Energy Performance Audit Report

Name: **Address:**

Year Built: 1870 **Age of Dwelling:** 138 Years **Square Footage of Home:** 2,400
Primary Foundation type: Crawlspace **Primary Heating Fuel type:** Propane
Date of Inspection: 4/16/08 **Time Scheduled:** 9:00 **Report Number:** 20
Weather Conditions: Partly sunny & cool **Temperature:** Upper 40's to start
House Is Facing: South

Individuals Present During Inspection:

Comments: **This is a 138 year old, 4 bedroom home situated in a rural setting in Ohio. The primary heating fuel used by this home is propane. Costs to heat the home have been mounting and the Client desires to make the home more energy efficient, more comfortable, and more cost effective to heat.**

This home is built on a crawl foundation that is quite drafty. Heating ducts run through the unheated crawlspace and are not professionally insulated. One 60,000 BTU furnace is located in the utility room on the first floor, while a second 40,000 BTU furnace is located in the attic. Both have manufacturer's efficiency ratings of 80%. This home is also serviced by two A/C compressors manufactured in 1995. One is a 2 ton unit and the other is a 1.5 ton unit. Both have SEER ratings of 11.3.

Audit Testing Summary

Heating/Ventilation/Air Conditioning – As much as half of the energy used in our homes is consumed in heating and cooling. Reducing heating and cooling costs can be as easy as changing the filters monthly, having the heating and cooling system cleaned and tuned yearly, and installing a programmable thermostat to reduce the heating and cooling load when you are away from your home. The Energy Star web site has a wealth of information about heating and cooling decisions and how to save energy, be more comfortable in your home, and help save the environment. Go to http://www.energystar.gov/ia/products/heat_cool/GUIDE_2COLOR.pdf .

The first floor furnace was manufactured by Trane and is Model #TDD060R936B1. The Preston's Guide data base indicates that this Furnace unit was manufactured between 1993 and 1995 (tag information suggests 1995), is rated at 60,000 BTU, and has a manufacturer's efficiency rating of 80.3%.

The attic furnace was manufactured by Trane and is Model #TDD040R924B. The Preston's Guide data base indicates that this Furnace unit was manufactured between 1993 and 1995 (tag information suggests 1995), is rated at 40,000 BTU, and has a manufacturer's efficiency rating of 80.3%.

A worst case draft test was done in the first floor Combustion Appliance Zone (CAZ) in accordance with BPI Standards and was found to be within acceptable limits for testing.

A flue gas test was performed on the first floor furnace from the roof. Results are as follows:

Ambient CO:	**0 PPM**
Stack temperature (f):	**147.0°**
CO2:	**3.26%**
Steady State Efficiency:	**86.9%**
Oxygen:	**16.0%**
Carbon Monoxide:	**3 PPM**

The attic furnace did not receive a flue gas test because the chimney was inaccessible.

Comments: The slope of the attic furnace flue pipe should be more positive to help ensure adequate draft.

To help maintain maximum efficiency from heating and A/C units, change the filters monthly during heavy use. Remember - this means changing the filters not just in the winter, but in the summer also when the A/C unit is in use.

The heating system should have routine clean and tune maintenance to maximize efficiency and increase safety and longevity of the unit.

The flue pipe slope for both the water heater and attic furnace should be increased.

Heating and Cooling Improvement Recommendations: None at this time. When replacing the HVAC system in the future consider an air or ground source Energy Star rated heat pump system.

Air Sealing: Sealing and insulating the "envelope" or "shell" of your home — its outer walls, ceiling, windows, doors, and floors — is often the most cost effective way to improve energy efficiency and comfort. ENERGY STAR estimates that a skilled contractor can save up to 20% on heating and cooling costs (or up to 10% on their total annual energy bill) by sealing and insulating.

