Louisiana Housing Corporation

Louisiana Energy Audit Procedures

Weatherization Assistant Audits

for

Site Built Residential Structures

(NEAT v.8.9)

Version 1.0

March 2021

TABLE OF CONTENTS

Introduction

The United States Department of Energy (USDOE) Weatherization Assistance Program has sponsored the development of a database computer software tool to help weatherization authorities make decisions about the cost effectiveness of individual energy conservation measures. Separate audit methods were developed for site built residential structures and for manufactured housing (i.e. mobile homes). The Weatherization Assistant is a single entry point for operating either type of audit and organizing other types of weatherization data.

If you are performing energy audits for site built residential structures, use the National Energy Audit Tool (NEAT).

If you are performing energy audits for manufactured homes, use the Manufactured Home Energy Audit program (MHEA).

All information for clients, energy audits, work orders, and setup information for the Weatherization Assistant is stored in a single Microsoft Access database file. The user interface is also written in Access and those familiar with this software will feel comfortable with the data entry conventions. However, the Microsoft Access software is not necessary to use the Weatherization Assistant.

I. Louisiana Audit Data Collection Standards

Auditors must develop a comprehensive list (i.e. work order) of energy conservation measures and health & safety upgrades for existing single family and manufactured housing stock in Louisiana using whole house building science founded principals.

LA WAP will use BPI's current Approved American National Standards (ANSI) approved home energy auditing standards as the **minimum** criteria and procedures for conducting Pre and Post field inspections, audit data collection, and diagnostic testing procedures for auditors and Quality Control Inspectors (QCI).

LA WAP will use the BPI's ANSI/BPI-1100-T-2014 Home Energy Auditing Standards and ANSI BPI-1200-S-2017 Standard Practice for Basic Analysis of Buildings for the **minimum** criteria for conducting a building science-based residential energy audit.

ANSI/BPI-1100-T-2014 Home Energy Auditing Standard:
http://www.bpi.org/sites/default/files/ANSI-BPI-1100-T-2014%20Home%20Energy%20Auditing%20Standard.pdf

ANSI BPI-1200-S-2017 Standard Practice for Basic Analysis of Buildings:
http://www.bpi.org/sites/default/files/ANSI%20BPI-1200-S-2017%20Standard%20Practice%20for%20Basic%20Analysis%20of%20Buildings.pdf

I.1 Procedures

All WAP measures will be cost effective as defined by DOE with a savings-to-investment ratio (SIR) which meets or exceeds 1.0, except for the cost of materials needed to eliminate health and safety hazards existing before or because of the installation of weatherization materials and general air sealing, including duct sealing.

I.2 Fuel Cost

The current State average fuel cost that is entered in the Weatherization Assistant energy audit software NEAT and MHEA setup library for a particular fuel type will be the cost associated with a unit consumption of that fuel (e.g., the cost per kilowatt hour for electricity, the cost per therm for natural gas). This information will be gathered by the Grantee for the State of Louisiana and updated annually from the U.S. Energy Information Administration (www.eia.gov) using the "Average Retail Prices of Electricity to Ultimate Customers by End-Use Sector" (https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_5_06_b) for cents per Kilowatt-hour of electricity and "Average Price of Natural Gas Sold to Residential Consumer, by state" (https://www.eia.gov/dnav/ng/hist/n3010la3m.htm) for natural gas.

The fuel cost data will not include any cost that does not depend on the per unit consumption of the fuel, such as a fixed customer charge, meter charge, or franchise fee. For electricity and natural gas, the fuel cost entered should be the marginal cost associated with these fuels statewide. Propane prices will be collected statewide annually and averaged for the setup library in Weatherization Assistant NEAT and MHEA. Annual data will be provided at the beginning of each Program Year by the Grantee and provided to all Subgrantees.

I.3 Measure Skipping

The list of prioritized WAP measures from the NEAT\MHEA audit must be installed in the unit in the order of cost–effectiveness. No deviation from the prioritized audit should happen as this would be a conflict of DOE rules.

If a measure is declined by a client, owner or occupant, appropriate client education would be provided to possibly eliminate the client's concerns. If the auditor deems the reason for declining the measure is legitimate, the auditor will complete all other weatherization measures and include in the client's file a comprehensive explanation of the rationale for skipping the specific measure. If the auditor deems this is not a legitimate reason for declining the measure, the work would be completed with installation of only measures with a higher SIR than the declined measure, and the client must be informed and documented that the home cannot receive future weatherization services.

At no point will measure skipping of cost-justified major measures occur (i.e. air sealing, duct sealing of ducts outside the thermal boundary, attic insulations, wall insulation and floor or belly insulation). Louisiana will follow the guidance established by DOE in WPN 19-4, Attachment 8 for alterations of a cost-justified work order.

I.4 Cost of Air Sealing

The cost of air sealing installed as an energy saving measure, which includes duct sealing, will be included in the overall SIR package of weatherization measures installed. The package of weatherization measures, including air sealing and duct sealing cost, will have a post-weatherization cumulative SIR of 1.0 or greater.

I.5 Weatherization Materials Installed

Only weatherization materials that **meet or exceed** the standards listed in Federal Regulations 10 CFR Appendix A to Part 440.21(b) will be installed in eligible site-built single family and manufactured dwelling units.

Ancillary materials, incidental repair materials, as well as health and safety materials, are not required to be listed in Appendix A. Measure cost and fuel cost will be updated annually or more often if a significant change in cost of measures or fuel cost is indicated that Weatherization Assistant NEAT and MHEA uses to estimate cost-effectiveness.

The following materials have DOE approval to be included with approved energy conservation materials listed in 10 CFR 440 Appendix A in Louisiana:

- Light Emitting Diode (LED) Lighting (Energy Star or Equal)
- Refrigerators (Energy Star or Equal)
- Low Flow Showerheads (2.5 gallons per minute (GPM) or less)
- Low Flow Faucet Aerators (1.0 GPM or less)

Default NEAT and MHEA expected lifetimes of **all** measures will be used in the NEAT and MHEA Setup Library, except for approved DOE revised measure maximum lifetimes (as per Attachment 9 of WPN 19-4) for Louisiana as follows:

NEAT Measures Considered	Life Expectancy
Attic insulation R-11	30 Years
Attic insulation R-19	30 Years
Attic insulation R-30	30 Years
Attic insulation R-38	30 Years
Attic insulation R-49	30 Years
Fill Ceiling Cavity	30 Years
Wall Insulation	30 Years
Lighting Retrofits (LED only)	20 Years

I.6 General Heat Waste (GHW) Reduction List

DOE approved GHW materials are provided with procedures to guide installation and will be installed in eligible homes without the need for justification. GHW items are intended to be relatively low-cost items that can be quickly and easily installed. The total GHW measure costs including labor **will not exceed $250.00**. Louisiana DOE approved GHW materials are as followed:

- Water heater wrap
- Water heater pipe insulation
- Faucet aerators
- Low-flow showerheads
- Limited weather-stripping and caulking for comfort
- Furnace or air conditioner filters
- Attic Hatch box weather stripping

I.7 Incidental Repair Measures (IRM)

Incidental Repair Measures are those minor repairs and installation of materials **necessary** for the **effective** performance or preservation of weatherization materials and must be justified in the client file with an explanation for their need and relationship to a specific energy conservation measure (ECM) or group of ECMs installed.

Justification of IRMs with one or more ECMs will have a total post-weatherization cumulative SIR of 1.0 or greater for the weatherized unit. Removal of the ECM with the lowest SIR and its related IRM will be used to achieve total post-weatherization cumulative SIR of 1.0 or greater. If one IRM is necessary to protect or enhance more than one ECM, then all of those ECMs together must be considered for removal until the total SIR for the package of measures is 1.0 or greater.

Funds will **not** be used to install IRMs deemed necessary to protect material in the building before the WAP audit is performed.

I.8 Ancillary Items

These are items **necessary** for proper installation of WAP materials. The cost of ancillary items and installation are to be **included** within the cost of the individual ECM when calculating the SIR for that individual EMC.

I.9 Health and Safety

Field procedures used for both site-built single family and manufactured homes will be identified in Louisiana's WAP Health and Safety Plan, WAP Field Guides and Master File.

As a rule, Louisiana WAP **does not permit** the general practice of non-renewable fuel switching when replacing furnaces/appliances.

I.10 Equipment Calibration

All in use WAP audit equipment requiring calibration shall be maintained and calibrated according to the manufacturer's recommendations. Calibration documentation must be submitted **annually** to LHC at the time of monitoring.

I.11 Energy Audit Data Collection and Field Procedures

An energy audit includes a site visit where data is collected and recorded using the Energy Audit Data Collection Form. Accurate documentation on diagnostic test processes, client education and site-specific energy modeling data is collected to use within the WA software.

Every completed weatherized unit **must** have a **Louisiana Energy Audit Data Collection Form** completed with pre and post (final inspection) audit data documented. WAP providers **must** have local procedures to ensure pre and post audit data collection are completed and accurate.

Attachment A: Louisiana Energy Audit Data Collection Form

Attachment B: Instructions for Louisiana Energy Audit Data Collection Form

II. Louisiana Final Inspection Standards

Auditors will need to reconcile the energy audit **Recommended Measures Report** to the final scope of work or work order. This is done by verifying only the measures called for on the **Recommended Measures Report** are on the scope of work or work order.

All Health & Safety, Incidental Repair, and Energy Conservation Measures completed on the unit **must** be on the scope of work or **Work Order**.

All Health & Safety, Incidental Repair and Energy Conservation Measures completed on the unit **must** be on the Energy Audit's **Recommended Measure Report**.

Auditors must verify that installed ECM measures have an SIR of 1.0 or greater as determined by WA audit report.

II.1 Louisiana Energy Audit Review Checklist

Every completed weatherized unit **must** have a **Louisiana Energy Audit Review Checklist** completed by the Quality Control Inspector.

The Quality Control Inspection must include an assessment of the original audit and confirm that the measures called for on the work order were appropriate and in accordance with Louisiana audit procedures and protocols approved by DOE.

Quality Control Inspectors and LHC Technical Monitors are **required** to use the Louisiana Energy Audit Review Checklist to verify initial field audit data collection and audit software data entry on every completed unit weatherized in Louisiana.

Attachment C: Louisiana Energy Audit Review Checklist

III. Obtaining Access

The computer-based Weatherization Assistant application provides access to the National Energy Audit Tool (NEAT) and the Manufactured Home Energy Audit (MHEA). Version 8.9.0.5 is the latest version of the computer-based Weatherization Assistant application.

Link to obtain and download the latest version of Weatherization Assistant 8.9: https://weatherization.ornl.gov/obtain/

This is the latest executable installation file for Version 8.9.0.5 of the computer-based Weatherization Assistant application, which was released on February 10, 2012.

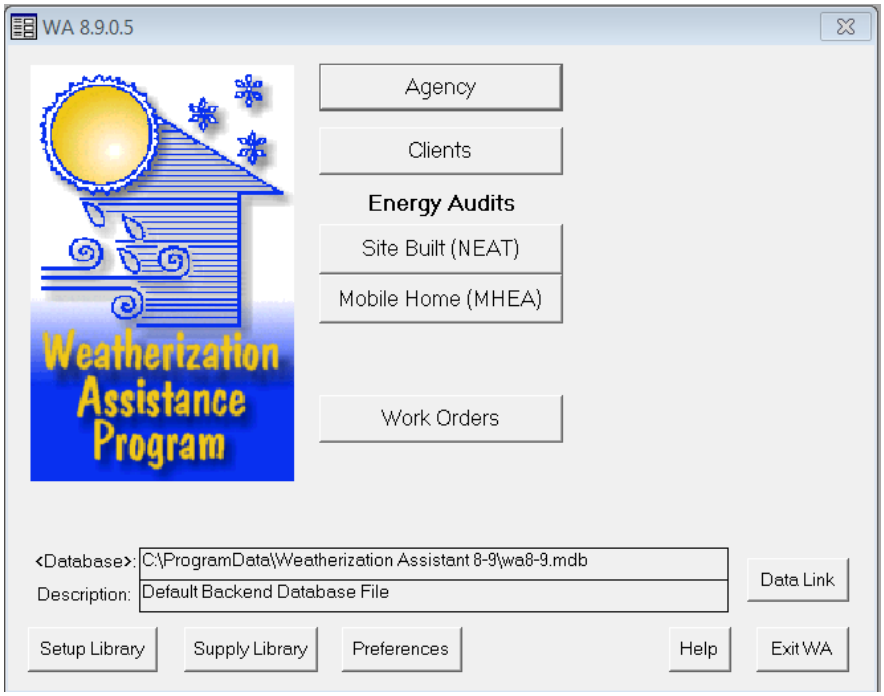
The executable file is provided as a zip file. After downloading the zip file to your computer, double click on it to unzip it into an exe file. After the zip file has been unzipped, it is no longer needed and can be deleted from your computer.

Click on the **WA** icon to install.

After installing the **WA** software Double Click the **WA 8.9** icon on the desktop to access the **WAP Assistant**.

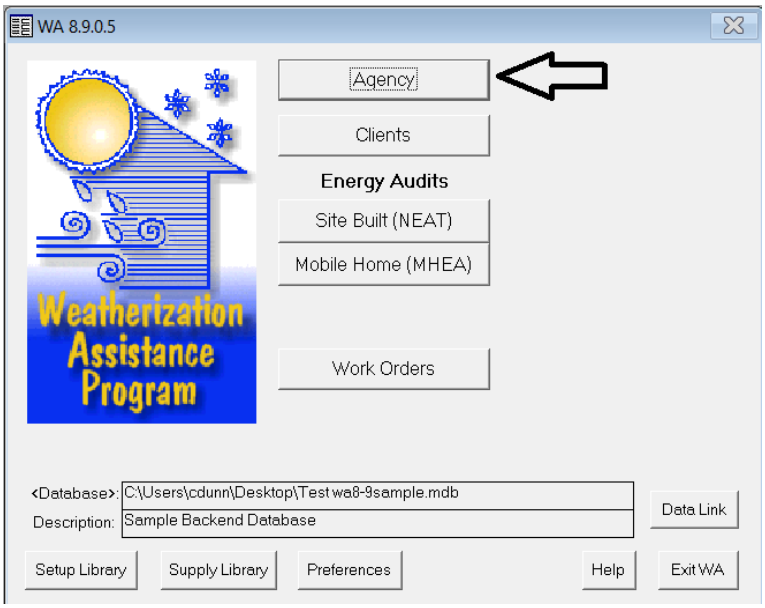
The main **WA Main Menu Splash Screen** will appear. See **WA Main Menu Splash Screen** below.

WA Main Menu Splash Screen



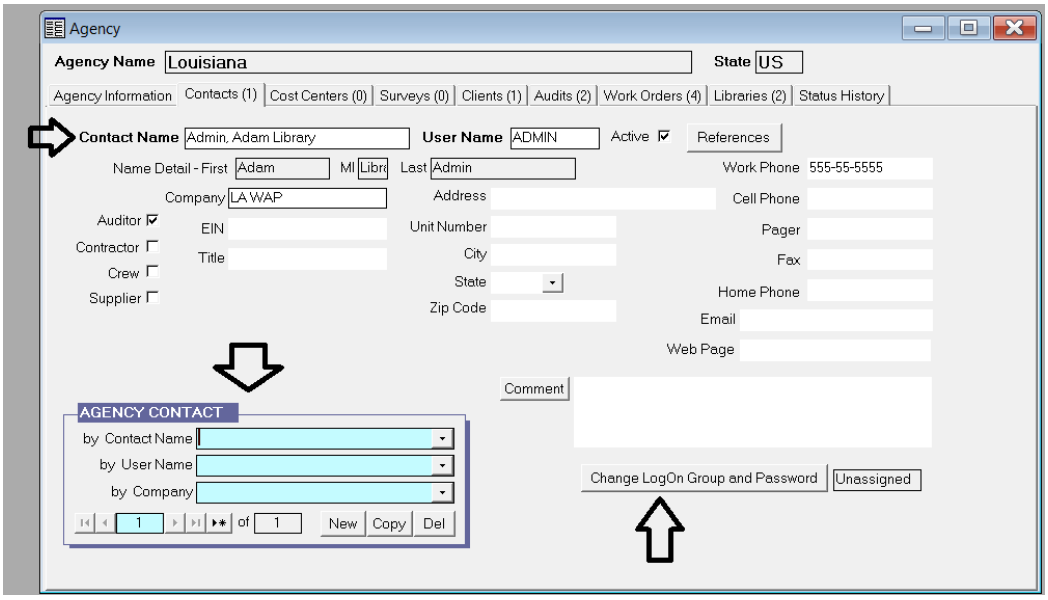
IV. User Permissions and Library Passwords

To set the **Log-On and Password** for Groups in WA, open the **Agency** tab from **WA Main Menu Splash Screen**.

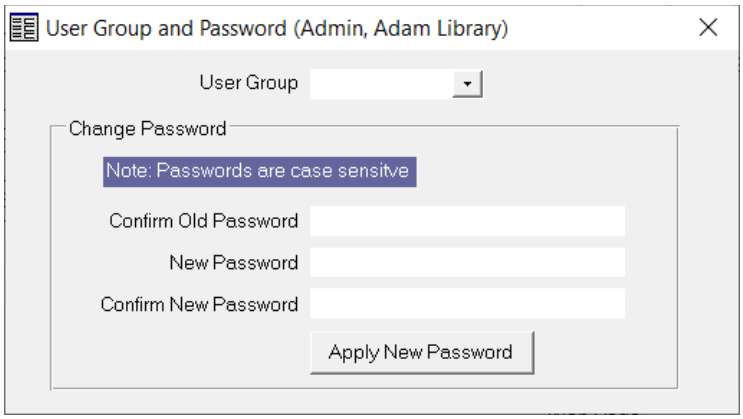


IV.1 Administrator Setup

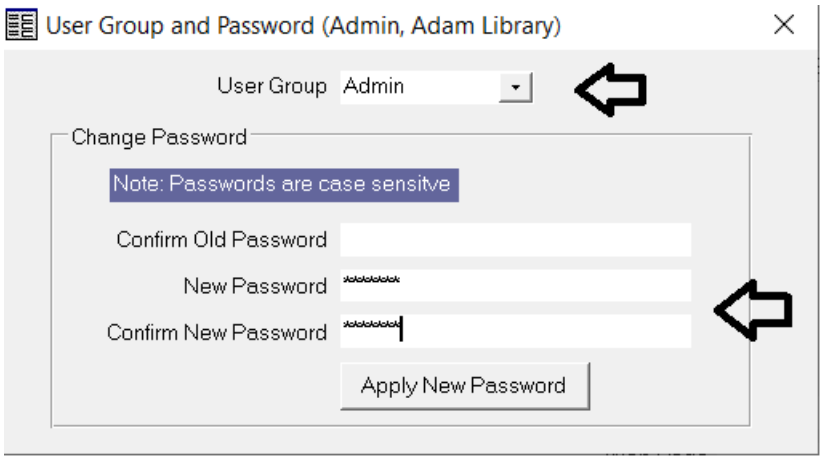
Click on the **Contact** tab and enter the person who will be the administrator of WA libraries. Existing contacts can be accessed from the **Agency Contact** control box in the bottom right.

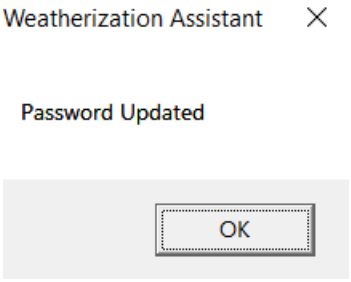


Click on the **Change LogOn Group and Password** button in the bottom right hand side of the **Contacts** tab.



To add a contact to the library administrator group use the drop down menu in the **User Group** and select **Admin**. Enter a password for the Library admin contact and click **Apply New Password**.

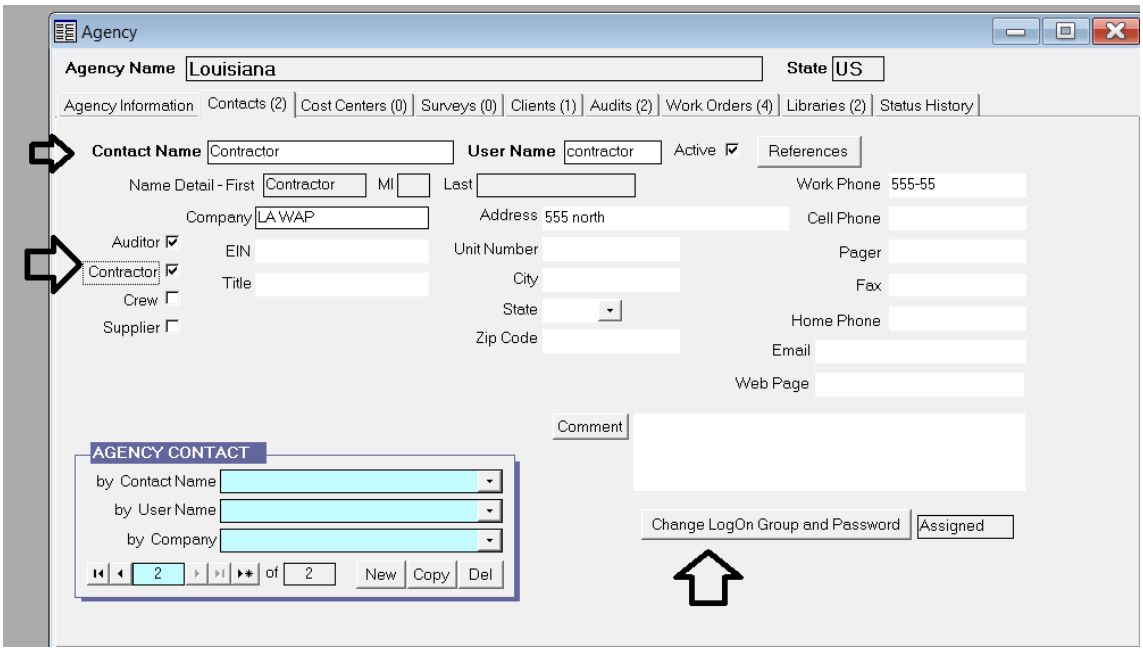




Multiple contacts can be designated as library administrators.

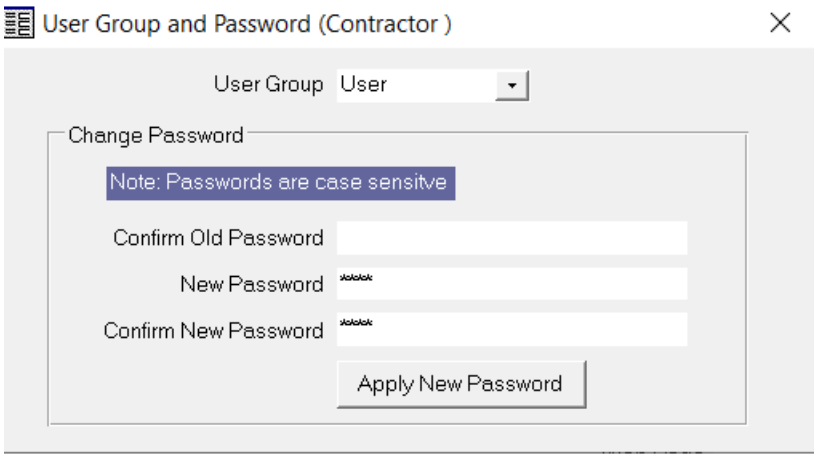
IV.2 User Setup

All other WA **Users** should only be able to enter into WA audits, run audits, reports and work orders. To do this enter or select the contact on the **Contact** tab and click on the **Change LogOn Group and Password** button in the bottom right hand side of the **Contacts** tab.

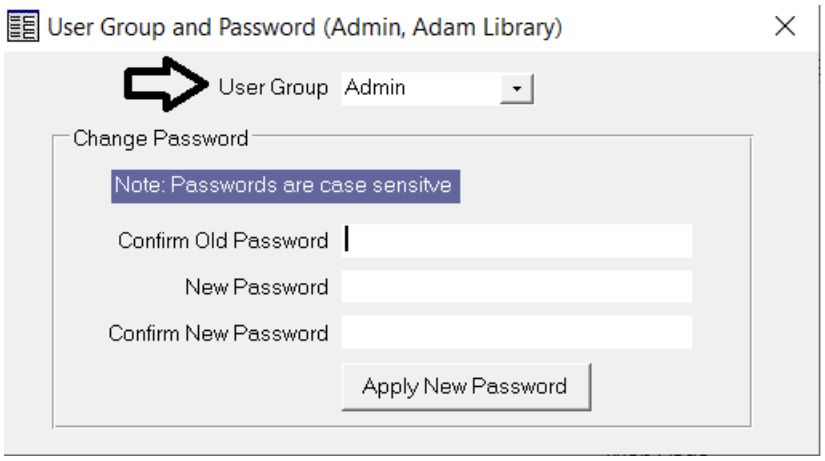


To add a contact to the **User** group, click **Change LogOn Group and Password**. In the drop down menu select **User**. Enter a password for the user contact and click **Apply New Password**.

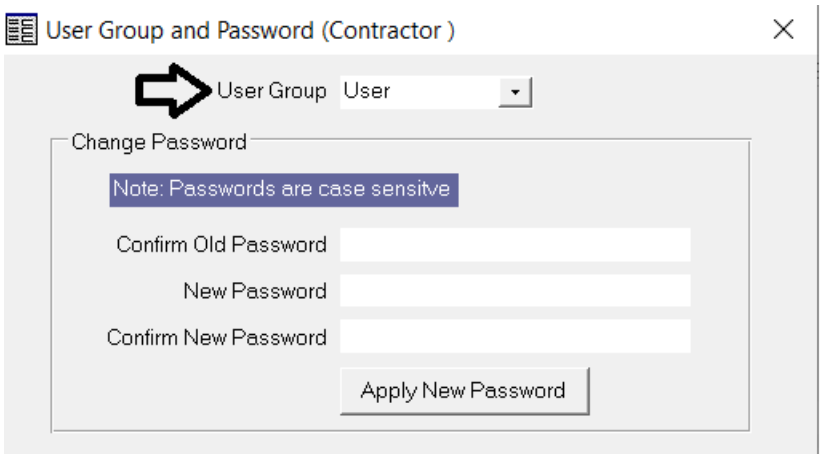
Add Auditors, Contactors, Crew and Supplier to the Group users by using the corresponding check box and assigning the contact.

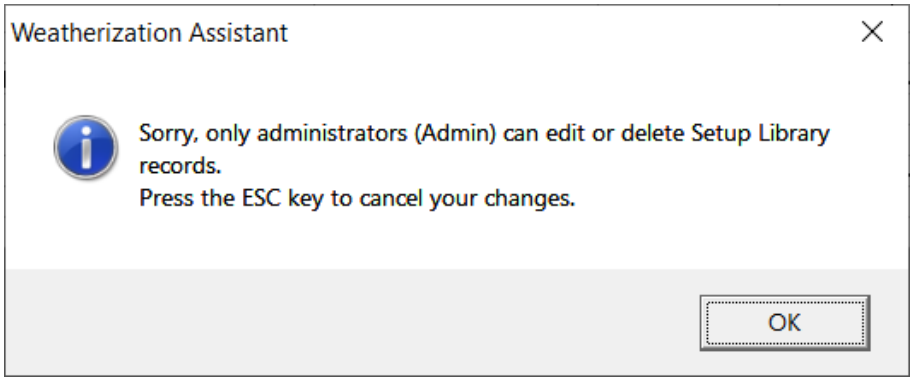


Admin users are able to change the libraries in WA.



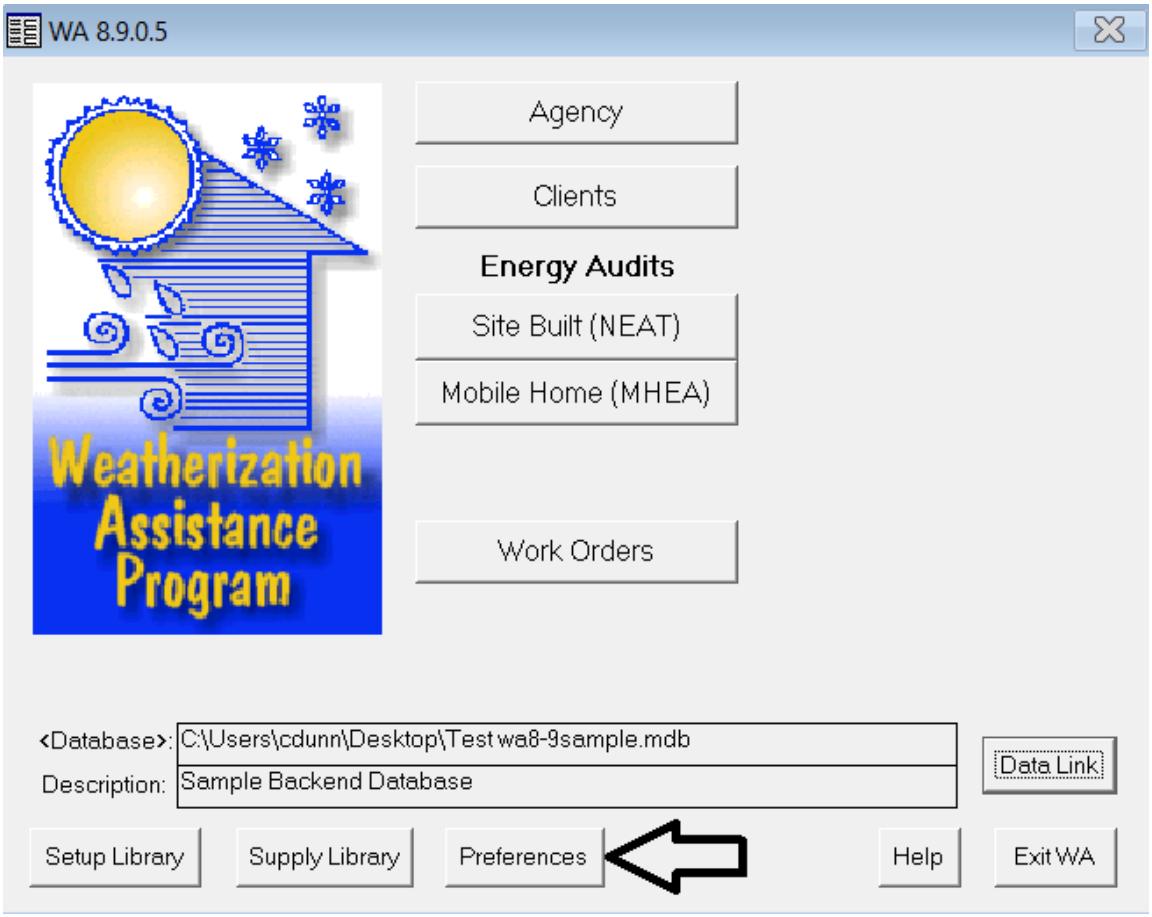
Group users are unable to change the libraries in WA.





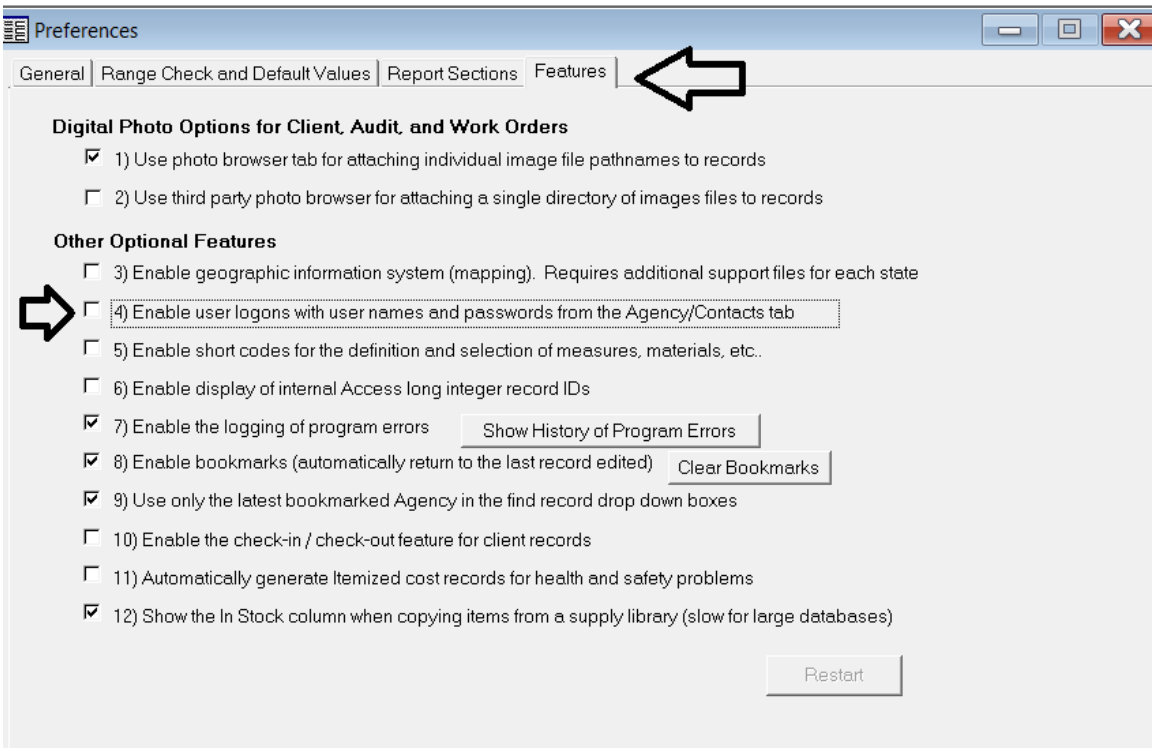
IV.3 Permission and Password Implementation

To implement this protection, you now must go to **WA Main Menu Splash screen** page and select the **Preferences** button.

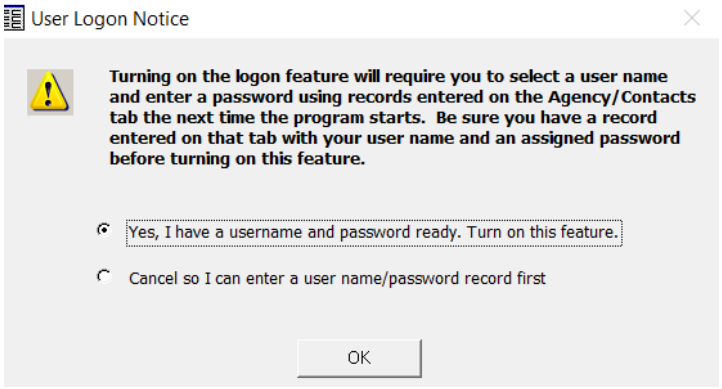


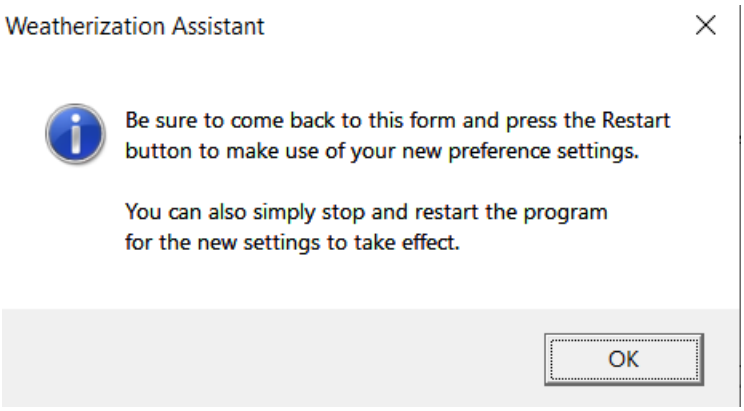
Navigate to the **Features** tab.

Select feature (4) under the **Features** tab to **Enable user logons with user names and passwords from the Agency/Client tab**.



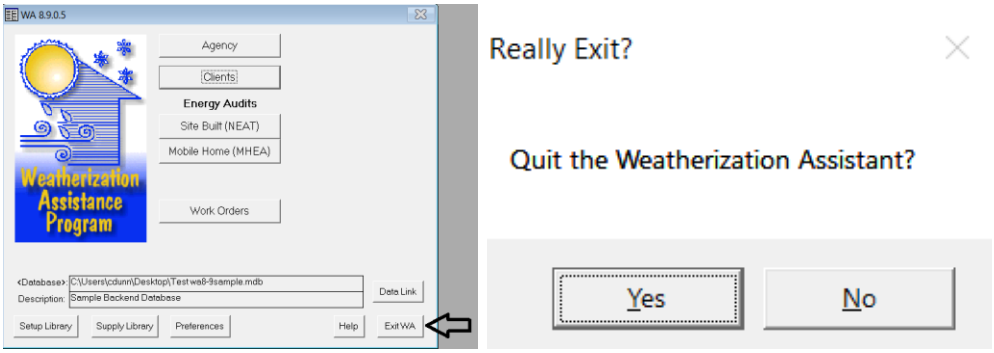
WARNING BEFORE ACTIVATING feature (4), be sure all client users know their logins and passwords for all library administrators, auditors, contractors, crew, etc.



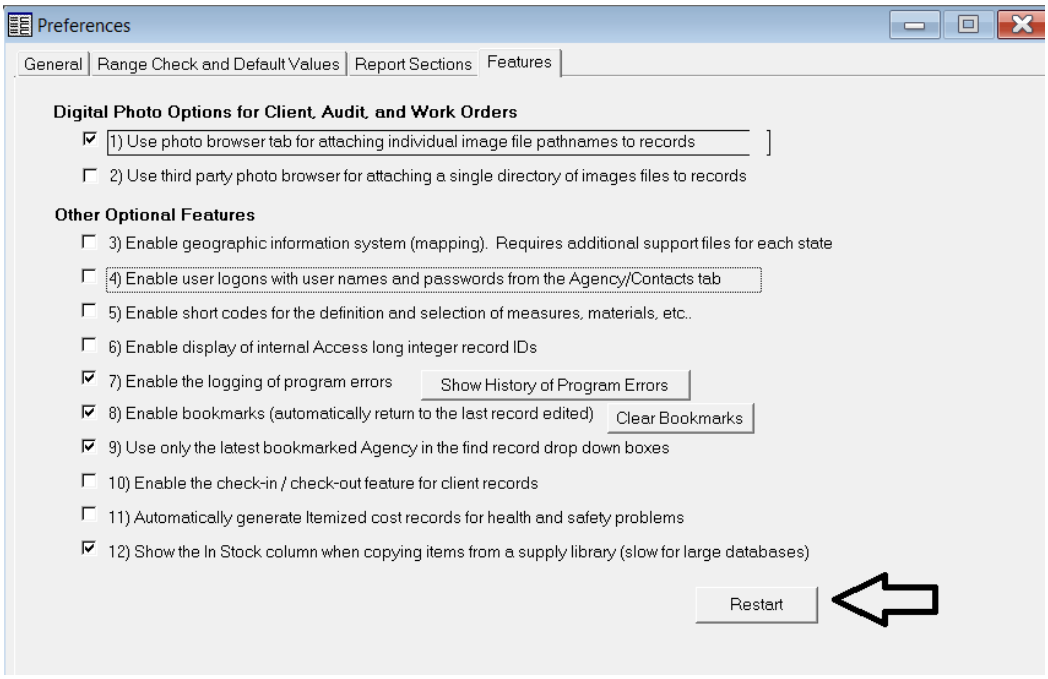


Select **Yes,** and click on the **OK** button to complete the password setup then select the **OK** button again.

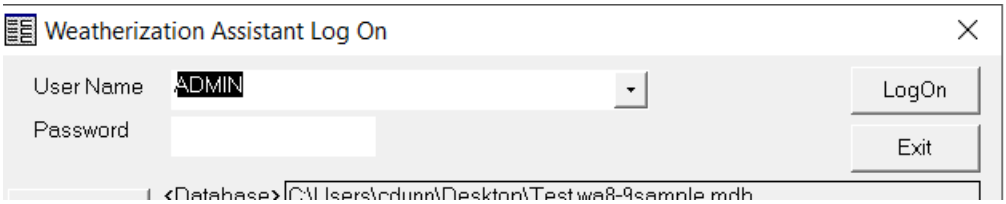
For the new settings to take effect, restart the WA software properly by using the **Exit WA** button on the software **WA Main Menu Splash Screen**.



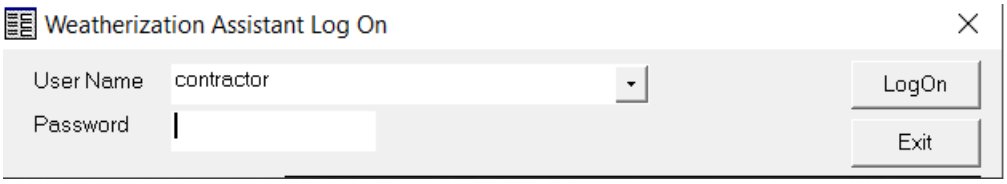
Or for the new settings to take effect, go to the **WA Main Menu Splash Screen** and select **Preferences** button; then navigate to the **Features** tab again and click the **Restart** button on the bottom right of the tab.



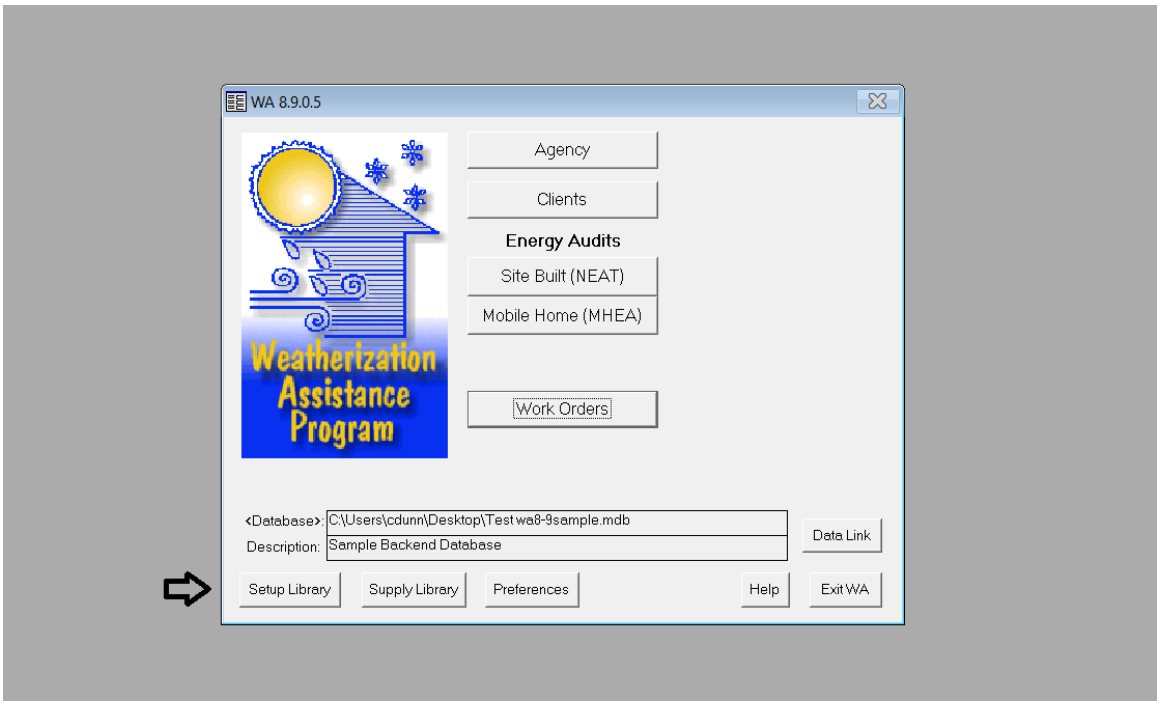
Upon restarting the WA software, the Log On box will appear for software access.



Select the appropriate WA **User** and click **LogOn**.

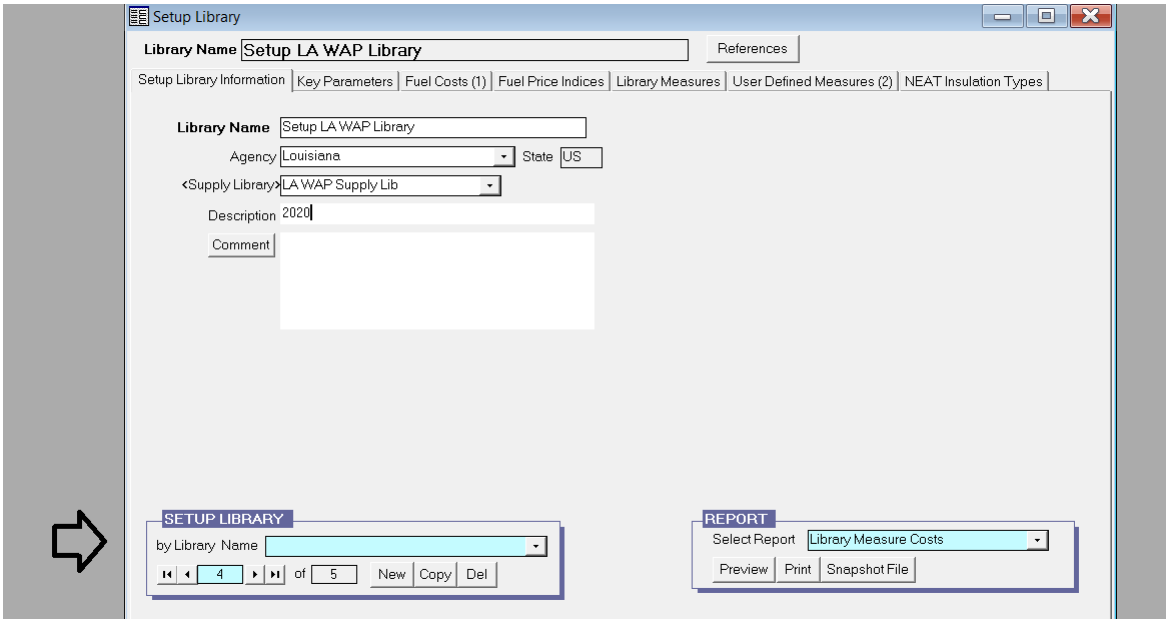


V. Setup Library



From **WA Main Menu Splash Screen,** select **Setup Library**.

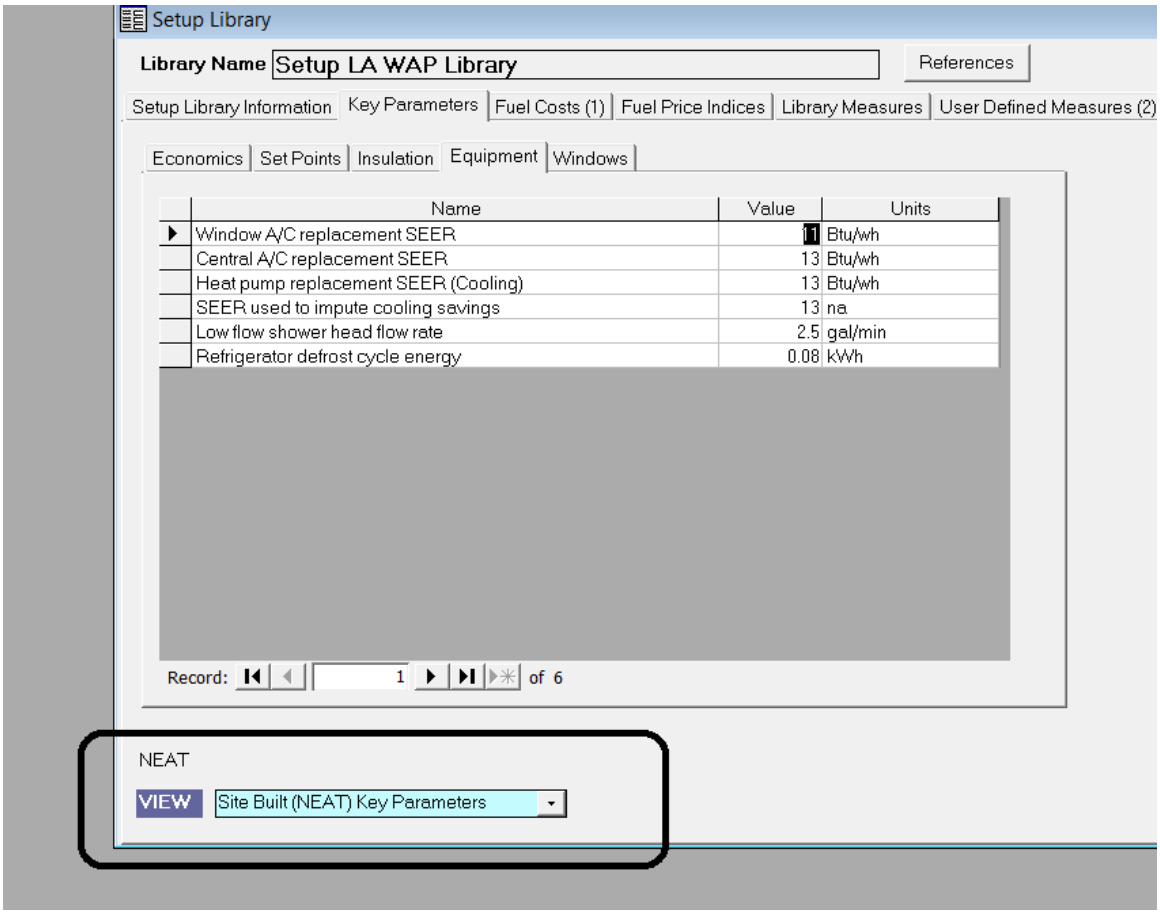
The **Setup Library Information** tab can be used to name, create, copy or delete Setup Library databases and data using the bottom left window.



