

# Metering and Verification of Savings Report for CU-1

At

**Valrico – Main Post Office  
2406 State Road 60 East  
Valrico, Florida 33594-9998**

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**Preliminary Report**  
*(Proprietary and Confidential)*



**SUNCOAST DISTRICT**

Presented on:  
**October 14, 1998**

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Developed by:



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## TABLE OF CONTENTS

<b>1. SUMMARY</b>	<b>1</b>
1.1 PROJECT SCOPE	1
1.2 CALCULATED RESULTS	2
1.3 MEASURED RESULTS	2
1.4 POWER MANAGER™ RESULTS	2
1.5 INTERPRETATION OF RESULTS	6

**1. SUMMARY**

**1.1 PROJECT SCOPE**

On July 13, 1998, Peoples Gas System, Inc., through Bosek, Gibson and Associates, Inc., completed a Preliminary Energy Survey of the **Valrico Main Post Office**. The Preliminary Energy Survey identified two energy conservation projects: a Comprehensive Lighting System Retrofit and an HVAC System Retrofit. The United States Postal Service – Suncoast District, interested in evaluating the technologies recommended in the report, issued a delivery order in mid-September to proceed with the implementation of the measures as a demonstration project.

The energy conservation projects implemented at the **Valrico Main Post Office** include a comprehensive lighting system retrofit, HVAC system retrofit and TeCom Interlane® Power Manager™ Upgrade.

The lighting project included the component retrofit of the existing lighting fixtures with new lighting technology types. Fluorescent lighting using T12 lamps and magnetic ballasts was retrofit with T8 lamps and low-wattage solid-state electronic ballasts. In certain areas where light levels permitted (i.e. lobby and postal store), fixtures were delamped and retrofit with custom designed reflectors. Also, in situations where fixtures were in close proximity to one another, ballasts were tandem wired together. In areas where lighting levels were below USPS guidelines (i.e. process floor), standard ballast factor electronic ballasts, T8 lamps and reflectors were installed to increase lighting levels.

The HVAC project included removal of the existing compressors in the heat pumps CU-1, CU-2 and CU-3 and replacing each with a down-sized high efficiency compressor retrofit with Dual Source™ Geothermal technology. The standard air handling unit evaporator coils were removed and replaced with Dual Coil™ technology offering improved dehumidification performance. New programmable thermostats were installed to limit temperature set points to a predefined range as well as schedule the operation of the equipment.

The TeCom Interlane® Power Manager™ was upgraded to the current 3.0 platform, additional points of sub-metering for HVAC and lighting performance verification were added and the enclosure was relocated indoors.

This report compares the analysis of the HVAC System Retrofit (Condensing Unit #1) with the actual results as verified with the Power Manager™. The focus on Condensing Unit #1 is to demonstrate the performance of the Global Energy and Environmental Dual Source™ Geothermal technology, as well as show how the information from TeCom's product line can be used by an energy service company.

1.2 CALCULATED RESULTS

The Preliminary Energy Survey, which included detailed computer modeling via the Department of Energy 2.1E hourly analysis program, projected an **8.2 kW** peak demand reduction.

<b>System Ambient Conditions</b>	<b>Pre-Retrofit Peak kW</b>	<b>Post-Retrofit Peak kW</b>	<b>Net Reduction in Peak kW</b>
CU-1 (88°F/78°F)	17.444 (July 8 <sup>th</sup> )	10.043 (July 8 <sup>th</sup> )	7.401 (42.4%)
CU-1 (92°F/82°F)	20.495 (August 8 <sup>th</sup> )	12.339 (August 8 <sup>th</sup> )	<b>8.156</b> <b>(39.8%)</b>
CU-1 (89°F/79°F)	15.605 (September 4 <sup>th</sup> )	9.185 (September 4 <sup>th</sup> )	6.42 (41.1%)
CU-1 (90°F/78°F)	15.123 (October 2 <sup>nd</sup> )	8.917 (October 2 <sup>nd</sup> )	6.206 (41.0%)

1.3 MEASURED RESULTS

Instantaneous site testing by BGA's construction management department provided a measurement that showed a **7.1 kW** reduction in peak demand.

