Westchester County Airport
Air Emissions Inventory

October 2008

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FIRST ENVIRONMENT

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Executive Summary

Westchester County Airport (the Airport) has prepared an air emissions inventory for transportation associated operations that occurred at the Airport in 2007. The air emissions inventory includes the "Kyoto six" greenhouse gases (GHGs) and an additional eight (Non-GHG) criteria pollutants associated with airport operations. The purpose of the inventory is to establish a snapshot of the Airport's emissions in 2007 and provide a basis to identify opportunities to reduce emissions.

The Airport is a 700-acre facility operated by the Westchester County Department of Transportation (DOT). The operations at the Airport are overseen by the DOT contractor, AvPorts. The Airport supports both commercial and general aviation within the County of Westchester and the New York Metropolitan Area.

The Air Emissions Inventory developed for the Airport includes:

- Scope 1 emissions – direct emissions associated with operations performed on behalf of DOT.
- Scope 2 emissions – indirect emissions associated with operations performed on behalf of DOT
- Scope 3 emissions – direct and indirect emissions associated with tenant operations and specified direct emissions associated with customer operations

The non-GHG emissions include all Scope 1 and Scope 3 direct emissions associated with operations performed on behalf of the DOT and tenant operations, but do not include Scope 2 indirect emissions.

The Airport's direct emissions consist of mobile combustion, stationary combustion, and fugitive emissions. Indirect emissions, or emissions that are a consequence of activities at the Airport but occur at sources owned or controlled by another entity, may include electricity consumption, imported steam, district heating, or cooling. The Airport's only indirect emissions consist of the consumption of purchased electricity. Tenant and vendor emissions were included in the inventory to more fully characterize the impact of air emissions associated with airport operations, as were selected customer emissions.

The total GHG emissions from the Airport for 2007 are 74,646 metric tons of CO_2 equivalent (CO_2e), which includes emissions from both direct and indirect sources. CO_2e is used to quantify total GHG because each greenhouse gas has a different Global Warming Potential (GWP). Using CO_2e equalizes the six greenhouse gases to one standard reference of metric tons of carbon dioxide equivalent.

The majority of GHG emissions, approximately 64%, are associated with Aircraft operations up to 3,000 feet, the limit of the Airport emissions study. The second greatest contributor is Ground Support Equipment (GSE), which is responsible for approximately 18% of emissions. Boilers and Furnaces and Purchased Electricity each make up approximately 7% of the emissions and Auxiliary Power Units contribute another 3.5%. The remaining sources are each below 1%. The breakdown of GHG sources is provided on Figure 1 below.

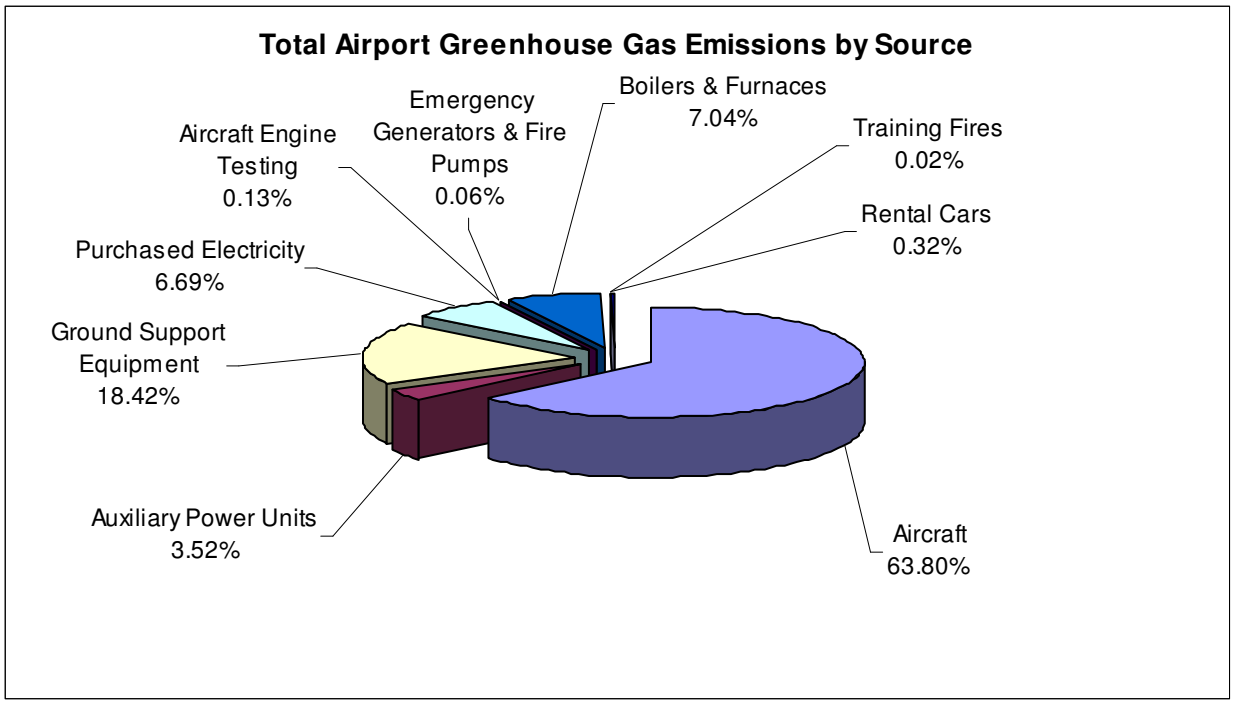

Figure 1: Total Airport Greenhouse Gas Emissions by Source

Figure 2 shows the GHG emissions divided between the six GHGs. Almost all emissions were CO_2 emissions. The total criteria pollutant (Non-GHG) emissions for each of the eight criteria pollutants are shown in Figure 3. Aircraft and GSE operations generated the majority of the

non-GHG emissions, with various stationary combustion sources producing the remaining emissions.

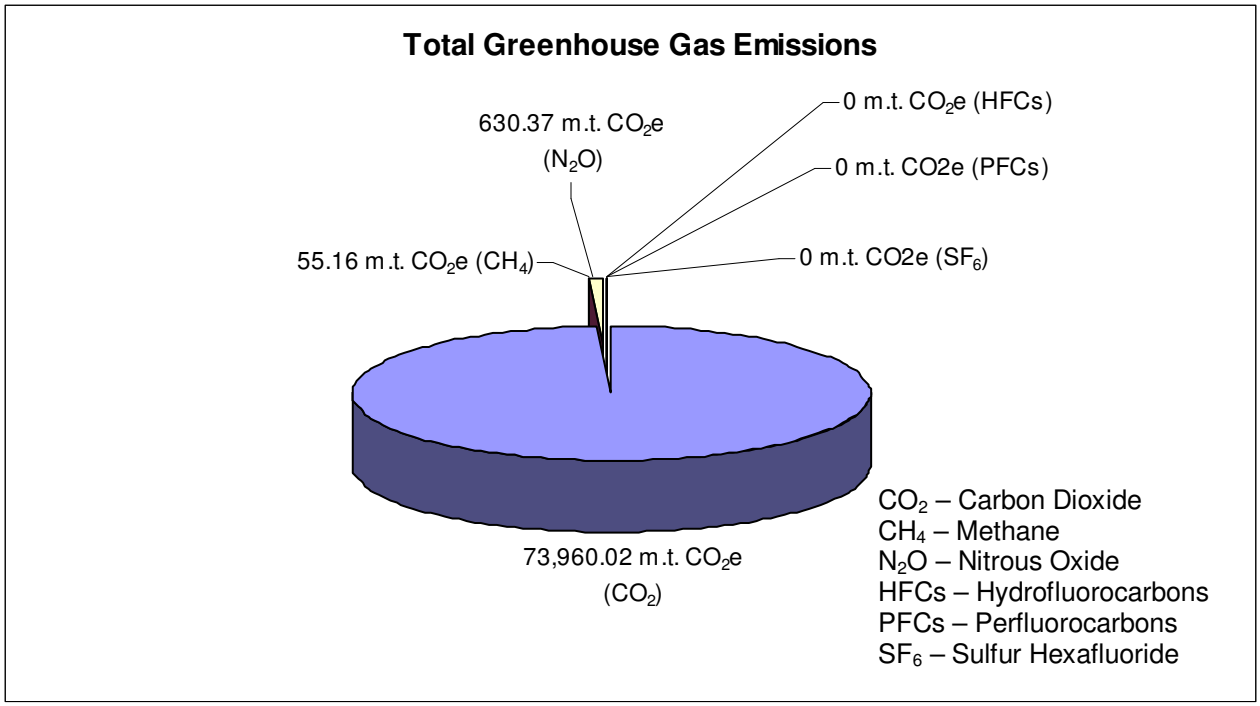

Figure 2: Total GHG Emissions by Type

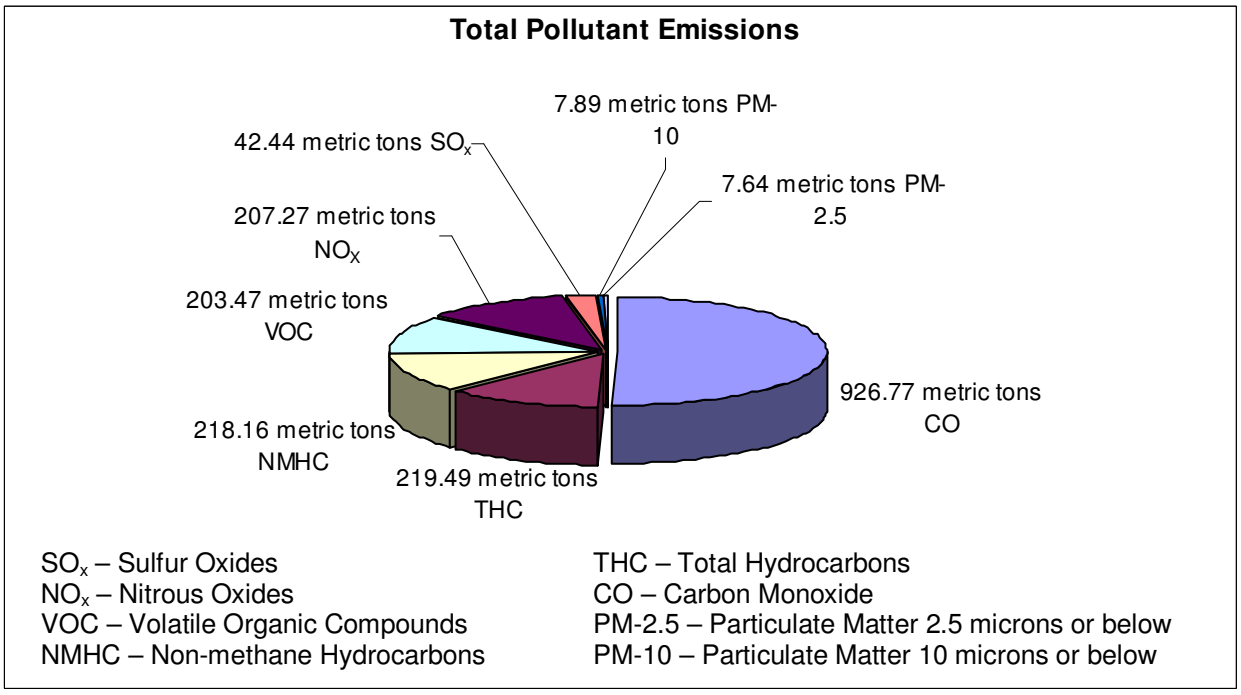

Figure 3: Total Criteria Pollutant Emissions by Type

This inventory relies on calculations from the Federal Aviation Administration (FAA)-approved *Emissions and Dispersion Modeling System* (EDMS), Version 5.0.2 and quantification methodologies published in The Climate Registry's *General Reporting Protocol*, Version 1.1. To the extent practical, the inventory is prepared in accordance with ISO 14064, Part 1.

Introduction

The Westchester Airport air emission inventory quantifies air emissions at the Westchester County Airport (the Airport) from the "Kyoto six" greenhouse gases—carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)—and eight additional non-GHG criteria pollutants—carbon monoxide (CO), total hydrocarbons (THC), total non-methane hydrocarbons (NMHC), volatile organic compounds (VOC), nitrogen oxides (NO_x), sulfur oxides (SO_x), and particulate matter (PM). The inventory establishes a baseline from which the Airport can benchmark future trends in air emissions. It also provides explanations of emission quantification methodologies and associated data collection procedures to guide inventory updating in future reporting periods.

Overview of Airport Operations

The Airport is a general and commercial aviation airport located in White Plains, New York. The Airport is managed by AvPorts, a private contractor to the Westchester County Department of Transportation (DOT). Tenant operations include commercial, private, and corporate aviation. Additionally, tenants and vendors provide support operations such as aircraft fueling and servicing, deicing, ground support, catering, vehicle operations, food services, car rental, and parking operations.

Commercial airlines operating during the reporting period covered by this inventory included Continental Airlines, American Airlines, Delta Air Lines, JetBlue Airways, Northwest Airlines, Air Tran, and United Airlines. Major tenants included Altria Corporate Services, Inc.; American Eagle; Avitat; Citigroup; Ground Handling, Inc. (GHI); IBM Corporation (Hangar F); International Paper; JetBlue; JP Morgan Chase Bank, N.A.; Landmark Aviation; Million Air (formerly Westair); NetJets - Executive Jet Management; Northwest Airlines; Panorama Flight Service; Pepsico; Signature Flight Support, Avis, Hertz, Budget Renal Car, National Rental Car, Enterprise, and DCL Limousine Service. Additional tenants and sub-tenets operate at the Airport, however their emissions are accounted for in the data collected from the sources above.

Organizational Boundaries

Organizational boundaries define the limits of an inventory by identifying the operations owned or controlled by the Airport and determine which activities should be included in its Air Emissions inventory.

The organizational boundaries of the Westchester County Airport emissions inventory include air transportation and air transportation support operations at the Airport whether provided by AvPorts, tenants or vendors. Aircraft engine emissions up to an altitude of 3,000 feet are included, as are rental car usage and limo service on the Airport property. Based on recommendations from the Port Authority of New York and New Jersey, aircraft engine emissions up to an altitude of 10,000 feet are also estimated for illustrative purposes.

Operations excluded from the inventory's organizational boundaries include:

- Vehicles, other than those associated with the rental cars and limousine service, operated by the public, vendors, employees (including those of tenants and vendors), and public or private carriers used to provide transportation to and from the Airport
- DOT and AvPorts Airport related functions that do not occur on Airport property
- Non-aviation related tenants on Airport property
- Operations by other Westchester County Departments at the Airport (Public Works, Public Safety, etc.) on the Airport Property
- Construction operations on the Airport property

Operational Boundaries

Operational boundaries in an Air Emissions inventory refer to the specific types of emission sources that the Airport, as defined by the inventory's organizational boundary, possesses and will include in its Air Emissions Inventory. All entities have a variety of emissions sources. To simplify the varying array of sources, industry best practice is to create groups and categories of common sources, creating a general framework for the organization of the inventory. This framework facilitates the identification of appropriate quantification methodologies for emission sources, collection of data, as well as reporting of inventory results. The direct and indirect emission sources within the operational boundaries of the inventory are provided below.

Direct Emissions

The following sources were identified as AvPorts (Scope 1) and tenant and vendor (Scope 3) direct sources of GHG emissions.

- CO_2, CH_4, and N_2O emissions from stationary combustion of No. 2 fuel oil and propane in boilers and furnaces;
- CO_2, CH_4, and N_2O emissions from stationary combustion of diesel and gasoline fuel in emergency generators and fire pumps;
- CO_2, CH_4, and N_2O emissions from stationary combustion of propane used during training fires;
- CO_2, CH_4, and N_2O emissions from stationary combustion of Jet A fuel and Aviation Gasoline used in Aircraft Engine Testing;
- CO_2, CH_4, and N_2O emissions from stationary combustion of Jet A fuel used in Auxiliary Power Units;
- CO_2, CH_4, and N_2O emissions from mobile combustion of Jet A fuel and Aviation Gasoline in aircraft engines;
- CO_2, CH_4, and N_2O emissions from mobile combustion of gasoline and diesel in ground service equipment (GSE)[1];
- CO_2, CH_4, and N_2O emissions from mobile combustion of gasoline and diesel in on-road vehicles; (includes Airport customer vehicle rentals)
- Fugitive emissions of HFCs[2] from stationary air conditioning units; and
- Fugitive emissions of SF_6 from high voltage circuit breakers.

The following direct emissions of non-GHGs were identified for the Airport:

- CO, THC, NMHC, VOCs, NO_x, SO_x, PM 2.5, and PM 10 emissions from stationary combustion of No. 2 fuel oil and propane in boilers and furnaces;
- CO, THC, NMHC, VOCs, NO_x, SO_x, PM 2.5, and PM 10 from stationary combustion of diesel and gasoline fuel in emergency generators and fire pumps;
- THC, NMHC, VOCs, PM 2.5, and PM 10 emissions from stationary combustion of propane used during training fires;
- CO, THC, NMHC, VOCs, NO_x, SO_x, PM 2.5, and PM 10 from stationary combustion of Jet A fuel and Aviation Gasoline in aircraft engine testing;
- CO, THC, NMHC, VOCs, NO_x, SO_x, PM 2.5, and PM 10 from stationary combustion of Jet A fuel in auxiliary power units;

[1] Although a minority of GSE is properly classified as stationary combustion sources, all equipment is modeled as mobile combustion sources in order to provide a complete report of service equipment as a category.

