Environmental Footprint for FLL Operations

Prepared for: Broward County Aviation Department

Fort Lauderdale, Florida

September 2005 (Revised)

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Prepared for

Broward County Aviation Department
Ft. Lauderdale, Florida

Prepared by

Clean Airport Partnership, Inc.
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PL&P Advertising

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Final Report

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Many companies provided specialized expertise to produce this report. Throughout the report they are referred to as the CAP team. The companies and their areas of responsibilities are: Clean Airport Partnership – Air Quality/Landside Vehicles, Environmental Consulting Group – Air Quality/Aircraft & Ground Support Equipment as well as report production, Labell Consulting – Data Acquisition, Westhorp & Associates – Solid Waste, Miller Legg – Water Quality, University of Central Florida – Noise, and Johnson Controls – Energy. The CAP team would like to thank the many members of BCAD staff who assisted by providing data and essential information.

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ACRONYMS

ADPD – Airport Development Plan Definition

ANAC – Airport Noise Abatement Committee

ANOMS – Airport Noise and Operation Monitoring System

APU – Auxiliary Power Unit

ASCE – Annual Comprehensive Site Evaluation

AST – Above Ground Storage Tank

ATCT – Air Traffic Control Tower

BCAD – Broward County Aviation Department

BCC – Broward County Board of County Commissioners

BOD – Biological Oxygen Demand

CAP – Clean Airport Partnership, Inc.

CO – Carbon Monoxide

CO_2 – Carbon Dioxide

COD – Chemical Oxygen Demand

CWA – Clean Water Act

CUP – Consumptive Use Permit

dB(A) – "A" weighted Decibel

DEA – Draft Environmental Assessment

DEIS – Draft Environmental Impact Statement

DOT – US Department of Transportation

EPA – US Environmental Protection Agency

EDMS – Emissions and Dispersion Modeling System

FAA – US Federal Aviation Administration

FAR – Federal Aviation Regulations

FBO – Fixed Base Operator

FDEP – Florida Department of Environmental Protection

FDOT – Florida Department of Transportation

FLL – Ft. Lauderdale-Hollywood International Airport

FLLS – Ft. Lauderdale South

FLLS2 – Ft. Lauderdale South – facility 2

GCTL – Groundwater Cleanup Target Levels

GSE – Ground Support Equipment

GSLD – General Service Large Demand

HID – High Intensity Discharge

IM – Impact Metric

INM – Integrated Noise Model

LTO – Landing and Take Off

KWH – Kilowatt Hour

Ldn – Day/Night Average Sound Level

MS4 – Municipal Separate Storm Sewer System

MSGP – Multi-Sector Group Permit

MSW – Municipal Solid Waste

NADC – Natural Attenuation Default Criteria

NADP – Noise Abatement Departure Profile

NEPA – National Environmental Policy Act

NO_x – Nitrogen Oxides

NPDES – National Pollution Discharge Elimination System

OES – Broward County Office of Environmental Services

PAC – Pre-Approved Advance Cleanup

PCPP – Petroleum Cleanup Participation Program

RCC – Rental Car Center

RMT – Remote Monitoring Terminals

SFWMD – South Florida Water Management District

SO_x – Sulfur Oxides

SPCC – Spill Prevention Control and Countermeasure

SWPPP – Storm Water Pollution Prevention Plan

TMDL – Total Maximum Daily Load

TOU – Time of Use

TSA – Transportation Security Administration

TSS – Total Suspended Solids

UST – Underground Storage Tank

VFD – Variable Frequency Drive

VOC – Volatile Organic Compounds

1. FLL Environmental Status

1.1. Executive Summary

The Clean Airport Partnership (CAP) and its team of subcontractors reviewed a wide range of operations at Ft. Lauderdale-Hollywood International Airport (FLL) to characterize the airport's environmental impacts. The environmental evaluations were used to create "Impact Metrics," which are quick and meaningful ways to characterize FLL's environmental performance. The Impact Metrics were subsequently combined into an environmental footprint for FLL. The airport can use the environmental footprint to evaluate the environmental ramifications of changes to airport operations as well as track environmental impacts over time.

Five environmental impact areas were evaluated for the baseline task:

- Water Quality - FLL has done a very good job protecting the groundwater under its property and does not have serious groundwater contamination problems, however, some risks were identified. Potential for storm water contamination was reviewed and additional data would be useful to confirm the adequacy of current controls and spill prevention plans. Potable water use and non-potable water use were also reviewed and Impact Metrics were developed for them.
- Solid Waste – Waste generation was estimated for airport facilities owned and operated by BCAD as well as the FBOs and other private tenants. Waste recycling was evaluated to arrive at a value for net waste generation. An on-site recycling facility operated by Airport Recycling Specialists helps reduce the net waste generation significantly and is a valuable asset for FLL.
- Air Quality - Air emissions from aircraft, ground support equipment, and auxiliary power units were quantified. Estimates of emissions from the cars, trucks, buses, and other highway vehicles that operate on the landside of the airport were also developed. Broward County does not have a serious air quality problem currently although airport air emissions are expected to increase in the future with growing demand for air travel.

- Noise - Community noise impacts were evaluated by creating a noise metric that includes the number of residences within the 65 dB(A) contour, the area of land within the same contour, and noise levels measured at ten monitoring locations.
- Energy - Electric power use at FLL was quantified to establish a baseline measure of energy use. Energy use was converted into an equivalent emissions rate to define the resulting environmental impact.

The results of evaluating each area were used to create Impacts Metrics. The Impact Metrics are absolute measures of environmental performance and are unrelated to compliance standards or any current environmental program goals. Rather than just measuring total noise impact or total air emissions, they are designed to measure how well noise or air emissions are being managed. As such, while increased air traffic will necessarily result in an increase in total air emissions, if the airport is operating more efficiently, the emissions will rise more slowly than one might anticipate and an Impact Metric of "emissions per passenger" will begin to fall indicating environmental progress.

The Impact Metrics were then combined to produce an environmental "footprint" for FLL. The footprint provides a valuable, objective tool for tracking environmental progress at FLL. BCAD staff can use the footprint as a measuring tool for facility operations and to track changes over time as the airport grows. The CAP team recommends that BCAD publish FLL's environmental footprint and a table of Impact Metrics each year in the *BCAD Annual Statistical Report.*

1.2. Introduction

On November 9, 2004, the Broward County Board of County Commissioners (BCC) approved a contract with CAP and its team of subcontractors, to implement a Green Airport Initiative (GAI) at FLL. The GAI is designed to help FLL improve environmental quality and operational efficiency, and become a community model for sustainable development. The first task under this contract is to prepare an environmental footprint for FLL.

The CAP team is comprised of subcontractors with specialized expertise in a wide range of environmental impact areas. They include:

- Environmental Consulting Group – air quality and environmental program management
- Miller Legg – water quality
- Westhorp & Associates – solid waste
- University of Central Florida – noise
- Johnson Controls – energy
- Labell Consulting – project coordination
- PL&P Advertising – community outreach

This report, prepared by the CAP team, defines each impact area, describes how the impact was measured, and presents an "Impact Metric" as a way to quantify FLL's environmental performance today and track performance in the future.

1.2. Purpose

The CAP team is cooperating with BCAD to create a collaborative program that identifies innovative approaches to protecting the natural environment *above and beyond* federal, state, and local regulatory requirements. We feel that a collaborative success in achieving broad environmental solutions between the CAP team, BCAD, and the community would reaffirm the airport's commitment to improving environmental quality in the Broward County area. The goal is to identify priority research and an overall environmental strategy that can yield benefits during a period that spans the next several years to several decades.

The context in which this project takes place is important. There is a projected increase in population in Broward County and economic growth that will result in increasing airline traffic at FLL. The airport will play an essential role in the economic prosperity and lifestyle of all citizens of South Florida. If managed effectively, this can be a very positive benefit for the natural environment as well as citizens' quality of life.

The GAI was designed to provide a framework for managing the environmental impacts of this growth. Its goal is to make FLL more environmentally progressive and to accommodate future demand for air travel in a manner illustrating the principles of sustainable development and creating a more livable community. Sustainable development means achieving simultaneous improvement in economic, social, and environmental performance. For FLL this means that today's increasing demand for air travel

should be met to grow revenues and increase employment opportunities, while improving the quality of life in surrounding communities as well as the region as a whole. As such the GAI is a mechanism for simultaneously facilitating airport growth and enhancing environmental quality.

To gauge environmental progress at FLL, it is essential to establish a baseline for measuring current environmental conditions. Elements of this facility "footprint" should be defined in a manner so that BCAD staff can use this as a measuring tool for facility operations. Impacts from airport operations on the environment should be quantified to develop the footprint. An important aspect of this task is to define meaningful measurements or "metrics" for each impact area, which we refer to as Impact Metrics. Identifying high quality source data is also important so the footprint can be updated later to show improvements measured on a consistent basis.

Several important criteria are relevant to the usefulness, applicability, and repeatability of this baseline for BCAD staff. These criteria include ease of data acquisition, repeatability on an annual basis, and minimal additional cost to BCAD operations. BCAD staff, consultants, and the community at large can then use this environmental footprint in evaluating the success of any innovative solution proposed by the CAP team in future task assignments.

1.3. Scope

The CAP team has completed a comprehensive review of readily-available existing permits, Best Management Plans, training programs, reports, studies, and assessments to define and quantify FLL environmental impacts, building on a prior study that CAP completed for FLL in 2003. When the CAP team identified data gaps in documentation supporting elements of the proposed environmental footprint, we analyzed the pertinent FLL operations and measured or computed the impacts to the extent practical. When the required data was unavailable, the CAP team has recommended that BCAD acquire the data for future analysis. The results of these assessments have been summarized in this FLL Environmental Footprint report.

The geographic extent of the project includes the airport and tenant operations within the area bounded by I-595 to the north, I-95 to the west, US-1 to the east, and Griffin Road to the south. North of the airport, beyond I-595, land is primarily used for residential purposes. Commercial and industrial development follows I-95 west of the airport. Further west are

single family and multifamily residences. To the east, between the airport and the Atlantic Ocean, industrial and transportation businesses are common in addition to open space in John U. Lloyd State Park. South of the airport, beyond Griffin Road, the land is predominantly residential.

1.4. Recent Environmental Studies at FLL

Several projects and studies are underway at FLL that are pertinent to the CAP team's Environmental Footprint study. Some of them are not environmental projects per se but the CAP team needs to be mindful of the impact these projects will have on operations.

Master Plan Update – A Master Plan update was prepared for the airport in 1994, and BCAD is in the process of updating the Master Plan. Leigh Fisher Associates has been engaged by BCC to assist BCAD in creating an Airport Development Plan Definition (ADPD). The ADPD is the first part of a two-phase update process for the FLL Master Plan, which addresses the expansion of FLL terminals and ancillary facilities from 2010-2020.

The ADPD process will provide County decision-makers with a range of potential future scenarios for the full build-out of FLL landside and terminal facilities to meet future demand for air travel, and a clear understanding of the technical issues associated with that build-out. Key areas addressed in the ADPD will include:

- managed growth and impacts
- financial capacity once Airline Agreements expire in 2011
- airfield configuration, operational capacity, and airspace compatibility
- terminal capacity and facilities and landside access and parking
- synergies with Port Everglades, including the handling of cruise passengers
- the role of 2020 Vision planning concepts
- balancing airfield, terminal, and landside development
- ongoing role of General Aviation at FLL
- development opportunities and constraints on the Airport's west side
- infrastructure needs (including fuel, power, water, sewer)
- coordination with the Runway 9R/27L Environmental Impact Statement Consultant Team, the Part 150 Study, and Environmental Services
- the stakeholder involvement process.

Phase I of the Master Plan was completed in 2006 and Phase II is underway at the time of this writing.

Concourse A and Group Check-In Facility - The project includes adding a five-gate concourse to Terminal 1 at FLL. Terminal 1 currently has two concourses, Concourses B and C, with nine gates on each terminal. The project proposes adding a hold room area, concessions, and a connector to Terminal 1. Ticketing and baggage make up areas were designed in Terminal 1 assuming that Concourse A would be added. The proposed project, being designed by URS, Inc., is integral to the design of Terminal 1 and, if approved by BCC, could be operational in fall 2008.

In addition, a Group Check-In Facility is proposed to accommodate existing cruise passengers and buses arriving from both Port Everglades and the Port of Miami. The facility will provide ticket counters, a passenger hold room with concessions (which will be integrated with Concourse A), a Transportation Security Administration (TSA) bag screening facility, a bag make-up shelter, and tug cart staging area. A passenger-only shuttle system will transport these passengers to the terminals. A Draft Environmental Assessment (DEA) was prepared and submitted to the US EPA for review and comment. The project has not been approved by the Broward County Commission as of this writing.

Environmental Impact Statement - Landrum & Brown is under contract to BCAD to conduct an EIS for the extension of the south runway (9R/27L) at FLL. The EIS is a study mandated by the National Environmental Policy Act (NEPA) and prepared under the direction of the Federal Aviation Administration (FAA). Its purpose is to review the future environmental, social, and economic impacts of a proposed project, such as the runway extension. The FAA anticipates issuing a Draft EIS (DEIS) document in the spring of 2007.

PART 150 Noise Compatibility Study - BCAD completed Part 150 studies for the Airport in 1987 and 1994, and is in the process of conducting a new Part 150 Study. The Federal Aviation Regulations (FAR) Part 150 as per the Federal Aviation Safety and Noise Abatement Act of 1979 includes a Noise Exposure Map and development of a Noise Compatibility Program. Leigh Fisher Associates is conducting the Part 150 study where the existing and future soundscape of the airport have been identified based on the land uses

surrounding FLL, and recommendations will be made for noise mitigation programs to benefit surrounding communities. The study is expected to be complete in the spring of 2007.

Noise Analyses – In addition to the Part 150 Study, there are two other activities underway that will be evaluating noise at FLL.

- BCAD prepares annual noise contours to monitor the extent of noise exposure on a continuing basis, most recently updated for 2003.
- Consultant HMMH, Inc. has proposed evaluating a "Fly Quiet Program," similar to a program at San Francisco International Airport.

1.5. Environmental Considerations at FLL

The first step in evaluating the environmental impacts of airport operations was to review complaints lodged by the public. Enumerating complaints is not necessarily an indicator of severity of impact but it is a useful approach to identifying those of importance to the public and a screen to ensure the CAP team did not miss any important concerns.

Noise is by far the most commonly identified complaint raised by the community surrounding FLL. In 2003, the airport had a total of 231 complaints, which is an average of 19 complaints per month. However, January alone had 41 complaints because typical departure patterns are reversed during cool weather fronts. In 2004, noise complaints greatly increased to 572. There was significant month-to-month variability. January, March and November generated 81, 88, and 67 complaints respectively due to corporate jet use of runway 9R for capacity management, 9L runway closures necessitating the use of runway 13/31, and regular "low and loud" noise complaints.

September 2004 was an anomaly with 140 noise complaints due to the closure of runway 9L for a runway overlay project. This was anticipated and a great deal of community outreach was conducted prior to the project.

On March 31, 2005 BCAD held an Airport Planning Symposium to present status reports on the Master Plan Update and the Green Airport Initiative. During the Symposium, the public was invited to comment on environmental issues of concern. The following are the most significant concerns expressed that evening.

- Substantial storm water runoff resulting from significant impervious surface at the airport

- Soil and groundwater contamination
- Vibration as a component of noise impacts
- Oily waste and black soot deposition on cars, lawn furniture, and houses
- Air emissions that result from delay
- Habitat degradation in parks and waterways surrounding the airport
- Local congestion and emissions from airport traffic and parking lot use

All members of the CAP team were represented at the Symposium and used the comments received that night to guide both the work underlying this report as well as planning for subsequent work anticipated under our contract.

1.6. Report Organization

This report is organized to present environmental impacts in separate chapters. Chapter 2 addresses water impacts including contamination of groundwater, potential for storm water runoff contamination, and potable water consumption. Chapter 3 describes solid waste generation and disposal at FLL. Chapter 4 describes the key sources of air emissions including aircraft, ground support equipment (GSE), and landside vehicles. Chapter 5 discusses noise impacts and Chapter 6 describes energy use at the airport. Chapter 7 presents the FLL environmental footprint developed by the CAP team. Following Chapter 7 are several appendices that include data used for many of the analyses that ultimately are components of the footprint.

2. Water

2.1. Introduction

Clean water is a priority for businesses and citizens in Broward County, Florida. It is important for agriculture and commerce as well as tourism and recreation, all key drivers of the regional economy. Water quality in the vicinity of FLL is potentially influenced in two ways.

1. Contamination of surface and groundwater[1] can occur as a result of the storage, use, handling, and disposal of hazardous and petroleum products on FLL property. Groundwater impacts can occur by way of the infiltration of surface spills into the soil and groundwater or the release of contaminants from underground storage or transmission structures. These can include process piping and underground storage tanks containing fuels and process waters. Storm water impacts can result from spills and runoff from the airport. Aircraft washing, equipment cleaning, rental car washing, oil and fuel spills, and maintenance activities are among the activities that can contaminate storm water and runoff into surrounding canals if appropriate measures are not taken to prevent it.
2. FLL airport and tenant operations can have an indirect effect on Broward County clean water through the use of potable water and non-potable groundwater for operational uses such as irrigation, process water, passenger services, food services, and drinking water.

Airports, which typically include large expanses of impervious surfaces and host activities that can generate discharges of potential contaminants (e.g., vehicle and aircraft fueling, and maintenance), have been subject to the requirements of the federal Clean Water Act's regulations for over a decade, but the application of these rules to the unique operating environment of airports still is being refined. More recently, other water quality initiatives, such as the identification of impaired water bodies and the efforts to set total

[1] The CAP team considers the presence of ANY amount of a contaminant in surface or ground water as "contamination," and this is the convention used throughout this report. In general, the regulatory community agrees with this convention, but the need for remediation of such contamination is typically determined through comparison against regulatory clean up levels or concentrations established within regulatory standards or guidelines.

maximum daily loads (TMDLs) for specific pollutants for those water bodies, have added complexity to what initially seemed a straight-forward permitting regime.

Activities at FLL have been reviewed to evaluate their potential (and actual) impact to surface water and groundwater. These activities have been collaboratively reviewed with BCAD staff and existing consultants using existing best management practices and economically viable procedures.

2.2. Groundwater

Groundwater flows in aquifers that underlay the airport. Throughout South Florida, groundwater is an important resource that has many uses including supply to municipal water treatment facilities, residential wells, and agricultural irrigation. Onsite groundwater is currently used for FLL irrigation supplies. Groundwater also flows into canals and rivers and eventually to the Atlantic Ocean. Once contaminated, groundwater is difficult and expensive to clean up. Preventing pollution from occurring is the most cost effective strategy. That is why the airport and its tenants are an important community partner to protect groundwater resources.

FLL has done a very good job protecting the groundwater under its property. As a result the airport does not have serious groundwater contamination problems, however, it remains a risk wherever fuels, chemicals, and other pollutants are handled. Groundwater contamination can occur when petroleum or chemical pollutants are spilled or dumped on the surface of the ground and then migrate into the groundwater or are released from containment or transmission structures placed underground. There is also the potential for fuel spills during refueling. If spillage occurs adjacent to unpaved areas, there is a significant risk of fuel causing soil and groundwater contamination. Further risks may be found with bulk storage facilities, particularly for fuel. This risk increases if underground fuel pipelines are used and also as fuel storage tanks and pipelines age.

There are areas of contaminated soil and groundwater at the airport that are primarily the result of historic operations and contamination inherited by FLL. For example, the airport acquired contaminated sites in the former Ravenswood neighborhood where properties were purchased as part of FLL's noise abatement program and to provide for the runway protection zone for Runway 9L/27R. Additionally, some former rental car sites have petroleum-

contaminated property, which has polluted the groundwater. Several of these sites have either active or passive remediation programs underway to remove or degrade sources of contamination and contain and/or treat the groundwater.

The types of groundwater contamination at FLL property can be divided into three types of facilities as follows:

- Non-regulatory Enforcement Sites
- Regulatory Enforcement Sites
    - Currently Inactive Sites (i.e., Dormant Sites)
    - Facilities Currently Conducting Groundwater Monitoring Programs (i.e., Active Sites)

The status of several sites around the airport is discussed in the following section. It is important to note that baseline criteria established in Section 1.1 of this report identify ease of data acquisition, repeatability on an annual basis, and minimal additional cost for additional data. Only three facilities currently conducting groundwater-monitoring programs meet all three of these criteria. BCAD would need to implement some type of groundwater monitoring at the remaining facilities identified in this section to allow their inclusion into the baseline footprint for water quality.

BCAD requires baseline testing prior to and at the conclusion of lease agreements to avoid situations where they unwittingly inherit contamination issues. This provides a useful degree of protection. Additionally we believe BCAD should consider whether to encourage former operating companies of currently inactive sites to implement an annual groundwater-monitoring program. There is little or no data on these sites. Without adequate data, BCAD may in the future find that they have inherited contaminated sites that will be potentially expensive to clean up should a company go bankrupt, default on their lease, or have a lease that predates the testing requirements.

2.2.1. Non-Regulatory Enforcement Sites

The CAP team conducted on-site inspections of flight operations, as well as on- and off-site airport tenant operations to note any visual sign of contamination and record any activities at or near the facilities that involve suspect hazardous substances. Several facilities around the airport store and handle fuel, used oil, and hazardous maintenance materials. There were no documented self-assessment or regulatory-driven assessment activities at

these facilities, however, their operations have the potential to result in groundwater contamination. As such, it was not possible to include these facilities in the environmental footprint due to the lack of analytical data.

During on-site inspections, we noted that the new underground gasoline storage tanks that serve the Rental Car Center do not have best available safeguards against a fuel spill that could result from a broken valve on a fuel delivery truck or the failure of a fuel transfer hose. We recommend BCAD add curbing to collect spilled fuel and keep it from the nearby storm drains.

2.2.2. Regulatory Enforcement Sites

The CAP team conducted a review of available U.S. EPA, State of Florida, and Broward County environmental regulatory lists to identify FLL airport or tenant operations with documented regulatory enforcement actions due to groundwater contamination. A summary of facilities on FLL property with documented regulatory involvement is provided as Table A-1 in Appendix A. Figure A-1 plots those sites within the airport property.

Based on an evaluation of facilities located on FLL property with documented groundwater contamination, the CAP team has further defined these sites as active or dormant. A review of each of these case files reveals a distinct criterion applicable to their inclusion in the environmental footprint. While all of the facilities listed in Table A-1 have previously documented groundwater impacts and are known to the regulatory community, a substantial number of these locations are either no longer under enforcement action (i.e., dormant) or have successfully completed the necessary remedial program and received a “no further action” status.

It is the opinion of the CAP team that while these “dormant” sites most likely contribute to the groundwater contamination on FLL property, the absence of repeatable groundwater data prevents including them in the baseline footprint. Conversely, active enforcement sites provide groundwater data on a regular basis, which allows the baseline footprint to track relative improvements in groundwater quality from year to year.

2.2.3. Dormant Sites

Aircraft Service International

Aircraft Services International (ASI) is located at 3451 SW 2nd Avenue. The ASI site is used as a maintenance shop for airport service vehicles. The site is

located on the northeast corner of the Fort Lauderdale-Hollywood International Airport. A recycling facility is located immediately west of the maintenance shop. Several airline freight terminals and an airline catering operation are located in the immediate vicinity of the site. An aboveground airline fueling tank farm is located immediately to the north of the facility. Groundwater sampling was conducted at ASI in response to the 2001 Florida Department of Environmental Protection (FDEP)-assigned cleanup task for the Innovative Technology Site, which includes the ASI facility. The purpose of the cleanup task was to gather baseline analytical data of soil and groundwater contamination for selected innovative technology sites. Soil and groundwater contamination was documented in 2002 within the Innovative Technology Site (including the ASI facility).

Based on the inherent limitation of a baseline evaluation, no further monitoring was recommended or approved by FDEP. Therefore the CAP team does not propose including this facility's groundwater data in the groundwater contamination Impact Metric. Additional sampling would be necessary, at a minimum, on an annual basis.

Carolina Aircraft

Carolina Aircraft Corporation (Carolina) is located at 3500 S.W. 11th Avenue in Fort Lauderdale, Florida. The Carolina site was previously used for aircraft leasing, storage, and maintenance. In October 2003, Federal Express renovated the Carolina site for use as a shipping terminal. Previous environmental work consisted of the excavation and removal of six underground storage tanks (USTs) in March 1992. The USTs were used for the storage of jet fuel, diesel fuel, and aviation gasoline. Approximately 1,200 cubic yards of excessively contaminated soils were removed in 1993. Subsequent sampling identified soil and groundwater contamination at the facility. In 1994, an additional 920 cubic yards of contaminated soil were removed. A monitoring-only plan was recommended and approved, however no additional data was readily available.

The remedial status of the Carolina site became inactive in 1996. Therefore, the CAP team does not propose including it in the groundwater contamination Impact Metric. Implementation of the approved groundwater monitoring program would be necessary for this site's inclusion into the groundwater contamination metric.

FLL Airport South

The Ft. Lauderdale Airport South (FLLS) facility is located at 300 Terminal Drive. Contaminated soil and groundwater have been documented at the FLLS site as a result of past operations of a fueling facility prior to construction of the South Terminal. An active remediation system was installed in August 1996 and operated through September 2001. The facility is currently eligible for funding under a state petroleum cleanup program with a score of 14. However, funding is available currently only for facilities with a score greater than 30.

Remedial status at this facility will remain inactive until funding becomes available for facilities with a score of 14. Based on this facility's inactive remedial status, the CAP team does not propose including it in the groundwater contamination Impact Metric. Once funding becomes available for this facility, or if FLL opts for a voluntary cleanup, assessment activities can be resumed and this site can then be included into the groundwater contamination metric.

FLL Airport South 2

The second Ft. Lauderdale Airport South facility (FLLS2) is also located at 300 Terminal Drive. In March of 1998, two sets of USTs were discovered during construction of the parking garage facility at FLL. It was suspected that these tanks were associated with a former service station located on Federal Highway prior to the roadway realignment in 1983. Gasoline and diesel contamination were documented in the groundwater and soil after excavation of the USTs. Approximately 30 cubic yards of contaminated soil were removed. Groundwater contamination was identified in 1998 and a groundwater monitoring plan was recommended. The facility was accepted into the Petroleum Cleanup Participation Program (PCPP), a state-funded reimbursement program in 1999. No additional data was readily available.

Based on the unavailability of data more recent than 1998, the CAP team does not propose including it in the groundwater contamination Impact Metric. Once this facility resumes active participation in the PCPP, or if FLL opts for a voluntary cleanup, assessment activities can be resumed and this site can then be included into the groundwater contamination metric.

2.2.4. Active Sites

Avis (Closed and Relocated Within Rental Car Center)

The former Avis Rental Car Services, Inc. (Avis) facility is located at 1555 Perimeter Road. Avis reported a discharge of unleaded gasoline in March 1985. Soil and groundwater contamination was documented. Free product was also identified. Avis applied for and was accepted into the Florida Pre-Approval Advance Cleanup (PAC) Program. A remedial action plan (RAP) was submitted and approved in June 2002. As part of the groundwater RAP, 28 injection wells were installed onsite to facilitate the injection of bio-slurry mixtures to decompose the contamination. Quarterly monitoring reports were submitted from October 2003 through November 2004 showing a decreasing trend in contaminant concentrations. Groundwater contamination proximal to the former UST tank farm remains above Florida Groundwater Cleanup Target Levels (GCTLs).

Avis was scheduled to vacate this facility in February 2005. During removal of the UST farm, it was recommended by Avis' consultant that dewatering and soil excavation activities be performed to remediate the remaining petroleum impacts that exist within the UST tank pit area.

Based on this facility's participation in the State PAC program, the CAP team proposes it's inclusion in the groundwater contamination Impact Metric. Three existing monitoring wells were used to model total contaminant mass in the groundwater associated with this facility. Table A-2 provides a summary of calculations indicating a total contaminant mass of 14.38 kg based on November 2004 data.

Budget (Closed and Relocated Within Rental Car Center)

The former Budget Rent A Car System, Inc. (Budget) facility is located at 1655 Perimeter Road. In November and December 2002, tank removal and closure activities were conducted within two UST farms. In February 2004, groundwater impacts were observed above GCTLs, but within natural attenuation default criteria (NADC). According to FDEP, additional assessment is required to delineate the groundwater contamination at the Budget facility.

Based on the FDEP requirement to complete additional assessment activities, the CAP team proposes this facility's inclusion in the groundwater contamination Impact Metric. Four onsite existing monitoring wells were used

to model total contaminant mass in the groundwater associated with this facility. Table A-2 provides a summary of calculations indicating a total contaminant mass of 0.036 kg based on February 2004 data.

General Rent-A-Car/Dollar Rent-A-Car (Closed and Relocated Within Rental Car Center)

The former Dollar Rent-A-Car (Dollar) facility is located at 1425 South Perimeter Road. The Dollar site includes a car rental facility, service area, fueling area, car/bus washing area, and associated vehicle parking areas. Groundwater impacts were identified proximal to the UST area located near the car wash and refueling area. A groundwater remediation system was installed in March 1988 and operated until at least 1996. The groundwater remediation system is currently inactive. In June 2004, groundwater and soil impacts were identified onsite in exceedance of GCTLs.

The USTs were scheduled to be removed in March 2005. Recent assessment activities recommended active remediation including removal of impacted soil and installation of a temporary air sparging system used to strip contaminants from groundwater. Additional monitoring was recommended post remediation.

Based on this facility's recommendation to actively remediate and monitor groundwater contamination, the CAP team proposes it's inclusion in the groundwater contamination Impact Metric. Five existing monitoring wells were used to model total contaminant mass in the groundwater associated with this facility. Table A-2 provides a summary of calculations indicating a total contaminant mass of 31.39 kg based on June 2004 data.

National Car Rental

The former National facility, located at 1795 Perimeter Road, consisted of an office/maintenance building, a car wash building, fuel dispensers, and USTs. The facility was previously demolished to allow for construction of the large, multi-level Rental Car Center. Groundwater impacts were documented in the immediate vicinity of the gasoline and diesel USTs. An active groundwater remediation system operated from 1991 through 1993. Post remediation monitoring was conducted until 1995. In 1995, FDEP granted inactive status to this facility based on reduction of groundwater contaminants. The USTs associated with the former facility were removed in 2002. Additional assessment activities conducted in 2003 identified soil and groundwater

contaminants in exceedence of regulatory standards so clean up is once again active.

The CAP team was unable to locate data more recent than 2003 for this site, so we do not propose including it in the groundwater contamination Impact Metric. Once current data is available, the site can be incorporated into the groundwater contamination metric.

2.2.5. Definition of Groundwater Footprint

Only the three former rental car facilities located on the eastern side of the FLL property (Avis, Budget, and General) actively conduct groundwater monitoring programs on a regular basis. These facilities, therefore, constitute the groundwater contamination baseline footprint for the FLL property.

A summation of contaminant mass calculated in Table A-2 results in a baseline designation of 45.822 kg of groundwater contaminants based on 2004 data. Since groundwater contamination is generally not related to air travel demand, number of passengers, or other operational variables at the airport, the CAP team proposed an Impact Metric for groundwater to be based simply on the total mass of groundwater contaminants identified at the four rental car facilities. The Impact Metric will be normalized as follows:

$IM_{current\ year}$ = (Current year contamination)/(2004 contamination)

IM_{2004} = (45.806kg)/(45.806 kg) = 1.0

IM_{2004} represents the baseline IM. While it is acknowledged that this contaminant mass does not reflect the actual total contaminant mass in the groundwater of the FLL airport property, it provides BCAD staff and the CAP team with verifiable and repeatable data to create an Impact Metric.

To refine this baseline representation of groundwater impacts, FLL would need to create additional data by requiring the installation and repeated sampling of groundwater monitoring wells within selected dormant sites or locations not currently identified by the regulatory agencies. If that is done the Impact Metric can be renormalized based on a new baseline collection of contamination sites.

2.3. Storm Water

FLL is a large air transport facility that is approximately 1,380 acres, which includes airport-related operations that potentially impact the water quality of

storm water runoff. These activities include commercial aircraft operations, private storage (airplanes and helicopters), and aircraft maintenance. In addition, FLL tenant operations include rental car facilities, air cargo, vehicle maintenance, aircraft maintenance, and airfield support. Storm water generally falls onto runways, ramp areas, and other impervious areas on the site and runs off through retention/detention ponds, drainage ditches, and culverts and into canals that lead to the ocean. About 77% of the airport property is impervious.

Airports are sources of a wide variety of pollutants that can contaminate storm water if untreated. Examples include:

- Industrial cleaners, pesticides, fertilizers, rubber particles from aircraft tires, and small metal particles from mechanical engine wear are all deposited on runways, taxiways, and grassy areas of the airfield.
- Car and equipment washing results in water contaminated with detergent, dirt and small particles, oil and grease, and metal residues. Car rental companies have water collection and recycle capabilities on their wash racks. Car washing water associated with maintenance is designed to be collected and disposed in the sanitary sewer. Unauthorized car and equipment washing, which is not conducted within these specially-designed wash racks, has the potential to impact storm water runoff.
- Oil and fuel spills come from gate areas, storage tanks, and ramp areas where refueling takes place.

FLL has fuel spill clean up procedures, policies requiring wash water collection and disposal, and other provisions in place to protect against storm water contamination, as explained more fully below.

Storm water runoff at FLL is primarily treated by biological action on pollutants in swales and detention and/or retention ponds. This type of treatment is designed to handle “first flush” runoff, which has the highest concentration of pollutants and otherwise would overwhelm the natural attenuation ability of the surrounding waters. The treatment sequence includes oil/water separators used for runoff in areas where oily runoff is most likely, such as ramp areas and maintenance shops. This treatment train (i.e., ramp scrubbing and runoff collection, oil/water separation, and biotreatment) is consistent with South Florida Water Management District design criteria. There are, however, no additional controls or backup systems to treat storm water runoff. Even though there are spill clean up procedures in place, there remains a potential that fuel spills or other contaminating substances could

find their way into the storm water discharge system, exceeding the capability of the natural attenuation designed into the system.

When defining pollution, it is important to group storm water pollutants into two major categories: point source and non-point source pollution. Point-source pollution is pollution that you can track to a specific source like a spill or drain pipe (a specific point where all the pollution is coming from). Non-point source pollution is not as easily tracked because it is typically spread out and does not come from a single source. Non-point source pollution is caused by rainfall moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into surface water bodies.

2.3.1. Point Sources

Point source releases of contaminants are commonly defined as inadvertent releases (or spills) of chemical or petroleum products as part of daily facility operations. These spills can occur as part of activities within the airport that require the handling of material or as part of bulk storage operations.

FLL operates with a Spill Prevention Control and Countermeasure (SPCC) Plan to prevent the discharge of oil in harmful quantities into the waters of the United States or adjoining shorelines. The primary emphasis of this Plan is on pollution prevention through the use of pollution prevention equipment and training and education to minimize accidental discharges. FLL has a number of facilities where fuel is stored and/or dispensed from aboveground storage tanks (ASTs). The FLL SPCC Plan addresses specific locations where there is storage of petroleum products in ASTs. Applicable to this document is the SPCC Plan requirement to document spill history and provide for a mechanism to document spill events onsite and respond with appropriate personnel and equipment to contain the spill and minimize any potential impacts to FLL surface water bodies.

The CAP team reviewed Daily Reports of airport activities documenting spill events recorded onsite from 2001 through 2004. Each of these reports identifies the location of the fuel spill, responsible party, quantity and type of petroleum product spilled, and spill response. Table A-3 in Appendix A summarizes the documented spills on an annual basis.

2.3.2. Non-Point Sources

The Clean Water Act (CWA) of 1972 sets forth a national objective to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. To accomplish this goal, the CWA established a comprehensive program that requires a permit for all pollutant discharges. In 1990, the U.S. EPA, as mandated under the CWA, developed a National Pollutant Discharge Elimination System (NPDES) storm water permitting program. Under this program, regulated sources fall into three categories including: Industrial Activity, Construction Activity, and Municipal Separate Storm Sewer Systems (MS4s). FLL is regulated under this program as a transportation facility and activities conducted within the airport properties are classified as industrial activities.

As such, FLL has an NPDES permit and has implemented appropriate pollution prevention programs to reduce contamination of storm water runoff. The FDEP is responsible for enforcing NPDES requirements and monitoring surface water in the vicinity of the airport. Although FLL does not use deicing materials in excess of 100,000 gallons or more per year and therefore, is not subject to the storm water monitoring regulations, an annual storm water sampling program is currently being conducted at airport outfalls.

FLL is divided into three major drainage basins for the purposes of NPDES reporting as noted on Figure A-2 (Appendix A). Surface water runoff is collected in a series of catch basins, oil-water separators, storm sewers, ditches, detention areas, and canals throughout the three basins. The runoff flows are conveyed offsite from FLL by way of seven outfalls, discharging southward into the Dania Cutoff Canal, northward via the Osceola Creek to the North River Canal, and eastward via the Florida Department of Transportation (FDOT) drainage system into the Dania Cutoff Canal (Figure A-3).

The Eastern/Terminal Basin is approximately 650 acres and contains four sub-basins numbered E1, E2, E3, and E4. The Eastern/Terminal Basin contains the passenger terminal area, ramps, taxiways, parking facilities, rental car agencies, and a portion of the following runways: 9L-27R, 9R-27L, and 13-31. Storm water runoff from sub-basins E2, E3, and E4 all discharge into the FDOT drainage system for U.S. Highway 1 – Interstate 595 interchange and Dania Cutoff Canal via Outfalls 1, 2, and 3.

The Northern Basin consists of approximately 250 acres. Fixed Base Operators (FBOs) constitute the majority of this basin. A portion of runway 9L-27R and some taxiways are also included in this basin. Storm water runoff from this area is collected in a canal located north of Taxiway A, which drains westward and northward to Outfall 4.

The Western Basin contains two interconnected sub-basins numbered W1 and W2 and consists of approximately 240 acres. The Western Basin contains FBOs, ramps, taxiways, parking facilities, BCAD maintenance facilities, and a portion of the following runways: 9L-27R, 9R-27L, and 13-31. This storm water runoff is discharged through two separate culverted structures into the Dania Cutoff Canal via Outfalls 6 and 7.[2]

BCAD conducts Annual Comprehensive Site Evaluations (ACSEs) as required by the FLL Storm Water Pollution Prevention Plan (SWPPP). The ACSE Report describes compliance monitoring for the air transportation-related activities and operations being conducted by FLL tenants in accordance with the requirements specified in the State of Florida Multi-Sector Generic Permit for Storm Water Discharge Associated with Industrial Activity (MSGP). This tenant inspection process allows BCAD consultants to evaluate tenant operations for compliance with the applicable MSGP.