<b>System</b>	<b>Pre-Retrofit Peak kW</b>	<b>Post-Retrofit Peak kW</b>	<b>Net Reduction in Peak kW</b>
CU-1	17.1 (late September)	10.0 (early October)	<b>7.1</b> <b>(41.5%)</b>

1.4 POWER MANAGER™ RESULTS

The following table and graphics show the pre-retrofit and post-retrofit conditions for the **Valrico Main Post Office** – a **7.9 kW** peak demand reduction.

<b>System</b>	<b>Pre-Retrofit Peak kW</b>	<b>Post-Retrofit Peak kW</b>	<b>Net Reduction in Peak kW</b>
CU-1	18.3 (September 4th)	10.4 (October 5th)	<b>7.9</b> <b>(43.2%)</b>

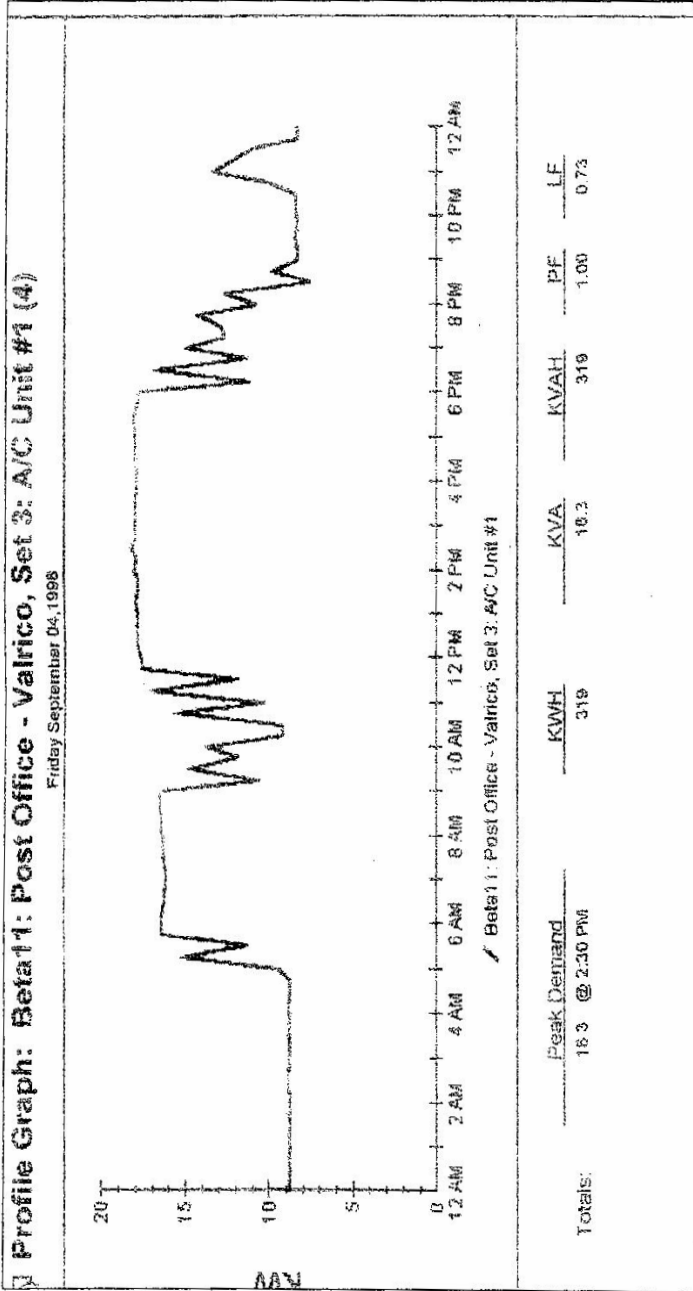


Figure 1: Pre-Retrofit Demand Profile for Condensing Unit #1 at the Valrico Main Post Office