[2] R-410a and R-134a were the only applicable refrigerants identified within the airport's operational boundaries.

- CO, THC, NMHC, VOCs, NO_x, SO_x, PM 2.5, and PM 10 from mobile combustion of Jet A fuel and Aviation Gasoline in aircraft engines;
- CO, THC, NMHC, VOCs, NO_x, SO_x, PM 2.5, and PM 10 from mobile combustion of gasoline and diesel in ground service equipment (GSE);
- Fugitive emissions of VOCs from runway coating and painting;
- Fugitive emissions of VOCs from the application of de-icing and anti-icing agents;
- Fugitive emissions of VOCs from solvent degreasing;
- Fugitive emissions of THC, NMHC, and VOCs from Jet A and aviation gasoline fuel tanks; and

While sand and salt were a potential source of fugitive emissions of PM 2.5 and PM 10, the sand and salt piles are stored in silos at the Airport, eliminating particulate matter emissions due to wind erosion. Thus, no data collection was necessary.

Energy Indirect Emissions

The following sources were identified as AvPorts (Scope 2) and tenant and vendor (Scope 3) indirect sources of GHG emissions.

- CO_2, CH_4, and N_2O from the consumption of electricity.

Indirect emissions of non-GHG criteria pollutants were not included in the inventory.

Biogenic Emissions

Biogenic emissions are emissions from organic origins that do not yield a net increase in atmospheric CO_2 because they are theoretically equivalent to the CO_2 absorbed during plant growth. They are produced from combusting a variety of biofuels such as biodiesel, ethanol, wood, wood waste, and landfill gas. Best practice in GHG inventories necessitates the separation of biogenic CO_2 emissions from anthropogenic, or man-made, CO_2 emissions. In accordance to ISO 14064's requirement to identify and quantify biogenic CO_2 emissions separately, no biogenic CO_2 emissions from the Airport were identified and thus the Air Emissions Inventory includes no CO_2 emissions from the combustion of biomass.

Source Exceptions

The following sources of GHG and non-GHG emissions were identified within the boundaries of the inventory but not quantified in emissions estimates due to the insufficiency of data available to First Environment. They are noted here as exceptions:

- Indirect Emissions from electricity consumption in all FAA operated facilities, including:
    - Air Traffic Control Tower/Radar Facility 8 & 9/ILS Buildings 2(Rwy 34) and 2(Rwy 16),
    - Airfield Blockhouse
    - Field Pumphouse
    - New Airfield Blockhouse

No electricity consumption activity data were provided by the tenant. Based on the small footprint of the FAA's facilities as compared to the total building footprint at the Airport, emissions of CO_2, CH_4, and N_2O from FAA's facilities are estimated at approximately less than one percent of the inventory.

- Stationary Combustion of No. 2 Fuel Oil used in boilers in Hangar V, including two 1.746 MMBtu boilers operated by Pepsico. While data was obtained for electricity consumption and fuel consumption associated with GSE operations, fuel consumption data of No. 2 Fuel Oil was not provided. According to Westchester County's Aspect and Impact Database, Hangar V-2 contains two 300-gallon aboveground storage tanks and one 10,000-galllon underground storage tank that store No. 2 Fuel Oil. Based on the boiler output size and the quantity and size of the storage tanks, emissions of CO_2, CH_4, N_2O, CO, THC, NMHC, VOC, NO_x, SO_x, PM 2.5, and PM 10 generated from the boiler usage would comprise a minor percentage of the total emissions.
- Mobile Combustion of gasoline and diesel in some ground service equipment, due to the fact that there was not enough data available to quantify the emissions of CO_2, CH_4, N_2O, CO, THC, NMHC, VOCs, NO_x, SO_x, PM 2.5, and PM 10 from the operation of the equipment. The excluded equipment comprised approximately 11 percent of the total quantity of GSE at the Airport, in which some equipment is rarely used. A list of equipment excluded from the inventory due to the lack of a meter is attached as Appendix A.

Reporting Period

This report covers air emissions from January 1, 2007 through December 31, 2007.

Inventory Year

The inventory establishes a baseline inventory of actual emissions generated during the 2007 calendar year. The baseline inventory will be used for comparison purposes in future years. The inventory was calculated from actual activity data for 2007 (e.g., aircraft take-off and landing data, equipment operating hours, fuel consumption, vehicle mileage, gallons of fuel transferred, tank size, and tank configuration). 2007 was selected as the baseline year because data representative of the Airport's activities is available, quantifiable, and verifiable.

Person Responsible

First Environment developed the inventory under the direction of Robert Funicello, Director of Environmental Projects at the Airport.

Inventory Data Collection Methodologies

Data Collected for Each Source

Two primary methodologies were utilized to collect data.

- Tenants were distributed customized tenant forms, which requested various types of data from their operations such as electricity consumption (when not passed through AvPorts), fuel consumption (when not operated by AvPorts), air conditioner systems and refrigerant consumption, chemical consumption in non-water fire suppression systems, and information regarding the tenant's inventory of GSE. An example of a tenant form is included in Appendix B. A "tenant form" was also issued to AvPorts to obtain the applicable data, from emission sources under its control.
- Data was collected directly from ongoing usage monitoring, such as hour meter readings and/or odometer readings from GSE and Airport vehicles, hour meter readings from AvPorts Stationary Emergency Generators and Fire Pumps, fuel deliveries and tank

level readings for AvPorts-operated boilers and furnaces, the PASSUR departure database for the aircraft landing and takeoff quantities, and electrical consumption as reported on NYPA and Con Edison invoices.

In some cases when data were not available for a particular source, individuals knowledgeable of the operations provided an estimate. The collection methodology for each source is summarized below. A complete list of all sources associated with each building, including boilers, furnaces, emergency generators, fire pumps, and electricity consumption, with their specific locations and fuel inputs, is provided in Appendix C.

Direct Emissions

Stationary Combustion

Boilers and Furnaces

Many buildings located on the Airport's property combust No. 2 fuel oil or propane in boilers and furnaces for heating purposes. Total fuel consumption for the Airport-owned and operated boilers and furnaces was obtained through fuel delivery invoices and tank level readings. Tenants reported total fuel consumed in boilers and furnaces they owned or operated on the tenant forms.

Emergency Generators and Fire Pumps

First Environment collected the following activity data for this source:

- Hour meter readings from emergency generators and fire pumps operated by AvPorts, which were collected during site visits conducted at the beginning and end of the year.
- Fuel usage data from emergency generators and fire pumps operated by various tenants, which were collected through the tenant forms.

Training Fires

Airport personnel estimated that approximately 50 percent of the Airport's 500-gallon propane tank is consumed during the Airport's monthly training fires. Thus, an estimated 250-gallons of propane per month was included in the inventory.

Engine Testing

Each time an Aircraft engine is tested, an Aircraft Run-up Logsheet is completed and provided to AvPorts. The logsheet contains information regarding the type of engine, power setting, and length of time each test was run. First Environment used the logsheets for the engine testing activities during 2007 to estimate the emissions.

Auxiliary power units

Auxiliary Power Units (APUs) usage is directly associated with Aircraft operations. APU emissions were determined from the quantity and type of aircrafts that landed and took off at the Airport (see Mobile Combustion, Aircraft).

Mobile Combustion

Aircraft

Data collected to calculate the emissions from aircraft operations at the Airport included the following:

- The PASSUR departure database, covering all flights at the Airport in 2007. This database provided the tail numbers and/or flight numbers of each aircraft that arrived and departed from the Airport.
- 2008 FAA Aircraft Registration Database, covering all registered aircraft in the United States. This database contains tail numbers of all registered aircraft linked with aircraft types and engine information.
- Taxi times collected by Airport staff during the month of September.

Ground Support Equipment

First Environment assembled the GSE inventory and activity data for both AvPorts and the tenants through site visits at the beginning and end of the year. During these site visits, First Environment staff collected the activity data, including hour meter readings; odometer readings; type of fuel; and year of manufacture, and logged the activity data into Master Equipment spreadsheets. Each piece of equipment was individually tracked. If a specific piece of equipment's activity data was unavailable either at the beginning of the year or end of the year, First Environment approximated its usage based on similar types of equipment. When equipment changes happened mid-year, the inventory was adjusted accordingly. First Environment also verified the GSE inventory of the tenants through the tenant forms.

On-Road Vehicles: Rental Cars and Limousine Service

First Environment obtained the following from site visits the rental car agencies and limousine service:

- Total number of car rentals in 2007;
- Total quantity of limousine trips in 2007; and
- Average fleet mixes

Fugitive Emissions

Surface Coating and Painting

According to the Airport staff, no major painting operations occurred at the Airport in 2007 aside from runway and roadway stripping. The Airport maintenance staff estimated that a quantity of 3,000 gallons of paint was used on the Airport's 500,000 square feet of runway and roadway stripping in 2007.

De-Icing and Anti-Icing

De-Icing and anti-icing activity data for the Airport was logged by each tenant and was collected by the AvPorts operations personnel. The activity data included the quantity (gallons) per month used of Type I and Type II De-icing and Anti-icing compounds.

Solvent Degreasing

Emissions from solvent degreasing were determined to be negligible because the Airport uses only bench top units in which the fluid is replaced one or two times per year.

Stationary Air Conditioner Systems

For stationary air conditioner systems, information regarding the location, number of units, refrigerant type, amount of refrigerant replaced, and the date the refrigerant was replaced in the Air Conditioner systems at the Airport was provided to First Environment through the tenant forms including the AvPorts form.

Fuel Tanks

Each fuel tank at the Airport is registered with the Westchester County Department of Health. The AvPorts operations personnel provided First Environment with the tank of type and dimensions from the two Aviation Gasoline fuel tanks and five Jet A fuel tanks.

High Voltage Circuit Breakers

SF_6 is used as an "insulator gas" in the Airport's high voltage circuit breakers, which are maintained by a contractor to the County. The AvPorts staff reported to First Environment that the SF_6 was not replaced during 2007.

Indirect Emissions – Purchased Electricity

Buildings and other powered equipment (lighting, etc.) around the Airport are supplied with electricity either through the Airport's electricity accounts or through individual tenant accounts with ConEdison. First Environment obtained kilowatt-hours consumption from the account invoices for the Airport accounts. Tenants with separate accounts provided their electricity consumption on the tenant forms.

Emissions Quantification Methodologies

Non-GHG criteria pollutant emissions are calculated using the FAA *Emissions and Dispersion Modeling System* (EDMS), Version 5.0.2 and GHG emissions are calculated using methodologies from The Climate Registry's (TCR) *General Reporting Protocol*, Version 1.1. Table 1 shows each source and the GHG and non-GHG criteria pollutant emissions each source emits. The quantification methodology for each source is summarized in the following paragraphs.

Table 1: GHGs and Criteria Pollutants by Source

Source Categories	Source Types	Sources	GHGs						Non GHG Criteria Pollutants							
			CO_2	CH_4	N_2O	HFCs	PFCs	SF_6	CO	THC	NMHC	VOC	NO_x	SO_x	PM 2.5	PM 10
Direct Emissions	Mobile Combustion	Airplane landing and take-offs	X	X	X				X	X	X	X	X	X	X	X
		Ground support equipment (GSE)	X	X	X				X	X	X	X	X	X	X	X
		On-Road Vehicles	X	X	X											
	Stationary Combustion	Boilers and furnaces	X	X	X				X	X	X	X	X	X	X	X
		Emergency generators & fire pumps	X	X	X				X	X	X	X	X	X	X	X
		Training Fires	X	X	X					X	X	X			X	X
		Aircraft engine testing	X	X	X				X	X	X	X	X	X	X	X
		Auxiliary power units (APUs)	X	X	X				X	X	X	X	X	X	X	X
	Fugitive Emissions	Surface coating / painting										X				
		Deicing										X				
		Solvent Degreasing										X				
		Fuel tanks, pipelines, pumps, etc.								X	X	X				
		Air conditioner systems				X										
		High Voltage Circuit Breakers						X								
Indirect Emissions	Purchased electricity	Purchased electricity	X	X	X											

Direct Emissions

Stationary Combustion

Boilers and Furnaces

The Direct GHG Emissions from this source were quantified from the fuel usage data as follows:

- CO_2 emissions were quantified using a default emission factor of 10.15 kilograms CO_2 per gallon of No. 2 Fuel Oil (Distillate Fuel Oil (#1, 2, & 4) and 5.74 kilograms CO_2 per

gallon of propane. Both default emission factors were obtained from TCR's General Reporting Protocol, v1.1, Table 12.1.

- CH_4 emissions were quantified using a default emission factor of 1.4 grams CH_4 per MMBtu of No. 2 Fuel Oil (Residual Fuel Oil Boilers) and 0.9 grams CH_4 per MMBtu for propane (Liquefied Petroleum Gases Boilers). Both default emission factors were obtained from TCR's General Reporting Protocol, v1.1, Table 12.8.
- N_2O emissions were quantified using a default emission factor of 0.3 grams N_2O per MMBtu of No. 2 Fuel Oil (Residual Fuel Oil Boilers) and 4.0 grams N_2O per MMBtu for propane (Liquefied Petroleum Gases Boilers). Both default emission factors were obtained from TCR's General Reporting Protocol, v1.1, Table 12.8.

The calculations are shown in Appendix D1.

The Direct non-GHG Emissions from this source were quantified as follows:

- All non-GHG criteria pollutants were calculated within EDMS, which employs the total fuel consumed and the type of fuel to calculate the fuel usage and the subsequent non-GHG criteria pollutant emissions using its default emission factors.

Emergency Generators and Fire Pumps

The total volume of fuel consumed is required to calculate GHG emissions from the operation of emergency generators and fire pumps. The tenants provided the volume of fuel consumed on their tenant forms. However, because only hour meter readings were available from the AvPorts operated emergency generators, the volume of fuel consumed was calculated using the following components:

- The output of EDMS's non-GHG criteria pollutant emissions calculations in pounds of NO_x per MMBtu, pounds of CO per MMBtu, and pounds of SO_x per MMBtu
- AP-42's[3] fuel consumption factors in pounds of non-GHG criteria pollutant per MMBtu of diesel
- 0.13869 MMBtu per gallon of diesel fuel from TCR's GRP, version 1.1, Table 12.1

[3] AP-42, Fifth Edition, Volume I, Chapter 3, Table 3.3-1

The AvPorts operated emergency generators consume only diesel fuel. The fuel consumption was calculated by multiplying each of the three non-GHG criteria pollutant emissions by AP-42's fuel consumption factors and converting MMBtu to gallons of diesel fuel.

Given the volume of fuel consumed, the Direct GHG Emissions from this source were quantified as follows:

- CO_2 emissions were quantified using a default emission factor of 10.15 kilograms CO_2 per gallon of diesel fuel (Distillate Fuel Oil (#1, 2, & 4) and 8.81 kg CO_2 per gallon for gasoline (Motor Gasoline). Both default emission factors were obtained from TCR's General Reporting Protocol, v1.1, Table 12.1.
- CH_4 emissions were quantified using a default emission factor of 11 grams CH_4 per MMBtu of diesel fuel and 11 grams CH_4 per MMBtu for gasoline. Both default emission factors were obtained from TCR's General Reporting Protocol, v1.1, Table 12.9.
- N_2O emissions were quantified using a default emission factor of 0.6 grams N_2O per MMBtu of diesel fuel and 0.6 grams N_2O per MMBtu for gasoline. Both default emission factors were obtained from TCR's General Reporting Protocol, v1.1, Table 12.9.

Appendix D2 contains the calculations for the tenant-operated equipment. Appendix D3 contains the calculations for the AvPorts-operated equipment.

The Direct non-GHG Emissions from this source were quantified as follows:

- All non-GHG criteria pollutants were calculated within EDMS using the hours of operation of each unit and the type of fuel to calculate. The emission factors are built into EDMS

Aircraft Engine Testing

EDMS was used to quantify the total volume of fuel consumed for the Engine Run-Up tests at the following standard power settings: 7%, 30%, 85%, or 100%. For the tests run at these standard settings, the total fuel consumption calculated by EDMS was used to calculate the GHG emissions. However, for engine run-up tests run at power settings other than the four standard settings, the total volume of fuel consumed per test was estimated with guidance from the FAA. A linear relationship was graphically developed for each engine type between the standard power settings and its corresponding fuel consumption. The fuel consumption in kilograms of fuel per second at the actual power setting was obtained from each engine's power

setting/fuel consumption curve. Using the average density of Jet A fuel and Aviation Gasoline, which was used to convert from the mass of the fuel consumed and the volume of fuel consumed, and the duration of the test, the volume of fuel consumed was calculated and used to quantify the GHG emissions.

The Direct GHG Emissions from the total volume of fuel consumed were quantified as follows:

- CO_2 emissions were quantified using a default emission factor of 9.57 kilograms of CO_2 per gallon of Jet A fuel and 8.32 kilograms of CO_2 per gallon of Aviation Gasoline obtained from TCR's General Reporting Protocol, v1.1, Table 13.1.
- CH_4 emissions were quantified using a default emission factor of 0.27 grams of CH_4 per gallon of Jet A Fuel and 7.04 grams of CH_4 per gallon of Aviation Gasoline obtained from TCR's General Reporting Protocol, v1.1, Table 13.6.
- N_2O emissions were quantified using a default emission factor of 0.31 grams of N_2O per gallon of Jet A Fuel and 0.11 grams of N_2O per gallon of Aviation Gasoline obtained from TCR's General Reporting Protocol, v1.1, Table 13.6.