V.1 Key Parameters

V.1.A Key Parameters (Equipment Sub Tab)

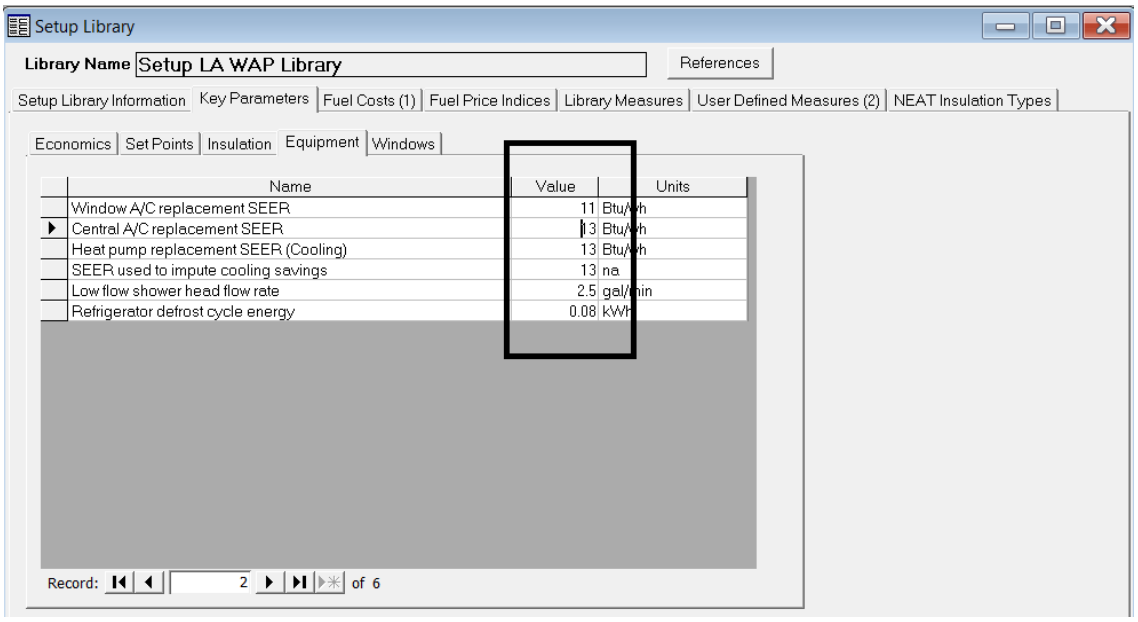
Under the **Key Parameters** tab, click on the **Equipment** sub tab. *If no Equipment tab is displayed then you are viewing MHEA, change to NEAT via the bottom right window drop-down menu.*



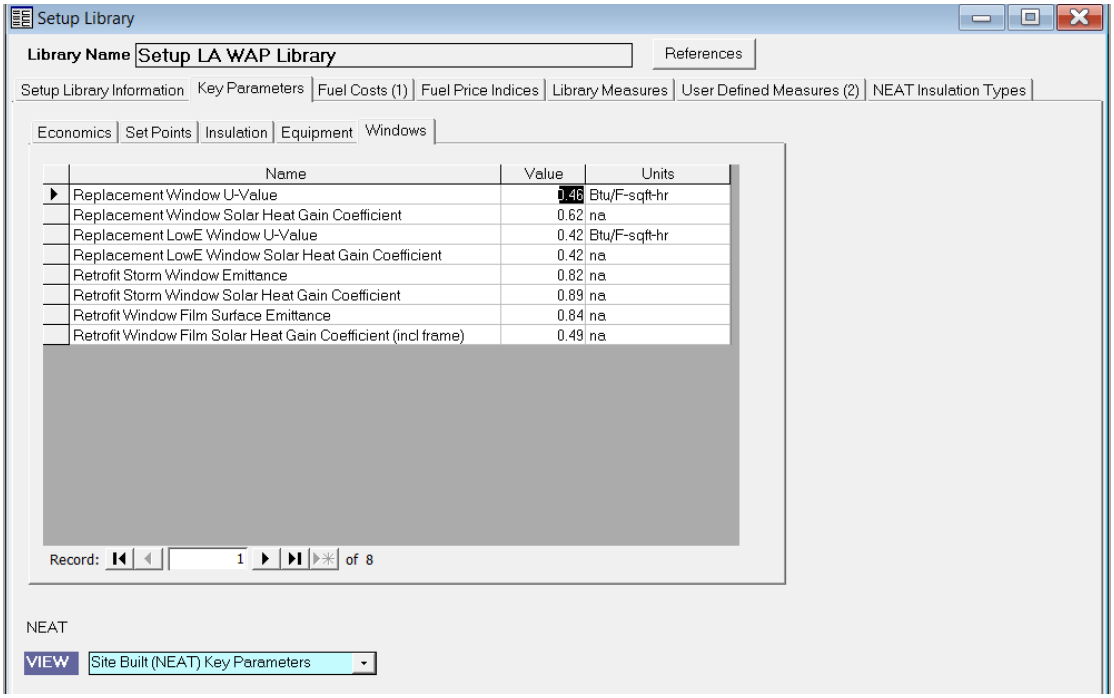
Here the auditor can adjust, change, or update the energy efficiencies of newer equipment.

Input changes to the Window A/C replacement SEER, Central A/C replacement SEER, Heat pump replacement SEER (Cooling), and SEER used to impute cooling savings to actual replacement SEER values of “ENERGY STAR” equipment. (Ex: from 13 SEER to 14.5 SEER). The higher the SEER value used - the higher the chances are that it will rank as an ECM. Equipment input must match the equipment being installed.

Some newer shower heads are rated for 1.5 gallons per minute. This also can be adjusted on the Equipment sub tab



V.1.B Key Parameters (Windows Sub Tab)

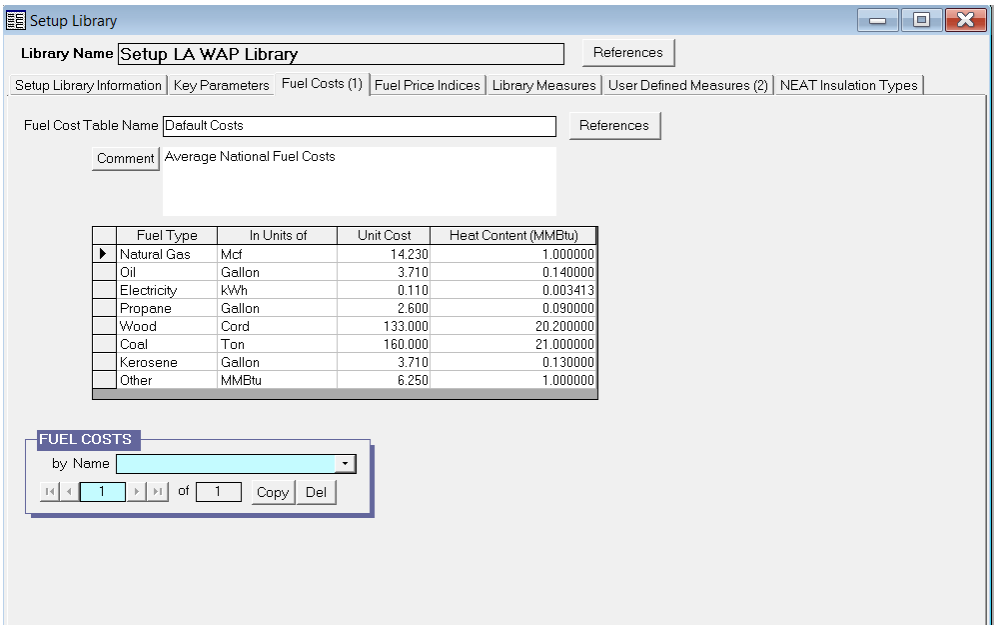


Here the auditor can verify, adjust, change, or update new replacement window energy efficiency information.

Adjustable energy efficiencies include the units of U-values, Solar Heat Gain Coefficients (SHGCs), and window emittance.

Obtain this information from the window vendor's technical literature or off the label on the window.

V.2 Fuel Costs

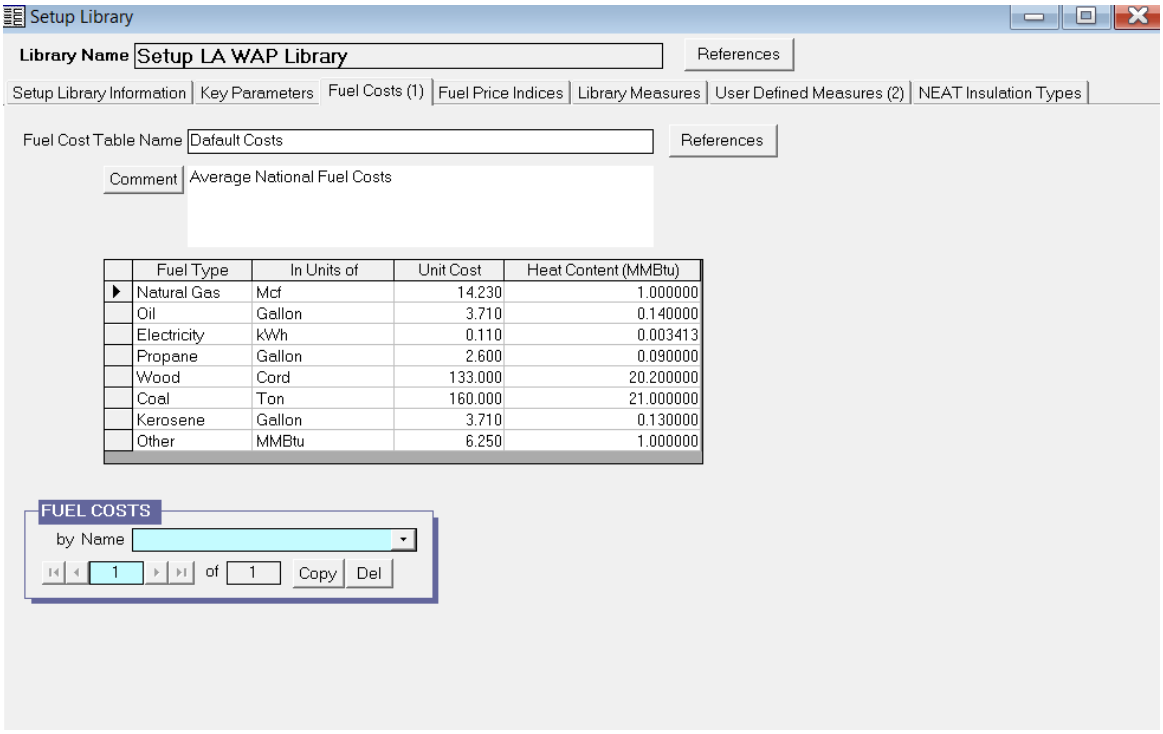


Here the auditor can verify, adjust, change, or update the actual pricing for fuel during an audit.

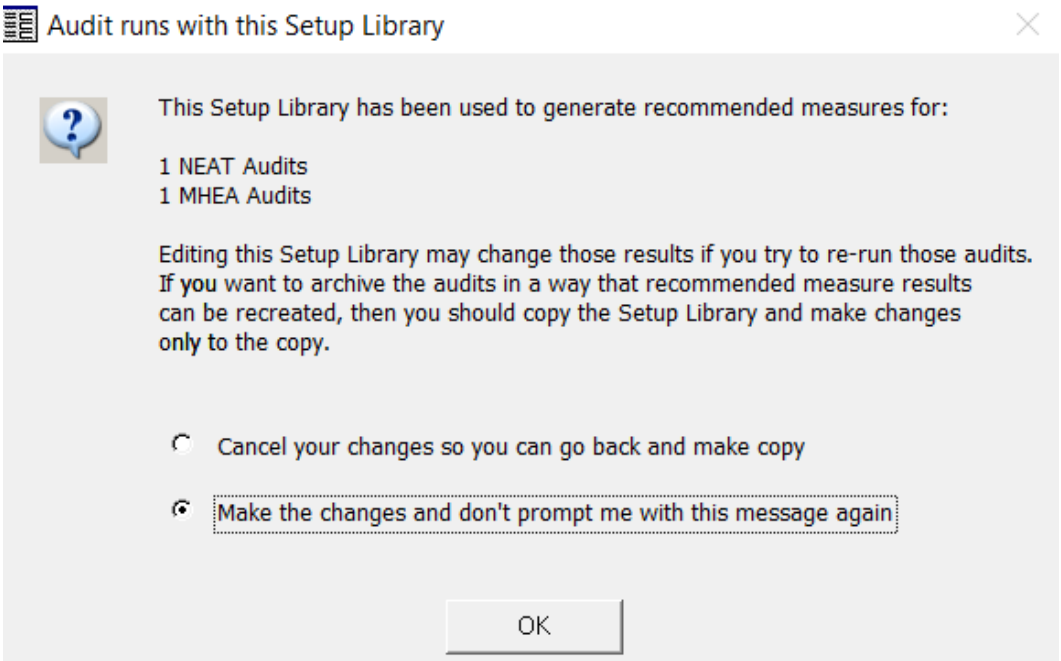
LA WAP Policy: LHC will provide **annual program year updates** to the three major fuels prices most commonly used in Louisiana's housing stocks.

Warning: After installing or reinstalling the Weatherization Assistant software on a computer, the **Fuel Costs** library will be set to a default fuel cost.

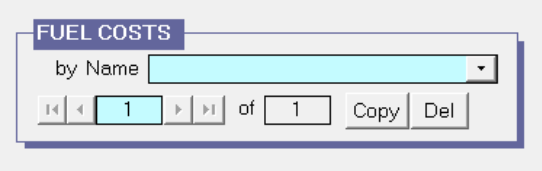
Do not use the default fuel pricing/cost. This will make the unit's audit not in compliance with LA Wx Standards and DOE rules.



After a fuel cost adjustment is made, read the pop-up box warning about edits to the Setup Library and changes it may have on existing audits. Then click on **Make the changes and don't prompt me with this message again** in the pop-up screen. Fuel costs can be updated individually (i.e Electricity kWh).



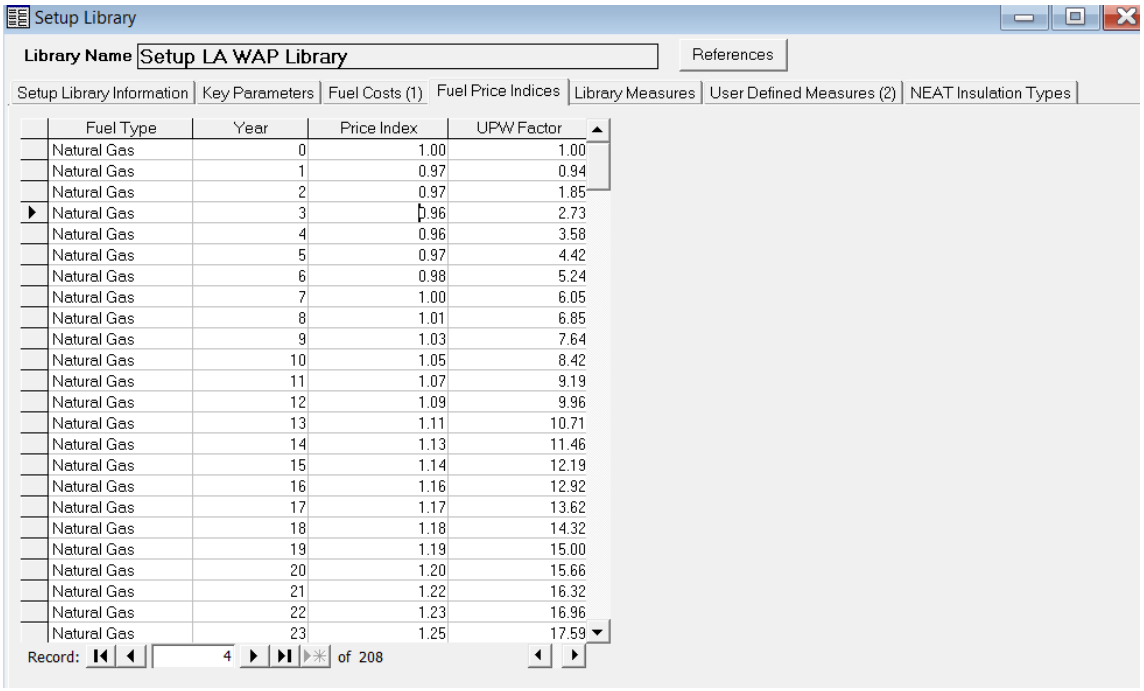
Additional **Fuel Costs** libraries can be created by clicking **Copy** at the bottom left of the screen.



V.3 Fuel Price Indices

The **Fuel Price Indices** Tab is not used by auditors. Do not adjust.

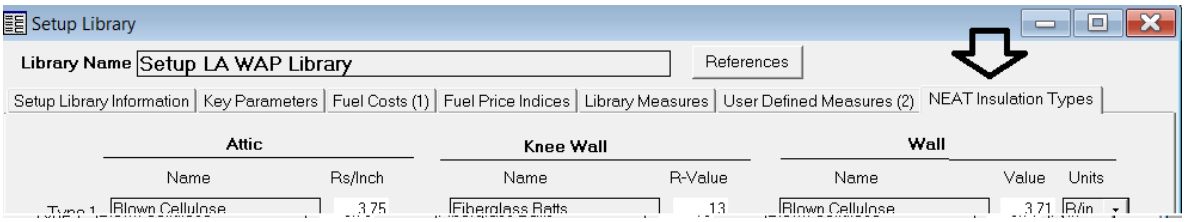
LA WAP Policy: Under LHC supervision and approval, LA WAP Agencies will only make adjustments for the LA WAP DOE approved updated lifetimes for specific measures (see **Attachment D**). Instructions will be provided by LHC at that time.



V.4 NEAT Insulation Types

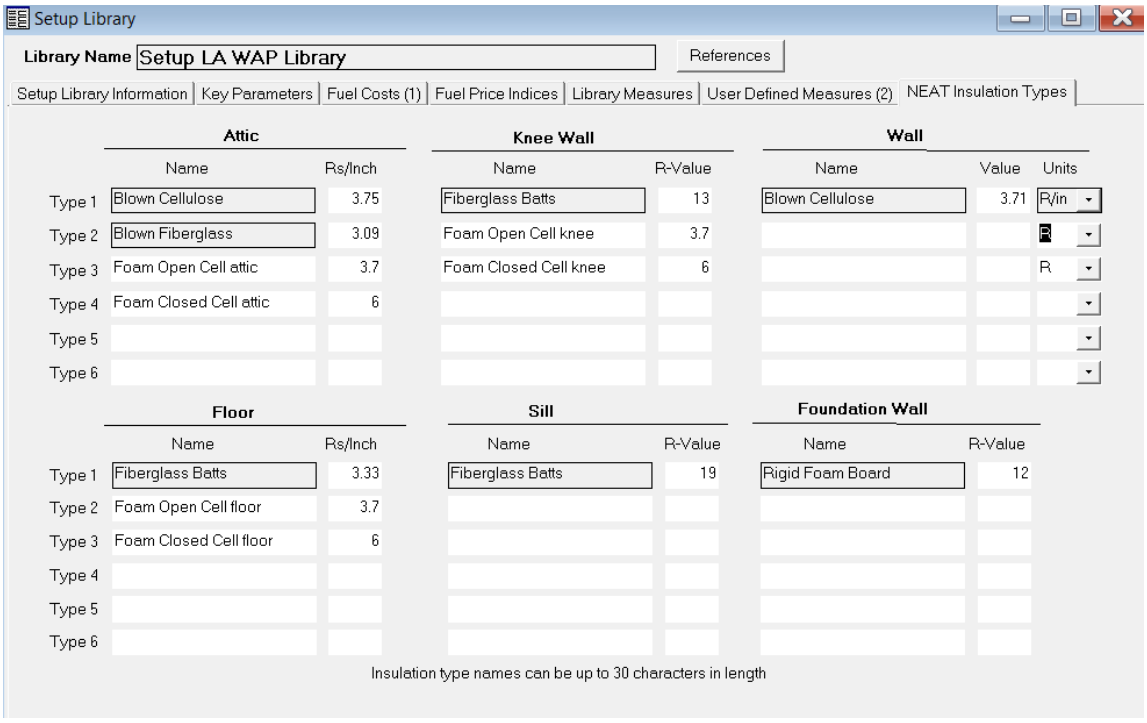
Before making changes to the Library Measures and User Defined Measures, verify the **NEAT Insulation Types** are correct for material used for insulation.

Click on the **NEAT Insulation Types** tab.



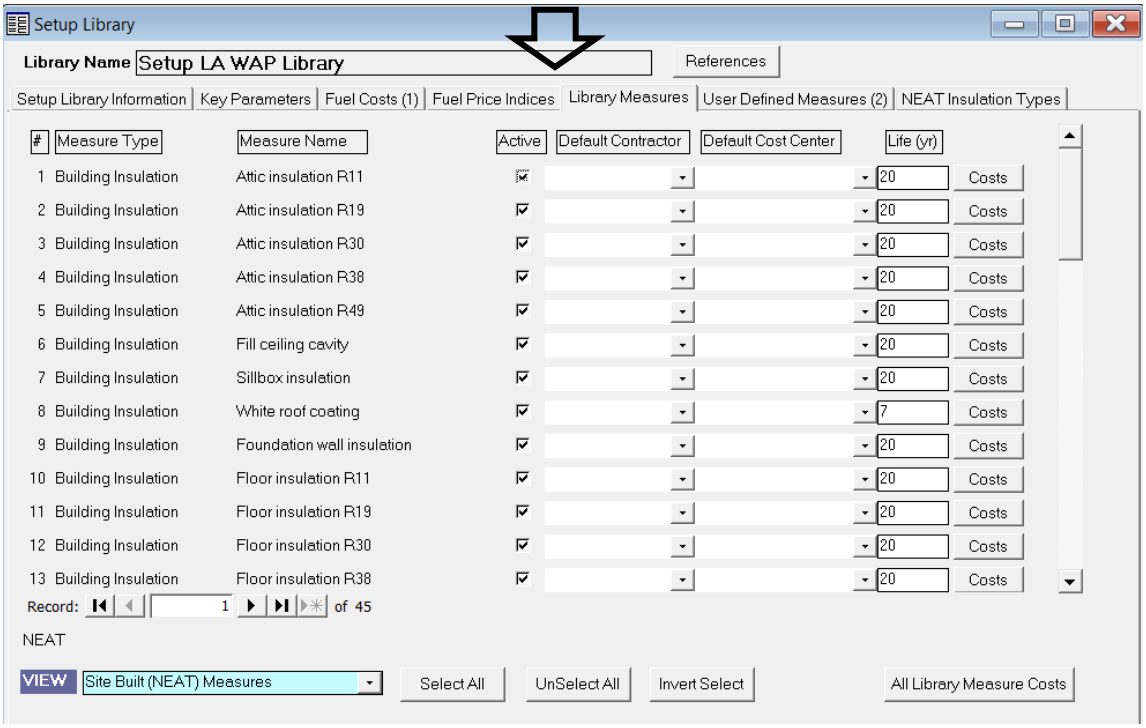
Auditors can verify R-values for insulation types in the Attic, Knee Wall, Wall, Floor, Sill and Foundation Wall.

Additional insulation types, locations and R-values can be added through the **NEAT Insulation Types** tab if approved by LHC.

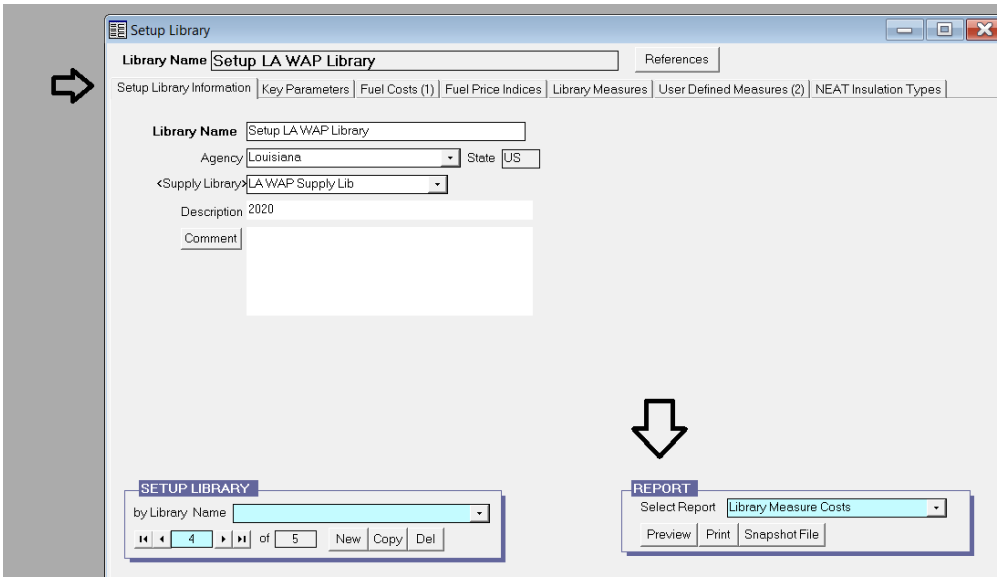


V.5 Library Measures

Click on the **Library Measures** tab.



NOTE: *For easy setup and measure cost adjusting, make a printout of the* ***Library Measures*** *tab by going back to the* ***Setup Library Information*** *tab. Select the* ***Library Measure Costs*** *report from the drop-down menu in the* ***Report*** *section. This will simplify and expedite this section by writing the actual pricing for each item on the print out.*



*Below is a printed example of the **Library Measure Costs** for NEAT's ECMs that is used during an audit run. Attention should be made to the **Units** and **Unit$** columns to verify the correct measure cost for local LA WAP Agencies and DOE justified SIRs analyzed by NEAT.*

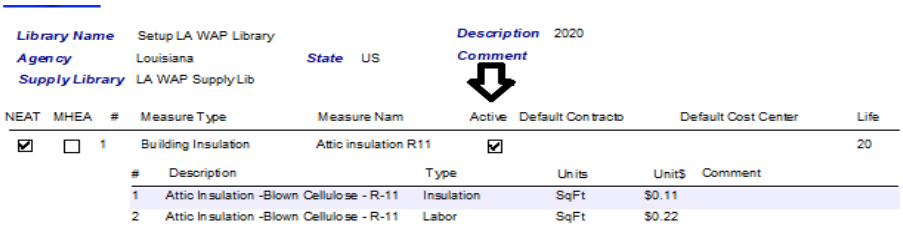
Library Measure Costs

Library Name Setup LA WAP Library **Description** 2020
Agency Louisiana **State** US **Comment**
Supply Library LA WAP Supply Lib

NEAT	MHEA	#	Measure Type	Measure Nam	Active	Default Contracto	Default Cost Center	Life
☑	☐	1	Building Insulation	Attic insulation R11	☑			20

#	Description	Type	Units	Unit$	Comment
1	Attic Insulation -Blown Cellulose - R-11	Insulation	SqFt	$0.11	
2	Attic Insulation -Blown Cellulose - R-11	Labor	SqFt	$0.22	
3	Attic Insulation -Blown Cellulose - R-11	Other	Each Atti	$0.00	
1	Attic Insulation -Blown Fiberglass - R-11	Insulation	SqFt	$0.14	
2	Attic Insulation -Blown Fiberglass - R-11	Labor	SqFt	$0.22	
3	Attic Insulation -Blown Fiberglass - R-11	Other	Each Atti	$0.00	
1	Attic Insulation -Foam Open Cell attic - R-11	Insulation	SqFt	9,999.00	Not considered unless cost is specified
2	Attic Insulation -Foam Open Cell attic - R-11	Labor	SqFt	$0.00	
3	Attic Insulation -Foam Open Cell attic - R-11	Other	Each Atti	$0.00	
1	Attic Insulation -Foam Closed Cell attic - R-11	Insulation	SqFt	9,999.00	Not considered unless cost is specified
2	Attic Insulation -Foam Closed Cell attic - R-11	Labor	SqFt	$0.00	
3	Attic Insulation -Foam Closed Cell attic - R-11	Other	Each Atti	$0.00	
1	Attic Insulation	Insulation	SqFt	9,999.00	Not considered unless cost is specified
2	Attic Insulation	Labor	SqFt	$0.00	
3	Attic Insulation	Other	Each Atti	$0.00	
1	Attic Insulation	Insulation	SqFt	9,999.00	Not considered unless cost is specified
2	Attic Insulation	Labor	SqFt	$0.00	
3	Attic Insulation	Other	Each Atti	$0.00	

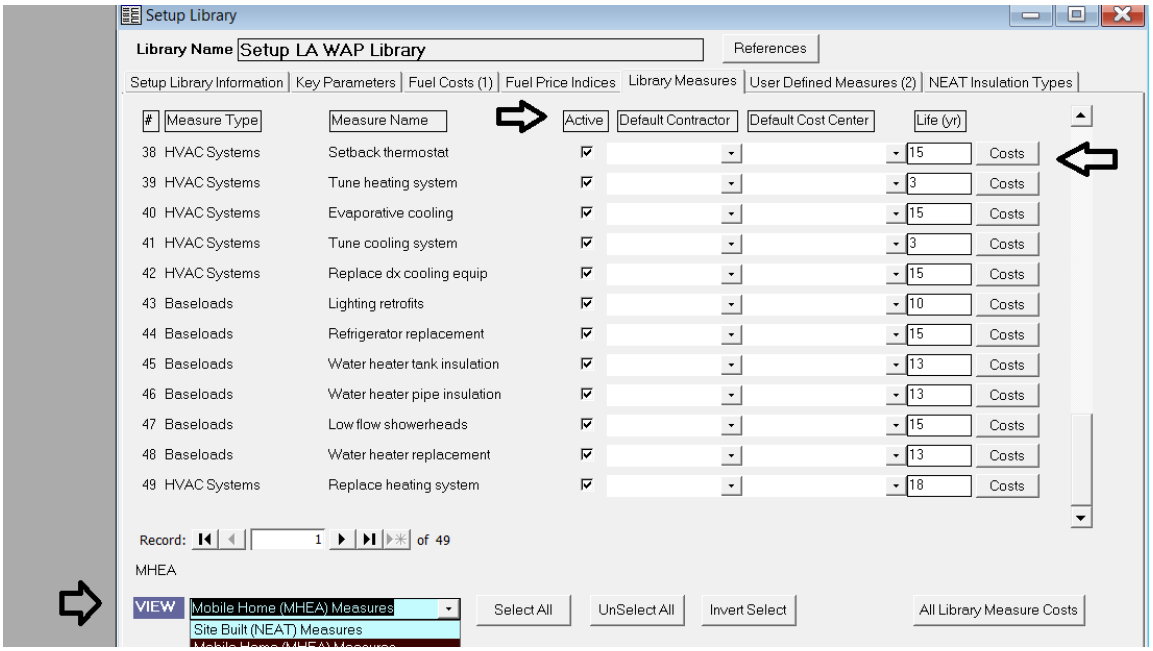
*A check in the **Active** box identifies the ECMs that will be analyzed by the NEAT software during an audit run. If the software approves, the Energy Conservation measures will be installed.*



Library Name Setup LA WAP Library **Description** 2020
Agency Louisiana **State** US **Comment**
Supply Library LA WAP Supply Lib

NEAT	MHEA	#	Measure Type	Measure Nam	Active	Default Contracto	Default Cost Center	Life
☑	☐	1	Building Insulation	Attic insulation R11	☑			20

#	Description	Type	Units	Unit$	Comment
1	Attic Insulation -Blown Cellulose - R-11	Insulation	SqFt	$0.11	
2	Attic Insulation -Blown Cellulose - R-11	Labor	SqFt	$0.22	

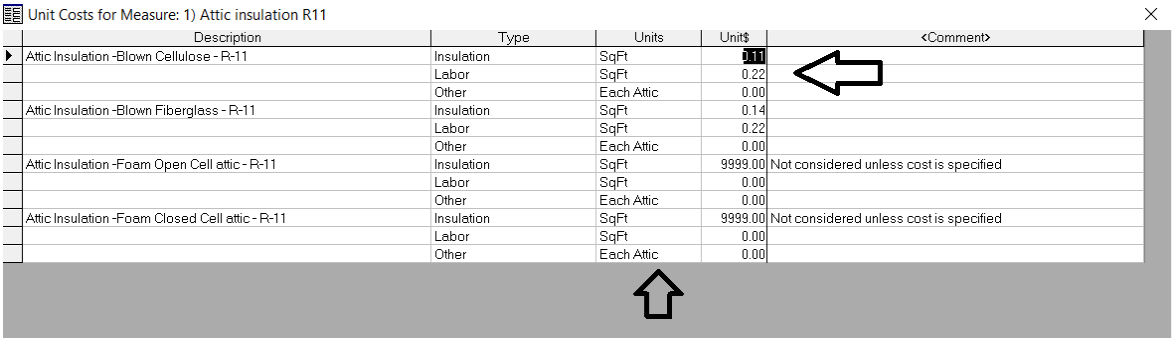


Use the checkbox in the **Active** column (third column) to turn off measures that are not used (with approval from LHC). You want to keep as many active as possible.

Attachment D: Enabled Library Measures for Louisiana NEAT Audits

Click on the **Costs** button of a measure type to adjust the ECMs material and labor cost.

The NEAT software analyzes 45 ECM types, and the MHEA software analyzes 49 ECM types. A check in the **Active** box indicates the software will analyze this measure for a SIR.

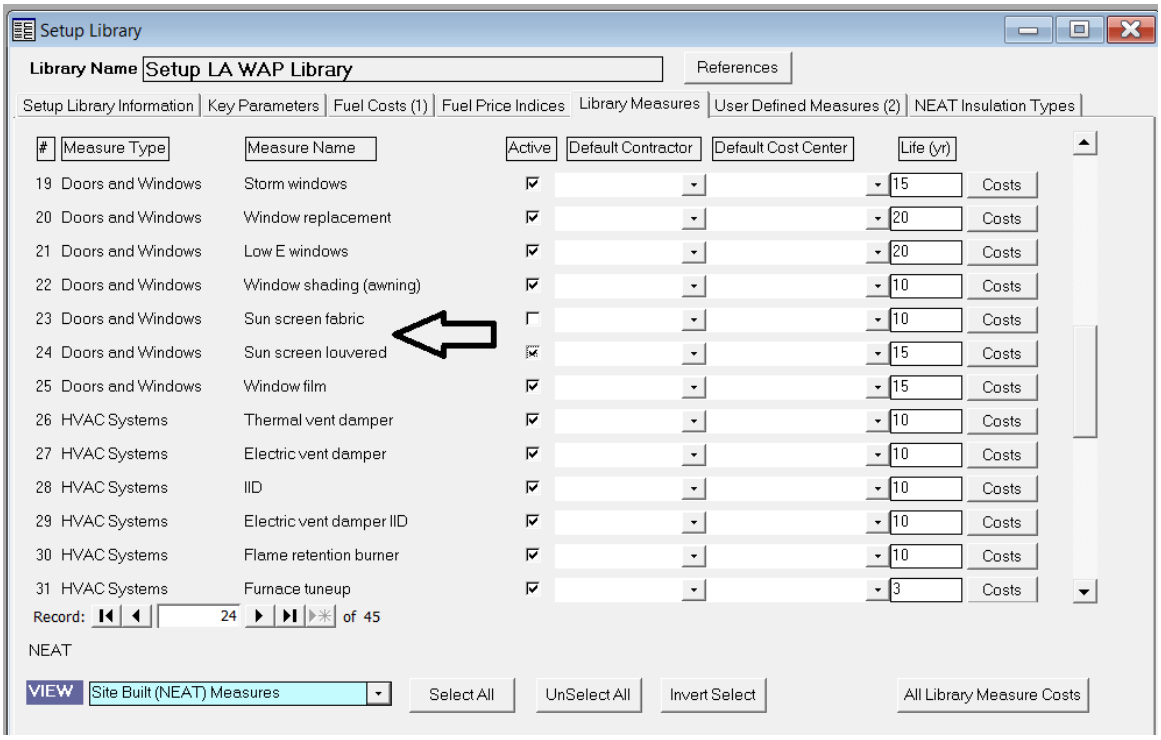


The **Library Measures** tab is a front end user interface which is connected to an MS access database. This database contains NEAT's ECM descriptions, costs for material and labor, units of material used, and other costs associated with installation of the ECMs.

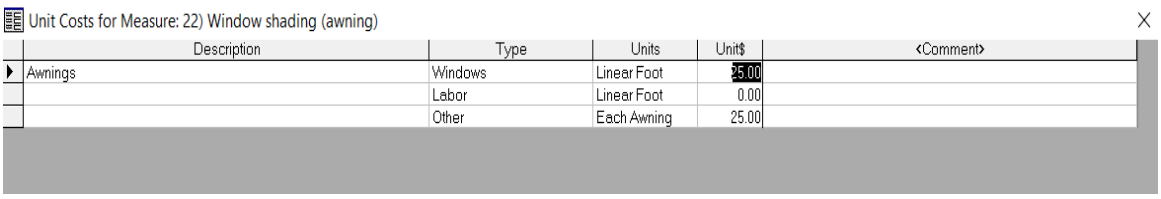
V.5.A Solar Screen Measures

If installing solar screens that block out **80% of heat gain or more**, then click on the **Sun screen fabric** active box (measure #23). Files must have documentation that the solar screen fabric is rated such.

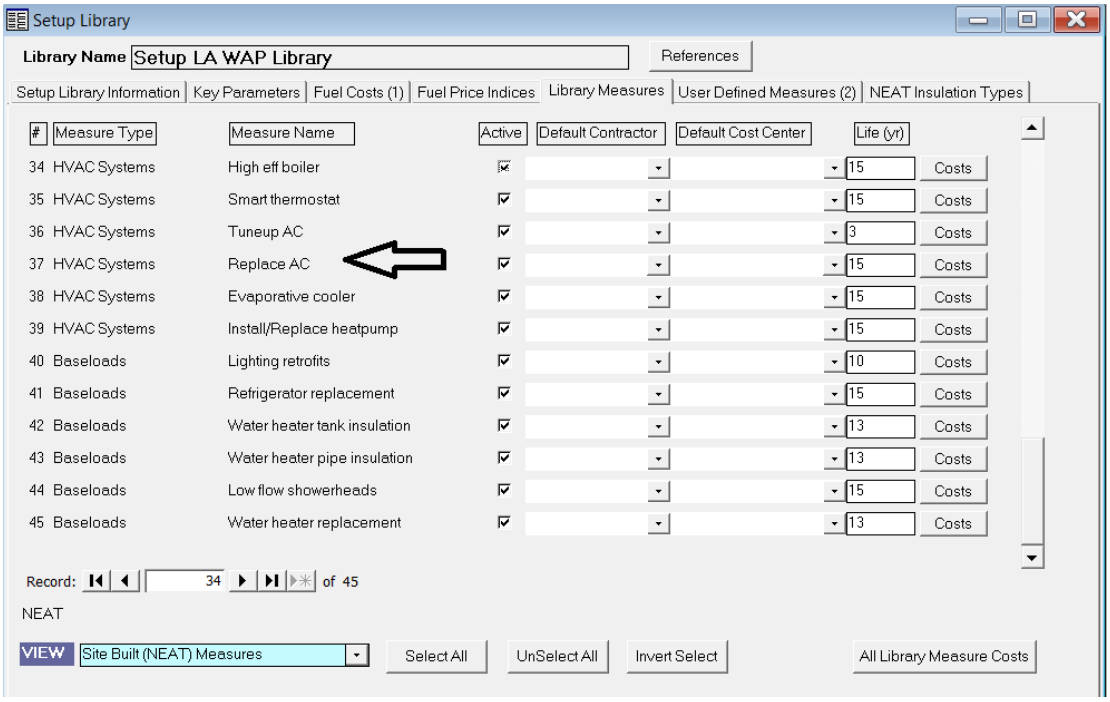
If you are using a fabric **below 80%**, then click off the **Sun screen fabric** active box (measure #23).



Cost details for other solar blocking ECMs, such as **awning**, **louvered screen**, and **window film**, can be adjusted within the Library Measure Tab in the Setup Library using the **Costs** button. These may be adjusted **with LHC approval.** Without LHC approval, the **default** settings must be used.



V.5.B AC Replacement Measure



Click on **Replace AC** (measure #37) **Costs** for HVAC Systems**.**

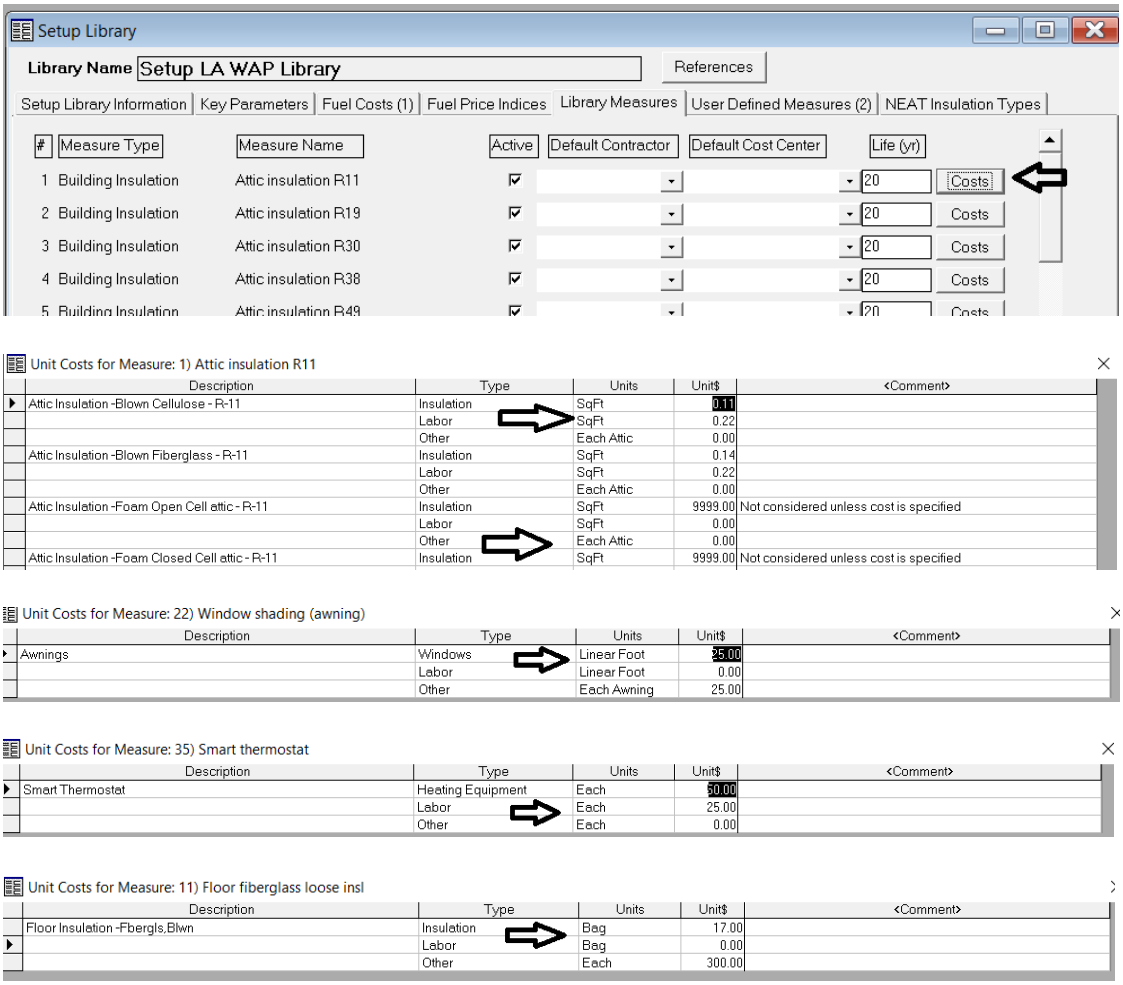
With NEAT, the BTU descriptions are SET units and cannot be changed. Choose the closest BTU value to the unit being installed. NEAT will adjust pricing and sizing to what is appropriate.

Note: *There are 12,000 BTU in 1 ton unit.*

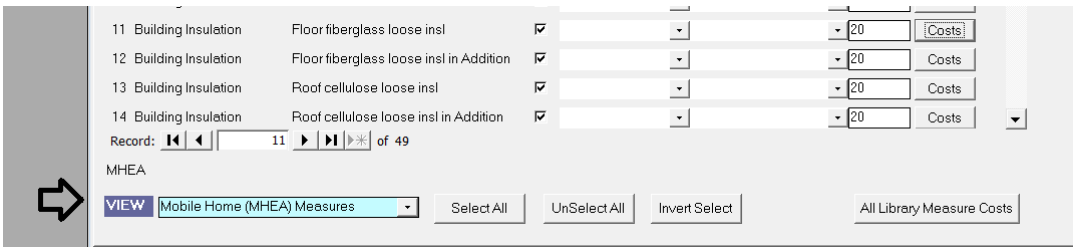
V.5.C Data Entry

Attention to detail and accuracy are needed in the **Library Measure** setup tab and the connected MS database.

The ECM total cost must be comprehensive and accurate for the units for each ECM (i.e. Sq. Ft, linear foot, each, per bag, etc).



To switch between Library Measures list for NEAT and MHEA, use the **View** drop-down menu and select NEAT or MHEA.



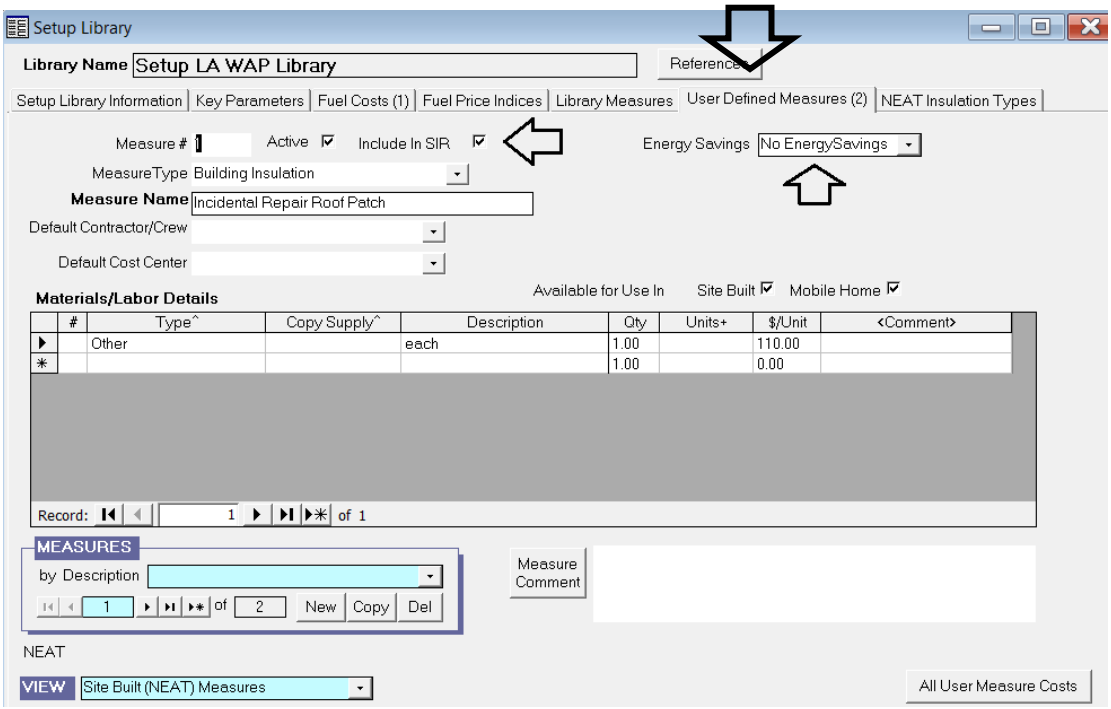
V.6 User Defined Measures

Click on the **User Defined Measures** Tab.

This is where Health & Safety (H&S) and Incidental Repairs (IRs) are entered.

LA WAP Policy: LA WAP Agencies should refer to the **Louisiana Health and Safety Plan** and **DOE Incidental Repairs Memo** for guidance on allowable Louisiana measures.

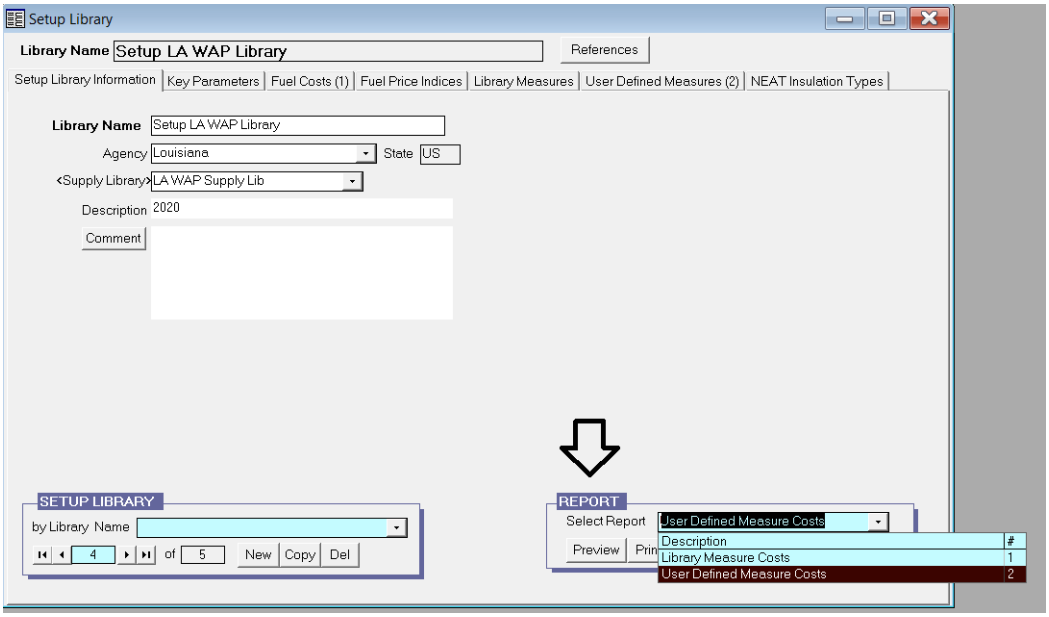
Select **No Energy Savings** for both H&S and IRs.



