

Update on ORNL Technical Support to the Weatherization Assistance Program

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**NASCSP 2020 Annual Training
Conference**

September 30, 2020



Weatherization Assistant Suite of Audit Tools

- National Energy Audit Tool (NEAT) and Manufactured Home Energy Audit (MHEA) have been migrated to the web-based application
 - Agency and Account forms
 - The audits themselves
 - The “Setup Library”
 - The Supply Library
 - Recommended Measures Report and Audit Input Report
- Migration of other elements from the Weatherization Assistant desktop application are being tested
 - Work Orders
 - User Defined Measures

The screenshot displays the Weatherization Assistant web application interface. At the top, there are navigation tabs for "Weatherization Assistant", "Agency", "Account", "Audit (NEAT)", "Libraries", and "User". The main content area is titled "NEAT" and shows audit details: Agency: Oak Ridge Nation..., Acct.: NEAT Run Testing, Acct. #: ORNL NEAT 001, Audit: Run Button Testing, and Audit #: 1279. Below this is a list of audit components with status indicators (red dot for required, yellow dot for recommended, green dot for optional, green checkmark for completed):

- General**
 - ✓ Audit
- Shell**
 - ✓ Walls
 - Windows
 - ✓ Doors
 - Unfinished Attics
 - Finished Attics
 - Foundations
- Systems**
 - ✓ Heating
 - Cooling
 - ✓ Ducts/Infiltration
- Baseloads**
 - Water Heating
 - Refrigerators
 - Lighting
- Other**
 - Health and Safety
 - Itemized Costs
 - Utility Bills
- Audit Recommendations**
 - ✓ Run
 - View

At the bottom, there is a "Reports" dropdown menu and an "Icon Key" section:

- Form is Required
- Form is Recommended
- Form is Optional
- ✓ Form is Completed

A dropdown menu is open on the right side, showing a list of audit tools: NEAT – National Energy Audit Tool (with a green checkmark), MHEA – Manufactured Home Energy Audit, MuTEA – Multifamily Tool for Energy Audits, Health and Safety Audit, and View Audit.

Weatherization Assistant Suite of Audit Tools

- Several new features have been added to NEAT and MHEA
 - LED Lighting
 - ASHRAE 62.2 ventilation calculation
- Design of modified Heating and Cooling forms for NEAT and MHEA has started to include many new features
 - Fuel switching
 - Multiple system replacements
 - Efficiency derating
- Work has begun with NREL on converting NEAT and MHEA's energy calculation engine to EnergyPlus

Weatherization Assistant Agency Account Audit (NEAT) Libraries User

NEAT
Agency: Oak Ridge Nation...
Acct.: NEAT Run Testing
Acct. #: ORNL NEAT 001
Audit: Run Button Testing
Audit #: 1279

General
● ✓ Audit

Shell
● ✓ Walls
● Windows
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● ✓ Heating
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Baseloads
● Water Heating
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Other
● Health and Safety
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Audit Recommendations
● ✓ Run
● View

Reports

Icon Key
● Form is Required
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✓ Form is Completed

FY 2021 Weatherization Assistant Activity

- Complete all changes to the NEAT and MHEA user interface (i.e., the forms that a user sees) by March 2021
- Continue conversion to EnergyPlus
- Training on the web-based Weatherization Assistant will be provided to training centers and Grantees by March 2021