The Direct non-GHG Emissions from this source were quantified as follows:

- All non-GHG criteria pollutant emissions were calculated using default emission factors from EDMS. For tests run at the standard power settings, EDMS automatically calculated the non-GHG criteria pollutant emissions. For engines tested at power settings other than the standard settings, the non-GHG emissions were calculated using the FAA-recommended method discussed above.

The calculations are shown in Appendix D3 (standard method) and D4 (graphical method).

Auxiliary Power Units

Because APUs are simply small jet-engines which essentially run at full-throttle, their emissions are calculated using the same methods as with the aircraft engines, functioning in only one given power setting.

However, unlike the Aircraft, EDMS does not inherently calculate the total volume of fuel consumed from the APUs, which is required to calculate the GHG emissions. To obtain the total volume of fuel consumed, First Environment obtained fuel flow estimates in pounds of fuel per minute from EPA's Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources, which lists fuel flows from five different types of APUs. These five different type of

APUs were then linked to each default APU in the EDMS model, and the fuel consumption was calculated. Appendix D4 contains a table showing the fuel flow estimates and the APU classification by type made by First Environment to perform this calculation.

The Direct GHG Emissions from the total volume of fuel consumed were quantified as follows:

- CO_2 emissions were quantified using a default emission factor of 9.57 kilograms of CO_2 per gallon of Jet A fuel obtained from TCR's General Reporting Protocol, v1.1, Table 13.1.
- CH_4 emissions were quantified using a default emission factor of 0.27 grams of CH_4 per gallon of Jet A Fuel obtained from TCR's General Reporting Protocol, v1.1, Table 13.6.
- N_2O emissions were quantified using a default emission factor of 0.31 grams of N_2O per gallon of Jet A Fuel obtained from TCR's General Reporting Protocol, v1.1, Table 13.6.

Appendix D6 contains the calculations.

The Direct non-GHG Emissions from this source were quantified as follows:

- EDMS calculates all non-GHG criteria pollutant emissions for each default APU by its association with the aircraft using the default emission factors.

Training Fires

The Direct GHG Emissions from this source were quantified from the fuel usage as follows:

- CO_2 emissions were quantified using a default emission factor of 5.74 kilograms of CO_2 per gallon of propane obtained from TCR's General Reporting Protocol, v1.1, Table 12.1.
- CH_4 emissions were quantified using a default emission factor of 11 grams of CH_4 per gallon of propane obtained from TCR's General Reporting Protocol, v1.1, Table 12.9.
- N_2O emissions were quantified using a default emission factor of 0.6 grams of N_2O per gallon of propane obtained from TCR's General Reporting Protocol, v1.1, Table 12.9.

Appendix D7 shows the calculations.

The Direct non-GHG Emissions from this source were quantified as follows:

- EDMS multiplies the total quantity of fuel consumed during the training fire by the default emission factor for each criteria pollutant to obtain the total emissions from THC, NMHC, VOCs, and particulate matter.

Mobile Combustion

Aircraft

The total volume of fuel consumed by the aircraft operation was calculated by EDMS using the International Civil Aviation Organization (ICAO) and Environmental Protection Agency (EPA) Times in Mode (TIM). The ICAO/EPA TIMs are based on broad aircraft categories and provide generalized times spent in the Aircraft's Approach, Idle, Takeoff and Climb Out modes. In each of the modes, the engine operates at a certain power setting that determines the rate at which fuel is consumed. EDMS uses the ICAO/EPA time in the Idle mode as the default time for taxing in and out of the Airport. For this inventory, the default taxi in and taxi out times were modified, using the Airport's September taxi time study results, to more accurately represent the taxi times at the Airport. Given the time spent in each mode, the fuel flow at each power setting, and the type of engine, EDMS calculates the total volume of fuel consumed during each aircraft's landing and takeoff cycle (LTO). The Airport's arrival and departure database was used in collaboration with the FAA's Aircraft Registration Database to determine the total number of LTOs of each aircraft and engine type. EDMS calculated the fuel flow for all aircraft and engine types at a mixing height of both the default of 3,000 feet and at 10,000 feet.

The Direct GHG Emissions from the total volume of fuel consumed were quantified as follows:

- CO_2 emissions were quantified using a default emission factor of 9.57 kilograms of CO_2 per gallon of Jet A fuel and 8.32 kilograms of CO_2 per gallon of Aviation Gasoline obtained from TCR's General Reporting Protocol, v1.1, Table 13.1.
- CH_4 emissions were quantified using a default emission factor of 0.27 grams of CH_4 per gallon of Jet A Fuel and 7.04 grams of CH_4 per gallon of Aviation Gasoline obtained from TCR's General Reporting Protocol, v1.1, Table 13.6.
- N_2O emissions were quantified using a default emission factor of 0.31 grams of N_2O per gallon of Jet A Fuel and 0.11 grams of N_2O per gallon of Aviation Gasoline obtained from TCR's General Reporting Protocol, v1.1, Table 13.6.

The calculations are shown in Appendix D8.

The Direct non-GHG Emissions from this source were quantified as follows:

- All non-GHG criteria pollutant emissions were calculated by EDMS using default emission factors.

Ground Support Equipment

The GHG emissions are calculated from the total volume of fuel consumed by the GSE. The fuel flow in grams per horsepower-hour was obtained from the Environmental Protection Agency's NONROAD model. Using the type of fuel and horsepower rating of the engine, an appropriate fuel flow was identified for each GSE and converted into gallons per horsepower-hour. The total volume of fuel consumed was calculated as a product of the fuel flow and total hours of operation of each GSE. If only odometer readings were available for a GSE, the total mileage was converted to hours using EPA's combined highway and city fuel efficiency for the specific vehicle. The total fuel consumption was then used to calculate the GHG emissions.

The Direct GHG Emissions from this source were quantified as follows:

- CO_2 emissions were quantified using a default emission factor of 10.15 kilograms CO_2 per gallon of diesel fuel and 8.81 kg CO_2 per gallon for gasoline fueled equipment. Both default emission factors were obtained from TCR's General Reporting Protocol, v1.1, Table 13.1.
- CH_4 emissions were quantified using a default emission factor of 0.58 kilograms CH_4 per gallon of diesel fuel and 0.50 kg CH_4 per gallon for gasoline fueled equipment. Both default emission factors were obtained from TCR's General Reporting Protocol, v1.1, Table 13.6.
- N_2O emissions were quantified using a default emission factor of 0.26 kilograms N_2O per gallon of diesel fuel and 0.22 kg N_2O per gallon of gasoline fueled equipment. Both default emission factors were obtained from TCR's General Reporting Protocol, v1.1, Table 13.6.

The actual calculations are shown in Appendix D9.

The Direct non-GHG Emissions from this source were quantified as follows:

- All Non-GHG criteria pollutant emissions were calculated within EDMS using default emission factors. For the fuel trucks and other miscellaneous equipment (weedwackers, snow blowers, etc.), which are not available in the EDMS GSE fleet, an equivalent type

of equipment was created. Appendix E shows the equivalent types of equipment used in the calculation.

On-Road Vehicles: Rental Cars and Limousine Service

The total fuel consumption for rental cars and the limousine service was calculated through the following process:

1) Fleets were divided into three categories: compact, mid-size, and SUV.
2) Average fuel economy for each category was determined from the Environmental Protection Agency's miles-per-gallon estimates and are as follows:

Category	EPA average miles/gal
Compact	25
Mid-Size	22
SUV	16

3) Assuming a distance traveled on the Airport's property of 2.8 miles round trip, each car's fuel consumption was calculated.

The Direct GHG Emissions from this source were quantified as follows:

- CO_2 emissions were quantified using a default emission factor of 8.81 kilograms CO_2 per gallon of gasoline obtained from TCR's General Reporting Protocol, v1.1, Table 13.1.
- CH_4 emissions were quantified using a default emission factor of 0.0147 grams CH_4 per mile traveled obtained from TCR's General Reporting Protocol, v1.1, Table 13.4 as "Model Year 2005" Gasoline Passenger Cars.
- N_2O emissions were quantified using a default emission factor of 0.0079 grams N_2O per mile traveled obtained from TCR's General Reporting Protocol, v1.1, Table 13.4 as "Model Year 2005" Gasoline Passenger Cars.

The Direct Non-GHG emissions were not calculated and not included. The calculations are shown in Appendix D10.

Fugitive Emissions

Surface Coating/Paintings

No GHG emissions were associated with painting and coating.

The Direct non-GHG Emissions from this source were quantified as follows:

- To calculate the THC, NMHC, and VOCs emitted during the painting of the Airport's runways and roadways, EDMS applied the specific default emission factor for the type of paint used and multiplied it by the quantity of paint consumed.

Deicing and Anti-Icing

No GHG emissions were associated with deicing and anti-icing.

The Direct non-GHG Emissions from this source were quantified as follows:

- For Aircraft Deicing and anti-icing, EDMS used the density and concentration (percent by mass) of the deicing chemical to estimate the emission factor, which is then multiplied by the quantity of deicing chemicals consumed to calculate the total VOC emissions.

Fuel Tanks

No GHG emissions were associated with fuel storage.

The Direct non-GHG Emissions from this source were quantified as follows:

Emissions from fuel tanks are associated with changes in the liquid level, temperature, and barometric pressure. EDMS uses default emission factors, the dimensions of each tank, and the type of tank as input to calculate the THC, NMHC, and VOC emissions from standing loss, rim seal loss, deck fitting loss, and deck seem loss.

Stationary Air Conditioner Systems

The Direct GHG Emissions from this source were quantified as follows:

Based on the information collected regarding the Airport's and tenants' air conditioner systems, all buildings except Building 1B use R-22, which is not a recognized "Kyoto" GHG and thus is not included in the inventory. Building 1B uses R-410A, but no refrigerant was replaced in 2007 and thus no emissions were calculated.

No non-GHG emissions were associated with the air conditioning systems.

Indirect Emissions

Purchased Electricity

The Direct GHG Emissions from this source were quantified from the kilowatt-hours used as follows:

- CO_2 emissions were quantified using a grid-based default emission factor for the EPA's 2006 eGRID NPCC NYC/Westchester Subregion of 0.92222 pounds of CO_2 per kWh consumed. This methodology is consistent with TCR's General Reporting Protocol, v1.1, Chapter 14.
- CH_4 emissions were quantified using a grid-based default emission factor for EPA's 2006 eGRID NPCC NYC/Westchester Subregion of 0.000038 pounds of CH_4 per kWh consumed. This methodology is consistent with TCR's General Reporting Protocol, v1.1, Chapter 14.
- N_2O emissions were quantified using a grid-based default emission factor for EPA's 2006 eGRID NPCC NYC/Westchester Subregion of 0.000006 pounds of N_2O per kWh consumed. This methodology is consistent with TCR's General Reporting Protocol, v1.1, Chapter 14.

The calculations are shown in Appendix D11.

Global Warming Potentials

The Global Warming Potentials, identified in the Second Assessment Report of the Intergovernmental Panel on Climate Change, were used to convert the GHG emissions associated with Airport activities into carbon dioxide equivalents (CO_2e).

The Global Warming Potentials used are as follows:

Carbon Dioxide (CO_2) - 1
Methane (CH_4) - 21
Nitrous Oxide (N_2O) – 310

Quantification of Emissions

Direct GHG Emissions

Total Direct Emissions were quantified as 69,655.07 metric tonnes (m.t.) CO_2e. This value includes both Scope 1 direct emissions associated with operations performed on behalf of the Westchester County DOT and Scope 3 direct emissions associated with tenant, vendor, and selected customer operations.

The quantity includes contributions of the following Kyoto six greenhouse gases:

Table 2a: Direct GHG Emissions

	m.t. GHG	m.t. CO_2e
Carbon Dioxide (CO_2)	68,983.88	68,983.88
Methane (CH_4)	2.42	50.86
Nitrous Oxide (N_2O)	2.00	620.33
Hydrofluorocarbons (HFCs)	0.00	0.00
Perfluorocarbons (PFCs)	0.00	0.00
Sulfur Hexafluoride (SF_6)	0.00	0.00

Direct emissions reported included sources under the control of airport tenants.

Energy Indirect GHG Emissions

Total Energy Indirect Emissions were quantified as 4,990 metric tonnes (m.t.) carbon dioxide equivalents (CO_2e). This value includes Scope 2 indirect emissions associated with activities performed on behalf of the Westchester County DOT and Scope 3 indirect emissions associated with tenant and vendor activity. All energy indirect emissions reported are from purchased electricity.

The quantity includes contributions of the following Kyoto six greenhouse gases:

Table 2b: Energy Indirect GHG Emissions

	m.t. GHG	m.t. CO_2e
Carbon Dioxide (CO_2)	4,976.13	4,976.13
Methane (CH_4)	0.21	4.31
Nitrous Oxide (N_2O)	0.03	10.04
Hydrofluorocarbons (HFCs)	0.00	0.00
Perfluorocarbons (PFCs)	0.00	0.00
Sulfur Hexafluoride (SF_6)	0.00	0.00

Emissions by Source

Tables 3a and 3b provide a summary of each source's GHG and non- GHG criteria pollutant emissions.

Table 3a: Total Greenhouse Gas Emissions

Emission Source	Greenhouse Gases (metric tons)						
	CO_2e	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6
Direct Emissions - Mobile Sources							
Aircraft	47,620.77	47,117.96	1.46	1.52	0.00	0.00	0.00
Ground Support Equipment	13,753.15	13,630.10	0.78	0.34	0.00	0.00	0.00
On-Road Vehicles	237.56	236.02	0.01	0.004	0.00	0.00	0.00
Direct Emissions - Stationary Sources							
Boilers & Furnaces	5,256.83	5,242.08	0.10	0.04	0.00	0.00	0.00
Emergency Generators & Fire Pumps	44.79	44.54	0.007	0.0004	0.00	0.00	0.00
Training Fires	17.33	17.22	0.003	0.0002	0.00	0.00	0.00
Aircraft Engine Testing	98.21	97.18	0.0028	0.0031	0.00	0.00	0.00
Auxiliary Power Units	2,626.42	2,598.78	0.07	0.08	0.00	0.00	0.00
Direct Emissions - Fugitive							
High Voltage Circuit Breakers	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Emission Source	Greenhouse Gases (metric tons)						
	CO_2e	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6
Energy Indirect Emissions							
Purchased Electricity	4,990.48	4,976.13	0.21	0.03	0.00	0.00	0.00
TOTAL	**74,645.55**	**73,960.02**	**2.63**	**2.03**	**0.00**	**0.00**	**0.00**

Table 3b: Total Non-GHG Criteria Pollutant Emissions

Emission Source	Criteria Pollutants (metric tons)							
	CO	THC	NMHC	VOC	NO_x	SO_x	PM-10	PM-2.5
Direct Emissions - Mobile Sources								
Aircraft	422.29	193.09	193.09	177.84	147.90	20.47	5.37	5.37
Ground Support Equipment	483.68	14.85	13.51	14.07	44.26	7.79	1.96	1.89
Direct Emissions - Stationary Sources								
Stationary Sources*	1.89	10.82	10.82	10.83	9.00	13.07	0.40	0.22
Training Fires	0.05	0.04	0.04	0.04	0.01		0.16	0.16
Auxiliary Power Units	18.87	0.69	0.69	0.69	6.09	1.11	0.00	0.00
TOTAL	**926.77**	**219.49**	**218.16**	**203.47**	**207.27**	**42.44**	**7.89**	**7.64**

* Because EDMS automatically consolidates the stationary sources as one quantity, the stationary sources are combined into one value, which includes Aircraft Engine Testing, Emergency Generators and Fire Pumps, and Boilers and Furnaces.

Uncertainty Assessment and Quality Assurance

With regard to an Air Emissions Inventory, quality refers to the general accuracy and consistency between an organization's actual emissions and quantified emissions. The difference between actual and quantified emissions results from uncertainty and error introduced by activities such as data collection, data management, calculations, and reporting. Inventory quality is impacted as data progresses from individual sources to the final report.

The inventory contains reporting uncertainty resulting from various errors introduced in certain activities. Overall uncertainties are as follows:

- Not all data was received from primary sources (i.e., invoices) and backup data was not provided with the information recorded on the tenant forms. Thus, errors present in the initial data will be transferred to errors in the emission calculations.
- Default emission factors, though used as a best practice, may present a level of uncertainty from the actual emissions.

Provided below are qualitative assessments of the identified uncertainties.

Stationary Combustion

Auxiliary Power Units

Actual hour meter readings could not be obtained from the Aircraft's APUs, but an EDMS default value of 13 minutes per arrival and 13 minutes per departure was used. Actual length of time depends on the circumstances at the gate and could either be shorter or longer than the default length of time.

Training Fires

Due to the fact that the fuel consumption used during the Airport's monthly training fires is not recorded, the annual quantity of fuel used for this source is estimated. The actual quantity of fuel consumed during the training fires may be less than or greater than the estimated quantity.

Mobile Combustion

Aircraft

Several obstacles encountered throughout the process of quantifying the Aircraft LTO emissions required numerous assumptions to be made and are discussed below:

- The PASSUR departure database was used to determine the number of aircraft type landings and takeoffs (LTOs). When the aircraft type identified by the tail number did not match the International Civil Aviation Organization's (ICAO's) aircraft type, the ICAO aircraft type was used.