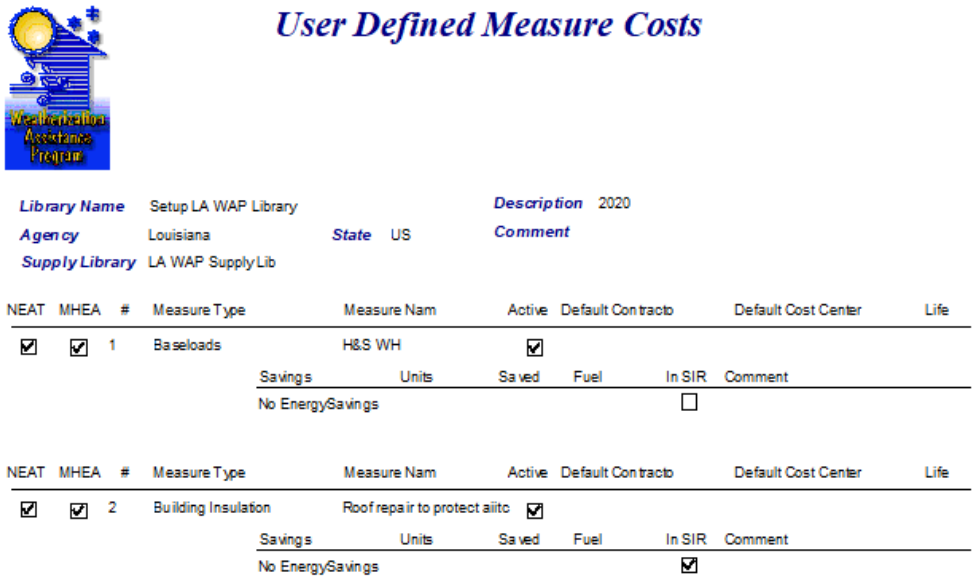
For Incidental Repairs to be included in the unit's overall cumulative SIR and ECM cost, **check the Include in SIR** box.

For Health & Safety repairs, **uncheck the Include in SIR** box.

> ***NOTE:*** *For easy setup and measure cost adjusting, make a printout of the* ***User Defined Measures*** *tab by going back to the* ***Setup Library Information*** *tab. Select the* ***User Defined Costs*** *report from the drop-down menu in the* ***Report*** *section. This will simplify and expedite this section by writing the actual pricing for each item on the print out.*



*Below is a printed example of the **User Defined Measure Costs** for NEAT's ECMs that will be analyzed. Attention should be made to the **Units** and **Unit$** columns to verify correct measure cost and DOE justified SIRs analyzed by NEAT.*



User Defined Measure Costs

Library Name Setup LA WAP Library **Description** 2020
Agency Louisiana **State** US **Comment**
Supply Library LA WAP Supply Lib

NEAT	MHEA	#	Measure Type	Measure Nam	Active	Default Contracto	Default Cost Center	Life
☑	☑	1	Baseloads	H&S WH	☑			

Savings	Units	Saved	Fuel	In SIR	Comment
No EnergySavings				☐	

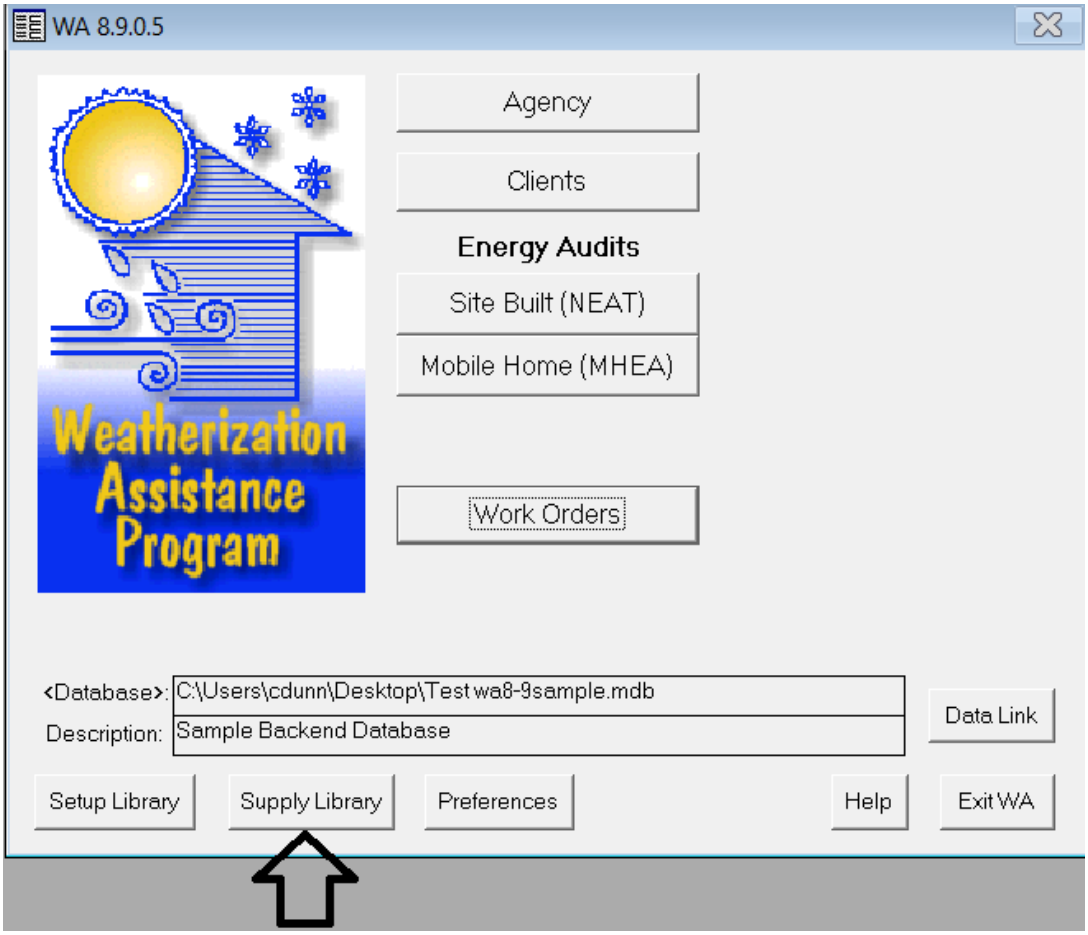
NEAT	MHEA	#	Measure Type	Measure Nam	Active	Default Contracto	Default Cost Center	Life
☑	☑	2	Building Insulation	Roof repair to protect aiitc	☑			

Savings	Units	Saved	Fuel	In SIR	Comment
No EnergySavings				☑	

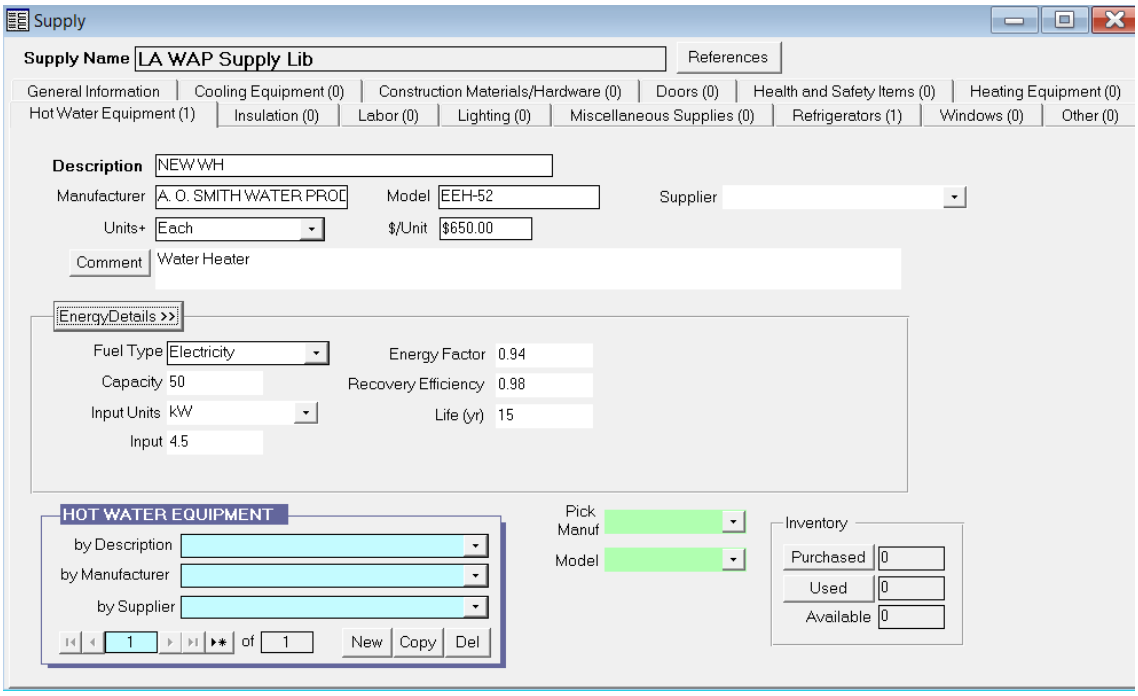
VI. Supply Library

Before starting, print out the **Library Measure Costs** and **User Defined Measure Costs** from the **Report** section. Write in your agency's pricings for each. Use the above step by step guide to build or check your libraries. Use **Attachment F** attached to this guide to assist with heating and cooling system efficiencies.

On the **WA Main Menu Splash Screen,** click on **Supply Library**. This is where new equipment and appliances need to be entered to provide auditors with replacement ECM equipment, Health & Safety items, and common Incidental Repair options to run an audit.



Enter replacement equipment, such as water heaters, refrigerators, cooling/heating equipment, Health & Safety items, Incidental Repairs and other ECM and appliances.



For further information regarding Refrigerators, Heating Equipment and Cooling Equipment, please see the following guidance below.

[Left Intentionally Blank]

VI.1 Refrigerators

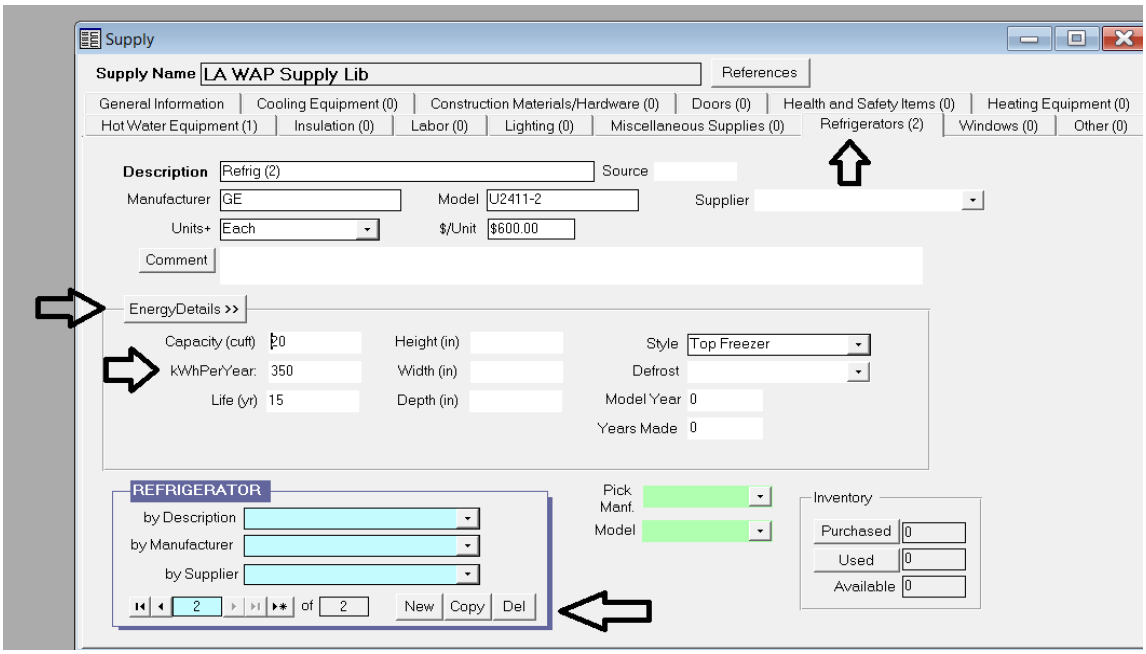
Add new replacement refrigerator information.

Accurate information on **kWhPerYear** usage is needed for NEAT to analyze the replacement refrigerator as an ECM.

LA WAP Policy: Agencies must use either the kWh data usage obtained from refrigerator metering or data obtained from the online refrigerator energy consumption database at http://www.mwepa.com/refmods.htm. Refrigerator metering is **required** for refrigerator replacement if a refrigerator's energy consumption is not accurately located via the approved web database.

Attachment E: Instructions for Measuring Refrigerator Energy Consumption

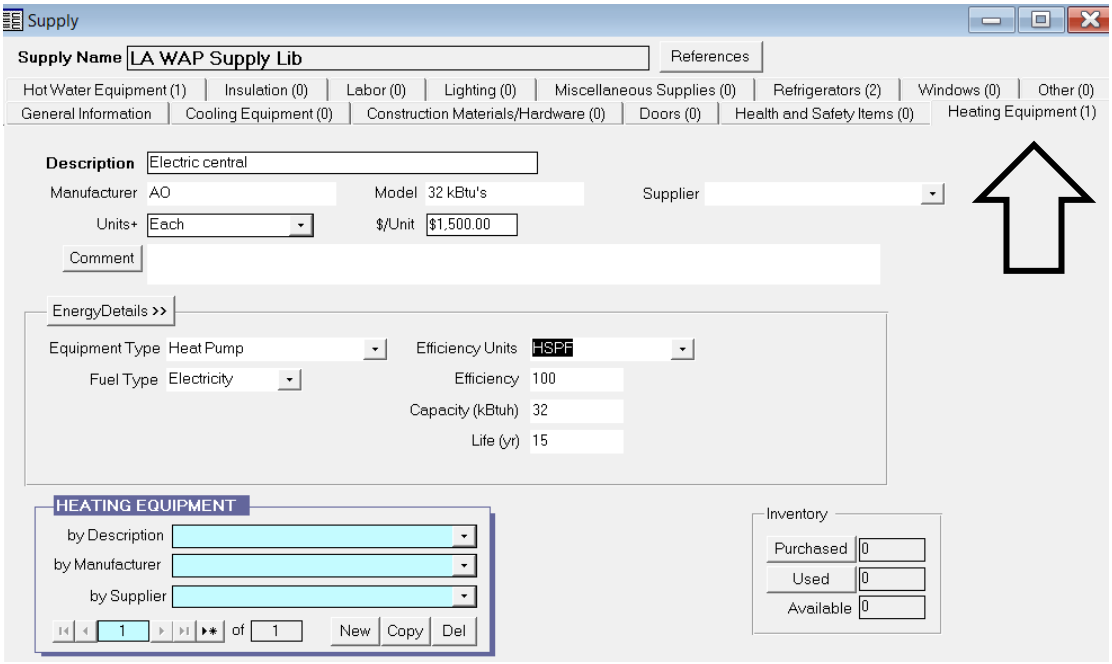
Use accurate **Energy/Details** for the replacement appliance.



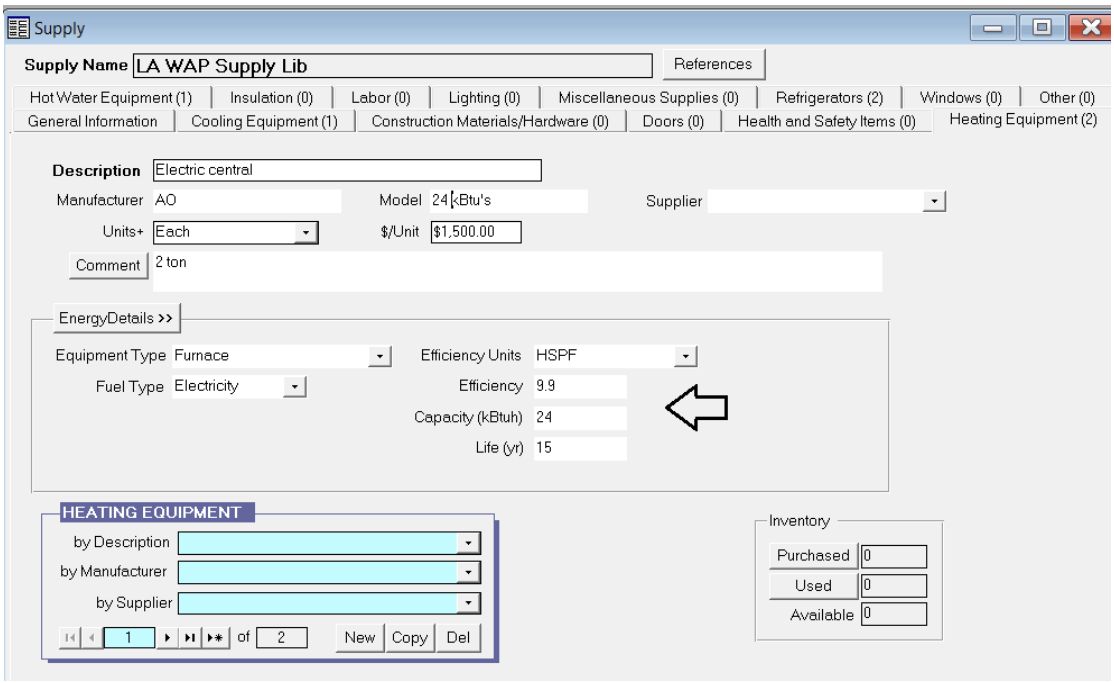
Use the **New**, **Copy** and **Del** button to add additional replacement appliances.

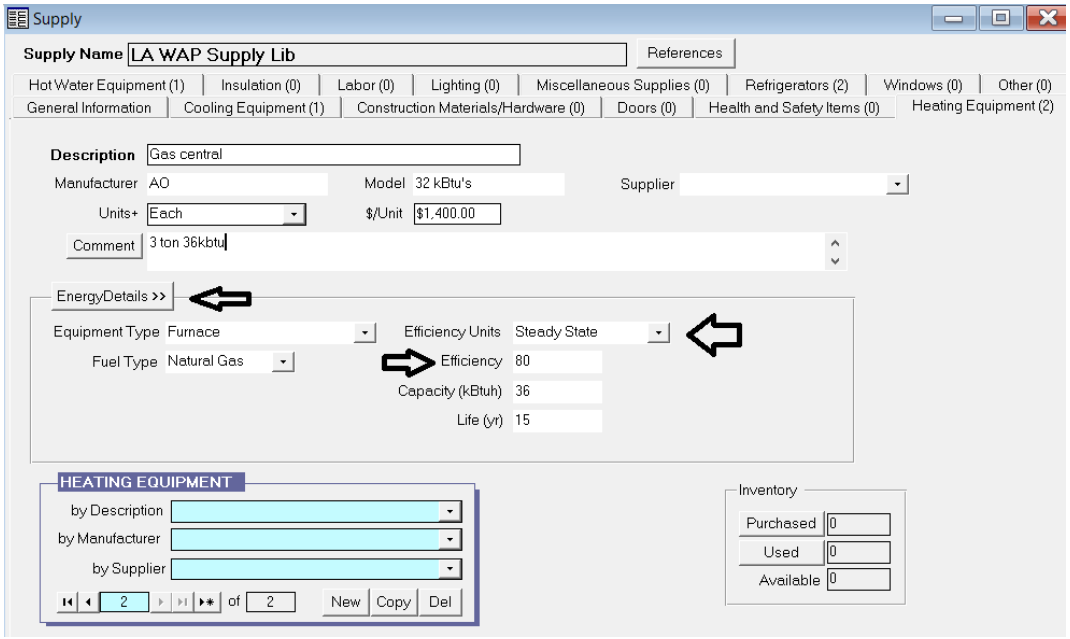
VI.2 Heating Equipment

Standard heating equipment can be added to the **Supply Library** via the **Heating Equipment** tab.



Attention is needed when entering heating system efficiency metrics under the **Energy/Details.**



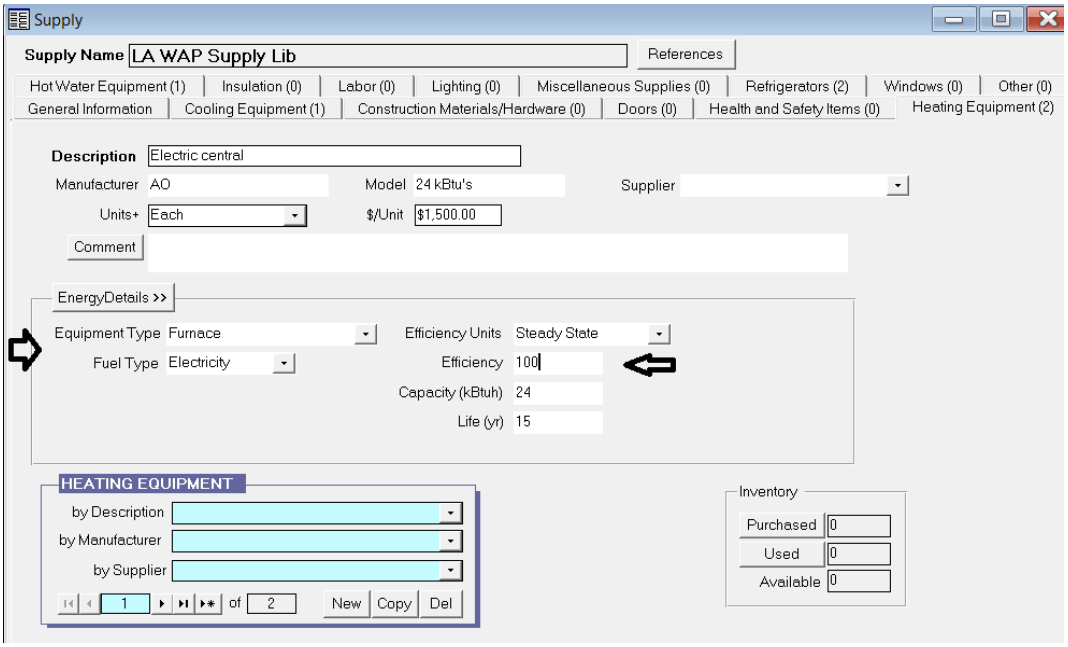


The heating system efficiency units used for data input are based upon the type of heating appliance (gas fired furnace, heat pump, etc.) and fuel type selected.

A gas furnace's **Efficiency Units** are **Steady State** or **AFUE**. Typically, the **Efficiency** of newer gas furnaces is measured at 80% or higher.

If a heating system is electric, the **Efficiency** is measured at 98-100%.

For unvented space heaters, the **Efficiency** is measured at 100%.



VI.2.A Heat Pumps

Heat Pumps use two efficiency ratings:

HSPF: Heating Season Performance Factor (HSPF) measures the heating efficiency of Heat Pumps. The most efficient models have HSPF ratings of 13. Though most are between 8 and 11.

SEER: Seasonal Energy Efficiency Rating (SEER) measures the air conditioning efficiency of Heat Pumps. **Units must be at least 14 SEER**. The most efficient heat pumps on the market have ratings of greater than 20 SEER. A SEER with a rating of 15 to 17 is average.

The smallest heat pumps are either 18,000 British Thermal Units (BTU) (aka 1.5 ton) or 24,000 BTU (2.0 ton). The largest are 60,000 BTU (5.0 ton). The ratings refer to the amount of heat the units move per hour.

Heat pump sizing is critical. HVAC professionals use a Manual J load test and similar methods to determine the replacement heat pump.

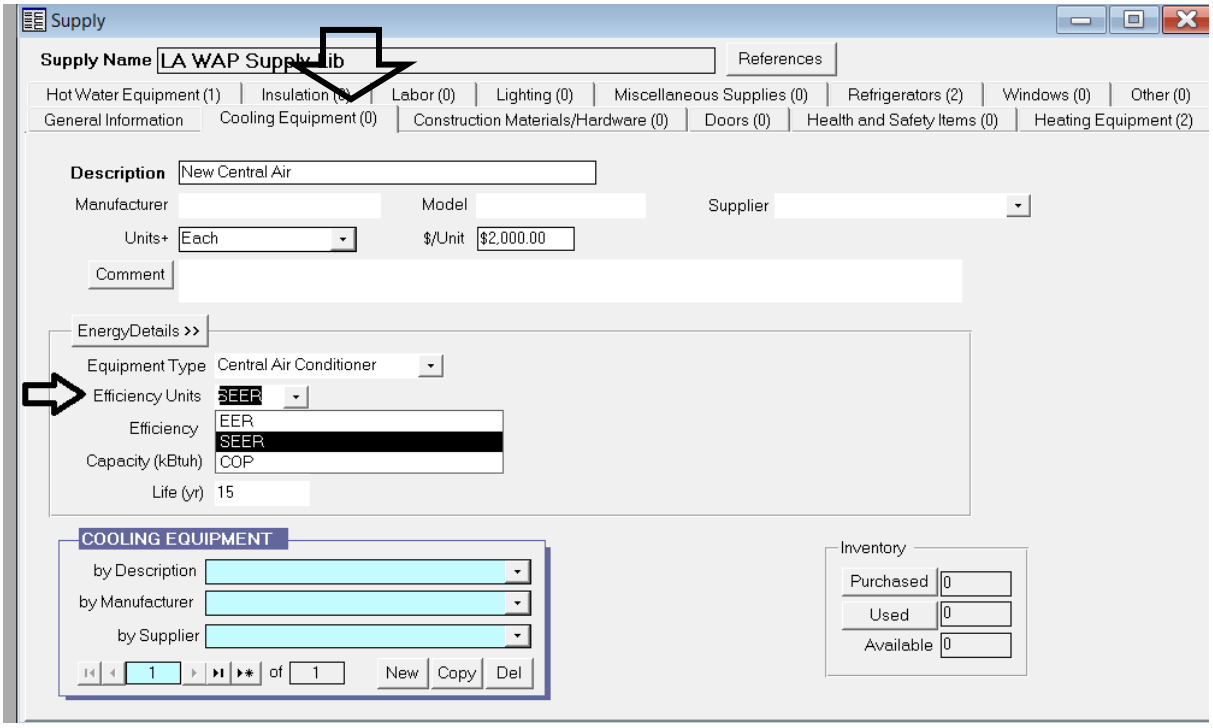
Moderate to High efficiency Heat Pumps are recommended in Zones 3 and 2 respectively.

Heat Pumps Efficiencies:

- Basic efficiency: Up to 15 SEER/8.5 HSPF
- Moderate efficiency: 15-17 SEER/8.5-9.5 HSPF
- High efficiency: 18 SEER/9.5 HSPF and higher

VI.3 Cooling Equipment

Standard cooling equipment can be added to the **Supply Library** via the **Cooling Equipment** tab.

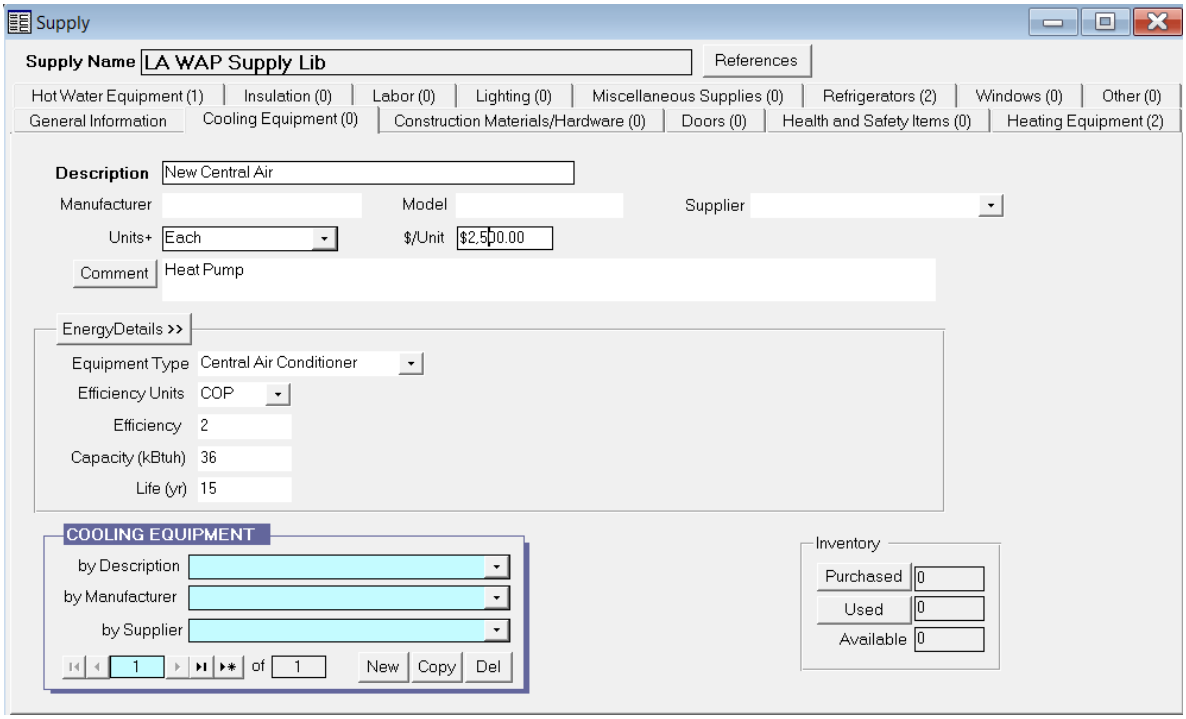


Attention is needed when entering cooling system efficiency metrics under the **Energy/Details.**

Cooling Equipment system efficiency ratings are based upon the type of appliance (central air conditioner, heat pump, etc.)

EER: Energy Efficiency Rating (EER) values are often encountered when looking at smaller window AC units. EER is calculated using a constant outside temperature of 95 degrees, a constant inside temperature of 80 degrees, and a humidity level of 50%. No seasonal temperature changes are factored into a unit's EER rating.

SEER: An air conditioner's SEER rating (typically used in central air conditioners) is the ratio of the cooling output of an HVAC unit over a typical cooling season (measured in BTUs), divided by the energy consumed in Watt-Hours. It is the average over a cooling season and calculated using a constant indoor temperature and varying outdoor temperatures ranging from the 60s to over 100 degrees.



COP: Coefficient of Performance (COP) is an expression of the efficiency of a heat pump. When calculating the COP for a heat pump, the heat output from the condenser is compared to the power supplied to the compressor. If the COP of heat pump used for air cooling has a COP = 2. This means that 2 kW of cooling power is achieved for each 1 kW of power consumed by the pump's compressor.

[Left Intentionally Blank]

VI.4 Data Collection Methods and Efficiency Conversions

The **preferred** data collection method for **accurate** energy audits generated for the WA software is the **exact** heating and cooling efficiency data from the manufacture's data plate.

For heating and cooling system efficiency conversions, the following formulas apply:

12,000 BTU in 1 ton

COP = EER / 3.412
EER = COP x 3.412

EER = .875 x SEER
SEER = EER / .875

Note: The only DOE approved Heating and Cooling Equipment Efficiencies Tables for use with Weatherization Assistant based on unit's age can be found in **Attachment F**.

DOE does **not** permit the use of these tables in lieu of actual efficiency testing of combustion appliances. Also, these tables may **only** be used to determine HSPF, SEER, COP, or EER values based on the year of manufacture and **only** on units older than 2008.

Attachment F: Heating and Cooling Equipment Efficiencies

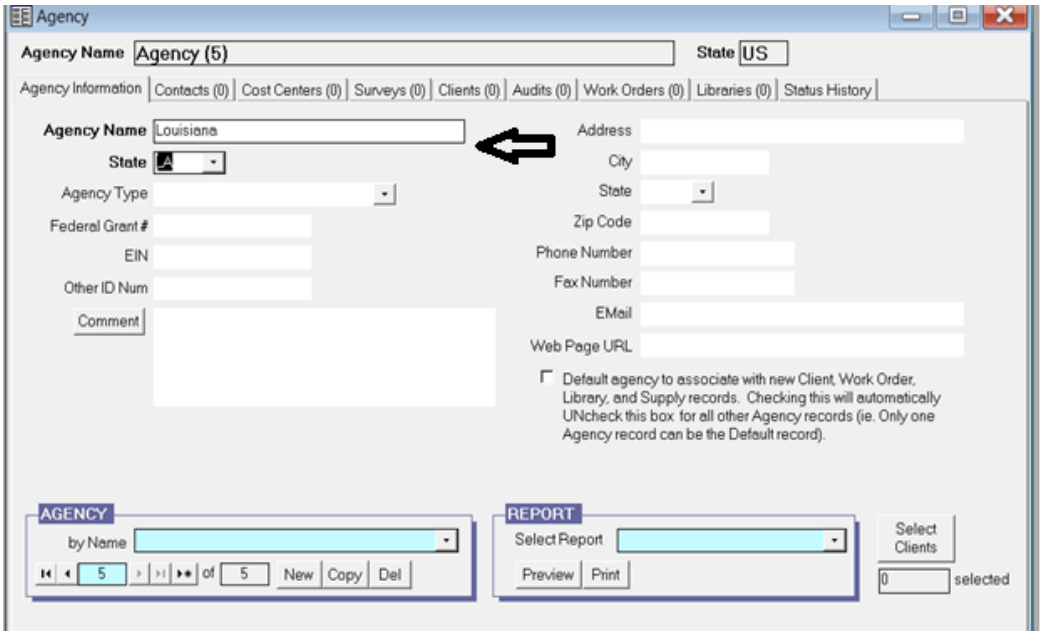
[Left Intentionally Blank]

VII. Agency

On the **WA Main Menu Splash Screen**, click on the **Agency** menu. The **Agency Information** tab will appear on the next screen.

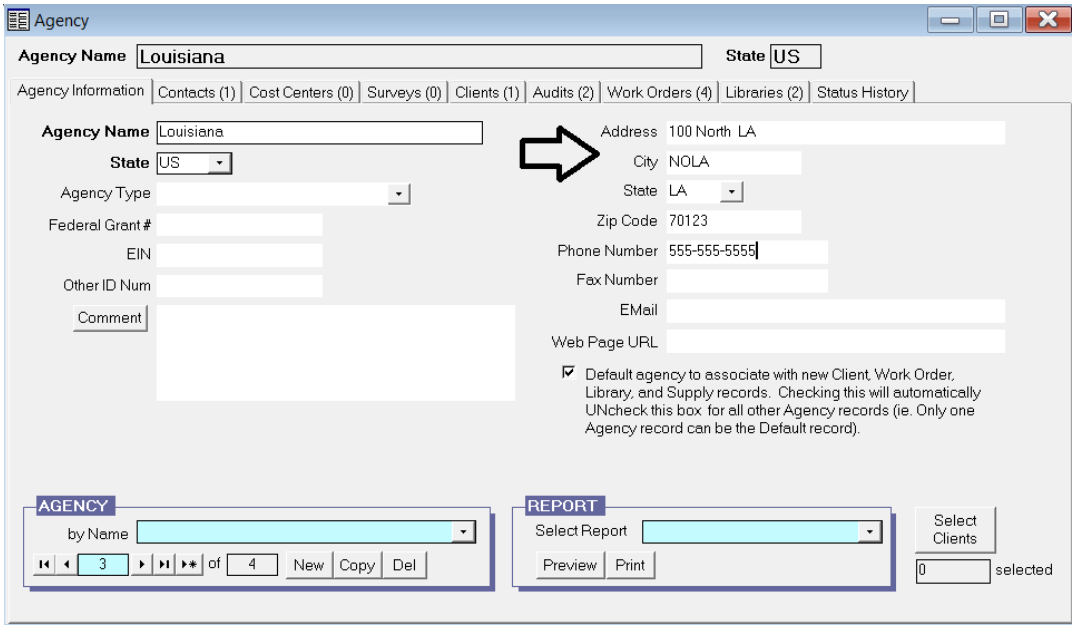
VII.1 Agency Information

Enter your **Agency Name** and select your **State** under the **Agency Information** tab. These are the only required fields.



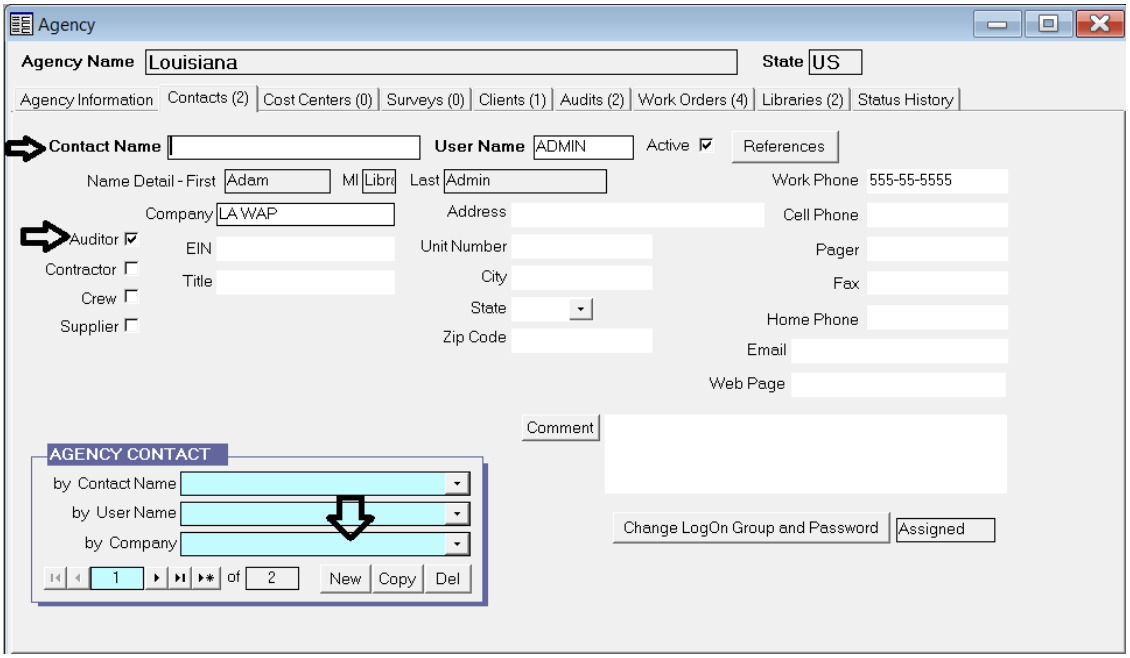
Any bordered box indicates a required field. Data must be entered in order to move on to the next screen.

Enter the Agency **Address** and **Phone Number**.



VII.2 Contacts

Click on the tab marked **Contacts**. The following screen will appear:



Delete names in the **Contact Name** field (if any default names are listed) by clicking **Del** in the **Agency Contact** box at the bottom left.

Enter your name in the **Contact Name** field and a user name (i.e. first name initial, last name) in the **User Name** field by clicking **New** in the **Agency Contact** box at the bottom left of the screen.

Check the **Auditor** box below the **Contact Name**.

Enter your company/agency name in the **Company** name field (an acronym is recommended).

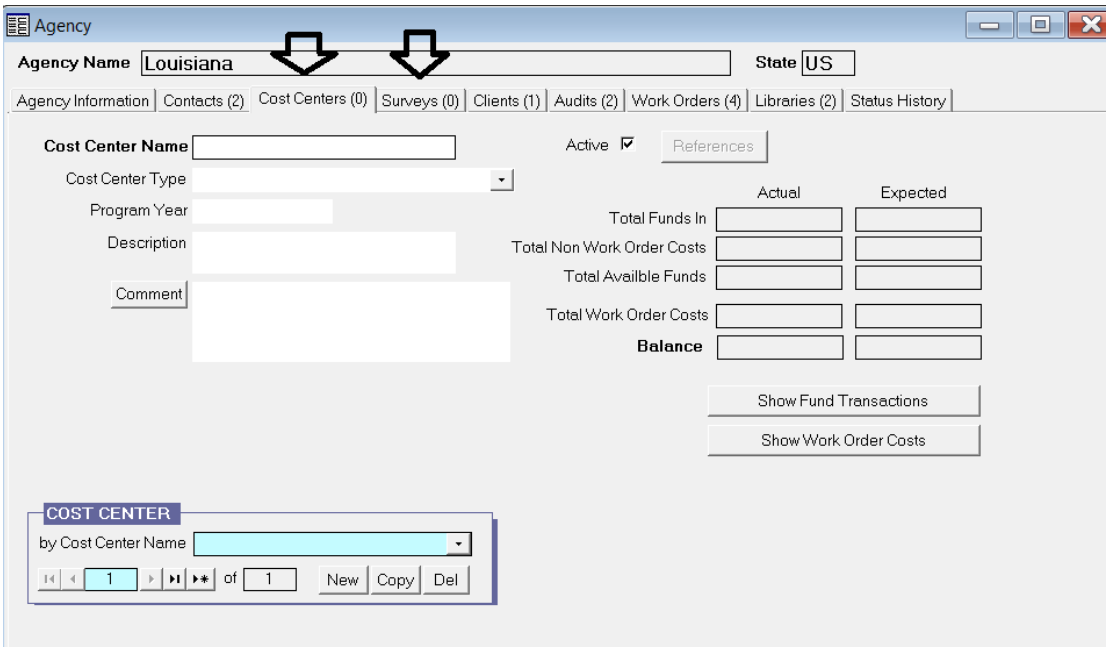
***Note**: It is not necessary to add contractors/crews.*

VII.3 Cost Centers and Surveys

The **Cost Centers** and **Survey** tabs are not necessary to complete an Energy Audit.

The **Cost Centers** tab can be used to track expenses for a weatherization grant.

You **may** enter the grant information in the fields found at the left hand of this screen. Click on the **New** button found at the bottom left of the screen to add a second or third funding source.

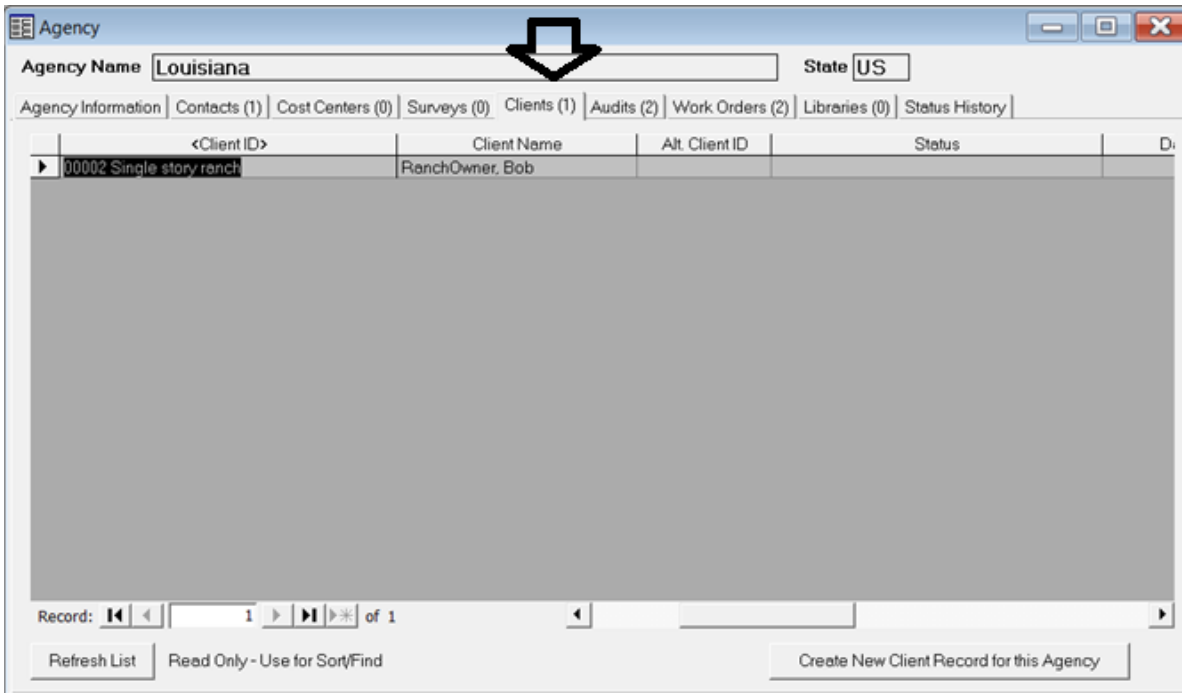


VII.4 Clients

Click on the **Client** tab to display existing client records.

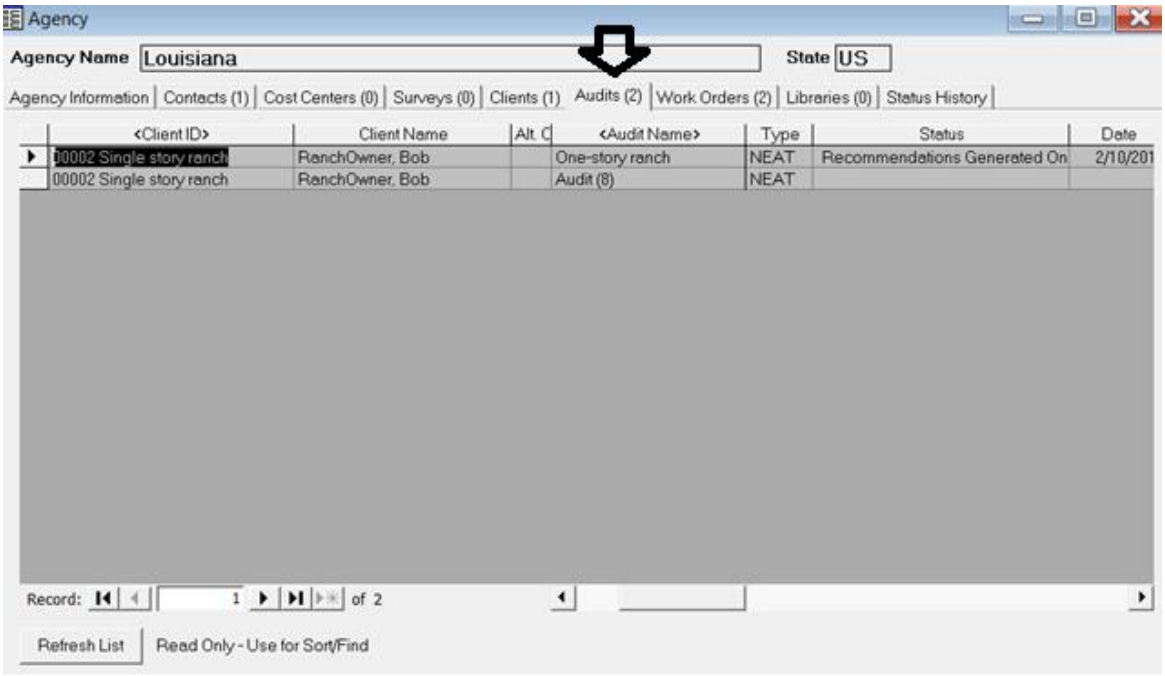
Double click to view a record.

Note: *You **may** create a new client record under this tab, but it is **preferable** to create a new client record under the **Client** button found on **WA Main Menu Splash Screen**. Creation of a new client record will be covered later in this manual.*



VII.5 Audits

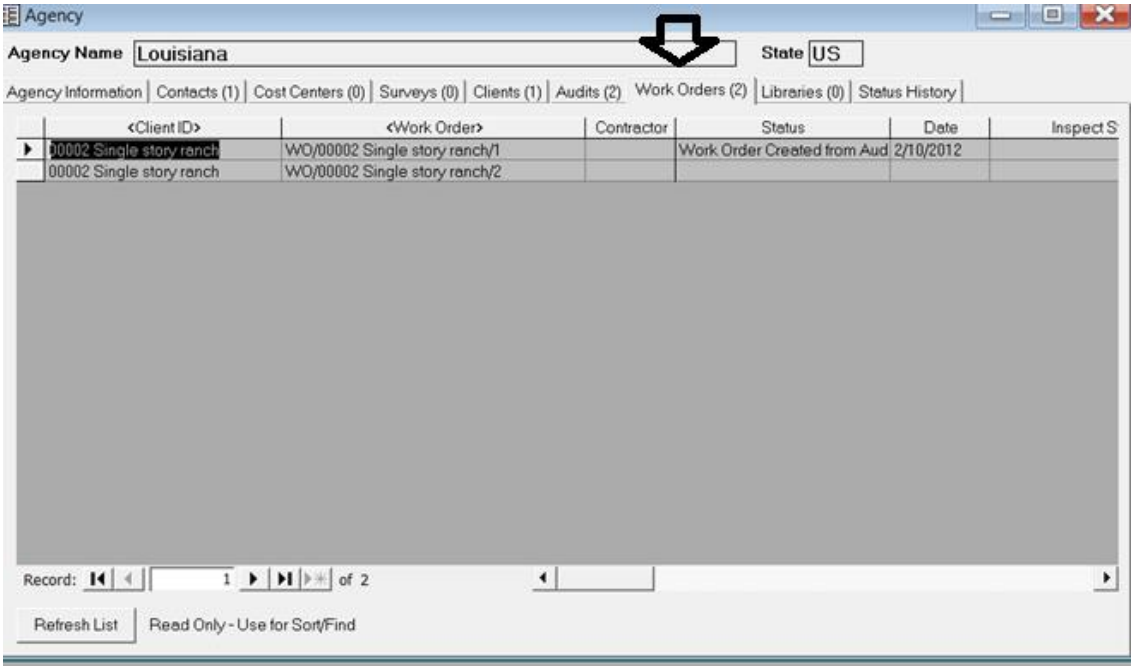
Click on the **Audits** tab to provide a list of Energy Audits that are currently existing in the WA database.



To access Client audit records, **left double click** on the **Client ID** you would like to select.

VII.6 Work Orders

Click on the **Work Orders** tab to display work orders that have been previously created in the database.