The CAP team reviewed available storm water analytical monitoring reports for FLL. Outfalls 1, 3, 4 and 7 are currently targeted for periodic sampling for *chemical contaminants* (metals and total petroleum hydrocarbons (TPH)) as part of a five year annual monitoring program. This program was initiated in 2002. Analytical data was reviewed for the 2002 sampling event. A summary of this sampling event is provided in Figure A-4.

In 2003, the testing regime was modified to focus on *water quality parameters* such as pH, total suspended solids (TSS), oil and grease, biological oxygen demand (BOD5), and chemical oxygen demand (COD). Consultants to BCAD sample a varying number of the seven airport outfalls for these parameters annually. Outfalls 1, 3, 4 and 7 were sampled in 2003, while all seven outfalls were sampled in 2004. A summary of these sampling events is presented in Figure A-4.

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[2] Plans are currently in place to revise this system as part of the Taxiway C-Westside project. Outfall control structures will be added, one existing outfall closed, existing surface canals closed, and a new outfall created.

2.3.3. Definition Of Storm Water Footprint

Based on an evaluation of types of storm water runoff at FLL and a review of available documentation, the CAP team proposes the creation of the following two Impact Metrics for storm water impacts from facilities within FLL property:

2.3.3.1. Point Sources

The first storm water Impact Metric addresses point source releases of contaminants within FLL. Most spills at FLL are contained and cleaned up, however, spills represent a potential source of releases to the environment. Also, the required documentation of each spill of petroleum products within the airport property provides a ready source of information. An annual summary of spill events and total quantity of material released provides a simple, yet powerful metric to evaluate facility daily operations as well as personnel training and responsiveness to emergency situations. Table A-3 summarizes the documented spills on an annual basis. A summation of spill events for 2002, 2003, and 2004 is as follows:

Year	Number of Spills	Quantity Released
2002	34	274.25 gallons
2003	24	200.5 gallons
2004	7	217 gallons

Number of spills and quantity spilled may indirectly relate to air travel demand since the amount of fuel handled increases with the number of flight operations at the airport. Therefore we propose an Impact Metric for point source storm water contamination be based simply on the total quantity of material spilled. Using 2004 as the baseline, the Impact Metric would be based on 217 gallons spilled. The Impact Metric will be normalized as follows:

$IM_{current\ year}$ = (Current year quantity release)/(2004 quantity release)

IM_{2004} = (217 gal)/(217 gal) = 1.0

To further illustrate the IM concept, the IM for 2002 and 2003 would be:

IM_{2002} = (274.25 gal)/(217 gal) = 1.26

IM_{2003} = (200.5 gal)/(217 gal) = 0.92

The objective of the Green Airport Initiative is for the IM to decrease over time illustrating improvement in the airport's operational performance, which is indicative of its environmental performance.

2.3.3.2. Non-Point Sources

The second storm water metric addresses non-point source releases of contaminants within FLL. Non-point source storm water contamination reflects a much broader evaluation of FLL operations and Best Management Practices. Most of the residual contaminants generated by airport operations ultimately find their way into storm water runoff. Storm events mobilize this material and direct the impacted runoff to one of the seven storm water FLL outfalls. The current analytical monitoring program provides an evaluation of chemical impacts and water quality parameters for storm water discharges from FLL. However, there is insufficient data and sampling coverage to compute an Impact Metric for non-point source storm water impacts at this time.

The CAP team recommends a refinement of the storm water sampling program to include all seven outfall locations in annual sampling events for both chemical and water quality parameters. Table A-4 provides an example of a reporting format for non-point source storm water monitoring. Averaged data can be generated from the quarterly and annual monitoring reports BCAD currently receives from consultants. This would provide a consistent and comprehensive Impact Metric for non-point source storm water impacts.

2.4. Water Use

Potable water for use at the airport comes from Broward County's Office of Environmental Services (OES). Water for use on site for irrigation comes from shallow wells drawing from the Biscayne Aquifer. The City of Hollywood treats wastewater resulting from the airport's potable water use at its wastewater treatment plant. The primary concern about potable and non-potable water use at FLL is the quantity consumed. Wasted water equates to wasted energy to process and pump the water. It also wastes capacity of the water supply and treatment systems.

2.4.1. Non-Potable Water Use

Non-potable water is primarily used for irrigation at the FLL airport. Of the 1,380 acres of land for FLL operations, only 320 acres are defined as pervious. Currently, only terminal area landscaping is irrigated using non-

potable water. (The Greenbelt is irrigated using potable water.) The irrigation water source consists of two pump and groundwater well facilities located within FLL property. One terminal area pump station is located within the original Palm Garage structure. A second terminal pump station has been installed to replace the East pump station that was abandoned due to the Terminal building expansion.

A review of existing South Florida Water Management District (SFWMD) Consumptive Use Permits (CUP) for FLL revealed the existence of a CUP (Permit #06-00431-W) dated August 12, 1982 for the use of groundwater from the Biscayne Aquifer for landscape irrigation serving 54.4 acres with a monthly withdrawal of 14 million gallons.

On March 14, 1991, this permit was reauthorized to irrigate 80.03 acres with an annual allocation of 95.83 million gallons. The permit was modified again in November 2004 to irrigate 52.47 acres with an annual allocation of 63.21 million gallons, and modified again in October 2006. SFWMD CUP permit conditions require quarterly monitoring reports documenting total groundwater withdrawn on a monthly basis during a three-month period.

2.4.2. Potable Water Use

The main sources of potable water use at FLL include:

- Terminal Building Amenities (bathrooms, restaurants, other food service operations, etc.)
- Aircraft Washing
- Fire Training Exercises
- Chillers; and
- Tenant and BCAD Operations

Reducing potable water use is a key action item under this program. FLL has shown sensitivity for the need to conserve potable water. Lavatories in the terminals at FLL have automatic low flow flushing and cutoff systems to minimize the use of fresh water. The CAP team has also initiated a cooperative investigation along with Dr. Daniel Meeroff of Florida Atlantic University into water use and possible initiatives to reduce this usage across the Airport. The CAP team also plans to carry out extensive water re-use feasibility studies, and implement programs, over the term of this evaluation.

BCAD provided monthly water bills for all potable water meters supplying FLL. In 2004, the airport consumed 143,135,000 gallons of potable water.

The CAP team believes the simplest and most accurate Impact Metric for potable water use for FLL and its tenants would be metered water use per passenger. This can readily be computed from billing data and can be tracked annually. For 2004 FLL potable water consumption was 14.1 gallons per passenger.

2.4.3. Definition Of Water Use Footprint

Based on an evaluation of types of water use at FLL and a review of available documentation, the CAP team proposes the creation of the following two Impact Metrics for water use within FLL property:

2.4.3.1. Non-Potable Water

The first Impact Metric addresses non-potable water use, primarily groundwater. SFWMD permitting conditions provide BCAD and the CAP team with a potentially inexpensive and reliable data set. According to the October 2006 Quarterly Withdrawal Report, approximately 9 million gallons of potable water is utilized per year.

Based on this information, the Non-Potable Impact Metric was established by calculating the following equation:

$IM_{current\ year}$ = (Current year total) / (2006 year total)

IM_{2006} = (9 million) / (9 million) = 1.0

2.4.3.2. Potable Water

The second Impact Metric addresses potable water use at FLL operations. OES can provide BCAD and the CAP team with monthly water use totals to measure water use onsite. This could be normalized to account for the number of passengers at the airport each month since potable water use should directly relate to the number of passengers that pass through the airport. This process would account for the expected growth of FLL, while still allowing BCAD to observe increases in efficiency based on any initiatives proposed by the CAP team.

$IM_{current\ year}$ = (Current year water use/passenger)/(2004 water use/passenger)

IM_{2004} = (14.1 gal/passenger)/(14.1 gal/passenger) = 1.0

3. Waste

3.1. Introduction

This section describes the CAP team's approach to quantifying the generation of solid waste at FLL and evaluating metrics for tracking waste generation in the future. The CAP team's approach to evaluate solid waste generation and recycling practices was first to divide the airport by land use types and then to quantify the different types of waste that are generated from each land use type.

3.2. Descriptions of Land Use

Based on the current operations at FLL, the CAP team observed three distinct land use types, which also happen to be separate geographical areas. This is shown on Figure B-1 in Appendix B. The largest component of the waste stream is the terminal area (Terminal Complex), which includes the concourses and the airfield. The other remaining areas are the North and West sides of the airport, which are occupied mainly by Fixed Based Operators (FBOs). The North side of FLL consists largely of tenants that handle cargo and private airplanes. The West side of FLL is comprised primarily of general aviation operations and FBOs and includes some light maintenance facilities.

3.3. Types of Waste Generated

Based on the types of land use described above, we calculated the waste generated at FLL using three categories. These consist of solid waste, which includes municipal solid waste (MSW), hazardous and non-hazardous waste, and special wastes. The term MSW in this report includes, but is not limited to,

- putrescible wastes such as from food preparation,
- paper,
- cardboard,
- metal,
- glass, and
- plastics.

Construction and demolition (C&D) waste can also be a large source of the waste stream at a site like FLL. However, this waste is disposed of by the contractors themselves and is not expected to continue at a significant rate

beyond the construction phase. Therefore, for the purpose of documenting FLL's environmental footprint, we are not including C&D in the waste stream. MSW is found in all three areas of the airport, and is the primary component of the Terminal waste stream.

Hazardous waste and non-hazardous waste are primarily found in the North and West sides of the airport. Hazardous wastes are defined as wastes that pose a substantial present or potential hazard to humans or other living organisms due to many different reasons[3]. Hazardous wastes include:

- antifreeze,
- diesel and jet fuel,
- waste oil,
- solvents, and
- batteries.

Non-hazardous waste, for the purpose of this report, is all other waste that is generated at FLL and that does not fall into either of the two previous categories. At FLL, this is comprised mostly of "contaminated" water from maintenance facilities. In general, we found that the majority of the hazardous waste was located in the North side of the airport, while the majority of the non-hazardous waste was found in the West side of FLL. The combined annual total hazardous and non-hazardous waste for FLL was computed to be 144,303 pounds (Table B-2).

We define special wastes in this report as the international waste generated at FLL from incoming aircraft. We explain how waste in this category is disposed of in further detail in Section 3.4.

3.4. Data Collection

The MSW at FLL's terminals is collected by Airport Recycling Specialists (ARS) and taken to their onsite facility for sorting and recycling. ARS achieves an average recycling rate of 38% annually (see Table B-1) through a proprietary process. They accept all the MSW from the terminal, which includes all the tenants within the terminal building, except the restaurant waste. For the purpose of this report, we assumed that this is a minor portion of the total waste stream. ARS also collects waste from the Rental Car Center and the

[3] Tchobanoglous G., Theisen H., and Vigil S., *Integrated Solid Waste Management*, McGraw-Hill Inc., 1993, p. 100.

portion of the airfield that is associated with the tenants inside the terminal. The only component of airfield waste that is not collected by ARS is the waste that comes in from international flights, which is placed in separate on-site dumpsters and hauled directly to an incineration facility in Miami-Dade County. Incinerating waste from international flights is a requirement of US Customs. The main components of this waste stream are paper and mixed food wastes. The CAP team assumed a density of 320 lb/yd3 for this waste, which is an average of the uncompacted densities of paper and mixed food wastes (150 lb/yd^3 and 490 lb/yd^3 respectively)[3].

The other tenants at the airport include the facilities owned and operated by BCAD, as well as the FBOs and other private tenants. To quantify the waste coming from these tenants, we performed site visits to five of these facilities and observed that they have their own waste pickups for MSW (mainly from Waste Management, Inc.), as well as hazardous and non-hazardous waste pickups from designated companies. The majority of the hazardous and non-hazardous waste that is picked up from the different companies is recycled. We observed the number and sizes of MSW dumpsters that were at each facility, and based on the frequency of garbage collection, calculated the quantity of garbage generated per year at each facility. Using an uncompacted specific density of 210 lb/yd^3 [3] for this waste, the total pounds of waste per acre per year were then calculated. For the hazardous and non-hazardous wastes, copies of disposal manifests from these tenants' designated waste collectors were compiled (see Appendix B) and from this, an average amount of liquid (hazardous and non-hazardous) waste was calculated as being generated from these facilities.

3.5. Definition of Solid Waste Footprint

Upon analyzing the gathered data, the CAP team calculated the amount of solid waste (in pounds) generated in the Terminal area on an annual basis. To estimate the amount of waste from the North and West sides of the airport, the percentage of the land that is actually developed and in use was calculated, and this total acreage was used. The CAP team calculated, from an address map provided by BCAD, that the North side is approximately 15% developed, while the West side has approximately 7% development. The rate of MSW generation is presented in pounds of waste, as quantities of solid waste are better presented in weight versus volume, since volume of solid waste differs depending on the compaction of the waste.

We believe MSW generation is generally related to the number of passengers that use the airport. Also the on-site recycling facility provides a valuable service recycling much of this waste and we would like to encourage recycling. On this basis we believe an appropriate Impact Metric for MSW is net MSW generated per passenger (that is, the amount of MSW generated less the amount recycled per passenger, which would represent the amount truly "wasted"). We divided the average annual net MSW generation by the average annual passengers to arrive at the baseline Impact Metric. Passenger statistics were gathered from the Annual Statistical Report, Fiscal Years Ended September 30, 1995 to 2004, prepared by BCAD <http://www.broward.org/airport/pdfs/2004annualstatistical.pdf>. From our calculations, the net amount of MSW generated at FLL is 1.78 lbs/passenger.

On this basis, the MSW Impact Metric calculation would be as follows:

$IM_{current\ year}$ = (Current year waste generation /passenger)/(2004 waste generation /passenger)

IM_{2004} = (1.78 lbs /passenger)/(1.78 lbs /passenger) = 1.0

The CAP team believes the appropriate metric for hazardous and non-hazardous should be based on the total amount of waste produced, with a goal to reduce the total amount of both hazardous and non-hazardous waste produced regardless of the growth in passengers. On this basis, the hazardous and non-hazardous waste Impact Metric calculation would be as follows:

$IM_{current\ year}$ = (Current year hazardous plus non-hazardous waste generation)/(2004 hazardous plus non-hazardous waste generation)

IM_{2004} = (144,303 lbs)/(144,303 lbs) = 1.0

3.6. Note on Solid Waste Generation

The findings of this study are approximate and should not be taken as the exact representation of waste generated at FLL. A significant amount of time and research needs to be dedicated with more in-depth research of tenants and their operations to be able to be more specific in quantifying the types of waste and their quantities. However, we believe this snapshot is an effective representation of the solid waste generated at FLL and appropriate for developing the solid waste Impact Metric.

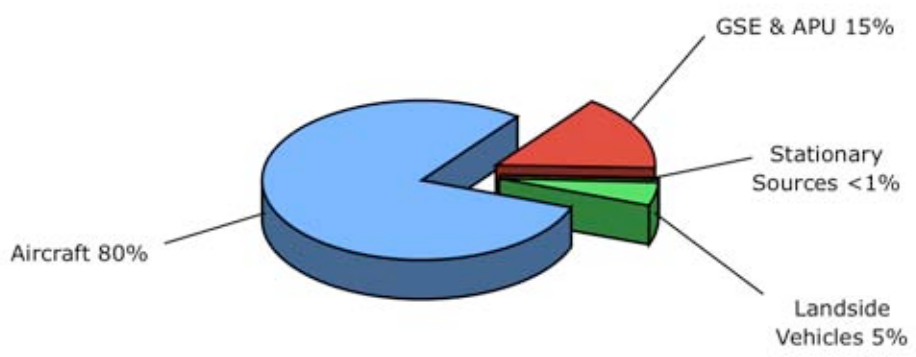
4. Air

4.1. Introduction

Most commercial and industrial activities result in the emission of a variety of air pollutants. Operating an airport is no different. Aircraft, the cars used by passengers, hotel shuttles, taxis, the many vehicles used to support loading and unloading luggage, cargo, and fuel on the aircraft, all generate emissions. And the pollutants are the same as those that come from typical city traffic, including carbon dioxide (CO_2), nitrogen oxides (NO_x), carbon monoxide (CO), sulfur oxides (SO_x), unburned or partially combusted hydrocarbons (also known as volatile organic compounds (VOC)), and particulates.

Ozone, commonly known as smog, is caused by a photochemical reaction between NO_x and VOCs in the atmosphere. Ozone pollution is often the most significant air quality concern for urban areas. For this reason, it is useful to focus on emissions of NO_x and VOCs when considering the source of airport air emissions. Figure 4-1[4] shows the primary sources of NO_x emissions at FLL.

Figure 4-1: Airport NO_x Emission Sources



[4] Clean Airport Partnership, Inc., *Fort Lauderdale-Hollywood International Airport; Building a Green Airport*, Final Report, August 2003.

Because of its proximity to the Atlantic Ocean to the east and the undeveloped lands of the Everglades to the west, Broward County does not have a serious air quality problem although it does typically experience a few days a year where ozone exceeds national health standards. Also, community members have raised questions about air pollution from the airport because of contamination they have found on their cars and outdoor furniture and odors they believe come from the airport. For these reasons it is important to track airport air emissions.

This chapter addresses emissions from aircraft operations, ground support equipment (GSE) and auxiliary power units (APU), and landside vehicles because of their significance in total air emissions. Each source is discussed in turn. With regard to aircraft, our focus is on commercial aircraft, which dominate the aircraft emissions segment. GSE include all equipment operating in support of the aircraft and in this same grouping we include APU, which are small jet turbine engines that provide power and air conditioning to aircraft. Landside vehicles include vehicles used by passengers, rental car companies, and delivery services, trucks, limousines, shuttle vehicles, and buses that travel to and from the airport and are certified for highway travel.

4.2. Aircraft

As seen in Figure 4-1, aircraft are the largest source of NO_x emissions at the airport, contributing 80% of the total. Since these emissions are the direct result of aircraft fuel consumption, they are directly related to the number of flight operations at the airport. Figure 4-2 shows FAA's latest forecast of commercial aircraft operations[5]. Overall, air emissions will be expected to grow at a similar rate as aircraft operations.

Growth in air travel at FLL has been steady with a brief decline following September 11, 2001. Steady growth is expected for the foreseeable future. Demand for air travel grows as the economy grows and prosperity increases. As more people come to South Florida to vacation, enjoy cruises, retire to the warm, pleasant climate, and take advantage of the business opportunities afforded by its position as a gateway to the Caribbean and Latin America, the local economy will grow and air travel demand along with it.

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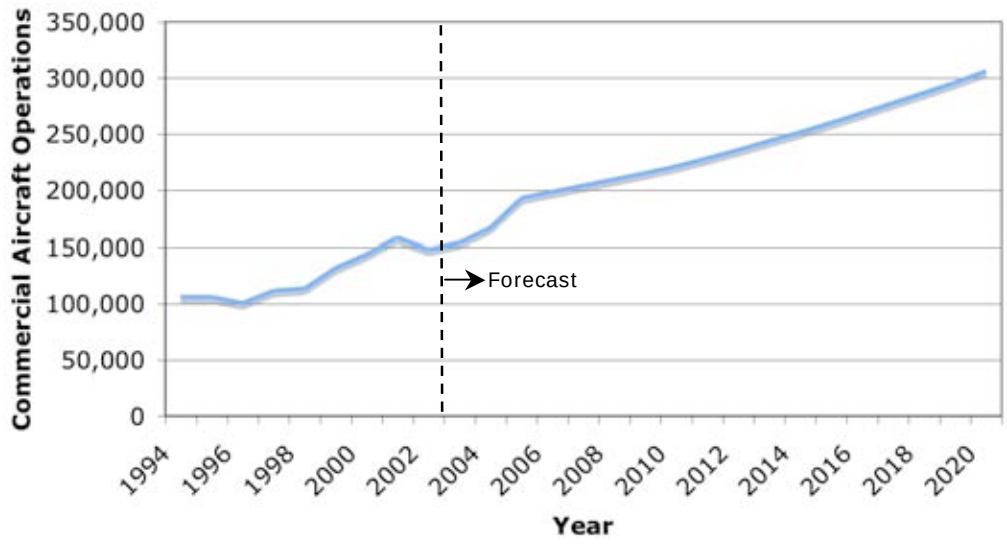
[5] U.S. Department of Transportation, Federal Aviation Administration, *FAA Terminal Area Forecast*, January 2005

To analyze aircraft emissions at FLL, the CAP team used the landing and take off (LTO) cycle as the basis of the analysis. An LTO includes the aircraft operation from the time the aircraft starts its engines, taxis to the runway, takes off, and climbs out toward cruise altitude as well as the approach, landing, and taxi in to the gate where the engines are shutdown.

Figure 4-2: FAA Forecast of FLL Operations



When quantifying aircraft emissions, engine size is significant in that larger engines typically emit more than smaller engines. Engine age and design are important since different engines have different emission characteristics. Also, different airlines use different operating procedures, which can result in different rates of emissions for similar operations. For these reasons, our analysis quantified aircraft emissions for each aircraft type (e.g., B737-300) in use at FLL by individual airlines.

Table C-1 in Appendix C presents a summary of aircraft departures at FLL by aircraft type for each airline during 2004[6]. The departures shown were used to compute emissions for each airline using FAA's Emissions and Dispersion Modeling System (EDMS). EDMS is the FAA's primary analytical tool for airport emissions inventory development and dispersion modeling and its use

[6] U.S. Department of Transportation, Bureau of Transportation Statistics, Office of Airline Information, *Airport Activity Statistics of Certificated Air Carriers*, Table 7, 12 months ending 12/31/2004.

is required by FAA for all air quality analyses for airport projects. The calculations were adjusted to reflect delay, variation in operating procedures among airlines, aircraft/engine specific operating performance, and airport operational efficiency. Table 4-1 presents a summary of air emissions by airline for 2004.

Table 4-1: Air Emissions by Airline for 2004

	Aircraft Air Emissions (lbs/yr)				
Carrier	CO	VOC	NOx	SOx	PM-2.5
AirTran Airways	91,534	1,817	95,584	8,644	172
American Airlines, Inc.	383,567	9,822	277,599	31,539	3,532
ATA Airlines	38,405	3,340	39,209	3,523	933
Continental Air Lines, Inc.	66,125	4,910	63,257	5,765	1,151
Delta Air Lines, Inc.	249,764	21,012	372,714	27,381	3,497
Federal Express Corporation	91,073	27,886	88,632	5,939	549
Gulfstream International	193,769	64,088	14,043	3,847	N/A
JetBlue Airways	109,363	1,263	147,987	14,198	1,779
Midwest Airlines, Inc.	2,771	68	3,014	322	22
Northwest Airlines, Inc.	56,915	6,206	44,011	4,941	888
Southwest Airlines Co.	378,690	33,354	191,152	21,819	2,412
Spirit Air Lines	209,274	1,171	158,279	20,472	1,268
United Air Lines, Inc.	63,564	1,726	57,640	6,305	741
United Parcel Service	6,850	580	7,516	615	108
US Airways (inc America West)	291,606	27,465	189,207	19,579	509
All Other Airlines	422,516	122,341	228,291	26,661	3,576
Total	2,564,252	325,232	1,882,551	192,906	20,965

4.2.1. Definition of Aircraft Emissions Footprint

Based on an evaluation of aircraft emissions at FLL and the importance of ozone for local air quality, the CAP team proposes the creation of two Impact Metrics, one reflecting NO_x emissions and one reflecting VOC emissions. We first considered how to represent the metric in a way to illustrate the effect of delay, best operating practices, and overall operational efficiency. As noted earlier, total emissions will inevitably grow as operations grow. Using emissions per operation would capture some of these important variables but larger aircraft generally produce more emissions than smaller aircraft. We propose using emissions per passenger, which is a measure of the environmental efficiency of moving people into and out of South Florida, which is the most fundamental purpose of FLL.

To derive emissions per passenger, we divided the annual emissions calculated for each airline by the annual passenger enplanements for each

airline. Passenger enplanements by airline were taken from the Annual Statistical Report, Fiscal Years Ended September 30, 1995 to 2004, prepared by BCAD <http://www.broward.org/airport/pdfs/2004annualstatistical.pdf>. Table 4-2 shows our calculations for NO_x and VOC emissions per passenger by airline for 2004.

Table 4-2: NO_x and VOC Emissions per Passenger at FLL for 2004

Carrier	VOC	NO_x
AirTran Airways	0.0046	0.2400
American Airlines, Inc.	0.0082	0.2321
ATA Airlines	0.0171	0.2012
Continental Air Lines, Inc.	0.0073	0.0937
Delta Air Lines, Inc.	0.0109	0.1940
Gulfstream International	0.6196	0.1358
JetBlue Airways	0.0013	0.1547
Midwest Airlines, Inc.	0.0040	0.1785
Northwest Airlines, Inc.	0.0238	0.1687
Southwest Airlines Co.	0.0287	0.1644
Spirit Air Lines	0.0014	0.1885
United Air Lines, Inc.	0.0063	0.2119
US Airways (inc America West)	0.0283	0.1950
All Other Airlines	0.1144	0.2135
Airport Average	0.0324	0.1876

On this basis, the VOC Impact Metric calculation would be as follows:

$IM_{current\ year}$ = (Current year VOC emissions/passenger)/(2004 VOC emissions/passenger)

IM_{2004} = (0.0324 lbs VOC/passenger)/(0.0324 lbs VOC/passenger) = 1.0

Similarly, the NO_x Impact Metric calculation would be as follows:

$IM_{current\ year}$ = (Current year NO_x emissions/passenger)/(2004 NO_x emissions/passenger)

IM_{2004} = (0.1876 lbs NO_x/passenger)/(0.1876 lbs NO_x/passenger) = 1.0

The CAP team recommends using the airport average Impact Metrics for VOC and NO_x when developing FLL's environmental footprint while still tracking the emissions per passenger for individual airlines, which will facilitate investigating the environmental impacts of fleet changes and changes in operating procedures.

4.3. GSE and APU

GSE and APU emissions represent approximately 15% of total NO_x emissions at FLL. Since equipment in both of these categories are used to support aircraft their use, and consequently emissions, will correlate directly to the number of aircraft operations. For this reason, emissions from GSE and APU are expected to increase in the future along with the growth in demand for air travel.

GSE are used to provide a wide variety of services to aircraft, as they are needed to move, service, load, and fuel the aircraft. Examples of GSE include baggage tractors, belt loaders, aircraft tugs, and ground power units. Different groups of GSE are required depending on a specific aircraft's needs and the airlines' operating practices.

To compute the emissions of GSE, the CAP team collected data on the makeup of GSE fleets and operating practices for the major airlines operating at FLL. The types of equipment and particularly the fuel type (e.g., gasoline, diesel, electricity) used by the equipment are significant in determining GSE emissions. Also significant is the equipment run time. The equipment used and run time varies by aircraft type as well as by airline. The GSE fleet makeup (by equipment type by fuel type by carrier) and run time for each LTO were inputs to EDMS to compute emissions. Since the GSE are used to service an aircraft during an LTO, the aircraft LTOs used to compute aircraft emissions as reported in Appendix C were the same inputs used to compute GSE emissions.

APUs are small jet engines, installed on aircraft, which are used to provide 400 Hz power and air conditioning to an aircraft when its main engines are shut down. They are often used throughout the time an aircraft is on the ground. However, some airlines plug into a 400 Hz power supply provided by the airport and ventilate and cool the aircraft using air conditioners installed at the terminal rather than use their APUs. Since the airport equipment uses electricity and is much more efficient than the APUs, the emissions are much less.

As with GSE, APU emissions are computed based on the specific equipment type used on individual aircraft and their run time. As noted, APU run time varies significantly between different airlines since some airlines choose to use gate power and air. The CAP team collected information on APU operating

practices for individual airlines at FLL as a basis for computing their emissions.

A summary of GSE and APU emissions by airline are presented in Table 4-4.

Table 4-4: Air Emissions from GSE and APU in 2004

	GSE/APU Air Emissions (lbs/yr)				
Carrier	CO	VOC	NOx	SOx	PM-2.5
AirTran Airways	33,058	2,449	14,277	2,811	238
American Airlines, Inc.	749,349	29,383	71,710	8,131	1,208
ATA Airlines	109391	4209	9480	1082	146
Continental Air Lines, Inc.	224,173	8,406	12,906	1,327	315
Delta Air Lines, Inc.	6,995	1,504	16,222	2,346	888
Federal Express Corporation	166,048	7,072	27,708	3,172	459
Gulfstream International	451,950	16,449	13,323	553	139
JetBlue Airways	590,762	21,852	41,140	3,627	725
Midwest Airlines, Inc.	205	33	284	46	18
Northwest Airlines, Inc.	4,248	498	11,546	1,424	126
Southwest Airlines Co.	21,383	2,538	24,813	4,460	732
Spirit Air Lines	486,113	19,396	40,982	5,990	1,030
United Air Lines, Inc.	4,844	560	12,780	1,583	141
United Parcel Service	2,141	194	2,355	302	18
US Airways (inc America West)	32,542	2,938	34,740	5,009	452
All Other Airlines	54,597	4,733	38,925	6,773	780
Total	2,904,741	119,765	358,914	45,825	7,177

4.3.1. Definition of GSE/APU Emissions Footprint

As with aircraft, the CAP team proposes the creation of two Impact Metrics for GSE and APU emissions, one for NO_x emissions and one for VOC emissions. We also believe it is appropriate to represent the GSE/APU Impact Metric as emissions per passenger.

To derive emissions per passenger, we divided the annual emissions calculated for each airline by the annual passenger enplanements for each airline, with enplanements coming from BCAD's Annual Statistical Report. Table 4-5 shows emissions of NO_x and VOC per passenger by airline for 2004.

On this basis, the VOC Impact Metric calculation for GSE/APU would be as follows:

$IM_{current\ year}$ = (Current year VOC emissions/passenger)/(2004 VOC emissions/passenger)

IM_{2004} = (0.0119 lbs VOC/passenger)/(0.0119 lbs VOC/passenger) = 1.0

Similarly, the NO_x Impact Metric calculation for GSE/APU would be as follows:

$IM_{current\ year}$ = (Current year NO_x emissions/passenger)/(2004 NO_x emissions/passenger)

IM_{2004} = (0.0358 lbs NO_x/passenger)/(0.0358 lbs NO_x/passenger) = 1.0

Table 4-5: GSE/APU Emissions of NO_x and VOC per Passenger at FLL for 2004

Carrier	VOC	NO_x
AirTran Airways	0.0061	0.0358
American Airlines, Inc.	0.0246	0.0600
ATA Airlines	0.0151	0.1783
Continental Air Lines, Inc.	0.0124	0.0191
Delta Air Lines, Inc.	0.0008	0.0084
Gulfstream International	0.1590	0.1288
JetBlue Airways	0.0228	0.0430
Midwest Airlines, Inc.	0.0020	0.0168
Northwest Airlines, Inc.	0.0019	0.0443
Southwest Airlines Co.	0.0022	0.0213
Spirit Air Lines	0.0231	0.0488
United Air Lines, Inc.	0.0021	0.0470
US Airways (inc America West)	0.0030	0.0358
All Other Airlines	0.0044	0.0364
Airport Average	0.0119	0.0358

The CAP team again recommends using the airport average Impact Metrics for GSE/APU VOC and NO_x when developing FLL's environmental footprint while still tracking the emissions per passenger for individual airlines, which will facilitate investigating the environmental impacts of GSE equipment changes and changes in operating procedures.

4.4. Landside Vehicles

Landside vehicles include cars, trucks, limousines, shuttle vehicles, and buses that travel to and from the airport and are certified for highway travel. As shown in Figure 4-1, landside vehicles represent about 5% of emissions related to airport activity. The CAP team's analysis of landside vehicle emissions focuses on those segments that generate the most air pollution at FLL and where emissions reductions are most achievable. Based upon sheer volume, privately owned passenger vehicles are the largest contributor to landside vehicle emissions. However, the opportunities for Broward County to reduce these impacts are limited and largely confined to providing alternative transit. For that reason our focus is on fleets that are owned, operated, or

leased by Broward County, or that service FLL through permit or licensing agreements. The two dominant fleets that meet these criteria are buses owned, operated, contracted, or leased by Broward County and the taxis that serve the facility.

Air pollutants from motor vehicles results from fuel combustion emitted through the tailpipe (mostly CO and NO_x with minor emissions of VOCs). Also, evaporative emissions of VOCs result from on-board fuel storage and refueling. We estimate that about 50% of total landside vehicle traffic is represented by private cars, about 25% by rental cars, 9% by taxis, 8% by buses, and 6% by airport shuttles.[7] It is significant that in contrast to airside sources, these emissions occur at ground level and at passenger loading and unloading sites, maximizing public exposure. As with other airport emission sources, we assume emissions from motor vehicles increases with the increase in passenger enplanements.

4.4.1. FLL Fleets

Twenty-seven, forty-foot long diesel-powered buses currently serve the Rental Car Center. The remote parking and employee parking lots are served by an additional fifteen, forty-foot long diesel buses and ten thirty-foot long diesel buses. FLL also operates three diesel trams that shuttle passengers from parking garages to the terminal areas.

To help reduce emissions from these vehicles, FLL will replace five of its thirty-foot diesel buses with state-of-the-art hybrid electric-diesel buses by the end of 2005. Based upon operating experience of these hybrids, FLL will then decide whether to expand this changeover to additional buses. Additionally, effective October 1, 2005, all of ShuttlePort's (52) diesel buses and FLL's three diesel trams began running on 20% biodiesel fuel (B-20). This fuel emits 15% less climate change-related CO_2 in a full life cycle assessment. B-20 also emits about 20% less CO, 20% fewer VOCs, and 12% less particulate matter. It also results in a 12-20% reduction in air toxics and a 20% reduction in mutaginicity while increasing NO_x by 2%. Biodiesel is non-

[7] *Fort Lauderdale-Hollywood International Airport Departing Passenger Survey 2000,* PMG Associates, Inc

toxic and degrades four times faster than conventional diesel, which reduces the impact of spills or leaks.[8]

The environmental benefits of converting to hybrid and biodiesel fuel vehicles are magnified by the long traditional operational life of the more traditional diesel vehicles and the extensive miles they travel. ShuttlePort buses make approximately fifty thousand round-trips a month with almost eight thousand additional round trips a month generated by the garage diesel trams.

Employee-Owned Vehicles - During an average day approximately 2,400 employee vehicles are parked in the lot during the peak noon period. Between 3,200 and 3.400 employees enter or exit the parking lot on an average day. During an average month, this means that employee driven vehicles generate between eighty and one hundred thousand vehicle trips.

Taxis - There are approximately eight hundred and fifty taxis permitted to serve Broward County. About six hundred of these taxis also hold permits to serve FLL. These FLL-permitted taxis are estimated to generate between thirty-seven thousand and forty-seven thousand vehicle trips on a monthly basis.

Broward County Bus Transit - The Broward County Mass Transit Department operates a transit route that is responsible for approximately 3,100 to 3,500 trips through FLL on a monthly basis. These vehicles are diesel powered with some in operation since 1990. The Department is planning to replace some of these vehicles with hybrid electric-diesel buses in 2006, although the numbers of vehicles to be replaced and their routes have not yet been determined.

4.4.2. Definition of Landside Vehicle Emissions Footprint

While there is a lack of data on vehicle types, trips, fuels, and similar landside vehicle information, the information is sufficient to enable the CAP team to determine those sectors that generate the most pollution and identify where reductions will be most significant and can be most easily affected by local initiatives.

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[8] US Environmental Protection Agency, Draft Technical Report EPA420-P-02-001, *A Comprehensive Analysis of Biodiesel Impacts on Exhaust Emissions*.

Privately owned vehicles that are discharging and loading passengers or parking at the airport represent the largest single source of motor vehicle pollution based upon their sheer numbers. In mid-April 2005, terminal area traffic counts found an average of between two hundred thousand and two hundred and fifty thousand vehicle trips per day. Practical short-term strategies for reducing this traffic are, however, limited by the area-wide dependence on vehicle travel and the implications of discouraging single occupant vehicle travel by airline passengers. Therefore, FLL fleets, employee owned vehicles, taxicabs, and transit buses lend the greatest opportunities for obtaining significant and near-term reductions in landside vehicle emissions.

The Environmental Impact Statement for FLL's proposed expansion will include a detailed inventory of landside vehicle emissions. This data and analysis may prove useful in more accurately calculating the degree of improvement that occurs from voluntary programs that the CAP team identifies.

To determine the landside footprint, the CAP team utilized data provided by Landrum and Brown in conducting their 2006 EIS analysis associated with FLL's capacity enhancement program. This analysis was based upon FAA's Emissions and Dispersion Modeling System (EDMS) Version 4.4. This analysis found that "roadways and parking" generated 366,000 pounds per year of NO_x emissions and 490,000 pounds per year of VOC emissions. This represents about 5% of total NO_x emissions at FLL and 24% of total VOC emissions.

Vehicle trips and concomitant emissions are directly related to the number of people that use the airport. To calculate emissions per passenger we divided the mass of NO_x and VOC emissions generated by the annual enplanements at FLL.

Based upon these assumptions, the mass of NO_x and VOC generated at FLL is .037 pounds/passenger and 0.049 pounds/passenger respectively. This is calculated by dividing the mass of NO_x and VOC generated by the 10,037,499 enplanements for 2004.

5. Noise

5.1. Background

To evaluate FLL noise impact the CAP team reviewed current noise contours, produced by the Integrated Noise Model (INM), reviewed recent Part 150 contractor results, and reviewed other relevant information. This allowed us to develop a baseline noise footprint of the airport that can be used to evaluate possible future enhancements and possibly to be able to compare the performance of FLL to other airports.

5.1.1 Aircraft Noise Analysis

INM 6.1 was used to produce noise exposure maps presenting contours of day/night average (Ldn) noise levels. The ranges reported for the noise exposures are Ldn over 75 dB (A), Ldn 70-75 dB(A), and Ldn 65-70 dB(A).

The following are important considerations to recognize during modeling: 1) Ldn values are affected by aviation activity levels (forecast number of aircraft operations, type of aircraft, times of operation, aircraft flight tracks), 2) aircraft acoustical performance (i.e., stage 3) has an impact, 3) Ldn is an acoustic average value of noise levels, and 4) flight tracks defined during modeling are narrow lines used to represent a much wider band of actual flight tracks, resulting in variations in the noise levels in some cases from that modeled.

5.1.2 Noise Compatibility Program

FLL has had a noise compatibility program underway since the last Part 150 Noise Compatibility Study in 1994. The following are important components of their program.

Preferential Flight tracks: FLL plans to continue to use the BCAD informal preferential flight track program.

Noise Abatement Departure Procedure: FLL uses the FAA standard noise abatement profile. The departure procedures for FLL are:

- Departures on 9L, 9R, 27R, and 27L – Remain on runway heading until 3,000 feet or 3 miles
- Departures on 13 – Turn left heading 090 degrees or as soon as speed and altitude permit, maintain 090 degrees until 3,000 feet or 3 miles

- Departures on 31 – Turn left heading 270 degrees as soon as speed and altitude permit, maintain heading of 270º until 3,000 feet or 3 miles.