- When available, the default engines for each aircraft type within EDMS were used. When EDMS did not specify a particular engine as a default, the first listed engine under the aircraft type was selected.

- Not all of the aircraft types arriving and departing from Westchester County Airport could be found within EDMS. These aircraft types were reviewed and equivalent aircraft types were assumed. Assumptions were made based on the type of engine and size of the aircraft.

- Approximately 0.7 percent of the arrivals had no information except a flight number of 1200. Jeremy Nielson, Operations Training Supervisor of the Westchester Aircraft Operations, informed First Environment that flight numbers of 1200 are visual flights, which usually consist of 2 to 4 passenger general aviation aircraft. In order to include these fights in the inventory, it was assumed that the aircraft type would be equivalent to the Cessna 172 Skyhawk.

The taxi time study performed by the Airport staff in September resulted in an average taxi in time of five minutes, as opposed to the EDMS default taxi in time of seven minutes, and an average taxi out time of 10 minutes, as opposed to the EDMS default taxi out time of 19 minutes. The study showed that the Airport-specific taxi times were shorter than the default taxi times used by EDMS. Thus, the airport-specific taxi times were used in the inventory quantification. Because the taxi time study was completed in September, any deicing activities or weather-related delays may not be included in the analysis and thus the taxi times do not represent the complete year-around average for the Airport. An analysis of taxi times is included in the Analyses section of this report.

On-Road vehicles: Rental Cars and Limousine Service

When collecting data from each rental car company, several assumptions had to be made that added to the uncertainty of the data collected, as follows:

- Average fleet mixes were only available for Avis and Budget. Average fleet mixes for Hertz, National, and Enterprise were determined through discussions with the fleet managers; and
- National could not obtain an actual quantity of cars rental for 2007 but assumed a number of 20,000, which was used in this inventory and generally in agreement with the other rental car companies.
- DCL Limo Service assumed 250 taxi runs per day.

Fugitive Emissions

Surface Coating/Painting

Within EDMS, two types of paint, water-based and solvent-based, are available when entering data for the surface coating/painting operations. Since the Airport's contracted painting operator did not supply the type of paint used for the surface coating/painting operations at the Airport, First Environment assumed that solvent-based paint was used. Of the two, the solvent-based paint has the highest emissions of VOCs.

Sensitivity Analyses

First Environment performed analyses of various emission calculations modeled through EDMS. The first type of analysis shows the differences between various EDMS default values and the corresponding Airport-specific values. The second type of comparison evaluates several components of each source's total emissions shown in Tables 3a and 3b.

EDMS Default Analysis

Comparisons were run in three different scenarios: 1) using EDMS-default GSE instead of Airport-specific GSE activity data, 2) using EDMS-default taxi times instead of the Airport-specific taxi times measured in September 2007 by the Airport operations personnel, and 3) running all aircraft emissions calculations with a 10,000 foot mixing height instead of a 3,000 foot mixing height.

GSE Analysis

A comparison was run against the emissions calculated from the primary GSE activity data for the Aircraft-related GSE and the EDMS default Aircraft –related GSE. Weedwackers, snow blowers and other non-aircraft related GSE, for which First Environment collected data, were not included as primary GSE in the comparison. Results showed that emissions of both GHGs and non-GHG criteria pollutants quantified using actual activity data are higher than those using default data. The results are presented in Table 4a and 4b.

Table 4a: Greenhouse Gas GSE Comparison

Emission Source	Greenhouse Gases (metric tons)						
	CO_2e	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6
Primary GSE	10,056.08	9,966.01	0.57	0.25			
EDMS default Primary GSE	5,120.66	5,074.82	0.29	0.13			

Table 4b: Criteria Pollutant GSE Comparison

Emission Source	Criteria Pollutants (metric tons)							
	CO	THC	NMHC	VOC	NO_x	SO_x	PM-10	PM-2.5
Actual GSE	372.01	11.28	10.29	10.72	36.68	6.73	1.77	1.70
EDMS default GSE	369.55	13.72	12.46	12.97	41.80	2.00	1.12	1.08

Taxi-Time Analysis

In September of 2007, Airport Operations personnel completed a taxi time study to evaluate the actual taxi times used on the two runways at the Airport. The taxi times influence the quantity of emissions emitted during the aircraft taxi-in and taxi-out modes. Tables 5a and 5b summarize the difference in emissions due to the variance of the taxi-times.

In accordance with the shorter actual taxi times, the results show that the emissions of both GHGs and non-GHG criteria pollutants generated using the Airport-specific taxi times are less than the emissions of both GHGs and non-GHG criteria pollutants using the EDMS default taxi times. However, the taxi times only affect the emissions of the Aircraft and not of the APUs or GSE.

Table 5a: Greenhouse Gas Taxi Time Comparison

Emission Source	Taxi Time	Greenhouse Gases (metric tons)						
		CO_2e	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6
Aircraft	default taxi times	61,934.44	61,280.74	1.88	1.98			
Aircraft	Westchester County Airport taxi times	47,620.77	47,117.96	1.46	1.52			

Table 5b: Criteria Pollutant Taxi Time Comparison

Emission Source	Taxi Time Study	Criteria Pollutants (metric tons)							
		CO	THC	NMHC	VOC	NO_x	SO_x	PM-10	PM-2.5
Aircraft	default taxi times	630.13	257.12	257.12	236.80	163.82	26.54	7.36	7.36

Aircraft	Westchester County Airport taxi times	422.29	193.09	193.09	177.84	147.90	20.47	5.37	5.37

Mixing Height Analysis

A mixing height of 3,000 feet is generally accepted by industry standards and is the default mixing height in EDMS. In order to evaluate how the emissions are affected by the mixing height, First Environment ran the various comparisons involving the aircraft activity using a mixing height of 10,000 feet. Tables 6a.1 and 6a.2 summarize the total emissions, Tables 6b.1 and 6b.2 show the emissions of the aircraft split between commercial and private, and Tables 6c.1 and 6c.2 summarize the emissions from the taxi time comparison.

The Aircraft GHGs and non-GHG criteria pollutant emissions increased in all scenarios analyzed due to the increase of the mixing height.

Table 6a.1: Greenhouse Gas Total Emissions With Mixing Height of 3000 and 10,000 Feet

Emission Source	Greenhouse Gases (metric tons)						
	CO_2e	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6
Direct Emissions - Mobile Sources							
Aircraft at 10,000 feet	73,466.78	72,689.55	2.36	2.35	0.00	0.00	0.00
Aircraft at 3,000 feet	47,620.77	47,117.96	1.46	1.52	0.00	0.00	0.00

Table 6a.2: Criteria Pollutants Total Emissions With Mixing Height of 3000 and 10,000 Feet

Emission Source	Criteria Pollutants (metric tons)							
	CO	THC	NMHC	VOC	NO_x	SO_x	PM-10	PM-2.5
Direct Emissions - Mobile Sources								
Aircraft at 10,000 feet	665.35	218.73	218.73	201.35	258.62	31.58	8.06	8.06
Aircraft at 3,000 feet	422.29	193.09	193.09	177.84	147.90	20.47	5.37	5.37

Total Emissions Analysis

First Environment performed various analyses on the breakdowns of several of the larger sources. The first analysis, shown in Tables 7a and 7b, divides the aircraft emissions between the commercial aircraft and the private aircraft. As expected, results show that the GHG emissions from the private aircraft operations are approximately 51 to 58 percent greater than the GHG emissions from commercial aircraft operations. The non-GHG criteria pollutant

emissions from private aircraft operations are also greater than the non-GHG criteria pollutant emissions from commercial aircraft operations.

Table 7a: Greenhouse Gas Emissions, Commercial vs. Private Aircraft

Emission Source	Greenhouse Gases (metric tons)						
	CO_2e	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6
Commercial Aircraft	15,542.92	15,379.37	0.43	0.50			
Private Aircraft	32,077.86	31,738.59	1.02	1.03			

Table 7b: Criteria Pollutant Emissions, Commercial vs. Private Aircraft

Emission Source	Criteria Pollutants (metric tons)							
	CO	THC	NMHC	VOC	NO_x	SO_x	PM-10	PM-2.5
Commercial Aircraft	41.91	5.31	5.31	5.03	60.71	6.68	0.88	0.88
Private Aircraft	380.37	187.79	187.79	172.81	87.19	13.79	4.49	4.49

In creating the inventory of the GSE, First Environment included the primary GSE that support the aircraft (luggage carriers, Ground Power Units, etc.) and secondary GSE, including equipment used in the airport operations (snow blowers, weedwackers, etc.). The second analysis, shown in Tables 8a and 8b, separates the primary GSE emissions from the total GSE emissions.

Table 8a: Greenhouse Gas Emissions, all GSE vs. Primary GSE

Emission Source	Greenhouse Gases (metric tons)						
	CO_2e	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6
All GSE	13,753.15	13,630.10	0.78	0.34			
Primary GSE	10,056.08	9,966.01	0.57	0.25			
Secondary GSE	3,697.07	3,664.10	0.21	0.09			

Table 8b: Criteria Pollutant Emissions, all GSE vs. Primary GSE

Emission Source	Criteria Pollutants (metric tons)							
	CO	THC	NMHC	VOC	NO_x	SO_x	PM-10	PM-2.5
All GSE	483.68	14.85	13.51	14.07	44.26	7.79	1.96	1.89
Primary GSE	372.01	11.28	10.29	10.72	36.68	6.73	1.77	1.70
Secondary GSE	111.67	3.57	3.23	3.35	7.59	1.06	0.20	0.19

Finally, the GSE emissions, as a whole, were divided between the each tenant's GSE, as summarized in Tables 9a and 9b. The distribution of emissions correlates to each tenant's activity at the Airport.

Table 9a: Greenhouse Gas Emissions, GSE

Emission Source	Greenhouse Gases (metric tons)						
	CO_2e	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6
Air Tran	109.8	109	0.006	0.003			
Altria	3.8	4	0.000	0.000			
American Eagle	37.5	37	0.002	0.001			
Avitat	1,580.4	1,566	0.089	0.040			
Citigroup	27.9	28	0.002	0.001			
GHI	5,472.3	5,424	0.308	0.136			
County Operations (AvPorts)	2,645.6	2,622	0.149	0.066			
Hangar F	14.1	14	0.001	0.000			
Jet Blue	157.6	156	0.009	0.004			
JP Morgan Chase	3.0	3	0.000	0.000			
Landmark	1265.0	1,254	0.072	0.032			
Million Air	250.2	248	0.014	0.006			
Net Jets	161.6	160	0.009	0.004			
Northwest	17.7	18	0.001	0.000			
Panorama	1126.6	1,116	0.064	0.028			
Pepsico-Interlaken	8.4	8	0.000	0.000			
Signature	872.1	864	0.049	0.022			
TOTAL	**13,753**	**13,630**	**0.78**	**0.34**			

Table 9b: Criteria Pollutant Emissions, GSE

Emission Source	Criteria Pollutants (metric tons)							
	CO	THC	NMHC	VOC	NO_x	SO_x	PM-10	PM-2.5
Air Tran	9.04	0.29	0.27	0.28	0.72	0.10	0.02	0.02
Altria	0.43	0.01	0.01	0.01	0.03	0.00	0.00	0.00
American Eagle	0.16	0.02	0.02	0.02	0.20	0.02	0.01	0.01
Avitat	73.92	1.93	1.76	1.83	4.62	0.89	0.24	0.23
Citigroup	2.87	0.09	0.08	0.08	0.13	0.03	0.00	0.00
GHI	276.53	8.19	7.43	7.73	21.65	4.82	0.74	0.71
County Operations (AvPorts)	71.29	2.27	2.06	2.13	4.67	0.83	0.16	0.16
Hangar F	0.86	0.02	0.02	0.02	0.04	0.01	0.00	0.00
Jet Blue	0.31	0.05	0.04	0.05	0.98	0.10	0.05	0.05
JP Morgan Chase	0.08	0.00	0.00	0.00	0.02	0.00	0.00	0.00
Landmark	8.34	0.50	0.48	0.51	4.22	0.27	0.34	0.33
Million Air	0.52	0.03	0.03	0.03	0.32	0.07	0.02	0.02
Net Jets	4.30	0.14	0.13	0.14	0.82	0.14	0.06	0.06
Northwest	2.23	0.07	0.06	0.06	0.09	0.02	0.00	0.00
Panorama	25.15	0.90	0.83	0.86	3.54	0.29	0.18	0.18
Pepsico-Interlaken	0.06	0.01	0.01	0.01	0.07	0.00	0.01	0.01
Signature	5.59	0.24	0.23	0.24	1.88	0.18	0.11	0.11
TOTAL	**481.68**	**14.77**	**13.45**	**14.00**	**43.99**	**7.78**	**1.95**	**1.88**

Verification of this Report

This report, the information it contains, and the data it is based upon have not been verified.

APPENDICES

Appendix A
GSE Source Exceptions

Fleet #	Equipment Number	Equipment Type	Manuf.	Model Number
4062	Auger	Auger (Post Hole)	Stihl	4308 - Typ. 50 U/Min
4299	Hedge Trimmer	Brush Cutter	RedMax/Komatsu Zenoah	BC3401 DL, 33.6cc
5401	Demo Saw	Demolition Saw (Hand)	Stihl	510
5413	Pipe Cleaner	Pipe Cleaner	General Pressure Snake (Honda Pipe Cleaner/Water Wash; Honda engine)	Honda GX340
5652	Broom 25	Snow Broom (blower)	Sweepster	22' plow
7461	Washer	Pressure Washer	Honda engine	Honda GX340
7461	Washer	Pressure Washer (Oil Burner)	Landa burner	2 gal diesel/hr rated at 336,000 BTUs
11044	Sweeper 1	Sweeper (Sidewalk)	Sweepster	
11144	Sweeper 2	Sweeper (Sidewalk)	Sweepster	
11244	Sweeper 3	Sweeper (Snow, walk-behind)	Sweepster / Briggs & Stratton	Intek I/C 206, OHV
17944	Grinder	Surface Grinder	Von Arx; Honda engine	Honda GX270
18644	Air Blower	Blower (Back Pack)	RedMax/Komatsu Zenoah	EB701
50144	Line Striper	Line Striper	Graco ; Honda engine	LineLazer IV ; Honda GX160
65444	Welder/Gen.	Welder / Generator	Miller / Kohler	Trailblazer 302 / CH20s
	Dewatering Pump	Pump	Multiquip / Hatz	MQ-410H / 1D81Z
	Lightstand 3	Lightstand	Niteworker	
	Lightstand 4	Lightstand	Niteworker	
	Sweeper 4	Sweeper	Sweepster	WSP36M
	Sweeper 5	Sweeper	Sweepster	WSP36M
3454	Blast 02	Snow Blower (blower)	Oskosh	H series
4056	Blast 10	Snow Blower (blower)	Oskosh	H series
5031	Forklift 43	Forklift	Yale	

Fleet #	Equipment Number	Equipment Type	Manuf.	Model Number
5190	Broom 22	Snow Broom (blower)	Sweepster	
5238	Broom 38	Snow broom (blower)	Sweepster	
43444	Blast 12	Snow Blast (blower)	Oskosh	
	Bus	Bus	Ford	Mini-Bus
	Bus 311	Bus	Ford	Mini-Bus
38844	Lightstand 2	Lightstand	Niteworker	Kubota - D905
	Runway X 1	Lighted X	Wanco	Lombardini 6LD
	Runway X 2	Lighted X	Wanco	
	Sweeper	Sweeper (Snow, walk-behind)	Sweepster	
	Bus 301	Bus	Ford	E-450 Super Duty
	127944	Truck	Ford	Power Stroke Turbo Diesel
337	102844	Shuttle Bus	Ford	
353	102944	Shuttle Bus	Ford	
	65385	Shuttle Bus	Ford	
7670	Gator 48	Gator	John Deere	
5236	Mower 33	Mower	Tiger	9030
7264	Mower 36	Mower	Howard Price	727
7428	Mower	Mower (Push)	John Deere	JS60 (274652 Family YBSXS, 1901VC)
48344	Mower 35	Mower	John Deere	1600 Turbo
48444	Mower 52	Mower	John Deere	1600 Turbo
83644	Mower 53	Mower	New Holland TM190 w/ Batwing Mower Deck	

Westchester County Airport (HPN)
Air Emissions Inventory
Equipment Logsheet

Instructions: Please complete by the Due Date marked below and return to the Airport Environmental Department. Enter data for the period from **JANUARY 1 - DECEMBER 31, 2007**. Thank you very much for your help in this important project, and please give Mike Parletta a call at **995 – 4858** if you have any questions.

Date Completed: _____ **Date Due:** _____ **Completed By:** _____

ELECTRICITY

Instructions: Complete the table below. If available, attach utility invoices for the period covering January 1 to December 31, 2007.

Provider and Electricity Account #	Electricity Quantity	Electricity Units	Source of Electricity Data

GENERATORS AND FIRE PUMPS

Instructions: If you have any generators or fire pumps, enter them in the following table. If the equipment is not equipped with either a meter or a fuel gauge, enter an estimate based on operation of the generator and make a check mark in the column labeled "Est." so that we know the figure is an estimate.