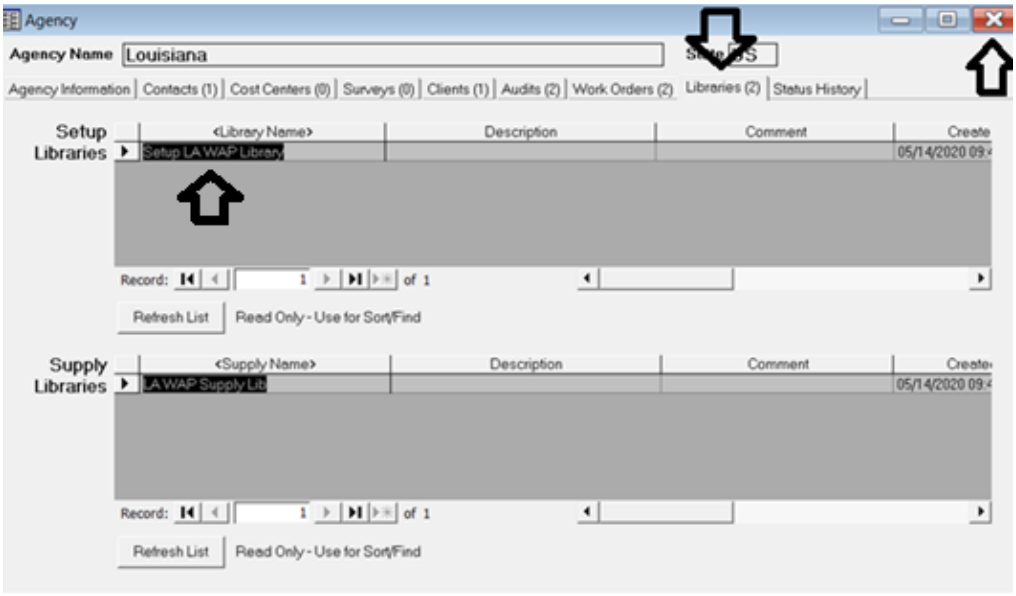


To access an existing work order, **left double click** on the **Work Order** you would like to select.

Note: *Although you **may** access the work orders from this page, it is **preferable** to access the work orders from the **Work Orders** button found on the **WA Main Menu Splash Screen**. Completion of work orders will be covered later in this manual.*

VII.7 Libraries

The **Libraries** tab provides a list of the **Setup** and **Supply Libraries** that are currently in the database.



***Note**: Libraries **may** be accessed from this page; however, it is **preferable** to access the libraries from the **Setup Library** and **Supply Library** buttons found on the **WA Main Menu Splash Screen**.*

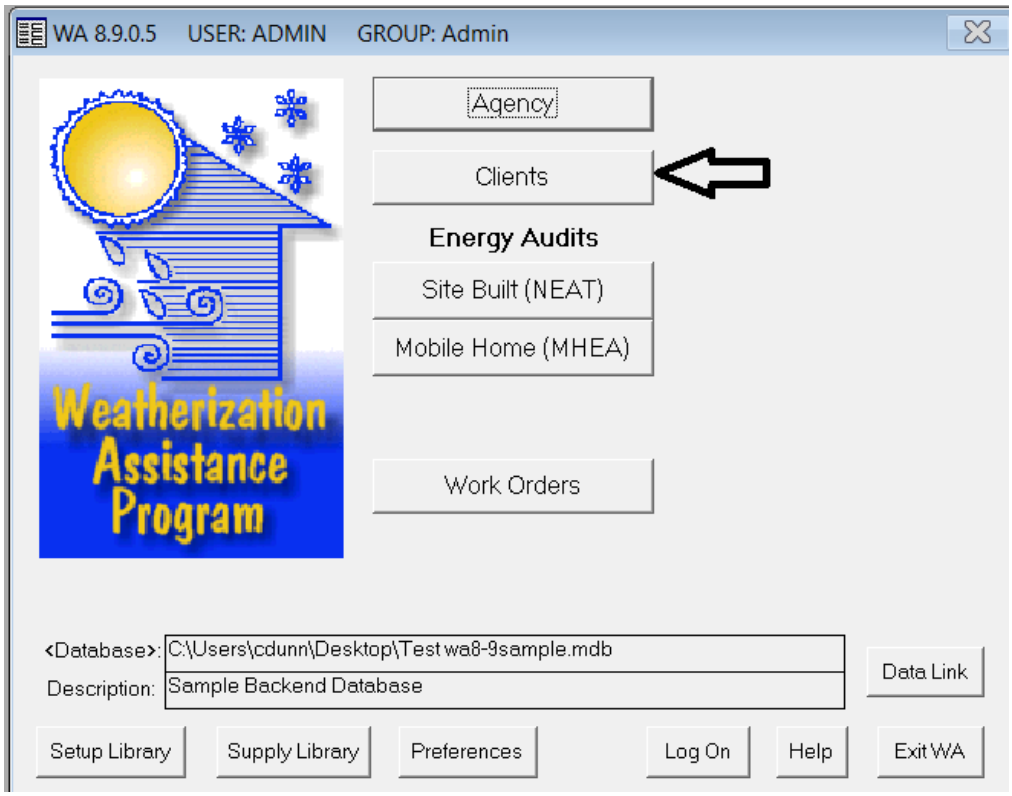
To access existing libraries, **left double click** on the **Library Name** you would like to select.

****Libraries must be setup in order to run an audit.****

No other tabs are required to be filled under the **Agency** menu. You may now exit the **Agency** menu by clicking the **X** button at the top right hand of the page.

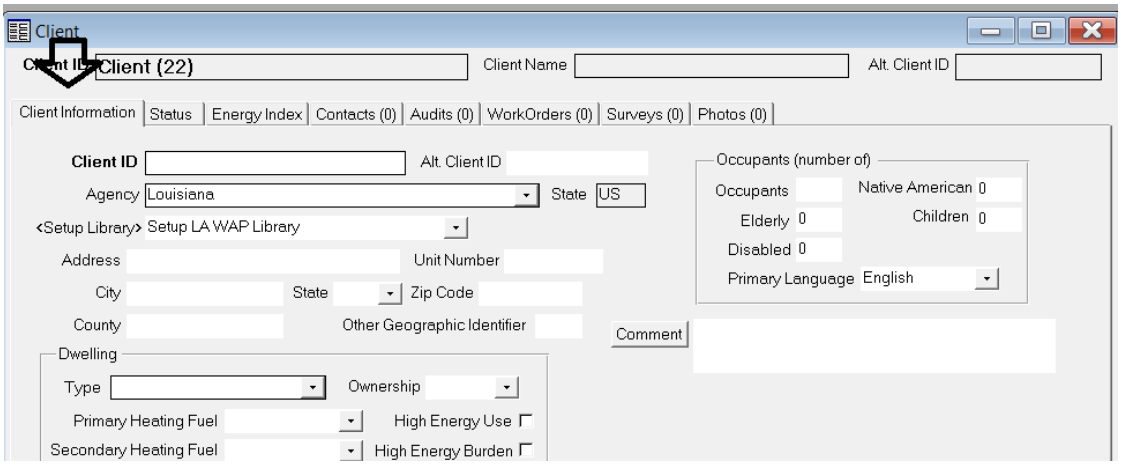
VIII. Clients

Click on the **Clients** menu from the **WA Main Menu Spash Screen**.

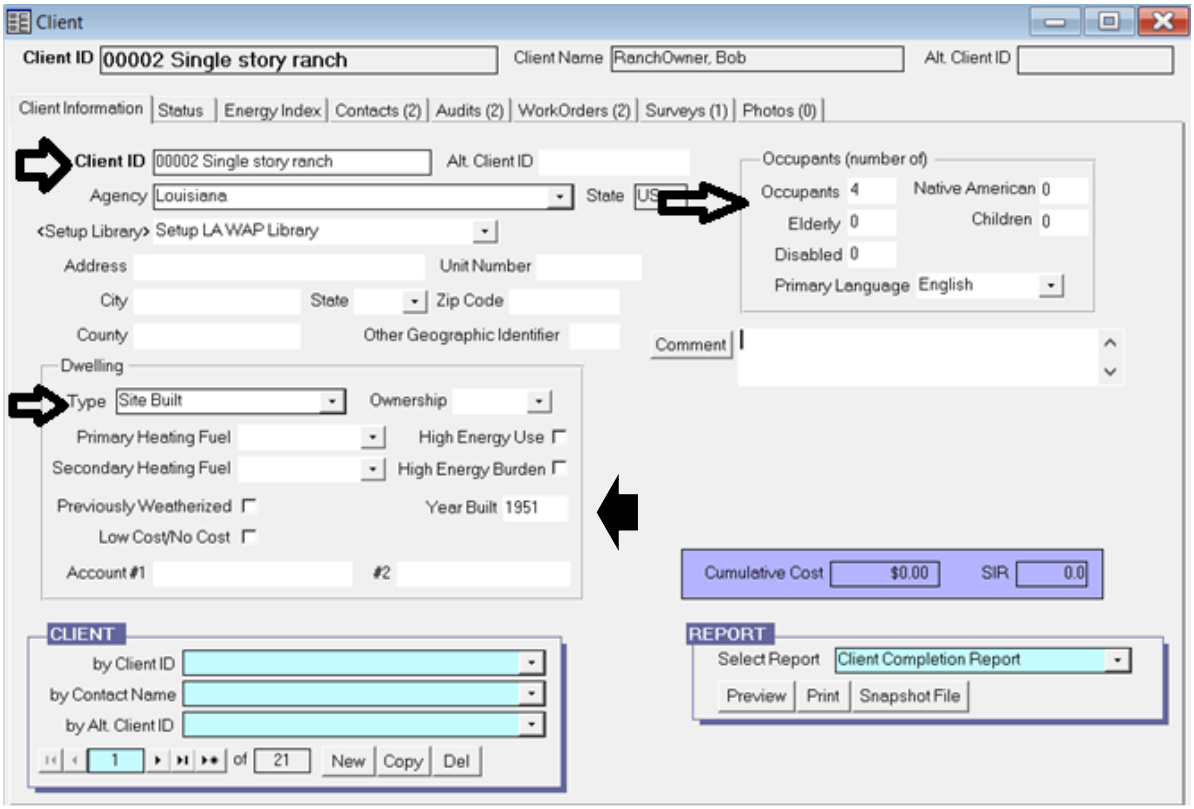


VIII.1 Client Information

The **Client Information** tab will be displayed.

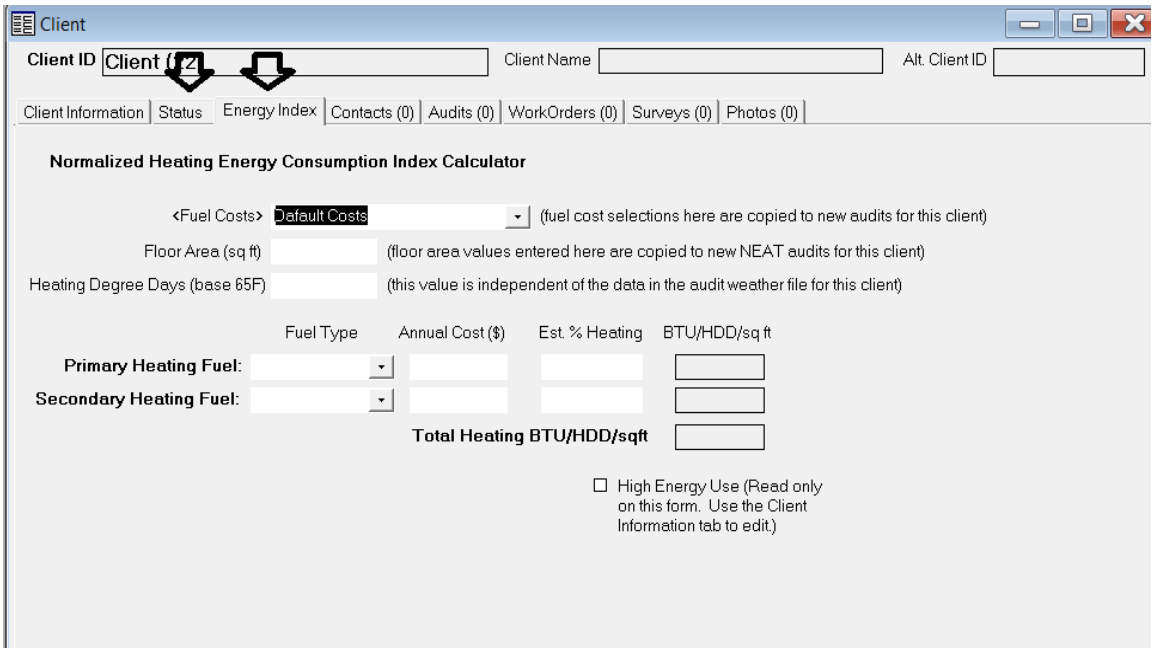


- Enter a unique **Client ID** (a number or name can be used). The **Client ID** should contain an abbreviation for the year, parish, agency, etc.
- Enter an (Alternative) **Alt. Client ID** (apartment name, building or lot number)
- Enter the full **Address** and **County/Parish** information of the client.
- Under **Dwelling,** select the **Type** of unit to be modeled from the drop-down menu.
- Enter the **Year Built** for compliance with EPA's RRP Rule and DOE lead policy.
- Enter the remaining information using the client's application, including **Dwelling Type** and **Number of Occupants.**



VIII.2 Status and Energy Index

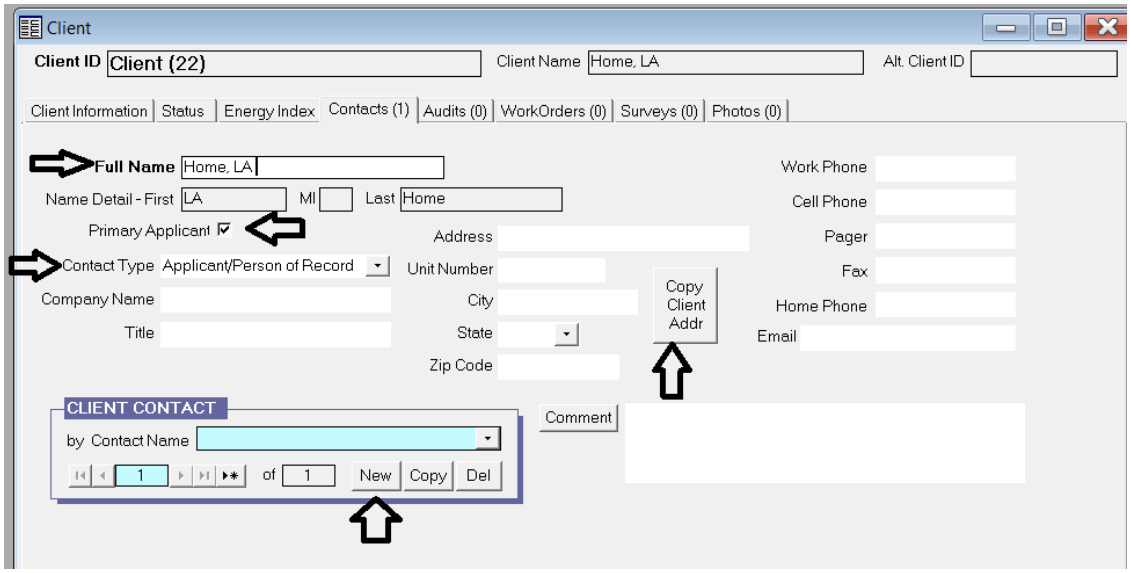
The **Status** tab and **Energy Index** tabs pages are not used by auditors.



[Left Intentionally Blank]

VIII.3 Contacts

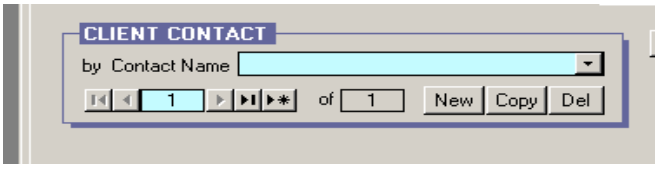
Click on the **Contacts** tab. This is where the applicant's contact information will be entered.



Check the **Primary Applicant** box and enter the applicant on record who applied for weatherization in the **Full Name** field.

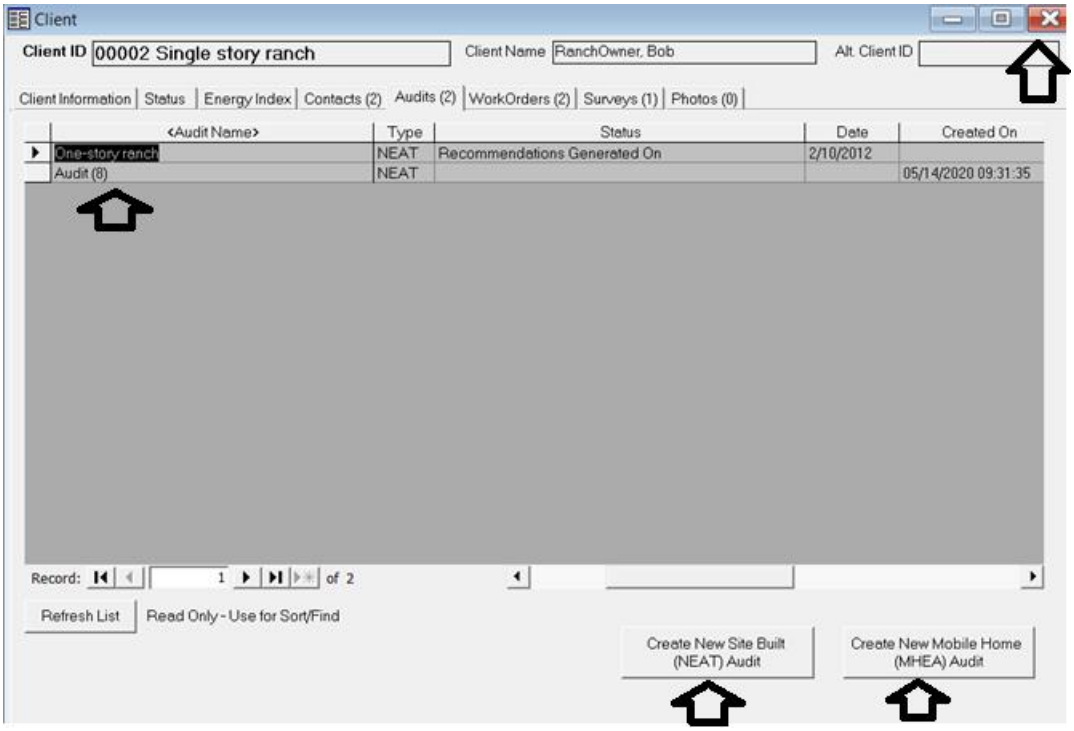
Click on **Copy Client Address** to quickly transfer the information from the previous **Client Information** tab then enter additional information.

To create a second contact number or person click the **New** button and enter the information of the secondary contact person. Use the appropriate **Contact Type** from the drop-down menu. *For any secondary contact person, do NOT check the Primary Applicant check box.*



VIII.4 Audits

Click on the **Audits** tab. This page provides a list of Energy Audits that are currently in the database.



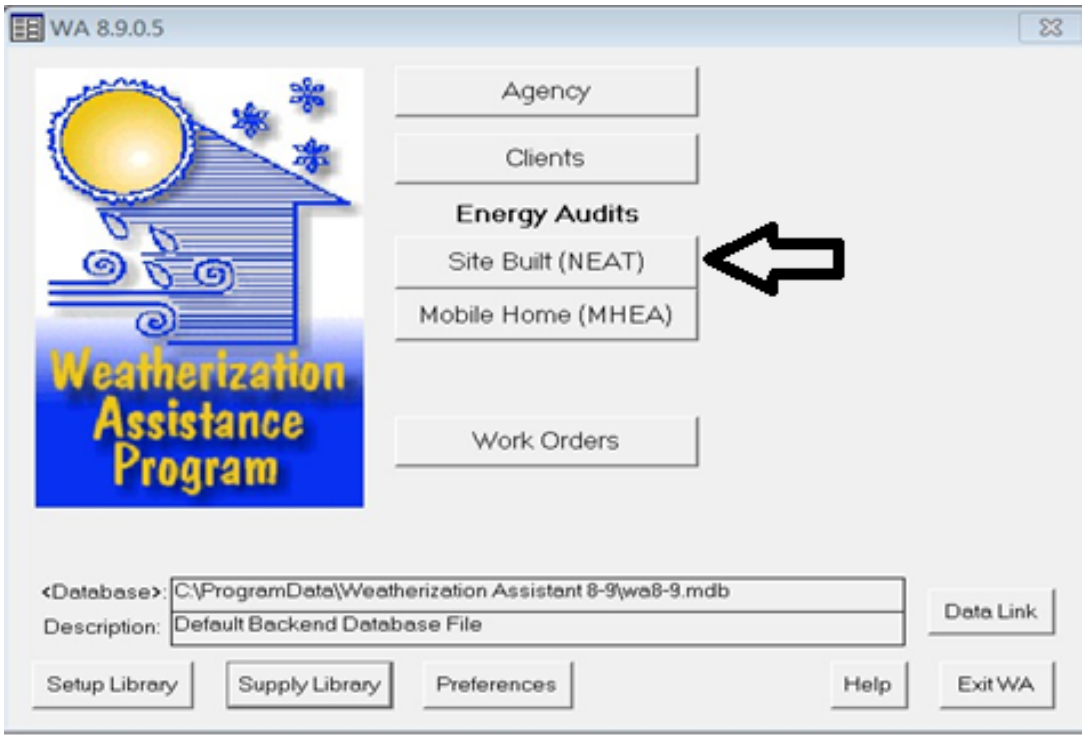
To access an Audit, **left double click** on the **Audit Name** you would like to select.

***Do NOT create new audits from this page. When you begin the audit from one of these buttons, all client information is NOT attached to the audit. And starting a new audit from this page may overwrite existing audits.*

No other tabs are required to be filled out under **Client** menu. You may now exit out of the **Client** menu by clicking the **X** button at the top right hand of the page.

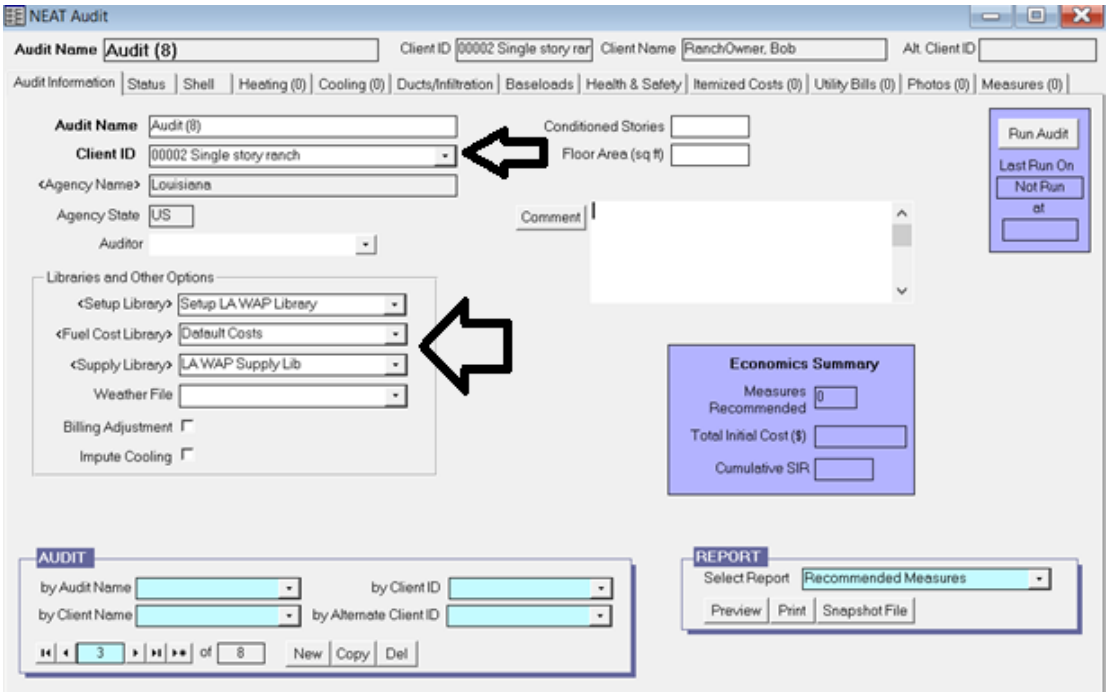
IX. Energy Audits

Next click on the **Site Built (NEAT)** button on the **WA Main Menu Splash Screen.**



[Left Intentionally Blank]

IX.1 Audit Information



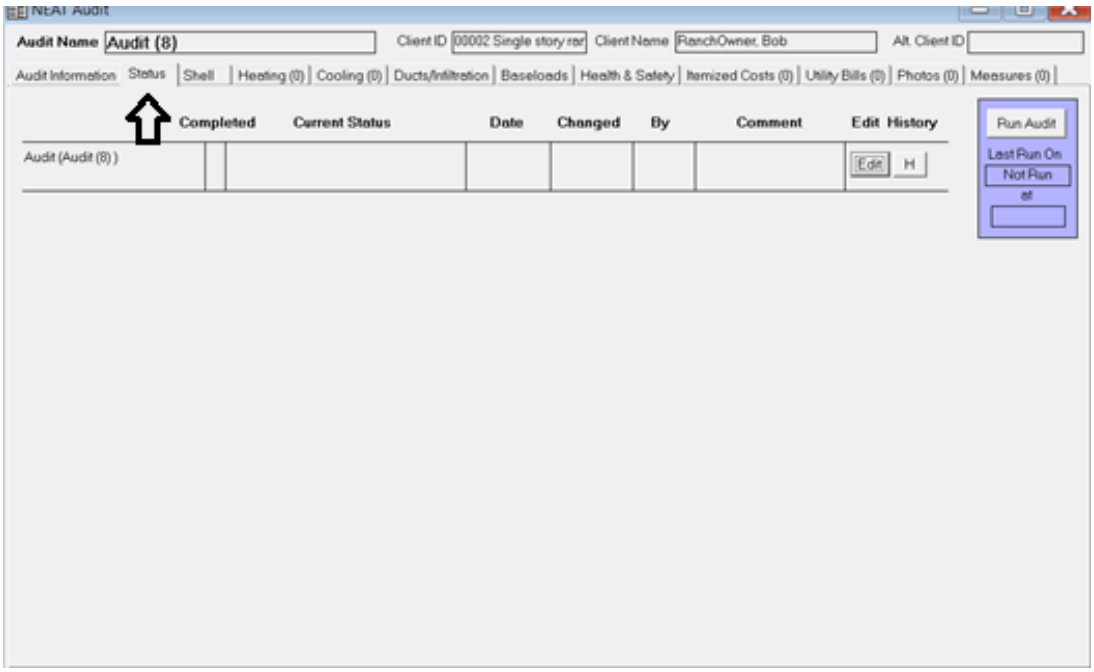
Any bordered box indicates a required field. Data must be entered in order to move on to the next screen.

Enter the **Audit Information** in each required field:

- **Audit Name**: address, name, audit number (Client ID) or Alternative Client ID.
- **Setup Library**: Using the drop-down menu, select the setup library you wish to use on this dwelling unit.
- **Fuel Cost Library**: Using the drop-down menu, select the fuel prices for the location.
- **Supply Library**: Using the drop-down menu, select the supply library that contains the material and labor cost you wish to use on this dwelling unit.
- **Weather File**: Using the drop-down menu, select the city that is closest to the unit you will be modeling.
- Enter the number of floors inside the thermal and air barrier of the home in the required data field for the number of **Conditioned Stories** (i.e. one stories, two stories etc.) and **Floor Area (sq. ft.)** fields.

IX.2 Status

The **Status** tab is not used by Auditors.



[Left Intentionally Blank]

IX.3 Shell

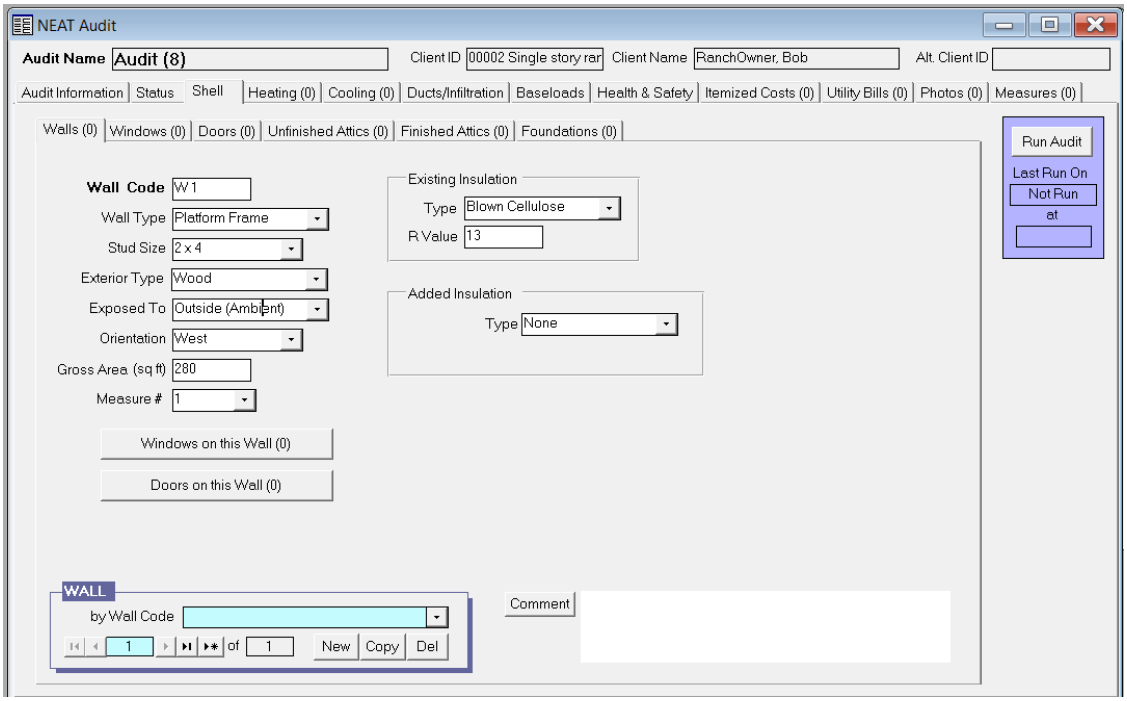
The next sections are data entry intensive and will require the specific information about the house, structure, windows, doors, and measurements as taken from the Auditor out in the field.

*Remember, if at any time you need help on how to complete a field, press the **F1 key** for the **HELP** screen.*

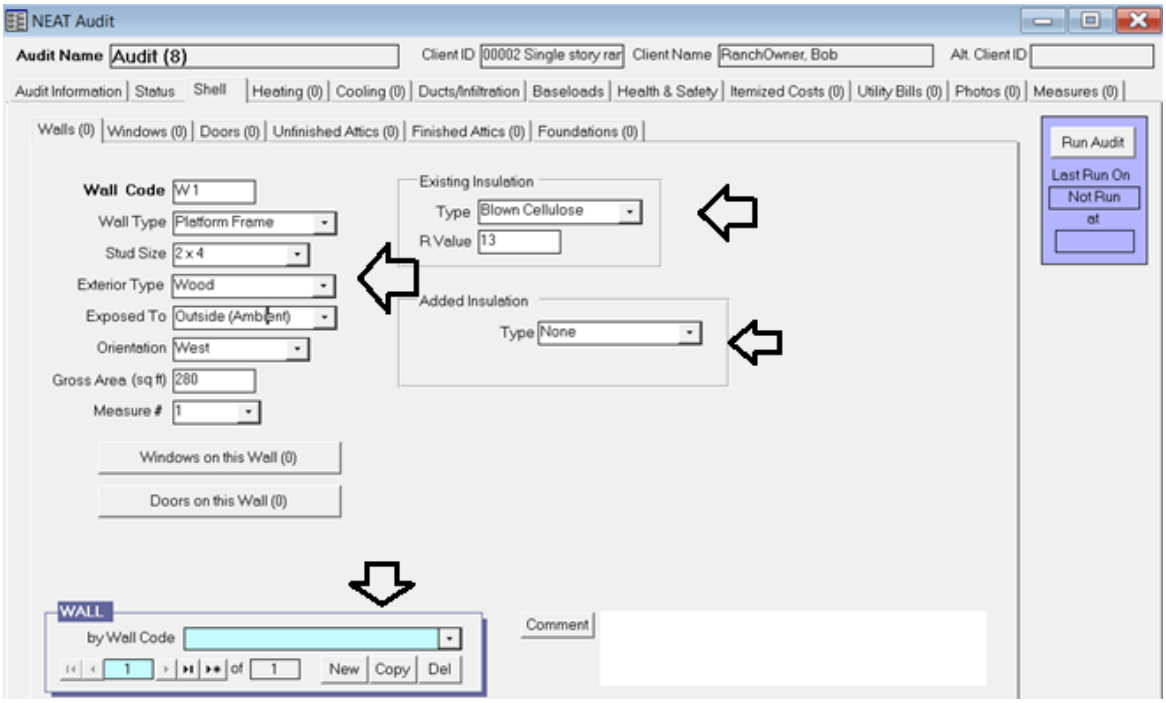
IX.3.A Shell (Walls Sub Tab)

Click on the **Shell** tab to enter **Wall Codes** under the **Walls** sub tab.

LA WAP Policy: Auditors must **physically** identify insulation levels in **all** exterior (shell) walls. Wall cavities **must** be insulated to **R-13,** or maximum structurally allowable, if an SIR of 1.0 or greater is generated in the **Recommended Measure Report.**



Use **Wall Codes** that make sense **(i.e. W1, N2).** Next, choose the **Wall Type.** If you select either Balloon Frame or Platform Frame, then a **Stud Size** field will appear that must be filled out.



Choose the **Exterior Type** from the drop-down menu. Next, choose an **Exposed To** option from the drop-down menu. ***(Use the F1 key for a description of each option in the list)***

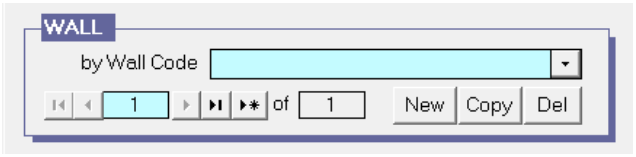
Enter wall **Orientation** (N, E, S or W).

Enter the **Gross Area in square feet**. *You must enter the square footage of each and all exterior (shell) walls. (Square footage is Length x Width; ex. 10 foot wall with 8 feet high = 10 x 8 = 80 sq. ft.)*

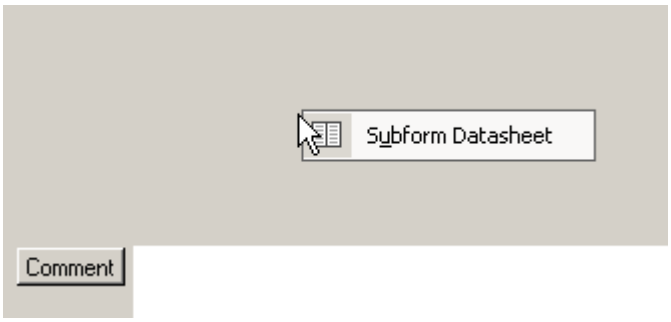
Enter the **Measure** #. (Typically, measures go in the order they are entered. For example, the first wall you enter will have a measure number of 1. The second wall will have a measure number of 2 and so on.

If there is **Existing Insulation**, auditors are required to select the insulation **Type** and input the **R- Value** under this section. Use the comment box at the bottom right to discuss the insulation or anything unique about this set of data.

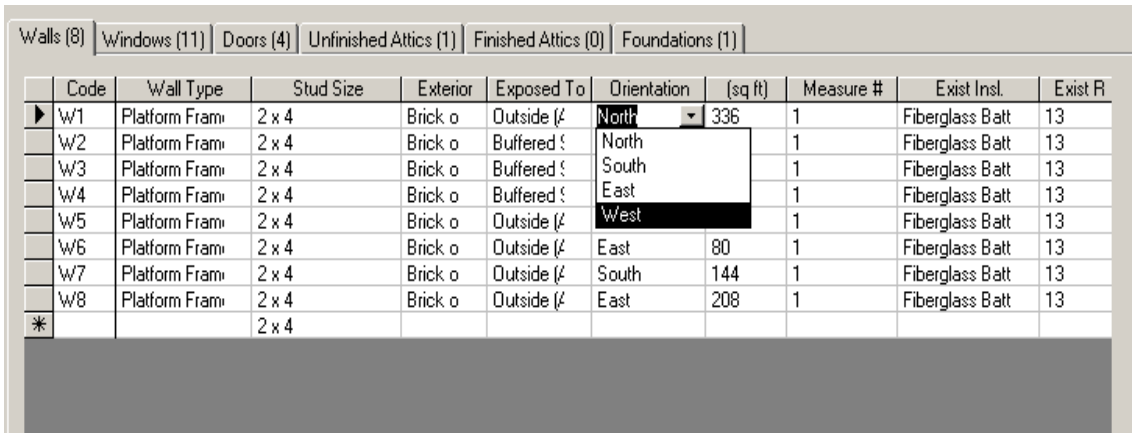
Use the **New** or **Copy** button in the **Wall** control box at the bottom left corner to enter additional shell walls.



When finished with all wall entries, place your mouse in the gray area above the comment box and **Right Click**. Select the pop-up box **Subform Datasheet.**



The wall MS database view will open with all the walls entered. Here you can check for wall accuracy and make changes. Simply click on the box and make the corrections. Use the scroll bar at the bottom of the walls window to access all fields.

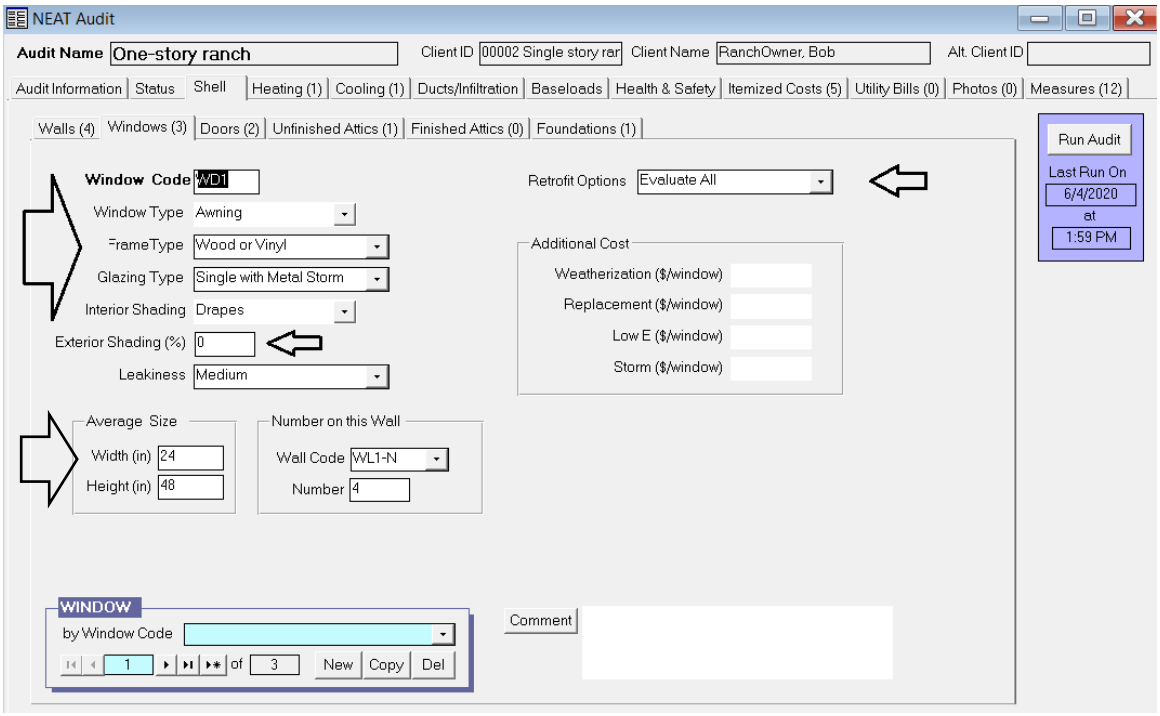


To exit the wall MS database **Right Click** and select the pop-up box **Subform Datasheet.**

IX.3.B Shell (Windows Sub Tab)

Under the **Shell** tab click on the **Windows** sub tab to begin entering your **Window Codes**.

Universal Policy: All window replacements must be correctly modeled with the NEAT Audit and have a **minimum** 1.0 SIR to be replaced as an energy conservation measure (ECM).



*Press the **F1** key for the **HELP** screen.*

Use **Window Codes** that make sense (i.e. **1WN** is the first window on the north wall.)

Use the drop-down menus under **Window Code** to select your **Window Type**, **Frame Type**, **Glazing Type,** and **Interior Shading** (ex. Blinds, Drapes, etc.)

Fill in the **Exterior Shading (%)** field by using the following rule of thumb:

Enter the approximate percentage of window area frequently shaded by eaves (typically 25%), porches (typically 100%), or other physical exterior barriers such as trees (varying percentage).

Enter and select the window **Leakiness** that fits the window description (i.e. Very Tight, Tight, Medium, Loose, or Very Loose).

- Degrade the leakiness description one level if the window panes themselves have become significantly loose in their mounting and/or a small (2 to 9 sq. in.) piece of glass is broken out.

- Degrade the leakiness two levels if there is a larger hole (9 to 25 sq. in.) in a window pane and/or an entire pane is missing.

- Specify the window to be Very Loose if more than 25 sq. in. of glass is missing in the window.

- Upgrade the leakiness description one level if an installed storm window is in greater than or equal to average condition.

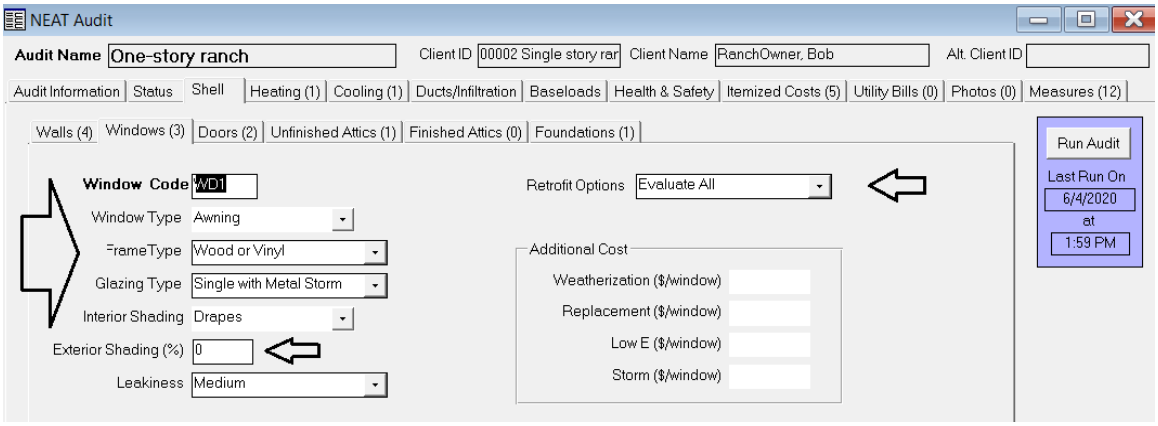
Typical leakiness categories by window type are as follows:

Window Type	**Typical Leakiness Classification**
Fixed	Very Tight
Casement	Very Tight
Single- / Double-hung (vertical slider) Non-Wood	Tight
Single- / Double-hung (vertical slider) Wood	Medium
Horizontal slider	Medium
Jalousie	Loose
Awning and hopper (casement design)	Very Tight
Awning and hopper windows (awning/jalousie design)	Medium

Complete the **Average Size** fields. Enter the actual size measured for width and height of window in **inches**. Next, complete the **Number on this Wall** section. Select the specific wall code where each window is located.

Repeat for each window.

It is preferred to enter each window individually, since it is rare that each one is identical in size, leakiness, or condition, etc.



To model windows for an Energy Conservation Measure (ECM), go to the **Retrofit Option**. In the drop-down menu, select **Evaluate All** to evaluate the window as an ECM. *(It is recommended that you select **Evaluate All** under **Retrofit Options** to allow the Audit Program to select the **best** recommended measure.)*

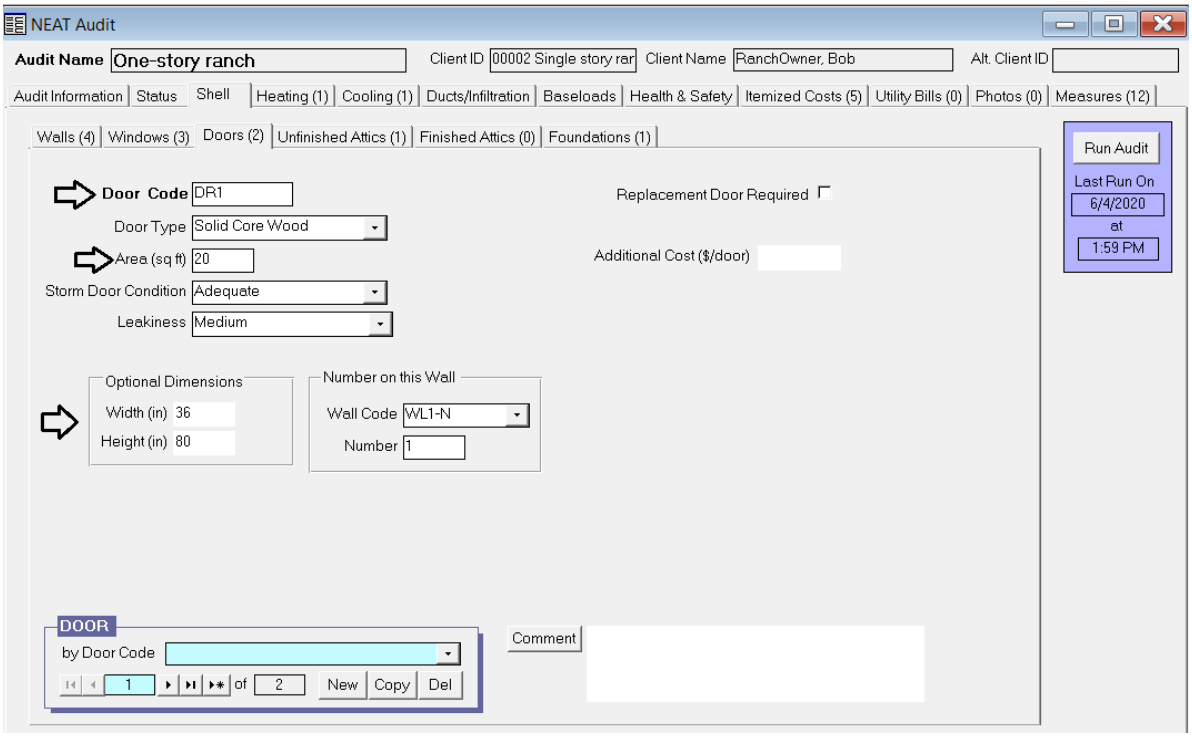
To model windows for an Incidental Repair (IR), click the **Itemized Cost** tab and check the **Include in SIR** box. No energy savings will be entered for IR repairs. The cumulative building SIR must be a minimum of 1.0 or greater in order to complete the Repair measures.

To model general window air sealing or a broken window pane, click the **Duct/Infiltration** tab then add the cost of the pane or air sealing into the total cost.

Use the **New** or **Copy** button at the bottom left to enter additional Windows. Use **Copy** to enter similar windows.

[Left Intentionally Blank]

IX.3.C Shell (Doors Sub Tab)



*Remember to press the **F1** key for **HELP** screen.*

Use **Door Codes** that make sense (i.e. **1DW** is the first door on the west wall.)

Select the **Door Type** from the drop-down menu. Indicate the **Area of the door in square feet** (a standard door is 20 sq. ft.).

Select the **Storm Door Condition** (or none if none exists) and applicable **Leakiness** (Tight, Medium, or Loose).

Door characteristics for leakiness determination are as follows:

- Tight doors will have the door and frame squared, no warping, functioning weather stripping in good condition around the door, a good seal at the threshold, no holes or structural damage, and latches that keep the door securely shut. If windows exist in the door, they will be fixed and well-sealed.

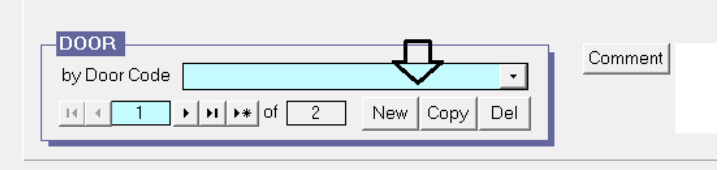
- Doors with medium leakiness will have some characteristics of loose doors, but retain substantial integrity. However, they would likely benefit from air sealing efforts.

- Loose doors will exhibit many, if not most, of the following problems: door and/or frame out of square, warping, weather stripping missing or severely damaged, no seal at the threshold, holes or significant structural damage, and latches that do not keep the door securely shut.

In this section, use the **Wall Code** to indicate which wall this door is located on and the number of doors on this same wall.

Note: *Always input data in the correct units called for by the software (i.e. door* ***Area*** *is in sq. feet and door* ***Optional Dimensions*** *is in inches.)*

Use the **New** or **Copy** button to enter additional Doors. Use **Copy** to enter similar doors.



[Left Intentionally Blank]

Universal Policy: Window and Door Replacement

Window and door replacement(s) **must** first be modeled and treated as an ECM(s) if cost justified. Window and door replacements **shall not** be included in the air sealing ECM. Window and door replacements are allowable as IRs to preserve the integrity of the associated ECM(s) as per WPN 19-5. All door repair cost must be entered into the WA (NEAT/MHEA) energy audit.

Door replacement as an energy conservation measure (ECM) option is provided within the NEAT/MHEA energy audit tool. If windows and doors are properly model and rank in the Recommended Measures Report with an SIR of 1.0 or greater, you may proceed with the replacement as an ECM.

