

## CUSTOMER SUMMARY PAGE



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Customer Name:	<u>Briar Rose Bed and Breakfast</u>	Account Number(s):	<u>53-3927217-8</u>
Service Address:	<u>2151 Arapahoe Ave Boulder, CO 80302</u>		
Additional Service Address:	<u></u>	Additional Service Address:	<u></u>
Customer Contact:	<u>Brendan Watt</u>	Site Contact:	<u>Brendan Watt</u>
Phone:	<u>(303) 417-1009</u>	Phone:	<u>(303) 417-1009</u>

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Xcel Energy Rep:	<u>Camilla Edwards</u>	Energy Auditor:	<u>Nate Korey</u>
Phone:	<u>(303) 571-6474</u>	Company:	<u>Nexant, Inc.</u>
Fax:	<u></u>	Phone:	<u>(303) 998-2471</u>

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Building Type:	<u>Lodging</u>	Peak Demand:	<u>17 kW</u>
Electric Service Provided by:	<u>Xcel Energy</u>	Gas Service Provided by:	<u>Xcel Energy</u>
Date of Site Visit:	<u>3/10/10</u>	Square Footage:	<u>3,500</u>

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## DISCLAIMER OF WARRANTIES AND LIMITATION OF LIABILITY

The suggestions in this Energy Assessment (“Assessment”) are provided as a service to Xcel Energy customers and are based on a visual analysis of conditions observed at the time of the survey, information provided by the customer and from Xcel Energy, and costs based on the energy assessor’s experience on similar projects. The performance guidelines provided in the Assessment are for informational purposes only and are not to be construed as a design document. Xcel Energy will not benefit in any way from a customer’s decision to select a particular contractor or vendor to supply or install the products and measures suggested by the energy assessor.

Xcel Energy and the energy assessor do not guarantee that any specific level of energy or costs savings will result from implementing any energy conservation measures described in this Assessment. Xcel Energy and the energy assessor shall not, under any circumstances, be liable to the customer in the event that potential energy savings are not achieved.

Xcel Energy advises that customers check with their Xcel Energy Account Manager to determine the estimated value of their rebate (if any) and to verify that the equipment qualifies for Xcel Energy programs prior to implementation of any conservation measure. Some measures identified in this report may qualify for an Xcel Energy Custom Efficiency rebate. Custom Efficiency projects require pre-approval prior to purchase and installation. The customer is responsible for submitting project information to their Xcel Energy Account Manager to obtain pre-approval for Custom Efficiency projects and to determine the eligible custom rebate amount.

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## Executive Summary

Briar Rose Bed and Breakfast (Briar Rose) requested that Xcel Energy perform an energy assessment to identify energy-related opportunities that show potential for improvement and investment options. This is the first step toward developing a long-term energy plan for Briar Rose. Nate Korey of Nexant, Inc. visited the customer's business site on March 10, 2010 and met with Brendan Watt. Table 1 below describes recommended energy conservation opportunities (ECO), for which costs, savings, rebates, and paybacks are calculated. This report also describes strategic opportunities, which are additional energy saving projects that require further study before implementation.

**Table 1: Summary of Energy Conservation Opportunities**

Energy Conservation Opportunity	Estimated Demand Savings (kW)	Estimated Energy Savings (kWh)	Estimated Thermal Savings (Therms)	Estimated Annual Cost Savings (\$)	Estimated Capital Cost (\$)	Simple Payback (Years)	Estimated Xcel Energy Incentives (\$)
Payback less than 2 years (capital cost opportunities)							
1 Lighting Retrofits	1.5	1,528	-5	\$353	\$528	1.3	\$62
Retrofit opportunities payback 2 – 10+ years							
2 Water Heater Tank Wrap	0.0	142	27	\$21	\$100	4.7	0
<b>Total</b>	<b>1.5</b>	<b>1,670</b>	<b>22</b>	<b>\$374</b>	<b>\$628</b>	<b>1.4</b>	<b>\$62</b>