Equipment Type	Manufacturer and/or Model Number	Output Size (kW)	Tank Size (gallons)	Tank #	Fuel	Date Data Collected	Hour Meter	Total Starts	Fuel Level (gallons)	Fuel Usage (gallons)	Est.
											☐
											☐
											☐

BOILERS, FURNACES, AND HEATERS

Instructions: There are no boilers or furnaces on record for your company. If you have any boilers, furnaces, or other heaters, please enter them in the following table. If you do not have fuel invoices or records of fuel use (inventories at the beginning and end of the year and deliveries received), please, enter an estimate based on operating conditions and make a check mark in the column labeled "Est." so that we know the figure is an estimate. If you have any tanks associated with the heat sources, please include them in the table and reference which heat sources are fed by each tank.

Equipment Type	Manufacturer and/or Model No.	Size (Heat Input, i.e. MMBtu)	Tank Registra -tion Number	Tank # (Registra -tion)	Tank Capacity (gallons)	Fuel	Fuel Used Between 01/01/07 and 12/31/07	Source of Fuel Used Figure (e.g. Invoices, Inventories & Deliveries)	Est.
									☐
									☐

HVAC – Air Conditioner Systems

Instructions: Complete the table below. If you do not have HVAC maintenance records, enter an estimate and make a check mark in the column labeled "Est." so that we know the figure is an estimate. Only include central A/C units and A/C units larger than a typical room air conditioner.

Air Conditioning Unit	Manufacturer and/or Model No.	Refrigerant Type	Amount of Refrigerant Replaced	Units	Date Recharged	Source of Data	Est.
							☐
							☐
							☐

NON-WATER FIRE SUPPRESSION SYSTEMS

Instructions: Complete the table below. If you do not have maintenance records, enter an estimate and make a check mark in the column labeled "Est." so that we know the figure is an estimate.

Fire Suppression Unit	Manufacturer and/or Model No.	Chemical Type	Amount of Chemical Replaced	Units	Date Recharged	Source of Data	Est.
							☐
							☐
							☐

GROUND SUPPORT EQUIPMENT (GSE)

Instructions: Confirm that the equipment listed in the table below is still in use. If the equipment is no longer in use, indicate the date it was replaced or the date it was taken out of service.

Your ID #	Equipment Type	Engine and/or Equipment Manufacturer	Model Number	Date Engine Manuf.	Fuel	In Use?	Date Replaced	Date Out of Service
						☐		
						☐		
						☐		

Your ID #	Equipment Type	Engine and/or Equipment Manufacturer	Model Number	Date Engine Manuf.	Fuel	In Use?	Date Replaced	Date Out of Service

Instructions: Enter any additional equipment in the table provided below.

Your ID #	Equipment Type	Engine and/or Equipment Manufacturer	Model Number	Date Engine Manuf.	Fuel	Rated Power (Hp)	Rpm for given Hp

Are there any errors in the equipment list (ID#, type, etc.) above? If so, please describe:

_____

_____

Is there any other equipment *that you operate* that burns fuel?

_____

Comments:

Thank you for your help. Please return the completed form to the Airport Environmental Department by the deadline listed on the front of the page.

Appendix C
Sources per Building

Location	Tenant	Purchased Electricity Source	Fuel Type Furnace/Boiler/Source	Fuel Type Generator/Fire Pump/Source
24 Purchase St - Switchgear building	AvPorts Maintenance Department	Airport Account		
Air Traffic Control Tower Radar Facility 8 & 9 ILS Buildings 2 (Rwy 34) & 2(Rwy 16)	FAA	data not provided	No. 2 Fuel Oil Boiler/data not provided	data not provided
Airfield Blockhouse	N/A	N/A	N/A	Diesel Generator/hour meter readings from equipment
Airfield Blockhouse	FAA	data not provided		
Building 1A	Entergy Nuclear Northeast/Joint News Center	Airport Account	No. 2 Fuel Oil Boiler/fuel invoices and tank level readings	
Building 1B	CAP/CAN	Airport Account	No. 2 Fuel Oil/Furnace/fuel invoices and tank level readings	
Building 10	AvPorts Maintenance Department	Airport Account	No. 2 Fuel Oil Boiler/fuel invoices and tank level readings	
Building 10	N/A	N/A	N/A	Diesel Generator/hour meter readings from equipment
Building 11	Unknown	Airport Account	No. 2 Fuel Oil Boiler/fuel invoices and tank level readings	
Building 11	N/A	N/A	N/A	Diesel Generator/hour meter readings from equipment
Building 15	Rudy's Inflight Catering?	Airport Account		
Building 2	Cosgrove Aircraft Services	Airport Account	No. 2 Fuel Oil Boiler/fuel invoices and tank level readings	
Building 3	vacant	Airport Account		
Building 4	Seasafe Aero Services	Airport Account	No. 2 Fuel Oil Boiler/fuel invoices and tank level readings	
Building 5	AvPorts Maintenance Department	Airport Account	No. 2 Fuel Oil Boiler/fuel invoices and tank level readings	
Building 7	vacant warehouse, planning to demolish	N/A		
Building 9	vacant warehouse, planning to demolish	N/A		
Car Rental Facilities	Avis, Budget, Hertz, National	Tenant Account	data not provided	
Field Pumphouse	FAA	data not provided		

Appendix C
Sources per Building

Location	Tenant	Purchased Electricity Source	Fuel Type Furnace/Boiler/Source	Fuel Type Generator/Fire Pump/Source
Hangar 26	N/A	N/A	N/A	Diesel Generator/hour meter readings from equipment
Hangar 26	NetJets	Airport Account	No. 2 Fuel Oil Boiler/no data collected	
Hangar 6	NetJets	Airport Account	No. 2 Fuel Oil Boiler (x2)/tenant form	Diesel Generator/tenant form
Hangar A	N/A	N/A	N/A	Diesel Generator/fuel purchases and tank level readings
Hangar A, Hangar C-1, Hangar C-2, Hangar G	Signature	Tenant Account	No. 2 Fuel Oil Boiler/tenant form (invoices, inventories, deliveries)	N/A
Hangar D	AvPorts Maintenance Department	Airport Account	No. 2 Fuel Oil Boiler/fuel invoices and tank level readings	
Hangar D	N/A	N/A	N/A	Diesel Generator/fuel purchases and tank level readings
Hangar D Pumphouse	AvPorts Maintenance Department	Airport Account		
Hangar D Pumphouse	N/A	N/A	N/A	Diesel Generator/fuel purchases and tank level readings
Hangar D-1, Bay 1	JP Morgan Chase	Tenant Account	No. 2 Fuel Oil Furnace (x2)/No. 2 Fuel Oil Boiler\tenant form (deliveries)	Diesel Generator/tenant form
Hangar D-1, Bay 2	Landmark	Tenant Account	No. 2 Fuel Oil Furnace (x2)/No. 2 Fuel Oil Boiler\tenant form (invoices)	
Hangar D-2	Altria	Tenant Account	No. 2 Fuel Oil Furnaces (x4)/tenant form (invoices)	
Hangar D-3	Landmark	Tenant Account	No. 2 Fuel Oil Furnaces (x4)	
Hangar E	N/A	N/A	N/A	Diesel Generator/hour meter readings from equipment
Hangar E Pumphouse	N/A	N/A	N/A	Diesel Generator/hour meter readings from equipment

Appendix C
Sources per Building

Location	Tenant	Purchased Electricity Source	Fuel Type Furnace/Boiler/Source	Fuel Type Generator/Fire Pump/Source
Hangar E-1	Avitat	Tenant Account	No. 2 Fuel Oil Furnaces (x3)/No. 2 Fuel Oil Boiler/tenant forms (deliveries)	Diesel Generator/tenant form
Hangar E-2	Citigroup	Tenant Account	No. 2 Fuel Oil Furnaces (x2)/No. 2 Fuel Oil Boiler/tenant forms (deliveries)	Diesel Generator/tenant form
Hangar E-3	Avitat	Tenant Account	No. 2 Fuel Oil Furnaces (x4)/No. 2 Fuel Oil Boiler/tenant form (deliveries)	
Hangar F	International Paper (Hangar F)	Tenant Account	No. 2 Fuel Oil Boiler/tenant form (estimated by maintennace staff)	Diesel Generator/tenant form
Hangar G	Signature	Tenant Account	No. 2 Fuel Oil Furnaces (HG-1, HG-2, HG-3, HG-4)/tenant form (invoices, inventories, deliveries)	
Hangar M	Million Air	Tenant Account		N/A
Hangar T	Panorama	Tenant Account	Propane Furnaces (x4)/tenant forms	Gasoline Generator/tenant form
Hangar V	Interlaken/Pepsico	Tenant Account	No. 2 Fuel Oil Boilers (x2)/none provided	
Hangar W	IBM	Tenant Account	No. 2 Fuel Oil Boilers (x2)/tenant form (deliveries)	Diesel Fire Pump/tenant form
New Airfield Blockhouse	FAA	data not provided	none provided	none provided
New Terminal (incl. Main Terminal, GHI Building, ARFF Building)	AvPorts Maintenance Department	Airport Account	see GHI Building, Main Terminal	
GHI Building	GHI	Airport Account	No. 2 Fuel Oil Boiler/fuel invoices and tank level readings	
Main Terminal	AvPorts	Airport Account	No. 2 Fuel Oil Boilers (x2)/fuel invoices and tank level readings	
Terminal	N/A	N/A	N/A	Diesel Generator/hour meter readings from equipment
New ARFF	N/A	N/A	N/A	Diesel Generator/hour meter readings from equipment

Appendix C
Sources per Building

Location	Tenant	Purchased Electricity Source	Fuel Type Furnace/Boiler/Source	Fuel Type Generator/Fire Pump/Source
Old Blockhouse	N/A	N/A	N/A	Diesel Generator/hour meter readings from equipment
Parking garage and ticket office	AvPorts Maintenance Department	Airport Account	N/A	N/A
Ramp Lights	AvPorts Maintenance Department	Airport Account	N/A	N/A
Roundabout lighting	AvPorts Maintenance Department	Airport Account	N/A	N/A
Security No. 5 - Lincoln Ave	N/A	N/A	N/A	Diesel Generator/hour meter readings from equipment
Security No. 7 - ARFF	N/A	N/A	N/A	Diesel Generator/hour meter readings from equipment
Overflow Parking Lot	N/A	Airport Account	N/A	N/A
Lincoln Avenue Traffic Light	N/A	Airport Account	N/A	N/A

Appendix D1
GHG Calculation: Boilers and Furnaces

Building	Equipment Type	County Permitted Operator	Fuel Type	Fuel Used (gallons)	Fuel Usage (MMBtu)	CO_2 Emissions (m.t. CO_2)	CH_4 Emissions (m.t. CH_4)	N_2O Emissions (m.t. N_2O)	Total CO_2e (m.t. CO_2e)
Building 10	Boiler	Avports Maintenance Department	#2 Fuel Oil	14,119	1,958	143.31	0.0027414	0.0005875	143.55
Building 11	Boiler	Department of Transportation	#2 Fuel Oil	3,669	509	37.24	0.0007124	0.0001527	37.30
Building 1A	Boiler	Entergy Nuclear Northeast/Joint News Center.	#2 Fuel Oil	21,053	2,920	213.69	0.0040878	0.0008760	214.05
Building 1B	Furnace	(CAP/CAN)	#2 Fuel Oil	887	123	9.00	0.0001722	0.0000369	9.02
Building 2	Boiler	Avports Maintenance Department	#2 Fuel Oil	9,974	1,383	101.24	0.0019366	0.0004150	101.41
Building 3	Boiler	Department of Transportation	#2 Fuel Oil	683.00	95	6.93	0.0001326	0.0000284	6.94
Building 4	Boiler	Seasafe Aero Services	#2 Fuel Oil	3,274	454	33.23	0.0006357	0.0001362	33.29
Building 5	Boiler	Avports Maintenance Department	#2 Fuel Oil	1,642.00	228	16.67	0.0003188	0.0000683	16.69
GHI Building	Boiler	Ground Handling Inc.	#2 Fuel Oil	8,477	1,176	86.04	0.0016460	0.0003527	86.19
Hangar D	Boiler	Altria (Maintained by AvPorts)	#2 Fuel Oil	34,509	4,786	350.27	0.0067005	0.0014358	350.85
Hangar D	Boiler	AvPorts	#2 Fuel Oil	24,245	3,363	246.09	0.0047076	0.0010088	246.50
Main Terminal	Boiler #1	Avports Maintenance Department	#2 Fuel Oil						
Main Terminal	Boiler #2	Avports Maintenance Department	#2 Fuel Oil	33,974	4,712	344.84	0.0065966	0.0014136	345.41
Hangar 6	Boiler	Netjets - Executive Jet Management	#2 Fuel Oil						
Hangar 6	Boiler	Netjets - Executive Jet Management		39,551	5,485	401.44	0.0076795	0.0016456	402.11
Hangar A	Boiler (A-1)	Signature Flight Support	#2 Fuel Oil	12,905	1,790	130.98	0.0025056	0.0005369	131.20
Hangar C-1	Furnace (C1-D)	Signature Flight Support	#2 Fuel Oil	12,905	1,790	130.98	0.0025056	0.0005369	131.20

Appendix D1
GHG Calculation: Boilers and Furnaces

Building	Equipment Type	County Permitted Operator	Fuel Type	Fuel Used (gallons)	Fuel Usage (MMBtu)	CO_2 Emissions (m.t. CO_2)	CH_4 Emissions (m.t. CH_4)	N_2O Emissions (m.t. N_2O)	Total CO_2e (m.t. CO_2e)
Hangar C-2, Bay 1	Furnace (C2-A)	Signature Flight Support	#2 Fuel Oil						
Hangar C-2, Bay 2	Furnace (C2-B)	Signature Flight Support	#2 Fuel Oil						
Hangar C-2, Bay 3	Furnace (C2-C)	Signature Flight Support	#2 Fuel Oil	12,905	1,790	130.99	0.0025057	0.0005369	131.20
Hangar D-1 Bay 1	Furnace	JP Morgan/Chase	#2 Fuel Oil						
Hangar D-1 Bay 1	Furnace	JP Morgan/Chase	#2 Fuel Oil						
Hangar D-1 Bay 1	Furnace	JP Morgan/Chase	#2 Fuel Oil	18,080	2,508	183.51	0.0035105	0.0007523	183.82
Hangar D-1 Bay 2	Furnace	Landmark Aviation	#2 Fuel Oil						
Hangar D-1 Bay 2	Furnace	Landmark Aviation		41,100	5,700	417.17	0.0079803	0.0017101	417.86
Hangar D-2	Furnace	Altria Corporate Services	#2 Fuel Oil						
Hangar D-2	Furnace	Altria Corporate Services							
Hangar D-2	Furnace	Altria Corporate Services							
Hangar D-2	Furnace	Altria Corporate Services		25,100	3,481	254.77	0.0048736	0.0010443	255.19
Hangar E-1	Boiler	General Electric - Avitat is the Managing Agent - July 2004 - see Avitat	#2 Fuel Oil						
Hangar E-1	Furnace	General Electric - Avitat is the Managing Agent - July 2004 - see Avitat							
Hangar E-1	Furnace	General Electric - Avitat is the Managing Agent - July 2004 - see Avitat							
Hangar E-1	Furnace	General Electric - Avitat is the Managing Agent - July 2004 - see Avitat		45,000	6,241	456.75	0.0087375	0.0018723	457.51
Hangar E-2	Boiler	Citigroup Inc.	#2 Fuel Oil						
Hangar E-2	Furnace	Citigroup Inc.							
Hangar E-2	Furnace	Citigroup Inc.		8,450	1,172	85.77	0.0016407	0.0003516	85.91

Appendix D1
GHG Calculation: Boilers and Furnaces

Building	Equipment Type	County Permitted Operator	Fuel Type	Fuel Used (gallons)	Fuel Usage (MMBtu)	CO_2 Emissions (m.t. CO_2)	CH_4 Emissions (m.t. CH_4)	N_2O Emissions (m.t. N_2O)	Total CO_2e (m.t. CO_2e)
Hangar E-3	Boiler	Avitat Westchester	#2 Fuel Oil						
Hangar E-3	Furnace	Avitat Westchester							
Hangar E-3	Furnace	Avitat Westchester							
Hangar E-3	Furnace	Avitat Westchester							
Hangar E-3	Furnace	Avitat Westchester		38,000	5,270	385.70	0.0073783	0.0015811	386.35
Hangar F	Boiler	International Paper	#2 Fuel Oil	7,000	971	71.05	0.0013592	0.0002913	71.17
Hangar G (NE)	Furnace (HG-1)	Signature Flight Support	#2 Fuel Oil						
Hangar G (NW)	Furnace (HG-2)	Signature Flight Support	#2 Fuel Oil						
Hangar G (SE)	Furnace (HG-4)	Signature Flight Support	#2 Fuel Oil						
Hangar G (SW)	Furnace (HG-3)	Signature Flight Support	#2 Fuel Oil	38,714	5,369	392.95	0.0075169	0.0016108	393.60
Hangar M (T-Hangars)	Boiler	Million Air (formerly Westair)	Propane						
Hangar M (T-Hangars)	Boiler	Million Air (formerly Westair)							
Hangar M (T-Hangars)	Furnace	Million Air (formerly Westair)		12,200	1,111	70.03	0.0009997	0.0044431	71.43
Hangar M (T-Hangars)	Furnace - Manifold	Million Air (formerly Westair)	Propane						
Hangar M (T-Hangars)	Furnace - Manifold	Million Air (formerly Westair)		16,650	1,516	95.57	0.0013643	0.0060638	97.48
Hangar W	Boiler	IBM Corporation	#2 Fuel Oil						
Hangar W	Boiler	IBM Corporation	#2 Fuel Oil	27,641	3,834	280.56	0.0021223	0.0011501	280.96
		Panorama	Propane						
		Panorama	Propane						
		Panorama	Propane						
		Panorama	Propane	28,805	2,623	165.34	0.0023604	0.0104905	168.64
	TOTAL					**5242.08**	**0.0954285**	**0.0411293**	**5256.83**