Major factors for ranking window and door replacements in the energy audit are: **leakiness, type, orientation, and installation cost**.

Door replacement should be considered when the door slab is damaged beyond repair and to the point of allowing air infiltration through the door slab itself.

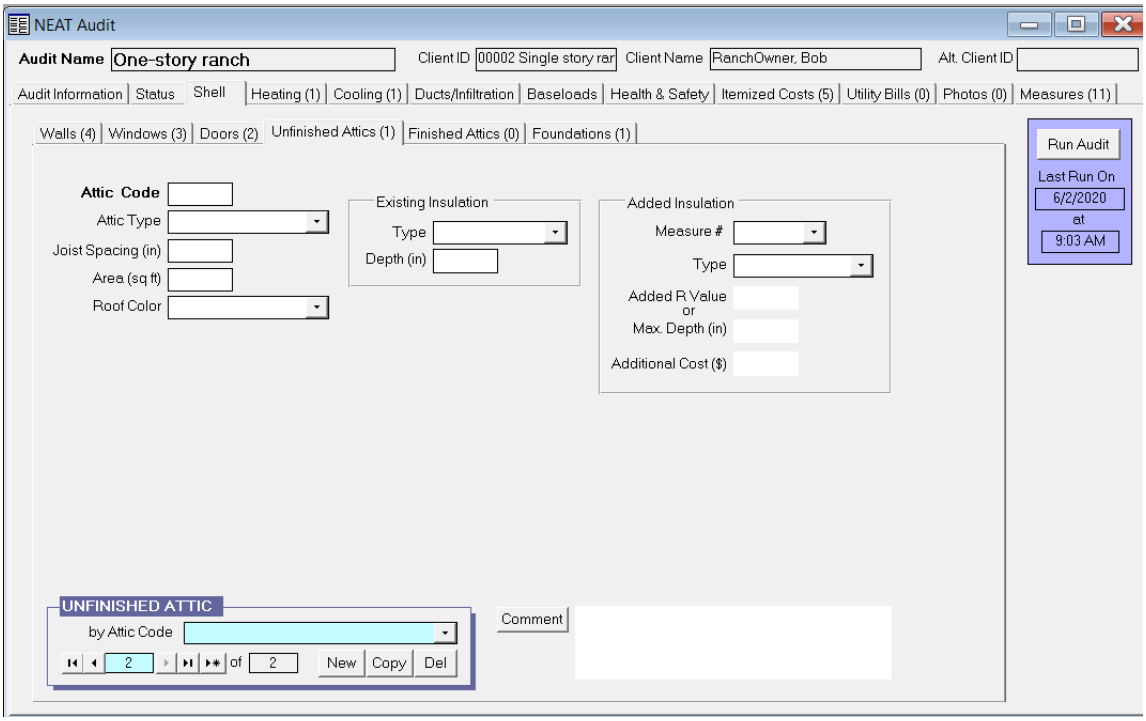
Clear photographic & written documentation of the defective items or aspects of windows and doors should be obtained and placed in the client file to validate repair/replacement actions.

Visual appearance (aesthetics) or customer desire are **not** valid reasons to authorize window or door replacement.

Components of the door which clearly allow for air infiltration, such as weather stripping, thresholds, hinges, striker plates, and broken door frames, should be considered as air infiltration measures. Air infiltration related repair measures include weather-stripping, patching holes in the door (like a wall patch), adjusting the door/strike plate/deadbolt to allow for proper closure/sealing, etc. All door air infiltration cost should be included in the air infiltration tab cost field in NEAT/MHEA.

Incidental repair measures related to windows and doors are only allowable to preserve the integrity of an associated energy conservation measure (ECM) and must meet the guidance outlaid in WPN 19-5. IR cost(s) must be included in the whole house SIR calculation, and the whole house SIR must have a SIR of 1.0 or greater.

IX.3.D Shell (Attics Sub Tabs)



*<u>Remember use the **F1** key for **HELP** screen.</u> Use the following for both Unfinished and Finished attics.*

Use **Attic Codes** that make sense (i.e. **1UA** is the first attic that is unfinished)

Use the drop-down menus under **Attic Code** to select the **Attic Type** (floored, un-floored, etc.)

Indicate the **Joist Spacing in inches** and attic **Area (sq. ft.)**

If there is **Existing Insulation**, select the insulation **Type** from the drop-down menu and input its **Depth in inches** in the required field.

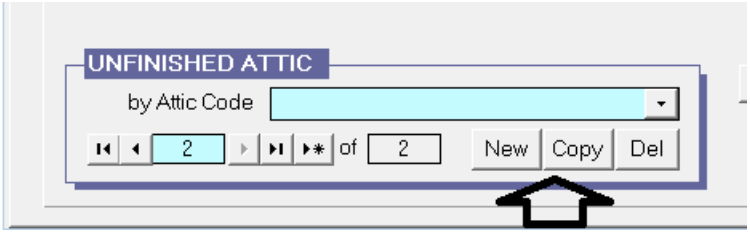
If you intend to **Add Insulation**, use the drop-down menus to complete the **Added Insulation** section with the **Measure #** and select the insulation **Type**.

Do not specify the **Added R Value** or **Max Depth** of the attic insulation as NEAT/MHEA will select the most cost effective insulation levels based on insulation type and cost of material and labor. By letting NEAT choose the added insulation levels, NEAT may allow measures with previously lower SIRs to be re-evaluated, which could result in an increase in total number of ECMs installed.

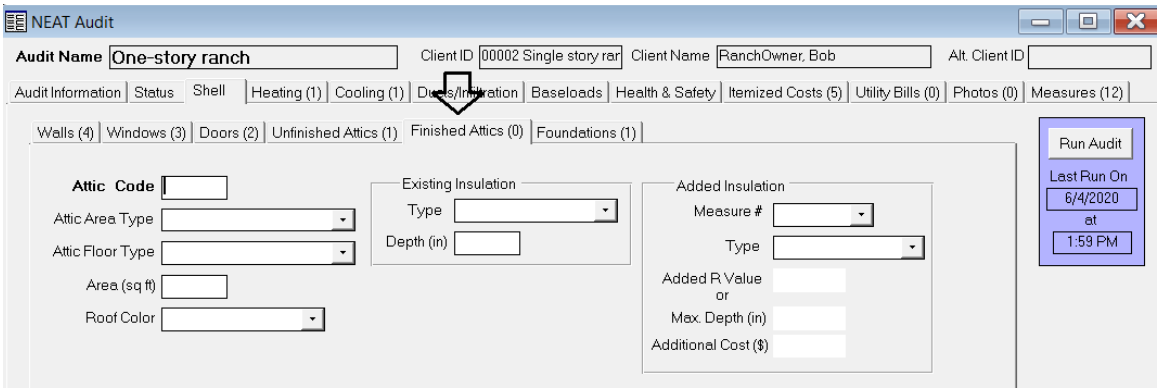
If attic insulation individual SIR is greater than 1.0 (i.e. a SIR > 3), the auditor may specify to increase the attic insulation R levels in NEAT/MHEA. The final attic insulation measure will still need to have an individual SIR > 1.0 along with the unit's cumulative SIR still maintaining a SIR > 1.0. Keep in mind this may effect or remove measures with lower SIRs that were in the audit's **Recommended Measures Report.**

Use **Comments** to further describe the Attic, if necessary.

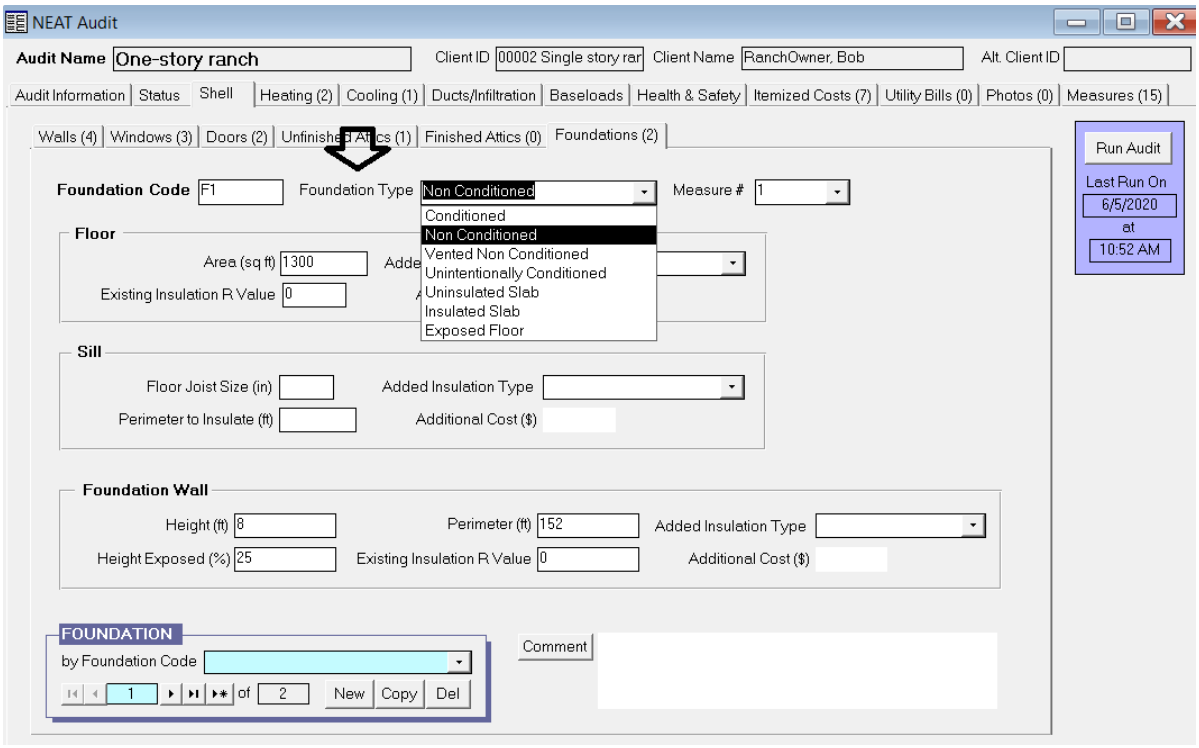
Use the **New** or **Copy** button to enter additional attics.



Remember the same functions can be used for both **Unfinished** and **Finished Attics**.



IX.3.E Shell (Foundations Sub Tab)

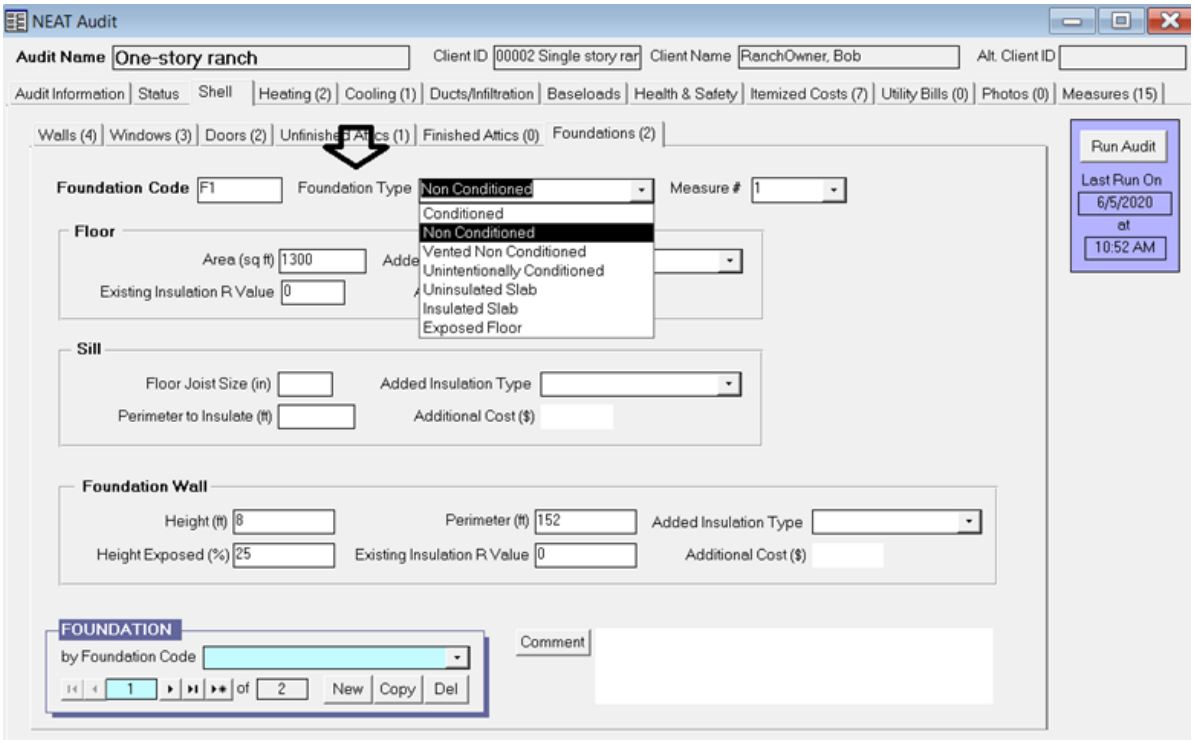


*Remember use the **F1** key for **HELP** screen.*

All buildings **must** have **Foundation** details entered into the audit.

Use **Foundation** and Crawl Space **Codes** that make sense (i.e. **F1** and **C1**)

Boxes will disappear based on which **Foundation Type** is selected.



Foundation Walls or **Floors** that define the heating envelope must be insulated, if possible, when the measure meets a minimum SIR of 1.0 or greater.

LA WAP Policy: Crawl spaces with >36" average height to ground, no insect infestations, and correctable ground moisture will be assessed for ground moisture barrier (DOE Louisiana Approved Variance).

The interior side of exterior walls of **Unintentionally Conditioned** Crawl Spaces must be insulated, if possible when the measure meets a minimum SIR of 1.0 or greater.

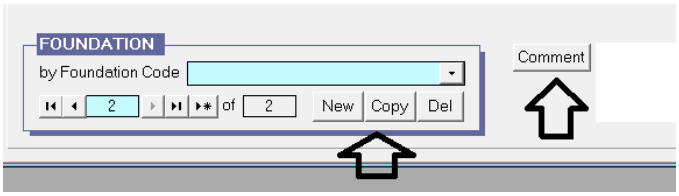
Box Sills and inaccessible Crawl Spaces must be insulated, if possible when the measure meets a minimum SIR of 1.0 or greater.

Do not deactivate *floor insulation in the* ***Setup Libraries.***

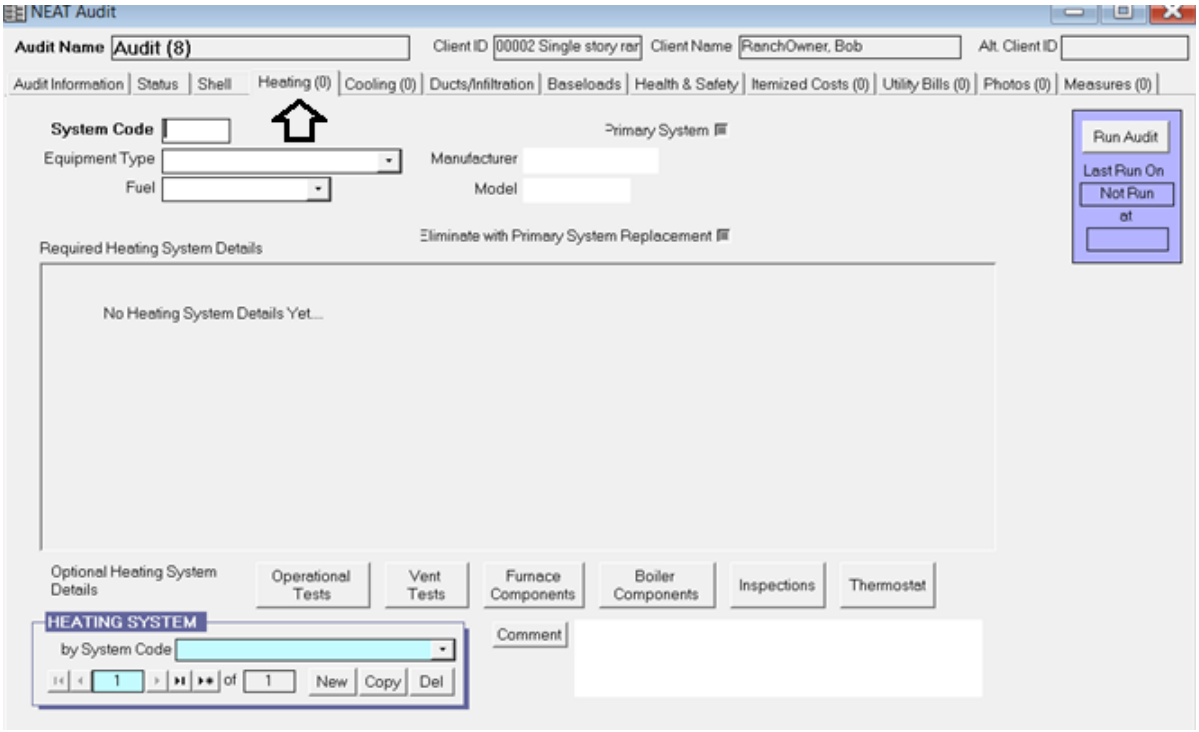
Floor Insulation **cannot** be modeled as an **Itemized Cost**.

Use **Comments** to further describe the foundation or any unique factors, if necessary.

Use the **New** or **Copy** button to enter additional comments or similar foundations.



IX.4 Heating

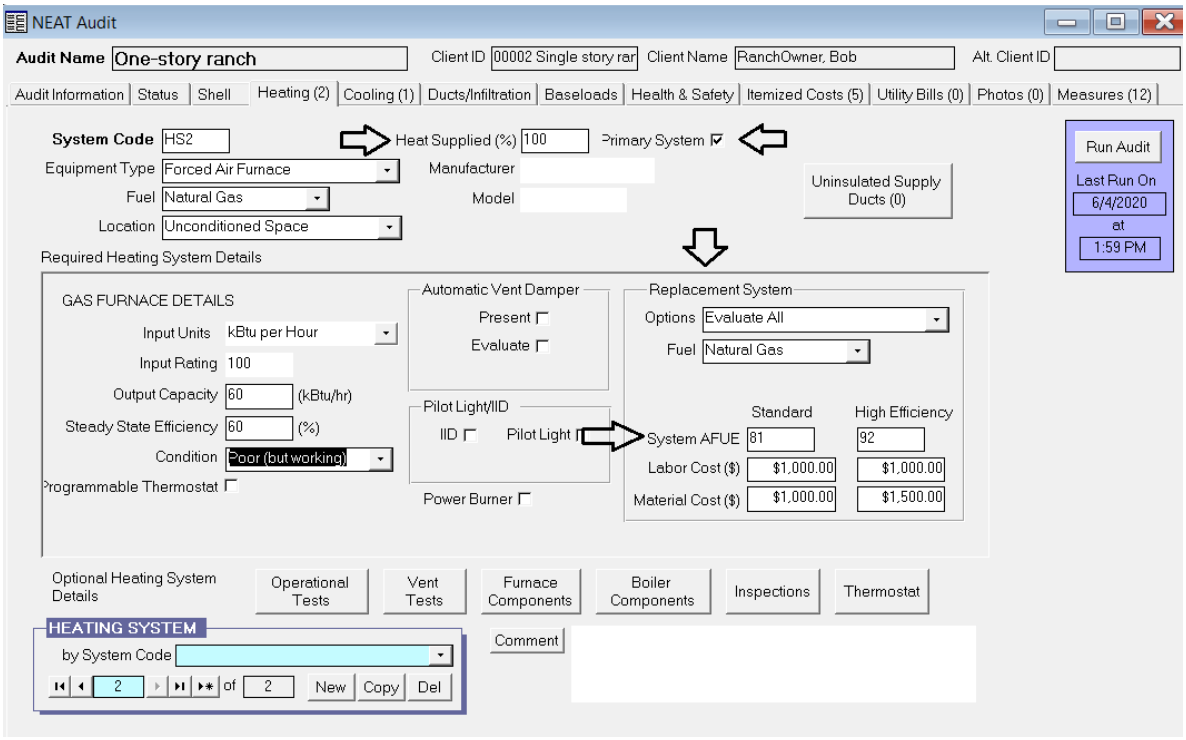


*Remember use the **F1** key for **HELP** screen.*

Follow the **Louisiana Health and Safety Plan** and **DOE's WPN 17-7 Attachment A** for Additional Health and Safety Guidance Related to Heating Systems for the following specific topics:

- Budget Category Decisions
- Code Compliance and Inspection
- Electric Space Heaters
- Fireplaces – Special Considerations
- Manufactured Homes – Special Considerations **(MHEA)**

- Masonry Chimneys
- Solid Fuel-Fired Heaters
- Unvented Gas- and Liquid-Fueled Space Heaters
- Vented Gas- and Liquid-Fueled Space Heaters



Use **System Codes** that make sense (i.e. **HS1, HS2**)

First, model heating systems for replacement as an ECM in the **Heating** tab by evaluating a replacement with a new heating system unit.

If there is more than one heater present, make sure that the **Primary System** box is only checked for **one** heating system.

The number and type of boxes to fill in will change once the Heating System **Equipment Type** and **Fuel** type are selected.

When multiple heating systems are present, the **Heat Supplied (%)** field for each heating unit **must** add up to a total of 100% when all heating systems are combined. *(i.e. HS1 50% + HS2 50% = 100%)*

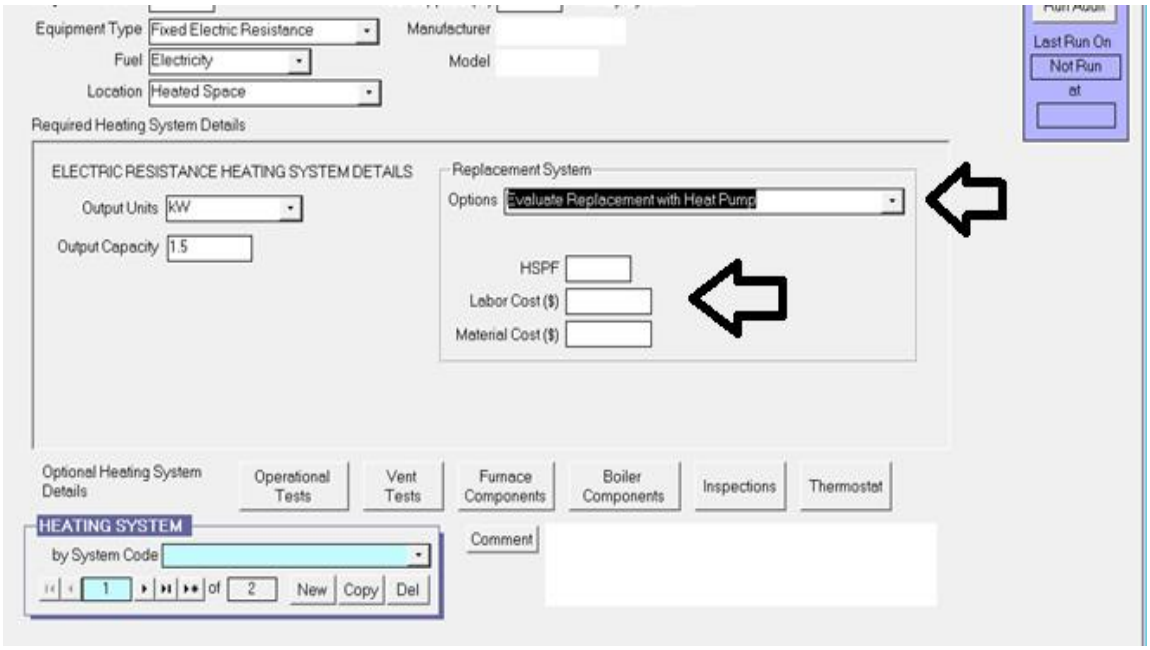
To evaluate **Heating Systems** as an ECM, run the energy audit with **Evaluate All** enabled in the software's **Heating** tab.

When modeling a **Gas Forced Air** system for replacement, model only the replacement unit in the **Replacement System**.

Under **Replacement System,** select **Evaluate All** from the **Options** drop-down menu and enter the new heating system's actual **AFUE** and **Cost** of the replacement system.

In the event that replacement of a heating system(s) results in a SIR <1.0 (less than one), model the replacement as a Health & Safety in the heating tab. Select **Replacement with Heat Pump *(or Electric Resistance)* Mandatory**. Uncheck the **Include in SIR** box to allow the SIR calculations for the rest of the measures to be evaluated with the replacement system in place.

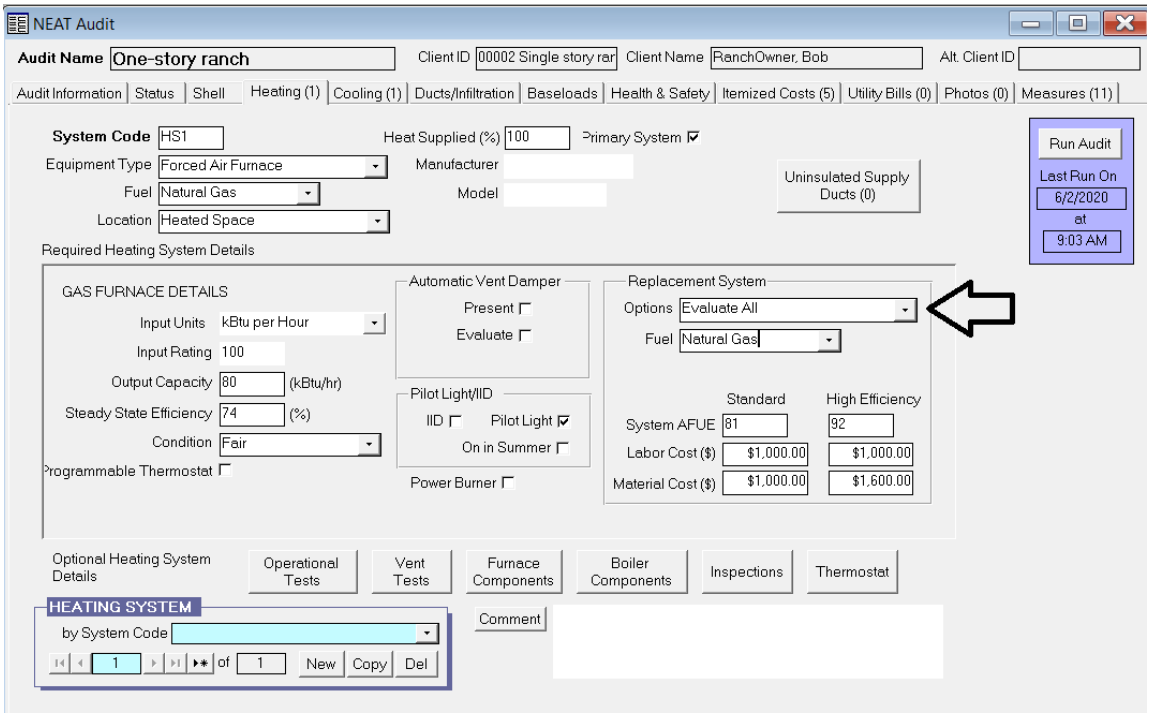
When modeling an **Electric Forced Air** heating system for replacement with a **Heat Pump**, enter **HSPF** and all **Costs** for an entire replacement unit here. A **Heat Pump** must also be modeled under **Heating** and **Cooling** tabs of the NEAT Audit.



Click on the **Cooling** tab.

Heat Pump replacement for a primary heating and cooling system must be modeled under the **Cooling** tab to link both units in the NEAT audit. Model the Air Conditioning unit by entering the required data on the existing cooling unit.

Navigate back to the **Heating** tab.



<u>Additional information on modeling NEAT for Heating and Cooling System replacements:</u>

- To evaluate Heating Systems and/or Cooling Systems for an ECM replacement in NEAT, auditors must verify that correct and accurate cost and efficiency data have been entered for both the furnaces and A/C units.

- In NEAT only, when inputting the data into the **Heating** tab and selecting **Fuel** type **Electricity**, the **Programmable Thermostat** check box in **Heating System Details** disappears and is no longer an option.

LA WAP Policy: On heating systems that use electricity for fuel, the **only** option for replacing the existing mercury thermostat is for **Health and Safety** reasons.

- Data entry errors in the energy audit can result in a satisfactory unit being replaced or an unsatisfactory unit not being identified for replacement.

  Note: *One error in the input data of BTU consumption, year manufactured, and/or SEER value will cause the replacement equipment's SIR to be skewed in the audit, and the audit invalid to DOE and Louisiana rules.*

- Attention and accuracy are needed when entering the following energy audit efficiency data:

  - The BTU input and output size of the existing unit.
  - The BTU of the replacement unit.
  - The SEER of the existing unit. (Use the most accurate SEER that can be determined by using the year manufactured.)
  - The SEER of the replacement unit. (Verify the SEER of the replacement unit.)
  - Do not use the manufactured year as the only form of appliance efficiency data.
  - The pricing and data of the replacement unit in the energy audit library.

- When replacing a heating and cooling system for an ECM, the cost can be shared across both **Heating** and **Cooling** tabs in NEAT in three different ways for software modeling.

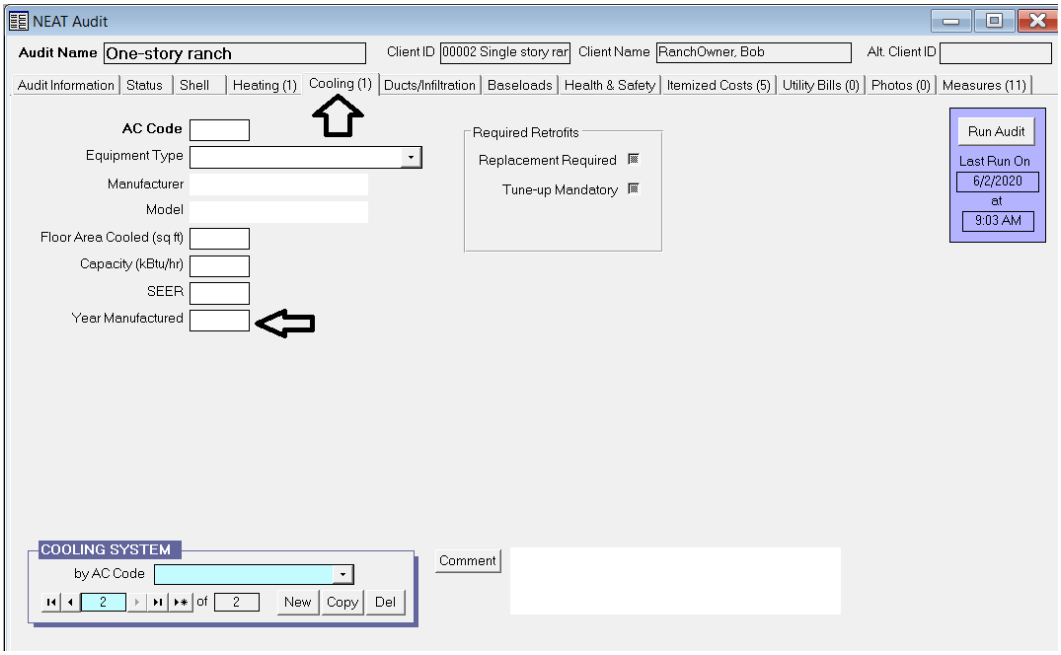
  Example Scenario: *You are replacing a heating, cooling and blower unit, the actual furnace costs $1000, the AC costs $1500, and the blower costs $500 for a total of $3000.*

  *1. The blower total cost of $500 could be added to the **Heating** Tab, or*

  *2. The blower total cost of $500 could be added to the **Other** cost under **HVAC Systems - Replace AC** measure cost in the **Setup Library**, or*

  3. The blower cost can be split between both the heating and cooling cost i.e. $250 to each.

IX.5 Cooling



*Press the **F1** key for the **HELP** screen.*

LA WAP Policy: Use **only** SEER for cooling system efficiencies data when using NEAT. Do not use the year manufactured.

Attachment F: Heating and Cooling Equipment Efficiencies

Do **not** use the **Year Manufactured** for cooling efficiency due to NEAT being designed in the 1990s. Flawed energy audits and inaccurate SIRs may occur if a more current year is used than the design year of NEAT. *This is applicable to cooling efficiency in **NEAT only**.*

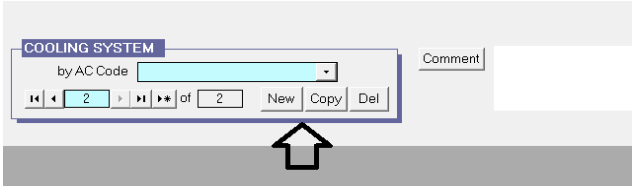
Once you select **Equipment Type**, the **Replacement Required** and **Tune-Up Mandatory** check boxes will be available under **Required Retrofits**.

Allow NEAT to evaluate either **Replacement Required** or **Tune-up Mandatory** on cooling systems. Cooling system replacement and tune-up cost are located in the **Setup Library** under the **Library Measures** tab.

An **Include in SIR** box will appear when either of the Required Retrofits options are selected.

LA WAP Policy: In the event that replacement of a cooling system(s) results in a SIR <1.0 (less than one) and "at risk" occupants (under 5 years of age, elderly, or documented medical condition) are present, model the replacement as a Health & Safety in the cooling tab. Uncheck the **Include in SIR** box to allow the SIR calculations for the rest of the measures to be evaluated with the replacement system in place.

At the bottom left of the page, click **New** or **Copy** to add additional cooling sources, and comments may be added in the **Comment** box.



Universal Policy: When addressing a system that utilizes a compressed refrigerant cycle to provide heating or cooling (not applicable to evaporative coolers), the following derating formula is the only approved calculation that may be used.

Degraded Efficiency = (Base EFF) * .99^{age}

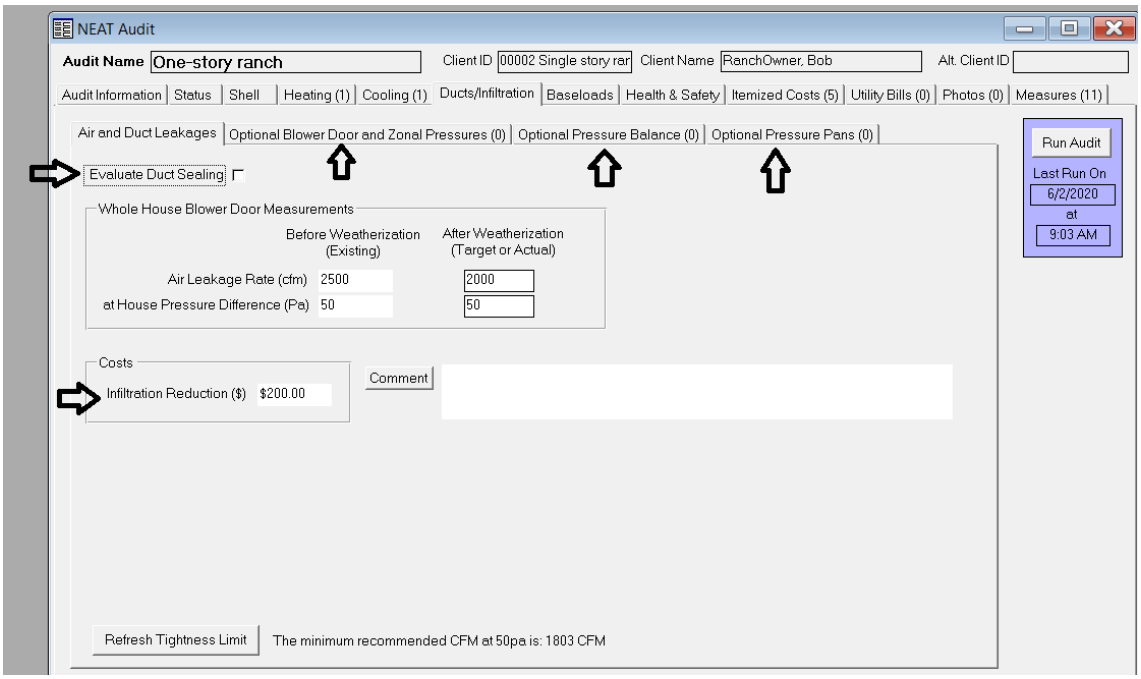
- **Base EFF** = Typical efficiency of Pre-Retrofit equipment when new (Seasonal Energy Efficiency Ratio (SEER), Energy Efficiency Ratio (EER), or Heating Seasonal Performance Factor (HSPF))

- **Age** = Age of equipment in years

Derating of combustion appliances in lieu of testing for combustion efficiency is **not allowed**.

IX.6 Ducts/Infiltration

IX.6.A Ducts/Infiltration (Air and Duct Leakages Sub Tab)



*Press the **F1** key for the **HELP** screen.*

Click on **Air and Duct Leakages** sub tab to enter information about Air and Duct Leakage.

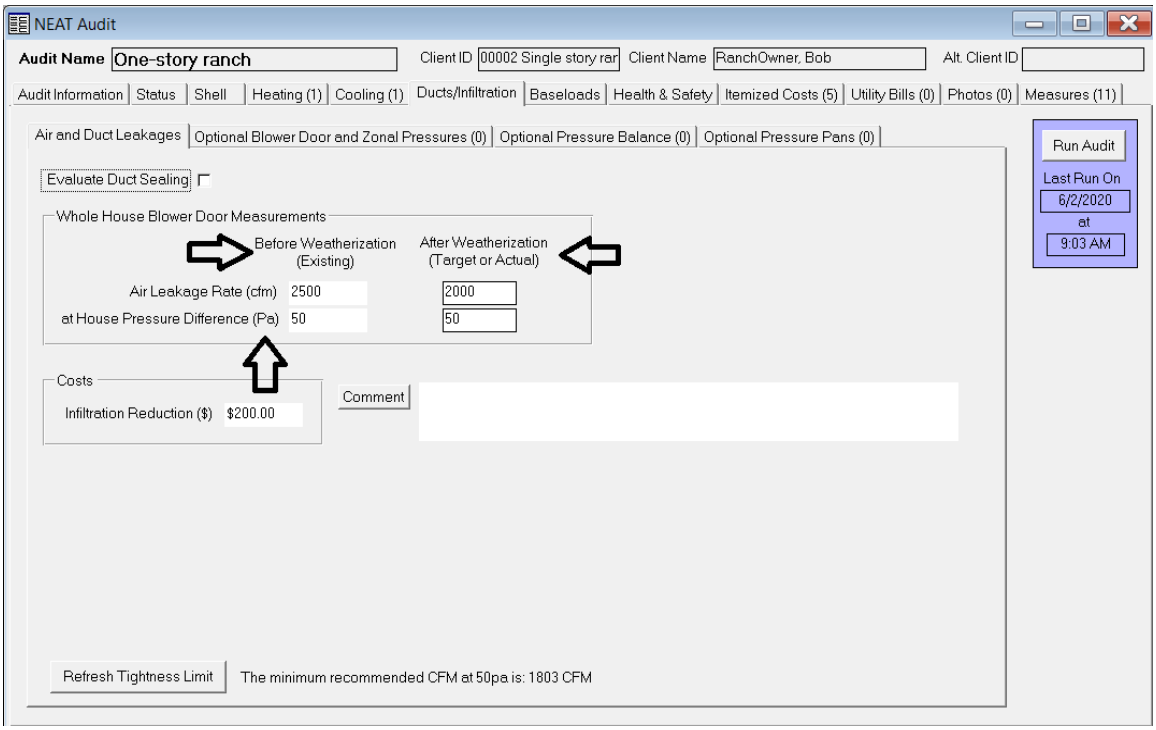
LA WAP Policy: LA WAP Agencies are not required to use the **Optional Blower Door and Zonal Pressures**, **Optional Pressure Balance**, or **Optional Pressure Pans** sub tabs.

LA WAP Policy: Do **not** check the **Evaluate Duct Sealing** box.

For actual sealing work techniques, follow the procedures in the Louisiana Weatherization Standard Work Specifications (SWS) Field Guides and **Attachment G** for HVAC Supply-Return Duct Testing and Duct Sealing (aka pan pressure testing).

Attachment G: Instructions for HVAC Supply-Return Duct Testing and Duct Sealing

Use the **Comment** box to enter air sealing directives for crews. These can easily be dropped onto the work order.

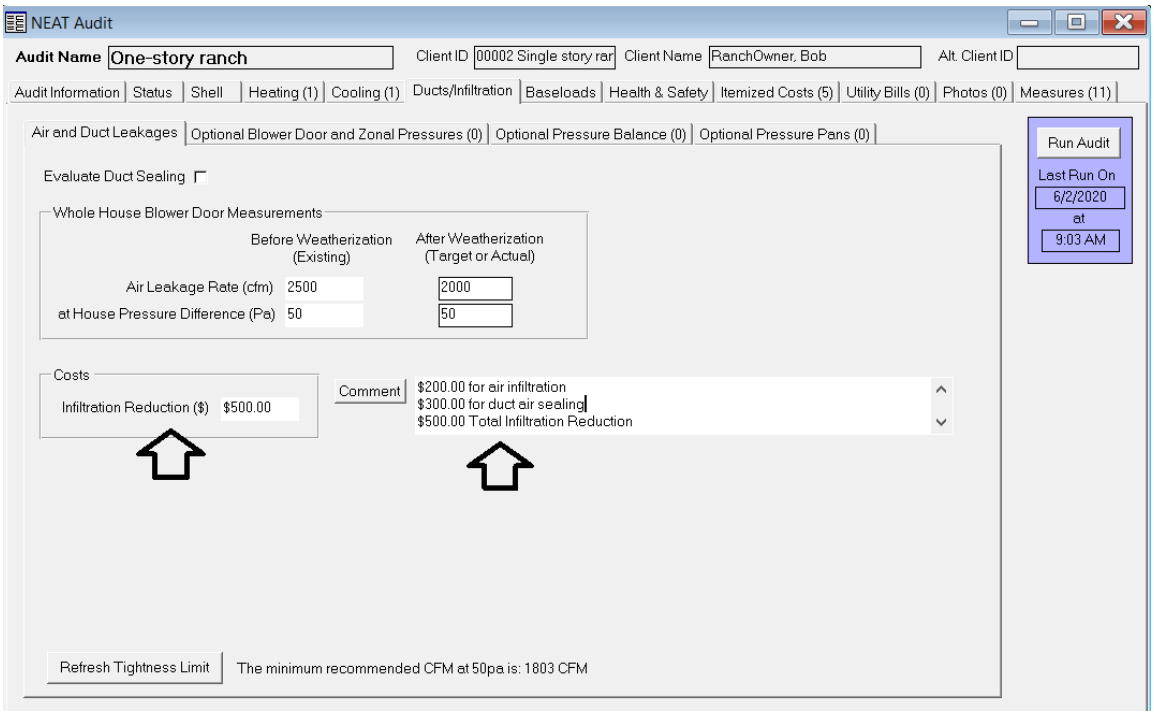


Enter the unit's pre-inspection Blower Door CFM50 reading in the **Whole House Blower Door Measurements** area in the **Before Weatherization (Existing)** - **Air Leakage Rate (cfm)** field.

House Pressure Difference (Pa) should be set to 50 Pa if using manometer in conjunction with PR/ FL @50 Mode. The manometer will mathematically adjust the actual air flow from the Blower Door fan using the Channel A building pressure reading and a Can't Reach 50 Pa Pressure factor to estimate the blower door reading at PR/ FL @50).

Enter the unit's Blower Door Target CFM50 reading in the **Whole House Blower Door Measurements** area in the **After Weatherization (Target or Actual)** – **Air Leakage Rate (cfm)** field using the following Target Reduction Percentages below:

TARGET REDUCTION PERCENTAGES					
No Air Sealing	20%	30%	40%	45%	50%
0-1250	1251-2750	2751-4250	4251-5500	5501-7500	>7501



LA WAP Policy: Duct air sealing material and labor charges are to be combined in the **Infiltration Reduction ($)** charges in the **Costs** box.

Enter an itemized total breakdown of the estimated air sealing cost for both Air Infiltration and Duct Air Sealing in the **Comment** box.

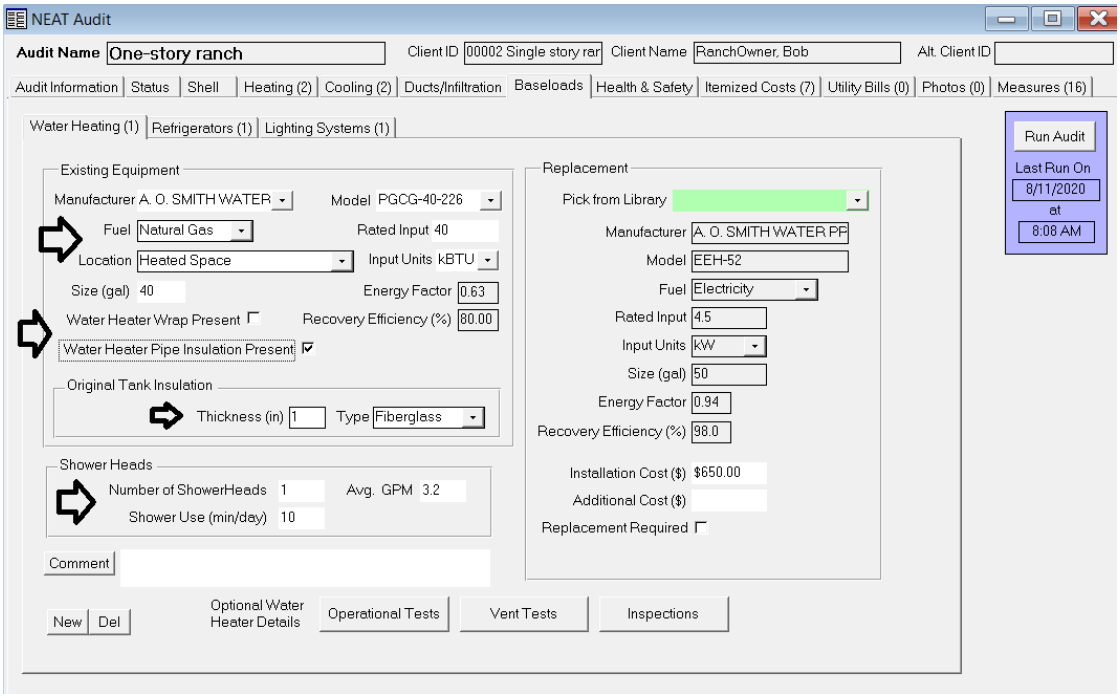
This information generates a baseline SIR for the building.

*Do **NOT** click the **Refresh Tightness Limit** button at the bottom left corner of the screen.*

IX.7 Baseloads

IX.7.A Baseloads (Water Heating Sub Tab)

Click on the **Baseloads** tab to begin entering water heater information under the **Water Heating** sub tab.



*Press the **F1** key for the **HELP** screen.*

Enter **Existing Equipment - Location** and existing Water Heater information from the manufactured data plate.

Complete the **Original Tank Insulation** section with the R-value, **Thickness (in.)** and **Type** from the drop-down menu.

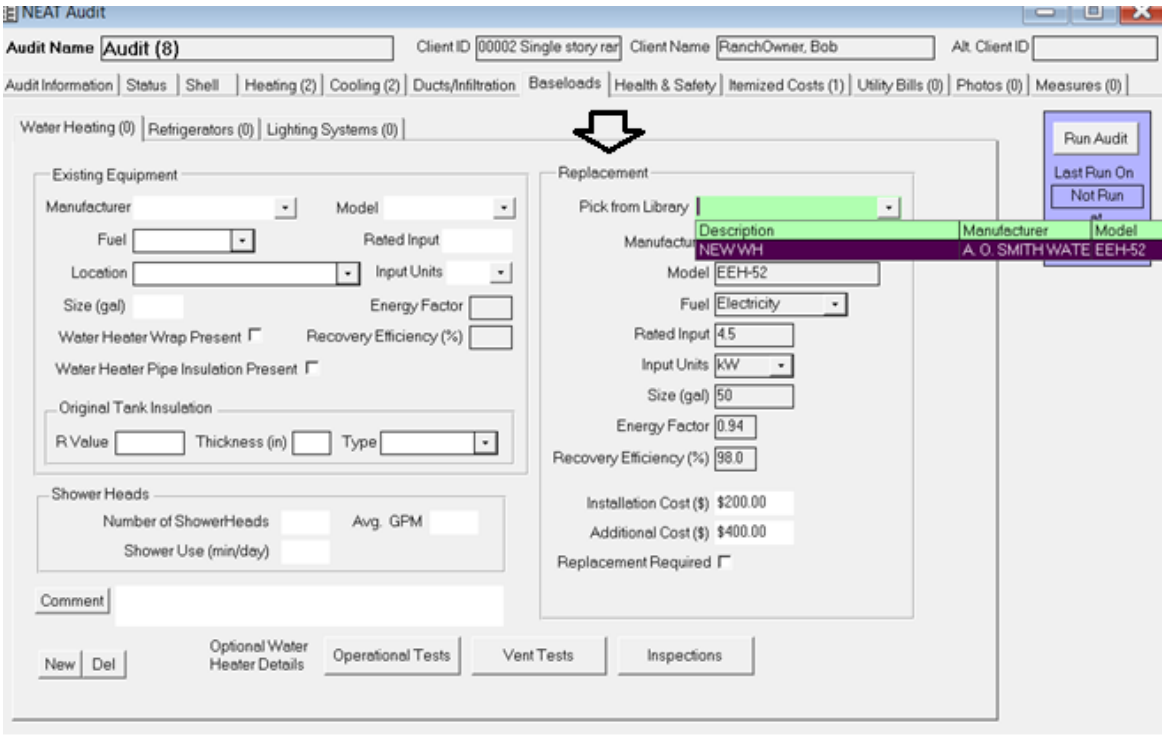
LA WAP Policy: Check the corresponding box if **Water Heater Wrap** or **Water Heater Pipe Insulation** are present. If the audit calls for **Water Heater Wrap**, a **minimum of R-11** must be installed if structurally (physically) possible. If the audit called for **Water Heater Pipe Insulation**, both hot and cold water pipes **within 6 feet** of the water heater must be insulated.

