3-dichloropropene, 1,1,2-trichloroethane, 1,2-dibromorethane, and 1,1,2,2-tetrachloroethylane) were found to have annual averages well above their AGC. In addition, 1,4-dichlorobenzene was found to have annual

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averages well above its AGC for years 1999 through 2003 at the College Point monitoring station. This compound was not reported in 2004.

Benzene remains the one compound that shows annual average concentrations well above its AGC at all monitoring sites, indicating that this is a ubiquitous compound throughout the State. The principle source is automotive tailpipe emissions and related gasoline storage and handling. There are also local industrial sources of benzene that are believed to contribute to the measured values at particular sites. Other compounds, such as trichloroethylene and tetrachloroethylene also exceed their AGCs at specific sites, as does methylene chloride. These exceedances have been attributed to local sources. NYSDEC reported that for most of the compounds measured, annual average concentrations are below the AGCs at most sites, and that with the exception of benzene, any annual concentrations above AGCs have been due to specific local sources of the compound in question.

One of the difficulties with attempting to determine background levels of non-criteria compounds based on local monitored data is the lack of information pertaining to the sources of these compounds (i.e., do they occur naturally? are they trace by-products of regional stationary combustion sources or mobile sources? are there local industrial or commercial sources that affect the ambient background levels?, etc.). Although NYSDEC has collected data at College Point in Queens, which is located approximately five miles from the Hunts Point WPCP, data collected at this site cannot automatically be considered representative of background levels near the plant because information on the regional and local sources of these trace compounds is limited. Hence, it is uncertain whether local sources of these trace compounds are disproportionately affecting the monitoring values at the College Point monitor.

Without the knowledge of the sources of these numerous compounds, the ranges in the monitored levels of the trace pollutants at locations throughout the City for the non-criteria air pollutants of concern were examined to determine at least if there were any reasonable trends in the monitored values at all of the New York City monitoring sites compared with the corresponding AGCs. For the most part, it can be seen that the monitored annual concentrations of non-criteria pollutants have been decreasing over the past several years. Since NYCDEP and NYSDEC monitoring stations collect a maximum of one sample per day, no comparisons with the Short-Term Guideline Concentrations (SGCs) were appropriate.

With respect to quantifying the contribution from other sources to the background, the accurate information on the source parameters and emission rates required for a dispersion modeling analysis is not currently available, and NYSDEC has not required inclusion of these sources when conducting an analysis for a comparison to *Air Guide-1* AGCs and SGCs.

Because there is great variability, no clear, discernible pattern among the monitored data throughout the City for the volatile non-criteria air pollutants of concern, and because there is very limited information on the sources of these compounds throughout the City, the monitored non-criteria air pollutant levels at College Point and at the other monitoring sites were not considered to be suitable for use as background for the Hunts Point WPCP. Therefore, background levels of zero were assumed for all volatile non-criteria air pollutants. This approach is consistent with NYSDEC Air Guide-1, and the NYSDEC guidance in *Air Guide-1* recommends that exceedances of the SGCs or AGCs due to the incremental impact from the facility be addressed.



## **E. THE FUTURE WITHOUT THE PROPOSED ACTION**

In the future without the proposed action, ambient levels of non-criteria air pollutants in the region are anticipated to be similar to that described for existing conditions. Land uses are expected to remain generally the same in this neighborhood and since air quality regulations mandated by the Clean Air Act are anticipated to maintain or improve air quality in the region, it can be expected that air quality conditions in the future without the proposed action would be no worse than those that presently exist.

In the future without the proposed action, the WPCP will operate as upgraded under the Phase I and Phase II Upgrades. This section discusses emission sources and parameters in the future without the proposed action. Most of the sources of non-criteria air pollutants would already be in place by the completion of the Phase II Upgrades. This section provides a summary of Phases I and II non-criteria air pollutant sources. Since the Phase II environmental assessment, changes were made to the wastewater process assumptions, including updates for the flowrate (124 mgd), mixed liquor suspended solids (MLSS) concentrations, flow splits in the aeration tanks, and the summer air flow rate from the blowers (3 operating). Given the changes in the wastewater parameters, the predicted non-criteria air impacts for the future without the proposed action were updated for this EIS and presented in this section. Combustion source emissions for the future without the proposed action are discussed, and the total impacts from such sources from the plant with the Phase I and II Upgrades and the proposed action are provided later in this chapter under “Probable Impacts of the Proposed Action.”

### **WASTEWATER PROCESS SOURCES**

Non-criteria pollutant process sources were modeled and updated for this analysis based on 124 mgd flow projection (year 2045) and site-specific parameters. Emissions from the process sources at the plant were determined using TOXCHEM+. TOXCHEM+ is an EPA approved computational model designed to estimate the emissions of specific contaminants from wastewater treatment processes in the atmosphere. The model performs a mass balance around each unit operation, as well as the whole plant and includes sorption, biodegradation, and volatilization mechanisms to define the fate of each compound in the treatment process. For contaminants that are biodegradable, proper modeling of the biological process is of great importance since the bacteria will remove a portion of the contaminant, limiting volatilization. The TOXCHEM+ model estimates pathway sources (influent and recycle loadings) and losses (volatilization, sorption, and biodegradation) from the wastewater and certain solids handling facilities (i.e., gravity thickeners). Using this model, it is possible to estimate emissions from complex treatment configurations while considering split flows, liquid streams, quiescent surfaces, drops/weirs, and packed media, as well as aerated, biological, and covered processes or any single operation or process. To predict emissions, the model considers the fate of the wastewater non-criteria pollutants due to volatilization, biodegradation, and adsorption onto solids, which are subsequently separated and removed for disposal. The model predicts the mass of each organic compound lost and/or emitted through volatilization, biodegradation, and adsorption from each unit operation analyzed. TOXCHEM+ was used in the analyses for Phases I and II. The most recent version of this fate model was used for the Phase III analysis.

TOXCHEM+ was set up to be specific to the Hunts Point WPCP and was modeled at 124 mgd. The set-up included detailed information on the plant’s design (physical dimensions) and operation to accurately simulate the plant unit operations. For example, the type of biological treatment and the number of units (i.e., tanks) were specified. Wastewater characteristics of the

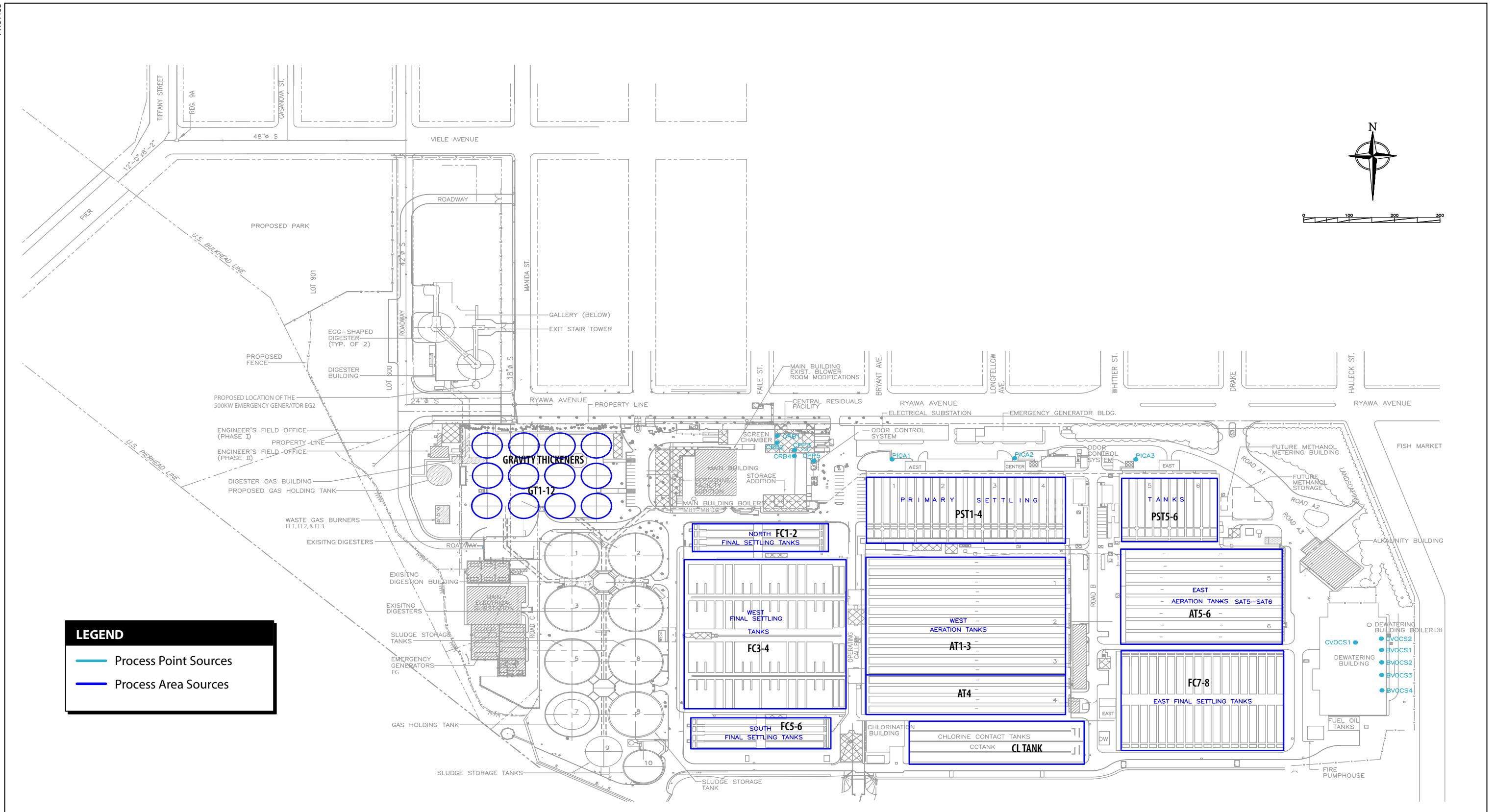
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plant, such as influent wastewater flow and temperature, non-criteria pollutant concentration, total suspended solids, and volatile suspended solids were also used as input. The result was an emissions model specifically designed for the Hunts Point WPCP.

The TOXCHEM+ model was run using maximum influent wastewater non-criteria pollutant concentrations, which simulated short-term (maximum 1-hour) emissions and average influent wastewater non-criteria pollutant concentrations, which simulated annual average emissions. Three TOXCHEM+ scenarios were run: the future without the proposed action, the future with the action with methanol addition, and the future with the proposed action with ethanol addition. The maximum emission rates occurred under the future with the proposed action with methanol addition. The future with the action with ethanol addition emissions rates were slightly lower.

The results of the TOXCHEM+ model were used as input to the ISCST3 dispersion model to determine the ambient impacts of the non-criteria pollutants from the wastewater treatment process sources, such as the screen channels, settling tanks, aeration tanks, and sludge thickeners. Figure 9-1 presents the locations of the process sources used in the modeling analysis. Each process source is labeled by source group. For example, the primary clarifier tanks 1 through 4 were modeled as source group PST1-4. The open wastewater processes were modeled as area sources. These included the primary clarifiers (PST1-4 and PST5-6), the aeration tanks (AT1-3, AT4, and AT5-6), the final settling tanks (FC1-2, FC3-4, FC5-6, and FC7-8), the chlorine contact tanks (Cltank), and the gravity thickeners (GT1-12). The wastewater processes that are covered and odor controlled using carbon adsorbers were modeled as point sources. These are the primary influent channel (PICA1, PICA2, and PICA3), the screenings in the main building (CRB1-CRB5), and the centrifuge in the dewatering building (CVOCS1, CVOCS2, BVOCS1-BVOCS4). Tables 9-2 and 9-3 present the process source non-criteria pollutant emission rates used in the modeling analysis. The values are presented in scientific notation. Table 9-4 presents the parameters for the odor control stacks.