CO2 Emission Factors			
#2 Fuel Oil =	10.15	kg CO2/gallon	Table 12.1, TCR GRP v1.1
propane =	5.74	kg CO2/gallon	Table 12.1, TCR GRP v1.1
CH4 Emission Factors			
#2 Fuel Oil =	1.4	g CH4/MMBtu	Table 12.8, TCR GRP, v1.1
propane =	0.9	g CH4/MMBtu	Table 12.8, TCR GRP, v1.1
N2O Emission Factors			
#2 Fuel Oil =	0.3	g N2O/MMBtu	Table 12.8, TCR GRP, v1.1
propane =	4	g N2O/MMBtu	Table 12.8, TCR GRP, v1.1
Conversion Factors			
1 kg =	0.001	m.t.	
1 g =	0.000001	m.t.	
1 barrel =	42	gallons	
# 2 Fuel Oil	0.14	MMBtu/gallon	Table 12.1, TCR GRP v1.1
Propane	0.09	MMBtu/gallon	Table 12.1, TCR GRP v1.1
Global Warming Potentials			
CO2	1		TCR GRP, v1.1, Appendix B
CH4	21		TCR GRP, v1.1, Appendix B
N2O	310		TCR GRP, v1.1, Appendix B

Appendix D2
Emergency Generator Fire Pump Greenhouse Gas Calculations

Tenant	Fuel	Fuel Usage	Fuel Usage units	Fuel Usage (MMBtu)	Average hours used in 2007	CO_2 Emissions (m.t. CO_2)	CH_4 Emissions (m.t. CH_4)	N_2O Emissions (m.t. N_2O)	Total CO_2e (m.t. CO_2e)
Net Jets	Diesel	17	gallons/hr	146.18	62	10.70	0.0016	0.0001	10.76
Avitat	Diesel				40				
JP Morgan	Diesel	15	gallons	2.08	60	0.15	0.0000	0.0000	0.15
Citigroup	Diesel				60				
Panorama	Gasoline	130	gallons	16.15	60	1.15	0.0002	0.0000	1.15
IBM	Diesel	140	gallons	19.42	60	1.42	0.0002	0.0000	1.43
IBM	Diesel	140	gallons	19.42	50	1.42	0.0002	0.0000	1.43
Hangar F	Diesel	20	gallons	2.77		0.20	0.0000	0.0000	0.20
TOTAL						**15.04**	**0.0023**	**0.0001**	**15.13**

Emission Factors

CO_2

diesel	10.15	kg CO2/gallon	Table 12.1, TCR GRP, V1.1
gasoline	8.81	kg CO2/gallon	Table 12.1, TCR GRP, V1.1

CH_4

diesel	11	g CH4/MMBtu	Table 12.9, TCR GRP, v.11, Petroleum Products, Commercial
gasoline	11	g CH4/MMBtu	Table 12.9, TCR GRP, v.11, Petroleum Products, Commercial

N_2O

diesel	0.6	g N2O/MMBtu	Table 12.9, TCR GRP, v.11, Petroleum Products, Commercial
gasoline	0.6	g N2O/MMBtu	Table 12.9, TCR GRP, v.11, Petroleum Products, Commercial

Conversion Factors:

1 kg =	0.001	m.t.	
1 barrel =	42	gallons	TCR GRP v1.1, Appendix C, standard conversion factors
gasoline	0.124238	MMBtu/gallon	TCR GRP v1.1, Table 12.1
diesel	0.13869	MMBtu/gallon	TCR GRP v1.1, Table 12.1

Global Warming Potentials

CO_2	1
CH_4	21
N_2O	310

Appendix D3
GHG Calculations: AvPorts Emergency Generators

Location	Fuel	Fuel Usage (gallons)	Fuel Usage (MMBtu)	CO_2 Emissions (m.t. CO_2)	CH_4 Emissions (m.t. CH_4)	N_2O Emissions (m.t. N_2O)	Total CO_2e (m.t. CO_2e)	NOx (lbs)	CO (lbs)	SOx (lbs)	NOx Fuel Usage (gallons)	CO Fuel Usage (gallons)	SOx Fuel Usage (gallons)
Terminal	Diesel	116.55	16.16	1.18	0.0002	0.0000	1.19	70.93	15.35	4.71	115.97	116.51	117.15
Airfield Blockhouse	Diesel	16.65	2.31	0.17	0.0000	0.0000	0.17	10.13	2.19	0.67	16.57	16.64	16.73
Building 10	Diesel	1882.38	261.07	19.11	0.0029	0.0002	19.22	1145.64	247.95	76.10	1873.10	1881.87	1892.16
Hangar D Pumphouse	Diesel	40.77	5.65	0.41	0.0001	0.0000	0.42	24.82	5.37	1.65	40.57	40.76	40.97
Hangar E Pumphouse	Diesel	0.00	0.00	0.00	0.0000	0.0000	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Security # 1 Building 11	Diesel	23.84	3.31	0.24	0.0000	0.0000	0.24	14.51	3.14	0.96	23.72	23.83	23.97
Security # 2 Hangar 26	Diesel	0.00	0.00	0.00	0.0000	0.0000	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Security # 3 Hangar D	Diesel	27.41	3.80	0.28	0.0000	0.0000	0.28	16.68	3.61	1.11	27.27	27.41	27.55
Security # 4 Hangar A	Diesel	5.96	0.83	0.06	0.0000	0.0000	0.06	3.63	0.79	0.24	5.93	5.96	5.99
Security # 5 Lincoln Ave	Diesel	484.18	67.15	4.91	0.0007	0.0000	4.94	294.68	63.78	19.58	481.80	484.05	486.70
Security # 6 Hangar E	Diesel	4.77	0.66	0.05	0.0000	0.0000	0.05	2.90	0.63	0.19	4.74	4.77	4.80
Security # 7 ARFF	Diesel	not included in inventory because site maintenance staff reported unit had been removed and that it was not operating						N/A	N/A	N/A	N/A	N/A	N/A
New ARFF	Diesel	303.76	42.13	3.08	0.0005	0.0000	3.10	184.87	40.01	12.28	302.27	303.68	305.34
Old Blockhouse	Diesel	0.00	0.00	0.00	0.0000	0.0000	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL				**29.50**	**0.0044**	**0.0002**	**29.67**						

Fuel Consumption Factors:

NOx	4.41	lb NOx/MMBtu fuel	AP-42, Fifth Edition, Volume I, Chapter 3, Table 3.3-1
CO	0.95	lb CO/MMBtu fuel	AP-42, Fifth Edition, Volume I, Chapter 3, Table 3.3-1
SOx	0.29	lb SOx/MMBtu fuel	AP-42, Fifth Edition, Volume I, Chapter 3, Table 3.3-1

Conversion Factors:

1 kg =	0.001	m.t.	
1 barrel =	42	gallons	TCR GRP v1.1, Appendix C, standard conversion factors
diesel	0.13869	MMBtu/gallon	TCR GRP v1.1, Table 12.1

Emission Factors (Diesel)

CO_2	10.15	kg CO2/gallon	Table 12.1, TCR GRP, V1.1
CH_4	11	g CH4/MMBtu	Table 12.9, TCR GRP, v.11, Petroleum Products, Commercial
N_2O	0.6	g N2O/MMBtu	Table 12.9, TCR GRP, v.11, Petroleum Products, Commercial

Global Warming Potentials

CO_2	1
CH_4	21
N_2O	310

Date	Time	Operator (Tail #)	Plane Model	Duration (min)	% Power	Initials	Engine	Fuel Flow (kg/s)	Fuel Type	Fuel Density (kg/gal)	Fuel Consumption (gallons)	CO_2 Emissions (metric tonnes CO_2)	CH4 Emissions (metric tonnes CH4)	N2O Emissions (metric tonnes N2O)
8/19/07	704	American Eagle	Embrear 35	30	100	MK	AE3007A1/3 Type 3 (reduced emissions)	0.3589	Jet A	3.056719	211.34	2.02	0.00	0.00
8/21	730	American Eagle	Embrear 35	30	100	MK	AE3007A1/3 Type 3 (reduced emissions)	0.3589	Jet A	3.056719	211.34	2.02	0.00	0.00
11/27/07	1840	Net Jets	971QS	10	100	CA	AE3007C SER	0.301	Jet A	3.056719	59.08	0.57	0.00	0.00
11/28	1030	Net Jets	971QS	10	100	RR	AE3007C SER	0.301	Jet A	3.056719	59.08	0.57	0.00	0.00
10/26	1100	906QS Net Jets	Citation X	30	100	VS	AE3007C Type 2	0.301	Jet A	3.056719	177.25	1.70	0.00	0.00
11/30	1015	Greenhill Aviation	22RG	10	100	DS	AE3007C Type 2	0.301	Jet A	3.056719	59.08	0.57	0.00	0.00
10/26	945	N906QS Net Jets	Citation X	20	85	DS	AE3007C Type 2	0.2527	Jet A	3.056719	99.20	0.95	0.00	0.00
8/29/07	1130	N932QS NetJets	Citation X	15	100	FS	AE3007C Type 2	0.301	Jet A	3.056719	88.62	0.85	0.00	0.00
10/24	1915	Net Jets	906QS Citation X	20	100	TB	AE3007C Type 2	0.301	Jet A	3.056719	118.17	1.13	0.00	0.00
10/12	2045	Net Jets	948QS Citation 10	10	100	TB	AE3007C Type 2	0.301	Jet A	3.056719	59.08	0.57	0.00	0.00
11/7/07	1100	Net Jets	Citation 10	3	100	VS	AE3007C Type 2	0.301	Jet A	3.056719	17.72	0.17	0.00	0.00
12/07		Net Jets	N725D/Citation X	10	100	MS	AE3007C Type 2	0.301	Jet A	3.056719	59.08	0.57	0.00	0.00
7/17/07	12:00	NetJets	913QS Citation X	10	100	AO	AE3007C Type 2	0.301	Jet A	3.056719	59.08	0.57	0.00	0.00
6/4/07	1500	NetJets 929QS	Cessna 750	15	100	FO	AE3007C Type 2	0.301	Jet A	3.056719	88.62	0.85	0.00	0.00
5/27/07	1800	NetJets 966QS	Citation X	20	100	FS	AE3007C Type 2	0.301	Jet A	3.056719	118.17	1.13	0.00	0.00
8/26/07	1440	Auidat 223MD	G-V	20	100	MK	BR 700 SERIES	0.707	Jet A	3.056719	277.55	2.66	0.00	0.00
8/9/07	1210	HGRW-IBM Corp	780E/Golfstream V	40	100	CC	BR700-710A1-10	0.707	Jet A	3.056719	555.10	5.31	0.00	0.00
8/23/07	930	JP Morgan	G-5	15	100	FS	BR700-710A1-10	0.707	Jet A	3.056719	208.16	1.99	0.00	0.00
8/24/07	1030	JP Morgan	GV 605CH	20	100	AO	BR700-710A1-10	0.707	Jet A	3.056719	277.55	2.66	0.00	0.00
		W	780E/Gulfstream V	40	100	MG	BR700-710A1-10	0.707	Jet A	3.056719	555.10	5.31	0.00	0.00
8/28	1715	607PM	G5	5	100	RR	BR700-710C411	0.747	Jet A	3.056719	73.31	0.70	0.00	0.00
10/17	1827	Net Jets	1881Q Falcon 20	20	100	MA	CF700-2D	0.3285	Jet A	3.056719	128.96	1.23	0.00	0.00
9/21/07	1511	3888D	Cessna180	5	100	JW	IO-360-B	0.01298	AvGas	2.611934	1.49	0.01	0.00	0.00
8/10	336CS	Citation Shares	Citation II	20	100	TB	JT15D-4 series	0.1697	Jet A	3.056719	66.62	0.64	0.00	0.00
8/10	336CS		Citation II	20	100	TB	JT15D-4 series	0.1697	Jet A	3.056719	66.62	0.64	0.00	0.00
9/15/07	1200	100QS	Beech 400A	15	100	SL	JT15D-5, -5A, -5B	0.2054	Jet A	3.056719	60.48	0.58	0.00	0.00
9/15/07	1030	108QS	Beechcraft 400A	10	100	RR	JT15D-5, -5A, -5B	0.2054	Jet A	3.056719	40.32	0.39	0.00	0.00
3/31	1926	353QS	560	25	100	JS	JT15D-5, -5A, -5B	0.2054	Jet A	3.056719	100.79	0.96	0.00	0.00
5/24/07	1000	391QS	Citation	30	100	MS	JT15D-5, -5A, -5B	0.2054	Jet A	3.056719	120.95	1.16	0.00	0.00
4/10/07	1345	507CS	C560XL	30	100	VS	JT15D-5, -5A, -5B	0.2054	Jet A	3.056719	120.95	1.16	0.00	0.00
4/8/07	1650	507CS	C560XL	45	100	SK	JT15D-5, -5A, -5B	0.2054	Jet A	3.056719	181.43	1.74	0.00	0.00
4/8/07	1804	507CS	C560XL	60	100	SK	JT15D-5, -5A, -5B	0.2054	Jet A	3.056719	241.91	2.32	0.00	0.00
4/9/07	1500	507CS	C560XL	45	100	VS	JT15D-5, -5A, -5B	0.2054	Jet A	3.056719	181.43	1.74	0.00	0.00
3/23	1850	546CS	560XL	15	100	MG	JT15D-5, -5A, -5B	0.2054	Jet A	3.056719	60.48	0.58	0.00	0.00
3/25	1100	546CS	560XL	20	100	JN	JT15D-5, -5A, -5B	0.2054	Jet A	3.056719	80.64	0.77	0.00	0.00
9/1	1832	668QS	560XL	10	100	AP	JT15D-5, -5A, -5B	0.2054	Jet A	3.056719	40.32	0.39	0.00	0.00
8/7/07	1000	Citation Shores	Cessna 560	10	100	TB	JT15D-5, -5A, -5B	0.2054	Jet A	3.056719	40.32	0.39	0.00	0.00

Date	Time	Operator (Tail #)	Plane Model	Duration (min)	% Power	Initials	Engine	Fuel Flow (kg/s)	Fuel Type	Fuel Density (kg/gal)	Fuel Consumption (gallons)	CO_2 Emissions (metric tonnes CO_2)	CH4 Emissions (metric tonnes CH4)	N2O Emissions (metric tonnes N2O)
10/12	1006	Net Jet	324QS Citation	6	100		JT15D-5, -5A, -5B	0.2054	Jet A	3.056719	24.19	0.23	0.00	0.00
12/15	1915	Net Jets	366 QS Citation Ultra	10	85	DW	JT15D-5, -5A, -5B	0.1727	Jet A	3.056719	33.90	0.32	0.00	0.00
11/24/07	1245	Net Jets	592QS Excel	10	100	DS	JT15D-5, -5A, -5B	0.2054	Jet A	3.056719	40.32	0.39	0.00	0.00
8/10	1445	Panorama	Citation XL	20	100	TW	JT15D-5, -5A, -5B	0.2054	Jet A	3.056719	80.64	0.77	0.00	0.00
9/20/07	1436	900RG	Caravan	8	100	LL	PT6A SER	0.089	Jet A	3.056719	13.98	0.13	0.00	0.00
10/26	847	Colgan Airlines	Beachcraft 1900	18	100	KO	PT6A-65B	0.089	Jet A	3.056719	31.45	0.30	0.00	0.00
10/26	805	Colgan Airlines	Beechcraft 1900	10	100	KO	PT6A-65B	0.089	Jet A	3.056719	17.47	0.17	0.00	0.00
8/07	625	NetJets Colgan	1900 171CV	5	100	MK	PT6A-67D	0.089	Jet A	3.056719	8.73	0.08	0.00	0.00
12/13	2015	Piedmont Airlines	908HA Dash 8	5	100	BO	PW123	0.1486	Jet A	3.056719	14.58	0.14	0.00	0.00
9/1	1031	790L	Falcon 2000	15	100	AP	PW308C Annular	0.3669	Jet A	3.056719	108.03	1.03	0.00	0.00
12/03	930	IBM	790M/Falcon 2000	15	100	TB	PW308C Annular	0.3669	Jet A	3.056719	108.03	1.03	0.00	0.00
5/30/07	1850	IBM 790m	Falcon2000 "Fpav"	15	100	CC	PW308C Annular	0.3669	Jet A	3.056719	108.03	1.03	0.00	0.00
11/16/07	1100	N/A (independent)	Falcon 2000	2	100	BO	PW308C Annular	0.3669	Jet A	3.056719	14.40	0.14	0.00	0.00
8/25/07	1224	NetJets	Cessna 680	20	100	TW	PW308C Annular	0.3669	Jet A	3.056719	144.04	1.38	0.00	0.00
10/12	1136		203WB Falcon 2000	7	100	KO	PW308C Annular	0.3669	Jet A	3.056719	50.41	0.48	0.00	0.00
8/12		Panorama	336CS Citation Bravo	30	30	CC	PW530A	0.0642	Jet A	3.056719	37.81	0.36	0.00	0.00
10/30		Net Jets	575QS	30	100	DS	PW545B	0.1785	Jet A	3.056719	105.11	1.01	0.00	0.00
3/29	1515	17KJ	G-2	15	100	MT	SPEY Mk511 Transply IIH	0.891	Jet A	3.056719	262.34	2.51	0.00	0.00
8/9	1440	600AR	N6	5	100	AO	TAY 611SER	0.741	Jet A	3.056719	72.73	0.70	0.00	0.00
5/10/07	1136	608PM	G4	10	900	SC	TAY 611SER	0.741	Jet A	3.056719	145.45	1.39	0.00	0.00
7/27/07	1514	N326JD	GIV	20	100	AP	TAY 611SER	0.741	Jet A	3.056719	290.90	2.78	0.00	0.00
6/9	1700	NetJets 460 QS	G4	10	100	TB	TAY 611SER	0.741	Jet A	3.056719	145.45	1.39	0.00	0.00
5/18/07	835	N531RA	Learjet 31A	20	100	SK	TFE 731-2B	0.225	Jet A	3.056719	88.33	0.85	0.00	0.00
5/21/07	1430	717MT	Hawker 800	30	100	TB	TFE731 SER	0.225	Jet A	3.056719	132.49	1.27	0.00	0.00
8/6/07	2100	Newman Racing 499NH	Sabre Jet	24	100	MS	TFE731 SER	0.225	Jet A	3.056719	106.00	1.01	0.00	0.00
8/1/07	1606	221BR	Dassault/SudFan Jet F-20	15	100	VS	TFE731-3	0.225	Jet A	3.056719	66.25	0.63	0.00	0.00
5/3/07	1330	908JB	Falcon	13	100	JS	TFE731-3	0.225	Jet A	3.056719	57.41	0.55	0.00	0.00
4/30/07	70935	908JB	Falcon 900	20	100	NV	TFE731-3	0.225	Jet A	3.056719	88.33	0.85	0.00	0.00
8/11	1330	American Eagle	EGF44IT/813AE	30	100	CC	TFE731-3	0.225	Jet A	3.056719	132.49	1.27	0.00	0.00
11/29	1141	Beauty Central Inc.	349H/FA-900	10	100	KO	TFE731-3	0.225	Jet A	3.056719	44.16	0.42	0.00	0.00
8/17/07	1042	CitiGroup	Falcon 900	30	100	SW	TFE731-3	0.225	Jet A	3.056719	132.49	1.27	0.00	0.00
5/24/07		CitiGroup 388GS	Falcon	60	100	MS	TFE731-3	0.225	Jet A	3.056719	264.99	2.54	0.00	0.00
11/19/07	1117	Hor F	349 H (HgRF)	15	100	VS	TFE731-3	0.225	Jet A	3.056719	66.25	0.63	0.00	0.00