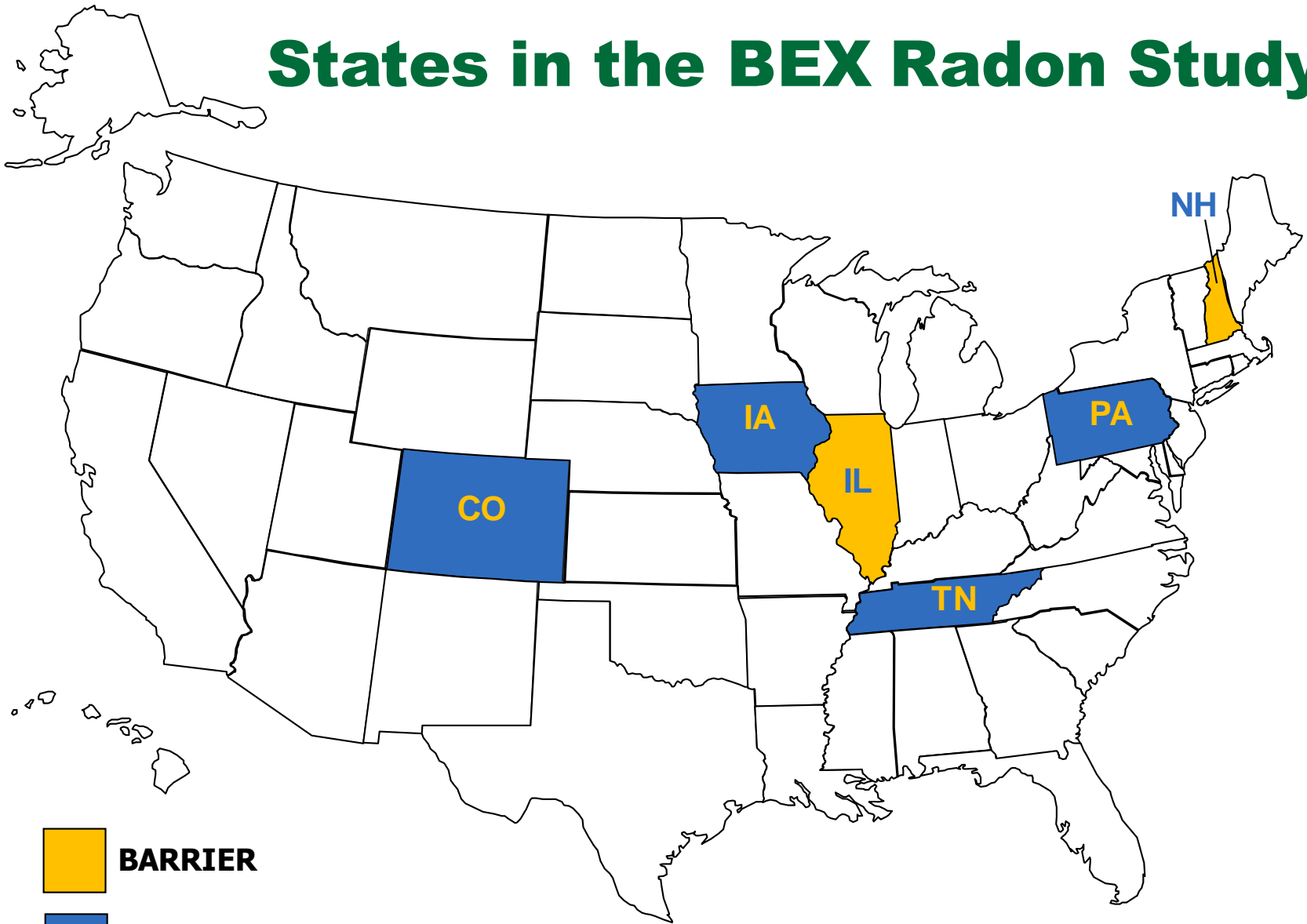
Seven Technical Studies Are Being Performed to Support the Program

- Radon Study
- Study on the Application of ASHRAE Standard 62.2-2016 in Multifamily Buildings
- Quality Work Plan (QWP) Evaluation
- Vermiculite Study
- Manufactured Housing Innovation Workshop
- Non-Energy Benefits Study
- HUD Notice of Funding Availability (NOFA)