Preferential Runway Use: Runway 9R/27L is closed between 10 p.m. and 7 a.m. for noise abatement and use of the runway is restricted to aircraft weighing less than 58,000 pounds; easterly flow operations are maximized; cargo aircraft operation is concentrated on Runway 9L/27R, which is the preferred runway and is the calm runway. All turbo jet arrivals and departures use this runway. Night-time jet operation has been maximized on Runway 9L/27R.

Airport Noise Monitoring Program: A permanent noise and operation monitoring system (ANOMS) was installed. The system includes ten remote monitoring terminals (RMT) located in different residential areas within the airport environs. The system was used to (1) identify changes in noise level, (2) verify the ongoing validity of noise exposure contours, (3) evaluate compliance with noise abatement procedures, (4) identify the need for amendment to existing procedures, (5) provide information to airport users to improve the effectiveness of abatement procedures, and (6) efficiently provide information to the public on a regular as well as on-demand basis. This program permitted time and location for aircraft engine maintenance run-ups to be determined and engine maintenance run-ups were prohibited between 11 p.m. and 7 a.m.

Test of Noise Abatement Departure Profiles (NADP): The NADP are intended to provide a standardized approach to noise abatement flight procedures at individual airports. NADP benefits require airlines serving the airport to use either “close-in” or “distant” procedures, depending on the greatest noise benefits for individual aircraft types being operated from the different runways at the airport.

Relocate Engine Maintenance Run-up Facility: Engine run up is conducted on runway between taxiways E2 and E3 as stated in the “Idle Power and Full Power Engine Run Rules” dated November 15, 1996 and revised May 2001.

Construct New Noise Berms or Barriers: Based on a feasibility report prepared by HMMH, Inc., it was concluded, based on the minimal benefits and the high cost associated with the location studied, that this type of noise abatement should not be considered.

Acquisition of Real Property by "Condemnation": BCAD has the ability to acquire land based on "Acquisition (condemnation)" instead of "Acquisition (Homeowner's request)." However, this is not a desired approach by BCAD and neither BCAD nor BCC has proposed the use of condemnation to acquire additional property for noise purposes.

Easement Acquisition: BCAD developed an avigation easement and voluntary sales assistance program for eligible property owners based on the 1997 65-70 DNL contour. Eligible property owners were offered $2,400 as a nominal fee for the avigation easement. The program began in June 2000 and was concluded in June 2003.

Voluntary Sales Assistance: BCAD assisted eligible single-home owners to sell their property and relocate from the 1997 Ldn 65-70 area. The program was completed in 2003.

Soundproofing: BCAD completed the insulation of the Wesley Chapel church and offered to sound insulate the Edgewater Elementary School and the Church of Resurrection as required to provide interior sound level of Ldn 45 or less. Soundproofing of both facilities has been refused.

5.1.3 Noise Contour Development

BCAD prepares annual noise contours to monitor the extent of noise exposure on a continuing basis. The Airport Noise Abatement Committee (ANAC) reviews and interprets the contours. The contours are prepared in a manner consistent with Part 150 Noise Exposure Map requirements. The latest 2003 Day-Night sound level contours developed by HMMH, Inc. were released on July 2004.

<u>General Notes from 2003 Day-Night Average Sound Level (Ldn) Study:</u>

5.1.3.1 Ldn was estimated using the FAA's Integrated Noise Model (INM) version 6.1, which was used to prepare the 2003 contours.

5.1.3.2 Based on FAA Air Traffic Control Tower (ATCT) 2003 traffic counts, overall operations at FLL increased by 2.5% over the previous year 2002. Commercial air traffic carrier service accounted for most of the increase while air taxi operation also increased. General Aviation and military aircraft remained relatively constant.

5.1.3.3 The fleet mix incorporates several different aircraft types. The air carrier group includes large jets operated by commercial passenger service and freight carrier operators. The air taxi/commuter group is comprised primarily of commuter and charter operators, typically flying turboprop aircraft, but including some regional jet aircraft. The military category contains both propeller and jet aircraft. The general aviation category contains the remaining operations. General aviation operations include jet and single- and twin-engine propeller driven aircraft.

5.1.3.4 The Day/Night split of activity was modeled assuming all military operations and general aviation operations occurred during the daytime. Itinerant aviation operations were split using percentages calculated from the full year's sample of ANOMS data and were:

- Jet arrivals: 90.6% during the day, 9.4% at night
- Jet departures: 92.4% during the day, 7.6% at night
- Non-jet arrivals: 95.9% during the day, 4.1% at night
- Non-jet departures: 95.7% during the day, 4.3% at night
- Run-up activity and runway utilization were monitored.

It was calculated that the 2003 contours were nearly identical to those for 2002 even though the overall activity at FLL increased by 7,267 operations (approximately 20 per day) or 2.6% from 2002 to 2003. This increase in operations was offset by continued reductions in the percentage of operations by older, noisier recertified aircraft.

5.1.4 Permanent Noise and Operation Monitoring

BCAD operates an automated system (ANOMS - Airport Noise & Operations Monitoring System) to monitor, correlate, and analyze aircraft operations, noise levels, weather conditions, and complaints. The system provides actionable information about individual aircraft operations. In addition, it evaluates noise on a flight-by-flight basis and provides cumulative information for identifying trends. System features include ten permanent noise monitors, a portable monitor, flight track monitor, and altitude monitor.

The Permanent Noise Monitor locations include:

1) Fort Lauderdale:

- 4548 SW 37th Avenue,
- 4609 SW 28th Avenue,
- 1021 SW, 32nd Court,
- 1750 SW 32nd Street, and
- 3411 SW 27th Street.

2) Dania Beach:

- 805-B NW 13th Avenue, and
- 325 NE 3rd Avenue.

3) Davie:

- 3900 SW 100th Avenue, and
- 3640 SW 55th Avenue

The most recent data are for 2003 as published in *Fort Lauderdale - Hollywood International Airport 2003 Day-Night Average Sound Level Contours,* July 2004. The data are for 8 monitoring locations that were operating throughout the year.

Table 5-1: Annual Noise Monitoring Data for 2003

Remote Monitoring Locations*	Measured Aircraft Ldn dB(A)
1	64
2	57
3	58
4	53
5	54
6	58
7	60
8	56
Overall Logarithmic Average	58.8

*Information only available for eight stations

5.1.5 Informal Runway Use Program

The Informal Runway Use Program is an approved runway use program that does not require a letter of understanding, and participation in the program is voluntary for aircraft operators/pilots. The programs included are:

Preferential runway use: Runway 9L is the preferred runway, and is the calm wind runway, Runway 9R/27L is closed between 10 p.m. and 7 a.m.

Helicopter arrival and departure procedures: East-west between the parallel runways 9L/27R and 9R/27L.

Operational safety criteria: No braking effectiveness less than good and the crosswind component for selected runway must not be greater than 20 knots.

5.1.6 The Noise Abatement Procedures

BCAD offers a voluntary program of operational noise abatement measures for all turbojet aircraft operators/pilots (regardless of weight). These procedures are:

- All turbojet aircraft are requested to use Runway 9L/27R for noise abatement purposes.
- Runway 9R/27L is restricted to aircraft weighing less than 58,000 pounds.
- No turns on departure below 400'.
- Engine maintenance run-ups are prohibited from 11:00 p.m. to 7:00 a.m.
- No air carrier and no aircraft training from 11:00 p.m. to 7:00 a.m.
- No jet aircraft training in excess of 60,000 pounds maximum takeoff weight.
- Runway 9R/27L is closed from 10:00 p.m. to 7:00 a.m. for noise abatement purposes.

5.1.7 Full Power & Idle Power Engine Run-up Procedures

BCAD established procedures for tenant airlines and ground handlers to perform aircraft idle power and full power engine runs for maintenance purposes such as fuel leak check, oil and hydraulic filter inspection/replacement, component replacement, engine overhaul, etc.

Full Power Engine Runs Procedures:

- Engine run shall not be positioned for run-up so that engine blast shall be directed at spectators, personnel, hangars, shops or other vehicles.
- Aircraft shall not taxi behind other aircraft in the process of engine run-up.
- All run-ups will be conducted in run-up designated areas.
- Engine maintenance run-up will be conducted at designated locations and shall not be conducted between 11 p.m. and 7 a.m.
- All full power engine run-up maintenance will be conducted on Runway 13/31 (between E2 and E3).

Idle Power Engine Runs Procedures:

- Idle power engines will be allowed at all aircraft gates and ramp between the hours of 7 a.m. and 11 p.m.
- Any requests for engine runs at the gate that will exceed an idle power setting must be approved on a case-by-case basis.

5.2. Definition of Noise Footprint

The impact on the local community is the most important delineator for noise control. Based on the independent variables described above, community noise impact, and the results from the abatement measures, a noise footprint Impact Metric can be quantified based on three key parameters. These are:

- The number of residences within the 65 dB(A): Ldn contour
- The area of the land within the 65 dB(A): Ldn contour
- Noise levels measured at the ten monitoring locations.

These three measures are analytical and can be derived using detailed modeling and evaluation of measurement data. The third variable, measured noise level, is important because it does not rely on modeling or long-term averaging. The CAP team proposes that each parameter be weighted equally and used as a three-prong indicator of the changes in noise impact on the community for FLL. The coefficients in the impact metric equation are derived to weight each variable equally. This leads to a predictive model that permits a quick review of the impact that any mitigation measures would provide. The suggested format for the noise Impact Metric (IM) is:

$$IM_{\text{current year}} = [0.333 * (\text{\# of residences above 65 dB(A): Ldn}) + 0.333 * (\text{land area within 65 dB(A): Ldn contour}) + 0.033 * (\Sigma_{1\text{-}10}\text{FLL noise monitors: Ldn})/10]/IM_{\text{Base year}}$$

Using the year 2005 as a base case the metric can be normalized so that changes in future years can easily be calculated and used to judge improvement or additional need. The resulting Impact Metric would be:

$IM_{2005} = (IM_{2005}) / (IM_{Base\ year}) = 1.0$

A future value greater than 1 indicates degradation from the current soundscape. A value less than 1 would indicate improvement in noise mitigation methods implemented or a possible success for those being considered.

Strong consideration was also given to weighting of these parameters by operational data, primarily for commercial air carriers. In the end this was not seen as desirable since the overall measures of impact should not change even if operations increase. In other words, increased operations should not increase impacts since improvements in engine and airframe technology plus initiatives in the Noise Compatibility Program should allow the airport to mitigate impacts, within reasonable, expected limits. However, there are physical limits to the benefits expected in technology improvements. Also, many additional parameters were investigated and could easily be added into the format if desired. For example, the greatest noise level observed at each monitoring station. These have not been added at this time because the true benefit of additional parameters is thought to be minimal in the analysis.

The CAP team feels that this approach will represent a very easy to understand and effective noise metric that can be used as a indicator of the change in noise impacts on the surrounding community.

5.3. Evaluation of the Metric

To evaluate the structure of the noise Impact Metric, the CAP team evaluated the soundscape at two other airports. Palm Beach International (PBI) was selected because of its close proximity and similar mission. Tampa International Airport (TPA) was selected because of the growth now occurring and its similarities in operations to FLL.

Information gathered from each of these airports is summarized in this section.

The basis of the comparison included the following points:

Land use Compatibility - The number of people residing within a sound level contour higher than Ldn of 65dB(A) varies between these 3 airports. Table 5-2 lists the number of homes above 65 dB(A) for the three airports.

Table 5-2: Comparison of Homes Within the 65 dB(A); Ldn Contour

	FLL		TPA		PBI	
	2000	2005	2000	2005	2003	2004
65-70 dB	70	10	172	25	2,725	2,770
70-75 dB	0	0	0	0	18	20

Supplemental Draft Environmental Impact Statement, February 2002 and *Estimated Impact Summary, FAR Part 150 Noise Compatibility Study Update*, February 21, 2007.

It should be noted that the years vary as a result of available data and the timing of the different programs. Also, even thought a significant effort is been made at FLL to reduce noise, more homes are expected to be impacted in the future as the number of flights increase. The Impact Metric discussed in the previous section includes an input for the number of homes above 65 dB(A) during future development and will provide a monitoring method for this impact, which, through careful planning and abatement considerations, may be reduced in the future.

Air Traffic Volume - Table 5-3 compares the traffic volume for each of three airports for the years 2000, 2004, and 2005 (up to July). For each airport, the volume is separated into sub-categories: Air Carrier (AC), Air Taxi/Commuter (AT), General Aviation (GA), and Military (MI). These figures are based on the yearly FAA Air Traffic Control Tower (ATCT). The table indicates that the total air traffic volume at FLL is greater than TPA, and much higher than PBI. Moreover, it should be noted that PBI air traffic volume has a substantial amount of GA volume, which by far exceeds those at FLL and TPA. This makes the noise mitigation issue more difficult at FLL.

Table 5-3: Comparison of Air Traffic Volumes

		ITINERANT				LOCAL		
LOC ID	DATE	AC	AT	GA	MIL	GA	MIL	TOTAL
FLL	2005	110,956	50,618	45,240	213	106	0	207,133
PBI	2005	37,995	24,014	60,840	607	2,082	30	125,568
TPA	2005	94,765	40,028	25,172	285	387	0	160,637
FLL	2004	173,540	68,495	72,568	629	98	6	315,336
PBI	2004	58,875	39,071	96,377	1,207	3,484	94	199,108
TPA	2004	148,102	55,486	40,560	601	526	0	245,275
FLL	2000	148,384	55,519	86,892	588	971	108	292,462
PBI	2000	55,476	34,889	114,436	1,028	8,383	115	214,327
TPA	2000	148,864	81,988	46,134	814	832	0	278,632

FAA Air Traffic Activity System (ATADS) http://www.apo.data.faa.gov/

Noise Compatibility Program - The following is a brief description of the noise abatement procedures used at each of the three airports:

1. Fort Lauderdale-Hollywood Airport (based on 1994 Part 150 update)

- Restriction on aircraft engines run-ups between 11:00 p.m. and 7 a.m.
- Preferential Flight tracks; continue to use the BCAD informal preferential flight track program.
- Preferential Runway Use, minimize use of Runway 9R/27L by Stage 2 aircraft, closing of Runway 9R/27L between the hours of 10 p.m. and 7 a.m., maximize east flow operations, concentrate cargo aircraft operation on Runway 9L/27R, and maximize night-time jet operation on Runway 9L/27R.
- Airport Noise Monitoring Program; permanent noise and operation monitoring system (ANOMS) were installed.
- Noise Abatement Departure Profiles (NADP); the NADP are intended to provide a standardized approach to noise abatement flight procedures at individual airports. NADP benefits would be to require airlines serving the airport to use either “close-in” or “distant” procedure, depending on the greatest noise benefits for individual aircraft types being operated from the different runways at the airport

- Relocate Engine Maintenance Run-up Facility; the engine maintenance run-ups facility will be relocated from its present location on Runway 13/31 to the east end of Runway 9L/27R and engine noise at the new location will be directed toward the east.
- Sound insulation.
- Easement acquisition.
- Voluntary sales assistance.

2. Tampa International Airport (based on 2000 update part 150)

- Establish preferential runway program; maximize daytime (6:00 a.m. to midnight) south flow preferential, adopt preferential order of runway use, and extend night (midnight to 6:00 a.m.) preference for 36L arrivals and 18R departures.
- Noise abatement flight paths for turbojet aircraft.
- Nighttime bi-directional runway use.
- Encourage operators of Turbojet aircraft to use recommended noise abatement arrival procedure.
- Recommend Turbojets use “distant” Noise Abatement Departure Procedure (NADP) profile.
- An engine maintenance runups enclosure will be constructed at the north end of the existing Delta Air Lines maintenance ramp, with the opening oriented to the south.
- Augment vegetation noise barrier along the western perimeter of the airport to increase its noise attenuation qualities.
- Establish a helipad on the east side of the Airport to help separate helicopter traffic and reduce unnecessary overflight of areas adjacent to the airport.
- Measures involve zoning and overlay zoning.
- Sound insulation.
- Purchase of Avigation Easement
- Public information program and comprehensive planning.

3. Palm Beach International Airport (based on 1994 part 150)

- Restriction on aircraft engines runups between 11:00 p.m. and 7 a.m.
- Runway use plan; runway is assigned based on aircraft destination.
- EPNL noise limit does not exceed 108 EPN dB.
- Environmental operating fees; collecting of environmental operating fees based on part 36 stage of the aircraft, type of operation, and time of day.
- Noise abatement flight paths for Turbojet aircraft.

- Preferential runway use program; Turbojet departures with southern departures will be assigned Runway 13, Corporate jets departures will be assigned Runway 31 when in the west flow and during the hours of 10 p.m. and 10 a.m. Runway 27R will be the preferred runway.
- Noise abatement departures procedures (NADP); two types close-in and distant.
- Maintenance runups procedures.
- Sound insulation.
- Easement acquisition.
- Transaction assistance.
- Land acquisition and relocation.
- Some other measures involve comprehensive planning, zoning, real estate disclosure, and building code revision.

Evaluating the Impact Metric

As can be seen from the previous section, abatement measures applied at the airports are quite similar. Accordingly, based on the similar noise control strategies, the operational data, and the location of the airports, a comparison of the three airports would seem to be justified.

Using two parameters, the size of the land area inside the 65 dB(A): Ldn contour and the number of residences within this contour makes an effective ways to compare the soundscape for the surrounding area.

The area of the 65 dB(A): Ldn contours were determined from the noise contours maps provided by each airport. Table 5-4 lists the area for each airport. Of note is that these values are not directly comparable due to the date differences of reported information.

Table 5-4: Area Within the 65 dB(A): Ldn Contour Zone (Acres)

FLL		TPA		PBI	
2000	2005	2000	2005	1998	2004
3,519	2,560	3,740	2,886	610	1,529

Supplemental Draft Environmental Impact Statement, February 2002 and *Estimated Impact Summary, FAR Part 150 Noise Compatibility Study Update*, February 21, 2007

Additionally, it should be noted that changes, such as differences in flight procedures and other abatement measures are different for each airport. Land use changes have also occurred at the airports. The result is that a direct comparison cannot be accomplished. FLL must continue to explore

abatement measures and innovative measures to reduce the noise impact, which could result in a smaller area of impact in the future.

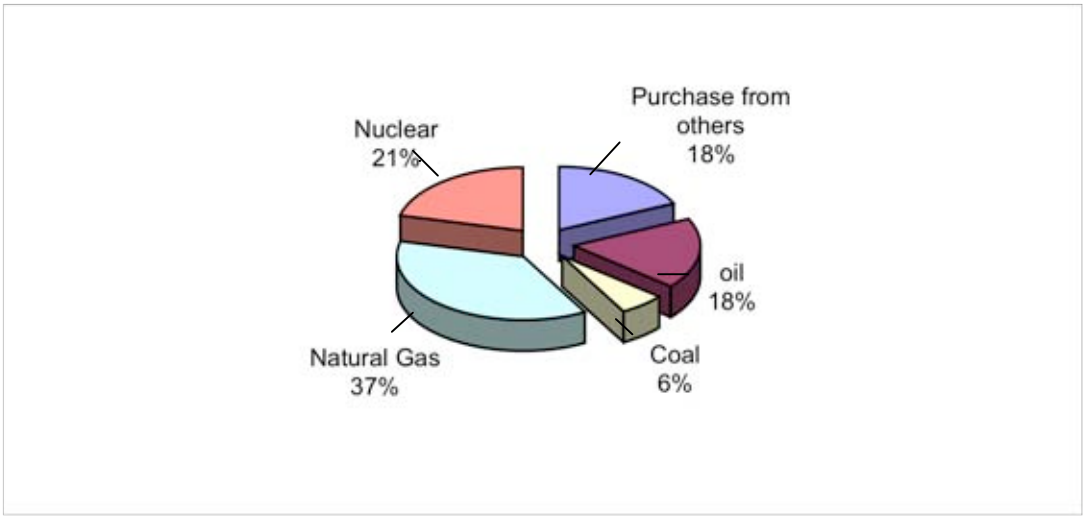
6. Electric Power

6.1. Introduction

This section describes electric power use at FLL with a goal of determining the baseline energy use at FLL. The reason for understanding electricity use at the airport is that power generation emits pollutants into the air. For this report, we use a regional value of the emissions per Kilowatt Hour (KWH) of electricity produced at the power plant to compute the environmental impact due to electric power consumption at the airport. Relative to fuel consumption at the airport, however, electricity use is very clean.

The airport is supplied electricity from Florida Power Light (FPL), the local electric utility. The utility generates electricity at several power plants in the South Florida area. The power plants use fuels ranging from nuclear to natural gas and coal. Figure 6-1 shows the typical fuel mix for FPL.

Figure 6-1: Typical FPL Fuel Mix



From the power plant the electricity is distributed along transmission lines and ultimately to its customers such as FLL. The electricity is supplied to the airport at many different service points. This is due to the evolution of the airport. As the airport expanded, new electric services were added to meet the needs. Many of these electric service points are individually metered and billed. The utility submits bills to the airport for each meter each month.

To determine the electricity use, the CAP team met with BCAD personnel and reviewed site plans. The terminals, concourses, and parking garages were

identified by name and location. Next, we reviewed the electric accounts and identified the electric account that was associated with each building. We discussed the general usage and operating parameters of each facility. Using the account numbers and other information provided by BCAD staff, we were able to retrieve the electricity consumption for the previous 24 months. This history includes the electric and associated cost.

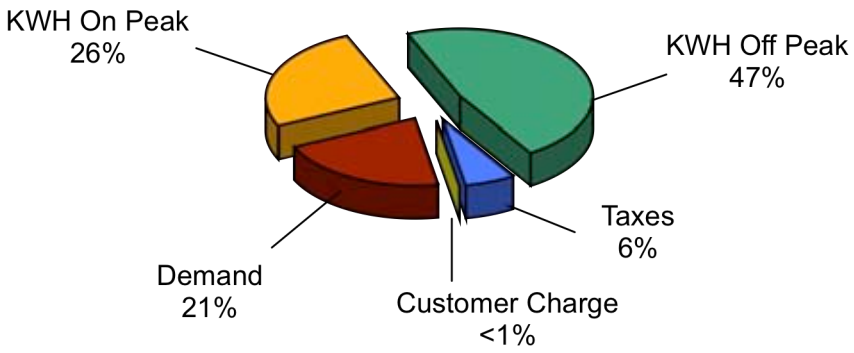
6.2. Utility Data Analysis

The electric bills include several components, which make up the total charge for electricity purchases. The first component of the bill is the electric *demand*. In general, demand is recorded as the largest amount of electricity required at an electric meter for any consecutive rolling 15-minute period in a given month. While demand is a widely used standard billing component, it is not generally used to calculate emissions generated as a result of energy usage at a specific facility. The reason for this is a term called *coincidental peak*. This refers to the fact that all buildings reach their peak demand for the month at different times of the day and different days of the month. For this reason, it is highly unlikely that the peak demand at any meter at FLL occurs at the same time the peak demand is seen at a power generating plant. For this reason, our analysis focuses on the component of *Kilowatt Hour or (KWH)*. Demand reduction is always important, however, because higher demand levels across the state makes it necessary for the utility to build more/bigger power plants.

In general, one KWH is generated every time a one-kilowatt load is on for one hour. It might be easier described as the amount of electricity used over time. For determining the environmental impact at FLL, we will not be concerned about on-peak and off-peak consumption.

Figure 6-2 identifies the cost components of a typical bill and illustrates the portion of the bill associated with each. This is included to give the reader a better understanding of electric utility billing, which is further described below.

Figure 6-2: Utility Bill Breakdown



The following is data from an FLL electricity bill.

Billing for Electric Use on Rate:GSLDT-1
GENERAL SVC LRG DEMAND TIME OF USE

FPL ACC# 06634-10553

Electric Service Amount	35,343.98**
Gross Receipts Tax Increase	362.49
Franchise Charge	1,928.15
Current Electric Charges	37,634.62

Meter Reading - Meter RV8907H

KWH Used	514000
On-Peak KWH Used	144096
Off-Peak KWH Used	369904
On-Peak Demand	931
Maximum Demand	931

Energy Usage

	Last Year	This Year
KWH This Month	529600	514000
Service Days	32	30
KWH/Day	16550	17133
On-Peak	$0.024360 per KWH	
Off-Peak	$0.009450 per KWH	
Fuel Charge:		
On-Peak	$0.042500 per KWH	
Off-Peak	$0.038960 per KWH	

```
Demand Charge:     $8.34 per KW
```

From the electric bill one can see the highest demand for the billing period was 931. On this bill, the highest demand during the month occurred during the utility's on-peak period. The on-peak and off-peak periods will be discussed below. As part of the baseline data, we track peak demand for future comparison. The bill component we focus on is the KWH consumption. The consumption for this billing period was 514,000 KWH. The utility company presents consumption for the same month in the prior year for comparison. The utility company also divides the consumption by the number of days in a billing period and provides the average consumption per day for the month. As shown in the sample bill, the KWH consumption that month was less than the prior year. However, this is the result of a different billing period. The average KWH per day was higher during the month of the bill.

6.3. Rate Structures

The rate structure is the cost the utility company applies to the billable components. For example, the first component to the utility bill is the fixed customer charge. This is the base fee the customer is charged each month. This fee varies depending on the rate structure. The two rate structures found most often at FLL are General Service Large Demand (GSLD) and Time of Use (TOU). The major difference in these two rates is as follows:

- The GSLD rate has a fixed charge for the maximum demand during the billing period and a fixed cost for each KWH consumed regardless of the time of day the actual consumption occurred.
- The TOU rate has a time of day component in the billing. The customer is charged for the maximum demand that was recorded during the on-peak hours. This may or may not be the highest peak recorded during the month. In addition, the on-peak KWH charges are billed at a higher rate than the KWH consumed during the off-peak hours. The sample bill included above used the TOU rate.

The TOU rate structure encourages facility managers to shift usage to off-peak hours if possible. While this is not possible for everyone, an opportunity exists for facilities such as FLL to save money by simple taking advantage of the lower rate during off-peak hours.

There is also a component of utility usage called *load factor*. In general, load factor is a calculated percentage value that determines the amount of electric load that is consumed every day of the billing period and compares it to the

calculated maximum using the maximum demand times total hours in the billing period. In general, if an account has a load factor of 75% or greater for at least 6 months of the year, the TOU rate will be less expensive. While these are general rules of thumb, a financial analysis using the actual rates charged by the local utility is needed to verify the proper rate structure.

The TOU rate was actually developed to reward utility accounts that could shift load and consumption to off-peak hours. While this does not actually "save" electricity or reduce emissions, the result of this rate could save money. While our focus is emissions, cost savings are almost always beneficial and could be re-invested into technology or equipment that could reduce consumption and ultimately reduce emissions.

Table E-1 in Appendix E presents a summary of each major electric account. The top half of the chart contains the account name and monthly billing history for each account. The first line on the bottom half of the chart contains the account number. This is helpful when retrieving billing and consumption information from the local utility company. The second line on this part of the graph contains the actual electric meter number. This number can be found on the face of the meter. The meter number is helpful in identifying meters in the field. This is especially helpful at locations such as FLL where a single site has a large number of electric meters and accounts. The next line on the chart contains the total KWH consumed over the previous 12 months. The next line contains the account average load factor over the 12-month period. The load factor for most of these meters is high (between 77-89%). This may present FLL with the opportunity to reduce load during low traffic hours (i.e. between 12:00 AM – 5:00 AM) (e.g., lighting control opportunities, reduction of outside air during off-peak hours, and backing-off variable frequency drives, (VFD)). As discussed earlier, the load factor is helpful in determining the rate schedule that best fits the account. The remaining lines list costs per unit for various components of the bill.

6.4. Emissions Impact

Table 6-2 presents data showing the equivalent emissions from electric power production. The emissions are associated with the KWHs consumed and are based on FPL's fuel mix.

Table 6-2: Pollution Equivalence Table

Pollution Equivalent for Each 10,000 KWH Consumption			
Pollutant	Emission Factor	Pollutant Equivalent	
CO_2	0.67	3.35	Tons of CO_2
SO_2	1.43	31.5	Pounds of SO_2
NO_x	0.60	13.3	Pounds of NO_2

For every 10,000 KWHs saved, the environmental benefit is equal to reducing the same level of emissions shown in Table 6-2.

As previously noted, the 12 major accounts at the airport consumed approximately 83,563,928 KWH over the 12-month study period. This results in the emissions identified in Table 6-3.

Table 6-3: FLL Pollution Equivalence

Pollution Equivalent for 83,563,928 KWH Consumption			
Pollutant	Emission Factor	Pollutant Equivalent	
CO_2	0.67	28,664	Tons of CO_2
SO_2	1.43	134	Tons of SO_2
NO_x	0.60	56	Tons of NO_x

6.5. Electricity Consumption Patterns

Electricity is the primary utility used at FLL. Lighting and air conditioning systems are the two services using the majority of the electricity. The lighting systems vary depending on the areas being served, however, the majority of the lighting systems in the terminals are fluorescent. Fluorescent lighting systems are common in public facilities such as airports. This type of lighting is fairly efficient and relatively easy to maintain. The parking garages and other areas also use high intensity discharge (HID) fixtures. These fixtures are generally used in large areas where the light levels are not as high. These fixtures are also used in areas that have high ceilings. In general, in air-conditioned buildings at the airport, lighting consumes 30 to 35 percent of the

electricity. In non air-conditioned areas and parking garages, lighting consumes as much as 95 percent of the electricity.

The majority of the cooling for the air-conditioning system is generated in large mechanical chiller plants. These plants represent a substantial use of electricity. In a terminal or concourse cooling and ventilation motors consume between 30 and 35 percent of the electricity. The remaining electricity at the airport is consumed by computer systems, including flight information systems, plug loads, exterior lighting, and aircraft systems requiring 400 Hz power while parked at the gate.

Figure 6-3: Monthly Electricity Cost at FLL (2004-2005)

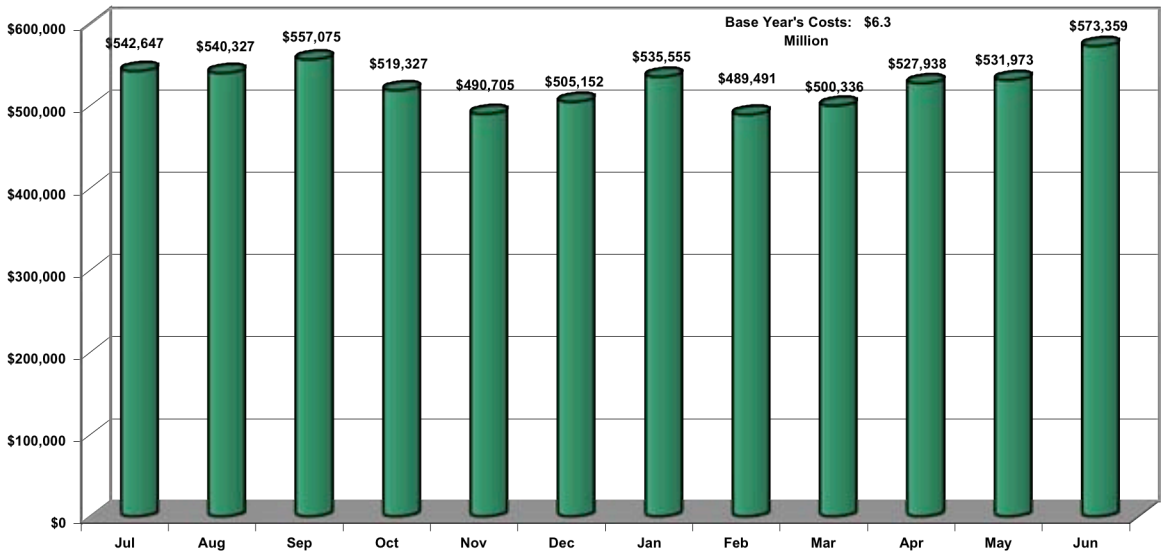


Figure 6-3 shows the monthly cost of electricity at FLL for 12 months. In South Florida, we would expect the usage to take the shape of a sine wave with the lowest usage in January or February and the highest in August-September. This is primarily due to the presence of *base loads*. Base loads are electric loads that are present regardless of other factors that might influence electric consumption. For example, the lights need to be on regardless of how many flights arrive and depart daily. The same applies for flight information systems, computers, exhaust fans, and other equipment that operates each day. These loads typically remain steady regardless of the number of passengers, the outside temperature, or other factors.

Figure 6-4 shows electricity consumption for Concourse C. Electricity consumption goes up as the temperature goes up. In any air-conditioned building, electricity consumption is *temperature sensitive*. For this reason, in South Florida we expect electricity consumption to be highest in August and September and lowest in January and February. This assumes that no other factors affect the consumption more than the outside temperature.

Figure 6-4: Temperature Sensitive Power Consumption

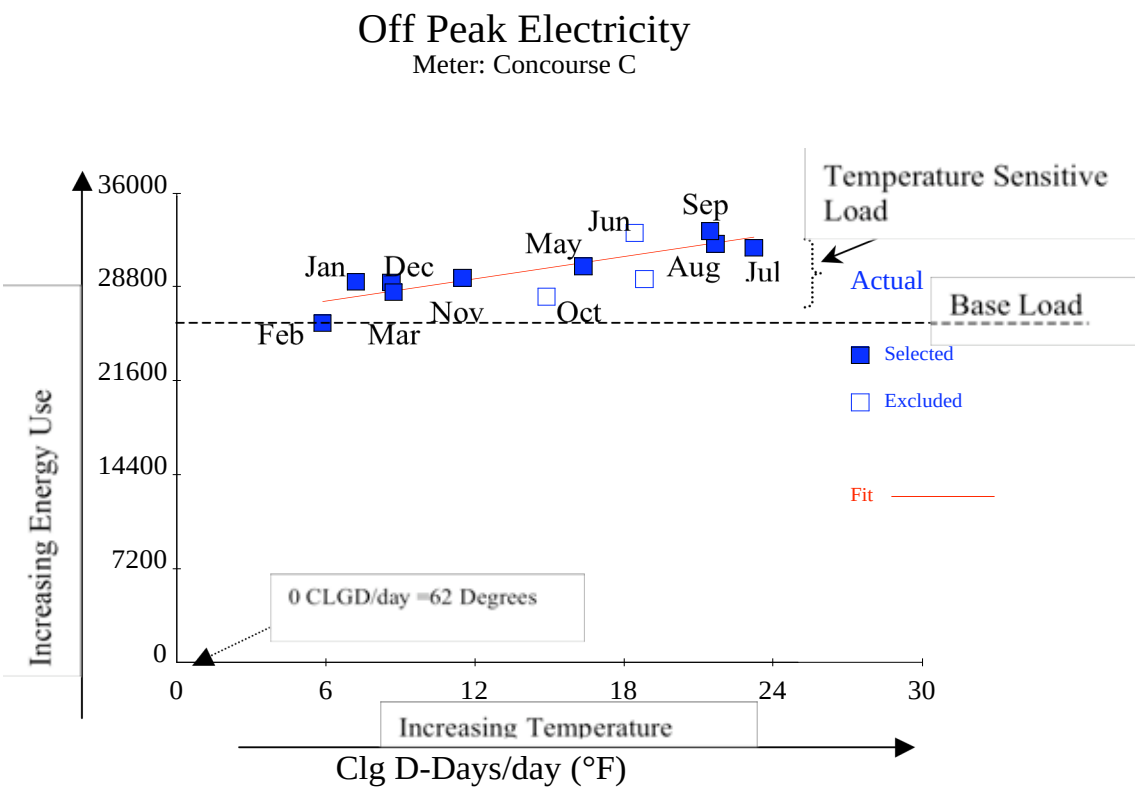
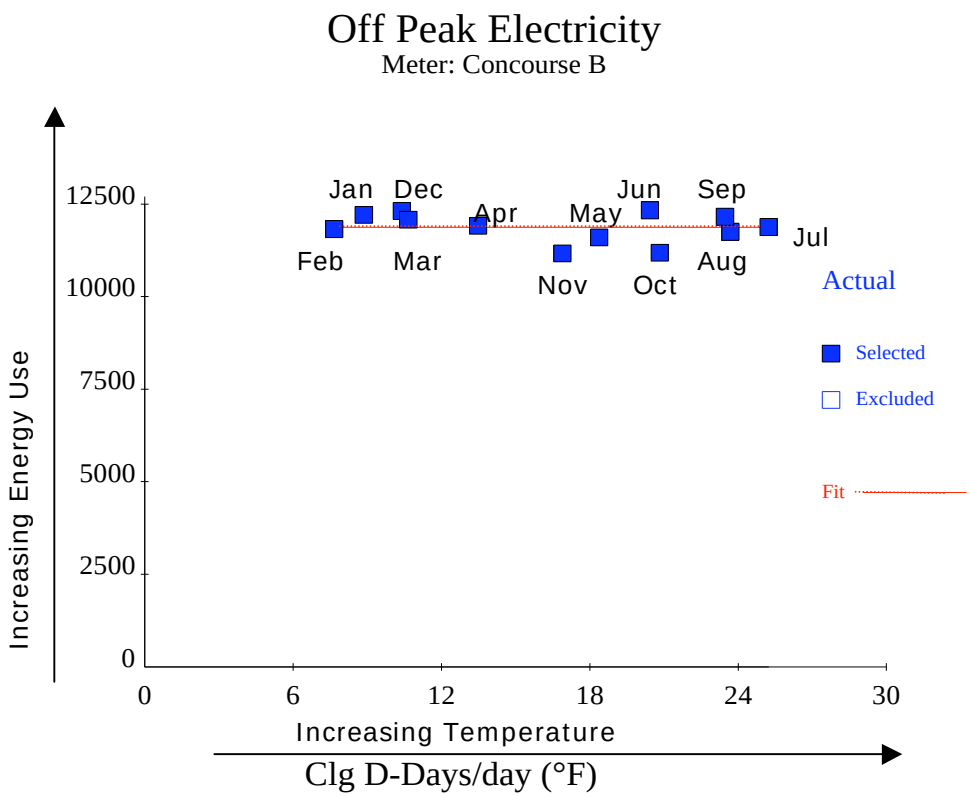


Figure 6-5 presents a consumption curve that is clearly not dependent on temperature. The usage is very consistent from month to month. This graph is typical of an account such as a non-air-conditioned facility. This could be lighting, a parking garage, or similar facility. The reason for the slight difference from month to month may be attributed to a different number of days in the billing period from one month to the next. This account would not likely have an air-conditioning system connected to the meter.