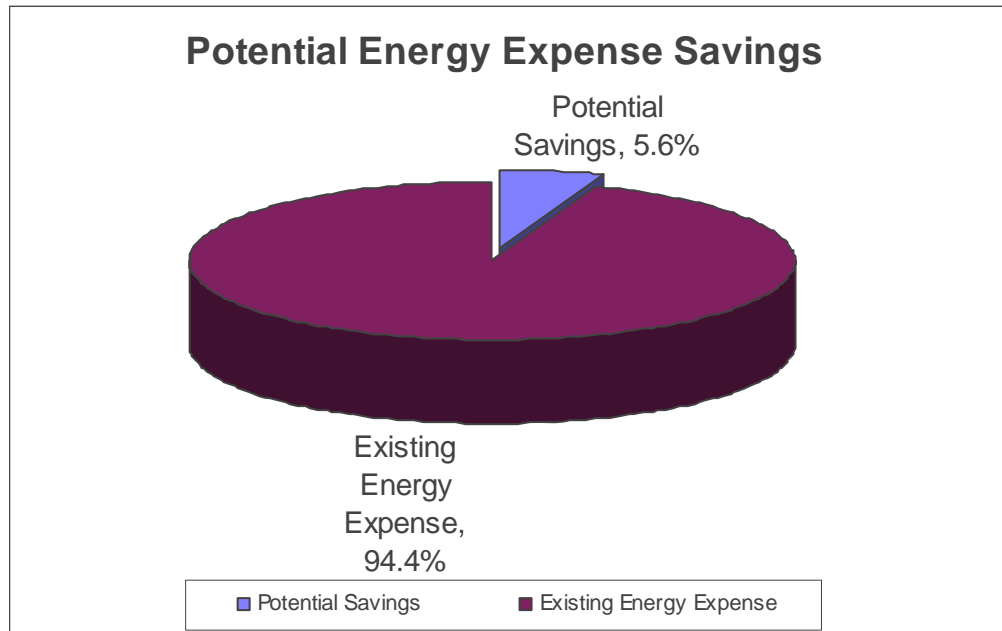
## Strategic Opportunities Summary

Strategic opportunities are measures that may be recommended, but did not warrant a full evaluation for this report. Further study is recommended before implementing these measures:

- Lighting Controls
- Upgrade Air Conditioners
- Unplug Secondary Refrigerator
- Consider Commercial Rate Schedule
- Familiarization with Rebate Programs

## Potential Energy Expense Savings

The following chart shows the potential percentage of this facility's annual energy expense that could be saved by implementing all of the Energy Conservation Opportunities recommended in this report.



## **Suggested Follow-up Action**

1. Your Xcel Energy account representative, Camilla Edwards, will answer any questions regarding this Energy Assessment.
2. Nate Korey at Nexant, Inc. will answer any questions regarding this Energy Assessment.

If you have any questions or need additional information, please do not hesitate to call.

Sincerely,  
Nate Korey  
Project Engineer  
Energy and Carbon Management  
Nexant, Inc.  
(303) 998-2471  
1401 Walnut St., Suite 400  
Boulder, CO 80302

## Facility and Operations Description

Briar Rose Bread and Breakfast (Briar Rose) is located at 2151 Arapahoe Avenue in Boulder, Colorado. The facility was constructed in the 1880s. Briar Rose has been under the current management since 2004, though the facility has been a bed and breakfast for roughly 30 years. The 3,500 square foot facility consists of a main building and a carriage house. Briar Rose has 10 guest rooms and one night keeper's quarters. It was reported that occupancy is very seasonally dependant, with the majority of guests staying during the summer.

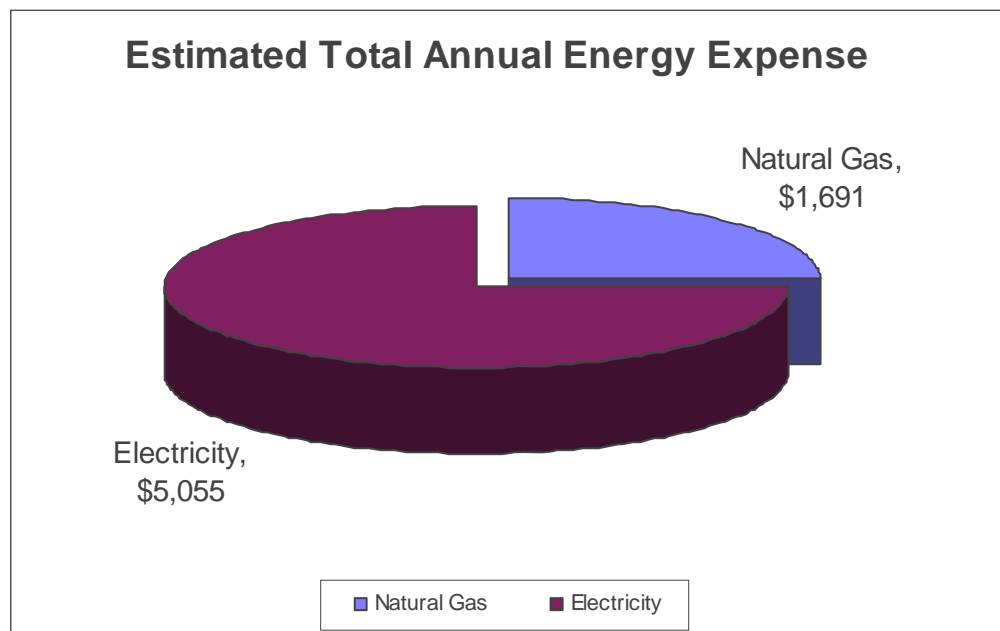
The facility has both heating and cooling throughout, though a variety of different systems is in place. The common areas, along with three of the guest rooms are heated with a natural gas fired furnace. The furnace was installed in 2004 and is rated for 95% efficiency. This furnace is controlled by a programmable thermostat. A total of four guest rooms and the kitchen are heated and cooled with split system heat pumps. These heat pumps were installed since 2004, and are controlled manually by the guests. One guest room and the night keeper's quarters are heated with electric resistance baseboard heaters. The carriage house, which has two guest rooms and a meditation room, is heated with an in-floor radiant system which gets hot water from a natural gas-fired tankless water heater. This system was installed in 2008. The rooms without heat pumps are cooled with through-the-wall air conditioners that were in place before the current management took over in 2004.