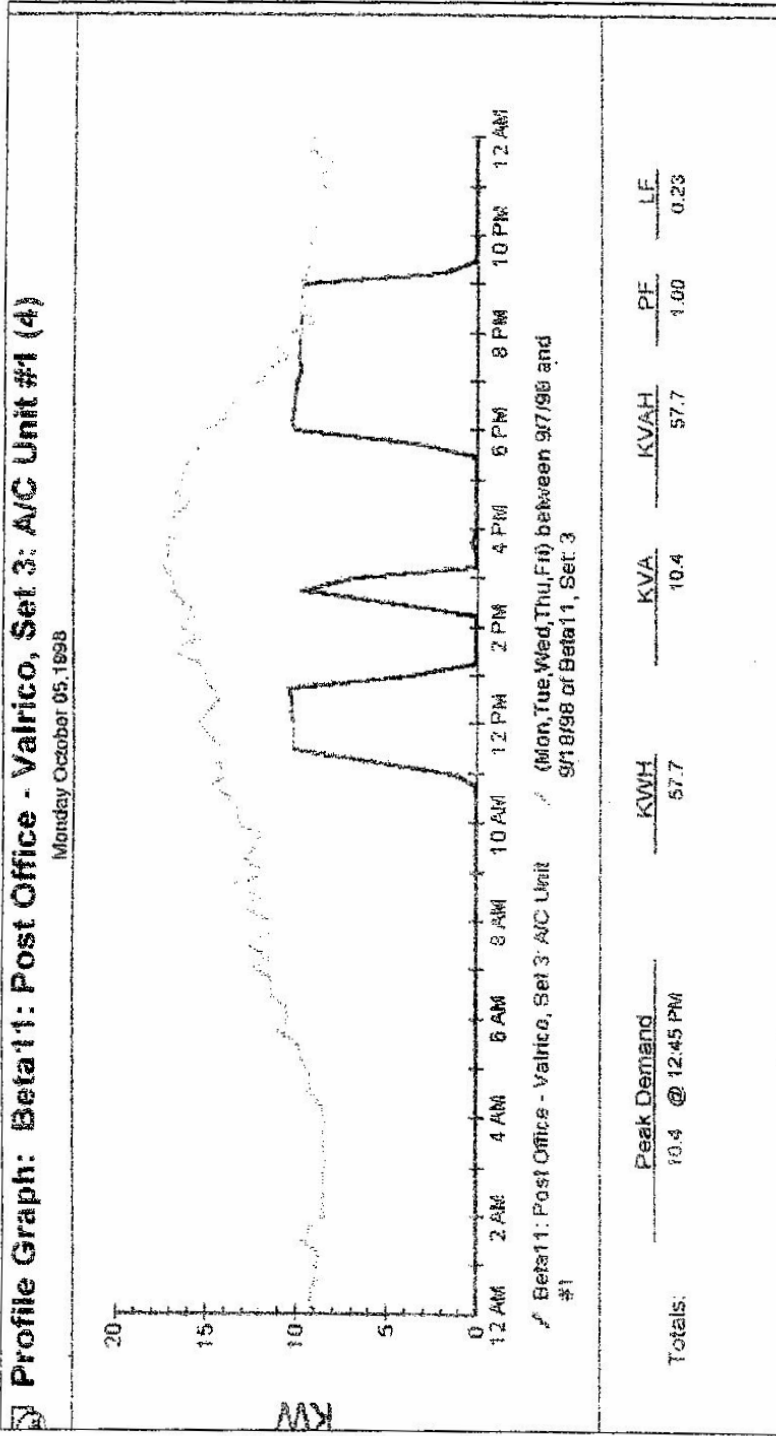


Figure 2: Comparison of Average September Weekday Pre-Retrofit Demand Profile versus Post-Retrofit Weekday Demand Profile (Evaporator Fan Cycling Mode) for Condensing Unit #1 at the Valrico Main Post Office