Figure 6-5: Power Consumption at Temperature-Independent Facility

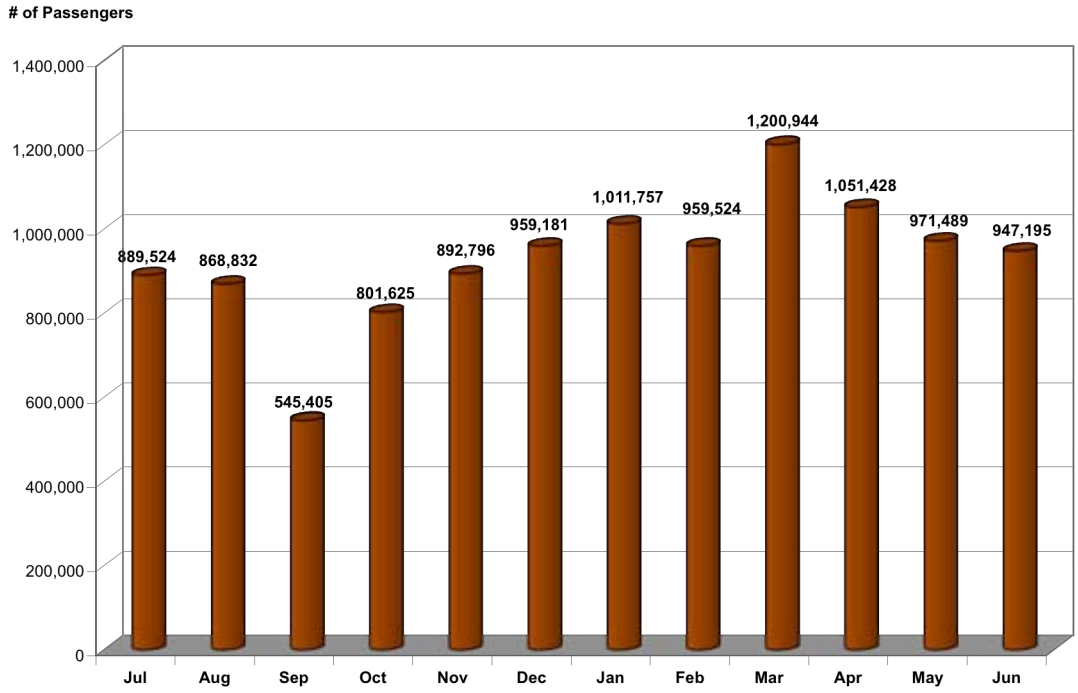


Analyzing the actual utility bills at FLL, we found that something other than outdoor temperature influences consumption. The graph is not what we would expect from a typical air-conditioned building in this area. From the graph, you can see that highest combined monthly bill was in June. The January, April, July, and August bills all have consumption data that is very close even though the average outside air temperature is very different. Also, September is much lower that we would expect. While we can see some effect or influence due to weather, this clearly indicates that something else is influencing electricity consumption.

Figure 6-6 shows monthly passenger enplanements at FLL. From this graph, we can see that September had the lowest passenger level and March the highest. If we look back to Figure 6-3, we can determine that passenger levels affect the electric consumption as does the outside air temperature. For

this reason, consideration should be given to temperature and passenger levels when comparing electric usage from one period to another.

Figure 6-6: Monthly Passenger Enplanement at FLL (2004-2005)



6.6. Definition of Power Consumption Footprint

Analyzing the electric utility bills, the CAP team determined the total electricity consumption during one year (in the 12 major accounts). While electricity use (measured in KWH consumed) is influenced by outside temperature it also reflects the number of passengers using services at the airport. On this basis we believe an appropriate Impact Metric is KWH consumed per passenger.

We divided the annual KWH consumed by the number of passengers to arrive at the baseline Impact Metric. Passenger statistics were taken from the Annual Statistical Report, Fiscal Years Ended September 30, 1995 to 2004, prepared by BCAD <http://www.broward.org/airport/pdfs/2004annualstatistical.pdf>. From our

calculations, the total amount of electricity consumed at FLL is 8.33 KWH per passenger per year.

On this basis, the Impact Metric calculation would be as follows:

$IM_{current\ year}$ = (Current year electricity consumption/passenger)/ (2004 electricity consumption/passenger)

IM_{2004} = (8.33KWH electricity consumption/passenger)/(8.33KWH electricity consumption/passenger) = 1.0

6.7. Note on Electricity Consumption

In the future, any decrease in electrical usage will result in a positive impact, however, the CAP team anticipates that we may be recommending the use of electric vehicles or equipment that will reduce emissions at the point of application but may increase total electricity consumption. This may result in an increase in this metric. For that reason we will have to be careful in analyzing the changes of this IM to ensure we are not understating the environmental benefits achieved.

7. Environmental Footprint

7.1. Introduction

As noted in Section 1, the CAP team believes it is important for BCAD to establish a means for tracking the airport's environmental performance. We propose the use of an environmental footprint of airport operations as an appropriate measuring tool.

Earlier chapters in this report have defined Impact Metrics for different environmental concerns. These metrics are quick and meaningful ways to characterize FLL's environmental performance in water, waste, air, noise, and energy use. And they are designed to track the airport's performance over time.

In this report we have computed metrics that established a baseline environmental performance that reflects current operations. The metrics were computed using high quality source data to the extent it could be identified. Other considerations in evaluating data sources were ease of data acquisition, repeatability on an annual basis, and minimal additional cost to BCAD operations. In some areas we identified the need for collecting data that can be used to better measure some aspect of the airport's environmental performance. In this section we use the Impact Metrics to create an environmental footprint for FLL.

7.2. Environmental Footprint

An environmental footprint should be a quick and easy way for BCAD management, the BCC, and interested public to gauge FLL's environmental performance. The power of using an environmental footprint is in tracking performance over time to see how the footprint changes – seeing where environmental initiatives are successful and where more effort may be required. The footprint can also be used to evaluate new operating procedures or new equipment prior to implementation. Subsequent tasks in CAP's Green Airport Initiative will be evaluating innovative technology, new operating procedures, and customized approaches to solving environmental concerns. We believe the footprint will be a valuable tool, along with a cost/benefit analysis, when making the decision on whether to proceed with a proposed project.

The Impact Metrics described in earlier sections are summarized in Table 7-1. The baseline values for the metrics, which generally are based on 2004 data, are also included.

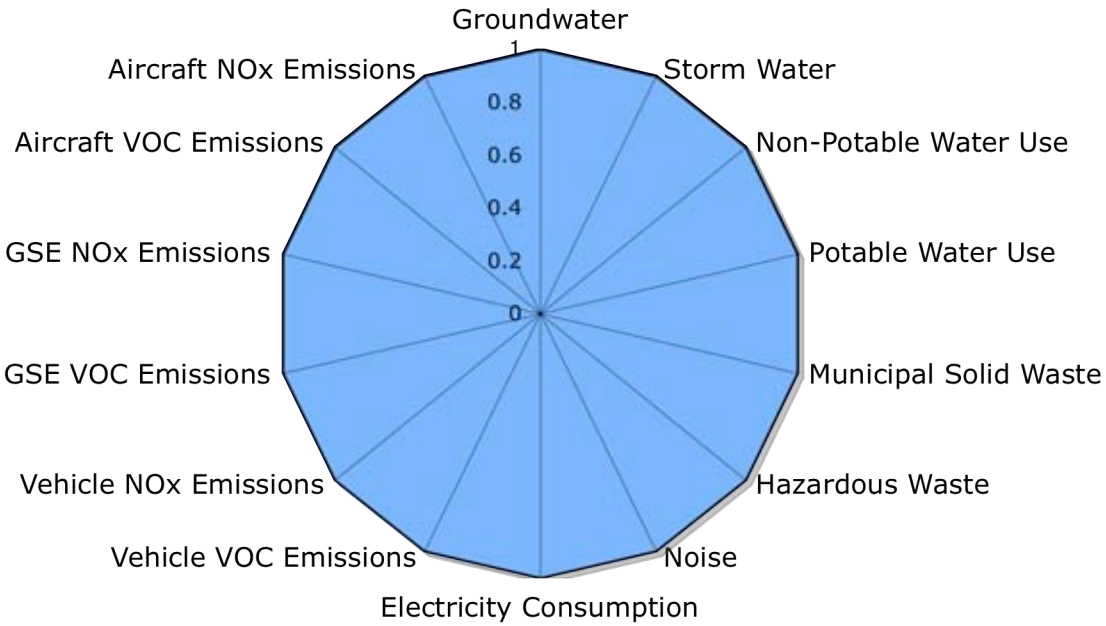
Table 7-1: Impact Metrics Used to Track Environmental Performance

Impact Area	Baseline Value	Units of Measure
Groundwater	45.806	Kilograms of contamination
Storm Water	217	Gallons of pollutant spilled
Non-Potable Water Use	9	Gallons (million) of groundwater used per year
Potable Water Use	14.1	Gallons of potable water use per passenger per year
Municipal Solid Waste	1.78	Pounds of waste generated (net) per day per passenger
Hazardous and Non-Hazardous Waste	144,303	Pounds of hazardous and non-hazardous waste generated per year
Aircraft VOC Emissions	0.0342	Pounds of VOC emissions per passenger per year
Aircraft NO_x Emissions	0.1876	Pounds of NO_x emissions per passenger per year
GSE VOC Emissions	0.0119	Pounds of VOC emissions per passenger per year
GSE NO_x Emissions	0.0358	Pounds of NO_x emissions per passenger per year
Vehicle VOC Emissions	0.049	Pounds of VOC emissions per passenger per year
Vehicle NO_x Emissions	0.037	Pounds of NO_x emissions per passenger per year
Noise	875	Non-dimensional
Electricity Consumption	8.33	KWH electricity consumption per passenger per year

The environmental footprint is a plot of these metrics. They are combined on a common axis to portray many environmental impacts in a single graphic. To put measures of different impacts, whose values are different orders of magnitude and that use different units of measure, on the same chart we normalized the metrics. This is the same as converting the measurements into percentages where 100% is the baseline value.

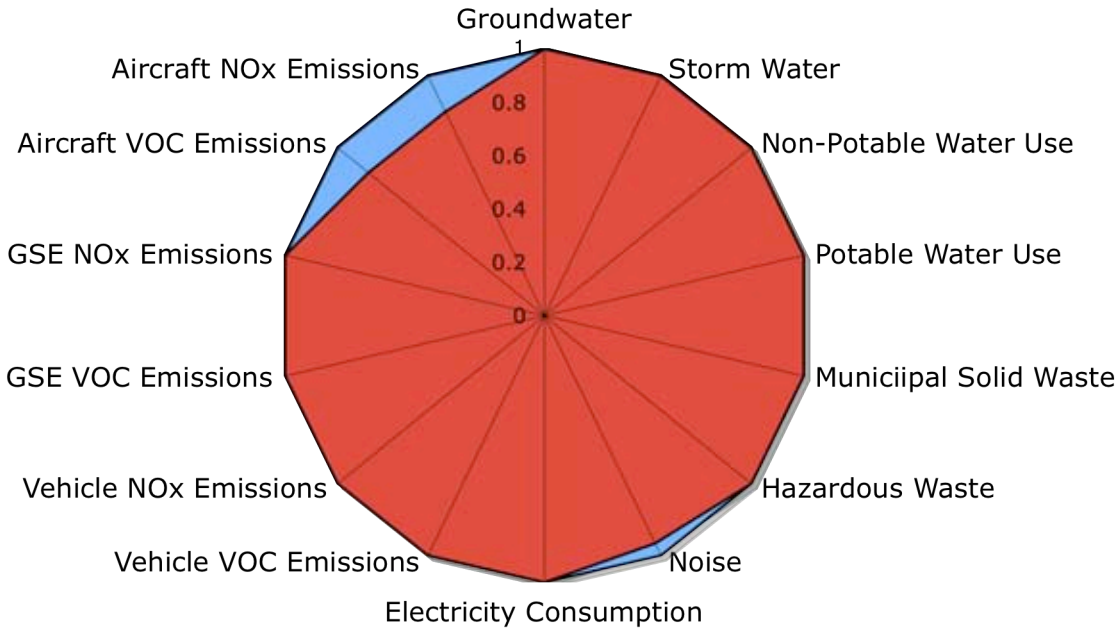
Developing the baseline footprint using normalized Impact Metrics results in a very basic graphic. Future versions of the footprint wills show changes that are taking place in environmental performance over time and will be much more informative. Figure 7-1 presents the baseline environmental footprint for FLL.

Figure 7-1: Baseline Environmental Footprint



BCAD staff, consultants, and the community at large can use the environmental footprint in evaluating future performance, success of an innovative solution proposed by the CAP team in future task assignments, or for any other change at the airport. Figure 7-2 shows a hypothetical footprint if a change in operating practices reduced aircraft VOC and NO_x emissions by 15% and noise impacts by 5%. It is clear from looking at Figure 7-2 that progress is being made in the airport's performance.

Figure 7-2: Hypothetical Environmental Footprint



The CAP team has developed the baseline environmental footprint based on our best efforts to collect data from existing, credible, reliable sources. It will be important to revise the baseline metrics anytime new data is made available or the structure of an IM is modified. This will ensure the revised footprint is an accurate portrayal of the airport's environmental performance. Also, the CAP team recommends that BCAD publish the footprint and a table of the latest computation of the Impact Metrics each year in the *BCAD Annual Statistical Report.*

2.3.3.3. Next Steps

CAP's finding in reviewing environmental impacts at FLL is that the airport already has a successful, comprehensive environmental program. It has implemented many strategies for reducing its environmental impact and controlling the emissions and residues from its operations and generally has been found to comply with key environmental regulations. Having a strong

program and enlightened management provide an excellent basis for setting the airport on a sustainable trajectory for the future.

The GAI, through this baseline report and technical reports on *Protecting Water Quality and Reducing Water Use*, *Energy Supply, Distribution, and Conservation*, *Reducing the Production and Disposal of Solid and Hazardous Waste*, and *Reducing Harmful Air Emissions*, provides a framework for identifying, organizing, and managing a sustainable environmental program that addresses issues on future growth, permitting requirements, and long-term energy and maintenance expenditures. Many opportunities for further reducing the airport's environmental footprint are described in these reports. By implementing some of these opportunities and adopting the principles of the GAI, FLL will demonstrate performance that represents clear leadership in environmental quality and energy consumption for airports.

There is also a coming national mandate for more rigorous management of the environmental impacts at airports. The Joint Planning and Development Office (JPDO) was established by Congress to develop plans for the future national aviation system, referred to as the Next Generation Air Transportation System (NextGen). Motivation for this new concept was described in the *NextGen Integrated Plan* (2004):

> "The current U.S. air transportation system it is under significant stress. With demand in aircraft operations expected to grow up to three times (3X) by 2025 the current air transportation system will not be able to accommodate this growth. Anticipated increases in air transportation demand will place significant environmental pressures on airports and communities throughout the U.S. Current operational trends show that environmental impacts such as noise, air emissions, water pollution, land use, climate change, and fuel consumption will be the primary constraints on the capacity and flexibility of the NextGen unless these impacts are managed and mitigated. Environmental issues have resulted in the delay and/or downscaling of certain airport capacity projects over the past decade. Airports will need to escalate their efforts to address the environmental concerns of their neighboring communities. Noise has been and will continue to be a primary area of concern. However, air quality, water quality, and other environmental demands are a growing challenge to enabling significant

> capacity expansion without a detrimental impact to the environment. Therefore, the NextGen environmental challenge is to manage aviation's environmental impacts in a manner that limits or reduces their "footprint" and enables the U.S. air transportation system to meet the nation's future transportation needs."

This concept is well aligned with the goals of the Green Airport Initiative. The NextGen plan is to manage environmental resources/impacts through an environmental management framework that is fully integrated into all NextGen operations. Recent JPDO plans note:

> "An environmental management framework ensures *environmental protection that allows sustained aviation growth*. The NextGen environmental management framework must account for interdependencies among many environmental issues so that in addressing some, others are not exacerbated. To achieve this, the NextGen environmental management framework consists of an enterprise-wide EMS program. The enterprise-wide EMS program does not treat the aviation system as a single unit, but as a community of organizations with a diverse range of requirements and drivers. It establishes systematic but flexible approaches that enable the environmental management framework to respond to the dynamic capacity demands of the aviation system. These are supported by enhanced information flow and better connections between individual component organizations.

The vision anticipates that airports and other organizations will connect through an information management system. To support this concept, the FAA reauthorization proposal pending in Congress provides options for funding environmental mitigation demonstration projects and special studies and reviews. This may provide FLL with the opportunity to implement the recommendations in CAP's GAI reports with funding support from FAA.

Appendix A – Water Data

Table A-1: Facilities on FLL Property with Documented Regulatory Involvement

Facility #	Name	Address	DEP ID	Funded	Lead Agency	Facility Type	Pollutant	2004 Data	Latest Data	Active/Inactive	Center/Peripheral	direction	Contamination (low, med, high)	Comments
0004	BCAD/Redwing CARR	2400 SW 36th St	068502536	PCR	EPD		gasoline	no		NFA w/ conditions	peripheral	West		NFA, closed with conditions
0502	Garside	2360 SW 36th St		NF		Engine Parts	chlorinated				peripheral	West		NOT ON OCULUS
0509	FLL Airport South	300 Terminal Dr	069800427	Funded	EPD	Aviation	jet fuel	no	2002	Inactive	center	center		Score of 14 as of 12-03
0520	BC Aviation-Gate 1	3545 SW 2nd Ave	069800428	PCR	EPD	Vacant lot	jet fuel	no	1999	NFA	center	NE		NFA as of 01-01
0521	FLL Airport South	300 Terminal Dr	069800334	Funded	EPD	Vacant lot	mixed	no	1998	Inactive	center	center		Accepted PCPP December 1999, Jan 1999 Tank closure report did not identify soil or groundwater contamination, 2-00 approved for state funding, NAM data exists, but not on Oculus.
1031	Walkers Aviation	500 SW 34th St.	068502863	Funded	EPD	Aviation	petroleum	no	1996	Inactive	center	west		Score of 10 as of Jan 05
1045	Formico Food/DOT	3381 SW 15 Ave	068840199	Funded	EPD	Gas Station	petroleum	no						OFFSITE?
1048	Aircraft Service Int'l	3451 SW 2nd Ave	068501476	Funded	EPD	Aviation	mixed	no	2002	Inactive	center	NE		Score of 10 as of 02-03
1076	FLL	290 SW 41st Ct	068733791	Funded	EPD	Aviation	petroleum	no	1986	Inactive	central	center		Approval for remedial action in 01-83. No additional information
1084	Avis Rent-A-Car	1555 N. Perimeter Rd	068501573	Funded	EPD	Car Dealer	mixed	yes	--	Active	center	east		
1086	Budget Rent-A-Car	1655 Perimeter Rd	068628480	Funded	EPD		petroleum	yes	--	Active	center	east		
1242	FLL	210 SW 34th St	068502388	Funded	EPD	Fuel Facility	petroleum	no	no	Inactive	center	NE		Score of 10 as of 01-05
1245	General Rent-A-Car	1425 S. Perimeter Rd	068837595	Funded	EPD	Car Dealer	petroleum	yes	--	Active	center	east		
1565	Dixie Metal Products	2251 SW 36th Street	068622353	Funded	EPD		petroleum	no			peripheral	west		NOT ON OCULUS
1590	Value Rent-A-Car	1030 Taylor Road	068943846	Funded	EPD	Car Dealer	petroleum	no	no	inactive	center	SE		No valuable info provided on Oculus
1659	Carolina Aircraft Co.	3500 SW 11th Ave	069101800	Funded	EPD	Aviation	petroleum	no	1993	Inactive	center	North		MOP approved in 1996, no data provided
1736	FEDEX Cargo	1401 SW 39th St	069101722	Funded	EPD	Fuel Facility	petroleum	no	no	Inactive	center	center-west		Eligible for abandon tank restoration in 1993. No CAR submitted as of 1997. No additional data avaialble.
2510	Hertz	2150 NE 7th Ave	069502756	NF	EPD	Car Dealer	mixed	yes	--	Active	center	east		
3658	Dania Motorcross	2600 SW 36th St		NF	DEP		metals				peripheral	west		NOT ON OCULUS
3325A	National Car Rental	1795 Perimeter Rd	068625843	Funded	EPD	Non-retail	diesel	no	2003	?	center	east		
3325B	National Car Rental	1795 Perimeter Rd	068625843	NF	EPD	Car Dealer	mixed				center	east		NOT ON OCULUS

Figure A-1: Facilities on FLL Property with Documented Regulatory Involvement

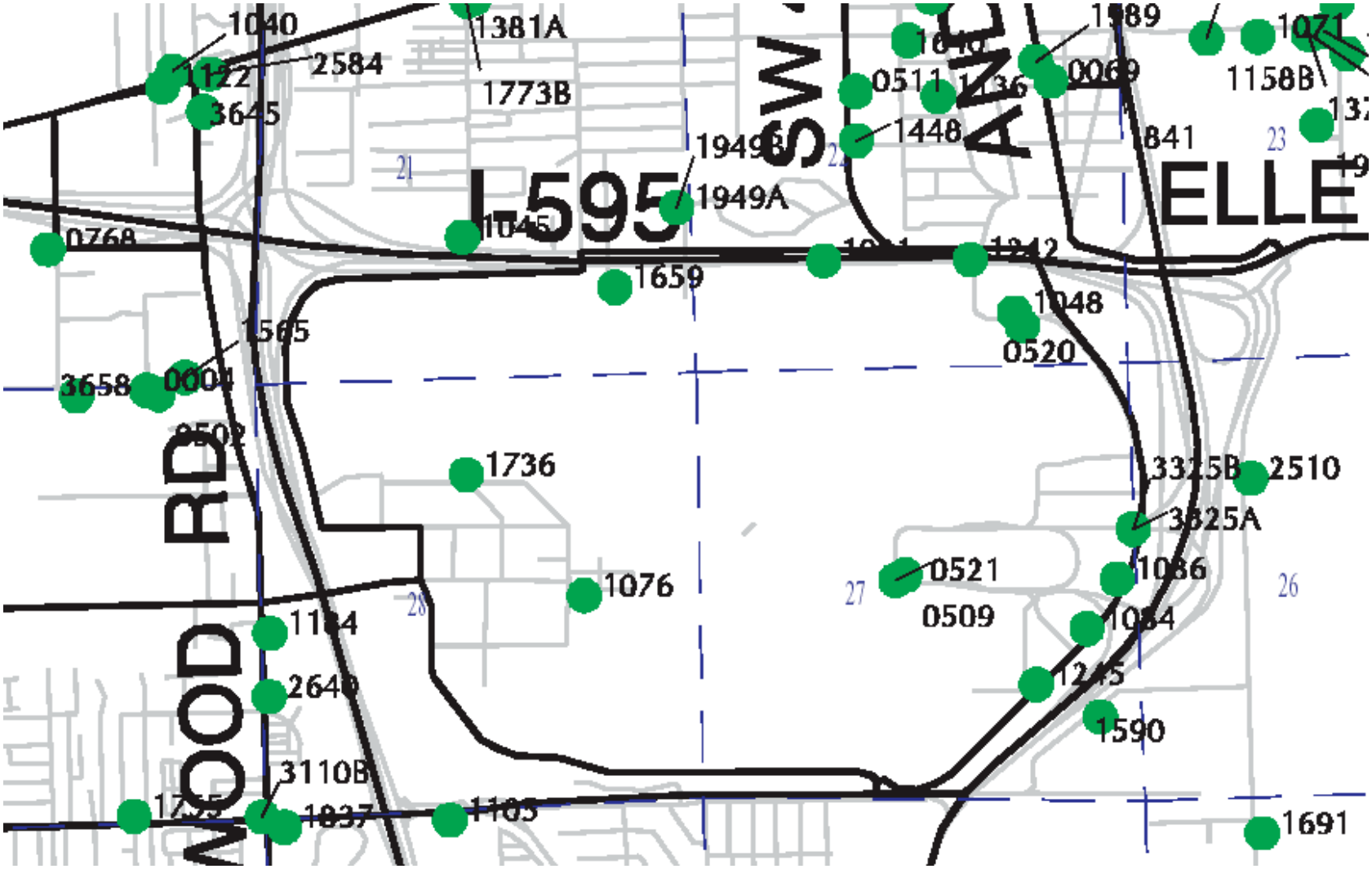


Table A-2: Active Groundwater Monitoring Facilities

AVIS																				
MW	Groundwater volume	Benzene		Toluene		Ethylbenzene		Xylenes		MTBE		TPH		Naphthalene		ethylnaphthal		ethylnaphthal		Total Contaminant Mass
	L	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	kg
3R	410000	1800	0.78	4500	0.73	1400	0.65	9800	3.11	500	0.17	33000	8.61	520	0.21	95	0.05	160	0.08	14.38
4R		3800		730		2600		12000		760		30000		530		91		160		
6R		130		83		740		950		0		0		470		180		250		
GENERAL RENT-A-CAR																				
MW	Groundwater volume	Benzene		Toluene		Ethylbenzene		Xylenes		MTBE		TPH		Naphthalene		ethylnaphthal		ethylnaphthal		Total Contaminant Mass
	L	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	kg
1	4715280	720	3.37	89	3.46	26	0.69	72	2.90	4200	20.96	N/A		N/A		N/A		N/A		31.39
2		700		790		230		910		3900										
3		1700		2700		460		2000		13000										
4		450		94		13		96		1100										
5		6		0		0		1.8		25										
BUDGET																				
MW	Groundwater volume	Benzene		Toluene		Ethylbenzene		Xylenes		MTBE		TPH		Naphthalene		ethylnaphthal		ethylnaphthal		Total Contaminant Mass
	L	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	kg
1	58000	5.23	0.00	N/A		N/A		0	0.00	0	0.00	0	0.03	0	0.00	0	0.00	0	0.00	0.036
2		9.62						0		2.64		0		0		0		0		
3		0						1.8		0		1640		135		44.6		25.7		
4		0						0		0		0		0		0		0		
HERTZ (Off airport property)																				
MW	Groundwater volume	Benzene		Toluene		Ethylbenzene		Xylenes		MTBE		TPH		Naphthalene		ethylnaphthal		ethylnaphthal		Total Contaminant Mass
	L	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	kg
2	801000	N/A		N/A		N/A		N/A		46	0.01	N/A		N/A		N/A		N/A		0.0142
9										1.7										
14										2.7										
MW	Groundwater volume	Benzene		Toluene		Ethylbenzene		Xylenes		MTBE		TPH		Naphthalene		ethylnaphthal		ethylnaphthal		
	L	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	µg/L	kg	
2	52000	5.23	0.0004	N/A		N/A		5.23	0.0004	N/A		N/A		N/A		N/A		N/A		
8		9.62						9.62												

Table A-3: Documented Fuel Spills at FLL

2004				
2/29/04	Jet Fuel	30 Gallons	Signature Ramp	No Environmental Impacts
3/5/04	Jet Fuel	Unavailable	E2 Ramp	vehicle possibily
9/8/04	Diesel Fuel	12 Gallons	Perimeter Rd. under I-595	Clean Up-No sormwater impacts
8/20/04	Jet Fuel	175 Gallons	610 SE 34 Ave.	Stored outside w/o secondary containment; waste paint discharge into ground/floor drain. Teneant arrested.
8/8/04	Jet Fuel Spill	Unavalible	3495 WS9 Ave Nation Jets ramp (gate252)	44 minutes to clean up
11/2/04	Jet Fuel Spill	Unavalible	Capital Cargo Ramp	Leaked into asphalt; Additional engine oil from planes leaking into stormwater systems
11/8/04	Motor Oil	Unavalible/Minor run	Gfiffen Road west of US1	Bus Fire; oilly runoff entered stormwater sys.
2004 Total		**217 gallons**		
2003				
11/29/03	Jet Fuel Spill	20 Gallons	Gate C6	30 min. clean up
11/15/03	(non aircraft) Fuel S	15 Gallons	H-7 Apron (AOA)	Cleaned and no stormwater damages found
8/20/03	Jet Fuel Spill	1 Gallon	F-3 Gate Ramp	No impact; cleaned with absorbant pads
4/24/03	Jet Fuel Spill	4 Gallons	Terminal 3 Gate F3	No impact to operations
4/24/03	Jet Fuel Spill	4 Gallons	Terminal1 Gate B1	No impact to operations
2/17/03	Jet Fuel Spill	2 Gallons	Unavailable	Incident secured
1/23/03	Jet Fuel Spill	1.5 Gallons	Gate F10	Minor spill-contained and cleaned
1/25/03	Jet Fuel Spill	2 Gallons	FTL Jet Center	No impacts
1/5/03	Jet Fuel Spill	10 Gallons	Gate D7	No impacts
3/6/03	Jet Fuel	12 Gallons	Terminnal 4 Gate H5	Contained and cleaned
3/19/03	Jet Fuel Spill	10 Gallons	Terminal 4 Gate H10	No impact to strom drainage
4/11/03	Jet Fuel Spill	2 Gallons	Terminal 3 Gate E4 Ramp	Contained and cleaned
5/10/03	Jet Fuel Spill	15 Gallons	Gate F6	Cleaned and no environmental impacts reported
5/18/03	Jet Fuel Spill	15 Gallons	Gate C8	No impacts to operations
6/2/03	Jet Fuel Spill	10 Gallons	Gate C1	No impacts to operations
7/4/03	Jet Fuel Spill	15 Gallons	Gate F10	Incident secured
7/6/03	Diesel Fuel	10 Gallons	Gate C-8	3 Gallons went into Drain
7/6/03	Jet Fuel	2 Gallons	Gate H4	Cleaned; No Impacts
7/11/03	Jet Fuel	3 Gallons	Terminal 3 Gate F3	No impact; cleaned with absorbant pads
7/12/03	Jet Fuel Spill	1/2 Gallons	Unavailable	No impact to operations
7/22/03	Jet Fuel Spill	7 Gallons	Gate D9	No impact to operations

Table A-3: Documented Fuel Spills at FLL (continued)

9/13/03	Lavatory Truck Spill	Unavalible	Gate D9 -exit	Contained and cleaned
11/15/03	Jet Fuel Spill	15 Gallons	Terminal 4 Gate H7	Contained and cleaned
12/17/03	Jet Fuel Spill	25 Gallons	Gate H1	Absorbant Pads used and placed in Storm Drains
2003 Total		**200.5 gallons**		
2002				
7/30/02	Jet Fuel Spill	6 Gallons	Gate H5	Contained and cleaned
7/28/02	Jet Fuel Spill	10 Gallons	Gate F-3	Contained and cleaned
7/3/02	Jet Fuel Spill	5 Gallons	Gate D4	Incident secured
7/14/02	Jet Fuel Spill	Minor Leakage	H10	Incident secured
7/14/02	Jet Fuel Spill	5 Gallons	Termional 3 Gate 5	Contained and cleaned
6/29/02	Jet Fuel	4 Gallons	H-5	Contained and cleaned
6/26/02	Kerosene Fuel	15 Gallons	Corner of 12 Terr at 40th St	Ran onto the road and ran onto the shoulder
5/19/02	Jet Fuel	Unknown	Terminal 4 Gate H5	Incident secured
5/18/02	Jet Fuel	8 Gallons	Gate C8	Area cleaned with absorbent pad
5/16/02	Jet Fuel	6 Gallons	Gate H3	Cleaned up
4/11/02	Fuel	2 Gallons	Terminal 4 Gate H1	Area cleaned and secured
4/19/02	Fuel	1 Quart	E10	Fuel was absorded with pad
5/2/02	Jet Fuel	7 Gallons	Terminal 3 Gate E5	Absorbant pads were used. Area was secure
5/29/02	Jet Fuel	25 Gallons	Beason-Simmons Terminal	Clean and Secured. No operational damage
6/2/02	Jet Fuel	1 Gallon	C7	Area was cleaned. No Enviro damage
6/1/02	Diesel Fuel	Minor Spill	Ravenswood Rd. and SW 42nd Ave	Affected area was cleaned
6/1/02	Jet Fuel	10 Gallons	D1	Cleaned with absorbent pads
3/3/02	Jet Fuel	20 Gallons	H9	Incident secured
3/14/02	Jet Fuel	1 Gallon	F2	Cleaned and secured
8/6/02	Jet Fuel	2 Gallons	C4	No Environmental Impacts
8/11/02	Jet Fuel	4 Gallons	H4	Incident cleaned and secured
9/2/02	Jet Fuel	3 Gallons	H8	Incidebt was secured; No enviro Impacts
9/17/02	Jet Fuel	5 Gallons	H3	Fuel was absorded with pad
9/28/02	Jet Fuel	25 Gallons	H3	Area was cleaned with absorbent pads
10/10/02	Jet Fuel	3 Gallons	Terminal 2 Gate D5	Spill was contained and cleaned
10/13/02	Jet Fuel	20 Gallons	FTL Jet Center	Area cleaned; No Impacts
10/21/02	Jet Fuel	5 Gallons	E10	Cleaned and secured
11/2/02	Jet Fuel	4 Gallons	F5	No impact to operations

Table A-3: Documented Fuel Spills at FLL (continued)

	11/9/02	Jet Fuel	50 Gallons	Amerijet Ramp	No Environmental Impacts. Incident was secured
	11/17/02	Fuel	6 Gallons	E5	No impacts to operations
	11/23/02	Jet Fuel	5 Gallons	Runway 27L	Cleaned and cleared
	12/6/02	Jet Fuel	3 Gallons	Terminal 2 Gate D6	Contained and cleaned
	12/18/02	Fuel	2 Gallons	E1	Minor-spill contained and cleaned
	12/22/02	Jet Fuel	12 Gallons	Terminal 1 Gate C1	Contained and cleaned
	Total 2002		**274.25 gallons**		
2001					
	12/10/01	Fuel	30 Gallons	Gate H2 ramp	Contained and cleaned
	2001 Total		**30 gallons**		

Figure A-2: Major Drainage Basins at FLL

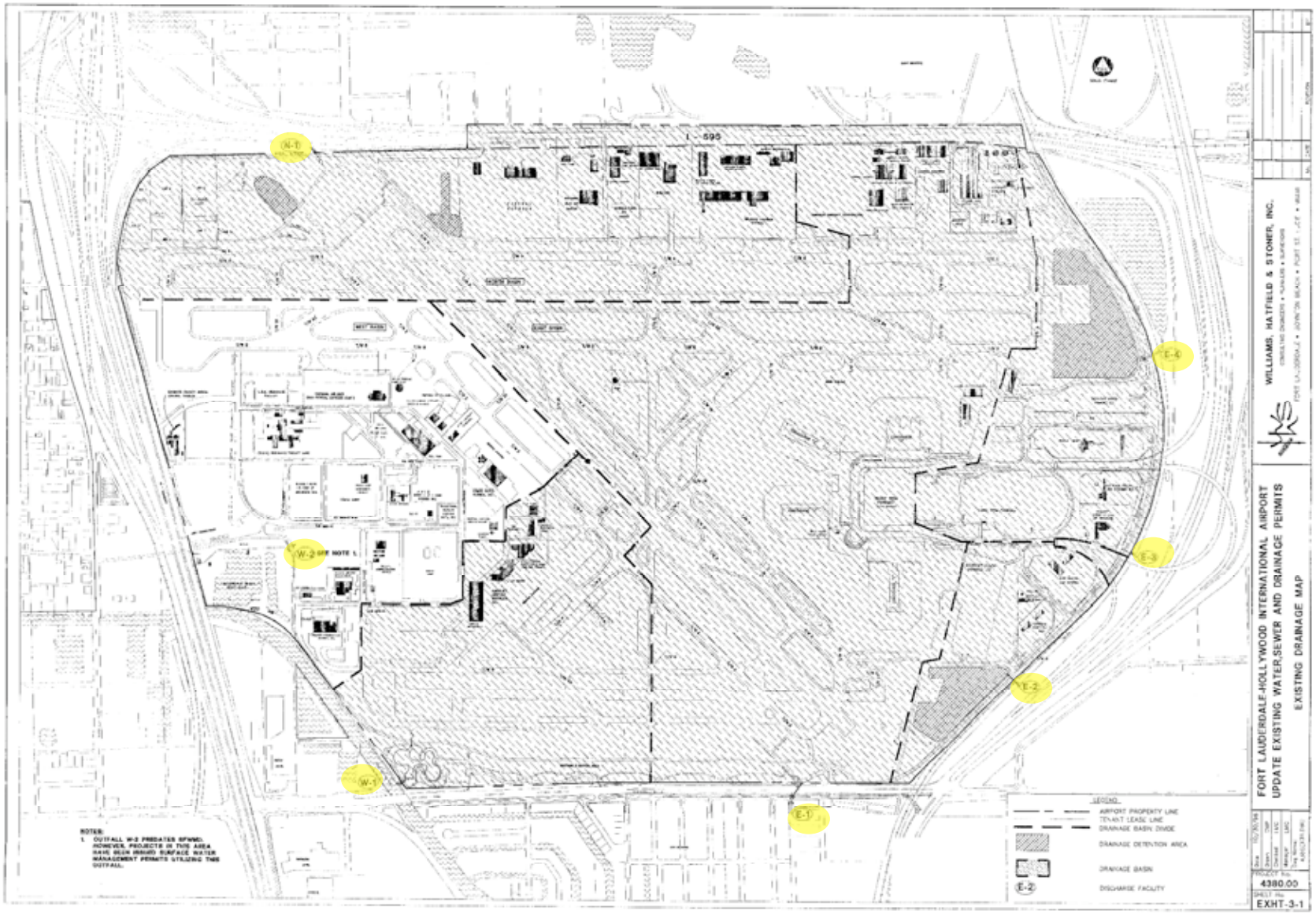


Figure A-3: FLL Outfall Locations

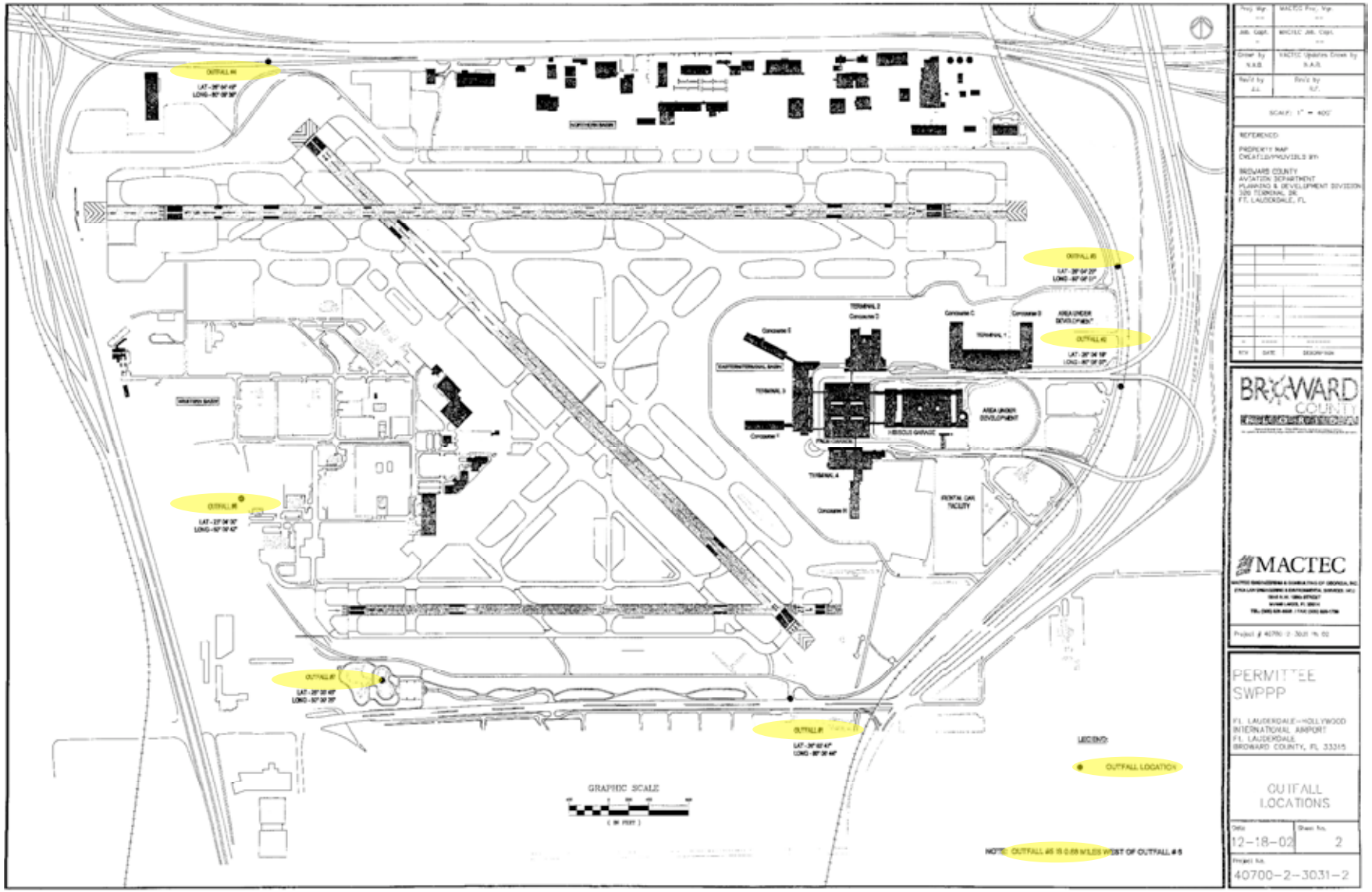


Figure A-4: Example Storm Water Monitoring Report

BROWARD COUNTY FLORIDA

MACTEC

2003 Analytical Stormwater Monitoring Report

FACILITY INFORMATION

FACILITY NAME	Ft. Lauderdale-Hollywood International Airport (FLL)	MONITORING PERIOD START DATE	01-01-2003
FACILITY ADDRESS	320 Terminal Drive, Ft. Lauderdale, Florida 33315	MONITORING PERIOD END DATE	12-31-2003
FACILITY PERMITTEE	Dolores Smith, P.E., BCAD Environmental Manager	FACILITY ID NO.	
FACILITY REPRESENTATIVE(S)	Dolores Smith, P.E., BCAD Environmental Manager Winston Cermak III, BCAD Environmental Officer	TELEPHONE TELEPHONE	954-359-6135 954-359-6161
FIELD SAMPLER'S NAME	Scott Yolanton, MACTEC E&C Project Scientist	TELEPHONE	305-829-5666
FIELD SAMPLER'S COMPANY	MACTEC ENGINEERING & CONSULTING, INC. - MIAMI LAKES		