The main building gets domestic hot water from a total of five storage water heaters. Two of these systems are electric and three are natural gas. The carriage house relies on the radiant system's tankless water heater for domestic hot water. Briar Rose also has a full, residential sized kitchen, along with a clothes washer and dryer. The kitchen is equipped with a commercial refrigerator and freezer. The small space in which the refrigerator and freezer are stored necessitates the use of an in-line duct system to exhaust hot air. Lighting in the facility is provided by a combination of incandescent and compact fluorescent lamps.

Briar Rose attempts to run the facility efficiently, and bills itself as an 'Eco B&B.' Where possible, Briar Rose installs efficient equipment such as the 95% furnace. Most of the appliances are EnergyStar certified. The attic has been insulated to R-49 and blinds have been installed on some windows to reduce heat gain in the summer. Finally, staff utilize small energy saving measures like caulking windows and shutting off lights when not in use.

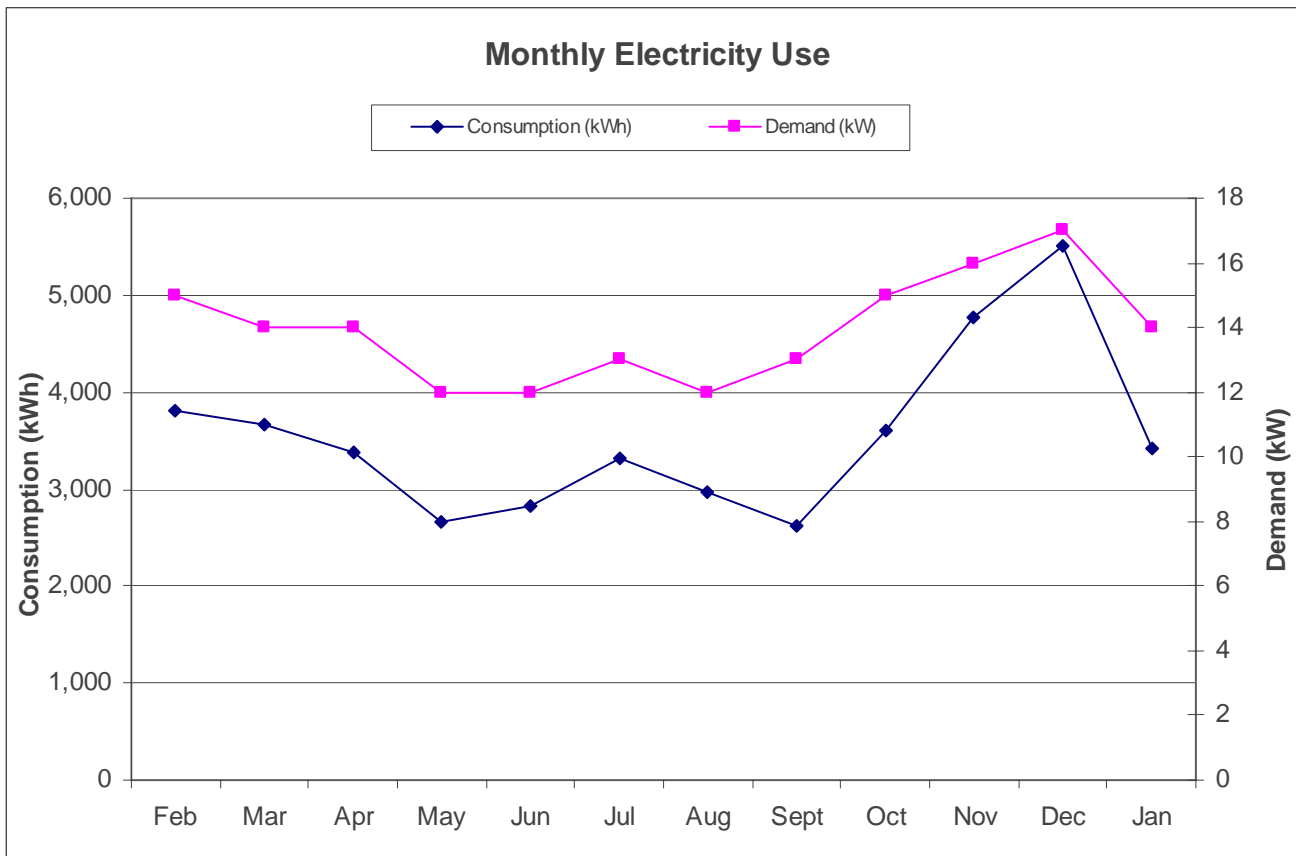
## Energy Profile

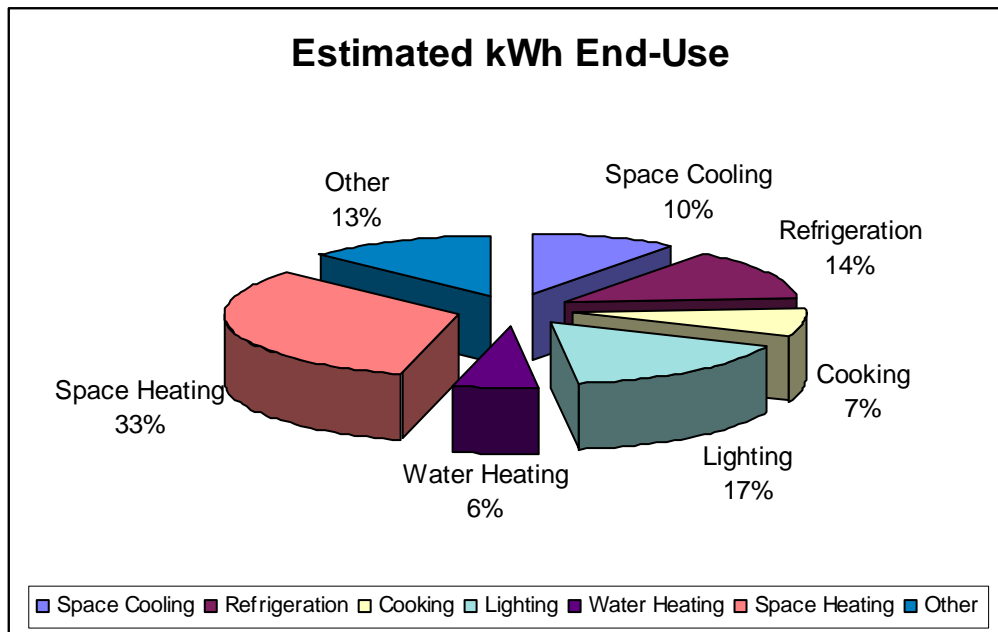
The following charts identify your electricity and natural gas usage.



Electricity Consumption – February 2009 - January 2010

Month	Days	Actual Demand	Billed Demand	Energy	Total Cost	Blended Cost/kWh	Load Factor
		kW	kW	kWh	\$	\$	%
Feb	29	15	15	3,817	\$398	\$0.10	36.6%
Mar	29	14	14	3,672	\$379	\$0.10	37.7%
Apr	30	14	14	3,376	\$377	\$0.11	33.5%
May	32	12	12	2,672	\$326	\$0.12	29.0%
Jun	30	12	12	2,830	\$357	\$0.13	32.8%
Jul	29	13	13	3,322	\$426	\$0.13	36.7%
Aug	32	12	12	2,972	\$393	\$0.13	32.2%
Sept	29	13	13	2,623	\$395	\$0.15	29.0%
Oct	29	15	15	3,605	\$461	\$0.13	34.5%
Nov	33	16	16	4,765	\$528	\$0.11	37.6%
Dec	34	17	17	5,513	\$577	\$0.10	39.7%
Jan	29	14	14	3,427	\$438	\$0.13	35.2%
<b>Total</b>	<b>365</b>			<b>42,594</b>	<b>\$5,055</b>		
<b>Avg.</b>	<b>30</b>	<b>14</b>	<b>14</b>	<b>3,550</b>	<b>\$421</b>	<b>\$0.12</b>	<b>34.5%</b>