Under the **Shower Heads** section, enter the **Number of Shower/Heads** in the unit, **Avg. GPM** (Average gallons per minutes) of all shower heads in use, and the total **Shower Use** in minutes for an average day.

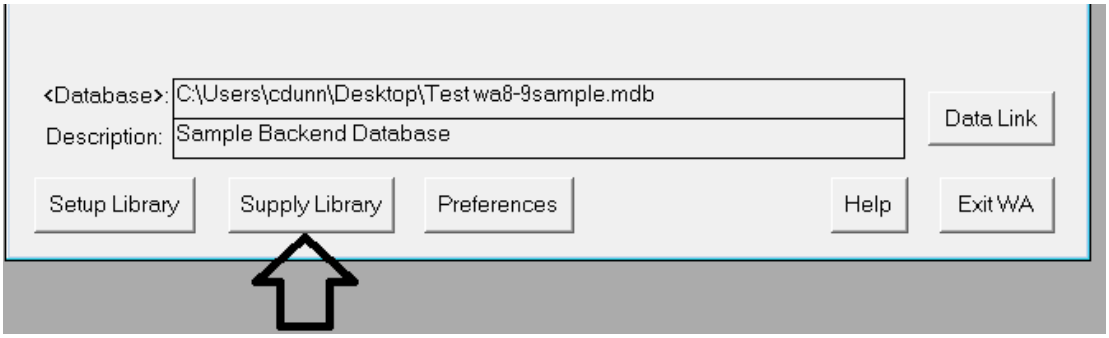
Universal Policy: Installed showerheads must be 2.5 gallons per minute (GPM) or less and faucet aerators installed must be 1.0 GPM or less.

LA WAP Policy: Water Heater **replacement** is a Health & Safety measure **only**.

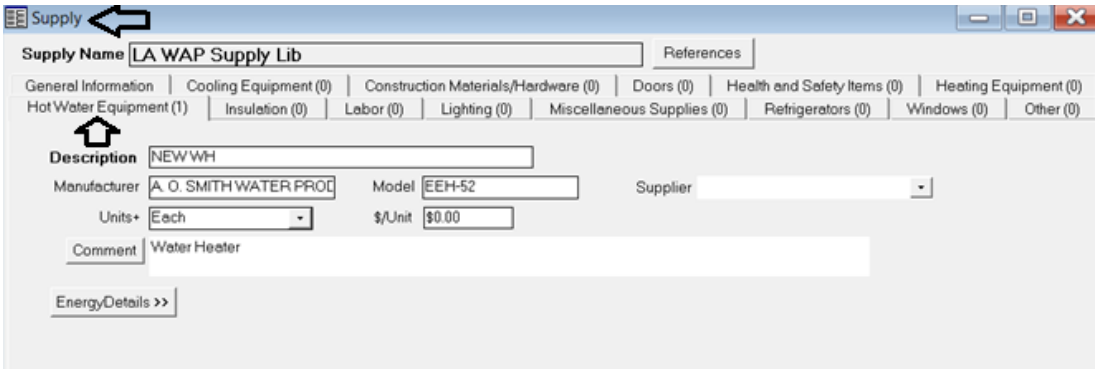
Universal Policy: A unit **without** hot water is **not** a Health & Safety measure.



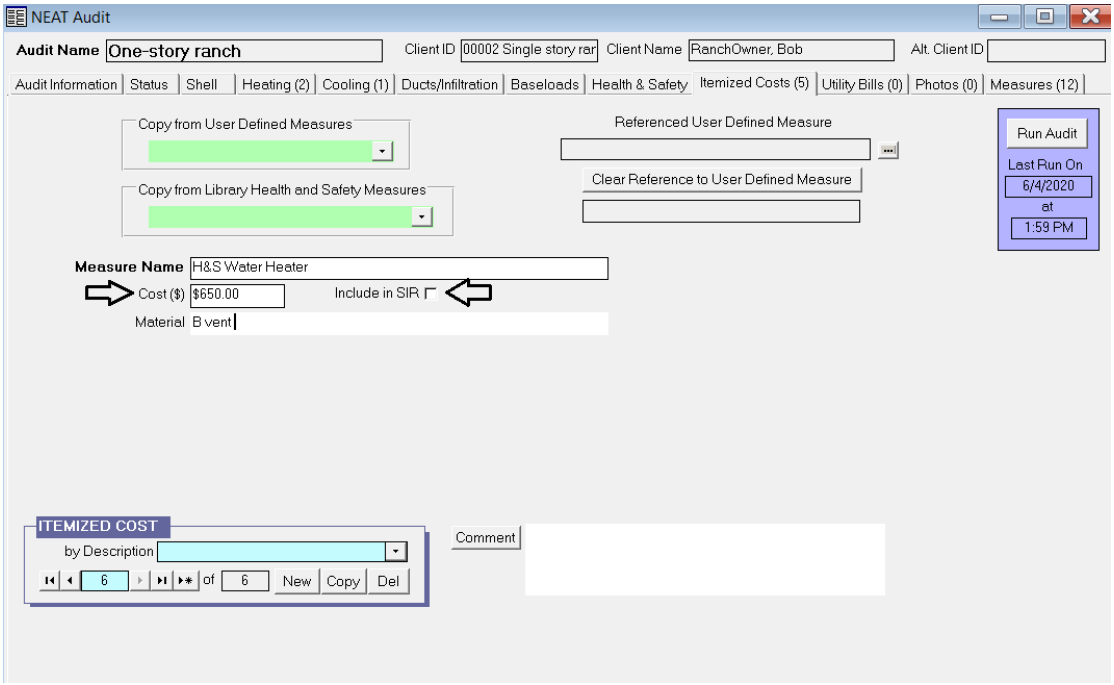
A **Replacement** for a Water Heater must be entered into the **Supply Library** in advance. This information must be entered into the **Supply Library** on the **WA Main Menu Splash Screen** under the **Hot Water Equipment** sub tab.



This information will be uploaded in the **Replacement – Pick from Library** found on the right hand portion of the **Baseload - Water Heating** sub tab.



To model the Water Heater as a Health and Safety measure, click on the **Itemized Costs** tab. Name the H&S Water Heater in the **Measure Name** box.



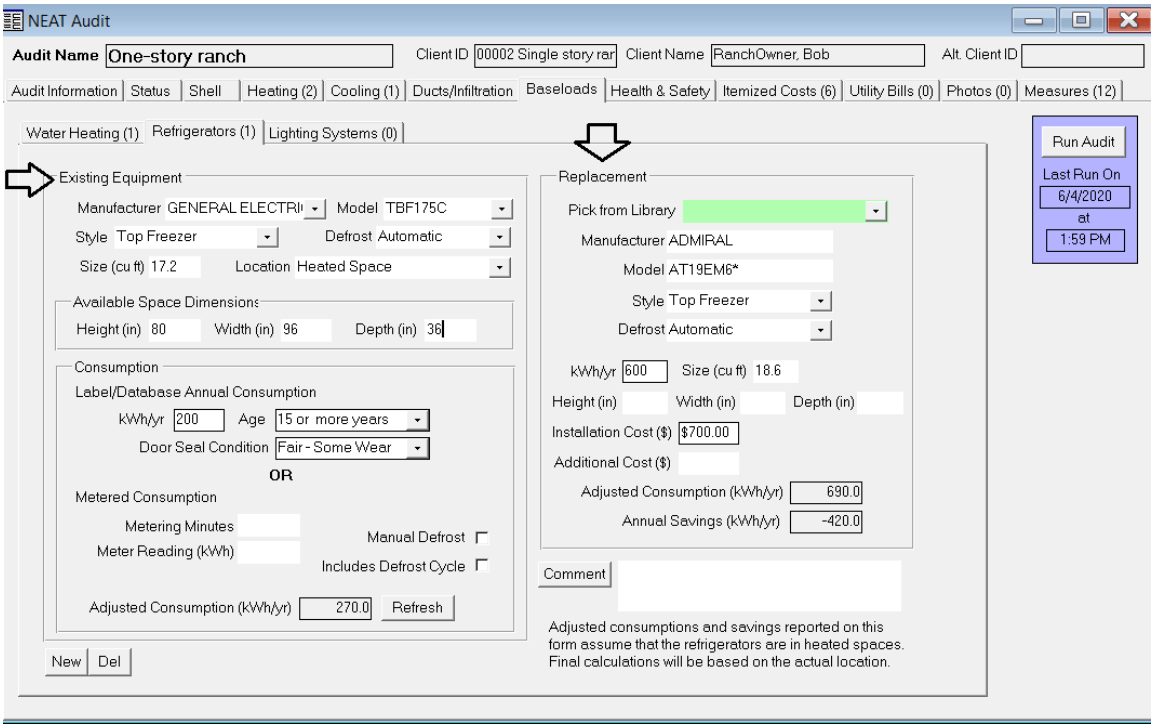
Do **not** check the **Include in SIR** box. There is no energy savings associated with a Health and Safety water heater replacement.

Enter the total cost for the water heater replacement in the **Cost ($)** field.

Universal Policy: Existing water heater tanks with an audit generated SIR of 1.0 or greater must be insulated with a **minimum of R-11** insulation, unless the manufacturer's instructions do not allow, or it is structurally impossible to insulate the tank.

IX.7.B Baseloads (Refrigerator Sub Tab)

Click on the **Refrigerators** sub tab under **Baseload**.



*Press the **F1** key for the **HELP** screen*

Enter **Existing Equipment - Location** and existing Refrigerator information from the manufactured data plate.

Enter the original refrigerator's **Consumption** by either:

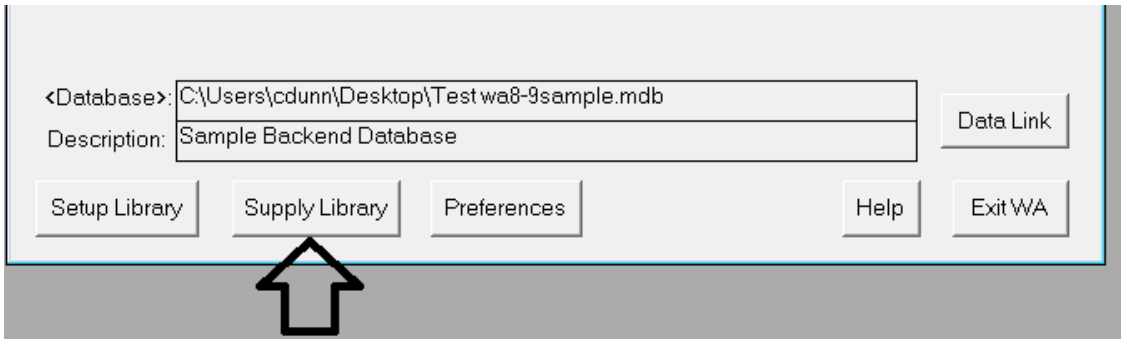
- Using accurate database information from a certified manufacturer's database (i.e AHAM or Homeenergy.org), or
- Following the DOE guidelines for Refrigerator Metered Consumption, and entering the refrigerator metered reading in minutes and kWh used.

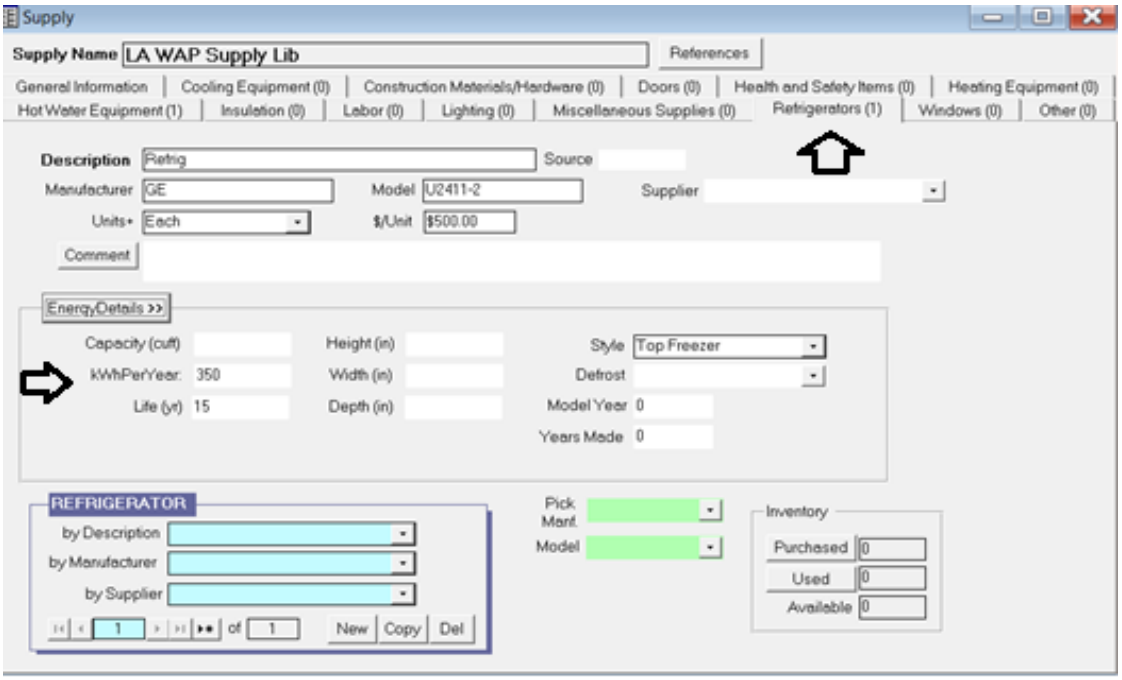
(https://nascsp.org/wp-content/uploads/2018/02/refrigerator_info_toolkit.pdf)

Enter accurate data for the existing refrigerator and a possible replacement from the **Replacement - Pick from Library** drop down menu.

Auditors must select a new **replacement** refrigerator for NEAT to compare energy consumption of the existing refrigerator for an ECM replacement.

A **Replacement** for a Refrigerator must be entered into the **Supply Library** in advance. This information must be entered into the **Supply Library** on the **WA Main Menu Splash Screen** under the **Refrigerator** sub tab.

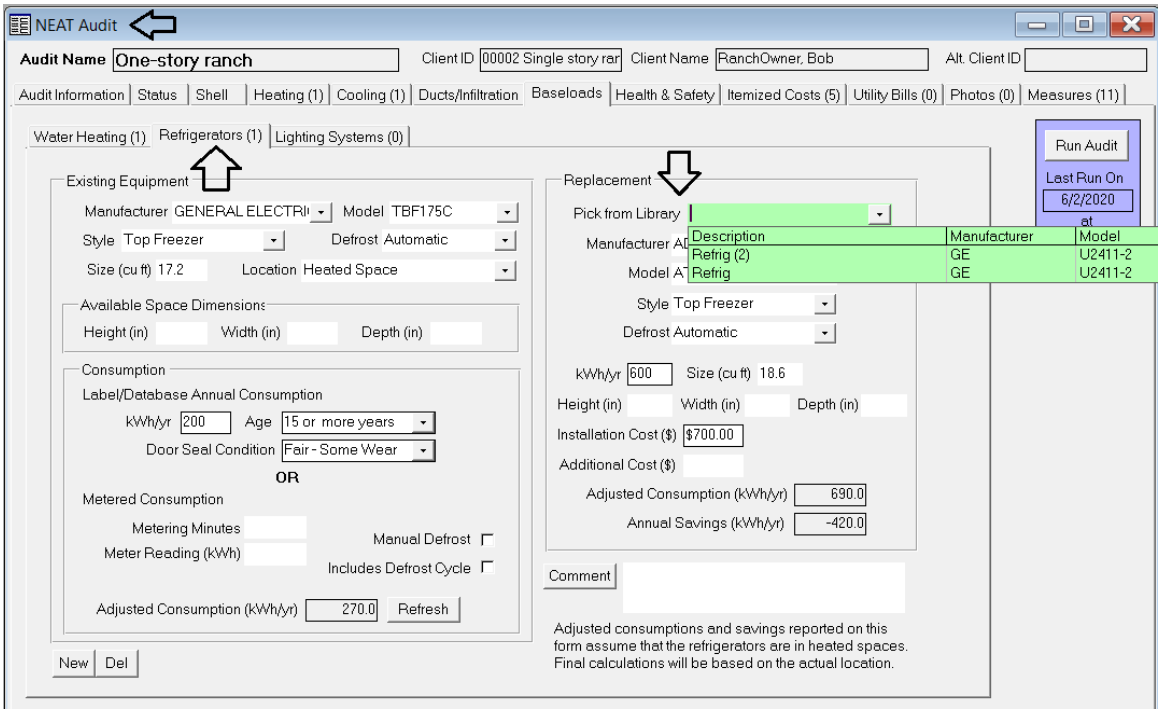




Verify and enter accurate replacement refrigerator energy consumption data under **Energy/Details** in the **kWhPerYear** field.

Note: *Entering inaccurate energy consumption data on existing refrigerators and new replacements will cause disallowable costs and invalid refrigerator replacement SIRs.*

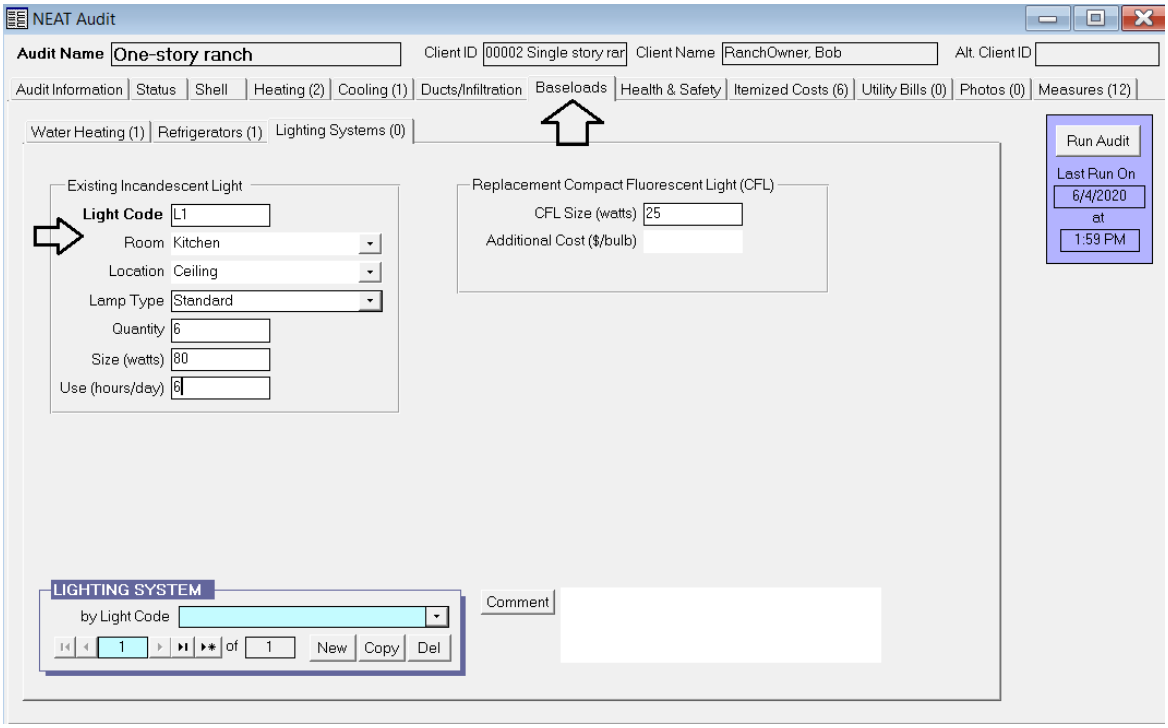
This information will be uploaded in the **Replacement – Pick from Library** found on the right hand portion of the **Baseload - Refrigerator** sub tab.



Verify accurate **kWh/yr** usage for both existing and new refrigerator for ECM replacement.

Replace the refrigerator if the measure receives an SIR of 1.0 or greater on the energy audit's **Recommended Measure Report**.

IX.7.C Baseloads (Lighting Systems Sub Tab)



*Press the **F1** key for the **HELP** screen*

Enter the required data on existing lighting and replacement lighting under the **Existing Incandescent Light** section and the **Replacement Compact Fluorescent Light (CFL)**.

Replace the lighting if the measure receives an SIR of 1.0 or greater on the energy audit's **Recommended Measure Report**.

IX.8 Health & Safety

Follow the Health and Safety guidelines as found in the **Louisiana Health and Safety Plan** and **DOE WPNs**.

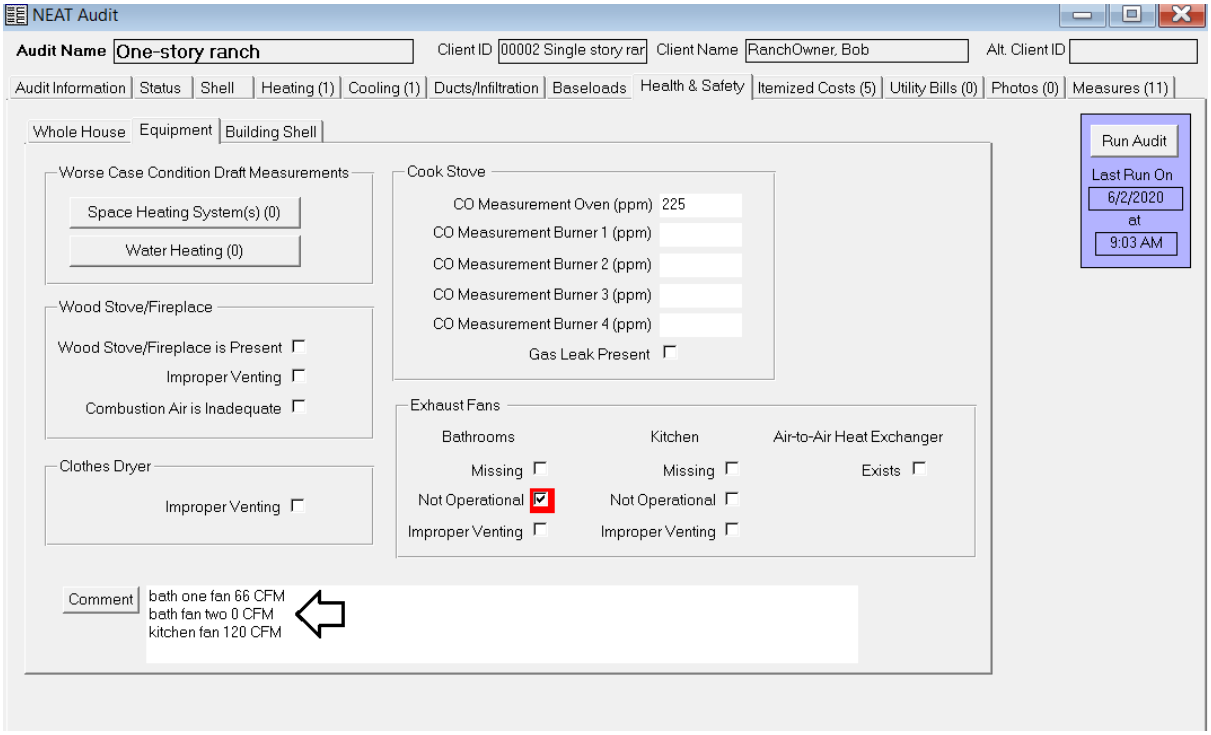
Enter the Health & Safety issues of the unit under **Whole House, Equipment,** and **Building Shell** under each sub tab. Select all Health and Safety boxes **that apply** to the unit.

Common hazards found include:

- Lead paint
- Moisture issues
- Electrical wiring
- CO
- Improper venting of combustion appliances

Universal Policy: The installed equipment manuals must be provided to the unit's occupants.

IX.8.A Health & Safety (Equipment Sub Tab)



Enter all exhaust fan CFM measurements in the **Comment** box and venting information on bathrooms and kitchen under the **Equipment** tab for ASHRAE 62.2 2016 standards.

Depending on the severity of the health and safety issue deferral may be necessary.

Do not **estimate** Health and Safety energy savings.

Do not check the **SIR box** on any Health and Safety measures.

For additional guidance related to ASHRAE 62.2 2016 standards, please refer to **Attachment H**.

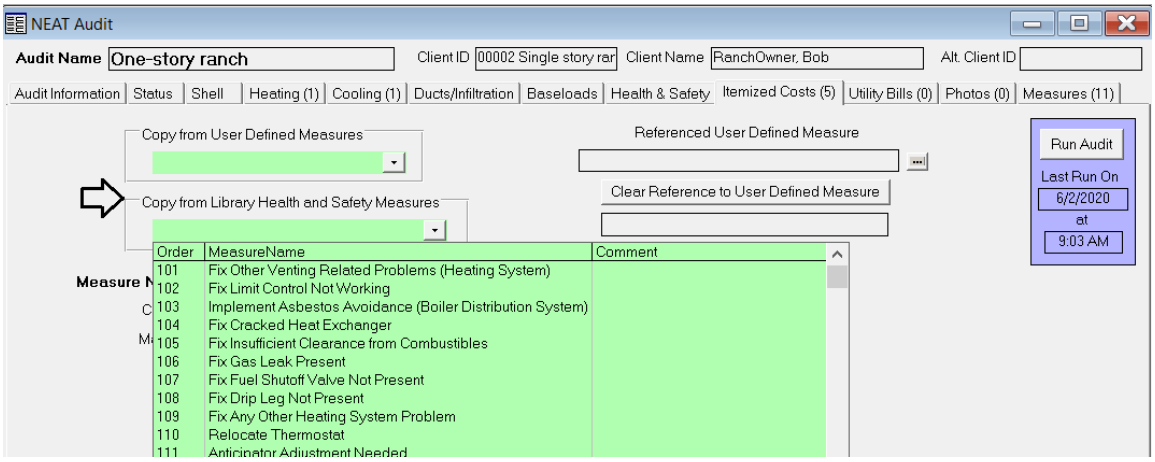
Attachment H: Additional ASHRAE 62.2 2016 Guidance

IX.9 Itemized Costs

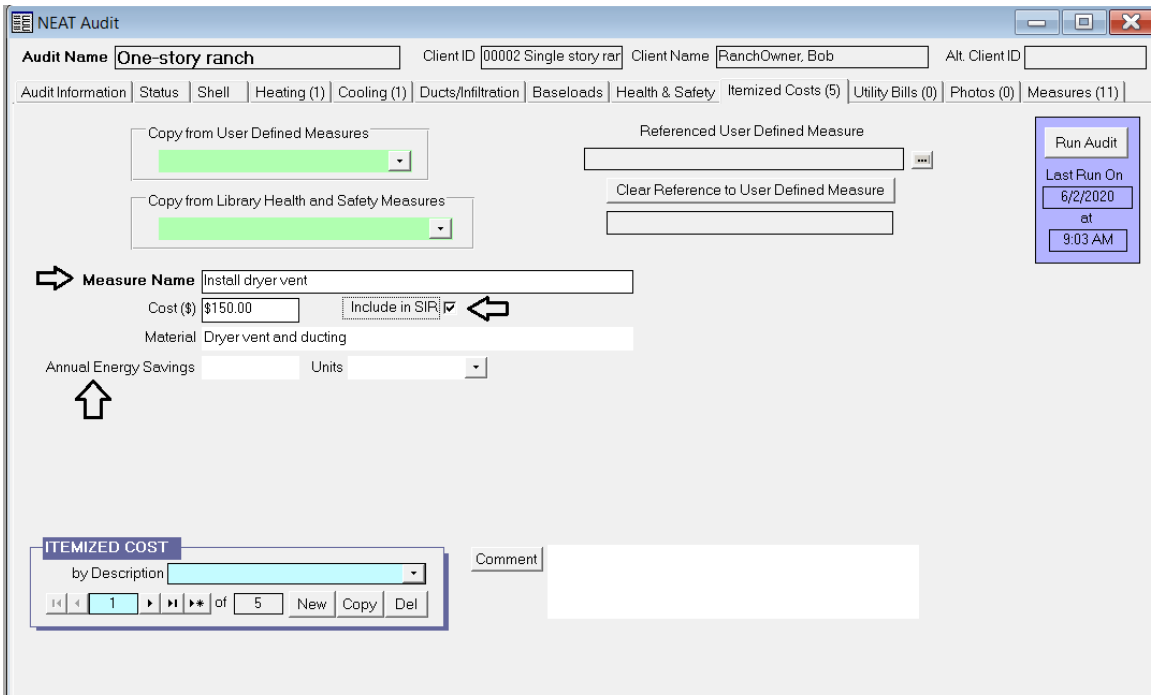
The **Itemized Costs** tab may be used to enter Repair and Health and Safety items not listed under **Health & Safety**.

Itemized Costs must not be used to estimate savings, SIR or items already offered under other tabs of the NEAT Audit.

Select from the **User Defined Measure Library** or from the **Library of Health and Safety Measures**. You can also create your own allowable named measure if it is not one in the existing library.



Do not estimate User Defined Health and Safety energy savings. Do not check **Include in SIR box** on any Health and Safety measures.



The **Itemized Costs** tab is also where the Incidental Repairs that are necessary to make weatherization work possible are added to the NEAT energy audit.

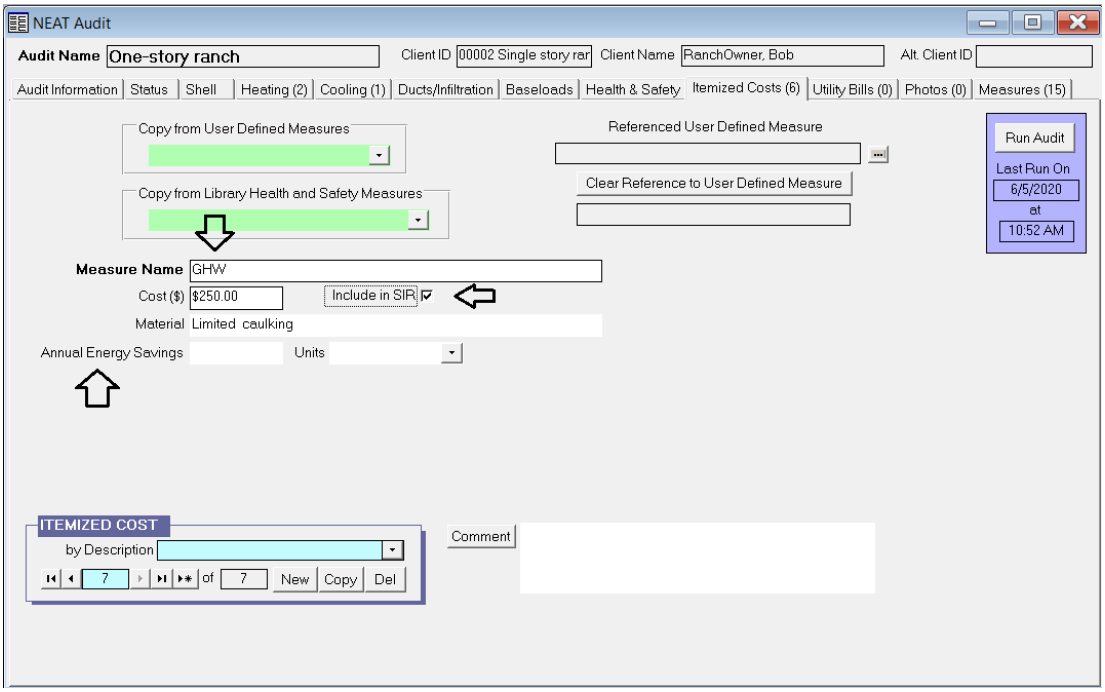
Universal Policy: Incidental Repairs are to be included in the unit's cumulative SIR, and the entire unit must still have a cumulative SIR of 1.0 or greater.

Enter the **Measure Name**, the **Cost ($)**, **Material** and check the **Include in SIR** box to make sure NEAT treats the measure as an Incidental Repair.

> ***NOTE:*** *If you do not check the* ***Include in SIR*** *box, the NEAT energy audit will treat the measure as a health and safety measure which is not accurate.*

No **Annual Energy Savings** should be used for Incidental Repairs.

Use the **Set Up Library** to setup frequently used Incidental Repairs used on the **Itemized Costs** Tab. To do this, please refer to ***V.6 User Defined Measures*** of this manual.



DOE approved General Heat Waste (GHW) materials will be installed in eligible homes without the need for justification as an ECM.

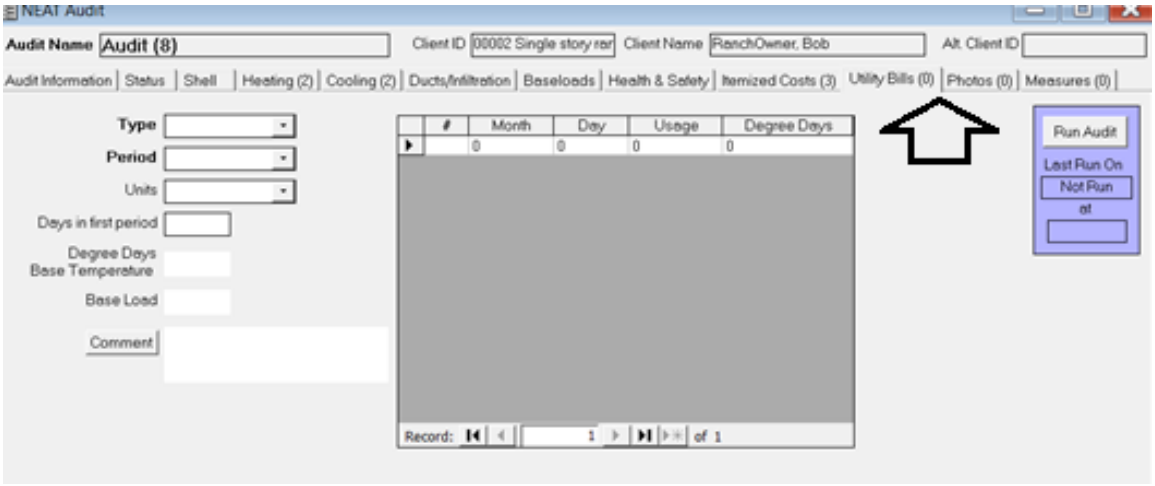
GHW items are intended to be relatively low-cost items that can be quickly and easily installed.

LA WAP Policy: The total GHW measure costs including labor **will not exceed $250.00**. Louisiana DOE approved GHW are as followed:

- Water heater wrap
- Water heater pipe insulation
- Faucet aerators
- Low-flow showerheads
- Limited weather-stripping and caulking for comfort
- Furnace or air conditioner filters
- Attic Hatch box weather stripping

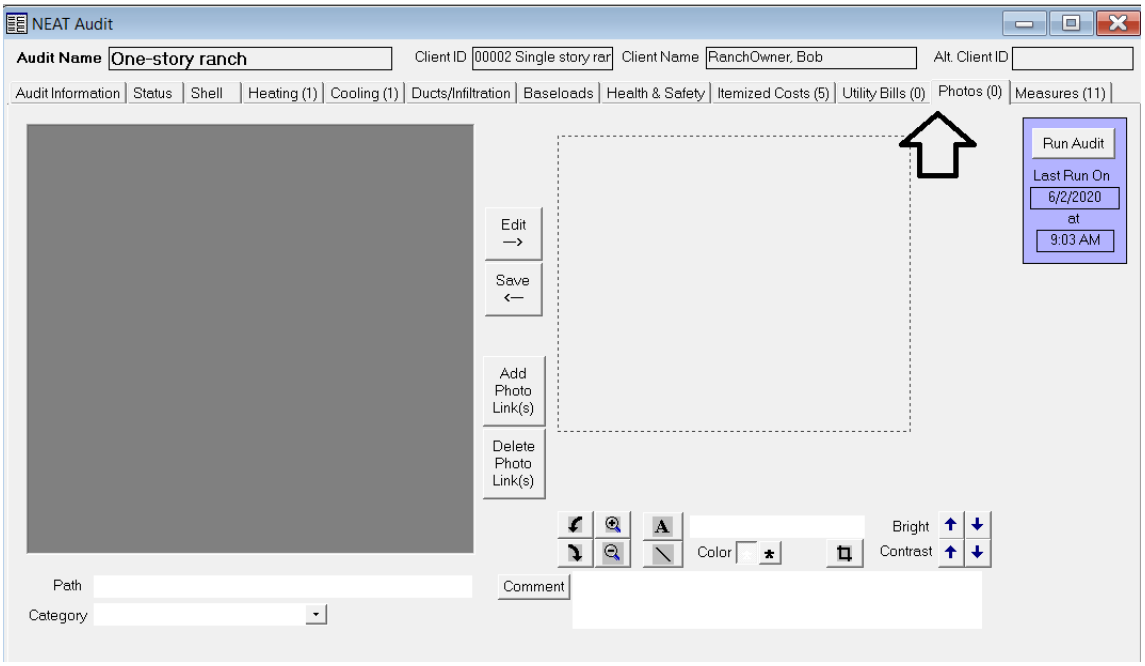
IX.10 Utility Bills

Louisiana WAP Agencies are not required to use the **Utility Bills** tab.



IX.11 Photos

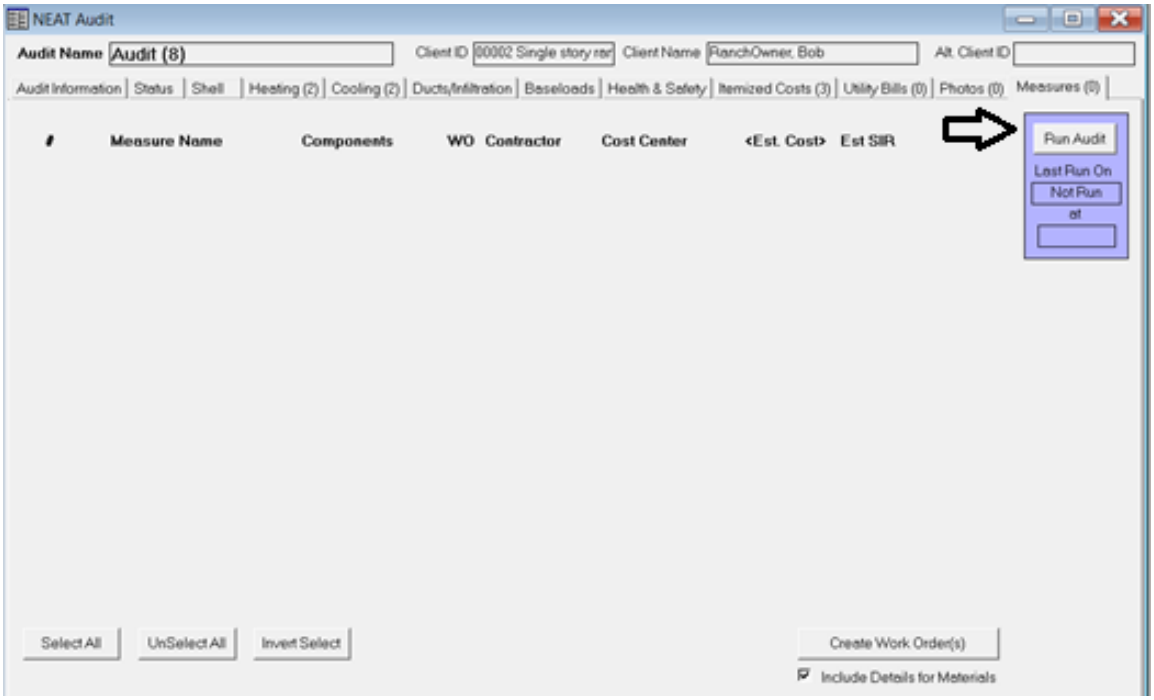
Louisiana WAP Agencies are not required to use the **Photos** tab.



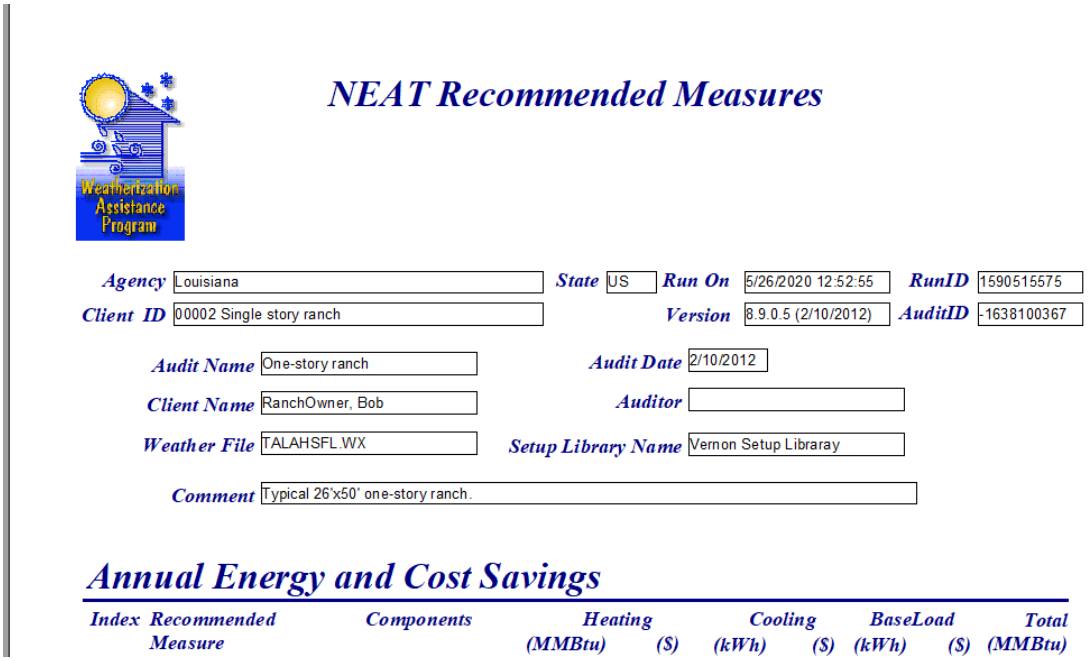
LA WAP Policy: All photos of installed measures are required to be placed in the unit's file.

IX.12 Measures

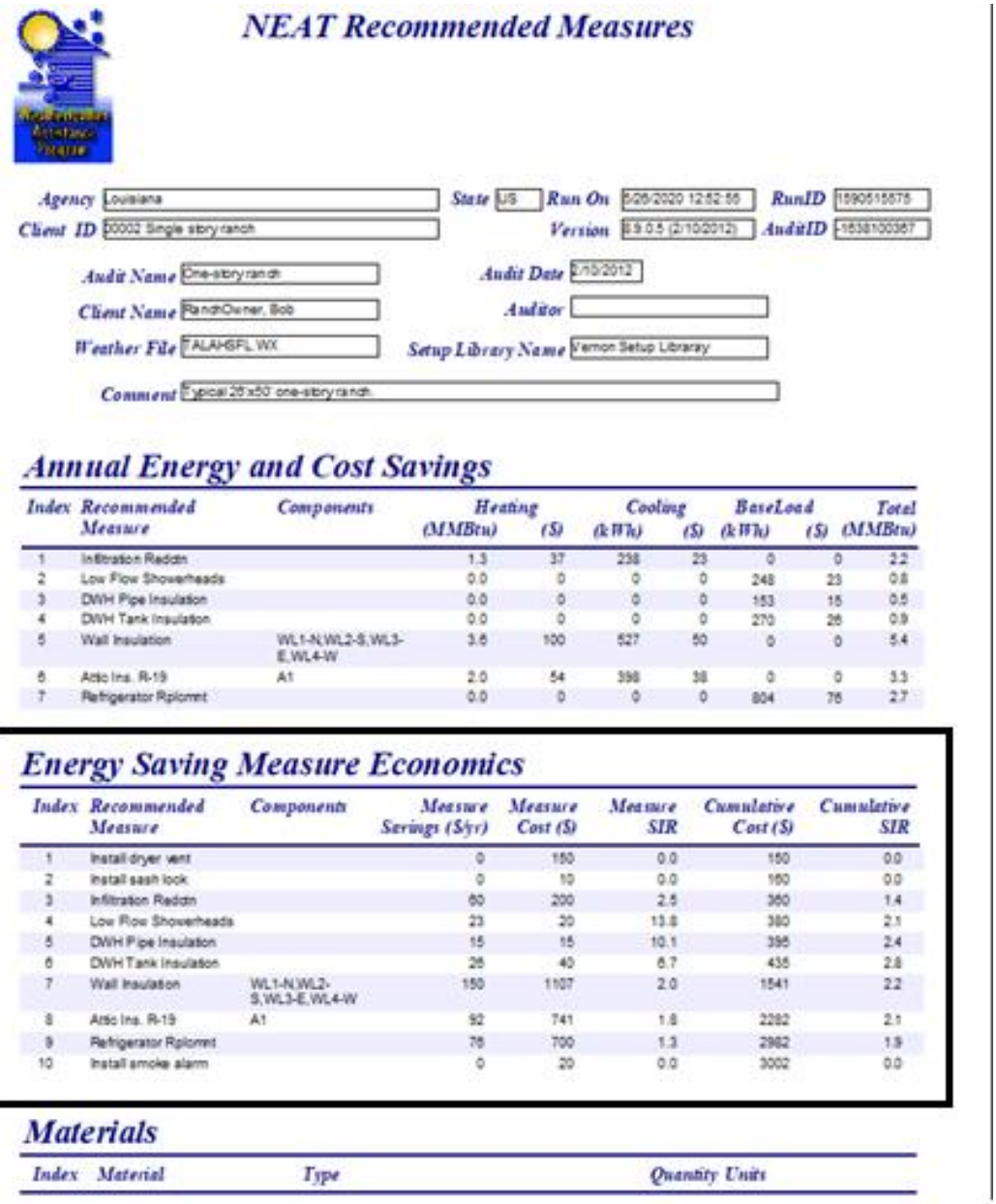
At this point, the energy audit is ready to run by clicking the **Run Audit** button on the **Measures** tab.



After evaluation of the **NEAT Recommended Measures** report, changes can be made under any tab within NEAT, and the audit may be re-run by returning to the **Run Audit** button.



X. NEAT Recommended Measures Report



NEAT Recommended Measures

Agency: Louisiana | State: LS | Run On: 5/26/2020 12:52:55 | RunID: 1590515575
Client ID: 00002 Single story ranch | Version: 8.9.0.5 (2/10/2012) | AuditID: 1638100367

Audit Name: One-story ranch | Audit Date: 2/10/2012
Client Name: RanchOwner, Bob | Auditor:
Weather File: TALAHSFL.WX | Setup Library Name: Vernon Setup Libraray
Comment: Typical 26'x50' one-story ranch.

Annual Energy and Cost Savings

Index	Recommended Measure	Components	Heating (MMBtu)	Heating ($)	Cooling (kWh)	Cooling ($)	BaseLoad (kWh)	BaseLoad ($)	Total (MMBtu)
1	Infiltration Reductn		1.3	37	238	23	0	0	2.2
2	Low Flow Showerheads		0.0	0	0	0	248	23	0.8
3	DWH Pipe Insulation		0.0	0	0	0	153	15	0.5
4	DWH Tank Insulation		0.0	0	0	0	270	26	0.9
5	Wall Insulation	WL1-N,WL2-S,WL3-E,WL4-W	3.6	100	527	50	0	0	5.4
6	Attic Ins. R-19	A1	2.0	54	398	38	0	0	3.3
7	Refrigerator Rplcmnt		0.0	0	0	0	804	76	2.7

Energy Saving Measure Economics

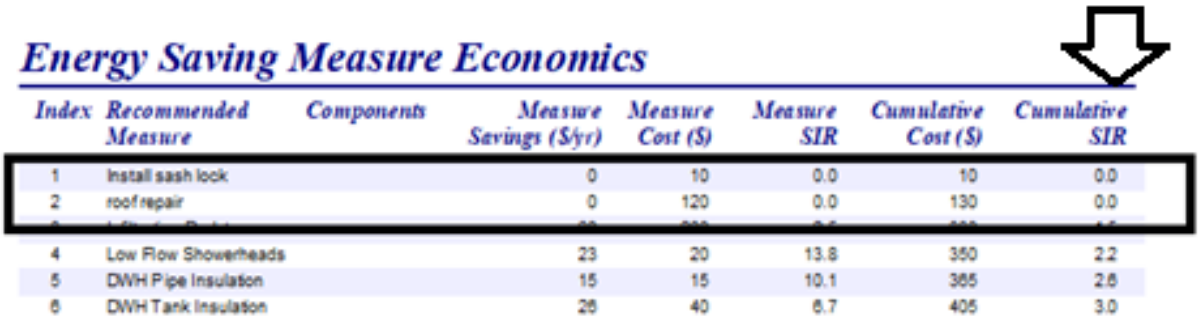
Index	Recommended Measure	Components	Measure Savings ($/yr)	Measure Cost ($)	Measure SIR	Cumulative Cost ($)	Cumulative SIR
1	Install dryer vent		0	150	0.0	150	0.0
2	Install sash lock		0	10	0.0	160	0.0
3	Infiltration Reductn		60	200	2.5	360	1.4
4	Low Flow Showerheads		23	20	13.8	380	2.1
5	DWH Pipe Insulation		15	15	10.1	395	2.4
6	DWH Tank Insulation		26	40	6.7	435	2.8
7	Wall Insulation	WL1-N,WL2-S,WL3-E,WL4-W	150	1107	2.0	1541	2.2
8	Attic Ins. R-19	A1	92	741	1.8	2282	2.1
9	Refrigerator Rplcmnt		76	700	1.3	2982	1.9
10	Install smoke alarm		0	20	0.0	3002	0.0

Materials

Index	Material	Type	Quantity	Units

The **Energy Saving Measure Economics** is the most important table for the energy auditor.