**Table 9-2**  
**Future Without the Proposed Action**  
**Wastewater Process Maximum Hourly Emissions**

Pollutant	Source Group (g/s)												
	AT1-3	AT4	AT5-6	FC1-2 & FC5-6	FC3-4	FC7-8	PST1-4	PST5-6	CLTANK	GT1-12 <sup>2</sup>	CRB1-5	PICA1-3	CVOCS1-2 & BVOCS1-4 <sup>3</sup>
Acetone	1.05E-03	5.84E-06	6.23E-04	6.30E-04	1.15E-03	9.45E-04	1.17E-02	5.83E-03	3.55E-04	5.25E-05	3.51E-06	3.15E-04	1.79E-08
Benzene	4.19E-04	2.75E-06	1.89E-04	3.01E-05	4.27E-05	4.16E-05	9.45E-04	4.72E-04	3.56E-05	7.64E-06	1.36E-07	3.15E-04	1.59E-07
Bis(2-ethylhexyl)phthalate	2.05E-03	6.62E-05	1.36E-03	1.05E-04	1.78E-04	1.57E-04	2.10E-04	1.05E-04	5.91E-05	7.00E-06	3.15E-08	1.76E-06	5.19E-07
Chloroform	6.28E-03	4.92E-04	3.50E-03	5.25E-04	7.35E-04	6.82E-04	1.68E-03	8.40E-04	5.26E-04	3.53E-05	2.27E-07	4.72E-04	6.46E-08
1,4-Dichlorobenzene	4.93E-03	1.05E-03	2.77E-03	4.20E-04	6.30E-04	5.77E-04	1.33E-03	6.65E-04	3.68E-04	3.09E-05	1.72E-07	3.15E-04	3.48E-06
Dichlorobromomethane	1.96E-04	5.63E-06	1.12E-04	5.05E-05	6.31E-05	5.25E-05	4.20E-04	2.10E-04	2.46E-05	4.95E-06	6.44E-08	5.25E-05	5.61E-08
cis-1,2-Dichloroethylene	1.35E-03	4.66E-05	8.08E-04	1.05E-04	1.27E-04	1.57E-04	7.70E-04	3.85E-04	1.06E-04	1.01E-05	9.90E-08	2.10E-04	2.01E-07
Methylene Chloride	2.96E-03	1.66E-04	1.62E-03	3.15E-04	4.20E-04	4.20E-04	1.12E-03	5.60E-04	2.59E-04	2.17E-05	1.41E-07	2.62E-04	8.60E-08
Ethyl benzene	2.53E-04	3.57E-06	1.43E-04	1.44E-05	2.06E-05	2.00E-05	4.90E-04	2.45E-04	2.08E-05	4.72E-06	7.17E-08	1.57E-04	9.06E-07
Hexachlorocyclohexane	1.15E-07	1.87E-08	7.43E-08	3.00E-08	6.06E-08	4.64E-08	4.90E-08	2.45E-08	1.99E-08	2.00E-09	2.46E-11	1.15E-09	1.90E-11
Methyl isobutyl ketone	6.85E-04	3.26E-05	4.55E-04	1.57E-04	2.47E-04	2.62E-04	7.35E-04	3.67E-04	8.38E-05	1.24E-05	1.47E-07	1.05E-04	2.09E-08
Naphthalene	4.15E-05	7.59E-07	2.42E-05	1.26E-05	1.90E-05	1.77E-05	2.45E-04	1.22E-04	5.54E-06	2.60E-06	4.58E-08	2.54E-05	6.71E-08
Phenanthrene	3.76E-05	1.00E-06	2.44E-05	5.33E-06	9.98E-06	8.01E-06	3.50E-05	1.75E-05	3.07E-06	5.10E-07	1.06E-08	9.64E-07	2.20E-08
Tetrachloroethylene	1.40E-02	1.03E-03	7.88E-03	4.72E-04	6.82E-04	6.30E-04	1.99E-03	9.97E-04	8.41E-04	3.76E-05	2.91E-07	7.87E-04	1.34E-06
Toulene	4.66E-03	6.00E-05	2.55E-03	2.62E-04	3.67E-04	3.67E-04	5.07E-03	2.54E-03	3.62E-04	5.25E-05	7.59E-07	1.78E-03	3.63E-06
m-Xylene	1.09E-03	3.76E-05	6.00E-04	5.25E-05	6.36E-05	5.25E-05	7.00E-04	3.50E-04	7.79E-05	8.54E-06	1.05E-07	2.62E-04	1.51E-06
o-Xylene	1.30E-04	1.02E-06	7.03E-05	9.12E-06	1.31E-05	1.26E-05	6.30E-04	3.15E-04	1.13E-05	5.89E-06	9.93E-08	2.10E-04	7.12E-07
p-Xylene	2.50E-04	2.61E-06	1.42E-04	1.45E-05	2.08E-05	2.01E-05	7.00E-04	3.50E-04	2.15E-05	6.67E-06	1.07E-07	2.62E-04	1.13E-06

**Notes:**

<sup>1</sup>. Emissions represent the total emissions per source group.

<sup>2</sup>. The sludge thickeners were modeled as 10 area sources (ST1, ST2, ST3, ST4, ST5, ST6, ST7, ST8, ST10, and ST12). During normal operations, only 10 of the 12 sludge thickeners are used, therefore, ST9, and ST11 were not assigned emission rates in the model.

<sup>3</sup>. CVOCS2 and BVOCS3 are considered standby and were not modeled.

**Table 9-3**  
**Future Without the Proposed Action**  
**Wastewater Process Maximum Annual Emissions**

Pollutant	Source Group (g/s)												
	AT1-3	AT4	AT5-6	FC1-2 & FC5-6	FC3-4	FC7-8	PST1-4	PST5-6	CLTANK	GT1-12 <sup>2</sup>	CRB1-5	PICA1-3	CVOCS1-2 & BVOCS1-4 <sup>3</sup>
Acetone	7.22E-04	4.08E-06	4.04E-04	4.72E-04	7.87E-04	6.82E-04	7.73E-03	3.87E-03	2.40E-04	4.41E-05	2.73E-06	2.10E-04	1.50E-08
Benzene	1.81E-04	1.61E-06	1.06E-04	2.12E-05	2.88E-05	2.89E-05	5.95E-04	2.97E-04	2.45E-05	5.25E-06	9.49E-08	2.10E-04	1.14E-07
Bis(2-ethylhexyl)phthalate	1.70E-03	5.29E-05	1.12E-03	1.05E-04	1.75E-04	1.05E-04	1.75E-04	8.75E-05	5.72E-05	6.67E-06	2.95E-08	1.59E-06	5.33E-07
Chloroform	3.61E-03	3.78E-04	2.00E-03	4.20E-04	5.77E-04	5.77E-04	1.19E-03	5.95E-04	3.68E-04	3.01E-05	1.81E-07	3.67E-04	5.75E-08
1,4-Dichlorobenzene	3.67E-03	8.92E-04	2.01E-03	4.20E-04	6.30E-04	5.77E-04	1.19E-03	5.95E-04	3.68E-04	3.22E-05	1.72E-07	3.15E-04	3.78E-06
Dichlorobromomethane	1.33E-04	4.46E-06	7.58E-05	4.89E-05	6.27E-05	5.25E-05	3.50E-04	1.75E-04	2.18E-05	4.83E-06	6.40E-08	5.25E-05	5.84E-08
cis-1,2-Dichloroethylene	9.72E-04	4.12E-05	5.94E-04	1.05E-04	1.27E-04	1.57E-04	6.65E-04	3.32E-04	1.06E-04	1.03E-05	9.90E-08	2.10E-04	2.13E-07
Methylene Chloride	2.00E-03	1.62E-04	1.14E-03	3.15E-04	4.20E-04	4.20E-04	9.45E-04	4.72E-04	2.51E-04	2.18E-05	1.35E-07	2.62E-04	9.04E-08
Ethyl benzene	1.43E-04	2.35E-06	7.89E-05	1.17E-05	1.60E-05	1.59E-05	3.50E-04	1.75E-04	1.63E-05	3.74E-06	5.81E-08	1.05E-04	7.47E-07
Hexachlorocyclohexane	9.27E-08	1.50E-08	6.03E-08	2.57E-08	5.12E-08	3.95E-08	4.10E-08	2.05E-08	1.67E-08	1.84E-09	2.27E-11	1.04E-09	1.92E-11
Methyl isobutyl ketone	4.65E-04	2.89E-05	2.39E-04	1.57E-04	2.46E-04	2.62E-04	6.30E-04	3.15E-04	7.78E-05	1.26E-05	1.47E-07	1.05E-04	2.20E-08
Naphthalene	3.04E-05	6.23E-07	1.78E-05	1.21E-05	1.74E-05	1.67E-05	2.10E-04	1.05E-04	4.92E-06	2.50E-06	4.55E-08	2.31E-05	6.84E-08
Phenanthrene	3.11E-05	8.53E-07	2.03E-05	4.78E-06	8.73E-06	7.11E-06	3.50E-05	1.75E-05	2.64E-06	4.91E-07	1.02E-08	8.77E-07	2.27E-08
Tetrachloroethylene	8.84E-03	8.84E-04	4.91E-03	4.20E-04	5.77E-04	5.77E-04	1.43E-03	7.17E-04	7.88E-04	3.32E-05	2.34E-07	5.77E-04	1.23E-06
Toluene	2.67E-03	5.41E-05	1.42E-03	2.10E-04	3.09E-04	3.15E-04	3.67E-03	1.84E-03	2.94E-04	4.26E-05	6.16E-07	1.36E-03	3.03E-06
m-Xylene	6.00E-04	2.41E-05	3.29E-04	4.02E-05	5.51E-05	5.25E-05	4.55E-04	2.27E-04	5.80E-05	6.35E-06	7.83E-08	1.57E-04	1.17E-06
o-Xylene	9.12E-05	8.35E-07	4.92E-05	9.10E-06	1.25E-05	1.24E-05	5.60E-04	2.80E-04	1.10E-05	5.73E-06	9.93E-08	2.10E-04	7.20E-07
p-Xylene	1.36E-04	1.60E-06	7.41E-05	1.08E-05	1.48E-05	1.48E-05	4.55E-04	2.27E-04	1.57E-05	4.86E-06	7.95E-08	1.57E-04	8.52E-07

**Notes:**

<sup>1</sup>. Emissions represent the total emissions per source group.

<sup>2</sup>. The sludge thickeners were modeled as 10 area sources (ST1, ST2, ST3, ST4, ST5, ST6, ST7, ST8, ST10, and ST12). During normal operations, only 10 of the 12 sludge thickeners are used, therefore, ST9, and ST11 were not assigned emission rates in the model.

<sup>3</sup>. CVOCS2 and BVOCS3 are considered standby and were not modeled.

**Table 9-4**  
**Future Without the Proposed Action**  
**Odor Control Stack Parameters**

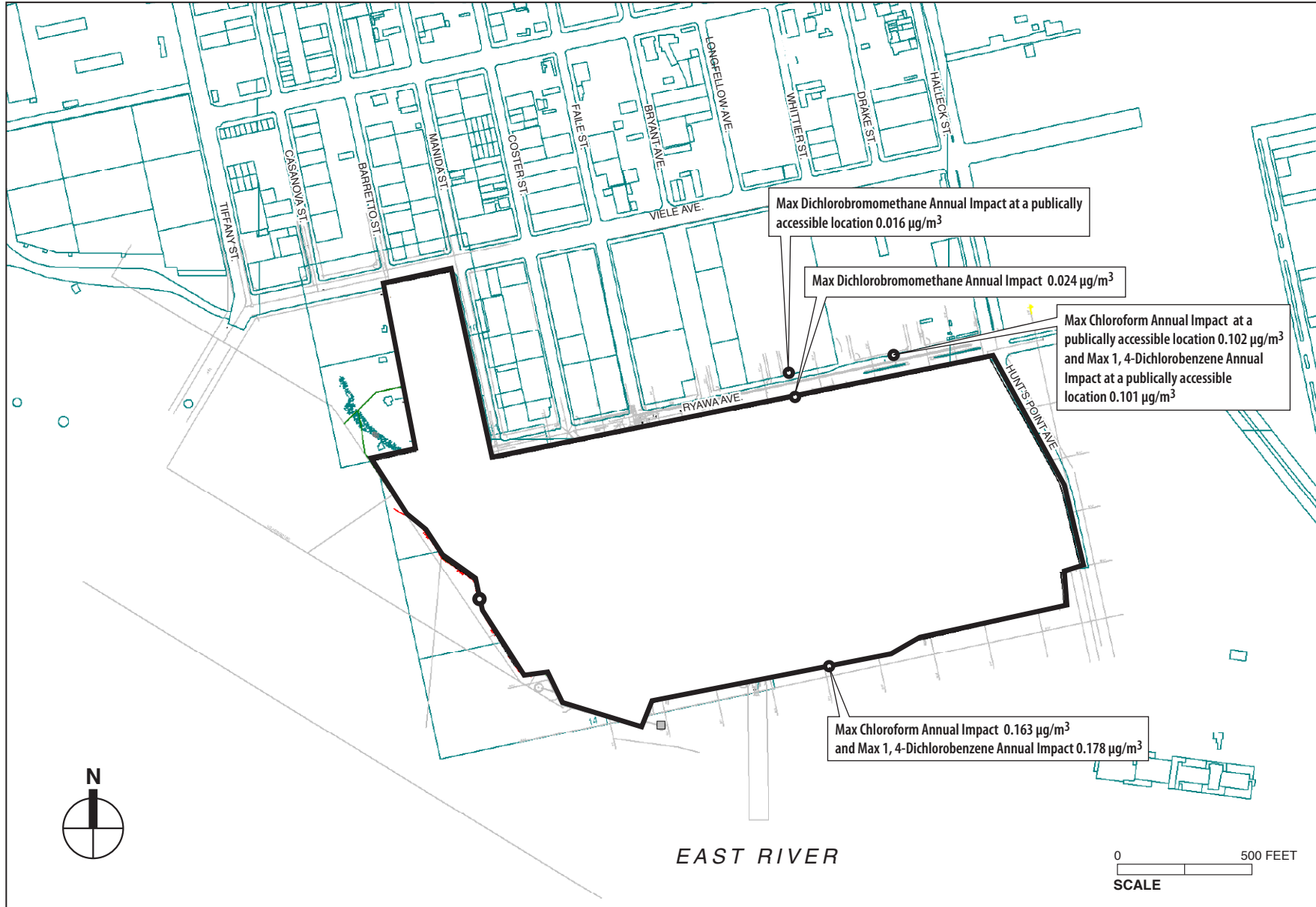
	PICA1, PICA2, PICA3	CRB1, CRB2, CRB3, CRB4	CRB5	CVOCS1, CVOCS2	BVOCS1, BVOCS2, BVOCS3, BVOCS4
Number of Stacks Modeled	3	4	1	1*	3*
Stack Height (ft)	10	95	95	53.5	70
Stack Diameter (ft)	19.5	2.5	4.5	0.92	3.67
Exit Temperature (F)	60	60	60	60	60
Velocity (ft/min)	5.9	3,248	2,716	4,356	4,734
<b>Notes:</b> * CVOCS2 and BVOCS3 are considered standby and were not modeled.					