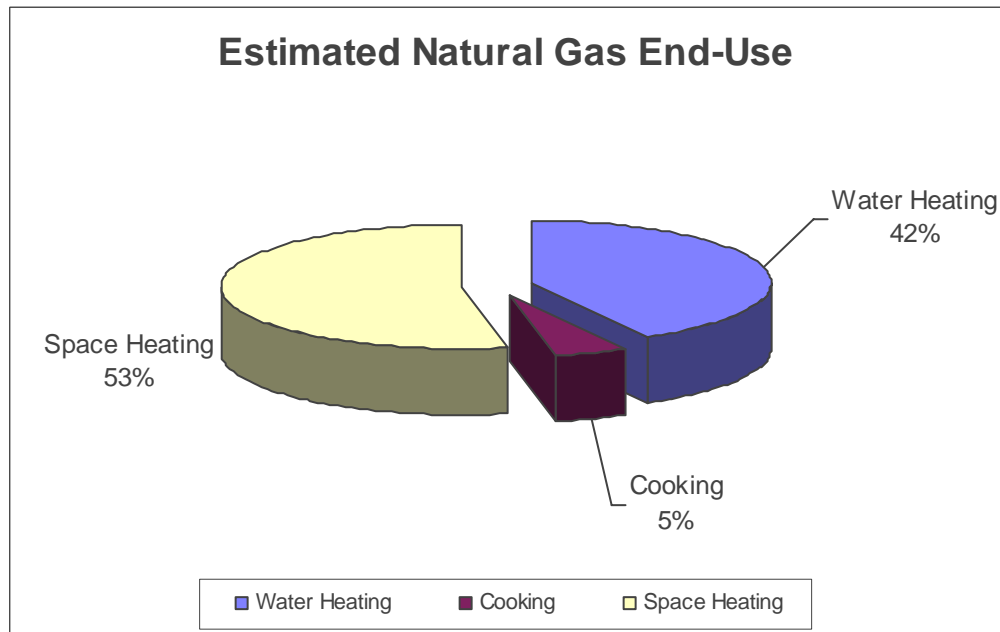
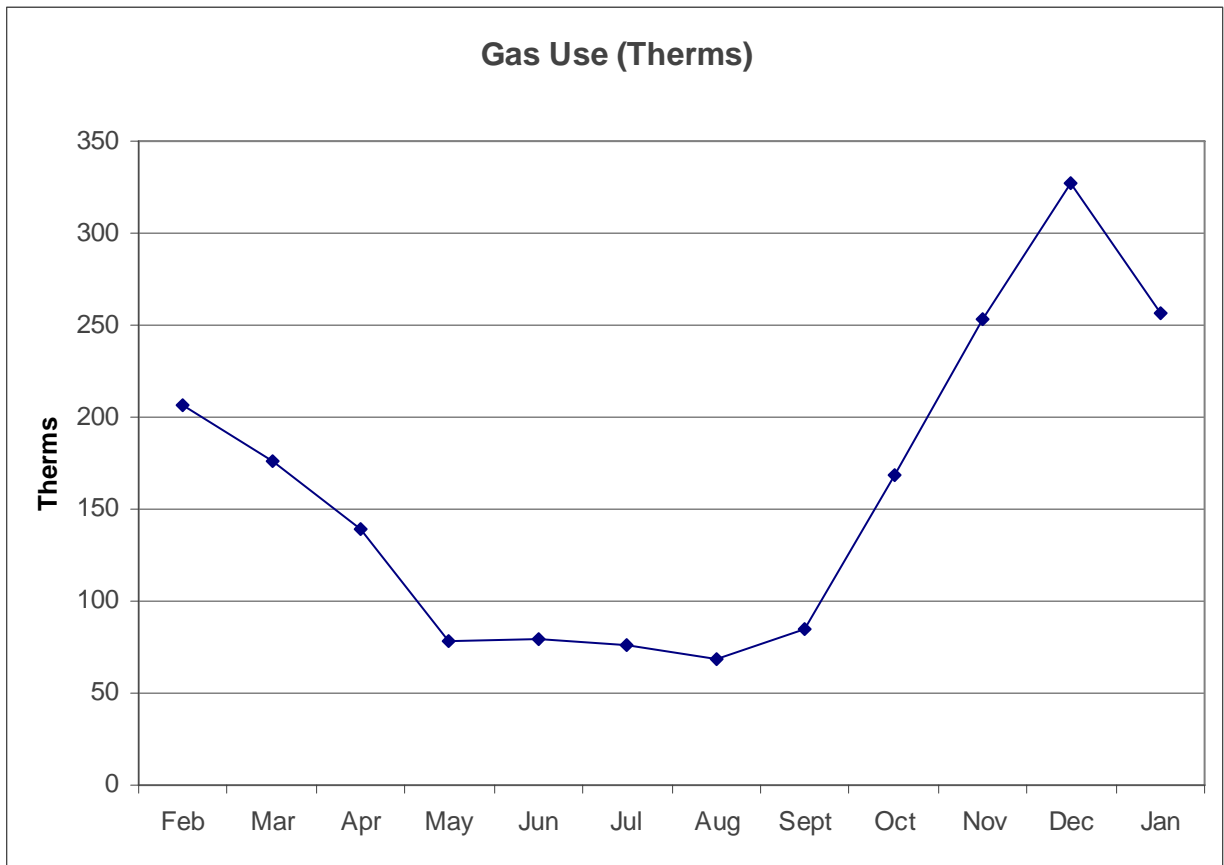