SUMMARY EVALUATION

Abbreviations:
CPY - Clear Pale Yellow
PY - Pale Yellow
VPY - Very Pale Yellow
PYLB - Pale Yellow Light Brown
PB - Pale Brown
VSA - Very Slight Amount

	Discharge Outfall No.	Sample Type	pH (s.u.)	TSS (mg/L)	Oil and Grease (mg/L)	BOD 5-Day (mg/L)	COD (mg/L)	Color	Clarity	Odor	Floating Solids	Settled Solids	Suspended Solids	Foam	Oil Sheen	Flow Measurement (gpd)	Storm Event Characteristics
Lab Detection Limit			1.0	5.0	2.0	2.0	5.0										
Parameter Benchmark Value			6-9	100	15	30	120										
Monitoring Event 1: Collected: 06-14-03 Received: 06-15-03 IAC Lab Report No. 30600720	1	Grab	7.59	BDL	BDL	BDL	BDL	None	Clear	None	None	None	None	None	None	N.M.	Partly Cloudy 1.17" rain
	3	Grab	9.20	BDL	11.0	BDL	BDL	None	Clear	None	None	VSA	None	None	None	N.M.	
	4	Grab	7.70	BDL	BDL	BDL	17.0	CPY	Clear	None	None	VSA	None	None	None	N.M.	
	7	Grab	7.87	6.0	BDL	BDL	80.4	CPY	Clear	None	None	None	None	None	None	N.M.	
Monitoring Event 2: Collected: 08-20-03 Received: 08-21-03 IAC Lab Report No. 30800-1030	1	Grab	7.09	BDL	BDL	BDL	5.9	PY	Clear	None	None	None	None	None	None	N.M.	Partly Cloudy 1.05" rain
	3	Grab	8.25	9.0	BDL	BDL	16.2	PYLB	SC	None	None	None	VSA	None	None	N.M.	
	4	Grab	7.95	BDL	BDL	BDL	5.9	Clear	Clear	None	None	None	None	None	None	N.M.	
	7	Grab	7.65	5.0	BDL	BDL	194.0	PY	Clear	None	None	None	None	None	None	N.M.	
Monitoring Event 3: Collected: 09-26-03 Received: 09-27-03 IAC Lab Report No. 30800-280	1	Grab	7.60	BDL	BDL	BDL	108.0	PY	None	Clear	None	None	None	None	None	N.M.	Mostly Cloudy 1.05" rain
	3	Grab	8.90	5.0	BDL	BDL	17.7	PY	None	Clear	None	None	None	None	None	N.M.	
	4	Grab	7.60	5.0	BDL	BDL	31.1	VPY	None	Clear	None	None	None	None	None	N.M.	
	7	Grab	7.60	23.0	BDL	BDL	601.0	PY	None	Clear	None	None	VSA	None	None	N.M.	
Average (outfall 1)			7.67	BDL	BDL	BDL	99.95										
Average (outfall 3)			8.45	7.00	11.00	BDL	16.50										
Average (outfall 4)			7.79	BDL	BDL	BDL	19.33										
Average (outfall 7)			7.62	12.00	BDL	BDL	291.0										
Average (monitoring event 1)			7.78	6.00	11.00	BDL	48.72										
Average (monitoring event 2)			7.82	7.00	BDL	BDL	57.28										
Average (monitoring event 3)			7.93	14.00	BDL	BDL	214.5										
Average (monitoring events)			7.88	10.00	11.00	BDL	114.4										

** = Precipitation Accumulation (ME = Monitoring Event):
[illegible]
ME1 - 0.15 inches of rainfall in the 3 hours preceding 6-14-03, 4:55 AM
ME2 - 0.27 inches of rainfall in the 6 hours preceding 8-14-03, 7:55 AM
ME3 - 0.05 inches of rainfall in the 24 hours preceding 8-19-03, 7:50 AM
ME2 - 2.75 inches of rainfall in the 24 hours preceding 8-21-03, 7:55 AM
ME3 - 0.40 inches of rainfall in the 24 hours preceding 09-26-03, 12:00 PM

Additional Comments:

The nature of the discharge for each monitoring event was due to stormwater runoff. There was an exceedance of the COD parameter benchmark at outfall 1 during monitoring event 3. There was an exceedance of the COD parameter benchmark for outfall 7 for monitoring events 1 and 3 as well as for the average of all the three events relating to each outfall 7 and for all outfalls for monitoring event 3. The MSGP states that "exceedances of a benchmark value does not automatically indicate that violation of a water quality standard has occurred. It does signal that modifications to the SWPPP may be necessary."

prepared by: _____ checked by: _____

MACTEC 40700-2 3031 0 Page 1 of 2 Report Date: April 2004

Figure A-4: Example Storm Water Monitoring Report (continued)

Table 1
Fort Lauderdale-Hollywood International Airport
Surface Water Analytical Data
MACTEC Project Number 40700-1-2763

			Sample ID	Outfall 1	Outfall 3	Outfall 4	Outfall 7
			Sample Collection Date	8/16/2002	8/16/2002	8/16/2002	8/16/2002
			Laboratory Order Number	69922	69924	69925	69926
Parameter	Units	Detection Limit	Surface Water Criteria				
Metals							
Selenium	mg/L	0.01	≤0.005	BDL	BDL	BDL	BDL
Barium	mg/L	0.05	NA	BDL	BDL	BDL	BDL
Cadmium	mg/L	0.005	HD	BDL	BDL	BDL	BDL
Chromium	mg/L	0.005	≤.011	0.007	BDL	BDL	0.010
Lead	mg/L	0.005	HD	BDL	BDL	BDL	BDL
Mercury	mg/L	0.0002	≤0.000012	BDL	BDL	BDL	BDL
Silver	mg/L	0.00035	≤0.00007	BDL	BDL	BDL	BDL
Total Residual Petroleum Hydrocarbons (TRPH) - Florida Petroleum Residual Organics							
TRPH (C8-C40)	mg/L	0.5	**	BDL	BDL	BDL	BDL

			Sample ID	Outfall 1	Outfall 3	Outfall 4	Outfall 7
			Sample Collection Date	12/6/2002	12/6/2002	12/6/2002	12/6/2002
			Laboratory Order Number	105231	105232	105233	105234
Parameter	Units	Detection Limit	Surface Water Criteria				
Metals							
Selenium	mg/L	0.01	≤0.005	BDL	BDL	BDL	BDL
Barium	mg/L	0.05	NA	BDL	BDL	BDL	BDL
Cadmium	mg/L	0.005	HD	BDL	BDL	BDL	BDL
Chromium	mg/L	0.005	≤.011	BDL	BDL	BDL	BDL
Lead	mg/L	0.005	HD	BDL	BDL	BDL	BDL
Mercury	mg/L	0.0002	≤0.000012	BDL	BDL	BDL	BDL
Silver	mg/L	0.00035	≤0.00007	BDL	BDL	BDL	BDL
Total Residual Petroleum Hydrocarbons (TRPH) - Florida Petroleum Residual Organics							
Total PRO	mg/L	0.5	**	BDL	BDL	BDL	BDL

			Sample ID	Outfall 1	Outfall 3	Outfall 4	Outfall 7
			Sample Collection Date	12/9/2002	12/9/2002	12/9/2002	12/9/2002
			Laboratory Order Number	105660	105661	105666	105667
Parameter	Units	Detection Limit	Surface Water Criteria				
Metals							
Selenium	mg/L	0.01	≤0.005	BDL	BDL	BDL	BDL
Barium	mg/L	0.05	NA	BDL	BDL	BDL	BDL
Cadmium	mg/L	0.005	HD	BDL	BDL	BDL	BDL
Chromium	mg/L	0.005	≤.011	BDL	BDL	BDL	BDL
Lead	mg/L	0.005	HD	BDL	BDL	BDL	BDL
Mercury	mg/L	0.0002	≤0.000012	BDL	BDL	BDL	BDL
Silver	mg/L	0.00035	≤0.00007	BDL	BDL	BDL	BDL
Total Residual Petroleum Hydrocarbons (TRPH) - Florida Petroleum Residual Organics							
Total PRO	mg/L	0.5	**	BDL	BDL	BDL	BDL

Notes:
mg/L = Milligrams per liter
NA = Not Available
BDL = Below Detection Limits
HD = Hardness-Dependent, per Chapter 62-302, F.A.C.
** = As provided in Chapter 62-302, F.A.C.

Prepared By: DS

Checked By: RF

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Table A-4: Example Non Point Source Storm Water Monitoring Report

*Storm water samples are collected 1 Meter below the surface water level.
*The Fort Lauderdale Airport contian 7 outfall wells that are.....

Monitoring Event/Date	Discharde Outfall No.	Sample Type	pH (s.u)	TSS (mg/L)	Oil/Grease (mg/L)	BODs 5 day (mg/L)	COD (mg/L)
	1	Grab	7.57	BDL	2.4	BDL	23.2
	2	Grab	7.4	BDL	BDL	BDL	8.32
	3	Grab	7.78	BDL	BDL	BDL	5.83
Event 1: 09-27-04	4	Grab	7.68	BDL	BDL	BDL	5.83
	5	Grab	7.65	BDL	BDL	BDL	BDL
	6	Grab	7.41	16	2.3	BDL	166
	7	Grab	7.55	12	BDL	BDL	245
	1	Grab	7.4	BDL	BDL	BDL	55.6
	2	Grab	7.8	BDL	BDL	BDL	28.2
	3	Grab	8.1	12	BDL	BDL	13.3
Event 2: 10-7-04	4	Grab	7.6	BDL	BDL	BDL	20.8
	5	Grab	7.8	BDL	BDL	BDL	10.8
	6	Grab	7.4	BDL	BDL	BDL	30.7
	7	Grab	7.3	5	BDL	BDL	88
	1	Grab	7.5	6.5	5.1	5.4	41
	2	Grab	7.5	5	5.1	24	34
	3	Grab	8.3	7.8	5.1	10.3	25
Event 3: 10-20-04	4	Grab	7.8	5	5.1	13	25
	5	Grab	7.9	5	5.1	8.7	25
	6	Grab	7.4	5	5.1	12	130
	7	Grab	7.5	5	5.1	6	180

Appendix B – Waste Data

Figure B-1: FLL Land Use

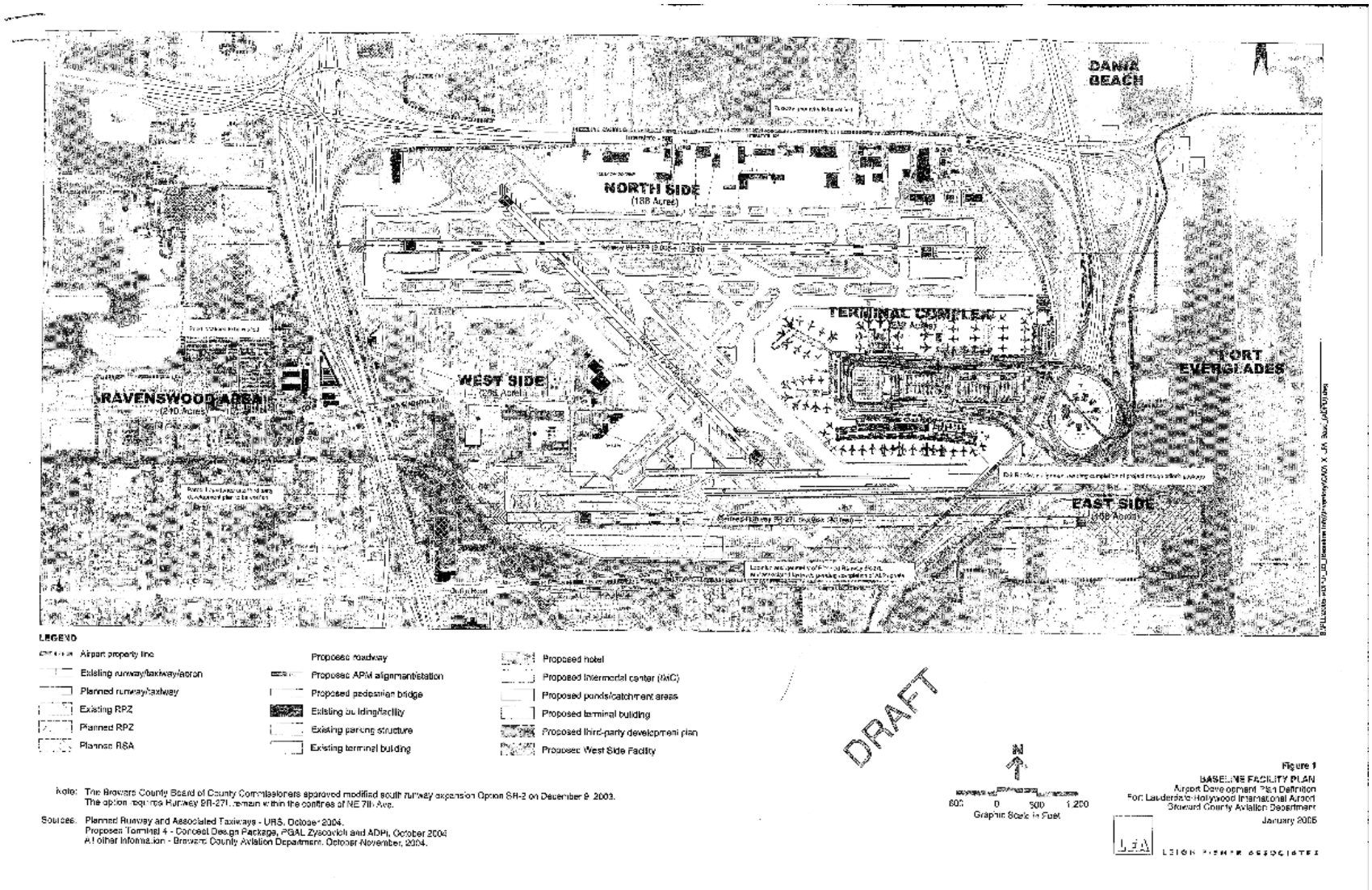


Table B-1: Airport Recycling Specialists Data

		Amount of waste in 2002 (tons)												Annual	Annual
Description of Waste		Jan	Feb	March	April	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Total (tons)	Total (lbs)
	Incoming	156.39	225.24	252.23	267.05	209.26	197.44	184.9	244.33	152.44	200.46	231.79	254.59	2,586.12	5,689,464
	Disposed off-site	34.0	122.47	145.8	157.83	119.28	110.24	70.47	153.28	98.77	105.77	152.35	152.33	1,403.19	3,087,018
RECYCLED	Aluminum	1.63	5.36	5.15	4.68	4.85	4.09	3.49	4.92	3.79	3.54	4.50	4.68	50.97	112,134
	Glass	8.72	5.94	11.31	10.18	9.41	8.36	9.30	10.08	7.935	10.5	9.00	7.46	108.26	238,181
	Cardboard	51.69	21.56	16.57	14.6	14.87	15.11	22.1	14.09	11.76	15.79	15.12	15.13	229.58	505,076
	Paper	70.35	69.91	83.4	79.38	61.05	59.64	59.51	61.95	40.15	84.67	70.82	75.38	734.12	1,747,064
	Total Recycled	132.39	102.77	116.43	109.22	89.38	87.2	94.43	91.05	63.685	94.69	99.44	101.96	1,192.93	2,602,435
Percentage Recycled		79.57%	45.63%	44.40%	40.90%	43.00%	44.17%	57.27%	37.27%	39.19%	47.24%	42.90%	39.93%	45.74%	45.74%

		Amount of waste in 2003 (tons)												Annual	Annual
Description of Waste		Jan	Feb	March	April	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Total (tons)	Total (lbs)
	Incoming	281.31	240.58	280.42	236.23	158.79	234.28	228.3	215.1	234.96	249.37	271.84	253.04	2,874.02	6,322,644
	Disposed off-site	173.07	161.52	176.02	152.54	89.92	139.27	148.14	154.07	150.8	161.51	192.92	185.75	1,866.53	4,106,366
RECYCLED	Aluminum	4.30	4.83	4.68	3.99	3.28	3.82	3.22	2.08	2.98	3.43	3.90	4.12	44.41	97,702
	Glass	5.83	5.48	0	9.10	0	0	5.41	4.94	3.94	5.13	5.18	5.64	50.43	110,946
	Cardboard	10.70	10.52	20.62	9.88	11.11	24.01	14.57	9.54	12.96	10.46	15.67	14.9	163.24	359,128
	Paper	67.51	58.25	79.1	60.72	54.48	67.18	55.86	44.49	64.25	61.84	55.97	72.83	740.41	1,628,702
	Total Recycled	88.24	78.85	104.4	83.69	68.87	95.01	79.16	61.03	84.16	80.86	78.92	97.29	1,007.49	2,216,478
Percentage Recycled		33.77%	32.81%	37.23%	35.43%	43.37%	40.55%	34.67%	28.37%	35.82%	35.23%	29.03%	36.99%	35.06%	35.06%

		Amount of waste in 2004 (tons)												Annual	Annual
Description of Waste		Jan	Feb	March	April	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Total (tons)	Total (lbs)
	Incoming	289.59	273.3	335.25	300.96	251.13	228.76	276.18	240.03	202.26	66.94	274.13	335.61	3,073.94	6,762,068
	Disposed off-site	227.3	168.93	230.01	198.81	153.18	172.1	207.21	153.12	118.17	22.68	177.89	240.29	2,049.50	4,508,900
RECYCLED	Aluminum	2.78	3.38	3.43	4.50	3.10	3.52	3.98	4.13	2.55	1.77	5.04	3.51	41.79	91,938
	Glass	5.92	7.15	7.26	9.76	6.03	5.25	8.27	8.65	9.46	2.05	7.47	10.35	89.60	197,120
	Cardboard	7.03	19.65	16.19	18.30	17.58	8.04	7.66	16.98	11.48	9.23	11.31	13.86	157.40	346,280
	Paper	62.47	74.69	79.36	69.50	71.24	39.85	49.05	57.17	60.62	30.29	72.62	69.45	735.35	1,617,770
	Total Recycled	79.29	104.87	106.24	102.15	97.95	56.66	68.97	86.91	84.09	44.25	96.44	96.32	1,024.14	2,253,108
Percentage Recycled		27.67%	38.30%	31.60%	33.94%	39.00%	24.77%	24.97%	36.21%	41.58%	66.10%	35.18%	28.61%	33.32%	33.32%

Table B-2: Waste Generated at FLL

Location	Description	Annual MSW (lbs)	Annual Hazardous Waste (lbs)	Annual Non-Hazardous Waste (lbs)
Terminal		6,258,105 [1]	N/A	N/A
Airfield (aircraft)	Domestic	Included in Terminal Waste	N/A	N/A
	International	233,600 [2]	N/A	N/A
West Side	BCAD Maintenance Facility	Included in Private Tenants' MSW	N/A	134,944
	Private Tenants	5,087,490	(--)	(--)
North Side	BCAD Maintenance Facility	Included in Private Tenants' MSW	9,359	N/A
	Private Tenants	9,582,356	(--)	(--)
	Total lbs MSW/yr	21,161,551	Total lbs MSW+other waste/yr	21,305,854
	lbs MSW/psgr	2.35	lbs waste/psgr	2.37

[1] Three-year average of ARS data
[2] Special waste that is incinerated

Annual Recycled Waste		Percentage Recycled
Terminal Waste	2,378,080	38
lbs recycled MSW/psgr	0.265	11.2
lbs haz and non-haz waste/yr	144,303	(--)

Net lbs MSW/yr	18,783,471
lbs MSW/psgr (net)	2.09

Table B-3: Waste Manifests from BCAD Facilities - 2002

2002

Date	Tenant	Disposal Company	Waste Type: Hazardous	Quantity: Gallons	Quantity: Pounds	Waste Type: Non-Hazardous	Quantity: Gallons	Quantity: Pounds
1/17/2002	BCAD	PMI				Petroleum Contaminated Absorbent Pads Used Oil Filters	55	 325
2/1/2002	BCAD	PMI				Contaminated Water	100	
2/12/2002	BCAD	EQ	Mineral Spirits Oil-Based Paint Waste Paint Solids Solvent-containing Rags	55 55 55 55				
2/20/2002	BCAD	PMI				Contaminated Water	165	
2/27/2002	BCAD	PMI				Contaminated Water	82	
4/19/2002	BCAD	EQ	Traffic Marking Waste Paint Solids Oil-Based Paint Mineral Spirits	 55 55	1,000 150 			
4/24/2002	BCAD	PMI				Contaminated Water	37	
5/3/2002	BCAD	PMI				Contaminated Water Petroleum Contaminated Sludge	296 54	
5/23/2002	BCAD	EQ	Traffic Marking Traffic Marking Solvent-containing Rags		6,200 790 325			
8/8/2002	BCAD	EQ	Mineral Spirits Oil Based Paint Waste Paint Solids Lacex Paint	55 55 55	 200 			
8/9/2002	BCAD	PMI				Contaminated Water	182	
8/13/2002	BCAD	PMI				Petroleum Contaminated Absorbent Pads Used oil filters	110	 325
10/14/2002	BCAD	PMI				Contaminated Water	2,184	
10/24/2002	BCAD	PMI				Contaminated Water	71	
12/10/2002	BCAD	EQ	Oil-Based Paint Mineral Spirits Solvent-containing Rags Waste Paint Solids	55 55 	 150 420			
12/12/2002	BCAD	PMI				Contaminated Water	105	
			TOTAL	605	9,235	TOTAL	3,431	650

Total lbs hazardous 14,282

Total lbs non-haz 29,272

Table B-4: Waste Manifests from BCAD Facilities - 2003

2003								
			Waste Type					
			Hazardous			Non-Hazardous		
				Quantity			Quantity	
Date	Tenant	Disposal Company		Gallons	Pounds		Gallons	Pounds
2/26/2003	BCAD	PMI				Petroleum Contaminated Absorbent Pads	55	
						Used oil filters		325
3/4/2003	BCAD	EQ	Oil-Based Paint	55				
			Mineral Spirits	55				
			Solvent-containing Rags		130			
			Waste Paint Solids		230			
			Latex Paint	55				
3/6/2003	BCAD	PMI				Contaminated Water	1,158	
5/23/2003	BCAD	PMI				Contaminated Water	52	
5/28/2003	BCAD	PMI				Contaminated Water	2,050	
6/24/2003	BCAD	EQ	Oil-Based Paint	55				
			Mineral Spirits	55				
			Solvent-containing rags		215			
			Waste Paint Solids		350			
			Latex Paint	55				
7/23/2003	BCAD	PMI				Petroleum Contaminated Absorbent Pads	110	
						Contaminated Water	41	
7/29/2003	BCAD	PMI				Contaminated Water	3,905	
7/30/2003	BCAD	PMI				Contaminated Water	3,065	
9/8/2003	BCAD	PMI				Contaminated Water	2,667	
9/16/2003	BCAD	EQ	Oil-Based Paint	55				
			Mineral Spirits	55				
			Solvent-containing Rags		900			
			Waste Paint Solids		370			
			Latex Paint	110				
			Toxic Liquids	5				
11/10/2003	BCAD	PMI				Contaminated Water	1,158	
11/14/2003	BCAD	PMI				Contaminated Water	1,300	
11/17/2003	BCAD	PMI				Petroleum Contaminated Absorbent Pads	55	
12/23/2003	BCAD	PMI				Contaminated Water	54	
						Used Oil Filters		325
			TOTAL	555	2,195	TOTAL	18,872	650
			Total lbs hazardous 6,825			Total lbs non-haz 156,416		

Table B-5: Waste Manifests from BCAD Facilities - 2004

2003

Date	Tenant	Disposal Company	Waste Type: Hazardous	Quantity: Gallons	Quantity: Pounds	Waste Type: Non-Hazardous	Quantity: Gallons	Quantity: Pounds
2/28/2003	BCAD	PMI				Petroleum Contaminated Absorbent Pads	55	
						Used oil filters		325
3/4/2003	BCAD	EQ	Oil-Based Paint	55				
			Mineral Spirits	55				
			Solvent-containing Rags		130			
			Waste Paint Solids		230			
			Latex Paint	55				
3/8/2003	BCAD	PMI				Contaminated Water	1,158	
5/23/2003	BCAD	PMI				Contaminated Water	53	
5/28/2003	BCAD	PMI				Contaminated Water	2,050	
6/24/2003	BCAD	EQ	Oil-Based Paint	55				
			Mineral Spirits	55				
			Solvent-containing rags		215			
			Waste Paint Solids		350			
			Latex Paint	55				
7/23/2003	BCAD	PMI				Petroleum Contaminated Absorbent Pads	110	
						Contaminated Water	41	
7/29/2003	BCAD	PMI				Contaminated Water	8,908	
7/30/2003	BCAD	PMI				Contaminated Water	3,065	
9/8/2003	BCAD	PMI				Contaminated Water	2,667	
9/16/2003	BCAD	EQ	Oil-Based Paint	55				
			Mineral Spirits	55				
			Solvent-containing Rags		900			
			Waste Paint Solids		370			
			Latex Paint	110				
			Toxic Liquids	5				
11/10/2003	BCAD	PMI				Contaminated Water	1,158	
11/14/2003	BCAD	PMI				Contaminated Water	1,300	
11/17/2003	BCAD	PMI				Petroleum Contaminated Absorbent Pads	55	
12/23/2003	BCAD	PMI				Contaminated Water	54	
						Used Oil Filters		325
			TOTAL	555	2,195	TOTAL	18,872	650

Total lbs hazardous 6,825

Total lbs non-haz 156,416

Table B-6: Waste Manifests from BCAD Facilities – 2005 (partial year)

2005

Date	Tenant	Disposal Company	Waste Type: Hazardous			Waste Type: Non-Hazardous		Quantity
1/24/2005	BCAD	PMI				Contaminated Water		1,000
2/18/2005	BCAD	EQ	Oil-Based Paint Mineral Spirits Solvent-containing Rags Latex Paint					55 55 250 200
3/1/2005	BCAD	PMI				Contaminated Water		2,860
4/8/2005	BCAD	PMI				Contaminated Water		2,058
						Total (gal):		6,128
						Total (lbs):		450

EQ = EQ Florida, Inc. (formerly US Liquids)
PMI = Petroleum Management Inc.

* To convert gallons to pounds, multiply by 62.4 lb/ft^3 and by 0.134 ft^3/gal.

Appendix C – Air Data

Table C-1: Commercial Aircraft Operations Data for FLL - 2004

Table C-1: Commercial Aircraft Operations Data for FLL - 2004

Carrier	Aircraft	Scheduled Departures	Non-scheduled Departures	Total Departures	Departures Scheduled
AIR TRANSPORT INTERNATIONAL	DOUGLAS DC-8-71		10	10	
	DOUGLAS DC-8-73		4	4	
	ALL TYPES		*14*	*14*	
AIRBORNE EXPRESS INC.	BOEING 767-200/ER	41		41	41
	DOUGLAS DC-9-40	78		78	78
	DOUGLAS DC-8-61	2		2	2
	DOUGLAS DC-8-63	209		209	209
	ALL TYPES	*330*		*330*	*330*
AIRTRAN AIRWAYS CORPORATION	BOEING 717-200	4,087		4,087	4,113
	BOEING 737-700/LR	267		267	267
	ALL TYPES	*4,354*		*4,354*	*4,380*
ALLEGIANT AIR	MD-87		1	1	
	ALL TYPES		*1*	*1*	
AMERICA WEST AIRLINES INC.	BOEING 757-200	159	1	160	159
	A320-100/200	614		614	632
	A319	10		10	10
	ALL TYPES	*783*	*1*	*784*	*801*
AMERICAN AIRLINES INC.	BOEING 737-800	1,230	2	1,232	1,269
	BOEING 757-200	5,406	8	5,414	5,487
	BOEING 767-200/ER	27		27	27
	BOEING 767-300/ER	29	3	32	29
	MD-80,1,2,3,8	3,081		3,081	3,127
	A300-600/R/CF/RCF	1		1	1
	ALL TYPES	*9,774*	*13*	*9,787*	*9,940*

AMERICAN EAGLE AIRLINES INC	EMBRAER-135	146		146	158
	EMBRAER-145	4		4	4
	EMBRAER-140	15		15	15
	ALL TYPES	*165*		*165*	*177*
AMERISTAR AIR CARGO	BOEING 737-200C		5	5	
	DOUGLAS DC-9-15F		1	1	
	ALL TYPES		*6*	*6*	
ATA AIRLINES	BOEING 737-800	1,097	1	1,098	1,097
	BOEING 757-200	167	4	171	167
	BOEING 757-300	67		67	67
	ALL TYPES	*1,331*	*5*	*1,336*	*1,331*
ATLANTIC SOUTHEAST AIRLINES	RJ-200ER/RJ-440	1		1	1
	CANADAIR RJ-700	1		1	1
	ALL TYPES	*2*		*2*	*2*
BOSTON-MAINE AIRWAYS	BOEING 727-200	7	4	11	7
	ALL TYPES	*7*	*4*	*11*	*7*
CAPE AIR	CESSNA C-402/402A	1,192		1,192	1,226
	ALL TYPES	*1,192*		*1,192*	*1,226*
CAPITAL CARGO INTERNATIONAL	BOEING 727-200		240	240	
	ALL TYPES		*240*	*240*	
CASINO EXPRESS	BOEING 737-200C		3	3	
	ALL TYPES		*3*	*3*	
CENTURION CARGO INC.	DOUGLAS DC-10-30		1	1	
	ALL TYPES		*1*	*1*	
CHAMPION AIR	BOEING 727-200		9	9	
	ALL TYPES		*9*	*9*	
CHAUTAUQUA AIRLINES INC	EMBRAER-135	2,359		2,359	3,073
	EMBRAER-145	1,006		1,006	1,348
	ALL TYPES	*3,365*		*3,365*	*4,421*
COMAIR INC.	CANADAIR RJ-100/ER	1,161		1,161	1,161

	RJ-200ER/RJ-440	57		57	123
	ALL TYPES	*1,218*		*1,218*	*1,284*
CONTINENTAL AIR LINES INC.	BOEING 737-700/LR	62		62	63
	BOEING 737-800	1,195	1	1,196	1,208
	BOEING 737-500	58		58	58
	BOEING 737-300	344		344	344
	BOEING 757-200	1,989		1,989	2,015
	BOEING 757-300	507		507	507
	BOEING 767-400	5		5	5
	BOEING 767-200/ER	5		5	5
	BOEING 737-900	515	1	516	519
	MD-80,1,2,3,8	122		122	122
	ALL TYPES	*4,802*	*2*	*4,804*	*4,846*
CUSTOM AIR TRANSPORT	BOEING 727-200		2	2	
	ALL TYPES		*2*	*2*	
DELTA AIR LINES INC.	BOEING 737-800	192	9	201	192
	BOEING 757-200	6,146	7	6,153	6,222
	BOEING 767-400	1,663	1	1,664	1,681
	BOEING 767-200/ER	17	1	18	17
	BOEING 767-300/ER	2,026	5	2,031	2,067
	BOEING 777	2		2	2
	MD-80,1,2,3,8	1,262		1,262	1,283
	MD-90	77		77	77
	ALL TYPES	*11,385*	*23*	*11,408*	*11,541*
EXECUTIVE AIRLINES	ATR-72	1,687	96	1,783	1,726
	ALL TYPES	*1,687*	*96*	*1,783*	*1,726*
EXPRESS.NET AIRLINES	A300B/C/F-100/200		10	10	
	BOEING 727-200		241	241	
	ALL TYPES		*251*	*251*	
FALCON AIR EXPRESS	BOEING 737-300		4	4	
	BOEING 727-200		13	13	
	ALL TYPES		*17*	*17*	
FEDERAL EXPRESS CORPORATION	CESSNA 208	893		893	893
	A300-600/R/CF/RCF	782		782	782

	A310-200C/F	34		34	34
	BOEING 727-100	23		23	23
	BOEING 727-200	192		192	192
	DOUGLAS DC-10-10	537		537	537
	DOUGLAS DC-10-30	45		45	45
	MD-11	21		21	21
	ALL TYPES	*2,527*		*2,527*	*2,527*
FLORIDA COASTAL AIRLINES	CESSNA C-402/402A	279		279	455
	ALL TYPES	*279*		*279*	*455*
FLYING BOAT INC.	GRUMMAN G-73	2,122		2,122	2,272
	ALL TYPES	*2,122*		*2,122*	*2,272*
FRONTIER AIRLINES INC.	BOEING 737-300	4		4	4
	A-318	43		43	44
	A319	495	1	496	507
	ALL TYPES	*542*	*1*	*543*	*555*
GULFSTREAM INT	BEECH 1900 A/B/C	8,166		8,166	10,622
	EMB-120 BRASILIA	136		136	136
	ALL TYPES	*8,302*		*8,302*	*10,758*
JETBLUE AIRWAYS	A320-100/200	7,381		7,381	7,458
	ALL TYPES	*7,381*		*7,381*	*7,458*
LYNDEN AIR CARGO AIRLINES	LOCKHEED L100-30		3	3	
	ALL TYPES		*3*	*3*	
MIAMI AIR INTERNATIONAL	BOEING 737-800		77	77	
	BOEING 727-200		12	12	
	ALL TYPES		*89*	*89*	
MIDWEST AIRLINES INC.	BOEING 717-200	27		27	27
	DOUGLAS DC-9-30		3	3	
	MD-80,1,2,3,8	149	7	156	150
	ALL TYPES	*176*	*10*	*186*	*177*
NETJETS LARGE AIRCRAFT CO	BOEING 737-700/LR		3	3	
	ALL TYPES		*3*	*3*	

NORTH AMERICAN AIRLINES	BOEING 757-200		44	44	
	BOEING 767-300/ER		5	5	
	ALL TYPES		*49*	*49*	
NORTHWEST AIRLINES INC.	BOEING 757-200	132	1	133	132
	BOEING 757-300	1		1	1
	DOUGLAS DC-9-30	221		221	233
	DOUGLAS DC-9-40	4		4	4
	DOUGLAS DC-9-50	3		3	3
	A320-100/200	1,056	3	1,059	1,056
	A319	879		879	915
	ALL TYPES	*2,296*	*4*	*2,300*	*2,344*
PACE AIRLINES	BOEING 737-300		24	24	
	BOEING 737-100/200		16	16	
	BOEING 757-200		10	10	
	ALL TYPES		*50*	*50*	
PAN AMERICAN AIRWAYS CORP.	BOEING 727-200	58	107	165	82
	ALL TYPES	*58*	*107*	*165*	*82*
PINNACLE AIRLINES INC.	RJ-200ER/RJ-440	100		100	102
	ALL TYPES	*100*		*100*	*102*
PLANET AIRWAYS	BOEING 727-100		1	1	
	BOEING 727-200		18	18	
	ALL TYPES		*19*	*19*	
PRIMARIS AIRLINES INC.	BOEING 757-200		1	1	
	ALL TYPES		*1*	*1*	
RYAN INTERNATIONAL AIRLINES	BOEING 737-100/200		4	4	
	BOEING 727-200		1	1	
	ALL TYPES		*5*	*5*	
SKY KING INC.	BOEING 737-100/200		18	18	
	ALL TYPES		*18*	*18*	
SOUTHEAST AIRLINES	DOUGLAS DC-9-30		196	196	
	MD-80,1,2,3,8		207	207	
	ALL TYPES		*403*	*403*	

SOUTHWEST AIRLINES CO.	BOEING 737-700/LR	6,509		6,509	6,711
	BOEING 737-500	236		236	236
	BOEING 737-300	6,614	2	6,616	6,614
	BOEING 737-100/200	10		10	11
	ALL TYPES	*13,369*	*2*	*13,371*	*13,572*
SPIRIT AIR LINES	MD-80,1,2,3,8	7,270		7,270	7,270
	A321	200		200	200
	ALL TYPES	*7,470*		*7,470*	*7,470*
SUN COUNTRY AIRLINES	BOEING 737-800	24		24	24
	ALL TYPES	*24*		*24*	*24*
TRANSMERIDIAN AIRLINES	BOEING 757-200		64	64	
	MD-80,1,2,3,8		1	1	
	BOEING 727-200		91	91	
	ALL TYPES		*156*	*156*	
UNITED AIR LINES INC.	BOEING 737-500	7		7	7
	BOEING 737-300	265		265	273
	BOEING 757-200	129	3	132	129
	A320-100/200	2,106	1	2,107	2,141
	A319	23		23	23
	ALL TYPES	*2,530*	*4*	*2,534*	*2,573*
UNITED PARCEL SERVICE	BOEING 757-200	171		171	171
	BOEING 727-100	77		77	77
	ALL TYPES	*248*		*248*	*248*
US AIRWAYS INC.	BOEING 737-400	2,537		2,537	2,568
	BOEING 737-300	674		674	693
	BOEING 757-200	1,641	1	1,642	1,673
	A320-100/200	228		228	229
	A319	1,098		1,098	1,118
	A321	967		967	983
	ALL TYPES	*7,145*	*1*	*7,146*	*7,264*
USA 3000 AIRLINES	A320-100/200	284	505	789	284
	ALL TYPES	*284*	*505*	*789*	*284*

USA JET AIRLINES INC.	DOUGLAS DC-9-15F		1	1	
	DOUGLAS DC-9-30		1	1	
	DASSAULT FALCON		2	2	
	ALL TYPES		*4*	*4*	
WORLD AIRWAYS INC.	MD-11		4	4	
	ALL TYPES		*4*	*4*	
COMMUNITY TOTAL	A-318	43		43	44
	A300-600/R/CF/RCF	783		783	783
	A300B/C/F-100/200		10	10	
	A310-200C/F	34		34	34
	A319	2,505	1	2,506	2,573
	A320-100/200	11,669	509	12,178	11,800
	A321	1,167		1,167	1,183
	ATR-72	1,687	96	1,783	1,726
	BEECH 1900 A/B/C	8,166		8,166	10,622
	BOEING 717-200	4,114		4,114	4,140
	BOEING 727-100	100	1	101	100
	BOEING 727-200	257	738	995	281
	BOEING 737-100/200	10	38	48	11
	BOEING 737-200C		8	8	
	BOEING 737-300	7,901	30	7,931	7,928
	BOEING 737-400	2,537		2,537	2,568
	BOEING 737-500	301		301	301
	BOEING 737-700/LR	6,838	3	6,841	7,041
	BOEING 737-800	3,738	90	3,828	3,790
	BOEING 737-900	515	1	516	519
	BOEING 757-200	15,940	144	16,084	16,155
	BOEING 757-300	575		575	575
	BOEING 767-200/ER	90	1	91	90
	BOEING 767-300/ER	2,055	13	2,068	2,096
	BOEING 767-400	1,668	1	1,669	1,686
	BOEING 777	2		2	2
	CANADAIR RJ-100/ER	1,161		1,161	1,161
	CANADAIR RJ-700	1		1	1
	CESSNA 208	893		893	893
	CESSNA C-402/402A	1,471		1,471	1,681
	DASSAULT FALCON		2	2	
	DOUGLAS DC-10-10	537		537	537

DOUGLAS DC-10-30	45	1	46	45
DOUGLAS DC-8-61	2		2	2
DOUGLAS DC-8-63	209		209	209
DOUGLAS DC-8-71		10	10	
DOUGLAS DC-8-73		4	4	
DOUGLAS DC-9-15F		2	2	
DOUGLAS DC-9-30	221	200	421	233
DOUGLAS DC-9-40	82		82	82
DOUGLAS DC-9-50	3		3	3
EMB-120 BRASILIA	136		136	136
EMBRAER-135	2,505		2,505	3,231
EMBRAER-140	15		15	15
EMBRAER-145	1,010		1,010	1,352
GRUMMAN G-73	2,122		2,122	2,272
LOCKHEED L100-30		3	3	
MD-11	21	4	25	21
MD-80,1,2,3,8	11,884	215	12,099	11,952
MD-87		1	1	
MD-90	77		77	77
RJ-200ER/RJ-440	158		158	226
ALL TYPES	*95,248*	*2,126*	*97,374*	*100,177*

Scheduled Departures	Takeoffs operated based on an airline's published flight schedule.
Non-scheduled Departures	Total number of aircraft takeoffs made in non-scheduled service.
Total Departures	Total number of aircraft takeoffs made in scheduled and non-scheduled service.
Departures Scheduled	Total number of aircraft takeoffs made that were in airline's published schedule.
Non-Scheduled Service	Revenue flights, such as charter flights, that are not operated in regular scheduled service and all nonrevenue flights incident to such flights.