All emissions from the primary clarifier influent channels were assumed to be released from the three carbon adsorbers used for control of those emissions (PICA1, PICA2, and PICA3). With respect to non-criteria pollutant emissions, no emission reduction credit was given to the carbon adsorbers at the Central Residuals Building (CRB1 through CRB5), dewatering building (CVOCS1, CVOCS2, and BVOCS1 through BVOCS4), and at the influent channels to the primary clarifiers.

On the basis of realistic, yet conservative, operational information updates in the TOXCHEM+ model for this assessment, such as wastewater flow rate, mixed liquor suspended solids (MLSS), MLSS volatile ratio, process air flow rate, the number of continuously stirred tank reactors for each aeration tank, and other parameters predicted, wastewater process non-criteria pollutant emissions are actually less than previously reported in the Negative Declaration for the Phase II Upgrade. Table 9-5 presents the Phase I and II non-criteria pollutant emissions currently modeled with updated parameters.

Table 9-6 presents the highest short-term and annual impacts from the process sources. All impacts are below the SGCs. The highest one-hour impact from process sources is chloroform, representing 15 percent of the SGC. The first column in Table 9-6 presents the maximum short-term impact predicted by the model. For example, for chloroform, the short-term impact is 21.77  $\mu\text{g}/\text{m}^3$ . The second column in the table presents the SGC for the compound. The SGC for chloroform is 150  $\mu\text{g}/\text{m}^3$ . Therefore, the percent of SGC is calculated as 15%, as indicated in the third column in the table. Similarly, the fourth, fifth, and sixth columns in the table present the annual impacts predicted by the model, the AGC for each specific compound, and the calculated percent of AGC, respectively.

The results of the future without the proposed action analysis showed that three compounds had predicted exceedances of their corresponding AGCs. 1,4-Dichlorobenzene was 2.15 times its AGC of 0.09  $\mu\text{g}/\text{m}^3$ , chloroform was 3.93 times its AGC of 0.043  $\mu\text{g}/\text{m}^3$ , and dichlorobromoethane was 1.22 times its AGC of 0.02  $\mu\text{g}/\text{m}^3$ . No non-criteria pollutant exceeds the AGC by more than 10 times. The peak impacts for all three compounds occurred at the plant's northern and southern fence lines. Figure 9-2 presents the maximum impacts and the maximum impacts at a publicly accessible area. The extent of the predicted exceedances to the north is just beyond the plant's fence line for less than 1 block to Viele Avenue, where there are no residential or park areas. The general land use in this area is industrial, utilities, transportation, and public parking. The extent of the predicted exceedances beyond the southern fence line is in the water. As discussed in Chapter 2, "Land Use, Zoning, Neighborhood Character, and Open Space," in the future without the proposed action, the Ryawa-Viele Connection of the South Bronx Greenway could be constructed by the year 2011. These predicted exceedances of the AGCs would occur on segments of this proposed greenway adjacent to the plant on Ryawa Avenue in the future without the proposed action.



- Project Site Boundary
- Maximum Impact

Maximum Predicted Non-Criteria  
Pollutant Annual Impacts  
Figure 9-2

**Table 9-5  
Future Without the Proposed Action  
Total Predicted Facility Emissions (lb/day)**

Non-criteria pollutant (from TOXCHEM+)	Future Without the Proposed Action	
	Hourly	Annual
acetone*	4.31	2.89
Benzene	0.48	0.29
bromodichloromethane (dichlorobromomethane)	0.23	0.19
chloroform (trichloromethane)	3.00	1.93
1,4-dichlorobenzene (p-dichlorobenzene)	2.50	2.04
dichloroethylene, 1,2, cis	0.78	0.63
ethyl benzene	0.26	0.18
methyl-2-pentanone,4- (methyl isobutyl ketone)	0.60	0.48
methylene chloride (dichloromethane)*	1.55	1.22
tetrachloroethene (tetrachloroethylene)*	5.59	3.76
Toluene	3.44	2.32
1,2-xylene (o-xylene)	0.27	0.24
1,3-xylene (m-xylene)	0.63	0.38
1,4-xylene (p-xylene)	0.34	0.21
Bis(2-ethylhexyl)phthalate	0.82	0.68
Hexachlorocyclohexane	0.00	0.00
Naphthalene	0.10	0.08
Phenthrene	0.03	0.02

**Note:** \* Not a VOC, therefore not included in the total calculation.

**Table 9-6  
Future Without the Proposed Action  
Maximum Short-Term and Annual Impacts from Process Sources**

Compound	Short-term Impact ( $\mu\text{g}/\text{m}^3$ )	SGC ( $\mu\text{g}/\text{m}^3$ )	Percent of SGC (%)	Annual Impact ( $\mu\text{g}/\text{m}^3$ )	AGC ( $\mu\text{g}/\text{m}^3$ )	Percent of AGC (%)
Acetone	<u>34.98</u>	180000	0%	<u>0.81</u>	28000	0%
Benzene	6.85	1300	1%	0.10	0.13	78%
Bis(2-ethylhexyl)phthalate	<u>3.90</u>	---	---	0.10	0.42	24%
Chloroform	<u>21.77</u>	150	15%	0.16882	0.043	393%
1,4-Dichlorobenzene	17.22	---	---	0.193	0.09	215%
Dichlorobromomethane	2.13	---	---	0.024	0.02	122%
cis-1,2-Dichloroethylene	6.91	---	---	0.17	1900	0%
Methylene Chloride	11.78	14000	0%	0.30	2.1	14%
Ethyl benzene	<u>3.55</u>	54000	0%	0.06	1000	0%
Hexachlorocyclohexane	0.00	---	---	0.00	---	---
Methyl isobutyl ketone	<u>5.05</u>	31000	0%	0.14	3000	0%
Naphthalene	1.00	7900	0%	0.03	3	1%
Phenanthrene	0.18	---	---	0.01	0.02	28%
Tetrachloroethylene	<u>36.64</u>	1000	4%	0.74	1	74%
Toulene	<u>42.04</u>	37000	0%	0.73	400	0%
m-Xylene	<u>6.68</u>	4300	0%	0.10	100	0%
o-Xylene	4.33	4300	0%	0.09	100	0%
p-Xylene	5.37	4300	0%	0.08	100	0%



As stated above, SGCs and AGCs are guideline concentrations rather than standards and AGCs in particular, are developed to protect the public health from the effects associated with long-term continuous, exposure to a contaminant.

The main contributors to the offsite exceedances of chloroform, 1,4-dichlorobenzene, and dichlorobromomethane are the emissions from the aeration tanks, chlorine contact tanks, the primary influent channels, and the primary settling tanks. It is expected that chloroform, 1,4-dichlorobenzene, dichlorobromomethane, and other non-criteria pollutants would be adsorbed on the carbon, thereby reducing the levels emitted through these odor control stacks. However, these were modeled assuming no reductions in non-criteria air pollutant emissions, including chloroform, 1,4-dichlorobenzene, and dichlorobromomethane, from the carbon adsorbers in the odor control system at the primary influent channels. In addition, all chloroform, 1,4-dichlorobenzene, and dichlorobromomethane emissions from the chlorine contact tanks were conservatively assumed to be emitted from the open portions of the tank.

An analysis of the chloroform impacts offsite demonstrated that maximum annual chloroform impacts occurred beyond the northern fence line along Ryawa Avenue extending less than 1 block to Viele Avenue and along the southern fence line extending into the water. An analysis of the 1,4-dichlorobenzene impacts offsite also demonstrated maximum annual impacts occurring just beyond the northern fence line on Ryawa Avenue and just beyond the southern fence line in the water and maximum annual impacts of Dichlorobromomethane occurred just beyond the northern fence line along the street before Ryawa Avenue. There are no residences or other permanent or occupied locations between Ryawa Avenue and Viele Avenue and along the water past the southern fence line. The predicted exceedances of the AGCs from these three compounds do not extend to the nearest residence or into the nearest residential neighborhood, or the Vernon C. Bain Center, hence there would be no long-term, continuous exposure in these areas. In addition, as discussed under “existing background concentrations” above, the monitored data throughout the New York City for volatile non-criteria air pollutants are greater than the AGCs and the incremental levels predicted from the plant. For example, monitored levels in 2004 of chloroform and 1, 4-dichlorobenzene at the College Point monitoring station were 4.5 and 5.9 times higher than their respective AGCs. The maximum predicted contributions from the plant for the future without the proposed action are well below 10 times the AGC.

#### **BEST AVAILABLE CONTROL TECHNOLOGY (BACT) ANALYSIS FOR NON-CRITERIA POLLUTANTS**

New York State regulations require that a Best Available Control Technology (BACT) be performed when the AGCs based on a one-in-million risk level for toxic non-criteria pollutants are exceeded by a factor less than 10 due to emissions from a stationary source. A BACT analysis was performed for the future without the proposed action and presented in the Negative Declaration for the Phase II Upgrade. Measures considered for reduction of non-criteria air pollutant emissions at the plant included:

- VOC stripping and control
- Tank covers and control of non-criteria air pollutants
- Control at the point of release into the collection system
- Acquisition of impacted land area to incorporate it within the plant’s fence line.

Of these options, the only technically feasible option was tank covers on the primary clarifiers and the aeration tanks and for treating the ventilation exhausts from the tanks using carbon

adsorption. The economic evaluation for this option showed that the cost effectiveness for combined control of the three non-complying VOCs was outside the range of the cost-effectiveness values considered acceptable in BACT analyses. Based on the analyses conducted, BACT was determined to be “no control” due to technical and economical feasibility reasons.

## **COMBUSTION SOURCES**

Ambient impacts from the plant’s combustion non-criteria pollutants were evaluated on both short-term and annual bases. The short-term evaluation was performed on a “potential to emit” basis. It was assumed that all combustion equipment at the Hunts Point WPCP would be operated simultaneously at maximum load. As described in Chapter 8, “Criteria Air Pollutants,” this assumption was overly conservative since all the equipment would not be operating because of the differences between the summer and winter conditions.

For combustion sources, this EIS analysis generally employs the same information and data that were utilized in the modeling for the Phase I and II Upgrade elements that were reported in the Phase II Negative Declaration. Chapter 8, “Criteria Air Pollutants,” provides a summary of the combustion source updates included for this EIS.