This chart is an estimate based upon data taken from the facility on the day of the audit, the utility bills and typical energy consumption of similar facilities.

#### Natural Gas Consumption – February 2009 – January 2010

Month	Days	Total Energy	Total Cost	Blended Cost/Therm	Degree Days (DD)	Therms/DD
		Therms	\$	\$		
Feb	29	206	\$190	\$0.92	784	0.26
Mar	29	176	\$150	\$0.85	702	0.25
Apr	30	139	\$106	\$0.77	511	0.27
May	32	78	\$72	\$0.92	151	0.52
Jun	30	79	\$76	\$0.96	35	2.26
Jul	29	76	\$69	\$0.90	16	4.75
Aug	32	68	\$64	\$0.95	10	6.80
Sept	29	85	\$81	\$0.96	271	0.31
Oct	29	169	\$155	\$0.92	611	0.28
Nov	33	253	\$220	\$0.87	984	0.26
Dec	34	327	\$279	\$0.85	1,240	0.26
Jan	29	257	\$227	\$0.88	911	0.28
<b>Total</b>	<b>365</b>	<b>1,913</b>	<b>\$1,691</b>		<b>6,226</b>	
<b>Avg.</b>	<b>30</b>	<b>159</b>	<b>\$141</b>	<b>\$0.90</b>	<b>519</b>	<b>1.38</b>





This chart is an estimate based upon data taken from the facility on the day of the audit, the utility bills and typical energy consumption of similar facilities.

## **Energy Star Benchmarking Results**

This facility is not eligible to receive an Energy Star Benchmarking score because it is too small. However, it was possible to calculate an Energy Use Index (EUI). This facility used 96.2 kBtu per square foot per year, based upon the past year of utility data. The national average EUI for lodging facilities is 100.0 kBtu per square foot per year, based on the U.S. Energy Information Administration's Commercial Building Energy Consumption Survey. This facility is slightly lower than the national average, likely due to the energy efficient equipment installed.

## Energy Conservation Opportunity Analysis

Table 2 below describes recommended energy conservation opportunities (ECO), for which costs, savings, rebates, and paybacks are calculated.

**Table 2: Summary of Energy Conservation Opportunities**

Energy Conservation Opportunity	Estimated Demand Savings (kW)	Estimated Energy Savings (kWh)	Estimated Thermal Savings (Therms)	Estimated Annual Cost Savings (\$)	Estimated Capital Cost (\$)	Simple Payback (Years)	Estimated Xcel Energy Incentives (\$)
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### Opportunity 1 – Lighting Retrofit

There are a number of opportunities at Briar Rose to upgrade the existing lighting systems. There are a handful of incandescent lamps throughout the facility which can be replaced with compact fluorescent lamps (CFLs). Due to the recent popularity of CFLs, a large array of lamps is now available for purchase. CFLs can be purchased to match the existing size, shape, and light quality of the existing incandescent lamps. Table 3, below, shows which CFLs to use to replace the existing incandescent lamps. In a number of places it was found that incandescent were being used because the fixtures were controlled with dimmer switches. It is now possible to purchase CFLs with dimming capabilities. It is recommended that CFLs be installed on the dimmer switches as well. For this retrofit, it will be beneficial to work with a lighting contractor to identify reputable and successful brands. Care should also be taken to follow the manufacturer's instructions for installation and use, to maximize the life of the lamp.