Excludes foreign flag air carriers.

Table 7:
12 months ending 12/31/2004

From Airport Activity Statistics of Certificated Air Carriers
Bureau of Transportation Statistics – US DOT

Appendix D - Noise Data

Table D-1: Noise Complaints at FLL – 2003*

	FLL Noise Complaints - 2003											
	Jan	**Feb**	**Mar**	**April**	**May**	**June**	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**
13/31 ops	3	0	1	0	0	14	0	1	1	0	1	0
27R ops	10	4	12	6	4	4	9	1	1	3	1	3
Engine Run	12	1	0	2	0	0	0	0	1	0	1	2
FXE ops	0	1	0	2	0	0	0	0	0	0	0	1
Helicopter ops	1	2	1	0	1	0	1	0	0	1	1	1
Miscellaneous	1	4	2	4	5	1	1	4	3	0	4	9
Regular comp.	14	8	8	5	7	4	3	8	7	9	8	1
Total	**41**	**20**	**24**	**19**	**17**	**23**	**14**	**14**	**13**	**13**	**16**	**17**

Table D-2: Noise Complaints at FLL – 2004*

	FLL Noise Complaints - 2004											
	Jan	**Feb**	**Mar**	**April**	**May**	**June**	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**
13/31 ops	4	6	40	0	7	1	0	0	140	14	45	9
27R ops	7	3	3	0	0	2	9	2	0	1	2	11
Engine Run	11	5	0	3	0	1	0	0	0	0	0	1
FXE ops	0	0	0	0	0	0	0	0	0	0	2	0
Helicopter ops	5	0	4	2	1	0	0	0	0	0	1	0
Miscellaneous	18	10	10	4	1	0	1	2	0	0	2	3
Regular comp.	36	20	31	16	7	8	10	15	0	12	15	9
Total	**81**	**44**	**88**	**25**	**16**	**12**	**20**	**19**	**140**	**27**	**67**	**33**

* Complaints received by FLL from the community surrounding the airport during 2003 and 2004. An explanation of the complaint codes appears on the following page.

Explanation of noise complaint codes

13/31 ops: An aircraft used runway 13/31 due to a problem with 9L such as maintenance or a disabled aircraft. These operations affect Dania neighborhoods southeast and Fort Lauderdale and Plantation neighborhoods northwest.

27R ops: West departures affecting neighborhoods in the Ravenswood, Edgewood, Lauderdale Isles, Forest Ridge, Davie, Long Lake, etc. neighborhoods.

Engine run: This is the high-powered engine testing the jets and turbo props perform on the center of the airfield. Run ups mainly affect the Dania Beach neighborhoods.

FXE ops: Residents will call in about an aircraft that is an operation at Fort Lauderdale Executive Airport.

Heli ops: These specific complaints are with respect to helicopter operations.

Miscell: This category includes any questions citizens have regarding noise, runway extension, contours, avigation easement and voluntary sales assistance, the future growth of the airport, airport studies, where to get more information, etc.

Regular: This is a normal “low and loud" noise complaint.

Appendix E – Energy Data and Calculations

Table E-1: Electric Usage by Account by Month

Electricity Use at Key FLL Meters

Table E-1: Electric Usage By Account By Month

Mth	Concourse-B (T1)	Concourse-C (T1)	North Concourse-D (T2)	# Mech (T3)	NW Concourse -E (T3)	West Terminal (T3)	AA West Concourse-F (T3)	West Concourse-F (T3)	S. Terminal-H (T4)	Admin (T4)	Hibiscus Parking	Cypress Parking*
Jul	$33,105	$86,527	$28,669	$93,719	$6,038	$31,492	$2,531	$11,275	$53,562	$51,633	$42,566	$101,529
Aug	$32,388	$87,833	$27,691	$92,620	$6,159	$30,721	$2,750	$10,823	$52,756	$53,562	$41,496	$101,529
Sep	$34,848	$94,059	$28,517	$94,287	$6,570	$31,758	$2,615	$11,486	$55,002	$52,756	$43,648	$101,529
Oct	$31,143	$81,138	$26,195	$82,977	$6,205	$29,477	$2,667	$11,264	$50,426	$55,002	$41,307	$101,529
Nov	$30,501	$74,150	$26,099	$72,339	$6,245	$29,015	$2,634	$9,955	$46,394	$50,426	$41,418	$101,529
Dec	$34,620	$80,815	$28,884	$66,878	$6,876	$31,771	$2,742	$10,745	$48,332	$46,394	$45,567	$101,529
Jan	$38,180	$88,741	$31,818	$69,017	$7,560	$33,984	$2,945	$11,386	$51,726	$48,332	$50,337	$101,529
Feb	$34,367	$74,628	$27,796	$59,637	$6,901	$29,899	$2,649	$10,545	$44,579	$51,726	$45,234	$101,529
Mar	$35,118	$80,318	$27,538	$69,139	$7,023	$29,617	$2,723	$11,600	$46,685	$44,579	$44,468	$101,529
Apr	$36,251	$89,615	$29,252	$72,629	$7,364	$30,808	$2,782	$13,030	$51,410	$46,685	$46,584	$101,529
May	$35,288	$89,862	$28,007	$76,461	$6,949	$29,722	$2,673	$12,554	$52,484	$51,410	$45,034	$101,529
Jun	$37,635	$97,857	$29,561	$95,432	$6,970	$31,381	$2,927	$12,867	$57,527	$52,484	$47,190	$101,529
TOTALS	**$413,444**	**$1,025,544**	**$340,027**	**$945,134**	**$80,860**	**$369,644**	**$32,637**	**$137,531**	**$610,883**	**$604,989**	**$534,849**	**$1,218,345**

Additional Account/Meter Information

	Concourse-B (T1)	Concourse-C (T1)	North Concourse-D (T2)	# Mech (T3)	NW Concourse -E (T3)	West Terminal (T3)	AA West Concourse-F (T3)	West Concourse-F (T3)	S. Terminal-H (T4)	Admin (T4)	Hibiscus Parking	Cypress Parking*
Acc #	066634-10553	79478-61022	69178-43226	69238-48284	69238-48284	69248-44209	69258-42236	42356-47098	69158-49274	84584-05100	48925-85375	58739-16141
Meter #	RV8907H	RV8910H	9V7896H	RV7627H	6V56269	RV8899H	RV7751H	6V79431	RV7628H	6V39088	DV80681	SV89037
KWH/Yr	5,894,558	14,810,400	5,004,960	13,560,960	1,122,480	5,425,600	455,280	1,723,320	8,862,960	630,180	7,905,200	18,168,000
Load Factor	77%	80%	89%	77%	84%	88%	85%	55%	83%	62%	89%	94%
% ON-Pk	26%	26%	26%	27%	N/A	26%	25%	N/A	26%	N/A	25%	26%
$/KWH	N/A	N/A	N/A	N/A	$0.061	N/A	N/A	$0.061	N/A	$0.061	N/A	N/A
$/KWH ON	$0.071	$0.072	$0.071	$0.072	N/A	$0.071	$0.083	N/A	$0.071	N/A	$0.071	$0.072
$/KWK/OFF	$0.052	$0.051	$0.052	$0.051	N/A	$0.052	$0.054	N/A	$0.052	N/A	$0.052	$0.051
$/KWD	$8.88	$8.827	$8.88	$8.827	$8.86	$8.88	$8.86	$8.86	$8.88	$8.86	$8.88	$8.827

*** Average Bill is Exroplated - not actual**

**** Palm Parking Lot gets its electric feed from the West terminal.**

Analysis of Electricity Use at Key FLL Meters

The following pages present the electric usage in a standard format for future comparison. Metrix Accounting Software is used for tracking utility bills, accounting for changes in weather, electric rates, and billing cycle days, when calculating savings over the Base year. The Base Year is calculated by inputting data (e.g., Cooling degree-days and electric bills) for a particular 12-month period before energy improvements are made. When actual savings are calculated, weather, billing days, and rates are "normalized" so a fair comparison can be made ("apples to apples" comparison).

This baseline can be used in the future to determine increases or decreases in consumption. The baselines were recorded using the Metrix Utility Accounting System. The baseline is actually a "best-fit" line (i.e. regression) that runs through a plot of data points plus an offset. These data points are a plot of the buildings energy use (KWH, KWH On-Peak, KWH Off-Peak, billed KWD) verses average temperature expressed in cooling degree-days (ClgDD). The baseline is an equation similar to a simple basic equation for a line: $y = mx + b$ + an Offset (where b and Offset are constants). The calculated value y is a data point on the baseline (i.e. KWH or KWD).

The constant b would be considered non-temperature, non-passenger sensitive base load (i.e. lighting, computers and even base chiller load such as pumps/fans). In this case it is the product of a constant (in KWH/days) times the number of days in the bill period.

The slope m would be ratio of KWH verses ClgDD. This is considered the temperature sensitive portion of the equation. For some of the airport meters, there is no direct correlation between temperature and energy use (probably as result of flight scheduling factors and passenger levels) so this variable will not be used in future comparisons on some of the electrical meters.

There is a correlation of energy use to temperature (ClgDDs) for most of the airport terminal meters; however, not as much as usual for South Florida, because some of the warmer months (i.e. September) are also the months with the least amount of travel. The exception to this is the energy use on the mechanical room at terminal 3; being that it is mostly chiller load, it is very temperature sensitive as demonstrated on previous example and graphs.

Area: Concourse B (T1) **Meter: RV8907H / GSLDT-1**
Unit: Qty On-pk (kWh) **Account: 06634-10553**

From	To	# Days	Reading	Incl?	HtgDD	ClgDD	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~130,840~~	~~◆~~	~~0~~	~~847~~	~~1.0~~	~~-9,604~~	~~130,840~~	~~0.0%~~
7/23/04	8/20/04	29	132,425	✓	0	774	1.0	-862	132,425	0.0%
8/21/04	9/21/04	32	133,433	◆	0	847	1.0	-13,251	133,433	0.0%
9/22/04	10/20/04	29	129,567	✓	0	691	1.0	870	129,567	0.0%
10/21/04	11/18/04	29	119,988	✓	0	577	1.0	-2,406	119,988	0.0%
11/19/04	12/21/04	33	122,534	✓	35	435	1.0	-4,489	122,534	0.0%
12/22/04	1/25/05	35	127,666	✓	50	408	1.0	-4,104	127,666	0.0%
1/26/05	2/24/05	30	121,663	◆	29	316	1.0	10,581	121,663	0.0%
2/25/05	3/25/05	29	119,040	✓	14	396	1.0	6,655	119,040	0.0%
3/26/05	4/25/05	31	128,286	✓	0	511	1.0	3,301	128,286	0.0%
4/26/05	5/24/05	29	137,781	◆	0	620	1.0	13,010	137,781	0.0%
5/25/05	6/23/05	30	144,096	◆	3	703	1.0	11,615	144,096	0.0%
Total or Average		**366**	**1,547,319**		**131**	**7,125**	**1.0**	**11,316**	**1,547,319**	**0.0%**

Concourse B (Account # 06634-10553): Tuning Period is 366 days from 6/23/04 until 6/23/05

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kWh) = 3,012.73 x #Days + 55.295 x ClgDD + Offset

This Baseline Equation has a Net Mean Bias of 0% and a Monthly Mean Error of ±0%. The underlying regression has a R^2=0.852
Baseline Costs are calculated using Rate Tariff documented in separate attachment

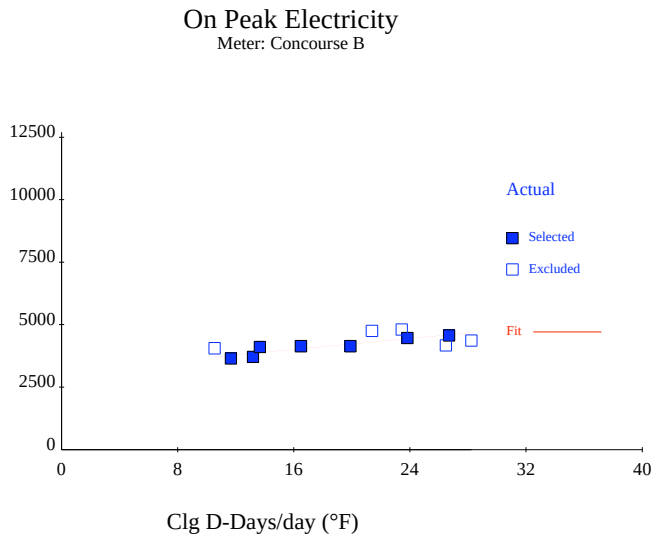
Explanations and Assumptions:

◆(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.

HtgDD=Heating Degree-Days calculated for Miami for a 65.0°F balance point.

ClgDD=Cooling Degree-Days calculated for Miami for a 57.0°F balance point

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: Concourse B (T1)
Unit: Qty Off-pk (kWh)

Meter: RV8907H / GSLDT-1
Account: 06634-10553

From	To	# Days	Reading	Incl?	HtgDD	ClgDD	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~356,360~~	~~✓~~	~~0~~	~~757~~	~~1.0~~	~~317~~	~~356,360~~	~~0.0%~~
7/23/04	8/20/04	29	340,775	✓	0	687	1.0	-3,400	340,775	0.0%
8/21/04	9/21/04	32	388,967	✓	0	751	1.0	9,188	388,967	0.0%
9/22/04	10/20/04	29	324,433	✓	0	604	1.0	-19,742	324,433	0.0%
10/21/04	11/18/04	29	323,812	✓	0	490	1.0	-20,363	323,812	0.0%
11/19/04	12/21/04	33	406,266	✓	35	343	1.0	14,619	406,266	0.0%
12/22/04	1/25/05	35	427,134	✓	50	310	1.0	11,751	427,134	0.0%
1/26/05	2/24/05	30	354,737	✓	29	230	1.0	-1,306	354,737	0.0%
2/25/05	3/25/05	29	350,160	✓	14	309	1.0	5,985	350,160	0.0%
3/26/05	4/25/05	31	369,314	✓	0	418	1.0	1,403	369,314	0.0%
4/26/05	5/24/05	29	336,377	✓	0	533	1.0	-7,798	336,377	0.0%
5/25/05	6/23/05	30	369,904	✓	3	613	1.0	13,861	369,904	0.0%
Total or Average		**366**	**4,348,239**		**131**	**6,045**	**1.0**	**4,519**	**4,348,239**	**0.0%**

Concourse B (Account # 06634-10553): Tuning Period is 366 days from 6/23/04 until 6/23/05

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kWh) = 11,866.09 x #Days + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.000
Baseline Costs are calculated using Rate Tariff documented in separate attachment

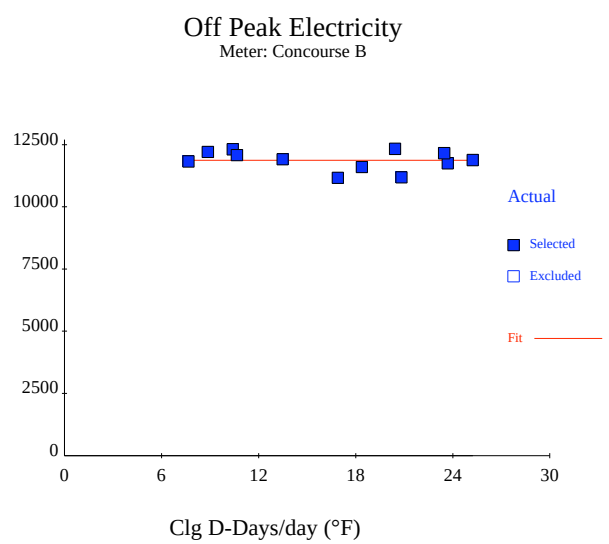
Explanations and Assumptions:

♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.

HtgDD=Heating Degree-Days calculated for Miami for a 65.0°F balance point.

ClgDD=Cooling Degree-Days calculated for Miami for a 65.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: Concourse B (T1) **Meter: RV8907H / GSLDT-1**
Unit: Dmd On-pk (kW) **Account: 06634-10553**

From	To	# Days	Reading	Incl?	HDD/da	CDD/day	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~863~~	~~✓~~	~~0~~	~~20~~	~~1.0~~	~~-9~~	~~863~~	~~0.0%~~
7/23/04	8/20/04	29	852	✓	0	19	1.0	-20	852	0.0%
8/21/04	9/21/04	32	868	✓	0	18	1.0	-4	868	0.0%
9/22/04	10/20/04	29	819	✓	0	16	1.0	-53	819	0.0%
10/21/04	11/18/04	29	831	✓	0	12	1.0	-41	831	0.0%
11/19/04	12/21/04	33	834	✓	1	6	1.0	-38	834	0.0%
12/22/04	1/25/05	35	882	✓	1	5	1.0	10	882	0.0%
1/26/05	2/24/05	30	824	✓	1	3	1.0	-48	824	0.0%
2/25/05	3/25/05	29	956	✓	0	6	1.0	84	956	0.0%
3/26/05	4/25/05	31	898	✓	0	8	1.0	26	898	0.0%
4/26/05	5/24/05	29	912	✓	0	13	1.0	40	912	0.0%
5/25/05	6/23/05	30	931	✓	0	16	1.0	59	931	0.0%
Total or Average		**366**	**10,473**		**4**	**143**	**1.0**	**1**	**10,473**	**0.0%**

Concourse B (Account # 06634-10553): Tuning Period is 366 days from 6/23/04 until 6/23/05

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kW) = 872.67 + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.1%. The underlying regression has a R^2=0.000
Baseline Costs are calculated using Rate Tariff documented in separate attachment

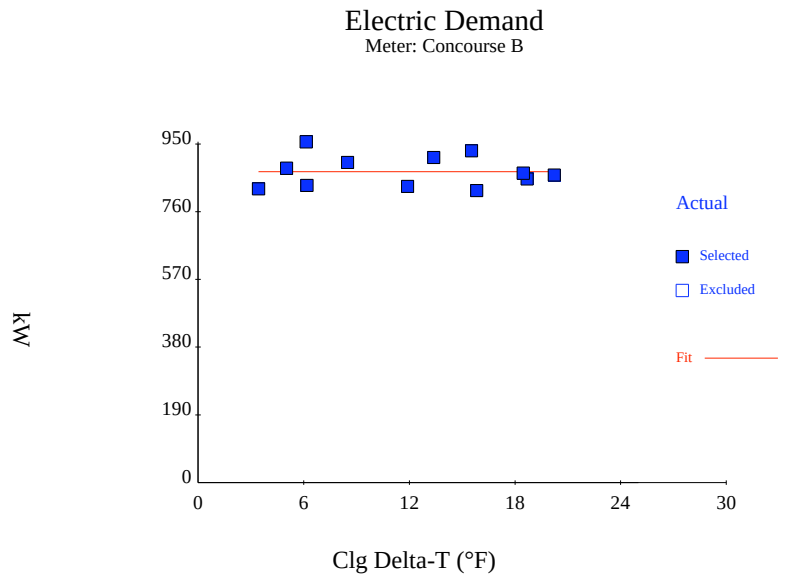
Explanations and Assumptions:

♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.

HDD/day=Heating Degree-Days per day calculated for Miami for a 65.0°F balance point.

CDD/day=Cooling Degree-Days per day calculated for Miami for a 65.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Concourse C (T1) **Meter: RV8910H GSLDT- 2**
Unit: Qty On-pk (kWh) **Account: 79478-61022**

From	To	# Days	Reading	Incl?	HtgDD	ClgDD	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~345,256~~	~~✓~~	~~0~~	~~727~~	~~1.0~~	~~-33,330~~	~~345,256~~	~~0.0%~~
7/23/04	8/20/04	29	364,087	✓	0	658	1.0	8,960	364,087	0.0%
8/21/04	9/21/04	32	370,062	✓	0	719	1.0	-20,091	370,062	0.0%
9/22/04	10/20/04	29	342,178	✓	0	575	1.0	7,147	342,178	0.0%
10/21/04	11/18/04	29	288,902	✓	0	461	1.0	-18,528	288,902	0.0%
11/19/04	12/21/04	33	276,285	✓	35	313	1.0	-22,320	276,285	0.0%
12/22/04	1/25/05	35	282,034	✓	50	280	1.0	-22,085	282,034	0.0%
1/26/05	2/24/05	30	256,156	✓	29	202	1.0	4,683	256,156	0.0%
2/25/05	3/25/05	29	272,001	✓	14	281	1.0	8,153	272,001	0.0%
3/26/05	4/25/05	31	315,721	✓	0	387	1.0	12,704	315,721	0.0%
4/26/05	5/24/05	29	353,108	✓	0	504	1.0	35,267	353,108	0.0%
5/25/05	6/23/05	30	375,717	✓	3	583	1.0	31,997	375,717	0.0%
Total or Average		**366**	**3,841,507**		**131**	**5,690**	**1.0**	**-7,444**	**3,841,507**	**0.0%**

Concourse C (Account # 79478-61022): Tuning Period is 366 days from 6/23/04 until 6/23/05

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kWh) = 6,752.16 x #Days + 242.1194 x ClgDD + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.808
Baseline Costs are calculated using Rate Tariff documented in separate attachment

Explanations and Assumptions:

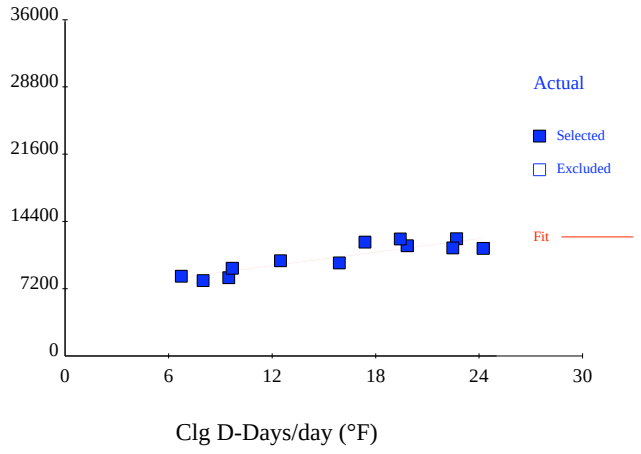
♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.

HtgDD=Heating Degree-Days calculated for Miami for a 65.0°F balance point.

ClgDD=Cooling Degree-Days calculated for Miami for a 61.0°F balance point

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.

On Peak Electricity
Meter: Concourse C



Concourse C (T1) **Meter: RV8910H GSLDT- 2**
Unit: Qty Off-pk (kWh) **Account: 79478-61022**

From	To	# Days	Reading	Incl?	HtgDD	ClgDD	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~953,144~~	~~✓~~	~~0~~	~~697~~	~~1.0~~	~~-24,842~~	~~953,144~~	~~0.0%~~
7/23/04	8/20/04	29	929,913	✓	0	629	1.0	-2,710	929,913	0.0%
8/21/04	9/21/04	32	1,057,138	✓	0	687	1.0	30,053	1,057,138	0.0%
9/22/04	10/20/04	29	851,422	♦	0	546	1.0	-57,536	851,422	0.0%
10/21/04	11/18/04	29	812,698	♦	0	432	1.0	-63,756	812,698	0.0%
11/19/04	12/21/04	33	960,515	✓	35	285	1.0	22,073	960,515	0.0%
12/22/04	1/25/05	35	1,020,766	✓	50	252	1.0	39,783	1,020,766	0.0%
1/26/05	2/24/05	30	779,844	✓	29	176	1.0	-49,594	779,844	0.0%
2/25/05	3/25/05	29	822,799	✓	14	253	1.0	-2,618	822,799	0.0%
3/26/05	4/25/05	31	913,479	✓	0	356	1.0	6,744	913,479	0.0%
4/26/05	5/24/05	29	880,092	✓	0	475	1.0	-8,622	880,092	0.0%
5/25/05	6/23/05	30	987,083	♦	3	553	1.0	50,154	987,083	0.0%
Total or Average		**366**	**10,968,893**		**131**	**5,341**	**1.0**	**-60,870**	**10,968,893**	**0.0%**

Concourse C (Account # 79478-61022): Tuning Period is 366 days from 6/23/04 until 6/23/05

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kWh) = 25,975.22 x #Days + 285.1213 x ClgDD + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.833
Baseline Costs are calculated using Rate Tariff documented in separate attachment

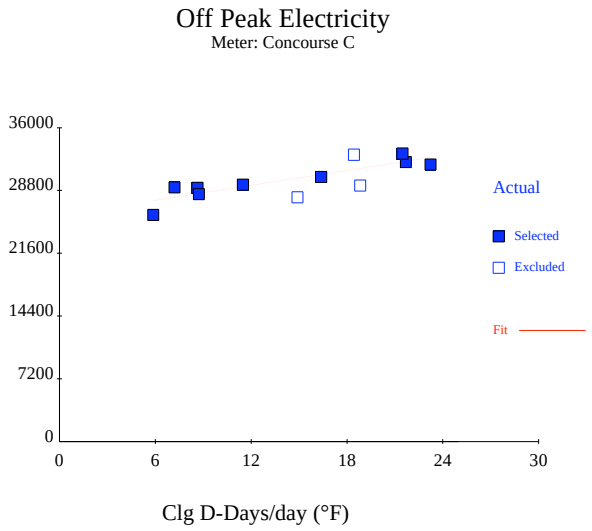
Explanations and Assumptions:

♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.

HtgDD=Heating Degree-Days calculated for Miami for a 65.0°F balance point.

ClgDD=Cooling Degree-Days calculated for Miami for a 62.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: Concourse C (T1) **Meter: RV8910H GSLDT- 2**
Unit: Dmd On-pk (kW) **Account: 79478-61022**

From	To	# Days	Reading	Incl?	HDD/da	CDD/day	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~2,177~~	~~✓~~	~~0~~	~~25~~	~~1.0~~	~~-54~~	~~2,177~~	~~0.0%~~
7/23/04	8/20/04	29	2,302	♦	0	24	1.0	92	2,302	0.0%
8/21/04	9/21/04	32	2,298	✓	0	23	1.0	91	2,298	0.0%
9/22/04	10/20/04	29	2,119	✓	0	21	1.0	-52	2,119	0.0%
10/21/04	11/18/04	29	1,940	♦	0	17	1.0	-178	1,940	0.0%
11/19/04	12/21/04	33	2,025	✓	1	10	1.0	-6	2,025	0.0%
12/22/04	1/25/05	35	1,995	✓	1	9	1.0	-15	1,995	0.0%
1/26/05	2/24/05	30	1,790	♦	1	8	1.0	-204	1,790	0.0%
2/25/05	3/25/05	29	2,054	✓	0	11	1.0	20	2,054	0.0%
3/26/05	4/25/05	31	2,220	♦	0	13	1.0	148	2,220	0.0%
4/26/05	5/24/05	29	2,153	✓	0	18	1.0	15	2,153	0.0%
5/25/05	6/23/05	30	2,252	♦	0	20	1.0	86	2,252	0.0%
Total or Average		**366**	**25,325**		**4**	**200**	**1.0**	**-56**	**25,325**	**0.0%**

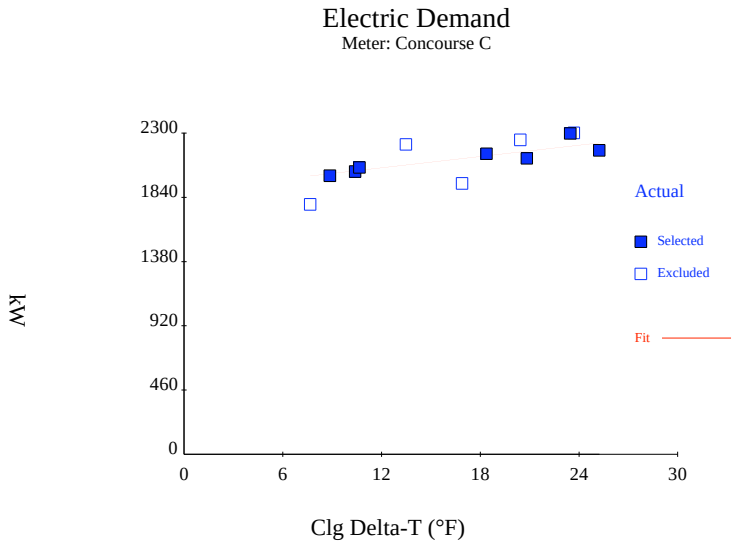
Concourse C (Account # 79478-61022): Tuning Period is 366 days from 6/23/04 until 6/23/05

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kW) = 1,890.38 + 13.4814 x CDD/day + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.773
Baseline Costs are calculated using Rate Tariff documented in separate attachment

Explanations and Assumptions:
♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.
HDD/day=Heating Degree-Days per day calculated for Miami for a 65.0°F balance point.
CDD/day=Cooling Degree-Days per day calculated for Miami for a 60.0°F balance point.
Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: N Terminal – D (T2)
Unit: Qty On-pk (kWh)

Meter: 9V7896H/GSLDT-1
Account: 69178-43226

From	To	# Days	Reading	Incl?	HtgDD	ClgDD	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~118,214~~	✓	~~0~~	~~847~~	~~1.0~~	~~-3,010~~	~~118,214~~	~~0.0%~~
7/23/04	8/20/04	29	116,826	✓	0	774	1.0	1,929	116,826	0.0%
8/21/04	9/21/04	32	112,589	♦	0	847	1.0	-13,832	112,589	0.0%
9/22/04	10/20/04	29	111,508	✓	0	691	1.0	851	111,508	0.0%
10/21/04	11/18/04	29	103,966	✓	0	577	1.0	-867	103,966	0.0%
11/19/04	12/21/04	33	103,685	✓	35	435	1.0	-4,288	103,685	0.0%
12/22/04	1/25/05	35	107,879	✓	50	408	1.0	-3,912	107,879	0.0%
1/26/05	2/24/05	30	99,703	✓	29	316	1.0	5,604	99,703	0.0%
2/25/05	3/25/05	29	96,030	✓	14	396	1.0	443	96,030	0.0%
3/26/05	4/25/05	31	105,388	✓	0	511	1.0	-1,271	105,388	0.0%
4/26/05	5/24/05	29	110,223	✓	0	620	1.0	3,193	110,223	0.0%
5/25/05	6/23/05	30	114,014	✓	3	703	1.0	146	114,014	0.0%
Total or Average		**366**	**1,300,025**		**131**	**7,125**	**1.0**	**-15,013**	**1,300,025**	**0.0%**

N Terminal (Account # 69178-43226): Tuning Period is 366 days from 6/23/04 until 6/23/05

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kWh) = 2,598.53 x #Days + 51.0844 x ClgDD + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.915
Baseline Costs are calculated using Rate Tariff documented in separate attachment

Explanations and Assumptions:

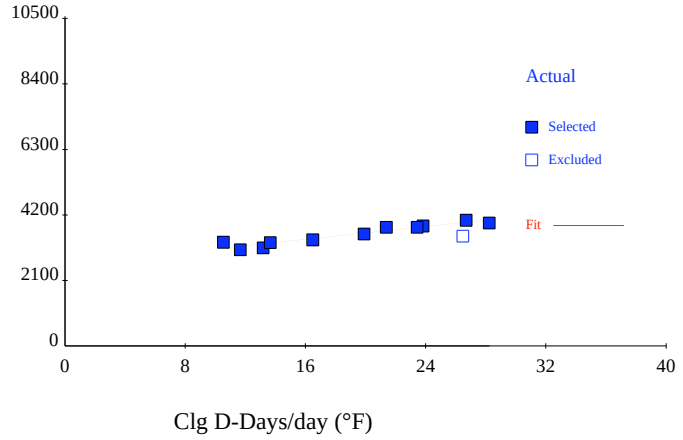
♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.

HtgDD=Heating Degree-Days calculated for Miami for a 65.0°F balance point.

ClgDD=Cooling Degree-Days calculated for Miami for a 57.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.