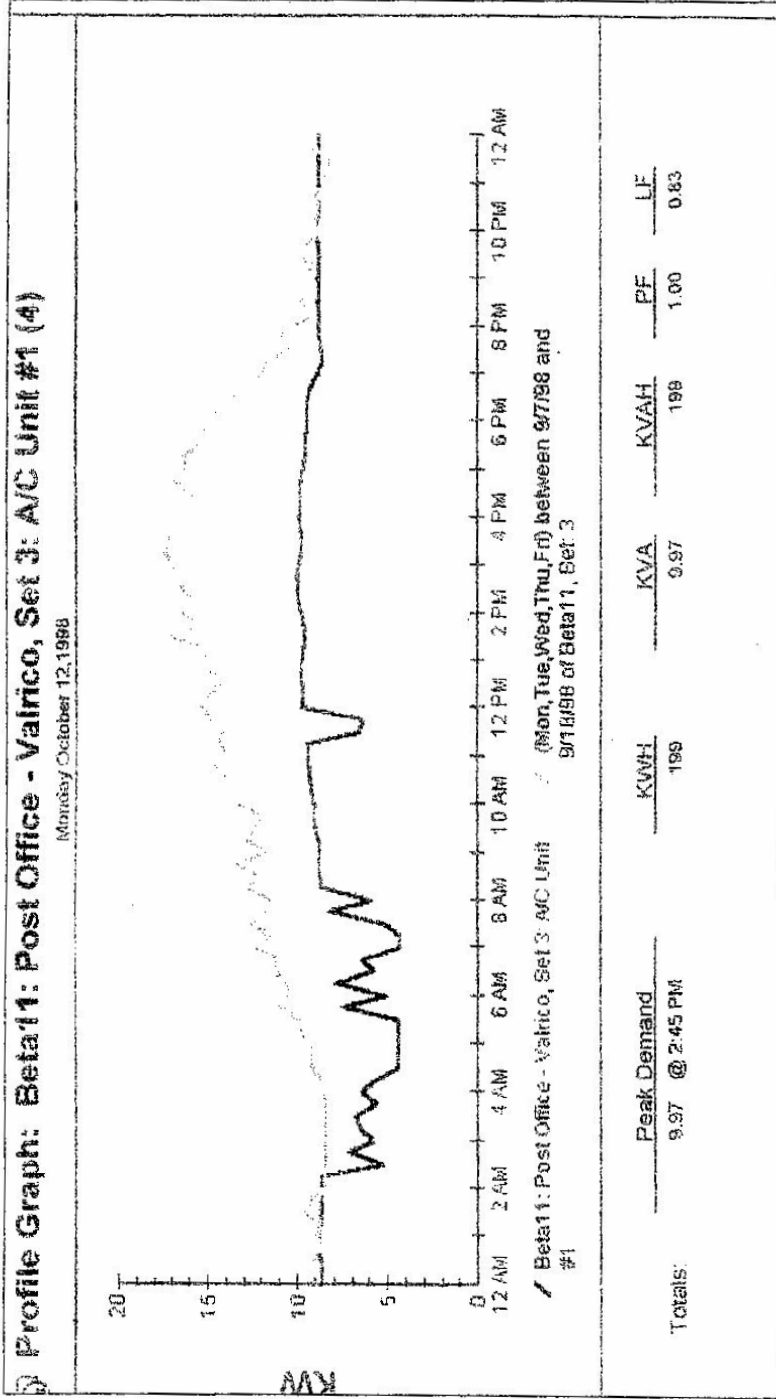


Figure 3: Comparison of Average September Weekday Pre-Retrofit Demand Profile versus Post-Retrofit Weekday Demand Profile (Evaporator Fan Continuous Mode) for Condensing Unit #1 at the Valrico Main Post Office

1.5 INTERPRETATION OF RESULTS

- ◆ The measured results demonstrate a peak demand reduction that is within 3.7% of the calculated peak demand reduction: 8.2 kW vs. 7.9 kW. The technology, as such, compares well in field performance versus manufacturer's performance claims.
- ◆ The use of real-time measurements allow for an easy validation of savings which may be used in future projects to minimize the extent of the metering and verification efforts over the ten to twenty year life of a performance contract (minimizing costs to owner and ESCO).
- ◆ The Power Manager™ has established a solid basis of technology performance that will benefit future project analysis projections of savings, thus reducing the ESCO's total risk.
- ◆ The Power Manager™ is an improvement over instantaneous validation due to the elimination of offset error (i.e. continuous measurement versus two discreet measurements subject to increased error from equipment and execution).
- ◆ Daily energy consumption was reduced by 37.6% from 319 kWh pre-retrofit to 199 kWh post-retrofit for the continuous evaporator fan operation mode.