The Incidental Repairs that are needed to complete, preserve, and/or protect energy conservation measures (ECMs) will be located above the ECMs with an Incidental Repair individual and Cumulative SIR of zero.



Energy Saving Measure Economics

Index	Recommended Measure	Components	Measure Savings ($/yr)	Measure Cost ($)	Measure SIR	Cumulative Cost ($)	Cumulative SIR
1	Install sash lock		0	10	0.0	10	0.0
2	roof repair		0	120	0.0	130	0.0
4	Low Flow Showerheads		23	20	13.8	350	2.2
5	DWH Pipe Insulation		15	15	10.1	365	2.6
6	DWH Tank Insulation		26	40	6.7	405	3.0

[Universal Policy](): Each individual **Measure SIR,** except for Infiltration Reduction**, must have an SIR of 1.0 or greater** to be eligible as an ECM.

The **Infiltration Reduction** individual measure SIR can be below 1.0 with air sealing performed on the unit, **as long as**, the unit's **total Cumulative SIR is 1.0 or greater.**

Energy Saving Measure Economics

Index	Recommended Measure	Components	Measure Savings ($/yr)	Measure Cost ($)	Measure SIR	Cumulative Cost ($)	Cumulative SIR
1	Install sash lock		0	10	0.0	10	0.0
2	new bonus room finished		0	3500	0.0	3510	0.0
3	roof repair		0	120	0.0	3630	0.0
4	Infiltration Redctn		7	500	0.1	4130	0.0
5	Smart Thermostat		96	75	15.2	4205	0.3
6	Low Flow Showerheads		16	20	9.7	4225	0.3
7	DWH Pipe Insulation		10	15	7.1	4240	0.4
8	Lighting Retrofits	L1	79	66	5.0	4306	0.4
9	DWH Tank Insulation		15	40	4.1	4346	0.5
10	Wall Insulation	WL1-N,WL2-S,WL3-E,WL4-W	251	1107	3.4	5452	1.1
11	Attic Ins. R-30	A1	254	1170	3.2	6622	1.4
12	Floor Ins. R-19	FCR1	145	1320	1.7	7942	1.5
13	H&S Water Heater		0	650	0.0	8592	0.0
14	Install dryer vent		0	150	0.0	8742	0.0

The Health and Safety items are assigned to the bottom of the table and do not have a SIR and do not contribute to the **Cumulative SIR**.

Energy Saving Measure Economics

Index	Recommended Measure	Components	Measure Savings ($/yr)	Measure Cost ($)	Measure SIR	Cumulative Cost ($)	Cumulative SIR
1	Install sash lock		0	10	0.0	10	0.0
2	new bonus room finished		0	3500	0.0	3510	0.0
3	roof repair		0	120	0.0	3630	0.0
4	Infiltration Redctn		23	200	1.0	3830	0.1
5	Low Flow Showerheads		27	20	16.0	3850	0.1
6	DWH Pipe Insulation		17	15	11.8	3865	0.2
7	DWH Tank Insulation		30	40	7.8	3905	0.3
8	Attic Ins. R-19	A1	157	741	3.1	4646	0.7
9	Wall Insulation	WL1-N,WL2-S,WL3-E,WL4-W	170	1107	2.2	5752	1.0
10	Install dryer vent		0	150	0.0	5902	0.0
11	Install smoke alarm		0	20	0.0	5922	0.0

Universal Policy: The whole house **Cumulative SIR** must have an **SIR of 1 or greater.** If not, all weatherization work is **ineligible**.

Excessive Incidental Repair work will bring the **Cumulative SIR** below 1, resulting in a package that does not meet DOE rules or Louisiana policies.

Energy Saving Measure Economics

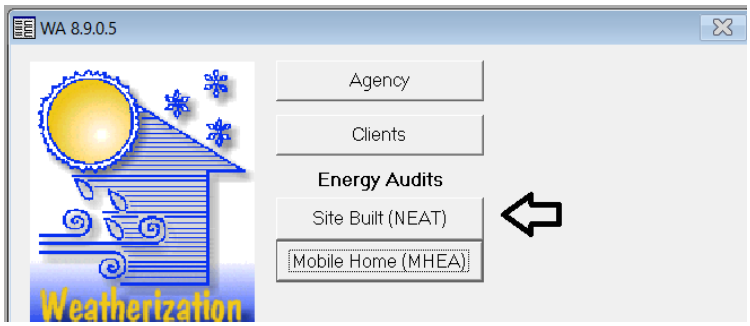
Index	Recommended Measure	Components	Measure Savings ($/yr)	Measure Cost ($)	Measure SIR	Cumulative Cost ($)	Cumulative SIR
1	Install sash lock		0	10	0.0	10	0.0
2	new bonus room finished		0	3500	0.0	3510	0.0
3	roof repair		0	120	0.0	3630	0.0
4	Infiltration Redctn		5	500	0.1	4130	0.0
5	Low Flow Showerheads		16	20	9.7	4150	0.1
6	DWH Pipe Insulation		10	15	7.1	4165	0.1
7	Smart Thermostat	HS1	39	75	6.1	4240	0.2
8	DWH Tank Insulation		15	40	4.1	4280	0.2
9	Attic Ins. R-19	A1	150	741	3.0	5021	0.6
10	Wall Insulation	WL1-N,WL2-S,WL3-E,WL4-W	160	1107	2.1	6127	0.9
11	Install dryer vent		0	150	0.0	6277	0.0
12	Install smoke alarm		0	20	0.0	6297	0.0

XI. Work Orders

XI.1 Creating a Work Order

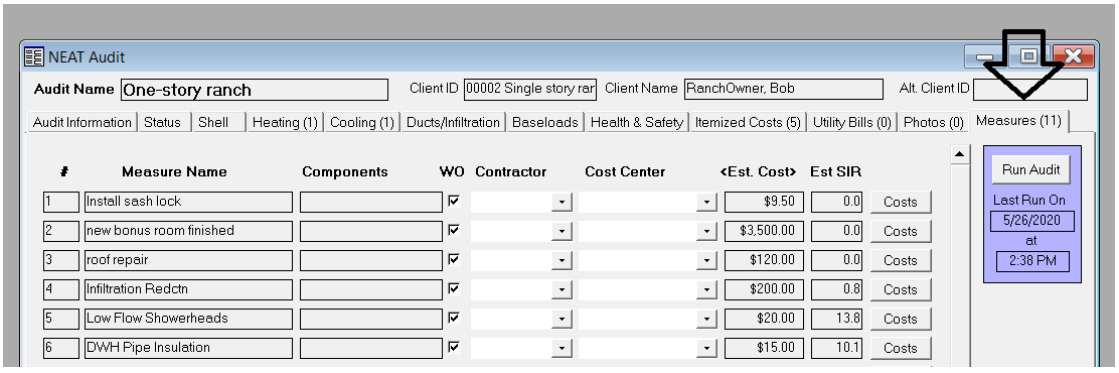
Once the WA audit has been run and completed for a unit, the next step is to create a **Work Order**.

From the **WA Main Menu Splash Screen,** click on **Site Built (NEAT)** button.

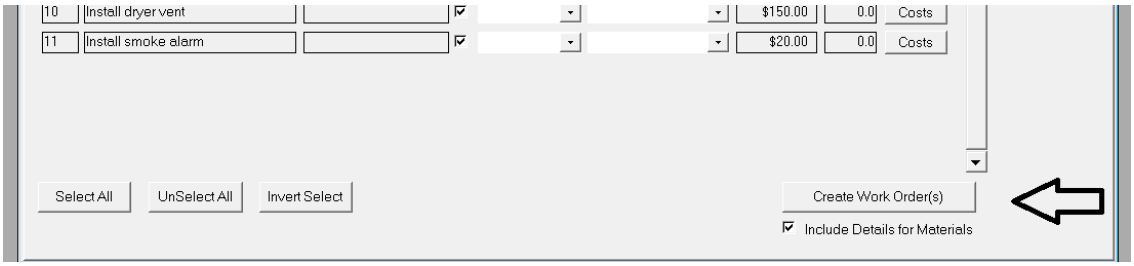


Note: *This is the recommended way to create a Work Order. To create a* ***new*** *work order for an audit, the best way is to create the work order* ***inside*** *the NEAT audit and not through the Work Order button on the WA Splash Screen. Creating a work order through the WA Splash Screen will not associate it to the audit being worked on.*

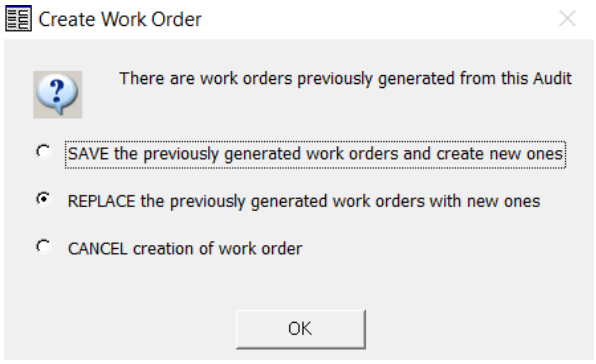
Navigate to the **Measure** tab.



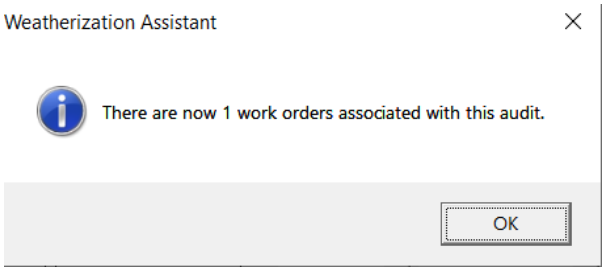
Click on the **Create Work Order(s)** button in the bottom right corner to create a work order.



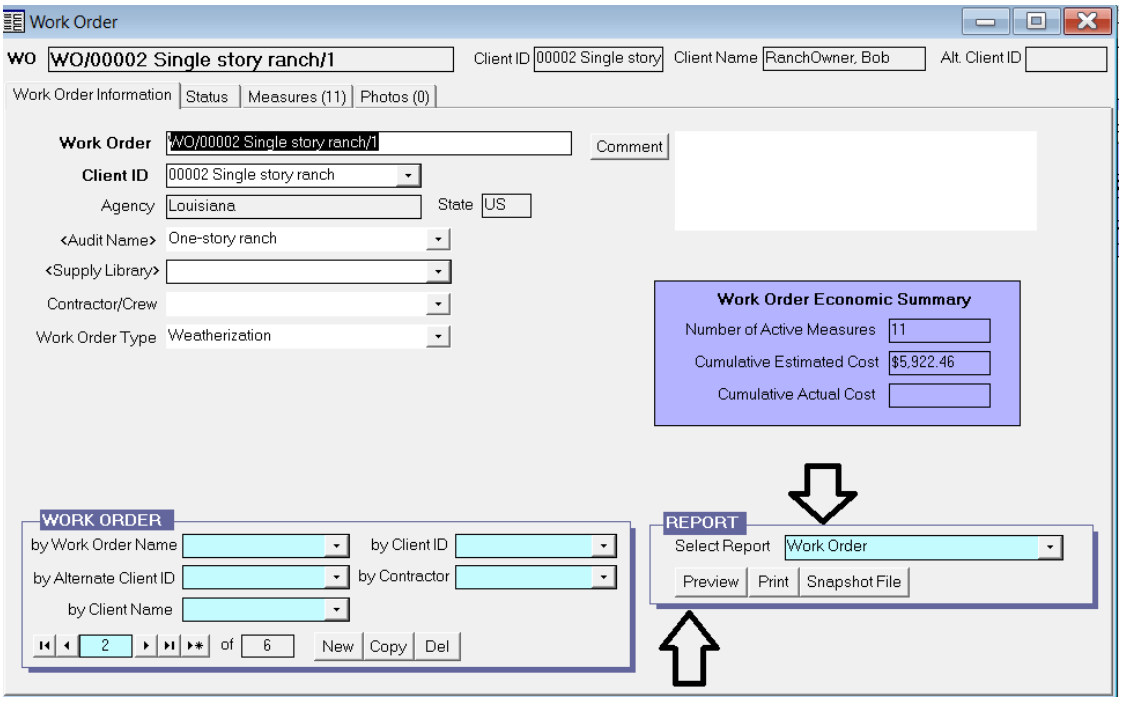
When the **Create Work Order** dialogue box appears choose the appropriate **option** and click **OK**.



Click **Ok** again for the **Work Order** tab.



Select **Work Order** in the **Report** box, and click the **Preview** button to view the work order in PDF format.



The **Work Order Report** will contain:

- Name of the Audit
- Client information
- All measures to be completed by the contractor
- Comments entered

[Left Intentionally Blank]

Work Order

WORK ORDER INFORMATION

Work Order Name: WO/00002 Single story ranch/1
Work Order Type: Weatherization
Audit Name: One-story ranch

CLIENT INFORMATION

Client Name: RanchOwner, Bob
Client ID: 00002 Single story ranch
Alt. Client ID:
Address: ,

CLIENT CONTACT INFORMATION

RanchOwner, Bob	(651) 234-5678	(651) 123-4567	Applicant/Person of Record	☑
RanchFriend, Fred		(651) 888-9999	Other Contact for Applicant	☐

AGENCY INFORMATION

Agency: Louisiana
Address: ,
Agency Phone:
Fax:
Email Address:

Company Name & License Number: _____

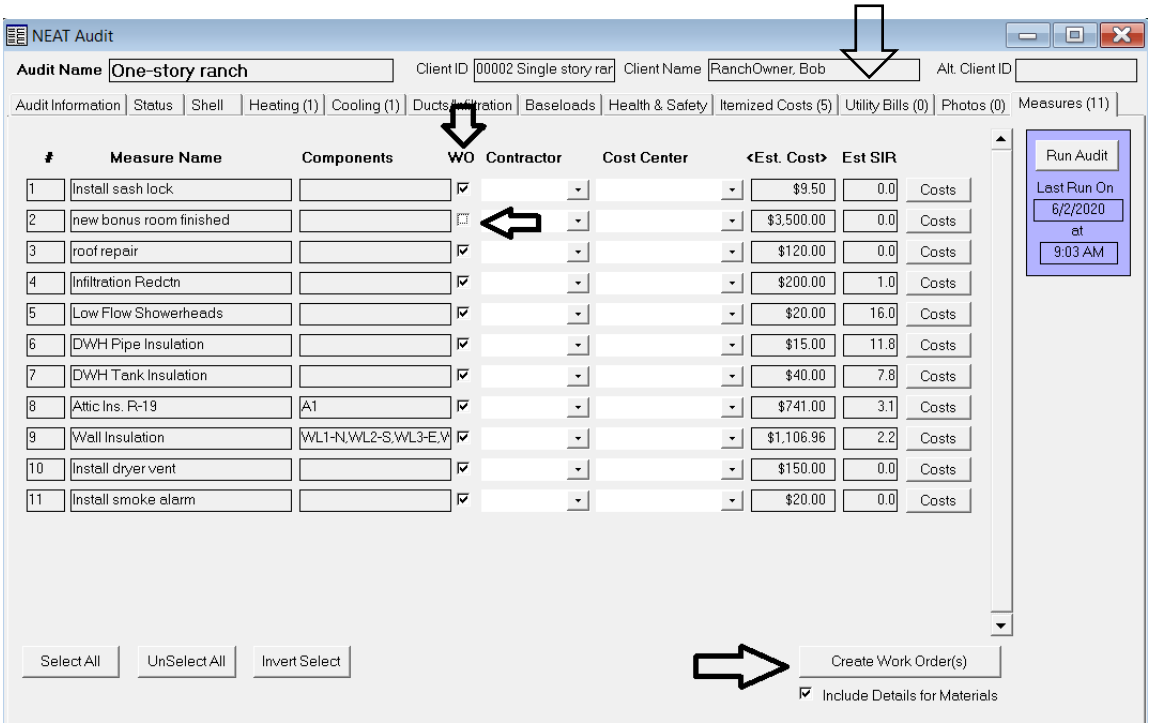
Contractor's Signature: _____

COMMENT

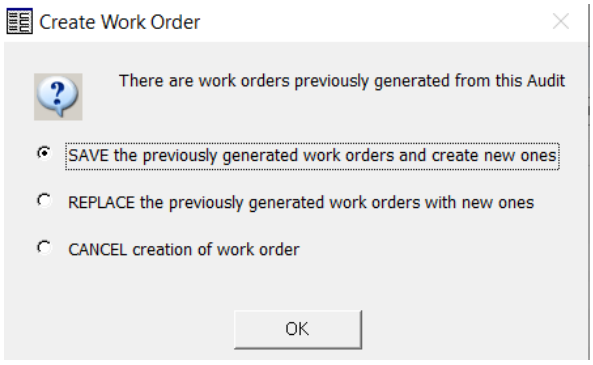
[Left Intentionally Blank]

XI.2 Customizing a Work Order

Under the **NEAT Audit - Measure** tab, multiple work orders can be created and customized with measures separated out for specific contractors by checking or unchecking the box under the heading **WO.**

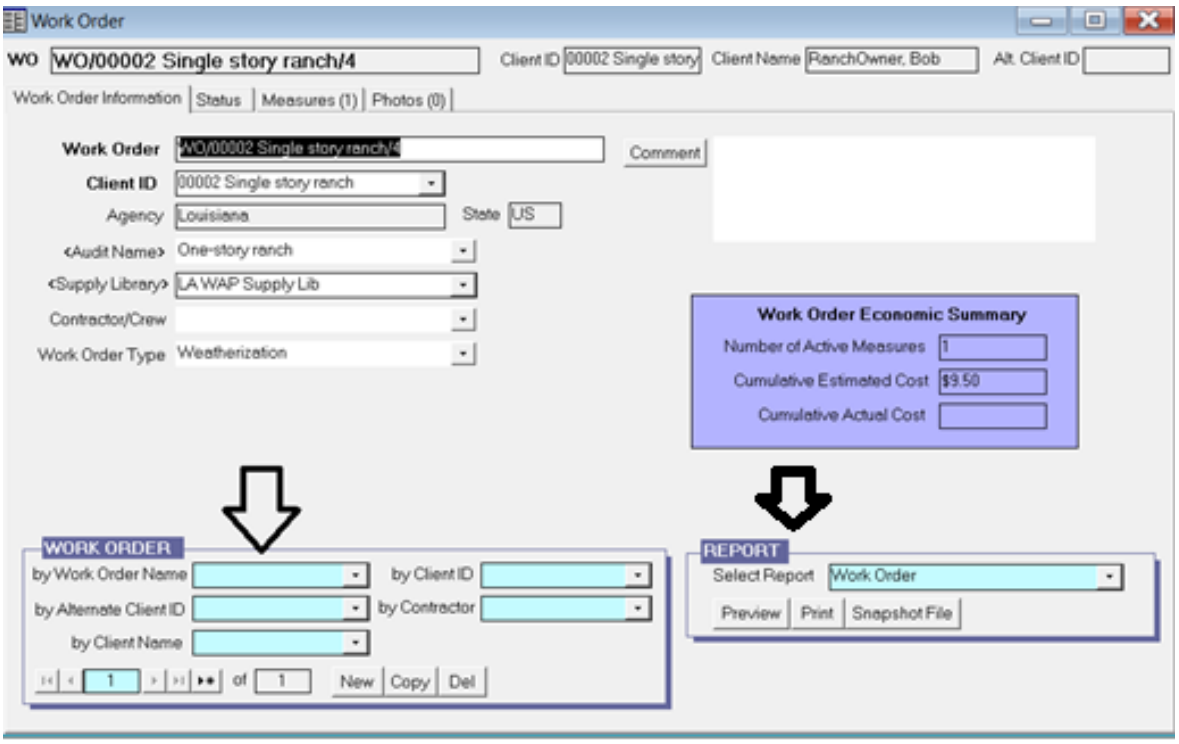


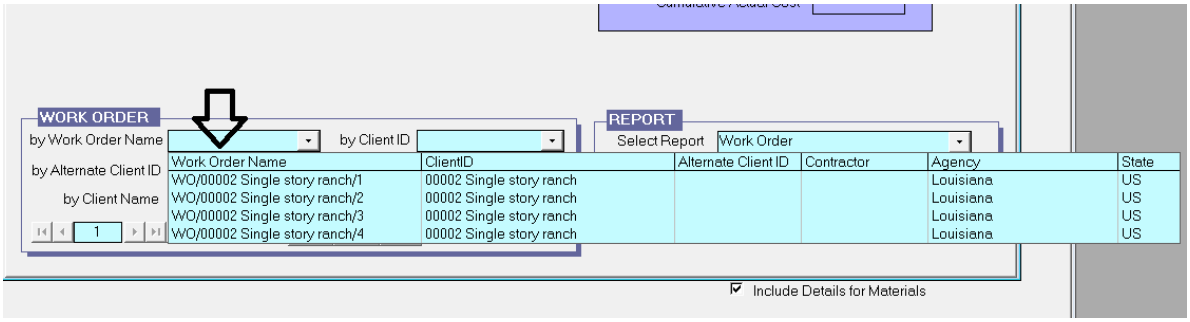
To create and print the customized work orders, select the **Create Work Order(s)** button at the bottom of the **Measure** tab. If this is going to be an additional work order, select the **SAVE the previously generated work orders and create new ones** option.



XI.3 Work Order Information

To view all work orders for the audit, click on the drop-down menu in the **Work Order** control box under the **Work Order Information** tab.

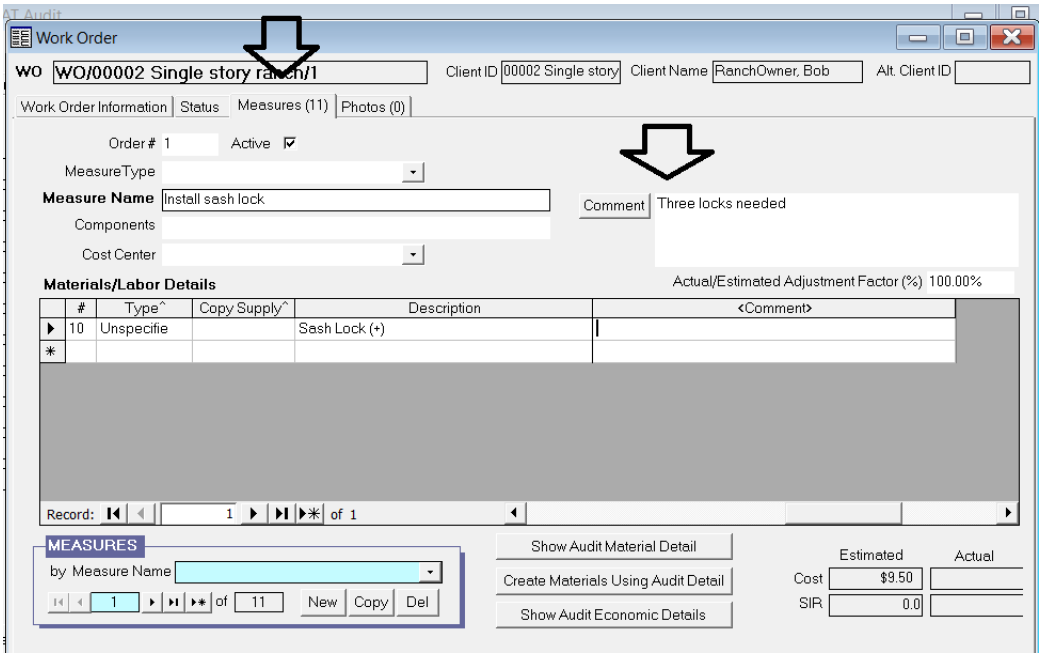




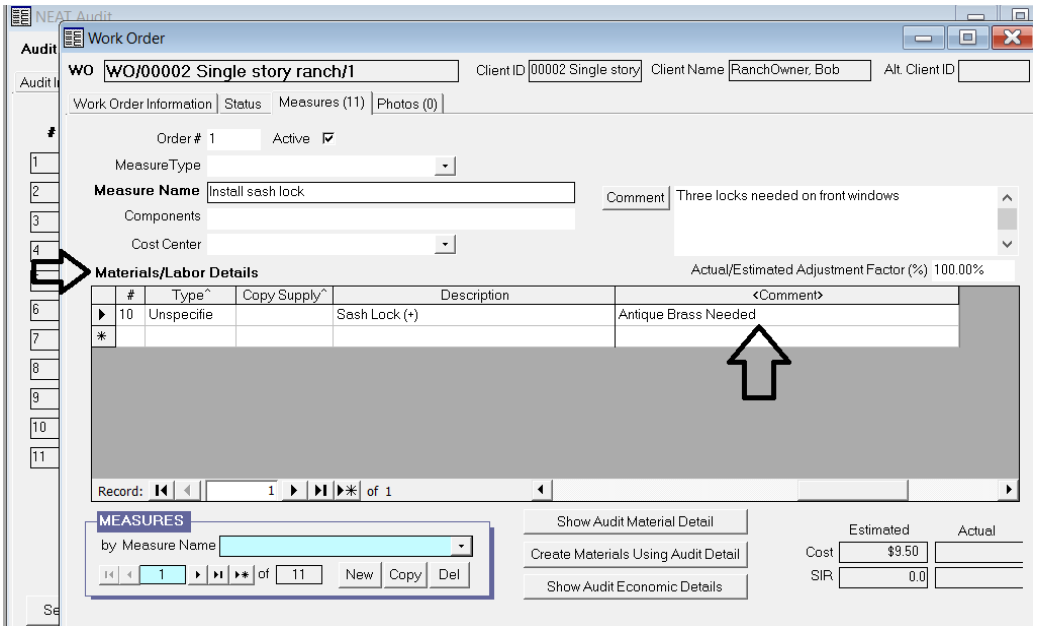
To preview, print, or take a snapshot file of the work order, use the **Report** control box.

XI.4 Measures

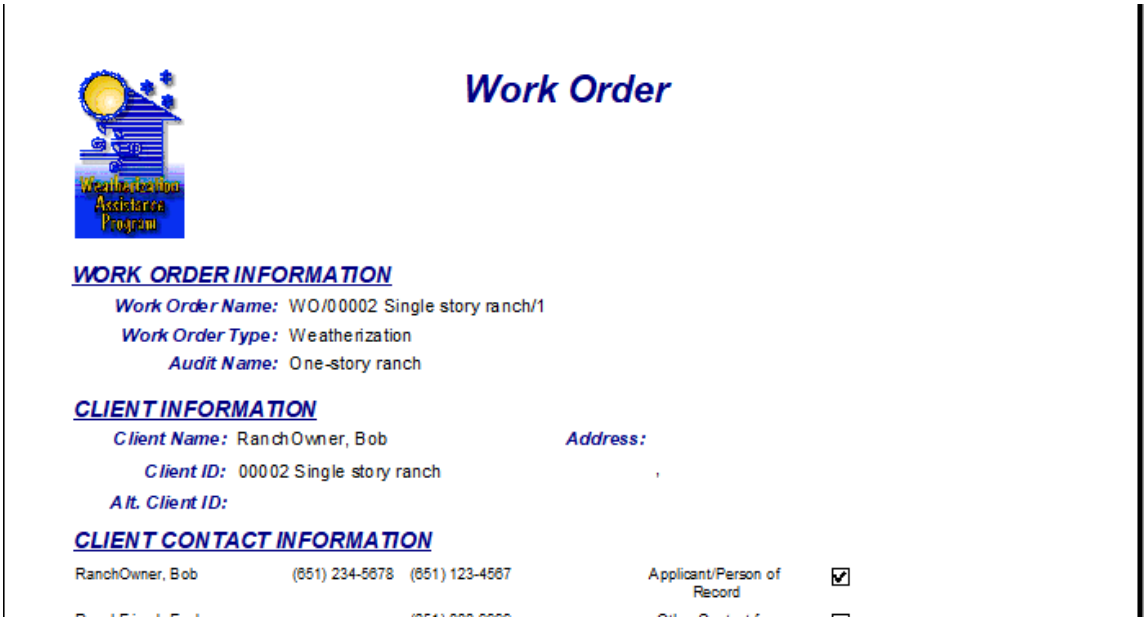
To **add comments and/or instructions** to the measures, click on the **Measure** tab in the **Work Order** and add the needed comments for the measure in the **Comment** box provided.



To add comments to the materials and/or labor, use the horizontal scroll bar in the **Material/Labor Details** box to navigate the spreadsheet to the right to locate the **Description** and **Comment** areas. Add the needed description and/or comments for the **Material/Labor Details**.



To print the Work Order with the added comments, go to the **Work Order Information** tab and select the **Work Order** in the **Report** box and click **print or preview.**



Work Order

WORK ORDER INFORMATION

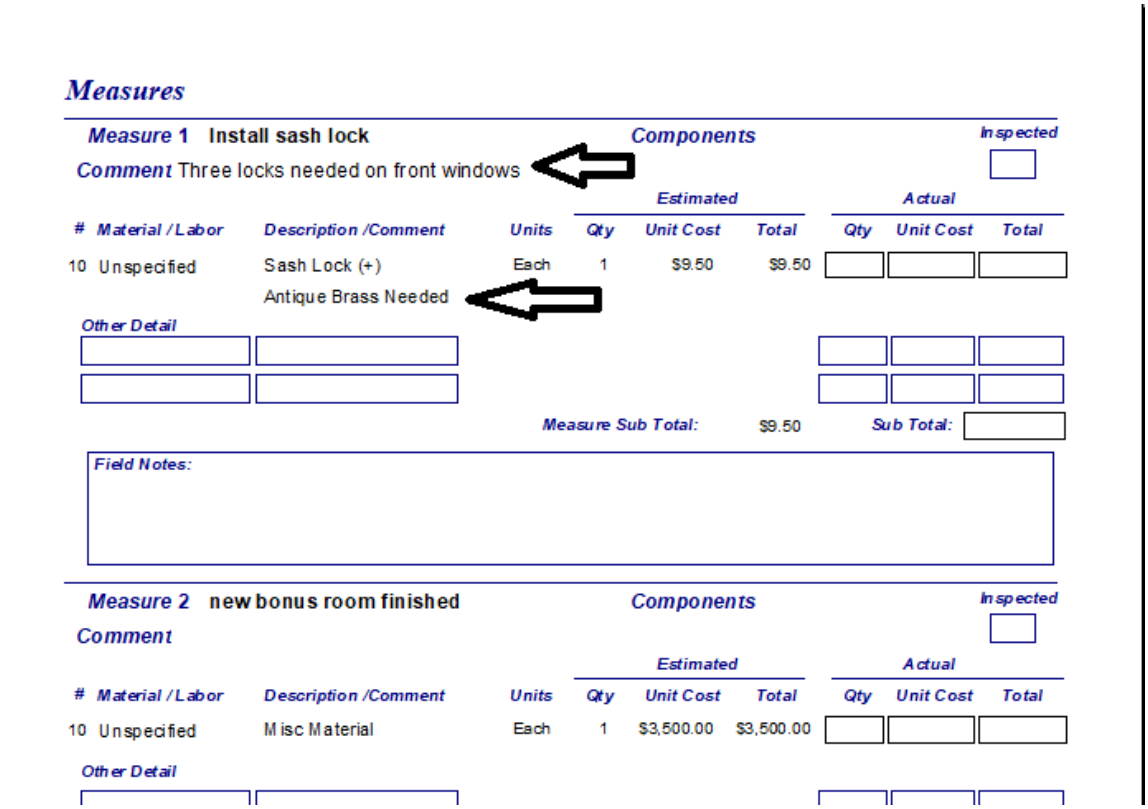
Work Order Name: WO/00002 Single story ranch/1
Work Order Type: Weatherization
Audit Name: One-story ranch

CLIENT INFORMATION

Client Name: RanchOwner, Bob *Address:*
Client ID: 00002 Single story ranch
Alt. Client ID:

CLIENT CONTACT INFORMATION

RanchOwner, Bob	(651) 234-5678	(651) 123-4567	Applicant/Person of Record ☑



Measures

Measure 1 Install sash lock — Components — Inspected ☐

Comment Three locks needed on front windows

#	Material / Labor	Description /Comment	Units	Estimated Qty	Estimated Unit Cost	Estimated Total	Actual Qty	Actual Unit Cost	Actual Total
10	Unspecified	Sash Lock (+)	Each	1	$9.50	$9.50			
		Antique Brass Needed							

Other Detail

Measure Sub Total: $9.50 *Sub Total:*

Field Notes:

Measure 2 new bonus room finished — Components — Inspected ☐

Comment

#	Material / Labor	Description /Comment	Units	Estimated Qty	Estimated Unit Cost	Estimated Total	Actual Qty	Actual Unit Cost	Actual Total
10	Unspecified	Misc Material	Each	1	$3,500.00	$3,500.00			

Other Detail

Attachment A

Louisiana Energy Audit Data Collection Form

Louisiana Housing Corporation

Energy Audit Data Collection Form

AGENCY / PARISH

App. Date:

Application #:

ClientID:

ClientName:

Day Phone:

ClientAddress:

parish:

ClientPrecinct:

Assessors:

Contact Types

1. Applicant/Person of Record
2. Other Contact for Applicant
3. Landlord / Owner 1
4. Landlord / Owner 2

Contact Name:	Relation:	Day Phone:	Type: -

Ownership:

Owner ◯
Renter ◯
Other ◯

Occupants:

SeniorFlag: ◯
JuvenileFlag: ◯
DisabilityFlag: ◯

Household size:
Ethnicity:
Client Language:
Disability Type:

Dwelling Setup

_____# Rooms (T house)
_____# Bedrooms
_____# Smokers/Pets
_____# Fireplaces
_____# Unvented Heaters
_____# CO2 Patient

Dwelling Type

◯ Site Built
◯ Mobile Home
◯ Duplex
◯ Multifamily(>4)
◯ Shelter
◯ Other

ROOF TYPE:

☐ FLAT
☐ PICKED
☐ GABLE
☐ HIP
☐ MANSARD

ROOF MATERIALS:

☐ SHINGLE
☐ METAL Industrial
☐ Metal Corrugated
☐ WOOD
☐ Slate
☐ Cool Seal Needed
☐ Need Repair

SIDING:

☐ Vinyl
☐ Brick
☐ Asbestos Shingle
☐ Hardie Board
☐ Wood Lap
☐ Aluminum
☐ Need Repair

Wind Shielding:

Well ◯ Normal ◯ Exposed ◯

Home Leakiness:

Tight ◯ Medium ◯ Loose ◯

Ventilated O Not Ventilated O

Orien Long Wall
North O East O South O West O

WARNING:

LEAD PAINT ◯
MOISTURE PROBLEMS ◯
SEWER PROBLEMS ◯
Not Friendly Trailer Access ◯
Beware of Dog(s) ◯
Gas Leaks in House ◯
Gas Leaks Outside House ◯

Cond. Stories:
Year Built:
Length :
Width:
Height:
FloorArea Sq':
Volume of Air
Outdoor Temp Pre:
Post:
Wind Condition Pre:
Post:

Orient Long Wall:
North ◯ East ◯ South ◯ West ◯

Blower Door Manometer Used Pre and Post:

Calibration dates Pre Post:

Pre :
Ring:
Pa:
Base:
CFM 50 AST :
ASHRAE Target:
Minimum CFM Reduction:
ASHRAE: Required MVR:
Fan Needed: ◯ Fan Cap:
Fan Run/Hour:
Post:
Ring:
Pa:
Base:

TARGET REDUCTION PERCENTAGES					
No Air Sealing	20%	30%	40%	45%	50%
0-1250	1251-2750	2751-4250	4251-5500	5501-7500	>7501

PRIMARY SOURCE OF HEAT:

☐ Unvented Heater ☐ Vented Gas Heater ☐ Portable 110 V
☐ Stove ☐ HVAC ☐ AC Windows 220V

Primary Heating Fuel:

Electricity ◯
Natural Gas ◯
Propane ◯
Oil ◯
Wood ◯

Annual Cost:

Est.% for Heating:

High Use ◉
High Burden ◉

Outdoor WH Closet: ◯

Louisiana Housing Corporation

Application #: ClientID: Date:

ClientName: Day Phone: Assessors:

Wall Type:		Exterior Type:		Exposure:
1. Baloon Frame	4. Cinder Block	1. Wood	4. Stucco	1. Exposed
2. Platform Frame	5. Adobe	2. Brick (Stone)	5. Masonite	2. Buffered
3. Masonry / Stone	6. Other	3. Metal (Vinyl)	6. Other	3. Attic

Existing Insulation		Add Insulation	MH Insulation
1. None	4. Rockwool	1. None	1. Batt/Blanket (in)
2. Bln Cellulose	5. Fiberglass Batts	2. Bln Cellulose	2. Loose Fill (in)
3. Bln Fiberglass	6. Polystyrene / Other	3. Bln Fiberglass	3. Foam Core (in)

Walls	Wall Type	Stud Size	Exterior Type	Exposure	Orientation	W' / H'	Area	Exist. Insul.	Depth	Add Insul	MH Type / Thick
WALL 01											
WALL 02											
WALL 03											
WALL 04											
WALL 05											
WALL 06											
WALL 07											
WALL 08											
WALL 09											
WALL 10											

WindowType	Slider	Frame Type	Glazing	Interior Shade	Ext. Shade	Leakiness	Number	Retrofit
1. Jalousie	1. Horizontal	1. Wood / Vinyl	1. Single Pane	1. Drapes	1. Low E Film	1. Tight	# of windows	1. Evaluate
2. Slider	2. Vertical	2. Metal	2. Sngl. P. W/ Storm	2. Drapes w/ Shades	2. Solar Screen	2. Medium	With the same	2. Add Storm
3. Fixed	3. Left - Right	3. Improved Metal	3. Double Pane	3. Blinds / Shades	3. Awning	3. Loose	Description	3. Weatherize
4. Door Window	4. Right - Left	4. COLOR - B M W	4. Dbl. P. W/ Low E	4. None	4. Carport	4. Very Loose		4. Replace
5. Door Slider					5. Porch			5. Solar Scrn
6. Skylight					6. None			6. None

S h a d e

Windows	Type	Slider	Frame	Color	Glazing	Interior	Exterior	%Shade	Leakiness	Wall	Num	Retro	W '	H '	NOTES
WIND 01															
WIND 02															
WIND 03															
WIND 04															
WIND 05															
WIND 06															
WIND 07															
WIND 08															
WIND 09															
WIND 10															

Louisiana Housing Corporation

Housing App#: | ClientID: | Assessors: | Date:

ClientName: | Day Phone:

Door Type	StormDoor	Number	Measure	Swing	Lockset	Air Seal	Threshold Oak/Bumper	Hinge	Strike
1. H-Core Wood 4. Sngl Sliding Glass 2. S-Core Wood 5. Dbl Pane Glass 3. Insulated Steel	1. Adequate 2. Deteriorated 3. None	# of Doors With the same Description	1. Repair 2. Replace	1. Right Hand 2. Left Hand	1. DeadBolt 2. Knob 3. Combo	1. Jamb Up 4. V-Seal (C/B) 2. Q-Lon 3. Sweep (M/B)	1. 3/4 Oak 4. 1 x 5/8 Bumper 2. 1 Oak 5. 1/2 Bumper 3. 1 Bumper 6. 3/4 Bumper (B)	1. Reg 2. NRP	1. Reg 2. Lrg

DoorCode	DoorType	Area	StormDoor	WallCode	Number	Measure	Swing	Width	Height	Thick	Lockset	Air Seal	Thresh	Hinge	Strike	Viewer
DOOR 01																
DOOR 02																
DOOR 03																
DOOR 04																
DOOR 05																
DOOR 06																

Unfinished Attic

AtticType	JoistSpace	Type	Material
1. Unfloored 2. Floored 3. Cathedral / Flat	1. 16 in 2. 18 in 3. 24 in	1. Batts 2. Blown 3. Other	1. Fiberglass 2. Rockwool 3. Cellulose

Existing Insulation

AtticCode	AtticType	Joist Sp	Area	Type	Material	Depth	R Value
UFA 01							
UFA 02							
UFA 03							

Mobile Home Ceiling

Roof Type	Roof Color	Exist Insula
1. Bowstring 2. Flat 3. Pitched	1. Reflective 1. Shaded 2. Normal	1. Batt/Blanket 1. Loose Fill 2. Foam Core

Type	Color	Insula	Depth in	R Value

Cathedral % | Roof Height at Center

Additional Framing

Type

1. Cathedral
2. Kneewall
3. Skylight

Type | Sq ft.

Centers

1. 16 in
2. 18 in
3. 24 in

O/C

Heat Sources

1. WH / Furn
2. Exh Fan
3. Rec Lght

HeatSrc

Hatch

1. Replace
2. WZNstrip
3. Batt/Baffle

Hatch

Stairbox

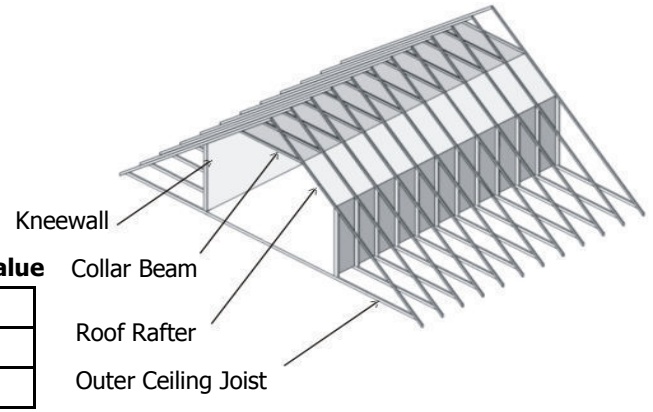
Exist | Add | Batt/Baffle

Finished Attic

Area Type	Floor Type	Type	Material
1. Outer Ceiling Joist 2. Collar Beam 3. Kneewall 4. Roof Rafter	1. Unfloored 2. Floored	1. Batts 2. Blown 3. Other	1. Fiberglass 2. Rockwool 3. Cellulose

Existing Insulation

Attic Code	Area Type	Floor	Area	Type	Material	Depth	R Value
FA01							
FA02							
FA03							



The four parts of a finished attic define the envelope of the heated area

Louisiana Housing Corporation

Housing App#: | ClientID: | Assessors: | Date:

ClientName: | Day Phone:

Foundations

Foundation Type

1. Conditioned
2. Non Conditioned
3. Vented Non Cond.
4. Unintentionally Cond.
5. Uninsulated Slab
6. Insulated Slab
7. Exposed Floor

FoundCode	FoundType
FD 01	
FD 02	
FD 03	

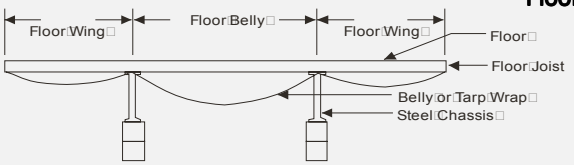
Floor — Area (sq ft) | Exist. Insul. R-Value

Sill — Joist Spacing (in) | Perimeter to Insul (ft)

F. Wall — Height (ft) | Height Exposed (%) | Perimeter (ft) | Exist. R-Value

Foundation Insulation options ○ Floor ○ None

Mobile Home Floor



Floor Joist Direction ○ Lengthwise ○ Widthwise

Is there a Skirt? ○ Yes ○ No

Floor Wing Description

Joist Size (in) | Loose Insul (in)

Batt Insul. Location

1. Attached to flooring
2. Between Joist
3. Attached Under Joist
4. None"

Location | Thickness

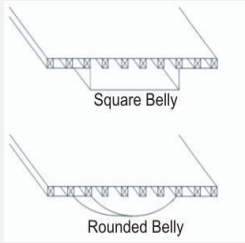
Floor Belly (Center) Desc.

Joist Size (in) | Loose Insul (in)

Batt Insul. Location

1. Attached to flooring
2. Between Joist
3. Attached Under Joist
4. Draped Below Joist
5. None

Location | Thickness



Belly Configuration

○ Square ○ Rounded ○ Flat

Belly Condition

○ Good ○ Average ○ Poor

Max Depth Belly Cavity (in)

Mobile Home Shell (Continued)

Walls — **MH Insulation**

1. Batt/Blanket (in)
2. Loose Fill (in)
3. Foam Core (in)

MH Type / Thick

Enter the wall area not accessible for insulating.

Uninsulatable Area (sq ft)

Windows — Average Size: Width | Height

Number Facing: North | East | South | West

Doors — Average Size: Width | Height

Number Facing: North | East | South | West

Carport / Porch / Roof

Width | Length | Orientation: N E S W

Mobile Home Additions

Use the "A" suffix in the Wall, Window, Door Code to signify a MH Addition; ie Wall01A, Win01A, D01A
Utilize the Wall, Window, and Door data collection pages, to record MH Addition information

Walls — Stud Size

Orientation: North East South West

Ventilation: Ventilated Not Ventilated

MH Addition Insul

1. Batt/Blanket (in)
2. Loose Fill (in)
3. Foam Core (in)

MH Addition - Wall config

1. Max Wall height at Interior wall
2. Max Wall height in Rm center
3. All Addition Wall the same height

MH Type / Thick

Addition Interior Wall — Max Height | Max Width

Windows — Average Size: Width | Height

Number Facing: North | East | South | West

Doors — Average Size: Width | Height

Number Facing: North | East | South | West

MH Addition - Floor Type

1. Crawl Space
2. Slab on Grade
3. Exposed Floor

Joist Size

Addition Floor Batt

1. Attach to flooring
2. Between Joist
3. Attach Under Joist
4. None

Depth in | Add inches

FlrLength | Width

Ceiling — Joist Size

Roof Color

1. Reflective
1. Shaded
2. Normal

Exist Insula

1. Batt/Blanket
1. Loose Fill
2. Foam Core

Depth in

Louisiana Housing Corporation

Housing App#: | ClientID: | Assessors: | Date:

ClientName: | Day Phone:

Heating Equipment Type		Fuel Type		Equipment Location
1. Gravity Furnace	6. Heat Pump	1. Natural Gas	5. Oil	1. Heated Space
2. Forced Air Furnace	7. V-Space heater	2. Electricity	6. Propane	2. Uncond. Space
3. Sealed Combustion	8. UnV-Space Heater	3. Wood	7. Coal	3. Unintentional Heated
4. Fixed Elect Resistance	9. V-Wall Furnace	4. Kerosene	8. Other	
5. Portable Electric	10. UnV-Wall Furnace			

Uninsulated Supply Ducts

Duct Type Rect/Round	Length	Width	Height if Rectangular	Diameter if Circular

MH	Primary Sys	SysCode	EquipType	FuelType	% Supplied	Equip Location	Manufacturer	Model	Sq'	Watt	Amp	Volt		HSPF or	Yr.Purch.
◯	◯	HS01											Heat Pump Details		
◯	◯	HS02													
◯	◯	HS03													

Required Heating System Details

Input Heating Units		Condition	
1. No Input	4. Lbs/hr	1. Good	4. Broken (non-function
2. kBTU/hr	5. CCM	2. Fair	5. None
3. Gals/hr		3. Poor (functions)	

Mobile Home Heating System Details

MH Duct Location
1. Floor
2. Ceiling
3. None

MH Duct Insulation Location	
1. Above Duct	4. No Insulation
2. Below Duct	
3. Around or Ductboard	

SysCode	MH Duct Loc	MH Duct Insul. Loc
HS01		
HS02		
HS03		

SysCode	InputUnits	InputRating	Output Cap. (in heat units)	SS Eff. %	EquipCond.	Smart Therm
HS01						◯
HS02						◯
HS03						◯

CO Analyzer Used Pre and Post Audit:

Calibration Date Pre Post:

Additional Heating System Details

Burner Condition	Pilot Condition	Elect. Serv. Switch
1. Good	1. Good	1. Good
2. Fair	2. Fair	2. Fair
3. Poor (working)	3. Poor (working)	3. Poor (working)
4. Broken (not working)	4. Broken (not working)	4. Broken (not working)

SysCode	BurnerCond	PilotCond	E.Serv.Switch	C/O levels	GasLeak	Cracked Heat Exchanger	Fuel Shut Off Not Present	Drip Leg Not Present	Therm.Type	Day Setting	Night Setting
HS01					◯	◯	◯	◯			
HS02					◯	◯	◯	◯			
HS03					◯	◯	◯	◯			

SysCode	Additional Comments
HS01	
HS02	
HS03	

Louisiana Housing Corporation

Housing App#: | ClientID: | Assessors: | Date:

ClientName: | Day Phone:

Cooling System Details

AC Unit Type

1. Central
2. Window
3. Heat Pump
4. Evaporative

AC Code	Additional Comments
AC0___	
AC0___	

AC Code	AC Type	AC Manufacturer	AC Model #	Area Cooled (sq')	Size (kBTU/hr)	SEER	Or Year Purchase
AC01							
AC02							
AC03							
AC04							

Mobile Home Additional Comments

Mobile Home Cooling System Details

EfficiencyUnits
1. COP
2. EER
3. SEER

DuctLocation
1. Floor
2. Ceiling
3. None

DuctInsul.
1. Above Duct
2. Below Duct
3. Around Duct
4. None

Primary	Mobile Home	Capacity (kBTU/hr)	Eff. Rating	Eff. Units	DuctLoc	Insul	% Cooled
○	○						
○	○						
○	○						
○	○						

WHOLE HOUSE INFILTRATION REDUCTION / BLOWER DOOR

Comments:

Pre Blower Door: CFM Reading | Pressure Differential (Pa)

Post Blower Door : | PA :

Zonal Pressures (Test WRT House and WRT Outdoors)

Zone Tested	Before		After		Zone Tested	Before		After	
	WRT House	WRT Outside	WRT House	WRT Outside		WRT House	WRT Outside	WRT House	WRT Outside
Attic 1					**Crawlspace**				
Attic 2					**Bellyboard**				

Comment

Pressure Pan Test

Sum of Pressure Pan Reading (PA)

	Location	Before	After		Location	Before	After		Location	Before	After
1				8				15			
2				9				16			
3				10				17			
4				11				18			
5				12				19			
6				13				20	RETURN		
7				14							

Louisiana Housing Corporation

Housing App#: | ClientID: | Assessors: | Date:

ClientName: | Day Phone:

B A S E L O A D S

Water Heater(s)

WH Code	Manufacturer	Model:	Serial #:
WH01			
WH02			

Fuel Type
1. Natural Gas
2. Electricity
3. Propane

Equipment Location
1. Heated Space
2. Uncond. Space
3. Unintentional Heated

Input Units
1. kBTU
2. kW

If WH wrap is present, skip Insul.Thick & Insul,Type

Is the first 5' of WH supply pipe insulated?