The combustion non-criteria pollutant impact analyses, which are described in this chapter, are consistent with the air quality analysis discussed in Chapter 8, “Criteria Air Pollutants.” For short-term conditions, the assumption is that the facility will participate in the Peak Load Management (PLM) program from June 1 through September 30 between the hours of 11 AM to 7 PM for up to 15 days. During this period, the analysis assumed six 2,000 kW emergency generators would operate for up to a maximum of six hours per day, under non-emergency conditions. The generators would be assumed to operate simultaneously, each at 75 percent load. However, between the DEIS and the FEIS, NYCDEP has committed to operate up to five generators under the PLM program. Therefore, this assumption is conservative. During the hours in the June through September period when the PLM program is not in effect, or if NYCDEP decides not to participate in the PLM program, the six 2,000 kW emergency generators would be subjected to maintenance testing under two operating scenarios. The first scenario, Scenario 2A, would be operation of four out of the six generators operating at 75 percent load for 2 hours per day. The second scenario, Scenario 2B, would be operation of three out of the six generators operating at partial load for 2 hours per day. For modeling purposes, 50 percent load conditions were used to simulate partial load operation. In the event that the NYCDEP decides to participate in the PLM program, on days when the generators are utilized in such a program, there would be no maintenance testing.

## **COMBUSTION UNIT EXHAUST PARAMETERS**

### *Short-Term Impacts Scenario for this EIS*

For the boilers, it was assumed that emissions from four main building boilers would be released through three flues, located in the southeast corner of the main building. It was assumed that Boilers 1, 2, 3, and 4 on natural gas. Boilers 1 and 2 and Boilers 3 and 4 would each be exhausted through a common stack. Boiler 5, which is exhausted through a separate flue, is standby equipment and was not used in the modeling analysis.

It was also assumed that the two replacement 40,000 scf waste gas burners would be operating at 100 percent capacity, the dewatering building boiler would be operating at 100 percent capacity firing distillate oil, and the six emergency generators would be operating at continuous operation for a maximum of six hours a day (11 AM to 5 PM) under PLM conditions or two hours per day

for maintenance and testing conditions. This is conservative since only five out of the six emergency generators would be in operation during PLM conditions.

Table 9-7 presents the combustion source short-term stack parameters.

**Table 9-7**  
**Future Without the Proposed Action**  
**Combustion Source Short-term Model Input Parameters <sup>1</sup>**

Source ID / Source Description		Grade Elev. (m)	Stack Ht. (m)	Stack Temp. (K)	Exit Velocity (m/s)	Stack Diam. (m)
MB1	Main Bldg. Boilers 1 and 2 (100%, Natural Gas)	3.66	23.16	402.6	8.84	1.067
MB2	Main Bldg. Boilers 3 and 4 (100%, Natural Gas)	3.66	23.16	402.6	8.84	1.067
FL1	Waste Gas Burner 1 (100%)	4.57	13.84	1144.3	8.82	1.83
FL2	Waste Gas Burner 2 (100%)	4.57	13.84	1144.3	8.82	1.83
DB	Dewatering Bldg. Boiler (100%, fuel oil No. 2)	3.35	26.52	436.0	8.84	0.581
EGPLM	Six 2,000 kW emergency generators (diesel) <sup>4</sup>	4.57	18.29 <sup>2</sup>	708.2	9.62 <sup>3</sup>	2.13
EG2A	Four, 2,000 kW emergency generators (diesel)	4.57	18.29 <sup>2</sup>	708.2	6.41 <sup>3</sup>	2.13
EG2B	Three, 2,000 kW emergency generators (diesel)	4.57	18.29 <sup>2</sup>	688.7	3.55 <sup>3</sup>	2.13

**Notes:**  
<sup>1</sup> All source parameters used in the tables are obtained from the project engineers. (m) stands for meters, where 1 meter is about 3.3 feet.  
<sup>2</sup> The existing emergency generator stack was constructed at a height of 60 feet (18.29 m). This is different from the Phase II modeling analysis, which assumed a 50-foot stack height.  
<sup>3</sup> The velocity was prorated based on the maximum number of generators assumed to be operating. EGPLM and EG2A reflect 75% load conditions. EG2B reflects 50% load conditions.  
<sup>4</sup> For the non-criteria pollutant analysis, the PLM program was conservatively modeled assuming six 2,000 kW emergency generators operating even though only five would operate.

*Annual Impacts Scenario for this EIS*

For the annual modeling analysis, actual projected utilization of the combustion equipment was used. The degree to which the boilers would be utilized depended on the plant’s heat load, which varied throughout the year. The dewatering building boiler was assumed to be operating for seven months of the year at a 62 percent utilization rate, firing distillate oil.

Annual emissions for the emergency generators were conservatively assumed to operate as part of the PLM program. If the plant participates in the program, the plant may be requested to operate the emergency generators which would reduce the peak electrical demand from the power utilities. For each request, the emergency generators would be operated for a maximum of six hours per day up to 15 times per year, potentially resulting in each emergency generator operating for an additional 90 hours per year between June and September (4 months). This is conservative since only five out of the six emergency generators would be in operation during PLM conditions. Normal exercising for testing and maintenance purposes would require average operation of 16 hours per year per unit between October and May (8 months). Therefore, the total number of hours for the emergency generators would be 106 hours per year per unit.

The degree to which the boilers and waste gas burners would be utilized depends on the plant’s heat load, which varies throughout the year. The average annual plant operating conditions utilized in this EIS were the same as those employed for the previous Phase I and II analyses, and are presented in Appendix 8 for Criteria Air Pollutants.

Table 9-8 presents the source input parameters used for the annual impacts modeling.

**Table 9-8**  
**Future Without The Proposed Action**  
**Combustion Source Annual Model Input Parameters**

Source ID	Source Description <sup>(1)</sup>	Grade elev. (m)	Stack height (m)	Stack temp. (K)	Exit Velocity (m/s)	Stack diam. (m)
MB1	Boiler 1 digester gas (0.85) (shares flue)	3.66	23.16	402.6	8.74	1.067
MB2	Boiler 1 digester gas (0.20)	3.66	23.16	402.6	4.321	1.067
MB3	Boiler 1 digester gas (0.50)	3.66	23.16	402.6	4.321	1.067
MB4	Boiler 4 natural gas (0.20)	3.66	23.16	402.6	4.42	1.067
MB5	Boiler 2 natural gas) (1.00) (shares flue)	3.66	23.16	402.6	8.74	1.067
MB6	Boiler 3 natural gas (1.00)	3.66	23.16	402.6	4.42	1.067
MB7	Boiler 3 natural gas (1.00)	3.66	23.16	402.6	4.42	1.067
MB8	Boiler 2 natural gas (0.50)	3.66	23.16	402.6	4.42	1.067
MB9	Boiler 3 natural gas (0.30)	3.66	23.16	402.6	4.42	1.067
MB10	Boiler 3 natural gas (0.91)	3.66	23.16	402.6	4.42	1.067
DB	Dewatering Bldg. Boiler (Fuel oil No. 2) (0.62)	3.35	26.52	436.0	8.84	0.581
FL1	Flare 1 (0.81)	4.57	13.84	1144.3	7.14	1.83
FL2	Flare 2 (0.43)	4.57	13.84	1144.3	3.80	1.83
EG	Six 2,000 kW generators (Diesel)	4.57	18.29	708.2	9.62	2.13
<b>Note:</b>						
<sup>(1)</sup> The number in parentheses indicates the actual projected utilization (i.e., percent of maximum capacity) of the combustion equipment.						

*Combustion Source Emissions Factors*

Non-criteria air pollutants, including speciated VOC, HAPs and metals emissions from the combustion units, were developed during the Phases I and II analysis and were updated in some cases using emission factors from similarly sized units and fuels. Emission factors were developed using EPA AP-42 Emission Factors (EPA, 2000) and utilizing data from the Newtown Creek SEIS (*Newtown Creek Water Pollution Control Plant Track 3 Upgrade Final Supplemental Environmental Impact Statement*, dated June 6, 2003). The compound list and emission rates for the combustion sources are presented in Appendix 9.

In the case of acrolein, which is potentially emitted by the boilers, waste gas burners and emergency generators, currently EPA and the California Air Resources Board (CARB) are investigating an acrolein sampling method from such stationary combustion sources. A publication from the EPA’s emissions measurement center (EMC) (<http://www.epa.gov/ttn/emc/>), highlights of the emissions measurement center’s activities for 2004/2005, on February 25, 2005, mentions current efforts to evaluate and develop an acrolein method for stationary source and ambient air applications to improve sample recoveries. No updates on the development and evaluations of the new method for acrolein are found in the most recent document, which was published on March 5, 2006. EPA has also confirmed that there are no current source methods for acrolein, but there is current research for ambient sampling methods such as the canister method (with method TO-15). EPA is hoping to have a new acrolein method some time in 2007. In the time period between the issuance of the Draft and Final EISs, the sampling test methods were reviewed again and it was determined that EPA still has not yet finalized an appropriate sampling method for acrolein. The EPA and California Air Resources Board (CARB) have deemed the wet chemistry method to be inaccurate. EPA and CARB are still in the process of developing appropriate stationary source sampling methods for acrolein. NYSDEC was consulted on this issue and concurs that the EIS has adequately discussed the situation of acrolein.

There is no sampling method with the precision required to perform an acrolein emissions impacts analysis. Until such time that methods are developed and approved and test data for combustion sources are made available, acrolein impacts cannot be quantified. The results from any analysis would be associated with a very large degree of uncertainty. In addition, the Phase III Upgrade would result in replacement of the flares and installation of a 500 kw emergency generator. The new flares would be highly efficient. The 500 kw generator would be used to provide power to the digester building in the event of power failure, and would not participate in the PLM program. These changes are not expected to have a significant effect on acrolein emissions.

## **F. PROBABLE IMPACTS OF THE PROPOSED ACTION**

The only new proposed sources with the potential to emit non-criteria pollutants are one new 500 kW emergency generator, three replacement waste gas burners, and the carbon addition sources. The waste gas burners were analyzed as part of the Phase II environmental assessment and are currently included in the air permit for the facility. This section discusses the emission sources and parameters in the future for the entire plant as upgraded under Phases I and II and the proposed action. Annual average and maximum hourly emissions from either methanol or ethanol as part of the carbon addition sources, and from the combustion sources were estimated. Both maximum 1-hour and annual average concentrations were determined at all of the receptor sites and compared with the SGCs and AGCs. In addition, the emissions of those compounds that were VOCs/HAPs were added to the process source emissions and compared with the 10-TPY threshold for individual HAPs and 25-TPY for total VOCs and HAPs.

### **WASTEWATER PROCESS SOURCES**

Maximum hourly and annual average emission rates were determined from the TOXCHEM+ model for the proposed action with either methanol or ethanol addition. The emissions of the other non-criteria pollutants were estimated to be lower than the future without the proposed action. The reduction in predicted emissions for the other compounds is the result of adding methanol and ethanol. This is because addition of these compounds enhances biodegradation rates in the aeration tanks (in both the oxic and anoxic zones). In the TOXCHEM model runs, mixed liquor suspended solids (MLSS) volatile ratio values modeled for the proposed action are significant (15 percent and 31 percent respectively for methanol and ethanol) compared to the near 0% value employed for the future without the proposed action. For the future with the proposed action, in the anoxic zones, there is increased compound loss due to biodegradation, reducing volatilization to the atmosphere. Since the emission estimates determined from the TOXCHEM+ model indicated that emissions are slightly higher when methanol is added than when ethanol is added, maximum predicted air concentrations for each of the non-criteria pollutants were determined based on methanol addition and were compared to the SGCs and AGCs. Tables 9-9 and 9-10 present the speciated non-criteria pollutant emissions under the Proposed Action with methanol addition. The emissions and impacts from methanol and ethanol for the carbon addition are discussed below.

### **CARBON ADDITION**

#### *EMISSION SOURCES AND PARAMETERS*

NYCDEP is exploring options to reduce dissolved nitrogen discharge at several of its wastewater treatment plants under NYCDEP's Applied Research Nitrogen Program (Nitrogen

Reduction Program). One such option involves the addition of carbon-based, biodegradation-enhancing compounds into the wastewater immediately upstream of the aeration tanks, thus reducing total nitrogen discharge. The compounds considered were methanol, ethanol, sodium acetate and acetic acid. Sodium acetate and acetic acid are no longer viable options for Hunts Point based on findings from the Applied Research Program and the fact that either acetic acid or sodium acetate would have significantly different handling and storage requirements. The design is now going forward based on both methanol and ethanol addition.

Estimates of methanol and ethanol emission rates from the wastewater treatment plant unit operations were developed by using representative carbon addition concentrations as input to the mathematical general fate model, TOXCHEM+. TOXCHEM+ is designed to estimate the emission of specific contaminants from wastewater treatment processes into the atmosphere. The model typically uses sorption, biodegradation and volatilization mechanisms to define the fate of each compound in the treatment process. However, TOXCHEM+ does not currently contain modules to properly model Biological Nitrogen Removal (BNR) operation and kinetics. Working with the EPA and Hydromantis (the TOXCHEM+ developer), methods to more closely approximate emissions resulting from BNR activities were developed.