On Peak Electricity
Meter: N Terminal



Area: N Terminal – D (T2)
Unit: Qty Off-pk (kWh)

Meter: 9V7896H/GSLDT-1
Account: 69178-43226

From	To	# Days	Reading	Incl?	HtgDD	ClgDD	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~317,146~~	~~✓~~	~~0~~	~~577~~	~~1.0~~	~~5,788~~	~~317,146~~	~~0.0%~~
7/23/04	8/20/04	29	298,614	✓	0	513	1.0	-795	298,614	0.0%
8/21/04	9/21/04	32	326,371	✓	0	559	1.0	-3,764	326,371	0.0%
9/22/04	10/20/04	29	280,652	♦	0	430	1.0	-15,846	280,652	0.0%
10/21/04	11/18/04	29	290,114	✓	0	316	1.0	-2,386	290,114	0.0%
11/19/04	12/21/04	33	347,515	♦	35	180	1.0	20,968	347,515	0.0%
12/22/04	1/25/05	35	367,801	♦	50	151	1.0	22,863	367,801	0.0%
1/26/05	2/24/05	30	293,657	✓	29	79	1.0	-236	293,657	0.0%
2/25/05	3/25/05	29	289,410	✓	14	157	1.0	2,486	289,410	0.0%
3/26/05	4/25/05	31	309,332	✓	0	232	1.0	370	309,332	0.0%
4/26/05	5/24/05	29	279,537	♦	0	359	1.0	-14,471	279,537	0.0%
5/25/05	6/23/05	30	304,786	✓	3	437	1.0	-1,662	304,786	0.0%
Total or Average		**366**	**3,704,935**		**131**	**3,990**	**1.0**	**13,314**	**3,704,935**	**0.0%**

N Terminal (Account # 69178-43226): Tuning Period is 366 days from 6/23/04 until 6/23/05

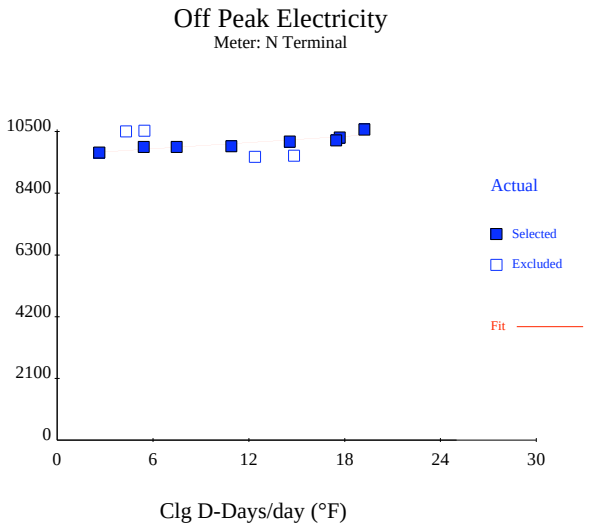
Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kWh) = 9,704.06 x #Days + 35.0712 x ClgDD + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.830
Baseline Costs are calculated using Rate Tariff documented in separate attachment

Explanations and Assumptions:
♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.
HtgDD=Heating Degree-Days calculated for Miami for a 65.0°F balance point.
ClgDD=Cooling Degree-Days calculated for Miami for a 66.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: N Terminal – D (T2)
Unit: Dmd On-pk (kW)

Meter: 9V7896H/GSLDT-1
Account: 69178-43226

From	To	# Days	Reading	Incl?	HDD/da	CDD/day	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~663~~	~~✓~~	~~0~~	~~30~~	~~1.0~~	~~2~~	~~663~~	~~0.0%~~
7/23/04	8/20/04	29	661	✓	0	29	1.0	4	661	0.0%
8/21/04	9/21/04	32	640	♦	0	28	1.0	-17	640	0.0%
9/22/04	10/20/04	29	627	♦	0	26	1.0	-25	627	0.0%
10/21/04	11/18/04	29	624	♦	0	22	1.0	-20	624	0.0%
11/19/04	12/21/04	33	638	♦	1	15	1.0	8	638	0.0%
12/22/04	1/25/05	35	656	♦	1	14	1.0	29	656	0.0%
1/26/05	2/24/05	30	616	✓	1	12	1.0	-9	616	0.0%
2/25/05	3/25/05	29	641	✓	0	16	1.0	10	641	0.0%
3/26/05	4/25/05	31	643	✓	0	18	1.0	6	643	0.0%
4/26/05	5/24/05	29	643	✓	0	23	1.0	-4	643	0.0%
5/25/05	6/23/05	30	641	✓	0	25	1.0	-10	641	0.0%
Total or Average		**366**	**7,695**		**4**	**259**	**1.0**	**-24**	**7,695**	**0.0%**

N Terminal (Account # 69178-43226): Tuning Period is 366 days from 6/23/04 until 6/23/05

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kW) = 599.38 + 2.0322 x CDD/day + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.766
Baseline Costs are calculated using Rate Tariff documented in separate attachment

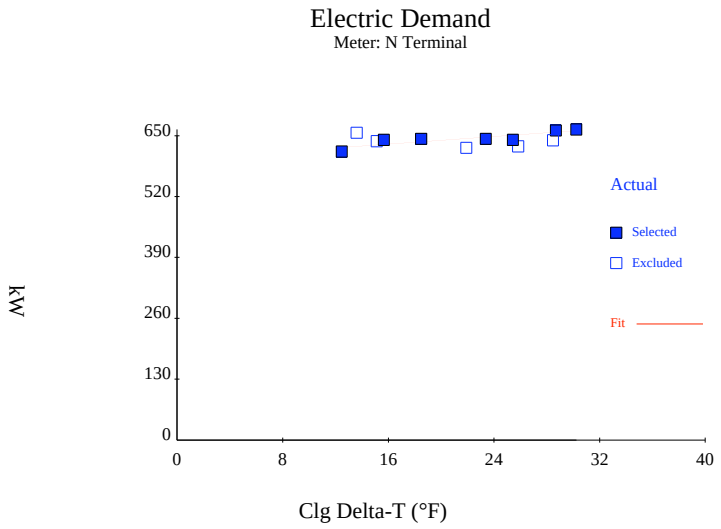
Explanations and Assumptions:

♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.

HDD/day=Heating Degree-Days per day calculated for Miami for a 65.0°F balance point.

CDD/day=Cooling Degree-Days per day calculated for Miami for a 55.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: Mechanical Room (T3)
Unit: Qty On-pk (kWh)

Meter: RV7627H/ GSLDT-2
Account: 69238-48284

From	To	# Days	Reading	Incl?	HtgDD	ClgDD	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~390,477~~	✓	~~0~~	~~787~~	~~1.0~~	~~-19,312~~	~~390,477~~	~~0.0%~~
7/23/04	8/20/04	29	396,454	✓	0	716	1.0	19,657	396,454	0.0%
8/21/04	9/21/04	32	383,689	✓	0	783	1.0	-29,034	383,689	0.0%
9/22/04	10/20/04	29	368,297	✓	0	633	1.0	27,344	368,297	0.0%
10/21/04	11/18/04	29	275,269	✓	0	519	1.0	-16,453	275,269	0.0%
11/19/04	12/21/04	33	221,764	✓	35	373	1.0	-16,230	221,764	0.0%
12/22/04	1/25/05	35	207,360	✓	50	340	1.0	-21,044	207,360	0.0%
1/26/05	2/24/05	30	205,550	✓	29	258	1.0	24,211	205,550	0.0%
2/25/05	3/25/05	29	219,475	✓	14	338	1.0	5,918	219,475	0.0%
3/26/05	4/25/05	31	259,990	✓	0	449	1.0	-6,164	259,990	0.0%
4/26/05	5/24/05	29	307,460	✓	0	562	1.0	-2,832	307,460	0.0%
5/25/05	6/23/05	30	373,886	✓	3	643	1.0	26,284	373,886	0.0%
Total or Average		**366**	**3,609,671**		**131**	**6,401**	**1.0**	**-7,655**	**3,609,671**	**0.0%**

 # Mech (Account # 69238-48284): Tuning Period is 366 days from 6/23/04 until 6/23/05

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kWh) = 2,330.70 x #Days + 431.8527 x ClgDD + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.942
Baseline Costs are calculated using Rate Tariff documented in separate attachment

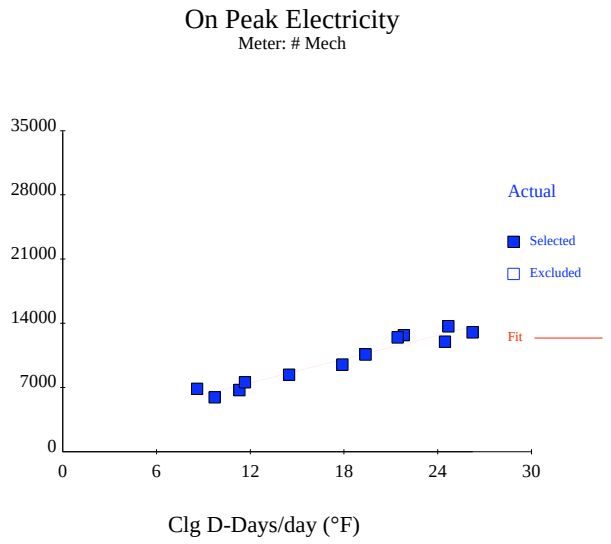
Explanations and Assumptions:

♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.

HtgDD=Heating Degree-Days calculated for Miami for a 65.0°F balance point.

ClgDD=Cooling Degree-Days calculated for Miami for a 59.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: Mechanical Room (T3)
Unit: Qty Off-pk (kWh)

Meter: RV7627H/ GSLDT-2
Account: 69238-48284

From	To	# Days	Reading	Incl?	HtgDD	ClgDD	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~1,039,923~~	✓	~~0~~	~~517~~	~~1.0~~	~~-13,114~~	~~1,039,923~~	~~0.0%~~
7/23/04	8/20/04	29	1,008,026	✓	0	455	1.0	32,006	1,008,026	0.0%
8/21/04	9/21/04	32	1,072,391	✓	0	495	1.0	2,022	1,072,391	0.0%
9/22/04	10/20/04	29	855,223	✓	0	372	1.0	-43,082	855,223	0.0%
10/21/04	11/18/04	29	781,451	✓	0	258	1.0	-10,114	781,451	0.0%
11/19/04	12/21/04	33	770,636	✓	35	136	1.0	17,441	770,636	0.0%
12/22/04	1/25/05	35	758,880	✓	50	107	1.0	-5,092	758,880	0.0%
1/26/05	2/24/05	30	623,650	✓	29	38	1.0	19,111	623,650	0.0%
2/25/05	3/25/05	29	668,481	✓	14	118	1.0	8,001	668,481	0.0%
3/26/05	4/25/05	31	706,010	✓	0	174	1.0	-44,834	706,010	0.0%
4/26/05	5/24/05	29	705,340	◆	0	301	1.0	-126,487	705,340	0.0%
5/25/05	6/23/05	30	961,474	✓	3	379	1.0	37,649	961,474	0.0%
Total or Average		**366**	**9,951,485**		**131**	**3,350**	**1.0**	**-126,494**	**9,951,485**	**0.0%**

 # Mech (Account # 69238-48284): Tuning Period is 366 days from 6/23/04 until 6/23/05

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kWh) = 18,965.30 x #Days + 936.3219 x ClgDD + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.973
Baseline Costs are calculated using Rate Tariff documented in separate attachment

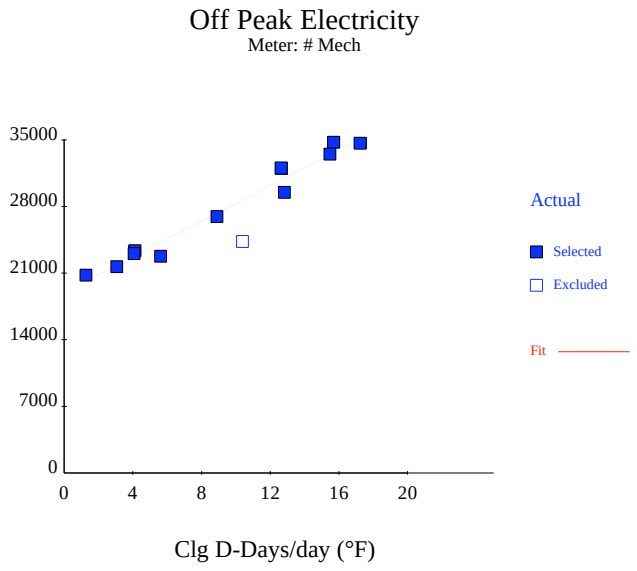
Explanations and Assumptions:

◆(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.

HtgDD=Heating Degree-Days calculated for Miami for a 65.0°F balance point.

ClgDD=Cooling Degree-Days calculated for Miami for a 68.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: Mechanical Room (T3)
Unit: Dmd On-pk (kW)

Meter: RV7627H/ GSLDT-2
Account: 69238-48284

From	To	# Days	Reading	Incl?	HDD/da	CDD/day	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~2,188~~	✓	~~0~~	~~25~~	~~1.0~~	~~-12~~	~~2,188~~	~~0.0%~~
7/23/04	8/20/04	29	2,183	✓	0	24	1.0	17	2,183	0.0%
8/21/04	9/21/04	32	2,135	✓	0	23	1.0	-26	2,135	0.0%
9/22/04	10/20/04	29	2,104	✓	0	21	1.0	1	2,104	0.0%
10/21/04	11/18/04	29	2,005	✓	0	17	1.0	-11	2,005	0.0%
11/19/04	12/21/04	33	1,856	✓	1	10	1.0	-16	1,856	0.0%
12/22/04	1/25/05	35	1,841	✓	1	9	1.0	3	1,841	0.0%
1/26/05	2/24/05	30	1,417	♦	1	8	1.0	-395	1,417	0.0%
2/25/05	3/25/05	29	2,118	♦	0	11	1.0	240	2,118	0.0%
3/26/05	4/25/05	31	1,961	✓	0	13	1.0	21	1,961	0.0%
4/26/05	5/24/05	29	2,024	✓	0	18	1.0	-25	2,024	0.0%
5/25/05	6/23/05	30	2,141	✓	0	20	1.0	47	2,141	0.0%
Total or Average		**366**	**23,973**		**4**	**200**	**1.0**	**-155**	**23,973**	**0.0%**

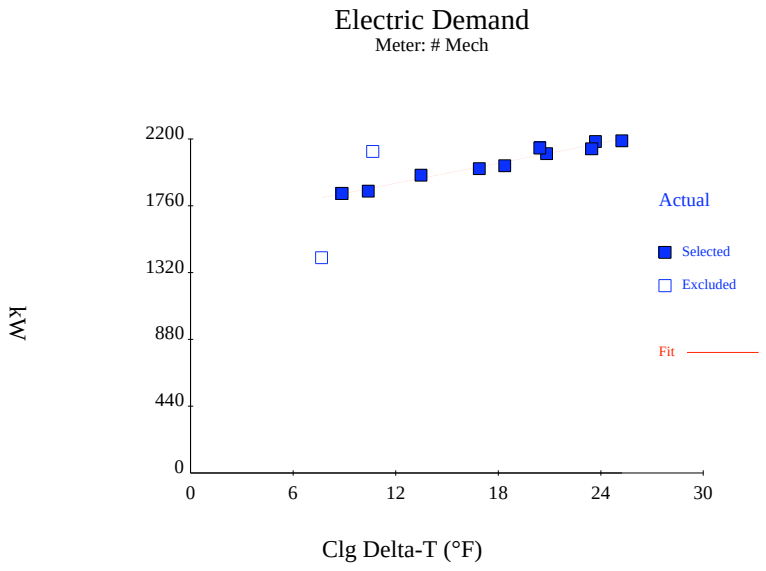
 # Mech (Account # 69238-48284): Tuning Period is 366 days from 6/23/04 until 6/23/05

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kW) = 1,642.85 + 22.0709 x CDD/day + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.968
Baseline Costs are calculated using Rate Tariff documented in separate attachment

Explanations and Assumptions:
♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.
HDD/day=Heating Degree-Days per day calculated for Miami for a 65.0°F balance point.
CDD/day=Cooling Degree-Days per day calculated for Miami for a 60.0°F balance point.
Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: NW Concourse – E (T3)
Unit: Qty On-pk (kWh)

Meter: 6V56269/GSD-1
Account: 42216-43028

From	To	# Days	Reading	Incl?	HtgDD	ClgDD	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~85,200~~	~~✓~~	~~0~~	~~607~~	~~1.0~~	~~-6,844~~	~~85,200~~	~~0.0%~~
7/23/04	8/20/04	29	87,360	✓	0	542	1.0	-1,616	87,360	0.0%
8/21/04	9/21/04	32	94,680	✓	0	591	1.0	-3,500	94,680	0.0%
9/22/04	10/20/04	29	88,320	✓	0	459	1.0	-656	88,320	0.0%
10/21/04	11/18/04	29	89,040	✓	0	345	1.0	65	89,040	0.0%
11/19/04	12/21/04	33	100,440	✓	35	204	1.0	-808	100,440	0.0%
12/22/04	1/25/05	35	106,800	✓	50	176	1.0	-584	106,800	0.0%
1/26/05	2/24/05	30	92,640	✓	29	103	1.0	596	92,640	0.0%
2/25/05	3/25/05	29	93,480	✓	14	178	1.0	4,505	93,480	0.0%
3/26/05	4/25/05	31	99,240	✓	0	263	1.0	4,128	99,240	0.0%
4/26/05	5/24/05	29	92,760	✓	0	388	1.0	3,785	92,760	0.0%
5/25/05	6/23/05	30	92,520	✓	3	466	1.0	476	92,520	0.0%
Total or Average		**366**	**1,122,480**		**131**	**4,322**	**1.0**	**-452**	**1,122,480**	**0.0%**

NW Concourse (Account # 42216-43028): Tuning Period is 366 days from 6/23/04 until 6/23/05

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kWh) = 3,068.12 x #Days + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.000
Baseline Costs are calculated using Rate Tariff documented in separate attachment

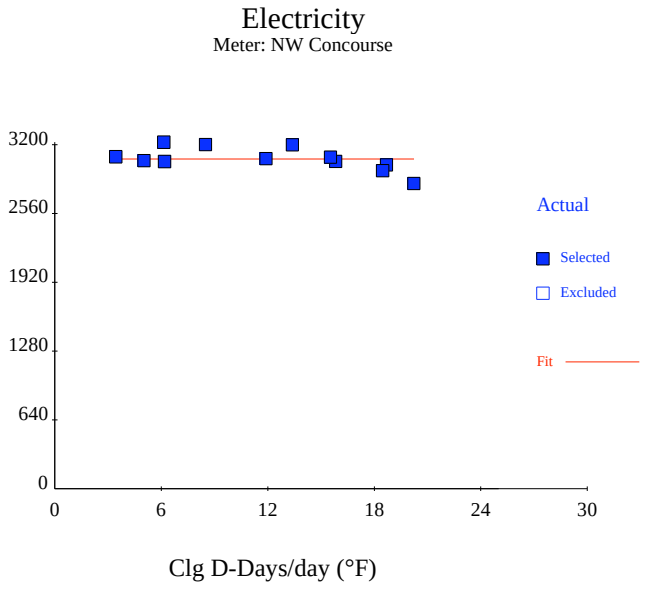
Explanations and Assumptions:

♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.

HtgDD=Heating Degree-Days calculated for Miami for a 65.0°F balance point.

ClgDD=Cooling Degree-Days calculated for Miami for a 65.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: NW Concourse – E (T3)
Unit: Dmd On-pk (kW)

Meter: 6V56269/GSD-1
Account: 42216-43028

From	To	# Days	Reading	Incl?	HDD/da	CDD/day	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~151~~	~~✓~~	~~0~~	~~20~~	~~1.0~~	~~-2~~	~~151~~	~~0.0%~~
7/23/04	8/20/04	29	151	✓	0	19	1.0	-2	151	0.0%
8/21/04	9/21/04	32	151	✓	0	18	1.0	-2	151	0.0%
9/22/04	10/20/04	29	150	✓	0	16	1.0	-3	150	0.0%
10/21/04	11/18/04	29	150	✓	0	12	1.0	-3	150	0.0%
11/19/04	12/21/04	33	149	✓	1	6	1.0	-4	149	0.0%
12/22/04	1/25/05	35	148	✓	1	5	1.0	-5	148	0.0%
1/26/05	2/24/05	30	150	✓	1	3	1.0	-3	150	0.0%
2/25/05	3/25/05	29	158	✓	0	6	1.0	5	158	0.0%
3/26/05	4/25/05	31	157	✓	0	8	1.0	4	157	0.0%
4/26/05	5/24/05	29	156	✓	0	13	1.0	3	156	0.0%
5/25/05	6/23/05	30	160	✓	0	16	1.0	7	160	0.0%
Total or Average		**366**	**1,831**		**4**	**143**	**1.0**	**0**	**1,831**	**0.0%**

NW Concourse (Account # 42216-43028): Tuning Period is 366 days from 6/23/04 until 6/23/05

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kW) = 152.58 + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.000
Baseline Costs are calculated using Rate Tariff documented in separate attachment

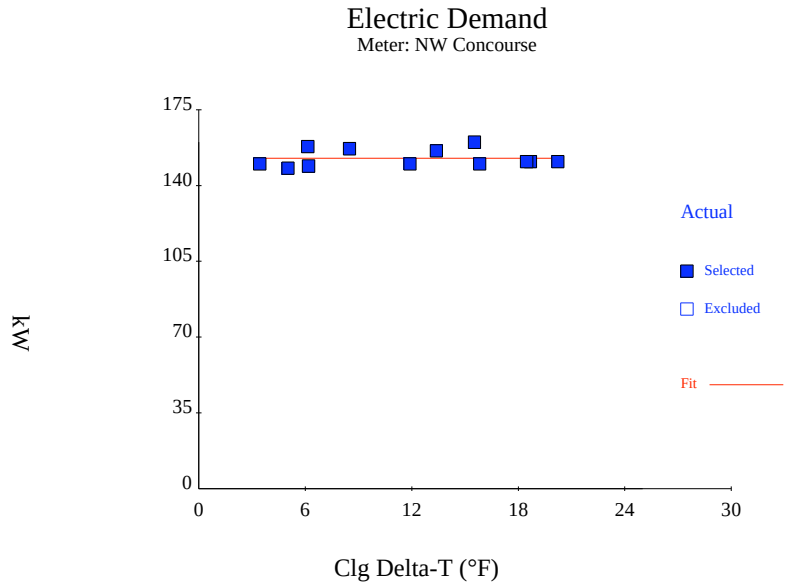
Explanations and Assumptions:

♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.

HDD/day=Heating Degree-Days per day calculated for Miami for a 65.0°F balance point.

CDD/day=Cooling Degree-Days per day calculated for Miami for a 65.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: W Terminal – F (T3)
Unit: Qty On-pk (kWh)

Meter: RV8899H/ GSLDT-1
Account: 69248-44209

From	To	# Days	Reading	Incl?	HtgDD	ClgDD	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~132,503~~	✓	~~0~~	~~607~~	~~1.0~~	~~-4,337~~	~~132,503~~	~~0.0%~~
7/23/04	8/20/04	29	132,470	✓	0	542	1.0	3,535	132,470	0.0%
8/21/04	9/21/04	32	127,469	♦	0	591	1.0	-14,276	127,469	0.0%
9/22/04	10/20/04	29	127,207	✓	0	459	1.0	4,472	127,207	0.0%
10/21/04	11/18/04	29	115,237	✓	0	345	1.0	1,017	115,237	0.0%
11/19/04	12/21/04	33	112,530	✓	35	204	1.0	-3,358	112,530	0.0%
12/22/04	1/25/05	35	112,843	✓	50	176	1.0	-7,053	112,843	0.0%
1/26/05	2/24/05	30	105,308	✓	29	103	1.0	6,115	105,308	0.0%
2/25/05	3/25/05	29	103,303	✓	14	178	1.0	1,557	103,303	0.0%
3/26/05	4/25/05	31	112,509	✓	0	263	1.0	-1,686	112,509	0.0%
4/26/05	5/24/05	29	118,833	✓	0	388	1.0	1,401	118,833	0.0%
5/25/05	6/23/05	30	122,862	✓	3	466	1.0	-3,446	122,862	0.0%
Total or Average		**366**	**1,423,074**		**131**	**4,322**	**1.0**	**-16,056**	**1,423,074**	**0.0%**

W Terminal (Account # 69248-44209): Tuning Period is 366 days from 6/23/04 until 6/23/05

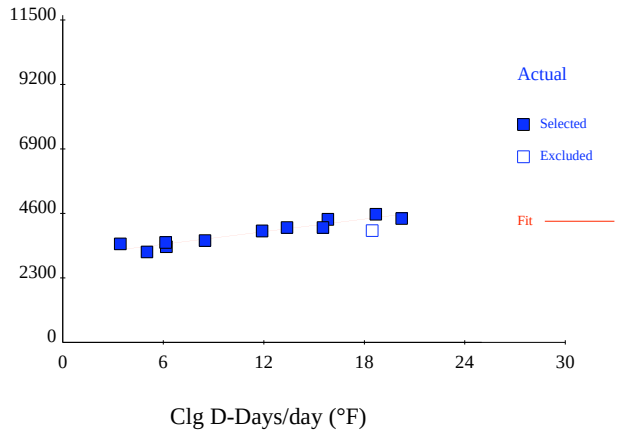
Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kWh) = 3,050.00 x #Days + 74.6950 x ClgDD + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.916
Baseline Costs are calculated using Rate Tariff documented in separate attachment

Explanations and Assumptions:
♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.
HtgDD=Heating Degree-Days calculated for Miami for a 65.0°F balance point.
ClgDD=Cooling Degree-Days calculated for Miami for a 65.0°F balance point.
Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.

On Peak Electricity
Meter: W Terminal



Area: W Terminal – F (T3)
Unit: Qty Off-pk (kWh)

Meter: RV8899H/ GSLDT-1
Account: 69248-44209

From	To	# Days	Reading	Incl?	HtgDD	ClgDD	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~341,497~~	✓	~~0~~	~~517~~	~~1.0~~	~~2,607~~	~~341,497~~	~~0.0%~~
7/23/04	8/20/04	29	323,530	✓	0	455	1.0	-1,983	323,530	0.0%
8/21/04	9/21/04	32	356,931	✓	0	495	1.0	-1,927	356,931	0.0%
9/22/04	10/20/04	29	309,593	♦	0	372	1.0	-12,062	309,593	0.0%
10/21/04	11/18/04	29	321,963	✓	0	258	1.0	5,607	321,963	0.0%
11/19/04	12/21/04	33	385,070	♦	35	136	1.0	32,403	385,070	0.0%
12/22/04	1/25/05	35	395,957	♦	50	107	1.0	23,647	395,957	0.0%
1/26/05	2/24/05	30	317,492	✓	29	38	1.0	866	317,492	0.0%
2/25/05	3/25/05	29	314,297	✓	14	118	1.0	4,448	314,297	0.0%
3/26/05	4/25/05	31	323,091	✓	0	174	1.0	-10,351	323,091	0.0%
4/26/05	5/24/05	29	294,367	♦	0	301	1.0	-23,988	294,367	0.0%
5/25/05	6/23/05	30	318,738	♦	3	379	1.0	-13,738	318,738	0.0%
Total or Average		**366**	**4,002,526**		**131**	**3,350**	**1.0**	**5,531**	**4,002,526**	**0.0%**

W Terminal (Account # 69248-44209): Tuning Period is 366 days from 6/23/04 until 6/23/05

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kWh) = 10,495.32 x #Days + 46.4802 x ClgDD + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.738
Baseline Costs are calculated using Rate Tariff documented in separate attachment

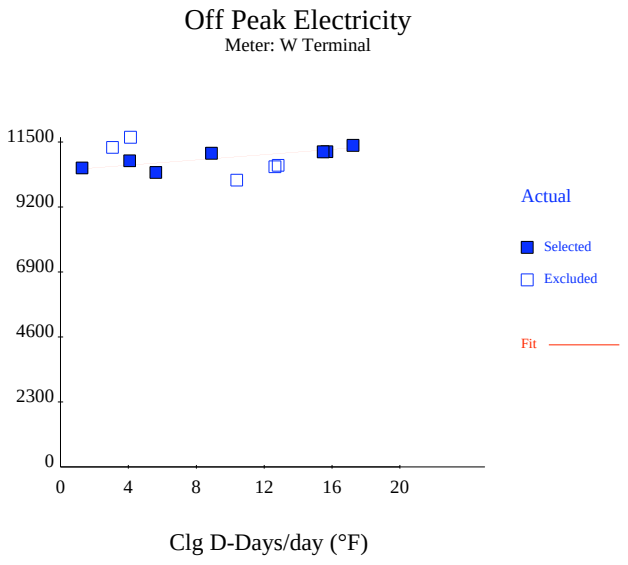
Explanations and Assumptions:

♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.

HtgDD=Heating Degree-Days calculated for Miami for a 65.0°F balance point.

ClgDD=Cooling Degree-Days calculated for Miami for a 68.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: W Terminal – F (T3)
Unit: Dmd On-pk (kW)

Meter: RV8899H/ GSLDT-1
Account: 69248-44209

From	To	# Days	Reading	Incl?	HDD/da	CDD/day	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~745~~	✓	~~0~~	~~19~~	~~1.0~~	~~-1~~	~~745~~	~~0.0%~~
7/23/04	8/20/04	29	753	✓	0	18	1.0	14	753	0.0%
8/21/04	9/21/04	32	732	✓	0	17	1.0	-6	732	0.0%
9/22/04	10/20/04	29	726	✓	0	15	1.0	0	726	0.0%
10/21/04	11/18/04	29	700	✓	0	11	1.0	-9	700	0.0%
11/19/04	12/21/04	33	699	✓	1	5	1.0	13	699	0.0%
12/22/04	1/25/05	35	702	✓	1	4	1.0	21	702	0.0%
1/26/05	2/24/05	30	669	✓	1	3	1.0	-5	669	0.0%
2/25/05	3/25/05	29	672	✓	0	5	1.0	-14	672	0.0%
3/26/05	4/25/05	31	681	✓	0	7	1.0	-14	681	0.0%
4/26/05	5/24/05	29	681	♦	0	12	1.0	-35	681	0.0%
5/25/05	6/23/05	30	694	♦	0	15	1.0	-31	694	0.0%
Total or Average		**366**	**8,456**		**4**	**132**	**1.0**	**-66**	**8,456**	**0.0%**

W Terminal (Account # 69248-44209): Tuning Period is 366 days from 6/23/04 until 6/23/05

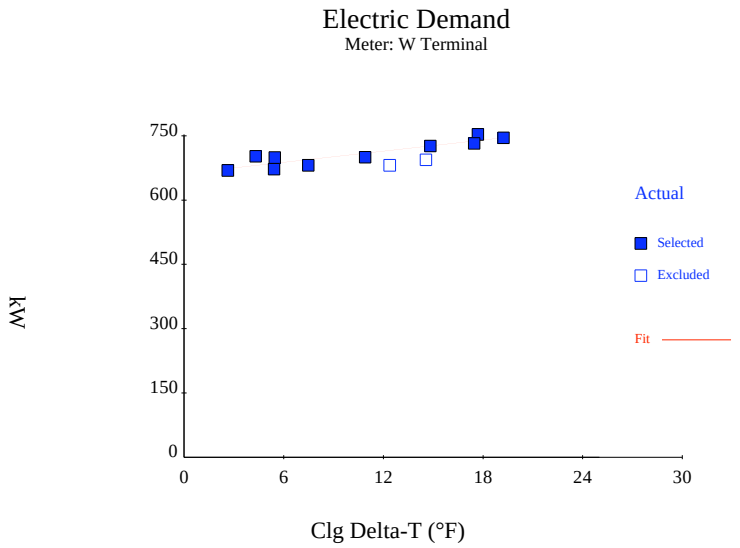
Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kW) = 662.41 + 4.3347 x CDD/day + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.833
Baseline Costs are calculated using Rate Tariff documented in separate attachment

Explanations and Assumptions:
♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.
HDD/day=Heating Degree-Days per day calculated for Miami for a 65.0°F balance point.
CDD/day=Cooling Degree-Days per day calculated for Miami for a 66.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: W Concourse – F Airlines (T3)
Unit: Qty On-pk (kWh)

Meter: RV7751H/GSDT-1
Account: 69258-42236

From	To	# Days	Reading	Incl?	HtgDD	ClgDD	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~9,262~~	~~◆~~	~~0~~	~~847~~	~~1.0~~	~~-1,681~~	~~9,262~~	~~0.0%~~
7/23/04	8/20/04	29	10,269	✓	0	774	1.0	-80	10,269	0.0%
8/21/04	9/21/04	32	9,307	◆	0	847	1.0	-2,077	9,307	0.0%
9/22/04	10/20/04	29	10,244	✓	0	691	1.0	319	10,244	0.0%
10/21/04	11/18/04	29	9,641	✓	0	577	1.0	300	9,641	0.0%
11/19/04	12/21/04	33	9,001	✓	35	435	1.0	-494	9,001	0.0%
12/22/04	1/25/05	35	9,316	✓	50	408	1.0	-481	9,316	0.0%
1/26/05	2/24/05	30	8,702	✓	29	316	1.0	477	8,702	0.0%
2/25/05	3/25/05	29	8,859	✓	14	396	1.0	445	8,859	0.0%
3/26/05	4/25/05	31	9,131	✓	0	511	1.0	-312	9,131	0.0%
4/26/05	5/24/05	29	9,402	✓	0	620	1.0	-159	9,402	0.0%
5/25/05	6/23/05	30	10,039	✓	3	703	1.0	-167	10,039	0.0%
Total or Average		**366**	**113,173**		**131**	**7,125**	**1.0**	**-3,911**	**113,173**	**0.0%**

W Concourse (Account # 69258-42236): Tuning Period is 366 days from 6/23/04 until 6/23/05

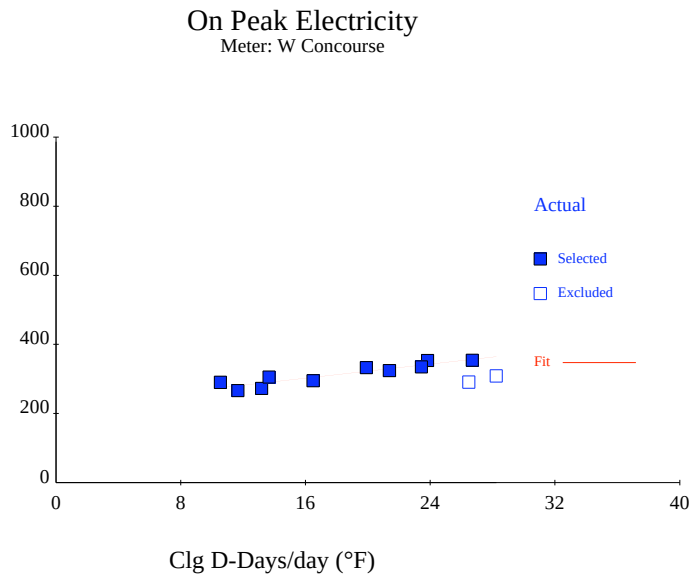
Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kWh) = 220.23 x #Days + 5.1200 x ClgDD + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.856
Baseline Costs are calculated using Rate Tariff documented in separate attachment

Explanations and Assumptions:
◆(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.
HtgDD=Heating Degree-Days calculated for Miami for a 65.0°F balance point.
ClgDD=Cooling Degree-Days calculated for Miami for a 57.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: W Concourse – F Airlines (T3)
Unit: Qty Off-pk (kWh)

Meter: RV7751H/GSDT-1
Account: 69258-42236

From	To	# Days	Reading	Incl?	HtgDD	ClgDD	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~26,498~~	~~◆~~	~~0~~	~~517~~	~~1.0~~	~~-3,113~~	~~26,498~~	~~0.0%~~
7/23/04	8/20/04	29	28,611	✓	0	455	1.0	164	28,611	0.0%
8/21/04	9/21/04	32	28,133	◆	0	495	1.0	-3,228	28,133	0.0%
9/22/04	10/20/04	29	27,676	✓	0	372	1.0	-441	27,676	0.0%
10/21/04	11/18/04	29	27,799	✓	0	258	1.0	134	27,799	0.0%
11/19/04	12/21/04	33	31,559	✓	35	136	1.0	703	31,559	0.0%
12/22/04	1/25/05	35	32,924	✓	50	107	1.0	346	32,924	0.0%
1/26/05	2/24/05	30	27,058	✓	29	38	1.0	-653	27,058	0.0%
2/25/05	3/25/05	29	27,861	◆	14	118	1.0	751	27,861	0.0%
3/26/05	4/25/05	31	29,029	✓	0	174	1.0	-140	29,029	0.0%
4/26/05	5/24/05	29	26,358	◆	0	301	1.0	-1,478	26,358	0.0%
5/25/05	6/23/05	30	28,601	◆	3	379	1.0	-463	28,601	0.0%
Total or Average		**366**	**342,107**		**131**	**3,350**	**1.0**	**-7,417**	**342,107**	**0.0%**

W Concourse (Account # 69258-42236): Tuning Period is 366 days from 6/23/04 until 6/23/05

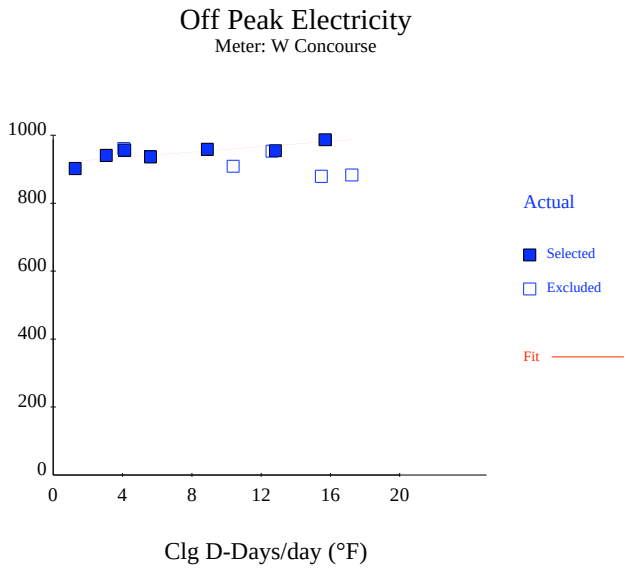
Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kWh) = 918.67 x #Days + 3.9677 x ClgDD + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.669
Baseline Costs are calculated using Rate Tariff documented in separate attachment

Explanations and Assumptions:
◆(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.
HtgDD=Heating Degree-Days calculated for Miami for a 65.0°F balance point.
ClgDD=Cooling Degree-Days calculated for Miami for a 68.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: W Concourse – F Airlines (T3)
Unit: Dmd On-pk (kW)

Meter: RV7751H/GSDT-1
Account: 69258-42236

From	To	# Days	Reading	Incl?	HDD/da	CDD/day	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~62~~	~~✓~~	~~0~~	~~18~~	~~1.0~~	~~0~~	~~62~~	~~0.0%~~
7/23/04	8/20/04	29	66	♦	0	17	1.0	4	66	0.0%
8/21/04	9/21/04	32	62	✓	0	16	1.0	0	62	0.0%
9/22/04	10/20/04	29	62	✓	0	14	1.0	1	62	0.0%
10/21/04	11/18/04	29	63	♦	0	10	1.0	3	63	0.0%
11/19/04	12/21/04	33	60	♦	1	5	1.0	2	60	0.0%
12/22/04	1/25/05	35	57	✓	1	4	1.0	-1	57	0.0%
1/26/05	2/24/05	30	57	✓	1	2	1.0	0	57	0.0%
2/25/05	3/25/05	29	59	✓	0	5	1.0	1	59	0.0%
3/26/05	4/25/05	31	56	♦	0	7	1.0	-2	56	0.0%
4/26/05	5/24/05	29	58	✓	0	11	1.0	-2	58	0.0%
5/25/05	6/23/05	30	67	♦	0	14	1.0	6	67	0.0%
Total or Average		**366**	**729**		**4**	**122**	**1.0**	**14**	**729**	**0.0%**

W Concourse (Account # 69258-42236): Tuning Period is 366 days from 6/23/04 until 6/23/05

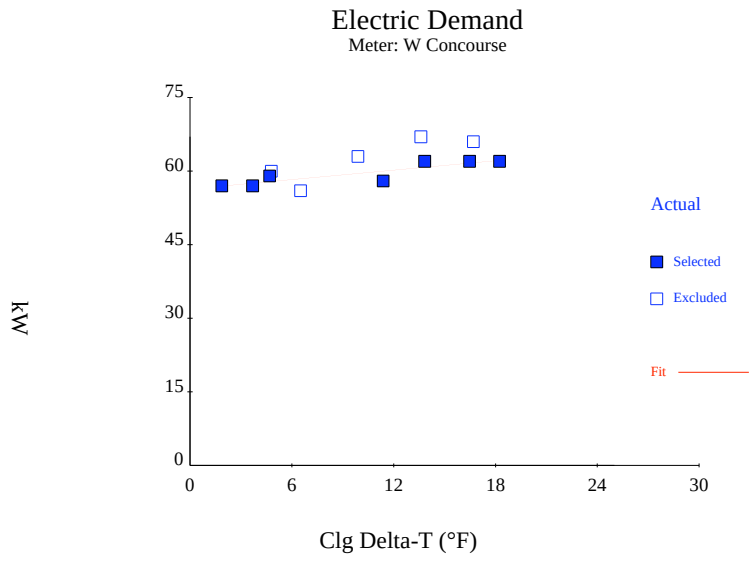
Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kW) = 56.38 + 0.3188 x CDD/day + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.785
Baseline Costs are calculated using Rate Tariff documented in separate attachment