Insulation Type
1. Fiberglass
2. Polyurethane

Shower Heads

of Shower Heads

Shower Use (min/day)

Average GPM

WH Code	Fuel Type	Equip.Loc.	Rated Input	Input Units	Gallons	WH Wrap	Pipe Insul.	Original Tank Insul. Thick.	Insul. Type	Water Heater Condition Good	Fair	Poor	Burner Condition Good	Fair	Poor	CO Level	WH Stand
WH01						○	○			○	○	○	○	○	○		○
WH02						○	○			○	○	○	○	○	○		○

Comments:

R e f r i g e r a t o r

Manufacturer | **Model**

Refrigerator Style
1. Top Freezer
2. Side by Side
3. Single Door
4. Sngl Door w/ Freezer
5. Bottom Freezer
6. Other

Defrost
1. Automatic
2. Manual
3. Partial Auto
4. Other

Refrigerator Location
1. Heated Space
2. Uncond. Space
3. Unintentional Heated

Size cu ft

Available Space Dimesions

Height(in)

Width(in)

Depth(in)

○ **Ice Maker**

Door Type
○ Single
○ Double

Door Swing
○ Right Hand
○ Left Hand

Freezer Type
○ Top
○ Bottom

C o n s u m p t i o n

Label / Database Annual Consumption

kWhr/yr

Refrig Age
1. < 5 Yrs.
2. < 10 Yrs.
3. < 15 Yrs.
4. > 15 Yrs.

Door Seal Condition
1. Good
2. Some Wear
3. Visible Gaps

Or

Metered Consumption

Minutes

Meter kWh

Temp F

Defrost
○ Manual Defrost
○ Includes Defrost Cycle

L i g h t i n g S y s t e m

Room Description
1. Family
2. Kitchen
3. Living
4. Rec
5. Dining
6. Bedroom
7. Bathroo
8. Utility

Location
1. Ceiling
2. Floor
3. Table
4. Wall
5. Closet
6. Other

Lamp Type
1. Standard
2. Floor
3. Other

Light Code	Room Desc	Room Location	Lamp Type	Qaunt.	Size (watts)	Usage (hr/day)
LT01						
LT02						
LT03						
LT04						
LT05						
LT06						
LT07						
LT08						
LT09						
LT10						

Louisiana Housing Corporation

Housing App#: | ClientID: | | Assessors: | Date:

ClientName: | Day Phone:

HEALTH & SAFETY

Whole House

Alarms Needed

- ◯ Smoke Detector
  Quantity : _____
- ◯ CO Monitor
  Quantity : _____

Carbon Monoxide Measurements

	PRE:	POST:
Rm with Heating System (ppm)		
Rm with Water Heater (ppm)		
Living Area (ppm)		
Kitchen (ppm)		

Comments:

Attic

- ◯ Recessed Lights Present
- ◯ Chimney/Flue Incorect Shielding
- ◯ Wiring/Electrical Problems
- ◯ Inadequate Ventilation
- ◯ Water Leaks Present
- ◯ Moisture Problems Evident
- ◯ Vermiculite Present
- ◯ Other Problems

Building SHELL

Walls

- ◯ Wiring/Electrical Problems
- ◯ Water Leaks Present
- ◯ Moisture Problems Evident
- ◯ Lead Based Paint is Likely
- ◯ Asbestos in Siding is Likely
- ◯ Other Problems

Comments:

Crawlspace / Basement

- ◯ Vapor Barrier Needed
- ◯ Wiring/Electrical Problems
- ◯ Water Leaks Present
- ◯ Plumbing Leaks Present
- ◯ Moisture Problems Evident
- ◯ Other Problems

Equipment

CO Analyz Used Pre Post:

Calibration Dates:

Worse Case Condition Draft Measurements - SPACE HEATING SYSTEM

Date	Conducted During: Audit (Pre)	Conducted During: Inspection (Post)	SysCode	Outdoor Temp (F)	Draft (Pa or in H20)	Spillage Time(sec)	Comments
	◯	◯	HS0__				
	◯	◯	HS0__				
	◯	◯	HS0__				
	◯	◯	HS0__				

Worse Case Condition Draft Measurements - WATER HEATING SYSTEM

Date	Conducted During: Audit (Pre)	Conducted During: Inspection (Post)	SysCode	Outdoor Temp (F)	Draft (Pa or in H20)	Spillage Time(sec)	Comments
	◯	◯	WH0__				
	◯	◯	WH0__				
	◯	◯	WH0__				
	◯	◯	WH0__				

Cook Stove CO Measurements

	PRE:	POST:
CO Measurement Oven (ppm)		
CO Measurement Burner 1 (ppm)		
CO Measurement Burner 2 (ppm)		
CO Measurement Burner 3 (ppm)		
CO Measurement Burner 4 (ppm)		

Gas Leak Present ◯

Exhaust Fans

KITCHEN

- ◯ Missing
- ◯ Non Operational
- ◯ Improper Venting

CFM PRE: POST:

BATHROOM 1

- ◯ Missing
- ◯ Non Operational
- ◯ Improper Venting

CFM PRE: POST:

BATHROOM 2

- ◯ Missing
- ◯ Non Operational
- ◯ Improper Venting

CFM PRE: POST:

BATHROOM 3

- ◯ Missing
- ◯ Non Operational
- ◯ Improper Venting

CFM PRE: POST:

Wood Stove / Fireplace

- ◯ Wood Stove / Fireplace is Present
- ◯ Improper Venting
- ◯ Inadequate Combustion Air

Clothes Dryer

- ◯ Improper Venting

Air-to-Air Heat Exchanger

◯ Exist ◯ Non Operational

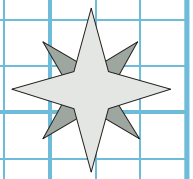
Housing App#:

ClientName:

Include the locations of; Heaters, A/C Units, Water Heaters, Attic Hatches, and Vents

○ Shielded - closely surrounded by other buildings ○ Normal - surrounded by trees / other bldgs ○ Exposed

Louisiana Housing Corporation



Attachment B

Instructions for Louisiana Energy Audit Data Collection Form

Attachment B
INSTRUCTIONS FOR LOUISIANA ENERGY AUDIT DATA COLLECTION FORM

This Data Collection Form is provided to demonstrate **minimum** data collection requirements for a Louisiana Weatherization Assistance Program (WAP) energy audit.

PAGE 1

- **Customer Information**

    1. Enter customer's critical information: WAP *Application #, Name, Address, Parish, Unique Client ID, Precinct* (if necessary), *and Phone Number*.

    2. Enter *Contact Types'* information (landlord/owner).

    3. Enter *Ownership, Occupants and Household Size, Ethnicity, Client Language, and Disability Type*.

- **Agency Information**

    1. Enter *Agency/Parish* information**.**

    2. Enter *Assessor* (auditor) information.

    3. *App. Date (*Appointment Date*)* = the current date.

- **Dwelling Information**

    1. Enter *Dwelling Setup, Dwelling Type, Roofing Type, Roof Materials, Siding* Type*, Wind Shielding, Home Leakiness* and for manufactured homes *walls Vented* and *Orientation of Long Wall.*

    2. Enter any and all health and safety *WARNINGS* associated with the unit. Document and provide unit's occupant with client education on H&S measures identified.

        Lead handout: In all homes built before 1978 where weatherization work may disturb painted surfaces, the EPA pamphlet entitled *Protect Your Family from Lead in Your Home* must be given to the customer and documented.

        Moisture Problems: Describe the nature and location of any indications of moisture problems including standing water, visible mold, or musty odors that could signal hidden mold.

    3. Enter *Cond. (Conditioned) Stories (one, two story).*

    4. Accurate *Year Built* of the unit (used for RRP Lead and Historic Preservation).

Attachment B
PAGE 1 Continued

5. For manufactured homes, enter the *Length, Width* and *Height* (not including the hitch or tongue).

6. Enter the square foot area or *Floor Area Sq'*. For a house with a rectangular floor plan, the square foot area is the length of the house (in feet) multiplied by the width (in feet). For houses with additions or complicated floor plans, break up the floor plan into easy-to-measure rectangles and add the square foot area of each rectangle.

7. For the *Volume of Air* field, multiply the square foot area of the house by the ceiling height to determine the volume of the house in cubic feet.

8. Enter current *Outdoor Temp (Temperature)* during both the *Pre* and *Post* inspection. Complete the same for the *Wind Condition.*

- **Blower Door Information**

1. Enter CFM 50 Pascal (Pa) information with *Pre* reading, *Ring* used, *Pa*. reading, and *Baseline* used.

2. Enter *CFM 50 AST* (air sealing target) using the *Target Reduction Percentages* chart, and enter the *Minimum CFM Reduction* for the unit using the same chart.

3. Enter CFM 50 Pa information with *Post* reading, *Ring* used, *Pa*. reading, and *Baseline* used.

4. In the *Blower Door Manometer Used* fields, enter the pressure gauge manometer's serial number used for pre and post audit testing, and the *Calibration Date* of the manometer used for pre and post audit testing.

- **ASHRAE Information**

1. Enter the *ASHRAE 62.2 2016 target* utilizing the residential energy dynamics calculator https://www.redcalc.com/ashrae-62-2-2016/. Enter the unit's ASHRAE data and use the calculator to find the air sealing target for installing an ASHRAE fan to be installed with 15 CMFs or greater.

2. If the blower door *CFM 50 AST* is below the *ASHRAE target,* then enter the ASHRAE *fan data* and *ASHRAE Required MVR*. If an ASHRAE *fan is needed*, then also enter *Fan Cap. (Captivity)* and if using a timer, enter *Fan Run/Hour* in minutes.

- **Primary Heating Source and Primary Fuel Information**

1. Enter the *Primary Source of Heat* and *Primary Heating Fuel,* and if necessary, estimate the *Annual Cost* for fuel (propane, oil) and the *Est. % (percent)* of fuel used for heating.

2. Enter whether the *Outdoor (Water Heater) WH Closet* is used by the unit.

Attachment B
PAGE 2

- **Customer Information**

    1. Enter customer's *Application #, Name, Unique client ID, Assessors,* current *Date,* and *Day Phone* number.

- **Wall Information**

    1. Enter *Wall Type, Stud Size, Exterior Type, Exposure, Orientation, Width* (in feet), *Height* (in feet), *Area* (Length x Width), *Existing Insulation* type and *Depth*, and for insulation on walls of *Manufactured Homes*: *Type* and *Thickness*.

        - Use this area to describe all exterior walls that are not part of the foundation
        - Use the naming "code" that matches the labeling in the sketches
        - Record the On Center (OC) spacing of studs in inches
        - Siding - Type (i.e. vinyl, brick, stucco, etc.)
        - Buff - Note if the wall is buffered (adjoins a non-conditioned space that is mostly airtight to the outdoors)
        - R-value as visually and physically verified for each stage (EA, CL, QCI)

- **Window Information**

    1. Enter *Window Type, Slider* direction, *Frame* material, *Color* for solar screen, number of glass *Glazing, Interior Shade, Exterior Shade, Percent Shaded* (default window is 20%), air *Leakiness, Wall* orientation, *Number* on wall*, Retrofit* needed*, Width, Height* and *Notes.*

        - Use to describe all exterior windows
        - Glass glazing types are Single Pane, Double Pane, Triple Pane, and LowE
        - Note if there is a storm window (windows that are installed on the outside of the already-installed, primary house windows), and the window frame type Metal/Vinyl/Wood
        - Record the overall leakage of the component (Very Tight, Tight, Average, Leaky, Very Leaky). Remember that any leakage condition other than "Average" should have photo documentation.

PAGE 3

- **Customer Information**

    1. Enter customer's *Application #, Name, Unique client ID, Assessors,* current *Date,* and *Day Phone* number.

Attachment B
PAGE 3 Continued

- **Door Information**

    1. Enter door information as needed for replacement or energy audit modeling the *Type, Area* (in feet), *Storm Door, Wall Code, Number, Measure, Swing, Width, Height, Thickness, Lockset, Air Sealing* measures*, Threshold, Hinge* (non-removable pin), and *Strike* (regular or large).

        - Use this table to describe all exterior doors
        - Note if there is a storm door and the condition (good/bad - G/B) of the Weather-stripping/Sweep (W/S)
        - Record the overall leakage of the component (Very Tight, Tight, Average, Leaky, Very Leaky). Remember that any leakage condition other than "Average" should have photo documentation

- **Unfinished Attic Information**

    1. Enter unfinished attic information *Attic Type, Joist Space, Area,* existing insulation *Type, Material, Depth* (in inches), and average *R value.*

        - Use this table to describe all attics above conditioned space or that will be above conditioned space when the weatherization is complete.

- **Mobile Home Ceiling**

    1. Enter manufactured unit's ceiling information including roof *Type*, roof *Color,* existing *Insulation* type, *Depth Inches, and R value.*

    2. Enter manufactured unit *Percentage of Cathedral* ceiling and *Roof Height* in feet at center.

- **Attic Additional Framing Information**

    1. Enter additional framing information on attics/ceiling *Type, Square Feet, O/C* stud center in inches, *Heat Sources*, attic *Hatch* needs and S*tairbox* or attic stair tent.

- **Finished Attic Information**

    1. Enter information on the four parts of a finished attics (bonus room in attic), *Area Type, Floor Area* in square feet*,* insulation *Type, Material, Depth and R value.*

Attachment B
PAGE 4

- **Customer Information**

    1. Enter customer's *Application #, Name, Unique client ID, Assessors,* current *Date,* and *Day Phone* number.

- **Foundation Information**

    1. Enter information on *Foundation Type, Foundation Insulation Type, Floor, Sills,* and *Foundation Wall Height*.

        - Use this to describe all foundation walls, wall height, including crawlspaces, etc.

- **Mobile Home Shell Information**

    1. Enter wall information on *Manufactured Home Insulation Type, Thickness* and any *Uninsulatable Area.*

    2. Enter information on manufactured unit's Windows and Doors with Average *Width* and *Height* along with window and door *Numbers* and *Facing* wall orientation.

    3. On manufactured units with carport or porch, enter the *Width, Length,* and *Orientation*.

- **Mobile Home Floor Information**

    1. Enter information on manufactured units' *Floor Joist Direction* and *Skirting.*

    2. Enter information on manufactured units' Floor Wing Description*, Joist Size, Loose Insulation* depth, *Location* of *Batt Insulation* (using the location codes) and batt insulation *Thickness*.

    3. Enter information on manufactured units' Floor Belly Center, *Joist Size, Loose Insulation* depth, *Location* of *Batt Insulation* (using the location codes) and batt insulation *Thickness*.

    4. Enter information on manufactured units' *Belly Configuration, Condition,* and *Maximum Depth* of *Belly Cavity's* insulation in inches.

- **Mobile Home Additions Information**

    1. On manufactured units with additions, enter information on wall *Stud Size, Orientation,* and if walls are *Ventilated*.

    2. Enter information on manufactured addition's *Insulation Type* and *Thickness.*

    3. Enter information on manufactured addition's *Maximum Wall Height* and *Maximum Width.*

Attachment B
PAGE 4 Continued

4. Enter information on manufactured addition's Windows and Doors with Average *Width* and *Height* along with window and door *Numbers* and *Facing* wall orientation.

5. Enter information on manufactured addition's *Floor Type, Length, Width, Joist Size,* and if floor is insulated, enter the floor insulation information *Depth* in inches of existing insulation and if *Added inches* of insulation is needed.

6. Enter information on manufactured addition's Ceiling *Joist Size, Roof Color, Existing Insulation,* and its *Depth* in inches.

PAGE 5

- **Customer Information**

1. Enter customer's *Application #, Name, Unique client ID, Assessors,* current *Date,* and *Day Phone* number.

- **Heating Equipment Type/Details Information**

1. Enter *Heating Equipment Type* (chart provided), *Fuel Type* (chart provided)*, %* percent heat *Supplied, Equipment Location* (chart provided)*, Manufacturer, Model* and *HSPF* or *Year (*if unit is a heat pump).

    - This table is used to record all data for heating systems. If the system is all electric, you will not record data in the test results that do not apply, but fill in all blanks with N/A.
    - Be sure to record the percentage (%) of the home's floor area that the unit heats.
    - Record all heating systems used by the unit.
    - Be sure to accurately record the model number of all units

2. Enter information on *Uninsulated Supply Duct Type, Length, Width, Height* and *Diameter*.

3. Enter information for Required Heating System Details: *Input Units* (chart provided)*, Input Rating, Output Capacity*, *Steady State Efficiency %*, *Equipment Condition* (chart provided)*,* and if a *Smart Thermostat* is used.

    - kBTU must be recorded for all systems. If Electric, convert kW to kBTU with this formula (kW x 3412).
    - SS Eff. % - Steady State Efficiency percentage (SSE%) is the calculated efficiency that a combustion analyzer provides for the heating system. Record this to the first decimal place (0.0)

Attachment B
PAGE 5 Continued

- $0^2/CO^2$ - This data is useful for efficiency tuning and should be recorded when possible.
- CO - Carbon Monoxide (CO) parts per millionth (PPM) Air Free (AF) and As Measured (AM).
- Spillage time - Record in minutes and seconds (0:00) for each appliance that is vented.
- Be sure to include a picture of all labels in the client file.

4. Enter Serial Number for the *CO Analyzer Used* for pre and post audit testing and the Analyzer's *Calibration Date Pre and Post audit*.

5. Enter Additional Heating System Details: *Burner Condition* (chart provided)*, Pilot Light Condition* (chart provided)*, Electrical Service Switch* (chart provided)*, CO levels ppm, Gas Leaks, Cracked Heat Exchanger, Fuel Shutoff Not Present, Drip Leg Not Present, Thermostat Type*, *Day* and *Night Setting* and any *Additional Comments.*

- **Mobile Home Heating Equipment Details Information**

1. Enter heating system *Manufactured Home Duct Location* (chart provided) and *Manufactured Home Duct Insulation Location* (chart provided).

PAGE 6

- **Customer Information**

1. Enter customer's *Application #, Name, Unique client ID, Assessors,* current *Date,* and *Day Phone* number.

- **Cooling System Details**

1. Enter *AC unit type* (chart provided)*, Manufacturer, Model Number, Area Cooled square foot, Size kBTU, SEER and Year Purchased.*

   - Record all of the systems that exist in the unit.
   - Record the type of units that exist - Window or Central and whether the unit is only an Air Conditioner (A/C) or a Heat Pump (HP)
   - Be sure to record the Model Number if legible as this is the source of all the performance data for the unit. If the Model Number is not legible, then estimate the age to determine modeling inputs accurately.
   - kBTU should be accurately determined from the Model Number or label.
   - Be sure to include a picture of all labels in the client file.

Attachment B
PAGE 6 Continued

2. Enter Whole House Infiltration Reduction / Blower Door *Pre and Post* infiltration reduction leakage in *CFM*, *Pressure Difference* in *Pa,* and any *Comments*.

3. Enter Zonal Pressure Test with the attic, with reference to *House* and *Outside* for *Before* and *After*.

4. Enter optional Zonal Pressure Test with *Crawlspace* or *Bellyboard,* with reference to *House* and *Outside* for *Before* and *After*.

    - These tests are always conducted with the house either pressurized or depressurized by a blower door to 50 Pascals difference with reference to the outside. Primary zones to be tested are spaces that are usually outside the envelope, or that may be considered for sealing to the outside of the home.

5. Blower door subtraction method is not used, as duct sealing is included with infiltration reduction.

6. Enter Supply and Return pressure pan test *Location* and reading in Pa, *Before* and *After*, and the *Sum of Pressure Pan reading Pa* for manufactured homes. Record the pressure testing performed on the duct system with the blower door at 50 Pa WRT to the outside. Record an accurate location description to make testing repeatable and do not forget to test return ducts as well

PAGE 7

- **Customer Information**

    1. Enter customer's *Application #, Name, Unique client ID, Assessors,* current *Date,* and *Day Phone* number.

- **Baseload Information**

    1. Enter Water Heater *Manufacturer, Model, Serial Number, Fuel Type* (chart provided), *Equipment Location* (chart provided), *Rated Input, Input Units (k*BTU or kW*), Gallons (*oil*,* propane*), Water Heater Wrap* present*, Water Pipe Insulation, Tank Insulation Thickness and Type, Condition, Burner Condition, CO* ppm and *Comments*.

        - Water heater closet or mechanical room must be at least 50 cubic feet in volume for every 1000 BTU/hour of rated input or combustion air venting must be added. For example, a 30,000 BTU/hour water heater would need at least 1500 cubic feet

Attachment B
PAGE 7 Continued

(30,000/1000x50) of open space, which is equal to a room measuring 10 feet by 9 feet with an 8-foot ceiling.

2. Enter *Shower Heads Numbers*, *Minutes* shower used in a day, and shower *Gallons Per Minute.*

3. Enter Refrigerator M*anufacturer, Model, Style* (chart provided)*, Defrost cycle* (chart provided)*, Location* (chart provided)*, Size in cubic feet, Height, Width, Depth, Door Type, Door Swing, Ice Maker* and *Freezer Type*.

4. Enter Refrigerator *Consumption kWhr per year, Age* (chart provided)*, Door Seal Condition* (chart provided) or *Metered Consumption* information.

5. Enter Lighting Systems *Room Description* (chart provided)*, Location* (chart provided)*, Lamp Type* (chart provided)*, Quantity, Size* in *watts* and *Usage in hours per day.*

PAGE 8

- **Customer Information**

1. Enter customer's *Application #, Name, Unique client ID, Assessors,* current *Date,* and *Day Phone* number.

- **Health and Safety**

1. Enter *Smoke Detector* and *CO Monitor Quantity*.

2. Enter *Carbon Monoxide Measurements (ppm)* in *Room with Heating System, Room with Water Heater, Living Area,* and *Kitchen*. Measure and record carbon monoxide level in the living area under NORMAL conditions.

- **Building SHELL**

1. Identify *Attic, Walls,* and *Crawlspace/Basement* health and safety issues.

- **Equipment** (Health and Safety Combustion)

1. On all combustion appliances, if possible, enter information on Worse Case Condition Draft Measurements of Heating Systems: *Date, Audit Inspection Pre* or *Post, CO Spillage Time* in *seconds* and *Comments.* BPI 1200 is the minimum testing standard for combustion appliances.

Attachment B
PAGE 8 Continued

2. Enter Serial Number for the *CO Analyzer Used* for *Pre* and *Post* audit testing and the Analyzer's *Calibration Date Pre and Post audit*.

3. Enter whether *Wood Stove / Fireplace is Present, Improper Venting* or *Inadequate Combustion Air* exists

4. Enter whether *Clothes Dryer Improper Venting* exists.

5. Enter *Air-to-Air Heat Exchanger* (ERV. HRV) *exist.*

6. Enter oven *Cook Stove CO Measurements Pre* and *Post* and visually inspect burners for clean flame.

7. Enter *Kitchen* and all *Bathrooms* exhaust fans' *Operation, Proper Venting* and *Pre* and *Post CFM* reading.

    - Ventilation fan information should be collected for all exhaust/supply fans that are intended to be included in ASHRAE 62.2-2016 calculations. This includes every kitchen and every full bath (meaning contains shower or bathtub).
    - Note whether or not the fan is properly vented to the outside, if there is an Operable Window in the room where it exists, whether a fan will be added to the room by the WAP work order, and record the measured CFM at each stage of the project.

PAGE 9

- **Customer Information**

1. Enter *Housing Application Number* and *Client Name*.

2. Draw the unit footprint (floor plan as viewed from above) in the space provided. Record unit's *dimensions* and *location* of *windows* and *exterior doors*. Include location of *heaters, A/C units, water heaters, attic hatches, venting,* unit's *shielding* and *exposure*. Also, note location of any obstructions or construction details that might complicate insulation or air sealing work. Be sure to note the cardinal directions on the footprint drawing.

Attachment C

Louisiana Energy Audit Review Checklist

LOUISIANA Energy Audit Review Checklist

Job Number:		**QCI Name (Print)**	
Initial Auditor:		**QCI Certificate #**	

FIELD DATA COLLECTION			
No	**Yes**	**Documentation**	**Notes (if needed)**
☐	☐	Are legible photos available that validate all data entry, diagnostic testing results, and equipment labels?	
☐	☐	Are all fields in the data collection form completely and legibly filled out?	
☐	☐	Does footprint drawing of each floor contain adequate dimensions?	
☐	☐	Is combustion safety testing (CO, CAZ, SSE, etc.) data recorded in the Home Energy Assessment Checklist (HEAC) and supported by photos?	
☐	☐	Do legible photos of all four sides of the dwelling exist?	
No	**Yes**	**Work Order**	**Notes (if needed)**
☐	☐	All identified costs (CFL/LED bulbs, flow restrictors, etc.) are entered	
☐	☐	Are there any measures in the work order that are not include in the WA software energy audit outcome?	
☐	☐	Do all measures in the work order contain a target (CFM, R-value, U-value, etc.)?	
☐	☐	Does the work order contain references to the SWS or Grantee Field Guide?	
No	**Yes**	**ASHRAE**	**Notes (if needed)**
☐	☐	Does the ASHRAE calculation include the kitchen?	
☐	☐	Is ASHRAE calculation use all full and ¾ bathrooms?	
☐	☐	Is the building height used in agreement with photos and number of conditioned floors?	
☐	☐	Does the ASHRAE calculation use the same CFM50 target as the software audit inputs?	
☐	☐	Does the calculation use the same square footage as the conditioned space input into the audit software?	
☐	☐	Is the occupant number used, less than bedrooms plus one?	
☐	☐	Is more than one new fan installed in this home?	

Envelope Audit Data				
Subspace:				
Sq.Ft.:	#Floors:			
	Blower Door CFM	**Attic** R Value	**Walls** R Value	**Floor/Sub** R Value
Pre-Wx				
Target				
Post-Wx				
QCI Initials				

ASHRAE Compliance				
Height:		# Bedrooms:		
Occupancy:		ASHRAE REDCalc:		
	Kitchen CFM	**Bath** CFM	**Bath 2** CFM	**Dwelling Unit Fan** CFM
Pre-Wx				
Target				
Post-Wx				
QCI Initial				

LOUISIANA Energy Audit Review Checklist

Audit Software Data Entry			
No	**Yes**	**Audit Software Settings**	**Notes (if needed)**
☐	☐	Was the correct modeling tool used for the housing type?	
☐	☐	Are the correct setup and supply libraries selected?	
☐	☐	Is the correct weather location selected?	
☐	☐	Are the heating/cooling efficiencies correct type??	
☐	☐	Are the fuel costs correct for the region?	
☐	☐	Is the conditioned square footage input consistent with the HEAC and footprint drawing?	
☐	☐	Do enable measures match Louisiana policies?	
No	**Yes**	**General Audit Results**	**Notes (if needed)**
☐	☐	Are all ECM and cumulative SIRs 1.0 or greater?	
☐	☐	Are all measures in the work order listed in the Recommended Measures Report?	
☐	☐	Do any heating/cooling/ have an SIR greater than 3?	
☐	☐	Are pre/post retrofit energy estimates savings more than 30%.?	
No	**Yes**	**Walls**	**Notes (if needed)**
☐	☐	Do opposing walls (N/S or E/W) gross square footage match each other?	
☐	☐	Do exterior exposures match pictures and footprint drawing (buffered, outside, etc.)?	
☐	☐	Do exterior siding type(s) match photos?	
☐	☐	Are the walls correctly oriented in the model (N/S/E/W)?	
☐	☐	Is R-value input consistent with age of home and depth of wall cavity?	
☐	☐	Is the added insulation type and R-value correct (cellulose, fiberglass, etc.)?	
☐	☐	If a buffered wall exists, is it modeled correctly??	
☐	☐	If MH, are conditioned addition walls entered into audit?	
No	**Yes**	**Windows/Doors (W/D)**	**Notes (if needed)**
☐	☐	Are any windows input as shaded more than 20%?	
☐	☐	Does total number of W/D match HEAC/photos?	
☐	☐	Are any W/D leakages input as loose or very loose?	
☐	☐	Replacement W/D U-values match program guidance?	
☐	☐	Are W/D assigned to correct walls per HEAC/photos?	
☐	☐	Do storm W/D inputs match HEAC/photos?	
☐	☐	Did the auditor force replacement of any W/D?	
☐	☐	Are any W/D replaced using air sealing, IRM, or H&S funds?	
No	**Yes**	**Attics**	**Notes (if needed)**
☐	☐	Is the total attic sq.ft equal to the total foundation sq.ft?	
☐	☐	Is the existing attic insulation input into model consistent with photographic documentation?	
☐	☐	Is the most cost-effective insulation R-value added?	

LOUISIANA Energy Audit Review Checklist

☐	☐	Are all four components of a finished attic modeled?	
☐	☐	Does roof type input match the photos?	
No	**Yes**	**Foundations**	**Notes (if needed)**
☐	☐	Is the foundation sq.ft more than the attic sq.ft?	
☐	☐	Is the correct foundation type entered (i.e. conditioned/unconditioned, vented/unvented, insulated/uninsulated, etc.)?	
☐	☐	Does the foundation insulation level input match the photo documentation and HEAC?	
☐	☐	Does the perimeter input match the HEAC and footprint?	
☐	☐	Is adding insulation considered for the thermal boundary?	
☐	☐	Does foundation height input match photos?	
No	**Yes**	**Heating**	**Notes (if needed)**
☐	☐	Are all existing heating systems entered into the audit?	
☐	☐	Existing heating system fuel matches HEAC.	
☐	☐	Do audit inputs indicate heating systems heat more than 100% of the conditioned space?	
☐	☐	Is the efficiency input for the heating system within 5% of original design?	
☐	☐	Does the efficiency input match the photo documentation of the testing?	
☐	☐	Does the input and output in the audit match the appliance data plate?	
☐	☐	Is the correct efficiency metric used (i.e. SSE, AFUE, HSPF, etc.) for the system type?	
☐	☐	Is replacement system information accurate (AFUE, HSPF, Cost, etc.)?	
No	**Yes**	**Cooling**	**Notes (if needed)**
☐	☐	Are all existing cooling systems entered into the audit?	
☐	☐	Do audit inputs indicate cooling systems cool more than 100% of the conditioned space?	
☐	☐	Is the efficiency input (SEER, EER) for the existing cooling system consistent with the appliance data plate?	
☐	☐	Is the system size (BTU) consistent with the appliance data	
☐	☐	Is replacement system information accurate (SEER, EER, BTU, Cost, etc.)?	
No	**Yes**	**Infiltration**	**Notes (if needed)**
☐	☐	Do the pre-audit blower door inputs match the photo documentation and the HEAC?	
☐	☐	Is the infiltration target correctly calculated based on the documented Louisiana target method?	
No	**Yes**	**Duct Sealing**	**Notes (if needed)**
☐	☐	Is selected test method correctly input?	
☐	☐	Are duct testing pressures consistent with the method chosen?	

LOUISIANA Energy Audit Review Checklist

☐	☐	Are pre and post pressure pan supply and return reduction documented in the HEAC??	
☐	☐	Is the duct sealing target consistent with Louisiana guidance (less than 2 pa)?	
No	**Yes**	**Water Heating**	**Notes (if needed)**
☐	☐	Existing equipment information, fuel, and location match field data collection	
☐	☐	Existing water heater wrap and water heater pipe insulation match data collection	
No	**Yes**	**Refrigerator**	**Notes (if needed)**
☐	☐	Audit contains legible photo of refrigerator data plate?	
☐	☐	Replacement refrigerator considered meets standards?	
☐	☐	If metered, is there a legible photo of metered data?	
No	**Yes**	**Lighting**	**Notes (if needed)**
☐	☐	Are any bulbs input as used more than 5 hours/day?	
☐	☐	Are replacement wattages consistent with bulb type?	
☐	☐	Is installed cost more than $5/bulb?	
No	**Yes**	**Incidental Repair Measures (IRM)**	**Notes (if needed)**
☐	☐	Are all Incidental Repairs included in the cumulative SIR calculation?	
☐	☐	Do all Incidental Repairs include comments that detail the specific ECM they are protecting?	
☐	☐	Do any measures have additional costs input?	
☐	☐	If yes, are there related comments describing why?	
No	**Yes**	**Health and Safety Items (H&S)**	**Notes (if needed)**
☐	☐	Are all installed H&S measures allowed per current, approved H&S plan?	
☐	☐	Does H&S expenditure exceed the cost of ECMs?	
No	**Yes**	**Ancillary Measures**	**Notes (if needed)**
☐	☐	Are all “ancillary” measures included in their related ECM’s cost?	

No	**Yes**	**Additional <u>Monitoring</u> Questions**	**Notes (if needed)**
☐	☐	Are all invoiced costs contained in the Recommended Measures (RM) Report?	
☐	☐	Do any invoiced costs exceed the RM costs?	
☐	☐	Are any potential ECM opportunities missed?	
☐	☐	Is there photo documentation of every installed measure in the QCI’s photo log?	

_____

QCI/Monitor Signature

_____

Date

Attachment D

Enabled Library Measures for Louisiana NEAT Audits

- Building Insulation Attic R11, R19, R30, R38 and R49 **
- Building Insulation Fill Ceiling Cavity **
- Building Insulation Sillbox Insulation
- Building Insulation White Roof Coating
- Building Insulation Floor Insulation R11, R19, R30, R38
- Building Insulation Wall Insulation **
- Building Insulation Kneewall Insulation
- Building Insulation Duct Insulation
- Doors and Windows Window Sealing
- Doors and Windows Door Replacement
- Doors and Windows Storm Windows
- Doors and Windows Window Replacement
- Doors and Windows Low E Replacement
- Doors and Windows Window Shading (Awning)
- Doors and Windows Sun Screen Fabric
- Doors and Windows Window Film
- HVAC System Furnace Tune-up
- HVAC System Replace Heating
- HVAC System High Eff Furnace
- HVAC System Smart Thermostat
- HVAC System Tune-up AC
- HVAC System Replace AC
- HVAC System Install/Replace Heatpump
- Baseload Lighting Retrofits ***
- Baseload Refrigerator Replacement
- Baseload Water Heater Tank Insulation
- Baseload Water Heater Pipe Insulation
- Baseload Low Flow Showerheads

**DOE approved lifetime measure update to 30 years under LHC supervision and approval.

***DOE approved lifetime measure update to 20 years under LHC supervision and approval.

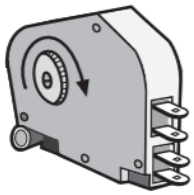
Attachment E

Instructions for Measuring Refrigerator Energy Consumption

A recording watt-hour meter is used to measure refrigerator energy consumption. At least **two hours** are needed to accurately measure refrigerator energy consumption.

If the refrigerator is an automatic defrost model, an inaccurate reading could result if the refrigerator goes into the electric defrost mode during the test period. The defrost cycle timer must be adjusted to prevent the defrost cycle from running during the test period.

The defrost cycle timer is a small electrical box that is usually located behind the front kick plate, on the rear of the refrigerator (back) and/or inside the mail compartment behind the lighting panel.



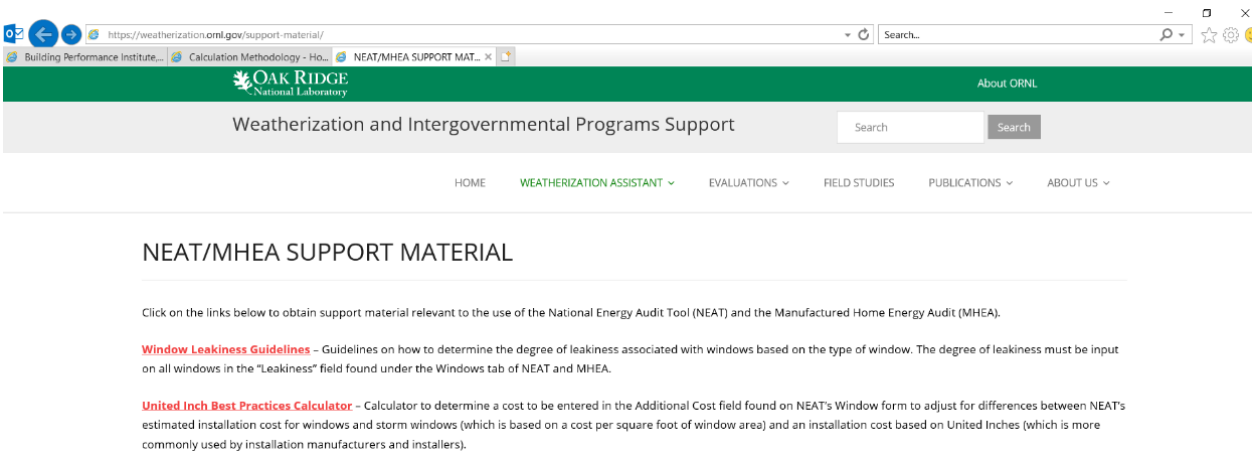
1. Access the defrost timer and advance the pinion shaft on the timer. This pinion shaft usually has a screwdriver slot to allow manual advancement of the defrost timer.
2. Turn the pinion shaft clockwise (a counter-clockwise turn may break the defrost timer) until you hear a click. This should turn on the refrigerator's defrost cycle.
3. Verify an increase in energy consumption with the watt-hour meter.
4. Turn the pinion shaft 10 to 20 degrees further until the timer clicks loudly again. This turns the defrost cycle off.
5. Verify this with the watt-hour meter.
6. Start the watt-hour metering at this point, as the defrost timer won't call for defrost cycle for several hours.
7. Meter the refrigerator at least two hours and avoid opening the refrigerator during testing.
8. Read the kilowatt/hours of consumption measured.
9. Divide this number by the number of hours in the test. This will be the kilowatt consumption in an hour.
10. Multiply this number times the total number of hours in a year – 8760 hours.
11. The product of the calculation will be annual metered kilowatt-hour consumption of the refrigerator.

Attachment F
HEATING and COOLING EQUIPMENT EFFICIENCIES

Weatherization and Intergovernmental Programs Support

Weatherization Assistant NEAT/MHEA Support material:

https://weatherization.ornl.gov/support-material/



The following pages are the only DOE approved Heating and Cooling Equipment Efficiencies Tables for use with Weatherization Assistant based on unit's age.

Attachment F

DOE approved Heating and Cooling Equipment Efficiencies Tables for use with Weatherization Assistant based on unit's age

Manufactured Date	Cooling Efficiency				Heat Pump Heating Efficiency
	Central Air Conditioner or Heat Pump	Room or Window Air Conditioner			
	(SEER)	(EER)	(SEER)[1]	(SEER)[2]	(HSPF)
<1970	6.0	6.0	5.5	6.5	5.0
1970	6.0	6.0	5.5	6.5	5.0
1971	6.1	6.0	5.5	6.5	5.2
1972	6.3	6.0	5.5	6.5	5.2
1973	6.5	6.1	5.6	6.7	5.3
1974	6.6	6.3	5.7	6.8	5.4
1975	6.8	6.4	5.9	7.0	5.4
1976	7.0	6.5	6.0	7.1	5.5
1977	7.2	6.7	6.1	7.3	5.6
1978	7.4	6.8	6.2	7.4	5.6
1979	7.5	6.9	6.3	7.6	5.7
1980	7.7	7.0	6.4	7.8	5.8
1981	7.9	7.2	6.6	7.9	5.8
1982	8.1	7.3	6.7	8.1	5.9
1983	8.2	7.4	6.8	8.2	6.0
1984	8.4	7.6	6.9	8.4	6.1
1985	8.6	7.7	7.0	8.5	6.1
1986	8.8	7.8	7.1	8.7	6.2
1987	9.0	8.0	7.3	8.8	6.3
1988	9.1	8.1	7.4	9.0	6.3
1989	9.3	8.2	7.5	9.2	6.4
1990	9.5	8.3	7.6	9.3	6.5
1991	9.7	8.5	7.7	9.5	6.5
1992	9.9	8.6	7.8	9.6	6.6
1993	10.0	8.7	8.0	9.8	6.7
1994	10.2	8.9	8.1	9.9	6.7
1995	10.4	9.0	8.2	10.1	6.8
1996	10.6	9.0	8.2	10.1	6.9
1997	10.7	9.0	8.2	10.1	6.9
1998	10.8	9.0	8.2	10.1	7.0
1999	10.9	9.0	8.2	10.1	7.1
2000	11.0	9.25	8.4	10.4	7.2
2001	11.1	9.5	8.7	12.1	7.2
2002	11.1	9.75	8.9	11.0	7.3
2003	11.2	9.75	8.9	11.0	7.3
2004	11.6	9.75	8.9	11.0	7.4
2005	11.9	9.75	8.9	11.0	7.5
2006	12.3	9.75	8.9	11.0	7.6
2007	12.7	9.75	8.9	11.0	7.6
2008	13.0	9.75	8.9	11.0	7.7
>2008	13.0	9.75	8.9	11.0	7.7

[1] fan runs continuously

[2] fan runs only when cooling

Attachment F

Home Energy Saver Equipment Efficiencies

Lawrence Berkeley National Laboratory
http://hes-documentation.lbl.gov/calculation-methodology

Heating and Cooling Equipment Efficiencies - Legacy System

In the detailed inputs level of the model, users can select the purchase year for their heating and cooling systems as an alternative to entering an efficiency value for the equipment. In these cases, we derive a shipment-weighted efficiency based on the purchase year of the equipment. A shipment-weighted efficiency is the average efficiency for all units sold within a particular year weighted by the number of units in each efficiency bin (AHAM 1996). Efficiencies for furnaces are measured as AFUE, or Annual Fuel Utilization Efficiency rating, which represents the seasonal or annual efficiency of the furnace. Heat pumps efficiency is shown as HSPF, Heating Seasonal Performance Factor.

The cooling efficiency for Central Air Conditioners and Electric Heat Pumps are rated by the seasonal efficiency of the equipment or SEER. Room Air Conditioners are rated by EER or Energy Efficiency Ratio, the ratio of the cooling output (in BTU) divided by the electrical energy consumption (in watt-hours).

Green shaded values did not have data available so the last available year is copied forward.

Yellow shaded values did not have data available so the first available year is copied backward.

Heating Equipment Efficiencies

Year	Gas Furnace (AFUE)	Electric Furnace (AFUE)	Oil Furnace (AFUE)	Propane Furnace (AFUE)	Gas Boiler (AFUE)	Oil Boiler (AFUE)	Heat Pump (HSPF)	Wall Furnace (AFUE)
1970	60.0	98	70.0	60.0	70.0	72.0	6.21	50.0
1971	61.4	98	71.8	61.4	71.2	73.6	6.21	54.8
1972	62.7	98	73.6	62.7	72.3	75.2	6.21	59.5
1973	62.7	98	73.6	62.7	72.3	75.2	6.21	59.5
1974	62.7	98	73.6	62.7	72.3	75.2	6.21	59.5
1975	65.8	98	73.6	62.7	72.3	75.2	6.21	59.5
1976	66.1	98	74.1	63.0	72.3	75.2	6.21	59.5
1977	66.4	98	74.5	63.3	72.3	75.2	6.21	59.5
1978	66.7	98	75.0	63.6	72.3	75.2	6.21	59.5
1979	68.7	98	75.5	64.8	72.3	75.2	6.21	59.5
1980	70.6	98	76.0	65.9	72.3	75.2	6.21	59.5
1981	70.4	98	76.8	67.1	77.4	77.4	6.21	63.1
1982	70.3	98	77.5	68.4	77.4	77.4	6.21	63.1
1983	70.1	98	78.3	69.6	77.4	77.4	6.20	63.1
1984	72.6	98	78.6	73.0	77.4	77.4	6.36	63.1
1985	72.9	98	78.6	73.8	77.4	77.4	6.39	63.1
1986	73.7	98	79.6	74.3	78.2	81.6	6.55	64.2
1987	74.3	98	79.8	75.1	78.2	81.6	6.71	64.2
1988	74.9	98	80.4	75.8	78.2	81.6	6.88	64.2
1989	74.7	98	80.4	75.5	79.7	83.1	6.92	65.6
1990	76.7	98	80.3	75.7	79.7	83.1	7.03	65.6
1991	77.5	98	80.8	76.9	79.7	83.1	7.06	65.6
1992	82.1	98	80.8	83.2	79.7	83.1	7.10	65.6
1993	82.4	98	80.9	83.8	79.7	83.1	7.10	65.6
1994	82.4	98	80.9	83.9	79.7	83.1	7.10	65.6
1995	82.3	98	80.9	84.1	79.7	83.1	7.10	65.6
1996	82.7	98	80.9	84.1	79.7	83.1	7.40	65.6
1997	82.9	98	80.9	84.1	79.7	83.1	7.10	65.6
1998	82.6	98	80.9	84.1	79.7	83.1	7.40	65.6
1999	82.6	98	80.9	84.1	79.7	83.1	7.40	65.6
2000	82.6	98	80.9	84.1	79.7	83.1	7.40	65.6
2001	83.1	98	80.9	84.1	79.7	83.1	7.40	65.6
2002	83.1	98	80.9	84.1	79.7	83.1	7.40	65.6
2003	83.5	98	80.9	84.1	79.7	83.1	7.40	65.6
2004	83.6	98	80.9	84.1	79.7	83.1	7.40	65.6
2005	83.9	98	80.9	84.1	79.7	83.1	7.40	65.6
2006	84.0	98	80.9	84.1	79.7	83.1	7.90	65.6
2007	84.1	98	80.9	84.1	79.7	83.1	7.90	65.6
2008	84.8	98	80.9	84.1	79.7	83.1	7.90	65.6
2009	84.8	98	80.9	84.1	79.7	83.1	7.90	65.6
2010	84.8	98	80.9	84.1	79.7	83.1	7.90	65.6

Attachment G

Instructions for HVAC Supply-Return Duct Testing and Duct Sealing

1. Use pressure pan testing to help identify leaky or disconnected central HVAC ducts outside the conditioned space.
2. Pressure pan testing is not to be used if HVAC ducts are located in conditioned space.
3. Setup the house to run standard blower door testing with house setup in winter mode.
4. Turn off central HVAC system.
5. Temporarily seal any outside fresh-air intakes to the HVAC duct system.
6. Open garages, attic or crawl spaces as much as possible to outdoors (prevent secondary air barrier).
7. Connect pressure pan hose to input tap on the manometer.
8. Pressure pan readings will be taken at each supply and return register of central HVAC system.
9. Depressurize house (in winter mode with open interior doors) with blower door to -50 or -25 Pascals with reference to outdoors.
10. With blower door running, place the pressure pan completely over the HVAC supply or return to form an air tight seal.
11. Record the Pascal reading on pressure pan hose connected manometer channel, which should be a positive number.
12. If HVAC return or grill is too large for pressure pan, seal the grill with tape (for air tight seal). Insert a pressure probe through the tape and record reading.
13. Repeat this test for each HVAC supply and return.
14. If HVAC ducts have no leakage to the outside, the pressure pan reading will be zero (0) Pascals. Pressure pan measurements higher than two (2) Pascals will require investigation and sealing of air leaks in central HVAC supply and return ducts.
15. If HVAC duct/return air sealing is performed on a unit incurring a cost, document pre and post pressure pan reading’s reduction.

Attachment H
Additional ASHRAE 62.2 2016 Guidance

Louisiana uses the ASHRAE 62.2 2016 advanced standards for indoor air quality. All Louisiana WAP ASHRAE calculations are required to use the Residential Energy Dynamics website.

https://www.redcalc.com/ashrae-62-2-2016/

Use **only** the following data audit input for the **Number of Occupants** box in the ASHRAE 62.2 2016 calculation web page:

Use the **greater of**:

- **Number of bedrooms in the unit plus one (i.e. three bedrooms + 1 = 4),** or
- **Number of occupants in unit**

Heater/Light/Vent (HLV) Combination Fans are not allowable under DOE WAP or ASHRAE. It is considered a secondary heat source.

A **whole-building ventilation fan** or **continuous local exhaust fan** shall be rated for sound at a maximum of 1.0 sone.

Demand-controlled local exhaust fans shall be rated for sound at a maximum of 3.0 sones.

Attachment I

Instructions for Importing and Exporting NEAT WDZ Files

Exporting and Sending NEAT WDZ Files

1. Create a folder on your desktop that you want to store the file in.
2. Have an existing client (or create a client) with a complete audit. Make sure to run that audit if you want the fuel indices to be shown.
3. Go to **Data Link**.
4. Go to **Import/Export Data**. Select **With another MSaccess Database**.
5. Click **Go**.
6. In the upper right hand corner, click **Browse**. (Make sure you do not create a password.)
7. Select the folder you created in Step 1.
8. Name the file to be exported "*Year Agency Client Name*".
9. Below the file name, click **Save as type** and select **Zipped Weatherization Databases (*.wdz).**
10. Make sure that **Create New Blank Database** is selected and click **Ok.**
11. On the left side of the screen, select the client that you are certain has the most recent set-up library.
12. In the center of the screen, click **Export.**
13. Now go to the folder that you stored the file, and you should see the file there. Copy the file to be attached to the email.

Importing Set-Up WDZ Files

1. Locate the folder where the agency library file is located.
2. Open WA 8.9 NEAT/MHEA Software Program 3. Go to **Data Link.**
3. Go to **Import/Export Data**. Select **With another MSaccess Database**.
4. Click **Go**.
5. In the upper right hand corner, click **Browse**. (Make sure you do not create a WDZ password.)
6. Select the folder you located on Step 1.
7. Click the file you want to import into WA 8.9. On the right side of the screen, select the file you would like to import.
8. In the center of the screen, click **Import.**
9. The agency library file and client submitted should now be available to view in the WA 8.9 NEAT/MHEA Software Program.