**Table 9-9**  
**Future With the Proposed Action**  
**Wastewater Process Maximum Hourly Emissions**

Pollutant	Source Group (g/s)												
	AT1-3	AT4	AT5-6	FC1-2 & FC5-6	FC3-4	FC7-8	PST1-4	PST5-6	CLTANK	GT1-12 <sup>2</sup>	CRB1-5	PICA1-3	CVOCs1-2 & BVOCs1-4 <sup>3</sup>
Acetone	8.83E-04	5.14E-06	4.92E-04	5.25E-04	9.97E-04	7.87E-04	1.16E-02	5.81E-03	2.97E-04	5.25E-05	3.51E-06	3.15E-04	1.68E-08
Benzene	2.92E-04	2.28E-06	1.59E-04	2.39E-05	3.40E-05	3.31E-05	9.45E-04	4.72E-04	2.83E-05	7.33E-06	1.36E-07	3.15E-04	1.53E-07
Bis(2-ethylhexyl)phthalate	3.10E-04	5.87E-05	1.99E-04	1.05E-04	1.75E-04	1.05E-04	1.75E-04	8.75E-05	5.84E-05	6.29E-06	3.15E-08	1.75E-06	4.66E-07
Chloroform	5.89E-03	4.35E-04	3.28E-03	4.72E-04	6.82E-04	6.82E-04	1.68E-03	8.40E-04	4.21E-04	3.39E-05	2.27E-07	4.72E-04	6.21E-08
1,4-Dichlorobenzene	4.42E-03	8.92E-04	2.47E-03	3.67E-04	5.77E-04	5.25E-04	1.33E-03	6.65E-04	3.68E-04	2.92E-05	1.72E-07	3.15E-04	3.29E-06
Dichlorobromomethane	1.68E-04	5.03E-06	9.61E-05	4.47E-05	6.18E-05	5.25E-05	4.20E-04	2.10E-04	2.18E-05	4.67E-06	6.44E-08	5.25E-05	5.29E-08
cis-1,2-Dichloroethylene	1.18E-03	4.21E-05	6.98E-04	1.05E-04	1.25E-04	1.05E-04	7.70E-04	3.85E-04	9.53E-05	9.60E-06	9.90E-08	2.10E-04	1.90E-07
Methylene Chloride	2.74E-03	1.62E-04	1.56E-03	3.15E-04	4.20E-04	4.20E-04	1.12E-03	5.60E-04	2.56E-04	2.08E-05	1.41E-07	2.62E-04	8.24E-08
Ethyl benzene	1.70E-04	2.93E-06	1.04E-04	1.12E-05	1.60E-05	1.54E-05	4.90E-04	2.45E-04	1.61E-05	4.56E-06	7.17E-08	1.57E-04	8.75E-07
Hexachlorocyclohexane	7.60E-08	1.81E-08	4.85E-08	2.90E-08	5.86E-08	4.49E-08	4.89E-08	2.44E-08	1.92E-08	1.94E-09	2.46E-11	1.15E-09	1.85E-11
Methyl isobutyl ketone	5.73E-04	3.01E-05	3.46E-04	1.57E-04	2.44E-04	2.10E-04	7.35E-04	3.67E-04	7.73E-05	1.17E-05	1.47E-07	1.05E-04	1.97E-08
Naphthalene	2.78E-05	6.29E-07	1.63E-05	1.00E-05	1.51E-05	1.40E-05	2.45E-04	1.22E-04	4.39E-06	2.48E-06	4.58E-08	2.54E-05	6.40E-08
Phenanthrene	1.15E-05	7.75E-07	7.31E-06	4.06E-06	7.60E-06	6.10E-06	3.50E-05	1.75E-05	2.34E-06	4.50E-07	1.06E-08	9.62E-07	1.94E-08
Tetrachloroethylene	1.32E-02	9.80E-04	7.49E-03	4.20E-04	6.30E-04	5.77E-04	1.99E-03	9.97E-04	8.41E-04	3.64E-05	2.91E-07	7.87E-04	1.30E-06
Toluene	3.66E-03	5.89E-05	2.00E-03	2.10E-04	3.09E-04	3.15E-04	5.07E-03	2.54E-03	3.01E-04	5.08E-05	7.59E-07	1.78E-03	3.48E-06
m-Xylene	8.59E-04	3.18E-05	4.85E-04	4.41E-05	6.17E-05	5.25E-05	7.00E-04	3.50E-04	6.45E-05	8.10E-06	1.05E-07	2.62E-04	1.43E-06
o-Xylene	7.55E-05	8.25E-07	4.49E-05	6.13E-06	8.78E-06	8.48E-06	6.30E-04	3.15E-04	7.59E-06	5.74E-06	9.93E-08	2.10E-04	6.95E-07
p-Xylene	1.60E-04	2.11E-06	9.81E-05	1.05E-05	1.51E-05	1.46E-05	7.00E-04	3.50E-04	1.56E-05	6.48E-06	1.07E-07	2.62E-04	1.09E-06

**Notes:**

<sup>1</sup>. Emissions represent the total emissions per source group.

<sup>2</sup>. The sludge thickeners were modeled as 10 area sources (ST1, ST2, ST3, ST4, ST5, ST6, ST7, ST8, ST10, and ST12). During normal operations, only 10 of the 12 sludge thickeners are used, therefore, ST9, and ST11 were not assigned emission rates in the model.

<sup>3</sup>. CVOCs2 and BVOCs3 are considered standby and were not modeled.

**Table 9-10**  
**Future With the Proposed Action**  
**Wastewater Process Maximum Annual Emissions**

Pollutant	Source Group (g/s)												
	AT1-3	AT4	AT5-6	FC1-2 & FC5-6	FC3-4	FC7-8	PST1-4	PST5-6	CLTANK	GT1-12 <sup>2</sup>	CRB1-5	PICA1-3	CVOCs1-2 & BVOCs1-4 <sup>3</sup>
Acetone	5.37E-04	3.60E-06	3.13E-04	3.67E-04	7.35E-04	5.77E-04	7.70E-03	3.85E-03	1.83E-04	4.14E-05	2.73E-06	2.10E-04	1.41E-08
Benzene	1.44E-04	1.34E-06	8.19E-05	1.70E-05	2.31E-05	2.32E-05	5.95E-04	2.97E-04	1.97E-05	5.03E-06	9.50E-08	2.10E-04	1.09E-07
Bis(2-ethylhexyl)phthalate	2.50E-04	4.72E-05	1.62E-04	5.25E-05	1.73E-04	1.05E-04	1.75E-04	8.75E-05	5.10E-05	5.98E-06	2.96E-08	1.59E-06	4.80E-07
Chloroform	3.39E-03	3.75E-04	1.89E-03	4.20E-04	5.77E-04	5.25E-04	1.19E-03	5.95E-04	3.68E-04	2.88E-05	1.82E-07	3.67E-04	5.51E-08
1,4-Dichlorobenzene	3.23E-03	7.87E-04	1.82E-03	4.20E-04	5.77E-04	5.25E-04	1.19E-03	5.95E-04	3.68E-04	3.03E-05	1.72E-07	3.15E-04	3.55E-06
Dichlorobromomethane	1.13E-04	3.99E-06	6.50E-05	4.33E-05	6.02E-05	5.25E-05	3.50E-04	1.75E-04	1.93E-05	4.55E-06	6.40E-08	5.25E-05	5.51E-08
cis-1,2-Dichloroethylene	8.61E-04	3.71E-05	4.33E-04	1.05E-04	1.25E-04	1.05E-04	6.65E-04	3.32E-04	9.52E-05	9.71E-06	9.92E-08	2.10E-04	2.01E-07
Methylene Chloride	1.84E-03	1.59E-04	1.08E-03	3.15E-04	4.20E-04	4.20E-04	9.45E-04	4.72E-04	2.49E-04	2.08E-05	1.35E-07	2.62E-04	8.61E-08
Ethyl benzene	1.02E-04	1.93E-06	5.78E-05	9.08E-06	1.24E-05	1.24E-05	3.50E-04	1.75E-04	1.26E-05	3.61E-06	5.83E-08	1.05E-04	7.19E-07
Hexachlorocyclohexane	6.05E-08	1.45E-08	3.89E-08	2.49E-08	4.97E-08	3.83E-08	4.09E-08	2.05E-08	1.61E-08	1.80E-09	2.27E-11	1.04E-09	1.87E-11
Methyl isobutyl ketone	4.59E-04	2.68E-05	2.35E-04	1.57E-04	2.44E-04	2.10E-04	6.30E-04	3.15E-04	7.18E-05	1.19E-05	1.47E-07	1.05E-04	2.07E-08
Naphthalene	2.01E-05	5.16E-07	1.19E-05	9.61E-06	1.39E-05	1.33E-05	2.10E-04	1.05E-04	3.91E-06	2.38E-06	4.55E-08	2.31E-05	6.51E-08
Phenanthrene	9.23E-06	6.60E-07	5.93E-06	3.65E-06	6.65E-06	5.46E-06	3.50E-05	1.75E-05	2.01E-06	4.32E-07	1.02E-08	8.77E-07	2.00E-08
Tetrachloroethylene	8.28E-03	8.29E-04	4.58E-03	3.67E-04	5.77E-04	5.25E-04	1.43E-03	7.17E-04	7.36E-04	3.19E-05	2.34E-07	5.77E-04	1.18E-06
Toluene	2.11E-03	4.62E-05	1.19E-03	2.10E-04	2.48E-04	2.62E-04	3.67E-03	1.84E-03	2.37E-04	4.07E-05	6.14E-07	1.36E-03	2.89E-06
m-Xylene	4.32E-04	2.03E-05	2.10E-04	3.33E-05	4.56E-05	4.54E-05	4.55E-04	2.27E-04	4.79E-05	5.98E-06	7.82E-08	1.57E-04	1.10E-06
o-Xylene	5.39E-05	6.74E-07	3.19E-05	6.25E-06	8.55E-06	8.50E-06	5.60E-04	2.80E-04	7.52E-06	5.56E-06	9.92E-08	2.10E-04	7.03E-07
p-Xylene	8.92E-05	1.29E-06	5.14E-05	7.98E-06	1.09E-05	1.09E-05	4.55E-04	2.27E-04	1.16E-05	4.71E-06	7.98E-08	1.57E-04	8.29E-07

**Notes:**  
<sup>1</sup>. Emissions represent the total emissions per source group.  
<sup>2</sup>. The The sludge thickeners were modeled as 10 area sources (ST1, ST2, ST3, ST4, ST5, ST6, ST7, ST8, ST10, and ST12). During normal operations, only 10 of the 12 sludge thickeners are used, therefore, ST9, and ST11 were not assigned emission rates in the model.  
<sup>3</sup>. CVOCs2 and BVOCs3 are considered standby and were not modeled.



The experimentation was carried out at the PO55A Applied Research Facility at the NYCDEP 26th Ward WPCP where the NYCDEP operates a demonstration pilot plant facility. At PO55A, four pilotscale reactors have been in operation since 1998 that were specifically designed and are operated to perform BNR using NYC's stepfeed BNR configuration. Each pilot is divided into four passes that are each subdivided into oxic and anoxic zones for nitrification and denitrification, respectively. The biomass in these pilot reactors is acclimated to either methanol or ethanol, which is added to enhance de-nitrification. The pilots served as biomass seed sources for the aerobic and anoxic biodegradation tests.

In an effort to more accurately model emissions for the full scale stepfeed BNR at Hunts Point, the biodegradation rate and the half saturation constant for both methanol and ethanol under both aerobic and unaerated, anoxic conditions were determined. Determination of the values under both conditions is required since the plant will have both anoxic and aerobic zones in the activated sludge system. The biodegradation rates for methanol and ethanol are lower in the anoxic zones as dictated by the fundamental kinetics of the biological process under this condition. The values are more representative of the anticipated kinetic values of volatile losses of methanol and ethanol from the full scale facilities than the default values that are currently used in the TOXCHEM+ model.

The testing determined the volatilization rates and the biodegradation rates for methanol and ethanol under both aerobic and anoxic conditions. These rates were then used to determine the half saturation coefficient,  $K_s$ , and the maximum rate of substrate removal,  $Q_m$ . The values of  $Q_m$  and  $K_s$  were then used to update the modified Monod kinetics equation in the TOXCHEM+ model to more accurately predict volatile losses at the Hunts Point Facility.