Explanations and Assumptions:
♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.
HDD/day=Heating Degree-Days per day calculated for Miami for a 65.0°F balance point.
CDD/day=Cooling Degree-Days per day calculated for Miami for a 67.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: W Concourse – F (T3)
Unit: Qty On-pk (kWh)

Meter: 6V79431/ GSD-1
Account: 42356-47098

From	To	# Days	Reading	Incl?	HtgDD	ClgDD	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~140,280~~	~~✓~~	~~0~~	~~757~~	~~1.0~~	~~-5,176~~	~~140,280~~	~~0.0%~~
7/23/04	8/20/04	29	139,200	✓	0	687	1.0	62	139,200	0.0%
8/21/04	9/21/04	32	145,560	♦	0	751	1.0	-7,740	145,560	0.0%
9/22/04	10/20/04	29	142,560	✓	0	604	1.0	6,146	142,560	0.0%
10/21/04	11/18/04	29	132,720	✓	0	490	1.0	47	132,720	0.0%
11/19/04	12/21/04	33	147,120	✓	35	343	1.0	3,189	147,120	0.0%
12/22/04	1/25/05	35	148,800	✓	50	310	1.0	-2,090	148,800	0.0%
1/26/05	2/24/05	30	125,760	✓	29	230	1.0	-2,402	125,760	0.0%
2/25/05	3/25/05	29	136,560	♦	14	309	1.0	9,826	136,560	0.0%
3/26/05	4/25/05	31	157,920	♦	0	418	1.0	19,568	157,920	0.0%
4/26/05	5/24/05	29	151,920	♦	0	533	1.0	17,836	151,920	0.0%
5/25/05	6/23/05	30	155,040	♦	3	613	1.0	14,310	155,040	0.0%
Total or Average		**366**	**1,723,440**		**131**	**6,045**	**1.0**	**53,576**	**1,723,440**	**0.0%**

W Concourse 2 (Account # 42356-47098): Tuning Period is 366 days from 6/23/04 until 6/23/05

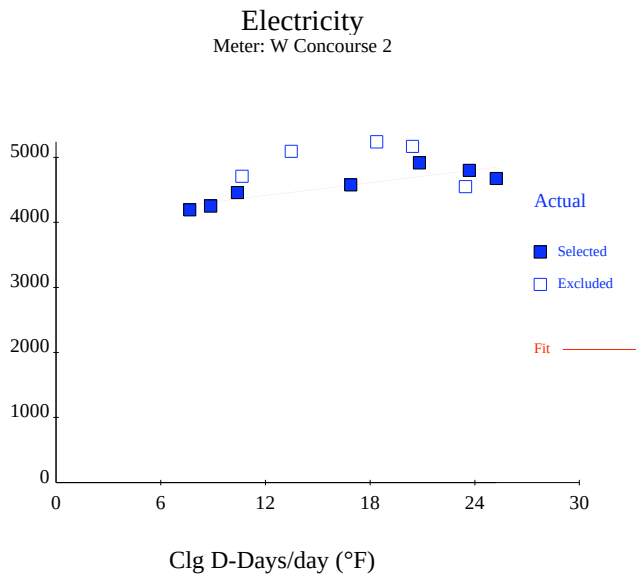
Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kWh) = 4,020.48 x #Days + 32.8152 x ClgDD + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.786
Baseline Costs are calculated using Rate Tariff documented in separate attachment

Explanations and Assumptions:
♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.
HtgDD=Heating Degree-Days calculated for Miami for a 65.0°F balance point.
ClgDD=Cooling Degree-Days calculated for Miami for a 60.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: W Concourse - F (T3)
Unit: Dmd On-pk (kW)

Meter: 6V79431/ GSD-1
Account: 42356-47098

From	To	# Days	Reading	Incl?	HDD/da	CDD/day	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~398~~	✓	~~0~~	~~28~~	~~1.0~~	~~3~~	~~398~~	~~0.0%~~
7/23/04	8/20/04	29	353	✓	0	27	1.0	-33	353	0.0%
8/21/04	9/21/04	32	389	✓	0	26	1.0	4	389	0.0%
9/22/04	10/20/04	29	382	✓	0	24	1.0	12	382	0.0%
10/21/04	11/18/04	29	295	♦	0	20	1.0	-52	295	0.0%
11/19/04	12/21/04	33	293	✓	1	13	1.0	-15	293	0.0%
12/22/04	1/25/05	35	300	✓	1	12	1.0	1	300	0.0%
1/26/05	2/24/05	30	334	♦	1	11	1.0	42	334	0.0%
2/25/05	3/25/05	29	379	♦	0	14	1.0	68	379	0.0%
3/26/05	4/25/05	31	394	♦	0	16	1.0	67	394	0.0%
4/26/05	5/24/05	29	384	✓	0	21	1.0	28	384	0.0%
5/25/05	6/23/05	30	398	♦	0	23	1.0	31	398	0.0%
Total or Average		**366**	**4,299**		**4**	**235**	**1.0**	**156**	**4,299**	**0.0%**

W Concourse 2 (Account # 42356-47098): Tuning Period is 366 days from 6/23/04 until 6/23/05

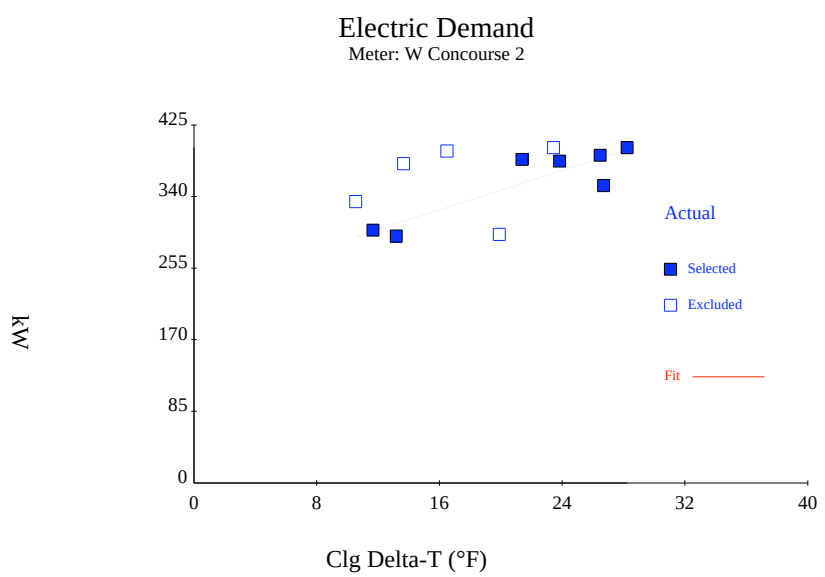
Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kW) = 231.02 + 5.8234 x CDD/day + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.797
Baseline Costs are calculated using Rate Tariff documented in separate attachment

Explanations and Assumptions:
♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.
HDD/day=Heating Degree-Days per day calculated for Miami for a 65.0°F balance point.
CDD/day=Cooling Degree-Days per day calculated for Miami for a 57.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: S Terminal – H (T4)
Unit: Qty On-pk (kWh)

Meter: RV7628H/ GSLDT-1
Account: 69158-49274

From	To	# Days	Reading	Incl?	HtgDD	ClgDD	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~222,761~~	✓	~~0~~	~~817~~	~~1.0~~	~~-15,514~~	~~222,761~~	~~0.0%~~
7/23/04	8/20/04	29	224,000	✓	0	745	1.0	1,295	224,000	0.0%
8/21/04	9/21/04	32	220,387	♦	0	815	1.0	-24,153	220,387	0.0%
9/22/04	10/20/04	29	215,136	✓	0	662	1.0	6,571	215,136	0.0%
10/21/04	11/18/04	29	183,171	✓	0	548	1.0	-5,972	183,171	0.0%
11/19/04	12/21/04	33	168,170	✓	35	404	1.0	-9,651	168,170	0.0%
12/22/04	1/25/05	35	169,849	✓	50	374	1.0	-9,466	169,849	0.0%
1/26/05	2/24/05	30	156,314	✓	29	287	1.0	8,335	156,314	0.0%
2/25/05	3/25/05	29	157,866	✓	14	367	1.0	-440	157,866	0.0%
3/26/05	4/25/05	31	186,498	✓	0	480	1.0	2,335	186,498	0.0%
4/26/05	5/24/05	29	206,196	✓	0	591	1.0	9,727	206,196	0.0%
5/25/05	6/23/05	30	223,982	✓	3	673	1.0	10,240	223,982	0.0%
Total or Average		**366**	**2,334,330**		**131**	**6,763**	**1.0**	**-26,693**	**2,334,330**	**0.0%**

S Terminal (Account # 69158-49274): Tuning Period is 366 days from 6/23/04 until 6/23/05

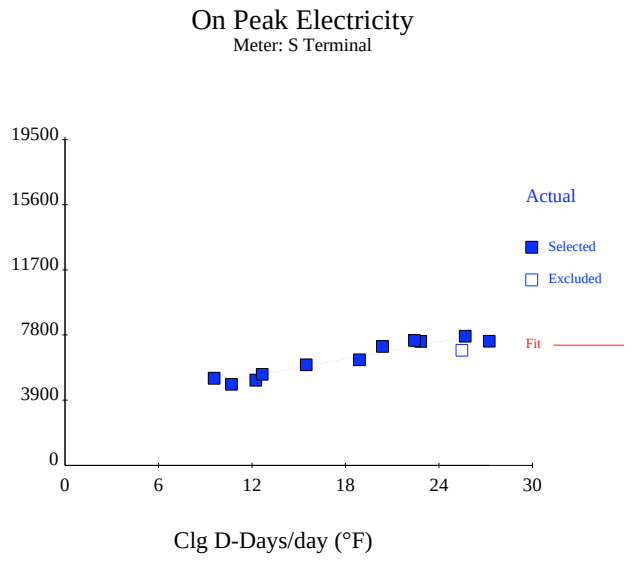
Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kWh) = 3,302.79 x #Days + 170.3683 x ClgDD + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.931
Baseline Costs are calculated using Rate Tariff documented in separate attachment

Explanations and Assumptions:
♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.
HtgDD=Heating Degree-Days calculated for Miami for a 65.0°F balance point.
ClgDD=Cooling Degree-Days calculated for Miami for a 58.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: S Terminal – H (T4)
Unit: Qty Off-pk (kWh)

Meter: RV7628H/ GSLDT-1
Account: 69158-49274

From	To	# Days	Reading	Incl?	HtgDD	ClgDD	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~581,479~~	✓	~~0~~	~~517~~	~~1.0~~	~~-5,885~~	~~581,479~~	~~0.0%~~
7/23/04	8/20/04	29	554,560	✓	0	455	1.0	-3,451	554,560	0.0%
8/21/04	9/21/04	32	629,213	✓	0	495	1.0	15,020	629,213	0.0%
9/22/04	10/20/04	29	537,024	✓	0	372	1.0	-2,865	537,024	0.0%
10/21/04	11/18/04	29	506,109	✓	0	258	1.0	-8,890	506,109	0.0%
11/19/04	12/21/04	33	573,670	✓	35	136	1.0	22,044	573,670	0.0%
12/22/04	1/25/05	35	589,511	✓	50	107	1.0	12,585	589,511	0.0%
1/26/05	2/24/05	30	467,926	✓	29	38	1.0	-14,855	467,926	0.0%
2/25/05	3/25/05	29	478,134	✓	14	118	1.0	-6,297	478,134	0.0%
3/26/05	4/25/05	31	526,302	✓	0	174	1.0	-1,989	526,302	0.0%
4/26/05	5/24/05	29	497,964	♦	0	301	1.0	-26,423	497,964	0.0%
5/25/05	6/23/05	30	586,910	♦	3	379	1.0	29,676	586,910	0.0%
Total or Average		**366**	**6,528,802**		**131**	**3,350**	**1.0**	**8,671**	**6,528,802**	**0.0%**

S Terminal (Account # 69158-49274): Tuning Period is 366 days from 6/23/04 until 6/23/05

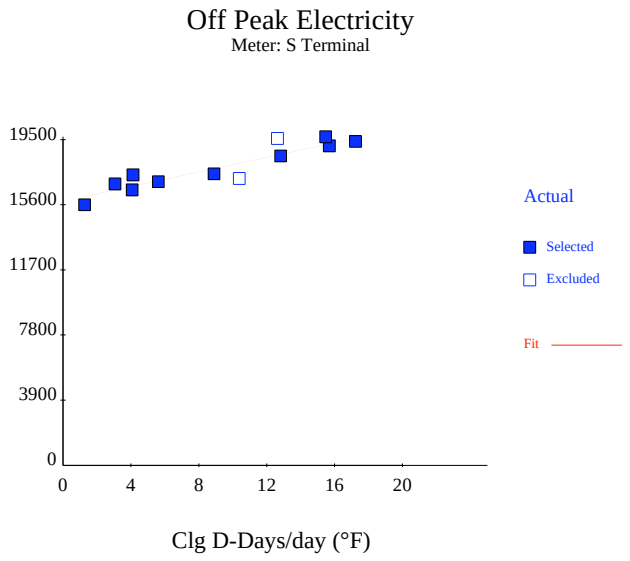
Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kWh) = 15,816.12 x #Days + 218.3372 x ClgDD + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.925
Baseline Costs are calculated using Rate Tariff documented in separate attachment

Explanations and Assumptions:
♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.
HtgDD=Heating Degree-Days calculated for Miami for a 65.0°F balance point.
ClgDD=Cooling Degree-Days calculated for Miami for a 68.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: S Terminal – H (T4)
Unit: Dmd On-pk (kW)

Meter: RV7628H/ GSLDT-1
Account: 69158-49274

From	To	# Days	Reading	Incl?	HDD/da	CDD/day	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~1,287~~	✓	~~0~~	~~20~~	~~1.0~~	~~-23~~	~~1,287~~	~~0.0%~~
7/23/04	8/20/04	29	1,329	✓	0	19	1.0	35	1,329	0.0%
8/21/04	9/21/04	32	1,215	♦	0	18	1.0	-77	1,215	0.0%
9/22/04	10/20/04	29	1,225	♦	0	16	1.0	-40	1,225	0.0%
10/21/04	11/18/04	29	1,177	✓	0	12	1.0	-48	1,177	0.0%
11/19/04	12/21/04	33	1,154	✓	1	6	1.0	-13	1,154	0.0%
12/22/04	1/25/05	35	1,160	✓	1	5	1.0	5	1,160	0.0%
1/26/05	2/24/05	30	1,037	♦	1	3	1.0	-102	1,037	0.0%
2/25/05	3/25/05	29	1,202	♦	0	6	1.0	36	1,202	0.0%
3/26/05	4/25/05	31	1,224	✓	0	8	1.0	34	1,224	0.0%
4/26/05	5/24/05	29	1,362	♦	0	13	1.0	122	1,362	0.0%
5/25/05	6/23/05	30	1,272	✓	0	16	1.0	10	1,272	0.0%
Total or Average		**366**	**14,648**		**4**	**143**	**1.0**	**-61**	**14,648**	**0.0%**

S Terminal (Account # 69158-49274): Tuning Period is 366 days from 6/23/04 until 6/23/05

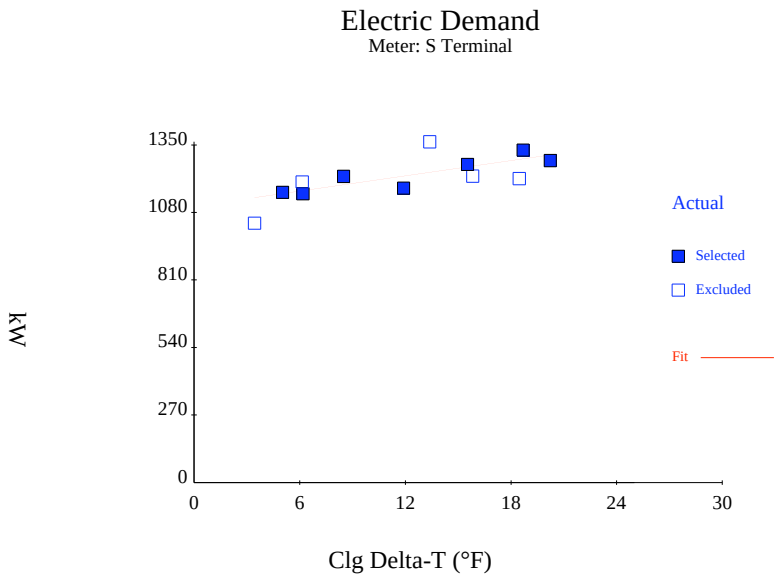
Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kW) = 1,103.80 + 10.2141 x CDD/day + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.807
Baseline Costs are calculated using Rate Tariff documented in separate attachment

Explanations and Assumptions:
♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.
HDD/day=Heating Degree-Days per day calculated for Miami for a 65.0°F balance point.
CDD/day=Cooling Degree-Days per day calculated for Miami for a 65.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: Admin 320
Unit: Qty On-pk (kWh)

Meter: 6V39088/ GSD-1
Account: 84584-05100

From	To	# Days	Reading	Incl?	HtgDD	ClgDD	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~57,780~~	✓	~~0~~	~~757~~	~~1.0~~	~~-377~~	~~57,780~~	~~0.0%~~
7/23/04	8/20/04	29	56,340	✓	0	687	1.0	1,205	56,340	0.0%
8/21/04	9/21/04	32	60,420	✓	0	751	1.0	-248	60,420	0.0%
9/22/04	10/20/04	29	50,460	✓	0	604	1.0	-2,668	50,460	0.0%
10/21/04	11/18/04	29	45,540	♦	0	490	1.0	-4,830	45,540	0.0%
11/19/04	12/21/04	33	46,260	♦	35	343	1.0	-5,867	46,260	0.0%
12/22/04	1/25/05	35	52,740	✓	50	310	1.0	-1,245	52,740	0.0%
1/26/05	2/24/05	30	45,780	✓	29	230	1.0	371	45,780	0.0%
2/25/05	3/25/05	29	46,020	✓	14	309	1.0	28	46,020	0.0%
3/26/05	4/25/05	31	51,720	✓	0	418	1.0	435	51,720	0.0%
4/26/05	5/24/05	29	53,700	✓	0	533	1.0	2,290	53,700	0.0%
5/25/05	6/23/05	30	63,420	♦	3	613	1.0	8,747	63,420	0.0%
Total or Average		**366**	**630,180**		**131**	**6,045**	**1.0**	**-2,159**	**630,180**	**0.0%**

84584-05100 (Account # 84584-05100): Tuning Period is 366 days from 6/23/04 until 6/23/05

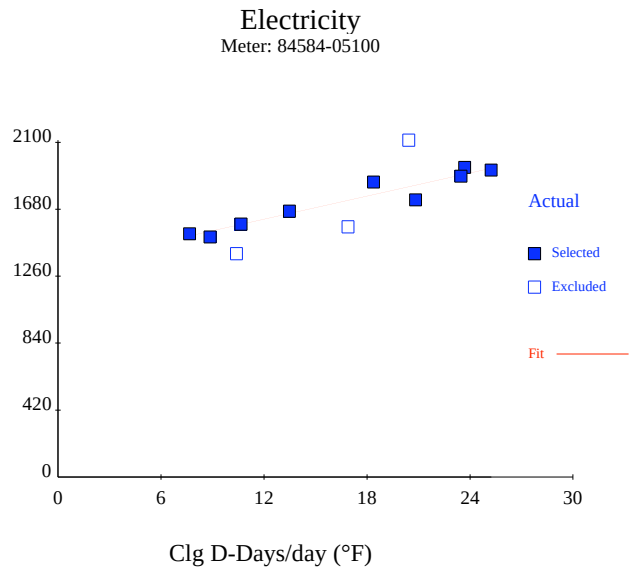
Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kWh) = 1,328.19 x #Days + 24.1890 x ClgDD + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.924
Baseline Costs are calculated using Rate Tariff documented in separate attachment

Explanations and Assumptions:
♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.
HtgDD=Heating Degree-Days calculated for Miami for a 65.0°F balance point.
ClgDD=Cooling Degree-Days calculated for Miami for a 60.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: Admin 320
Unit: Dmd On-pk (kW)

Meter: 6V39088/ GSD-1
Account: 84584-05100

From	To	# Days	Reading	Incl?	HDD/da	CDD/day	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~119~~	~~✓~~	~~0~~	~~21~~	~~1.0~~	~~0~~	~~119~~	~~0.0%~~
7/23/04	8/20/04	29	116	✓	0	20	1.0	-2	116	0.0%
8/21/04	9/21/04	32	111	♦	0	19	1.0	-7	111	0.0%
9/22/04	10/20/04	29	120	✓	0	17	1.0	3	120	0.0%
10/21/04	11/18/04	29	115	✓	0	13	1.0	1	115	0.0%
11/19/04	12/21/04	33	105	♦	1	7	1.0	-6	105	0.0%
12/22/04	1/25/05	35	109	✓	1	6	1.0	-1	109	0.0%
1/26/05	2/24/05	30	110	✓	1	4	1.0	1	110	0.0%
2/25/05	3/25/05	29	118	♦	0	7	1.0	7	118	0.0%
3/26/05	4/25/05	31	110	✓	0	9	1.0	-2	110	0.0%
4/26/05	5/24/05	29	122	♦	0	14	1.0	7	122	0.0%
5/25/05	6/23/05	30	135	♦	0	17	1.0	19	135	0.0%
Total or Average		**366**	**1,390**		**4**	**154**	**1.0**	**20**	**1,390**	**0.0%**

84584-05100 (Account # 84584-05100): Tuning Period is 366 days from 6/23/04 until 6/23/05

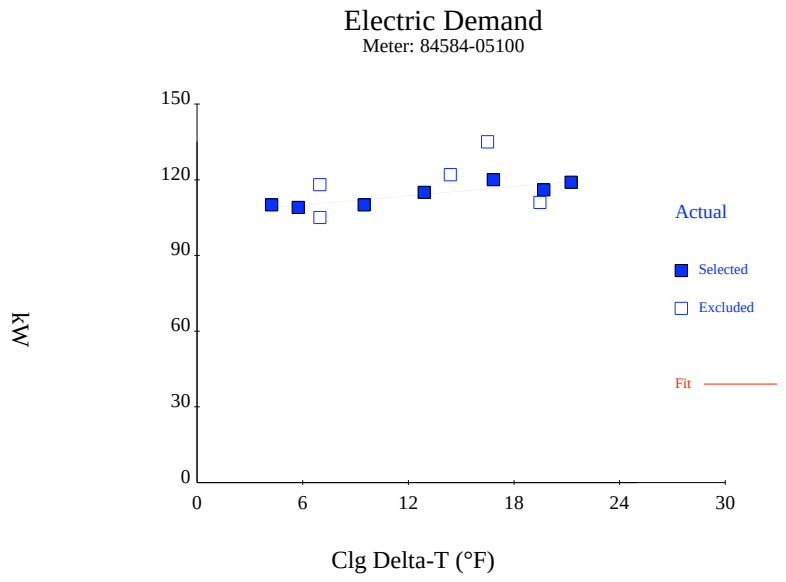
Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kW) = 106.38 + 0.6060 x CDD/day + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.804
Baseline Costs are calculated using Rate Tariff documented in separate attachment

Explanations and Assumptions:
♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.
HDD/day=Heating Degree-Days per day calculated for Miami for a 65.0°F balance point.
CDD/day=Cooling Degree-Days per day calculated for Miami for a 64.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: # Toll Plaza
Unit: Qty On-pk (kWh)

Meter: 6V39119/ GSD-1
Account: 19302-50541

From	To	# Days	Reading	Incl?	HtgDD	ClgDD	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~33,540~~	~~◆~~	~~0~~	~~667~~	~~1.0~~	~~2,521~~	~~33,540~~	~~0.0%~~
7/23/04	8/20/04	29	29,160	✓	0	600	1.0	-48	29,160	0.0%
8/21/04	9/21/04	32	31,560	✓	0	655	1.0	-547	31,560	0.0%
9/22/04	10/20/04	29	27,900	✓	0	517	1.0	132	27,900	0.0%
10/21/04	11/18/04	29	25,800	✓	0	403	1.0	11	25,800	0.0%
11/19/04	12/21/04	33	26,580	✓	35	257	1.0	733	26,580	0.0%
12/22/04	1/25/05	35	26,280	✓	50	226	1.0	-325	26,280	0.0%
1/26/05	2/24/05	30	22,200	✓	29	151	1.0	137	22,200	0.0%
2/25/05	3/25/05	29	21,840	✓	14	227	1.0	-894	21,840	0.0%
3/26/05	4/25/05	31	26,280	✓	0	325	1.0	549	26,280	0.0%
4/26/05	5/24/05	29	25,800	✓	0	446	1.0	-735	25,800	0.0%
5/25/05	6/23/05	30	29,580	✓	3	524	1.0	1,043	29,580	0.0%
Total or Average		**366**	**326,520**		**131**	**4,998**	**1.0**	**2,577**	**326,520**	**0.0%**

 # Toll (Account # 19302-50541): Tuning Period is 366 days from 6/23/04 until 6/23/05

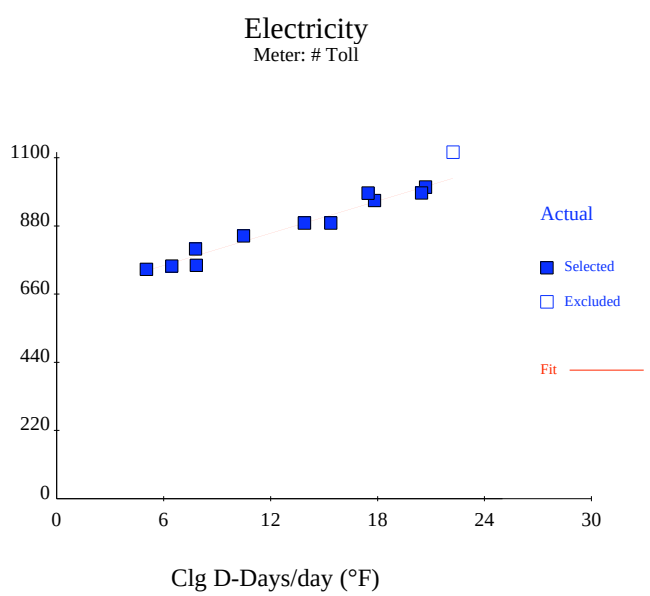
Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kWh) = 648.05 x #Days + 17.3582 x ClgDD + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.961
Baseline Costs are calculated using Rate Tariff documented in separate attachment

Explanations and Assumptions:
◆(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.
HtgDD=Heating Degree-Days calculated for Miami for a 65.0°F balance point.
ClgDD=Cooling Degree-Days calculated for Miami for a 63.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: # Toll Plaza
Unit: Dmd On-pk (kW)

Meter: 6V39119/ GSD-1
Account: 19302-50541

From	To	# Days	Reading	Incl?	HDD/da	CDD/day	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~74~~	~~✓~~	~~0~~	~~20~~	~~1.0~~	~~2~~	~~74~~	~~0.0%~~
7/23/04	8/20/04	29	69	✓	0	19	1.0	-2	69	0.0%
8/21/04	9/21/04	32	63	◆	0	18	1.0	-8	63	0.0%
9/22/04	10/20/04	29	62	◆	0	16	1.0	-8	62	0.0%
10/21/04	11/18/04	29	68	✓	0	12	1.0	1	68	0.0%
11/19/04	12/21/04	33	64	✓	1	6	1.0	0	64	0.0%
12/22/04	1/25/05	35	64	✓	1	5	1.0	0	64	0.0%
1/26/05	2/24/05	30	57	◆	1	3	1.0	-6	57	0.0%
2/25/05	3/25/05	29	64	✓	0	6	1.0	0	64	0.0%
3/26/05	4/25/05	31	69	◆	0	8	1.0	3	69	0.0%
4/26/05	5/24/05	29	68	✓	0	13	1.0	0	68	0.0%
5/25/05	6/23/05	30	70	✓	0	16	1.0	0	70	0.0%
Total or Average		**366**	**792**		**4**	**143**	**1.0**	**-18**	**792**	**0.0%**

 # Toll (Account # 19302-50541): Tuning Period is 366 days from 6/23/04 until 6/23/05

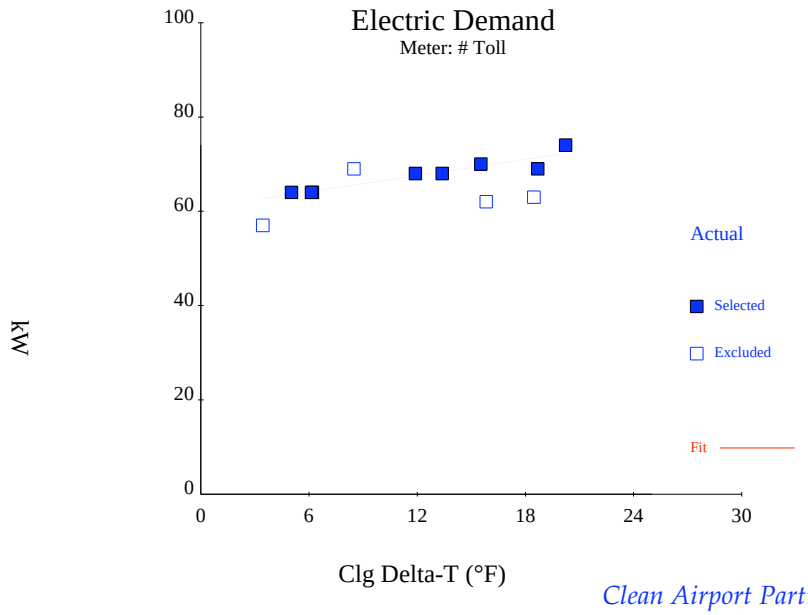
Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kW) = 60.76 + 0.5673 x CDD/day + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.892
Baseline Costs are calculated using Rate Tariff documented in separate attachment

Explanations and Assumptions:
◆(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.
HDD/day=Heating Degree-Days per day calculated for Miami for a 65.0°F balance point.
CDD/day=Cooling Degree-Days per day calculated for Miami for a 65.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Area: Parking Garage (Hibiscus)
Unit: Qty On-pk (kWh)

Meter: DV80681/ GSLDT-1
Account: 48925-85375

From	To	# Days	Reading	Incl?	HtgDD	ClgDD	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~166,800~~	✓	~~0~~	~~607~~	~~1.0~~	~~6,686~~	~~166,800~~	~~0.0%~~
7/23/04	8/20/04	29	162,000	✓	0	542	1.0	7,223	162,000	0.0%
8/21/04	9/21/04	32	158,400	✓	0	591	1.0	-12,388	158,400	0.0%
9/22/04	10/20/04	29	160,800	✓	0	459	1.0	6,023	160,800	0.0%
10/21/04	11/18/04	29	157,200	✓	0	345	1.0	2,423	157,200	0.0%
11/19/04	12/21/04	33	160,800	✓	35	204	1.0	-15,325	160,800	0.0%
12/22/04	1/25/05	35	186,000	✓	50	176	1.0	-799	186,000	0.0%
1/26/05	2/24/05	30	160,800	✓	29	103	1.0	686	160,800	0.0%
2/25/05	3/25/05	29	152,400	✓	14	178	1.0	-2,377	152,400	0.0%
3/26/05	4/25/05	31	154,400	✓	0	263	1.0	-11,051	154,400	0.0%
4/26/05	5/24/05	29	163,200	✓	0	388	1.0	8,423	163,200	0.0%
5/25/05	6/23/05	30	167,200	✓	3	466	1.0	7,086	167,200	0.0%
Total or Average		**366**	**1,950,000**		**131**	**4,322**	**1.0**	**-3,387**	**1,950,000**	**0.0%**

Parking (Account # 4892585375): Tuning Period is 366 days from 6/23/04 until 6/23/05

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kWh) = 5,337.12 x #Days + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.000
Baseline Costs are calculated using Rate Tariff documented in separate attachment

Explanations and Assumptions:

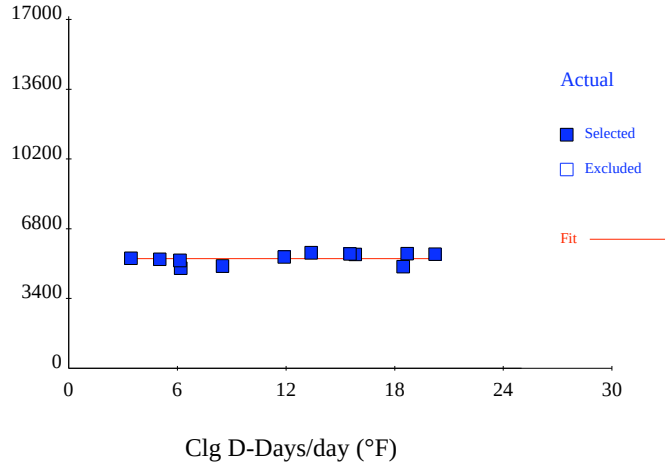
♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.

HtgDD=Heating Degree-Days calculated for Miami for a 65.0°F balance point.

ClgDD=Cooling Degree-Days calculated for Miami for a 65.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.

On Peak Electricity
Meter: Parking



Area: Parking Garage (Hibiscus)
Unit: Qty Off-pk (kWh)

Meter: DV80681/ GSLDT-1
Account: 48925-85375

From	To	# Days	Reading	Incl?	HtgDD	ClgDD	Multiplier	Offset	Baseline	Deviation
~~6/23/04~~	~~7/22/04~~	~~30~~	~~478,800~~	✓	~~0~~	~~607~~	~~1.0~~	~~-9153~~	~~478,800~~	~~0.0%~~
7/23/04	8/20/04	29	463,600	✓	0	542	1.0	-8087	463,600	0.0%
8/21/04	9/21/04	32	516,400	✓	0	591	1.0	-4083	516,400	0.0%
9/22/04	10/20/04	29	462,800	✓	0	459	1.0	-8887	462,800	0.0%
10/21/04	11/18/04	29	470,400	✓	0	345	1.0	-1287	470,400	0.0%
11/19/04	12/21/04	33	554,000	✓	35	204	1.0	17252	554,000	0.0%
12/22/04	1/25/05	35	568,400	✓	50	176	1.0	-878	568,400	0.0%
1/26/05	2/24/05	30	480,800	✓	29	103	1.0	-7153	480,800	0.0%
2/25/05	3/25/05	29	474,800	✓	14	178	1.0	3113	474,800	0.0%
3/26/05	4/25/05	31	514,400	✓	0	263	1.0	10182	514,400	0.0%
4/26/05	5/24/05	29	467,600	✓	0	388	1.0	-4087	467,600	0.0%
5/25/05	6/23/05	30	503,200	✓	3	466	1.0	15,247	503,200	0.0%
Total or Average		**366**	**5,955,200**		**131**	**4,322**	**1.0**	**2,180**	**5,955,200**	**0.0%**

Parking (Account # 4892585375): Tuning Period is 366 days from 6/23/04 until 6/23/05

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kWh) = 16,265.08 x #Days + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2=0.000
Baseline Costs are calculated using Rate Tariff documented in separate attachment

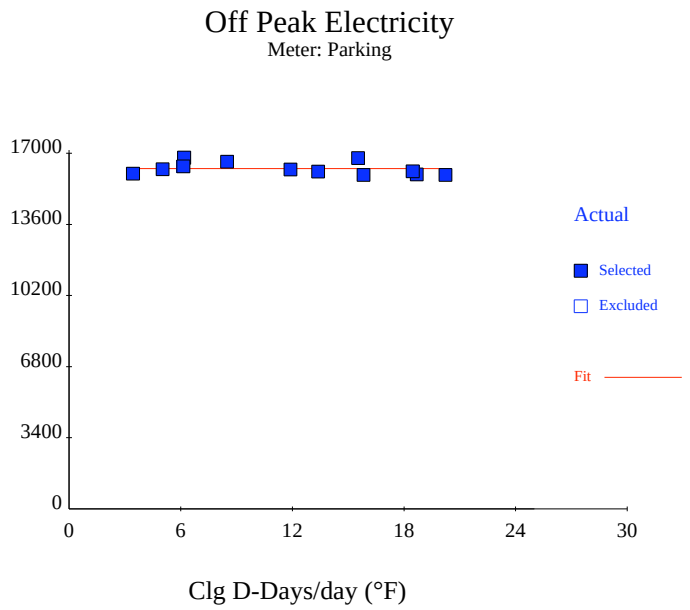
Explanations and Assumptions:

♦(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.

HtgDD=Heating Degree-Days calculated for Miami for a 65.0°F balance point.

ClgDD=Cooling Degree-Days calculated for Miami for a 65.0°F balance point.

Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.



Account: 48925-85375

Area: Parking Garage (Hibiscus) **Meter: DV80681/ GSLDT-1**
Unit: Dmd On-pk (kW)

From	To	# Days	Reading	Incl?	HDD/da	CDD/day	Multiplier	Offset	Baseline	Deviation
6/23/04	7/22/04	30	1,012	☑	0	20	1.0	-2	1,012	0.0%
7/23/04	8/20/04	29	1,028	☑	0	19	1.0	14	1,028	0.0%
8/21/04	9/21/04	32	1,012	☑	0	18	1.0	-2	1,012	0.0%
9/22/04	10/20/04	29	1,008	☑	0	16	1.0	-6	1,008	0.0%
10/21/04	11/18/04	29	1,000	☑	0	12	1.0	-14	1,000	0.0%
11/19/04	12/21/04	33	1,000	☑	1	6	1.0	-14	1,000	0.0%
12/22/04	1/25/05	35	996	☑	1	5	1.0	-18	996	0.0%
1/26/05	2/24/05	30	1,000	☑	1	3	1.0	-14	1,000	0.0%
2/25/05	3/25/05	29	1,016	☑	0	6	1.0	2	1,016	0.0%
3/26/05	4/25/05	31	1,008	☑	0	8	1.0	-6	1,008	0.0%
4/26/05	5/24/05	29	1,044	☑	0	13	1.0	30	1,044	0.0%
5/25/05	6/23/05	30	1,048	☑	0	16	1.0	34	1,048	0.0%
Total or Average		**366**	**12,172**		**4**	**143**	**1.0**	**0**	**12,172**	**0.0%**

Parking (Account # 4892585375): Tuning Period is 366 days from 6/23/04 until 6/23/05

Below is the equation used to calculate the Baseline values for the tuning period and all future periods:

Baseline (kW) = 1,014.33 + Offset

This Baseline Equation has a Net Mean Bias of 0.0% and a Monthly Mean Error of ±0.0%. The underlying regression has a R^2 =0.000
Baseline Costs are calculated using Rate Tariff documented in separate attachment

Explanations and Assumptions:
☐(empty checkbox) under 'Incl?' indicates that the bill is excluded from the regression.
HDD/day=Heating Degree-Days per day calculated for Miami for a 65.0°F balance point.
CDD/day=Cooling Degree-Days per day calculated for Miami for a 65.0°F balance point.
Offset is derived from Modification(s) in effect during the tuning period and is replicated annually for all future periods.