Date	Time	Operator (Tail #)	Plane Model	Duration (min)	% Power	Initials	Engine	Fuel Flow (kg/s)	Fuel Type	Fuel Density (kg/gal)	Fuel Consumption (gallons)	CO_2 Emissions (metric tonnes CO_2)	CH4 Emissions (metric tonnes CH4)	N2O Emissions (metric tonnes N2O)
6/10	926	Intelacon Aviation 50 HC	Falcon 50	32	100	FO	TFE731-3	0.225	Jet A	3.056719	141.33	1.35	0.00	0.00
8/13	400	Interlaken	50HC Falcon 50	25	100	VS	TFE731-3	0.225	Jet A	3.056719	110.41	1.06	0.00	0.00
8/15/07	1330	Interlaken	Falcon 50	10	100	TW	TFE731-3	0.225	Jet A	3.056719	44.16	0.42	0.00	0.00
5/21/07	2000	N50HC	Falcon 50	15	100	JBW	TFE731-3	0.225	Jet A	3.056719	66.25	0.63	0.00	0.00
8/15/07	1720	PepsiCo	Falcon 50	20	100	VS	TFE731-3	0.225	Jet A	3.056719	88.33	0.85	0.00	0.00
8/13	1000	PepsiCo	Falcon 50 503PC	60	100	VS	TFE731-3	0.225	Jet A	3.056719	264.99	2.54	0.00	0.00
4/21/07	2053	432FX	Lear45	30	100	MG	TFE-731-SER	0.225	Jet A	3.056719	132.49	1.27	0.00	0.00
3/26	1300	826CA	LEAR45	15	100	JN	TFE-731-SER	0.225	Jet A	3.056719	66.25	0.63	0.00	0.00
10/16	1325	Flight Options	831LX Hawker	60	100	LS	TFE-731-SER	0.225	Jet A	3.056719	264.99	2.54	0.00	0.00
8/11	1800	Panorama	686AB	30	100	CC	TFE-731-SER	0.225	Jet A	3.056719	132.49	1.27	0.00	0.00
10/16	1130		831LX Hawker	5	100	KO	TFE-731-SER	0.225	Jet A	3.056719	22.08	0.21	0.00	0.00
Total												**89.35**	**0.00253**	**0.00289**

Emission Factors			**References**
Jet A Fuel	9.57	kg CO_2/gal	TCR GRP, v1.1, Table 13.1
Aviation Gasoline	8.32	kg CO_2/gal	TCR GRP, v1.1, Table 13.1
Jet A Fuel	0.27	g CH4/gal	TCR GRP, v1.1, Table 13.6
Aviation Gasoline	7.04	g CH4/gal	TCR GRP, v1.1, Table 13.6
Jet A Fuel	0.31	g N2O/gal	TCR GRP, v1.1, Table 13.6
Aviation Gasoline	0.11	g N2O/gal	TCR GRP, v1.1, Table 13.6

Conversion Factors

density of Jet A fuel =	807.5	kg/m^3	from IPCC "Aviation and Global Atmosphere", Table 7-9
	6.738905	lb/gal	average, ASTM D1655 Jet A density = 775 to 840 kg/m^3
	3.056719	kg/gallon	
m^3 =	264.1721	gallons	
1 kg =	2.20462	lbs	
1 kg =	0.001	metric tons	

density of 100LL AvGas =	715	kg/m^3	from Air BP Handbook of Products, 2000
	5.966956	lb/gal	
	2.706569	kg/gallon	
m^3 =	264.1721	gallons	
1 kg =	2.20462	lbs	
1 kg =	0.001	metric tons	

	690	kg/m^3	from Air BP Handbook of Products, 2000
density of 80 AvGas =	5.758321	lb/gal	
	2.611934	kg/gallon	
m^3 =	264.1721	gallons	
1 kg =	2.20462	lbs	
1 kg =	0.001	metric tons	

1 kg = 1000 grams

Engine Type	Power Setting	CO Emission Index (g/kg)	HC Emission Index (g/kg)	NOx Emission Index (g/kg)	SOx Emission Index (g/kg)	Fuel Flow (kg/s)	Time (min)	Number of Test Cycles	Total CO (m.t.)	Total HC (m.t.)	Total NOx (m.t.)	Total SOx (m.t.)
	70%	0.50	0.00	14.00	1.36	0.21	10.00	1	0.0001	0.0000	0.0018	0.0002
AE3007C Type 2	90%	0.00	0.00	18.00	1.36	0.27	58.00	1	0.0000	0.0000	0.0169	0.0013
	70%	12.00	4.50	8.50	1.36	0.14	15.00	1	0.0015	0.0006	0.0011	0.0002
JT15D - 5 Series	75%	7.50	3.00	9.00	1.36	0.15	10.00	1	0.0007	0.0003	0.0008	0.0001
SPEY Mk511	80%	4.00	3.00	18.00	1.36	0.14	15.00	1	0.0005	0.0004	0.0023	0.0002
TFE 731	90%	1.70	0.00	17.00	1.36	0.14	7.00	1	0.0001	0.0000	0.0010	0.0001
TFE-731-2-2B	90%	2.00	0.00	13.90	1.36	0.14	24.00	1	0.0004	0.0000	0.0028	0.0003
TFE-731-3	90%	1.90	0.00	17.00	1.36	0.14	20.00	1	0.0003	0.0000	0.0029	0.0002
Total									**0.0036**	**0.0012**	**0.0295**	**0.0025**

Engine Type	Power Setting	Fuel Flow (kg/s)	Time (min)	Number of Test Cycles	Total Fuel Consumption (gal)	Total CO_2 (metric tons CO2)	Total CH4 (metric tons CH4)	Total N2O (metric tons N2O)
	70%	0.21	10.00	1	41.22	0.39	0.000011	0.000013
AE3007C Type 2	90%	0.27	58.00	1	307.39	2.94	0.000083	0.000095
	70%	0.14	15.00	1	41.22	0.39	0.000011	0.000013
JT15D - 5 Series	75%	0.15	10.00	1	29.44	0.28	0.000008	0.000009
SPEY Mk511	80%	0.69	15.00	1	203.16	1.94	0.000055	0.000063
TFE 731	90%	0.20	7.00	1	27.48	0.26	0.000007	0.000009
TFE-731-2-2B	90%	0.19	24.00	1	89.51	0.86	0.000024	0.000028
TFE-731-3	90%	0.20	20.00	1	78.52	0.75	0.000021	0.000024
					Total	**7.83**	**0.000221**	**0.000254**

Emission Factors for Jet A Fuel	**References**
9.57 kg CO_2/gal	TCR GRP, v1.1, Table 13.1
0.27 g CH4/gal	TCR GRP, v1.1, Table 13.6
0.31 g N2O/gal	TCR GRP, v1.1, Table 13.6

Conversion Factors

density of Jet A fuel =	807.5 kg/m^3	from IPCC "Aviation and Global Atmosphere", Table 7-9
	6.73890487 lb/gal	average, ASTM D1655 Jet A density = 775 to 840 kg/m^3
	3.05671946 kg/gallon	
m^3 =	264.1721 gallons	
1 kg =	2.20462 lbs	
1 kg =	0.001 metric tons	
1 kg =	1000 grams	

APU Type in EDMS	# LTOs	Corresponding APU Type from Table 5-9	Fuel Flow (lb/min)	Fuel Flow (gal/min)	Fuel Consumption (gallons)	Total CO_2 (m.t. CO_2)	Total CH4 (m.t. CH4)	Total N2O (m.t. N2O)
APU GTCP 85 (200 HP)	4228	APU GTC85-72 (200HP)	3.50	0.52	57,093.55	546.39	0.015	0.02
APU GTCP331-200ER (143 HP)	49	APU GTC85-72 (200HP)	3.50	0.52	661.68	6.33	0.000	0.00
APU GTCP331-500 (143 HP)	5	APU GTC85-72 (200HP)	3.50	0.52	67.52	0.65	0.000	0.00
APU GTCP85-129 (200 HP)	71	APU GTC85-72 (200HP)	3.50	0.52	958.76	9.18	0.000	0.00
APU GTCP85-98 (200 HP)	128	APU GTC85-72 (200HP)	3.50	0.52	1,728.47	16.54	0.000	0.00
APU TSCP700-4B (142 HP)	4	APU GTC85-72 (200HP)	3.50	0.52	54.01	0.52	0.000	0.00
APU GTCP 331-350	2	APU GTCP100-54 (400 HP)	6.88	1.02	53.09	0.51	0.000	0.00
APU GTCP 36-300 (80HP)	1128	APU GTCP95-2 (300 HP)	4.88	0.72	21,237.97	203.25	0.006	0.01
APU GTCP 660 (300 HP)	2	APU GTCP95-2 (300 HP)	4.88	0.72	37.66	0.36	0.000	0.00
APU GTCP 36-100	13931	APU T-62T-27 (100 HP)	1.70	0.25	91,372.44	874.43	0.025	0.03
APU GTCP 36-150[]	11955	APU T-62T-27 (100 HP)	1.70	0.25	78,412.00	750.40	0.021	0.02
APU GTCP 36-150[RR]	824	APU T-62T-27 (100 HP)	1.70	0.25	5,404.56	51.72	0.001	0.00
APU 131-9	136	APU WR27-1	2.33	0.35	1,222.58	11.70	0.000	0.00
APU GTCP 36 (80HP)	1470	APU WR27-1	2.33	0.35	13,214.70	126.46	0.004	0.00
APU GTCP 36-4A	4	APU WR27-1	2.33	0.35	35.96	0.34	0.000	0.00
TOTAL						**2,598.78**	**0.073**	**0.08**

Emission Factors for Jet Fuel **References**

9.57	kg CO_2/gallon	TCR GRP, v1.1, Table 13.1
0.27	g CH4/gallon	TCR GRP, v1.1, Table 13.6
0.31	g N2O/gallon	TCR GRP, v1.1, Table 13.6

Conversions

1000	grams per kilogram
1000	kilograms per metric tonne

Notes:

1) Assumed APUs run a total of 26 minutes (default value in EDMS).

Annual Consumption (gallons)	Annual Consumption (MMBtu)	Total CO_2 Emissions (m.t. CO_2)	Total CH_4 Emissions (m.t. CH_4)	Total N_2O Emissions (m.t. N_2O)
3,000	273	17.22	0.00300	0.00016

Emission Factors:

Propane CO2 =	5.74	kg CO2/gallon	Table 12.1, TCR GRP, v1.1
Propane CH4 =	11	g CH4/MMBtu	Table 12.9, TCR GRP, v.11, Petroleum Products, Commercial
Propane N2O =	0.6	g N2O/MMBtu	Table 12.9, TCR GRP, v.11, Petroleum Products, Commercial

Conversion Factors:

Propane	3.824	MMBtu/Barrel	Table 12.1, TCR GRP v1.1
1 barrel =	42	gallons	TCR GRP v1.1, Appendix C, standard conversion factors
	0.091047619	MMBtu/gallon	

Notes:
1. Annual consumption is estimated by airport personnel, assuming 250 gallons of propane used for each training fire, which occurs once every month of the year

Appendix D8
GHG Calculations: Aircraft

Trial	Description	Mixing Height (ft)	Total Fuel Consumption (kg Jet A)	Total Fuel Consumption (kg AvGas)	Total Fuel Consumption (gallons Jet A)	Total Fuel Consumption (gallons AvGas)	CO2 Emissions (m.t. CO_2)	CH4 Emissions (m.t. CH4)	N2O Emissions (m.t. N2O)
1	Total GHG Emissions	10,000	23,097,305.82	122,423.59	7,556,239.98	45,232.02	72,689.55	2.36	2.35
1	Total GHG Emissions	3,000	15,000,140.03	50,557.37	4,907,267.48	18,679.50	47,117.96	1.46	1.52
3a	Commercial Aircraft	10,000	7,645,401.05	-	2,501,178.51	-	23,936.28	0.68	0.78
3a	Commercial Aircraft	3,000	4,912,269.21	-	1,607,039.60	-	15,379.37	0.43	0.50
3b	Private Aircraft	10,000	15,451,904.77	122,423.59	5,055,061.46	45,232.02	48,753.27	1.68	1.57
3b	Private Aircraft	3,000	10,087,870.82	50,557.37	3,300,227.89	18,679.50	31,738.59	1.02	1.03
5	EDMS default taxi time	10,000	27,684,919.75	130,505.44	9,057,069.21	48,218.04	87,077.33	2.78	2.81
5	EDMS default taxi time	3,000	19,515,887.74	58,639.22	6,384,585.82	21,665.52	61,280.74	1.88	1.98

Emission Factors

				References
CO2	Jet A Fuel	9.57	kg CO_2/gallon	TCR GRP, v1.1, Table 13.1
CO2	Aviation Gasoline	8.32	kg CO_2/gallon	TCR GRP, v1.1, Table 13.1
CH4	Jet A Fuel	0.27	g CH4 / gallon	TCR GRP, v1.1, Table 13.6
CH4	Aviation Gasoline	7.04	g CH4 / gallon	TCR GRP, v1.1, Table 13.6
N2O	Jet A Fuel	0.31	g N2O / gallon	TCR GRP, v1.1, Table 13.6
N2O	Aviation Gasoline	0.11	g N2O / gallon	TCR GRP, v1.1, Table 13.6

Conversion Factors

Jet A fuel =	807.5	kg/m^3	from IPCC "Aviation and Global Atmosphere", Table 7-9
	6.74	lb/gal	average, ASTM D1655 Jet A density = 775 to 840 kg/m^3
	3.06	kg/gallon	
m^3 =	264.17	gallons	
1 kg =	2.20	lbs	
1 kg =	0.001	metric tons	

100LL AvGas =	715	kg/m^3	from Air BP Handbook of Products, 2000
	5.97	lb/gal	
	2.71	kg/gallon	
m^3 =	264.17	gallons	
1 kg =	2.20	lbs	
1 kg =	0.001	metric tons	
1 g =	0.000001	metric tons	

Note: It is stated in the Air BP Handbook of Products that the 100LL grade of AvGas is used most frequently, so it is assumed that all aircraft using AvGas are using 100LL.