TOXCHEM+ was also set up to be specific to the proposed Hunts Point WPCP Phase III Upgrade operating conditions. The plant's wastewater flow rate was modeled as 124 mgd (2045 projected flow). The set-up included detailed information on the plant's operation to accurately simulate the proposed plant unit operations. The accuracy of sensitive parameters were assessed and updated based on biodegradation rate pilot testing results. Parameters having the greatest effect on aeration tank non-criteria pollutant emissions were updated, including:

- MLSS
- MLSS volatile ratio
- Process air flow rate, and
- The number of continuously stirred tank reactors for each aeration tank.

Maximum hourly and average annual emissions were developed. Table 9-11 presents these emission rates.

**Table 9-11  
Future With the Proposed Action  
Carbon Addition Emissions**

Pollutant	Source Group (g/s)												
	AT1-3	AT4	AT5-6	FC1-2 & FC5-6	FC3-4	FC7-8	PST1-4	PST5-6	CLTANK	GT1-12 <sup>2</sup>	CRB1-5	PICA1-3	CVOCS1-2 & BVOCS1-4 <sup>3</sup>
Methanol – Max. 1-hour Emissions	3.08E-02	9.19E-07	1.43E-02	1.73E-03	3.36E-03	2.62E-03	1.40E-04	7.00E-05	1.02E-03	5.25E-05	0.00E0	2.13E-06	1.10E-08
Ethanol – Max 1-hour Emissions	1.11E-02	1.06E-07	5.32E-03	2.62E-04	5.25E-04	4.20E-04	2.40E-05	1.20E-05	1.70E-04	9.94E-06	0.00E0	3.93E-07	2.25E-09
Methanol – Annual Average Emissions	2.57E-02	8.94E-07	1.20E-02	1.63E-03	3.20E-03	2.47E-03	1.40E-04	7.00E-05	9.67E-04	5.25E-05	0.00E0	2.23E-06	1.26E-08
Ethanol – Annual Average Emissions	9.68E-03	1.07E-07	4.59E-03	2.62E-04	5.25E-04	4.20E-04	2.39E-05	1.19E-05	1.70E-04	1.09E-05	0.00E0	4.31E-07	2.71E-09
<b>Notes:</b>													
1. Emissions represent the total emissions per source group.													
2. The sludge thickeners were modeled as <u>10</u> area sources (ST1, <u>ST2</u> , ST3, <u>ST4</u> , ST5, ST6, <u>ST7</u> , ST8, ST10, and ST12). During normal operations, only <u>10</u> of the 12 sludge thickeners are used, therefore, ST9, and ST11 were not assigned emission rates in the model.													
3. CVOCS2 and BVOCS3 are considered standby and were not modeled.													

**COMBUSTION SOURCES**

The only additional combustion source emitting non-criteria pollutants that was not evaluated in the Phase I and II Upgrades is the 500 kW emergency generator. The waste gas burners are replacements for existing burners. The three replacement waste gas burners were evaluated as part of the Phases I and II environmental review and results were presented in the Phase II negative declaration. The emergency generator stack parameters were obtained from manufacturer data. Non-criteria pollutant emission estimates were obtained using emission rates developed for the Phase II analysis and updated using AP-42 emission factors. All of the facility’s combustion sources were input into the ISCST3 dispersion model to estimate the impact from each source (boilers, waste gas burners, and emergency generators) under the multi-phase plant upgrade even though the only new Phase III source not included in the previous analyses for the Phase II Upgrade was the 500 kW emergency generator.

*Short-term Impacts Modeling*

The non-criteria pollutant modeling for Phase III included the same combustion sources and equipment utilization as Phases I and II, with the addition of the 500 kW emergency generator. The 500 kW emergency generator would not participate in the PLM program. Therefore, this generator would operate at 100 percent load for 2 hours once per month for maintenance testing and exercising, except during emergencies.

*Annual Impacts Modeling*

The annual impacts analysis proposed for Phase III assumed the same projected utilization of equipment assumed for Phases I and II. This is considered representative of the worst-case plant operating conditions. Annual operation of the 500 kW emergency generator assumed that the generator would operate for 24 hours per year for maintenance testing. The modeling analysis assumed 65 hours per year as a conservative worst-case annual condition. Table 9-12 presents the short-term and annual stack parameters for the 500 kW emergency generator. Detailed emission rates are provided in Appendix 9.

**Table 9-12  
Future With the Proposed Action  
Combustion Model Input Parameters**

Source ID / Source Description		Grade Elev. (m)	Stack Ht. (m)	Stack Temp. (K)	Exit Velocity (m/s)	Stack Diam. (m)
EG500	One 500 kW emergency generator	6.10	10.67	755.9	23.45	0.305

**MODELING RESULTS**

Table 9-13 presents the highest short-term and annual impacts from the wastewater process sources. All impacts are below the SGCs. The highest one-hour impact from the process sources is chloroform, representing 14 percent of the SGC. The short-term impact from the first column in the table is 20.84 µg/m<sup>3</sup>.

**Table 9-13**

**Future With the Proposed Action**

**Maximum Short-Term and Annual Predicted Impacts from Process Sources**

Compound	Short-term Impact (µg/m <sup>3</sup> )	SGC (µg/m <sup>3</sup> )	Percent of SGC (%)	Annual Impact (µg/m <sup>3</sup> )	AGC (µg/m <sup>3</sup> )	Percent of AGC (%)
Acetone	33.93	180000	0%	0.77	28000	0%
Benzene	6.69	1300	1%	0.10	0.13	76%
Bis(2-ethylhexyl)phthalate	1.55	---	---	0.049	0.42	12%
Chloroform	20.85	150	14%	0.163	0.043	379%
1,4-Dichlorobenzene	16.19	---	---	0.178	0.09	198%
Dichlorobromomethane	2.08	---	---	0.024	0.02	120%
cis-1,2-Dichloroethylene	6.58	---	---	0.15	1900	0%
Methylene Chloride	11.58	14000	0%	0.30	2.1	14%
Ethyl benzene	3.43	54000	0%	0.055	1000	0%
Hexachlorocyclohexane	0.00047	---	---	0.00001	---	---
Methyl isobutyl ketone	4.76	31000	0%	0.13	3000	0%
Naphthalene	0.96	7900	0%	0.02	3	1%
Phenanthrene	0.13	---	---	0.0044	0.02	22%
Tetrachloroethylene	35.51	1000	4%	0.71	1	71%
Toulene	40.50	37000	0%	0.70	400	0%
m-Xylene	6.37	4300	0%	0.095	100	0%
o-Xylene	4.25	4300	0%	0.090	100	0%
p-Xylene	5.24	4300	0%	0.073	100	0%

As predicted in the future without the proposed action, three compounds had predicted exceedances of their corresponding AGCs under the proposed action. 1,4-Dichlorobenzene was 1.98 times its AGC of 0.09 µg/m<sup>3</sup>, chloroform was 3.79 times its AGC of 0.043 µg/m<sup>3</sup>, and dichlorobromoethane was 1.20 times its AGC of 0.02 µg/m<sup>3</sup>. These exceedances are slightly lower than those predicted for the future without the proposed action. These exceedances occurred at or slightly beyond the plant’s northern and southern fence lines and are comparable to those predicted in the future without the proposed action.

The results of the carbon addition source modeling are presented in Tables 9-14 and 9-15.

**Table 9-14**

**Future With the Proposed Action**

**Maximum 1-hour Predicted Impacts from Carbon Addition**

Pollutant	Maximum 1-hour Impact	SGC	% of SGC
Methanol	46.64	33,000	0.14%
Ethanol	14.14	---	---
<b>Note:</b> * There is no SGC established for ethanol.			

The results of the carbon addition source modeling analysis show that the maximum predicted 1-hour and annual impacts are both well below the applicable SGCs and AGCs for these compounds.

**Table 9-15**  
**Future With the Proposed Action**  
**Maximum Annual Predicted Impacts from Carbon Addition**

Pollutant	Maximum Annual Impact	AGC	% of AGC
Methanol	1.30	4000	0.03%
Ethanol	0.37	45,000	0.00%

The results of the combustion source modeling are shown in Tables 9-16 and 9-17. The maximum 1-hour concentrations are presented compared to the SGCs in Table 9-16, and the maximum annual average concentrations are compared to the AGCs in Table 9-17.

**Table 9-16**  
**Maximum 1-hour Combustion Impacts<sup>(1)</sup>**

Compound	SGC	Combustion 1-hour Impact	Percent of SGC
1,1-Dichloroethene	---	1.42E-03	---
1,1,1-Trichloroethane	68000	6.57E-03	0%
1,2-Dichloroethane	---	1.24E-03	---
1,2-Dichlorobenzene	30000	2.12E-04	0%
1,3-Dichlorobenzene	30000	9.20E-05	0%
2-Methylnaphthalene	---	4.13E-05	---
3-Methylchloranthrene	---	3.10E-06	---
7,12-Dimethylbenz(a)anthracene	---	2.75E-05	---
Acenaphthene	---	9.12E-03	---
Acenaphthylene	---	1.74E-02	---
Acetaldehyde	4500	6.30E-02	0%
Acrolein	0.19	<sup>(2)</sup>	---
Anthracene	---	2.34E-03	---
Benzo(a)anthracene	---	1.23E-03	---
Benzo(a)pyrene	---	4.86E-04	---
Benzo(b)fluoranthene	---	2.09E-03	---
Benzo(b,k)fluoranthene	---	2.12E-05	---
Benzo(g,h,i)perylene	---	1.08E-03	---
Benzo(k)fluoranthene	---	4.14E-04	---
Butane	---	3.61E+00	---
Carbon Tetrachloride	1900	3.84E-05	0%
Chrysene	---	2.92E-03	---
Dibenzo(a,h)anthracene	---	6.78E-04	---
Dichlorobenzene	---	2.06E-03	---
Ethane	---	5.33E+00	---
Fluoranthene	---	7.67E-03	---
Fluorene	---	2.42E-02	---
Formaldehyde	30	1.22E+00	4%
Hexane	---	3.10E+00	---
Indeno(1,2,3-cd)pyrene	---	8.14E-04	---
Pentane	---	4.47E+00	---
Polycyclic Organic Matter	---	4.72E-02	---
Propane	---	2.75E+00	---
Propylene	---	5.26E+00	---

**Table 9-16 (cont'd)  
Maximum 1-hour Combustion Impacts<sup>1</sup>**

Compound	SGC	Combustion 1-hour Impact	Percent of SGC
Pyrene	---	7.06E-03	---
Trichloroethene	54000	0.00E+00	0%
Vinyl Chloride	180000	1.57E-05	0%
Xylenes	4300	3.64E-01	0%
Arsenic	---	8.36E-03	---
Barium	---	7.57E-03	---
Beryllium	1	6.03E-03	1%
Cadmium	---	7.90E-03	---
Chromium	---	8.42E-03	---
Cobalt	---	1.45E-04	---
Copper	100	1.35E-02	0%
Lead	---	1.89E-02	---
Manganese	---	1.27E-02	---
Mercury	1.8	6.46E-03	0%
Molybdenum	---	1.89E-03	---
Nickel	6	9.62E-03	0%
Selenium	---	3.01E-02	---
Vanadium	---	3.96E-03	---
Zinc	---	5.79E-02	---
Acetone	180000	0.00E+00	0%
Benzene	1300	1.47E+00	0%
Bis(2-ethylhexyl)phthalate	---	0.00E+00	---
Chloroform	150	1.59E-03	0%
1,4-Dichlorobenzene	---	1.24E-03	---
Dichlorobromomethane	---	0.00E+00	---
Dichloroethylene 1,2cis	---	0.00E+00	---
Methylene Chloride (Dichloromethane)	14000	2.75E-01	0%
Ethylbenzene	54000	9.10E-04	0%
Hexachlorocyclohexane	---	0.00E+00	---
Methyl isobutyl ketone	31000	0.00E+00	0%
Naphthalene	7900	2.62E-01	0%
Phenanthrene	---	7.71E-02	---
Tetrachloroethene	1000	2.09E-03	0%
Toluene	37000	6.78E-01	0%
Xylene, m	4300	0.00E+00	0%
Xylene, o	4300	1.56E-03	0%
Xylene, p	4300	0.00E+00	0%

**Notes:**

<sup>1</sup> These impacts represent the maximum combined impact from the Phase I, II, and proposed action combustion sources. Impacts presented are the maximum predicted under either emergency generator PLM scenarios or maintenance testing scenarios 2A or 2B. Short-term impacts from all three scenarios are presented in Appendix 9.