A small number of MR16 halogen lamps were also being used in some fixtures. It is recommended that these lamps be replaced with MR16 LED lamps. As LEDs are still considered an emerging technology, it is again recommended that Briar Rose consult with a lighting contractor to identify reliable brands.

Xcel Energy currently offers rebates for upgrading these lighting systems. A rebate of \$1 per lamp is available for replacing incandescent lamps with CFLs rated at 18 Watts or lower. CFLs greater than 18 Watts are eligible for a rebate of \$2 per lamp.

The scope of the proposed lighting retrofit, including potential rebates from Xcel Energy is shown in Table 3.

**Table 3. Scope of Lighting Retrofit**

Qty	Existing Fixture	Existing Lamp Wattage	Existing Ballast Type	Existing Total Input Wattage	Proposed Fixture	Proposed Lamp Wattage	Proposed Ballast Type	Proposed Total Input Wattage	Xcel Energy Rebate
30	Incandescent Lamps	60	NA	60	Compact Fluorescent	15	NA	15	\$1.00
10	Incandescent Lamps	40	NA	40	Compact Fluorescent	9	NA	9	\$1.00
7	Incandescent Lamps	75	NA	75	Compact Fluorescent	18	NA	18	\$1.00
3	Incandescent Lamps	100	NA	100	Compact Fluorescent	23	NA	23	\$2.00
6	Incandescent Lamps	30	NA	30	Compact Fluorescent	9	NA	9	\$1.00
5	MR16 Halogen	35	NA	35	MR16 LED	5	NA	5	\$0.00

The summary of the costs, savings, rebates, and paybacks for this ECO are given in Table 2. The assumptions that were included in this analysis include:

- 510 average annual operating hours
- Interactive heating and cooling savings were included

#### Opportunity 2 – Water Heater Tank Wrap

Domestic hot water is responsible for a significant portion of Briar Rose's total energy usage. The majority of the hot water is provided by stand alone storage water heaters. These units are all fairly new, and upgrading to higher-efficiency models would not be cost-effective. Storage water heaters heat incoming water and maintain it at a high temperature so that it will be available when needed. Heat loss through the walls of the tank requires energy to be added throughout the day to keep the water hot. Installing an insulating blanket on the water heaters will help reduce the heat lost through the walls of the tank. A tank wrap is a low cost measure that can be easily installed, however, be sure to check the manufacturer's warranty and instruction manual before proceeding.

The summary of the costs, savings, rebates, and paybacks for this ECO are given in Table 2. The assumptions that were included in this analysis are listed below:

- Water heaters:
  - Natural gas: 3
  - Electric: 1 (analysis was not performed on the inaccessible water heater in the West Wing)
- Blanket R Value: R-10
- Cost: \$25 per blanket

### **Strategic Opportunity Analysis**

In addition to the Energy Conservation Opportunities described and evaluated in the previous section, there were also other energy related measures that were identified during our audit. These energy measures were not fully evaluated as Energy Conservation Opportunities for one of several reasons: 1) they are outside the scope of a walk-through analysis, 2) there was not enough information to estimate or evaluate the recommendations 3) the measures may not be desirable presently, but should be considered in the future, 4) the measures are already completely or partially being done and should continue as regular practice. These recommended measures should be considered as part of the facility's future energy efficiency plan.

#### Opportunity 3 – Lighting Controls

There are a number of potential lighting control retrofits at Briar Rose. These retrofits included occupancy sensors in the guest rooms and photocells on exterior lights. An analysis was performed for both these retrofits and it was found that neither measure is cost-effective at this time. In both cases it was found that the simple payback was significantly longer than the expected life of the measure. This long payback period is attributable to short operating hours and the energy efficient lamps already in place. If Briar Rose elects to install these measures anyway, they will be eligible for rebates from Xcel Energy's Lighting Efficiency program.

#### Opportunity 4 – Upgrade Air Conditioners

A large number of rooms in Briar Rose are cooled using through-the-wall AC units. Many of these AC units appeared to be very old and nearing (or past) the end of their expected life. Though it is impossible to determine the payback of replacing the current units without knowing the actual usage of the AC by the guests, it is recommended that these units be upgraded to EnergyStar qualified units when they reach the end of their lives. EnergyStar estimates that the effective useful life of a through-the-wall AC is 10 years, and that a 10 year old unit uses 35% more energy than a new EnergyStar model.