Sealing Leaks

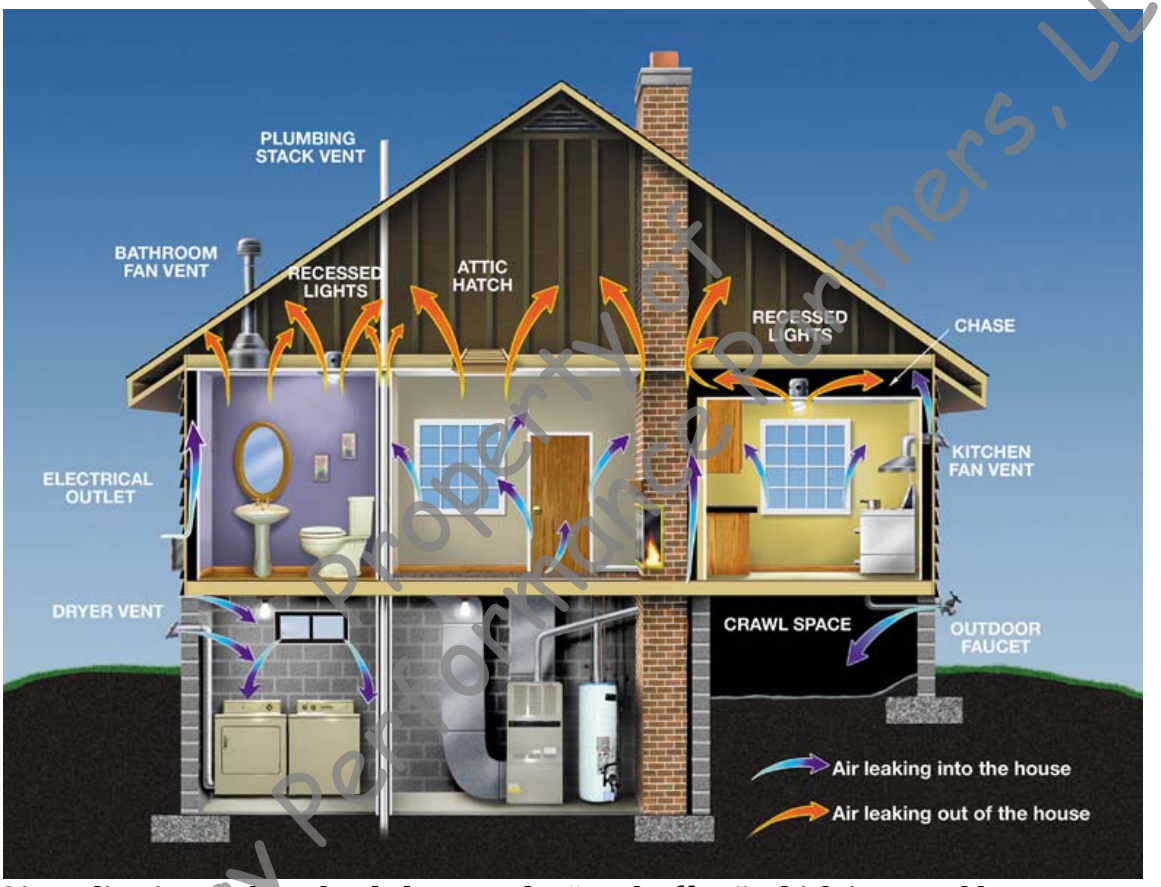
Many air leaks and drafts are easy to find because they are easy to feel — like those around windows and doors. But holes hidden in attics, basements, and crawlspaces are usually bigger problems. Sealing these leaks with caulk, spray foam, or weather stripping will have a great impact on improving your comfort and reducing utility bills.

After any home sealing project EPP will go through a complete "Test Out" procedure to make sure that your combustion appliances (gas- or oil-fired furnace, water heater, and dryer) are venting properly. For additional information on Indoor Air Quality (IAQ) issues related to homes, such as combustion safety, visit EPA's Indoor Air Quality Web site.

Air Infiltration (Blower Door) Testing: All exterior doors and windows were closed and the house was placed in the winter mode. Fireplace dampers were closed and

the hearth was sealed as needed. All combustible appliances were placed on "pilot". The blower door was set up in the side entry door and the house was brought to -50 Pascals for testing.

Actual air infiltration for this home was found to be: 4900 CFM50. This is almost 3 times the air flow needed for this to be a healthy house. This unnecessary and completely preventable air flow robs the house of heat BTUs during the winter, cooling BTUs during the summer, and adds significantly to heating and cooling costs. How do we slow the losses? By air sealing as many air infiltration areas as possible.



Air sealing is a tool used to help tame the "stack effect" which is caused by warmer air rising and being replaced with cooler air. This cooler air must be heated to maintain the comfort levels in the home which waste large amounts of energy. In order to reduce air infiltration, we must first quantify the amount of air coming in. This is done through blower door testing.

Duct Sealing:

In houses with forced-air heating and cooling systems, ducts are used to distribute conditioned air throughout the house. In a typical house, however, about 20 percent of the air that moves through the duct system is lost due to leaks and poorly sealed connections. The result is higher utility bills and difficulty keeping the house comfortable, no matter how the thermostat is set.