Total GHG Emissions	Total Fuel Consumption (gal):	Total CO_2 emissions (m.t. CO_2)	Total CH_4 emissions (m.t. CH_4)	Total N_2O emissions (m.t. N_2O)
Diesel	611,160.57	6,203.28	0.35	0.16
Gasoline	842,999.18	7,426.82	0.42	0.19
TOTAL		**13,630.10**	**0.78**	**0.34**

EDMS Default GSE	Total Fuel Consumption (gal):	Total CO_2 emissions (m.t. CO_2)	Total CH_4 emissions (m.t. CH_4)	Total N_2O emissions (m.t. N_2O)
Diesel	239,905.07	2,435.04	0.14	0.06
Gasoline	299,634.58	2,639.78	0.15	0.07
TOTAL		**5,074.82**	**0.29**	**0.13**

Primary GSE	Total Fuel Consumption (gal):	Total CO_2 emissions (m.t. CO_2)	Total CH_4 emissions (m.t. CH_4)	Total N_2O emissions (m.t. N_2O)
Diesel	494,349.97	5,017.65	0.13	0.29
Gasoline	561,674.75	4,948.35	0.12	0.28
TOTAL		**9,966.01**	**0.25**	**0.57**

Trial 6 - Tenant-specific GSE

Tenant Name	Fuel Type	Total Fuel Consumption (gal):	Total CO_2 emissions (m.t. CO_2)	Total CH_4 emissions (m.t. CH_4)	Total N_2O emissions (m.t. N_2O)
Air Tran	Diesel	5,382.80	55	0.003	0.001
	Gasoline	6,153.73	54	0.003	0.001
	Air Tran Total		**109**	**0.006**	**0.003**
Altria	Diesel	135.79	1	0.000	0.000
	Gasoline	270.68	2	0.000	0.000
	Altria Total		**4**	**0.000**	**0.000**
American Eagle	Diesel	3,660.72	37	0.002	0.001
	Gasoline	-	-	-	-
	American Eagle Total		**37**	**0.002**	**0.001**
Avitat	Diesel	82,036.51	833	0.048	0.021
	Gasoline	83,261.90	734	0.042	0.018
	Avitat Total		**1,566**	**0.089**	**0.040**
Citigroup	Diesel	651.14	7	0.000	0.000
	Gasoline	2,393.16	21	0.001	0.001
	Citigroup Total		**28**	**0.002**	**0.001**
GHI	Diesel	152,677.34	1,550	0.089	0.040
	Gasoline	439,712.85	3,874	0.220	0.097
	GHI Total		**5,424**	**0.308**	**0.136**
Airport (AvPorts)	Diesel	98,038.26	995	0.057	0.025
	Gasoline	184,661.32	1,627	0.092	0.041
	HPN Total		**2,622**	**0.149**	**0.066**
Hangar F	Diesel	-	-	-	-
	Gasoline	1,581.86	14	0.001	0.000
	Hangar F Total		**14**	**0.001**	**0.000**

Trial 6 - Tenant-specific GSE (cont.)

Tenant Name	Fuel Type	Total Fuel Consumption (gal):	Total CO_2 emissions (m.t. CO_2)	Total CH_4 emissions (m.t. CH_4)	Total N_2O emissions (m.t. N_2O)
Jet Blue	Diesel	15,388.69	156	0.009	0.004
	Gasoline	-	-	-	-
	Jet Blue Total		**156**	**0.009**	**0.004**
JP Morgan Chase	Diesel	169.73	2	0.000	0.000
	Gasoline	140.73	1	0.000	0.000
	JP Morgan Chase Total		**3**	**0.000**	**0.000**
Landmark	Diesel	102,015.69	1,035	0.059	0.027
	Gasoline	24,757.31	218	0.012	0.005
	Landmark Total		**1,254**	**0.072**	**0.032**
Million Air	Diesel	11,563.43	117	0.007	0.003
	Gasoline	14,824.67	131	0.007	0.003
	Million Air Total		**248**	**0.014**	**0.006**
Net Jets	Diesel	8,965.51	91	0.005	0.002
	Gasoline	7,847.60	69	0.004	0.002
	Net Jets Total		**160**	**0.009**	**0.004**
Northwest	Diesel	-	-	-	-
	Gasoline	1,994.03	18	0.001	0.000
	Northwest Total		**18**	**0.001**	**0.000**
Panorama	Diesel	73,816.74	749	0.043	0.019
	Gasoline	41,680.69	367	0.021	0.009
	Panorama Total		**1,116**	**0.064**	**0.028**
Pepsico-Interlaken	Diesel	814.72	8	0.000	0.000
	Gasoline	1.90	0	0.000	0.000
	P/I Total		**8**	**0.000**	**0.000**
Signature	Diesel	65,542.25	665	0.038	0.017
	Gasoline	22,581.24	199	0.011	0.005
	Signature Total		**864**	**0.049**	**0.022**

Emission Factor References:

Fuel Type	EF kg CO2/gal (TCR GRP 1.1, Table 13.1)	EF g N2O/gal (TCR GRP 1.1, Table 13.6 "Construction")	EF g CH4/gal (TCR GRP 1.1, Table 13.6 "Construction")
Diesel	10.15	0.26	0.58
Gasoline	8.81	0.22	0.5

Appendix D10
GHG Calculations: Rental Cars

	Avis (total rented in 2007)	Budget (total rented in 2007)	Hertz (total rented in 2007)	National (total rented in 2007)	Enterprise (total rented in 2007)	DCL Limo Service (total trips in 2007)	average miles per gallon	total miles driven	Gallons Consumed	CO_2 Emissions (m.t. CO_2)	CH_4 Emissions (m.t. CH_4)	N_2O Emissions (m.t. N_2O)
compact	6,751	5,023	19,695	4,000	10,448	0	25	128,570	5,143	45.31	0.0019	0.0010
mid-size	1,731	899	5,050	8,000	2,262	91,250	22	305,739	13,897	122.43	0.0045	0.0024
SUV	5,920	4,177	17,271	8,000	8,919	0	16	124,004	7,750	68.28	0.0018	0.0010
										236.02	**0.008**	**0.004**

Emission Factors:

CO_2 =	8.81	kg/gallon	TCR GRP v1.1, Table 13.1
CH_4 =	0.0147	g/mile	TCR GRP v1.1, Table 13.4 (Model Year 2005, Gasoline Passenger Cars)
N_2O =	0.0079	g/mile	TCR GRP v1.1, Table 13.4 (Model Year 2005, Gasoline Passenger Cars)

1 kg =	0.001	metric tons
1 g =	0.000001	metric tons

Notes:
1) Total miles driven was calculated by multiplying the total number of cars rented in 2007 by 2.8 miles. It is approximately 1.4 miles from the rental car facilities to the Airport's property boundary.
2) Average miles per gallon was obtained from EPA's MPG estimates on www.fueleconomy.gov using a typical car type for each category.

Year	Tenant Responsible for Account	Location / Building	Tenant / Description	Source Type	GHG	Activity Amount	Units	Estimated	Emission Factor Source	Emission factor	EF Units	Conversion Factor	Conversion Factor	CF Units	Calc GHG Emissions (m.t. GHG)	GWP Conversion	Calc Emissions ($MTCO_2e$)	Reported Emissions (m.t. CO_2e)
2007	Panorama	Hangar T (T-Hangars and H T Fire Pumphouse)	N/A	Purchased Electricity	CO2	345,120	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.92222	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	144.37	1	144.37	144.37
2007	Panorama	Hangar T (T-Hangars and H T Fire Pumphouse)	N/A	Purchased Electricity	CH4	345,120	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000038	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.0059	21	0.12	0.12
2007	Hangar F	Hangar F	N/A	Purchased Electricity	CO2	233,640	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.92222	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	97.7344	1	97.73	97.73
2007	Panorama	Hangar T (T-Hangars and H T Fire Pumphouse)	N/A	Purchased Electricity	N2O	345,120	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000006	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.0009	310	0.29	0.29
2007	Hangar F	Hangar F	N/A	Purchased Electricity	CH4	233,640	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000038	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.0040	21	0.08	0.08
2007	Hangar F	Hangar F	N/A	Purchased Electricity	N2O	233,640	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000006	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.0006	310	0.20	0.20
2007	Panorama	Hangar T (T-Hangars and H T Fire Pumphouse)	N/A	Purchased Electricity	CO2	90,320	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.92222	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	37.78	1	37.78	37.78
2007	Panorama	Hangar T (T-Hangars and H T Fire Pumphouse)	N/A	Purchased Electricity	CH4	90,320	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000038	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	21	0.03	0.03
2007	Panorama	Hangar T (T-Hangars and H T Fire Pumphouse)	N/A	Purchased Electricity	N2O	90,320	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000006	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	310	0.08	0.08
2007	AvPorts Maintenance Department	Parking garage and ticket office	N/A	Purchased Electricity	CO2	73,386	kWh	Yes	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.92222	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	30.70	1	30.70	30.70
2007	AvPorts Maintenance Department	Parking garage and ticket office	N/A	Purchased Electricity	CH4	73,386	kWh	Yes	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000038	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	21	0.03	0.03
2007	AvPorts Maintenance Department	Parking garage and ticket office	N/A	Purchased Electricity	N2O	73,386	kWh	Yes	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000006	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	310	0.06	0.06
2007	AvPorts Maintenance Department	Hangar D	2nd floor offices, bay areas 2 & 3 only	Purchased Electricity	CO2	24,516	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.92222	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	10.26	1	10.26	10.26
2007	AvPorts Maintenance Department	Hangar D	2nd floor offices, bay areas 2 & 3 only	Purchased Electricity	CH4	24,516	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000038	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	21	0.01	0.01
2007	AvPorts Maintenance Department	Hangar D	2nd floor offices, bay areas 2 & 3 only	Purchased Electricity	N2O	24,516	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000006	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	310	0.02	0.02
2007	AvPorts Maintenance Department	24 Purchase St - Switchgear building	N/A	Purchased Electricity	CO2	11,340	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.92222	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	4.74	1	4.74	4.74
2007	AvPorts Maintenance Department	24 Purchase St - Switchgear building	N/A	Purchased Electricity	CH4	11,340	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000038	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	21	0.00	0.00
2007	AvPorts Maintenance Department	24 Purchase St - Switchgear building	N/A	Purchased Electricity	N2O	11,340	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000006	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	310	0.01	0.01
2007	AvPorts Maintenance Department	New Terminal	Includes ARFF, GHE Buildings (GHI)	Purchased Electricity	CO2	2,871,200	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.92222	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	1,201.06	1	1,201.06	1201.06
2007	AvPorts Maintenance Department	New Terminal	Includes ARFF, GHE Buildings (GHI)	Purchased Electricity	CH4	2,871,200	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000038	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.05	21	1.04	1.04
2007	AvPorts Maintenance Department	New Terminal	Includes ARFF, GHE Buildings (GHI)	Purchased Electricity	N2O	2,871,200	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000006	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.01	310	2.42	2.42
2007	AvPorts Maintenance Department	Hangar E Pumphouse	N/A	Purchased Electricity	CO2	120,600	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.92222	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	50.45	1	50.45	50.45
2007	AvPorts Maintenance Department	Hangar E Pumphouse	N/A	Purchased Electricity	CH4	120,600	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000038	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	21	0.04	0.04
2007	AvPorts Maintenance Department	Hangar E Pumphouse	N/A	Purchased Electricity	N2O	120,600	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000006	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	310	0.10	0.10
2007	AvPorts Maintenance Department	Hangar D Pumphouse	N/A	Purchased Electricity	CO2	48,240	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.92222	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	20.18	1	20.18	20.18
2007	AvPorts Maintenance Department	Hangar D Pumphouse	N/A	Purchased Electricity	CH4	48,240	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000038	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	21	0.02	0.02
2007	AvPorts Maintenance Department	Hangar D Pumphouse	N/A	Purchased Electricity	N2O	48,240	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000006	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	310	0.04	0.04
2007	AvPorts Maintenance Department	Ramp Lights	Runway, Taxi way, FAA	Purchased Electricity	CO2	45,760	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.92222	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	19.14	1	19.14	19.14
2007	AvPorts Maintenance Department	Ramp Lights	Runway, Taxi way, FAA	Purchased Electricity	CH4	45,760	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000038	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	21	0.02	0.02
2007	AvPorts Maintenance Department	Ramp Lights	Runway, Taxi way, FAA	Purchased Electricity	N2O	45,760	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000006	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	310	0.04	0.04
2007	AvPorts Maintenance Department	Roundabout lighting	N/A	Purchased Electricity	CO2	29,520	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.92222	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	12.35	1	12.35	12.35
2007	AvPorts Maintenance Department	Roundabout lighting	N/A	Purchased Electricity	CH4	29,520	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000038	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	21	0.01	0.01
2007	AvPorts Maintenance Department	Roundabout lighting	N/A	Purchased Electricity	N2O	29,520	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000006	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	310	0.02	0.02
2007	Signature	Hangar A, Hangar C-1, Hangar C-2, Hangar G	American Eagle (Hangar A), GHI (Hangar A), Northwest (Hangar C-2)	Purchased Electricity	CO2	1,775,570	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.92222	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	742.74	1	742.74	742.74
2007	Signature	Hangar A, Hangar C-1, Hangar C-2, Hangar G	American Eagle (Hangar A), GHI (Hangar A), Northwest (Hangar C-2)	Purchased Electricity	CH4	1,775,570	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000038	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.03	21	0.64	0.64
2007	Signature	Hangar A, Hangar C-1, Hangar C-2, Hangar G	American Eagle (Hangar A), GHI (Hangar A), Northwest (Hangar C-2)	Purchased Electricity	N2O	1,775,570	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000006	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	310	1.50	1.50
2007	Altria	Hangar D-2	N/A	Purchased Electricity	CO2	364,440	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.92222	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	152.45	1	152.45	152.45
2007	Altria	Hangar D-2	N/A	Purchased Electricity	CH4	364,440	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000038	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.01	21	0.13	0.13
2007	Altria	Hangar D-2	N/A	Purchased Electricity	N2O	364,440	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000006	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	310	0.31	0.31
2007	IBM	Hangar W	N/A	Purchased Electricity	CO2	774,560	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.92222	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	324.01	1	324.01	324.01

Year	Tenant Responsible for Account	Location / Building	Tenant / Description	Source Type	GHG	Activity Amount	Units	Estimated	Emission Factor Source	Emission factor	EF Units	Conversion Factor	Conversion Factor	CF Units	Calc GHG Emissions (m.t. GHG)	GWP Conversion	Calc Emissions ($MTCO_2e$)	Reported Emissions (m.t. CO_2e)
2007	IBM	Hangar W	N/A	Purchased Electricity	CH4	774,560	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000038	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.01	21	0.28	0.28
2007	IBM	Hangar W	N/A	Purchased Electricity	N2O	774,560	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000006	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	310	0.65	0.65
2007	Avitat	Hangar E-1	N/A	Purchased Electricity	CO2	150,500	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.92222	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	62.96	1	62.96	62.96
2007	Avitat	Hangar E-1	N/A	Purchased Electricity	CH4	150,500	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000038	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	21	0.05	0.05
2007	Avitat	Hangar E-1	N/A	Purchased Electricity	N2O	150,500	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000006	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	310	0.13	0.13
2007	Avitat	Hangar E-3	N/A	Purchased Electricity	CO2	200,000	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.92222	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	83.66	1	83.66	83.66
2007	Avitat	Hangar E-3	N/A	Purchased Electricity	CH4	200,000	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000038	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	21	0.07	0.07
2007	Avitat	Hangar E-3	N/A	Purchased Electricity	N2O	200,000	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000006	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	310	0.17	0.17
2007	Million Air	Hangar M	N/A	Purchased Electricity	CO2	440,350	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.92222	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	184.20	1	184.20	184.20
2007	Million Air	Hangar M	N/A	Purchased Electricity	CH4	440,350	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000038	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.01	21	0.16	0.16
2007	Million Air	Hangar M	N/A	Purchased Electricity	N2O	440,350	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000006	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	310	0.37	0.37
2007	JP Morgan Chase	Hangar D-1, Bay 1	N/A	Purchased Electricity	CO2	240,500	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.92222	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	100.60	1	100.60	100.60
2007	JP Morgan Chase	Hangar D-1, Bay 1	N/A	Purchased Electricity	CH4	240,500	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000038	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	21	0.09	0.09
2007	JP Morgan Chase	Hangar D-1, Bay 1	N/A	Purchased Electricity	N2O	240,500	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000006	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	310	0.20	0.20
2007	Citigroup	Hangar E-2	N/A	Purchased Electricity	CO2	186,910	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.92222	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	78.19	1	78.19	78.19
2007	Citigroup	Hangar E-2	N/A	Purchased Electricity	CH4	186,910	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000038	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	21	0.07	0.07
2007	Citigroup	Hangar E-2	N/A	Purchased Electricity	N2O	186,910	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000006	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	310	0.16	0.16
2007	Landmark	Hangar D-1, Bay 2	N/A	Purchased Electricity	CO2	550,010	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.92222	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	230.08	1	230.08	230.08
2007	Landmark	Hangar D-1, Bay 2	N/A	Purchased Electricity	CH4	550,010	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000038	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.01	21	0.20	0.20
2007	Landmark	Hangar D-1, Bay 2	N/A	Purchased Electricity	N2O	550,010	kWh	No	eGRID 2006 v 2.1 (2004 data) - NPCC NYC/Westchester (NYCW)	0.000006	lbs/kWh	lbs to metric tonnes	0.000453592	m.t. / lbs	0.00	310	0.46	0.46

Appendix E
GSE Equivalents

Airport/Tenant Equipment	EDMS Equivalent
Deicing Truck	Catering Truck
Fire Fighting Vehicle	Fuel Truck F750
Ford Tractor	Baggage Tractor
Vans/Buses	Service Truck
Dump Trucks/Plows	Service Truck
Loader	Cargo Tractor
Snow Broom (engine)	Sweeper
Deicing Engine	User-created
Weed Wacker	User-created
Snow Blower	User-created