#### Opportunity 5 – Unplug Secondary Refrigerator

In addition to the commercial refrigerator and freezer used for primary food storage, Briar Rose also uses a residential sized refrigerator for spillover food. It was reported that this refrigerator is operational year round, whether or not it is being utilized. It is recommended that this refrigerator be unplugged when it is not being used. This refrigerator may already be working overtime because it is in an unheated portion of the facility, and reducing its usage will be a simple way of saving energy.

#### Opportunity 6 – Consider Commercial Rate Schedule

Briar Rose is currently on a Secondary General rate schedule from Xcel Energy. Under this rate schedule Briar Rose is charged for both electricity and peak demand. Commercial customers are required to use this rate if their monthly peak demand exceeds 25 kW. Briar Rose has not exceeded this level in the past two years, with a 2009 maximum of 17 kW set in December. It is recommended that Briar Rose speak with Xcel Energy about switching to a Commercial rate schedule. The commercial rate schedule has a slightly higher electricity rate, but has lower monthly service charges and no peak demand charge. It is estimated that Briar Rose could save approximately \$420 per year by switching rate schedules.

#### Opportunity 7 – Familiarization with Rebate Programs

The Briar Rose facility has a large amount of energy using equipment for various purposes. Due to the natural lifecycle and turnover of equipment, as well as the expansion and development of new systems, new equipment is installed periodically. It is recommended that staff at Briar Rose familiarize themselves with all of the rebate programs available to them through Xcel Energy. These rebate programs are designed to reduce the capital cost required to install high-efficiency equipment, reduce paybacks, and make energy-efficiency a more attractive proposition. Additionally, changes in market forces cause rebate programs to constantly shift their requirements and incentive levels. It is recommended that Briar Rose keep up to date with current program offerings so that economic and purchasing decisions can be made in an educated manner. More information about programs offered by Xcel Energy can be found on their website at:

<http://www.xcelenergy.com/SiteCollectionDocuments/docs/ConservationProgramsSummariesCO.pdf>

Applications can be downloaded by selecting Colorado from the pull down menu and clicking on the appropriate program on the left on the following web page:

[http://www.xcelenergy.com/Business/Programs\\_Resources](http://www.xcelenergy.com/Business/Programs_Resources)

## Payment Options

In addition to the energy conservation measures we recommend in this energy assessment, Xcel Energy offers cash rebates and a variety of payment and billing programs to better manage your cash flow.

*BillWise from Xcel Energy<sup>SM</sup>* programs include payment options like:

- Auto Pay – a simple and convenient way to have monthly energy payment automatically withdrawn from a bank account on the day it is due.
- EFT (Electronic Funds Transfer) – allows simplification of the bill paying process and improving cash management by directly transferring money from your account to Xcel Energy.
- Pay By Phone – allows quick and secure transfer of energy payment from a bank account directly to Xcel Energy, right over the phone, at no cost.
- Credit/Debit Cards Payments – allows payment of energy bill online or by phone using a credit or debit card for a small fee.

The Billing options include – EDI (Electronic Data Interchange) which allows receipt of your energy bill electronically the day after the billing cycle is complete. More information on all these programs can be obtained by discussing eligibility requirements with your Xcel Energy representative. You also can call the Business Solution Center at 1-800-481-4700 or visit us at [xcelenergy.com](http://xcelenergy.com) for more information about qualifying for cash rebates, discount rates or billing/payment options.

## Glossary

The following definitions will help you understand the information and how it relates to your energy bills.

Actual Demand is the highest average 15 minutes of demand over a billing period.

Billed Demand is the actual demand plus the adjusted demand for power factor correction.

A CCF is 100 cubic feet of natural gas. A therm is a unit of energy equivalent to 100,000 BTU. For the purposes of measuring energy use, a therm and a CCF of natural gas are equivalent.

Load Factor is a measure of efficiency. Load factor is the ratio of average load in kilowatt supplied during a designated period to the peak load occurring that period.

$$\text{Load Factor} = \frac{\text{kWh supplied in a period}}{\text{Peak kW in a period} \times \text{Hours in a Period}}$$

An Energy Conservation Opportunity is an energy saving measure that was evaluated with estimated costs, savings, rebates, and simple payback.

Strategic Opportunities are recommended measures that were not fully evaluated for this report.