<sup>2</sup> In the case of acrolein, which is potentially emitted by the boilers, waste gas burners and emergency generators, currently EPA and the California Air Resources Board (CARB) are investigating an acrolein sampling method from such stationary combustion sources. Until such time that methods are developed and approved for combustion sources are made available, acrolein impacts cannot be accurately quantified. There is no way to correctly estimate acrolein emissions and the resulting acrolein impacts at Hunts Point WPCP at the SGC level.

**Table 9-17  
Maximum Annual Combustion Impacts<sup>(1)</sup>**

Compound	AGC	Combustion Annual Impact	Percent of AGC
1,1-Dichloroethene	70	2.04E-05	0%
1,1,1-Trichloroethane	1000	1.25E-04	0%
1,2-Dichloroethane	0.038	1.34E-05	0%
1,2-Dichlorobenzene	360	5.34E-06	0%
1,3-Dichlorobenzene	360	4.08E-06	0%
2-Methylnaphthalene	---	3.75E-07	---
3-Methylchloranthrene	---	2.81E-08	---
7,12-Dimethylbenz(a)anthracene	---	2.50E-07	---
Acenaphthene	---	4.32E-06	---
Acenaphthylene	---	5.18E-06	---
Acetaldehyde	0.45	7.05E-04	0%
Acrolein	0.02	<sup>(2)</sup>	---
Anthracene	0.02	8.19E-07	0%
Benzo(a)anthracene	0.02	6.94E-07	0%
Benzo(a)pyrene	0.02	1.62E-07	0%
Benzo(b)fluoranthene	---	6.46E-07	---
Benzo(b,k)fluoranthene	---	1.18E-07	---
Benzo(g,h,i)perylene	---	5.08E-07	---
Benzo(k)fluoranthene	---	1.49E-07	---
Butane	45000	3.28E-02	0%
Carbon Tetrachloride	0.067	1.19E-05	0%
Chrysene	0.02	1.07E-06	0%
Dibenzo(a,h)anthracene	0.02	3.44E-07	0%
Dichlorobenzene	---	1.88E-05	---
Ethane	---	4.84E-02	---
Fluoranthene	---	2.68E-06	---
Fluorene	---	7.52E-06	---
Formaldehyde	0.06	2.45E-02	41%
Hexane	200	2.81E-02	0%
Indeno(1,2,3-cd)pyrene	---	4.29E-07	---
Pentane	4200	4.06E-02	0%
Polycyclic Organic Matter	---	2.63E-04	---
Propane	110000	2.50E-02	0%
Propylene	3000	1.55E-03	0%
Pyrene	0.02	2.48E-06	0%
Trichloroethene	0.5	1.13E-05	0%
Vinyl Chloride	0.11	6.96E-07	0%
Xylenes	100	2.56E-04	0%
Arsenic	0.00023	4.78E-05	21%
Barium	1.2	6.88E-05	0%
Beryllium	0.00042	3.37E-05	8%
Cadmium	0.0005	5.07E-05	10%
Chromium	1.2	5.54E-05	0%
Cobalt	0.001	1.31E-06	0%
Copper	0.02	8.03E-05	0%
Lead	0.38	1.08E-04	0%
Manganese	0.05	7.30E-05	0%
Mercury	0.3	3.76E-05	0%
Molybdenum	1.2	1.72E-05	0%
Nickel	0.004	6.63E-05	2%
Selenium	20	1.68E-04	0%
Vanadium	0.2	3.59E-05	0%
Zinc	50	4.98E-04	0%
Acetone	28000	0.00E+00	0%
Benzene	0.13	1.10E-03	1%

**Table 9-17 (cont'd)  
Maximum Annual Combustion Impacts<sup>1</sup>**

Compound	AGC	Combustion Annual Impact	Percent of AGC
Bis(2-ethylhexyl)phthalate	0.42	0.00E+00	0%
Chloroform	0.043	3.21E-04	1%
1,4-Dichlorobenzene	0.09	2.51E-05	0%
Dichlorobromomethane	0.02	0.00E+00	0%
Dichloroethylene 1,2cis	1900	0.00E+00	0%
Methylene Chloride (Dichloromethane)	2.1	6.20E-03	0%
Ethylbenzene	1000	5.07E-06	0%
Hexachlorocyclohexane	---	0.00E+00	---
Methyl isobutyl ketone	3000	0.00E+00	0%
Naphthalene	3	1.72E-04	0%
Phenanthrene	0.02	2.38E-05	0%
Tetrachloroethene	1	5.90E-05	0%
Toluene	400	8.87E-03	0%
Xylene, m	100	0.00E+00	0%
Xylene, o	100	8.70E-06	0%
Xylene, p	100	0.00E+00	0%

**Notes:**  
<sup>1</sup> These impacts represent the maximum combined impact from the Phase I, II, and III Combustion sources.  
<sup>2</sup> In the case of acrolein, which is potentially emitted by the boilers, waste gas burners and emergency generators, currently EPA and the California Air Resources Board (CARB) are investigating an acrolein sampling method from such stationary combustion sources. Until such time that methods are developed and approved for combustion sources are made available, acrolein impacts cannot be accurately quantified. There is no way to correctly estimate acrolein emissions and the resulting acrolein impacts at Hunts Point WPCP at the AGC level.

The results of the short-term impact combustion analysis indicate that the maximum 1-hour concentrations were well below their respective SGC for all compounds for which emission factors could be determined. The highest 1-hour impact from the combustion sources was formaldehyde at 4 percent of its SGC, followed by beryllium at 1 percent of its SGC.

The result of the combustion analysis for comparison with the AGCs indicated that all compounds are well below their respective AGCs. The highest annual impact from the combustion sources was formaldehyde at 41 percent of its AGC, followed by arsenic at 21 percent of its AGC, and beryllium at 10 percent of its AGC.

**TOTAL WASTEWATER PROCESS SOURCE AND COMBUSTION SOURCE IMPACTS**

Total wastewater process source (including all processes and the carbon addition) and combustion source impacts are presented in Tables 9-18 and 9-19.

Total impacts from the wastewater process sources, including carbon addition, and the combustion sources are below the SGCs and AGCs, except for chloroform, 1,4-dichlorobenzene, and dichlorobromomethane. Maximum predicted off-site impacts for chloroform, 1,4-dichlorobenzene, and dichlorobromomethane were slightly lower than those predicted for the future without the proposed action. With the proposed project, the concentrations of chloroform, 1,4-dichlorobenzene, and dichlorobromomethane would be 3.79 times, 1.98 times, and 1.20 times their respective AGCs. These exceedances occurred at or slightly beyond the plant’s northern and southern fence lines and are comparable to those predicted in the future without the proposed action.



Table 9-18  
Total Maximum Hourly Impacts

Compound	Combustion Sources Impacts ( $\mu\text{g}/\text{m}^3$ )	Process Sources Impacts <sup>(1)</sup> ( $\mu\text{g}/\text{m}^3$ )	Total Impacts ( $\mu\text{g}/\text{m}^3$ )	SGC ( $\mu\text{g}/\text{m}^3$ )	Percent of SGC
1,1-Dichloroethene	1.42E-03	---	1.42E-03	---	---
1,1,1-Trichloroethane	6.57E-03	---	6.57E-03	68000	0%
1,2-Dichloroethane	1.24E-03	---	1.24E-03	---	---
1,2-Dichlorobenzene	2.12E-04	---	2.12E-04	30000	0%
1,3-Dichlorobenzene	9.20E-05	---	9.20E-05	30000	0%
2-Methylnaphthalene	4.13E-05	---	4.13E-05	---	---
3-Methylchloranthrene	3.10E-06	---	3.10E-06	---	---
7,12-Dimethylbenz(a)anthracene	2.75E-05	---	2.75E-05	---	---
Acenaphthene	9.12E-03	---	9.12E-03	---	---
Acenaphthylene	1.74E-02	---	1.74E-02	---	---
Acetaldehyde	6.30E-02	---	6.30E-02	4500	0%
Acrolein	1.78E-01	---	---	<sup>(2)</sup> ---	---
Anthracene	2.34E-03	---	2.34E-03	---	---
Benz(a)anthracene	1.23E-03	---	1.23E-03	---	---
Benzo(a)pyrene	4.86E-04	---	4.86E-04	---	---
Benzo(b)fluoranthene	2.09E-03	---	2.09E-03	---	---
Benzo(b,k)fluoranthene	2.12E-05	---	2.12E-05	---	---
Benzo(g,h,i)perylene	1.08E-03	---	1.08E-03	---	---
Benzo(k)fluoranthene	4.14E-04	---	4.14E-04	---	---
Butane	3.61E+00	---	3.61E+00	---	---
Carbon Tetrachloride	3.84E-05	---	3.84E-05	1900	0%
Chrysene	2.92E-03	---	2.92E-03	---	---
Dibenzo(a,h)anthracene	6.78E-04	---	6.78E-04	---	---
Dichlorobenzene	2.06E-03	---	2.06E-03	---	---
Ethane	5.33E+00	---	5.33E+00	---	---
Fluoranthene	7.67E-03	---	7.67E-03	---	---
Fluorene	2.42E-02	---	2.42E-02	---	---
Formaldehyde	1.22E+00	---	1.22E+00	30	4%
Hexane	3.10E+00	---	3.10E+00	---	---
Indeno(1,2,3-cd)pyrene	8.14E-04	---	8.14E-04	---	---
Pentane	4.47E+00	---	4.47E+00	---	---
Polycyclic Organic Matter	4.72E-02	---	4.72E-02	---	---
Propane	2.75E+00	---	2.75E+00	---	---
Propylene	5.26E+00	---	5.26E+00	---	---
Pyrene	7.06E-03	---	7.06E-03	---	---
Trichloroethene	---	---	0.00E+00	54000	0%
Vinyl Chloride	1.57E-05	---	1.57E-05	180000	0%
Xylenes	3.64E-01	---	3.64E-01	4300	0%
Arsenic	8.36E-03	---	8.36E-03	---	---
Barium	7.57E-03	---	7.57E-03	---	---
Beryllium	6.03E-03	---	6.03E-03	1	1%
Cadmium	7.90E-03	---	7.90E-03	---	---
Chromium	8.42E-03	---	8.42E-03	---	---
Cobalt	1.45E-04	---	1.45E-04	---	---
Copper	1.35E-02	---	1.35E-02	100	0%
Lead	1.89E-02	---	1.89E-02	---	---

**Table 9-18 (cont'd)**  
**Total Maximum Hourly Impacts**

Compound	Combustion Sources Impacts (µg/m <sup>3</sup> )	Process Sources Impacts <sup>1</sup> (µg/m <sup>3</sup> )	Total Impacts (µg/m <sup>3</sup> )	SGC (µg/m <sup>3</sup> )	Percent of SGC
Manganese	1.27E-02	---	1.27E-02	---	---
Mercury	6.46E-03	---	6.46E-03	1.8	0%
Molybdenum	1.89E-03	---	1.89E-03	---	---
Nickel	9.62E-03	---	9.62E-03	6	0%
Selenium	3.01E-02	---	3.01E-02	---	---
Vanadium	3.96E-03	---	3.96E-03	---	---
Zinc	5.79E-02	---	5.79E-02	---	---
Acetone	---	<u>3.39E+01</u>	<u>3.39E+01</u>	180000	0%
Benzene	1.47E+00	<u>6.69E+00</u>	<u>8.16E+00</u>	1300	<u>1%</u>
Bis(2-ethylhexyl)phthalate	0.00E+00	<u>1.55E+00</u>	<u>1.55E+00</u>	---	---
Chloroform	1.59E-03	<u>2.09E+01</u>	<u>2.09E+01</u>	150	<u>14%</u>
1,4-Dichlorobenzene	1.24E-03	<u>1.62E+01</u>	<u>1.62E+01</u>	---	---
Dichlorobromomethane	---	<u>2.08E+00</u>	<u>2.08E+00</u>	---	---
Dichloroethylene 1,2cis	---	<u>6.58E+00</u>	<u>6.58E+00</u>	---	---
Methylene Chloride (Dichloromethane)	2.75E-01	<u>1.16E+01</u>	<u>1.19E+01</u>	14000	0%
Ethylbenzene	9.10E-04	<u>3.43E+00</u>	<u>3.43E+00</u>	54000	0%
Hexachlorocyclohexane	---	<u>4.73E-04</u>	<u>4.73E-04</u>	---	---
Methyl isobutyl ketone	---	<u>4.76E+00</u>	<u>4.76E+00</u>	31000	0%
Naphthalene	2.62E-01	<u>9.62E-01</u>	<u>1.22E+00</u>	7900	0%
Phenanthrene	7.71E-02	<u>1.34E-01</u>	<u>2.11E-01</u>	---	---
Tetrachloroethene	2.09E-03	<u>3.55E+01</u>	<u>3.55E+01</u>	1000	<u>4%</u>
Toluene	6.78E-01	<u>4.05E+01</u>	<u>4.12E+01</u>	37000	0%
Xylene, m	---	<u>6.37E+00</u>	<u>6.37E+00</u>	4300	0%
Xylene, o	1.56E-03	<u>4.25E+00</u>	<u>4.25E+00</u>	4300	0%
Xylene, p	---	<u>5.24E+00</u>	<u>5.24E+00</u>	4300	0%
Methanol	---	<u>4.66E+01</u>	<u>4.66E+01</u>	33000	0.14%
Ethanol <sup>±</sup>	---	<u>1.41E+01</u>	<u>1.41E+01</u>	---	---

**Note:** <sup>(1)</sup> Based on Methanol Addition. The maximum predicted impacts with Ethanol addition are slightly lower.  
<sup>(2)</sup> In the case of acrolein, which is potentially emitted by the boilers, waste gas burners and emergency generators, currently EPA and the California Air Resources Board (CARB) are investigating an acrolein sampling method from such stationary combustion sources. Until such time that methods are developed and approved for combustion sources are made available, acrolein impacts cannot be accurately quantified. There is no way to correctly estimate acrolein emissions and the resulting acrolein impacts at Hunts Point WPCP at the SGC.

**Table 9-19  
Total Maximum Annual Impacts**

Compound	Combustion Sources Impacts ( $\mu\text{g}/\text{m}^3$ )	Process Sources Impacts <sup>1</sup> ( $\mu\text{g}/\text{m}^3$ )	Total Impacts ( $\mu\text{g}/\text{m}^3$ )	AGC ( $\mu\text{g}/\text{m}^3$ )	Percent of AGC
1,1-Dichloroethene	2.04E-05	---	2.04E-05	70	0%
1,1,1-Trichloroethane	1.25E-04	---	1.25E-04	1000	0%
1,2-Dichloroethane	1.34E-05	---	1.34E-05	0.038	0%
1,2-Dichlorobenzene	5.34E-06	---	5.34E-06	360	0%
1,3-Dichlorobenzene	4.08E-06	---	4.08E-06	360	0%
2-Methylnaphthalene	3.75E-07	---	3.75E-07	---	---
3-Methylchloranthrene	2.81E-08	---	2.81E-08	---	---
7,12-Dimethylbenz(a)anthracene	2.50E-07	---	2.50E-07	---	---
Acenaphthene	4.32E-06	---	4.32E-06	---	---
Acenaphthylene	5.18E-06	---	5.18E-06	---	---
Acetaldehyde	7.05E-04	---	7.05E-04	0.45	0%
Acrolein	4.61E-03	---	---	(2)	---
Anthracene	8.19E-07	---	8.19E-07	0.02	0%
Benz(a)anthracene	6.94E-07	---	6.94E-07	0.02	0%
Benzo(a)pyrene	1.62E-07	---	1.62E-07	0.02	0%
Benzo(b)fluoranthene	6.46E-07	---	6.46E-07	---	---
Benzo(b,k)fluoranthene	1.18E-07	---	1.18E-07	---	---
Benzo(g,h,i)perylene	5.08E-07	---	5.08E-07	---	---
Benzo(k)fluoranthene	1.49E-07	---	1.49E-07	---	---
Butane	3.28E-02	---	3.28E-02	45000	0%
Carbon Tetrachloride	1.19E-05	---	1.19E-05	0.067	0%
Chrysene	1.07E-06	---	1.07E-06	0.02	0%
Dibenzo(a,h)anthracene	3.44E-07	---	3.44E-07	0.02	0%
Dichlorobenzene	1.88E-05	---	1.88E-05	---	---
Ethane	4.84E-02	---	4.84E-02	---	---
Fluoranthene	2.68E-06	---	2.68E-06	---	---
Fluorene	7.52E-06	---	7.52E-06	---	---
Formaldehyde	2.45E-02	---	2.45E-02	0.06	41%
Hexane	2.81E-02	---	2.81E-02	200	0%
Indeno(1,2,3-cd)pyrene	4.29E-07	---	4.29E-07	---	---
Pentane	4.06E-02	---	4.06E-02	4200	0%
Polycyclic Organic Matter	2.63E-04	---	2.63E-04	---	---
Propane	2.50E-02	---	2.50E-02	110000	0%
Propylene	1.55E-03	---	1.55E-03	3000	0%
Pyrene	2.48E-06	---	2.48E-06	0.02	0%
Trichloroethene	1.13E-05	---	1.13E-05	0.5	0%
Vinyl Chloride	6.96E-07	---	6.96E-07	0.11	0%
Xylenes	2.56E-04	---	2.56E-04	100	0%
Arsenic	4.78E-05	---	4.78E-05	0.00023	21%
Barium	6.88E-05	---	6.88E-05	1.2	0%
Beryllium	3.37E-05	---	3.37E-05	0.00042	8%
Cadmium	5.07E-05	---	5.07E-05	0.0005	10%
Chromium	5.54E-05	---	5.54E-05	1.2	0%
Cobalt	1.31E-06	---	1.31E-06	0.001	0%
Copper	8.03E-05	---	8.03E-05	0.02	0%
Lead	1.08E-04	---	1.08E-04	0.38	0%

**Table 9-19 (cont'd)**  
**Total Maximum Annual Impacts**

Compound	Combustion Sources Impacts (µg/m <sup>3</sup> )	Process Sources Impacts <sup>1</sup> (µg/m <sup>3</sup> )	Total Impacts (µg/m <sup>3</sup> )	AGC (µg/m <sup>3</sup> )	Percent of AGC
Manganese	7.30E-05	---	7.30E-05	0.05	0%
Mercury	3.76E-05	---	3.76E-05	0.3	0%
Molybdenum	1.72E-05	---	1.72E-05	1.2	0%
Nickel	6.63E-05	---	6.63E-05	0.004	2%
Selenium	1.68E-04	---	1.68E-04	20	0%
Vanadium	3.59E-05	---	3.59E-05	0.2	0%
Zinc	4.98E-04	---	4.98E-04	50	0%
Acetone	---	<u>7.71E-01</u>	<u>7.71E-01</u>	28000	0%
Benzene	1.10E-03	<u>9.92E-02</u>	1.00E-01	0.13	77%
Bis(2-ethylhexyl)phthalate	---	<u>4.90E-02</u>	<u>4.90E-02</u>	0.42	12%
Chloroform	3.21E-04	1.63E-01	1.63E-01	0.043	380%
1,4-Dichlorobenzene	2.51E-05	1.78E-01	1.78E-01	0.09	198%
Dichlorobromomethane	---	2.40E-02	2.40E-02	0.02	120%
Dichloroethylene 1,2cis	---	<u>1.54E-01</u>	<u>1.54E-01</u>	1900	0%
Methylene Chloride (Dichloromethane)	6.20E-03	<u>2.96E-01</u>	<u>3.02E-01</u>	2.1	14%
Ethylbenzene	5.07E-06	<u>5.53E-02</u>	<u>5.53E-02</u>	1000	0%
Hexachlorocyclohexane	---	<u>1.48E-05</u>	<u>1.48E-05</u>	---	---
Methyl isobutyl ketone	---	<u>1.31E-01</u>	1.31E-01	3000	0%
Naphthalene	1.72E-04	<u>2.44E-02</u>	<u>2.46E-02</u>	3	1%
Phenanthrene	2.38E-05	<u>4.42E-03</u>	<u>4.44E-03</u>	0.02	22%
Tetrachloroethene	5.90E-05	<u>7.05E-01</u>	<u>7.05E-01</u>	1	71%
Toluene	8.87E-03	<u>7.03E-01</u>	<u>7.12E-01</u>	400	0%
Xylene, m	---	<u>9.45E-02</u>	<u>9.45E-02</u>	100	0%
Xylene, o	8.70E-06	<u>8.98E-02</u>	<u>8.98E-02</u>	100	0%
Xylene, p	---	<u>7.32E-02</u>	<u>7.32E-02</u>	100	0%
Methanol	---	<u>1.30E+00</u>	<u>1.30E+00</u>	4000	0.03%
Ethanol <sup>1</sup>	---	3.74E-01	3.74E-01	45000	0%

**Notes:** <sup>(1)</sup> Based on Methanol Addition. The maximum impacts with Ethanol addition are slightly lower.  
<sup>(2)</sup> In the case of acrolein, which is potentially emitted by the boilers, waste gas burners and emergency generators, currently EPA and the California Air Resources Board (CARB) are investigating an acrolein sampling method from such stationary combustion sources. Until such time that methods are developed and approved for combustion sources are made available, acrolein impacts cannot be accurately quantified. There is no way to correctly estimate acrolein emissions and the resulting acrolein impacts at Hunts Point WPCP at the AGC level.

Impacts based on four egg digesters (four-digester scenario) would be similar to the impacts with only two digesters. As demonstrated in Chapter 8, “Criteria Air Pollutants,” there were no major changes in either combustion sources or effects on air dispersion from such sources under the four-digester scenario. In addition, there would be no significant changes in the process emission sources, and since wastewater emissions are mostly ground level sources, their dispersion would not be influenced by additional egg digesters. Therefore, the impacts under the four-digester scenario are expected to be the same as those predicted for the two-digester scenario.

**BEST AVAILABLE CONTROL TECHNOLOGY (BACT) ANALYSIS FOR NON-CRITERIA POLLUTANTS**

As discussed above, a BACT analysis was performed for the future without the proposed action and presented in the Phase II negative declaration. The BACT analysis only pertains to

wastewater emissions, since maximum predicted concentrations from combustion sources were all less than the applicable SGCs and AGCs. While the proposed action slightly improves the impacts from chloroform, 1,4-dichlorobenzene, and dichlorobromomethane, the previous BACT analysis that was performed for the future without the proposed action is still applicable for the proposed action.

Between the issuance of the DEIS and the FEIS, NYCDEP has included activated carbon filters for the primary effluents channels as part of the Phase III Upgrade. These activated carbon filters would also remove non-criteria pollutants. Since the analysis was performed without taking any credits for the activated carbon systems, it would over predict the maximum off-site concentrations. Therefore, it would be conservative to use these concentrations to represent the impacts of non-criteria air pollutants from the proposed Phase III Upgrade with the installation of an activated carbon system for the primary effluent channels.

### **TOTAL VOC AND HAP EMISSIONS**

To determine the status of the Hunts Point WPCP as upgraded under the proposed action with the 1990 Clean Air Act Amendment (CAAA) VOC threshold of 25 TPY VOCs and the thresholds of 25 TPY total HAPs and 10 TPY of an individual HAP, the unit process wastewater-based emissions were added to the VOC and HAP emissions from the unit combustion sources to determine a total facility estimate of VOC and HAP emissions.

Using the TOXCHEM+ modeling with updated sensitive parameters and carbon addition, the wastewater processes at the plant with the proposed action were estimated to emit 3.17TPY of VOCs. The combustion source emissions from the multi-phase analysis were estimated to emit a total of 1.12 TPY of VOCs. Total VOCs under the multi-phase plant upgrade is estimated to be approximately 4.29 TPY. The plant is estimated to emit a total of 4.39 TPY of HAPs. Therefore, plant-wide VOCs and HAPs emissions with and without the proposed action are below the major source thresholds.

### **CONCLUSIONS**

In the future without the proposed action, three compounds from the wastewater process, chloroform, 1,4-dichlorobenzene, and dichlorobromomethane had exceedances of the AGC in areas where there are no residences or other permanent or occupied locations beyond the northern fence line between Ryawa Avenue and Viele Avenue and beyond the southern fence line in the water. The predicted exceedances of the AGCs from these three compounds do not extend to the nearest residence or into the nearest residential neighborhood, or the Vernon C. Bain Center, hence there would be no long-term, continuous exposure in these areas. The proposed South Bronx Greenway would be located in the area where these predicted exceedances of the AGCs would occur; however there would be no long term continuous exposure in these areas. The maximum predicted impacts from the combined wastewater treatment process and combustion sources associated with non-criteria air pollutants without the proposed action are well below 10 times the respective AGC for the three pollutants, and the previous BACT analysis demonstrated that additional controls were not required.

Under the proposed action the incremental levels of the 3 non-criteria air pollutants with predicted exceedances of the AGCs would be slightly reduced due to the carbon addition, and predicted off-site levels would remain relatively unchanged compared to the future without the proposed action conditions. The results of the BACT analysis for the future without the proposed

## **Hunts Point WPCP**

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action would be applicable to the proposed action. Therefore, no potential significant adverse non-criteria air pollutant impacts are expected from the proposed action. \*