BARRIER Plus Expanded (BEX) Radon Study

- Study to assess whether current weatherization practices are effective in preventing increases in indoor radon levels following weatherization
- Funded by DOE WAP and EPA
- Principle Investigators
 - University of Illinois at Urbana-Champaign (Paul Francisco)
 - National Center for Healthy Housing (Jonathan Wilson)
- Precautionary measures include installation of
 - Mechanical ventilation per ASHRAE 62.2-2016
 - Sealed plastic ground covers over exposed bare dirt foundations
 - Sealed sump pump covers

States in the BEX Radon Study



 **BARRIER**

 **EXPANDED PORTION OF THE STUDY**

Radon Study (continued)

- Draft final report
 - Has been reviewed by DOE, EPA, and ORNL
 - Will be published upon DOE approval
- Summary findings and recommendations
 - Current practices have produced substantial benefits compared to previous practices
 - On average, there is no statistically significant change in indoor radon levels in the lowest living levels of homes using current weatherization practices
 - DOE will continue to support the implementation of current weatherization practices and the package of precautionary measures in all homes (when applicable) as specified by WAP
 - Sealing of sump pump pits will likely need to be emphasized during future trainings

Application of ASHRAE Standard 62.2-2016 in Multifamily Buildings Study

- WPN 17-7 requires the installation of ventilation in accordance with ASHRAE Standard 62.2-2016
- ASHRAE 62.2-2016 expanded its scope to include multifamily dwelling units
- Practitioners feel that the standard errs on requiring ventilation rates that are too high in multifamily buildings
 - Difficult and costly to achieve
 - Could significantly increase energy costs
 - One deficiency: no infiltration credit
- There is a lack of data on the indoor air quality levels in multifamily buildings or the benefits of improved ventilation
- Data are needed for DOE to provide guidance and for practitioners to recommend changes to the standard

Multifamily Building Ventilation Study

- Measure the impact of weatherization and feasible ventilation improvements on the indoor air quality (IAQ) in large, centrally-ventilated multifamily buildings
- Principle Investigators
 - University of Illinois at Urbana-Champaign (Paul Francisco)
 - Association for Energy Affordability (David Hepinstall)
- Data collection in multifamily buildings in New York City and upstate New York
 - 11 buildings, 6-8 units per building
 - Pre- and post-retrofit ventilation rates, infiltration rates, and the following IAQ parameters
 - Indoor temperature
 - Relative humidity
 - Formaldehyde, CO₂, NO₂, and CO
 - PM_{2.5}

Multifamily Building Ventilation Study (continued)

- Status
 - Data collection completed in 3 buildings
 - Pre-weatherization data collected in 6 buildings
 - Post-weatherization data and 2 additional buildings will be monitored over the 2020/2021 winter
- Draft final report will be prepared by May 2021

Quality Work Plan (QWP) Evaluation

- The Quality Work Plan (QWP) (WPN 15-4) describes requirements to support and verify quality work under WAP
 - Defines what constitutes a quality installation of weatherization measures: the Standard Work Specifications (SWS)
 - Requires communication of guidelines and standards
 - Outlines how these measures are inspected and validated
 - Prescribes acceptable training and credentialing of workers
- Has the implementation of the QWP been a net positive for the program (i.e., has it improved the overall quality of the program)?
 - Anecdotal information seems to point toward an answer of yes
 - However, no quantifiable data available at this time

QWP Evaluation – Study Concept

- Perform an evaluation to measure improvements in weatherization work quality attributable to the QWP since WPN 15-4 was implemented
- Work quality was evaluated as part of the most recent national program evaluation (~2010)
 - Identified how program services were delivered to clients
 - Analyzed the quality with which those services were delivered
- The new evaluation will be based on the methodology used in the national evaluation
- Results will be used by DOE to drive future policy decisions and encourage additional adoption by utilities and the wider retrofit industry

QWP Evaluation – Status

- An evaluation plan has been developed by Three3
 - Principals: Bruce Tonn, Beth Hawkins, and Erin Rose
 - They managed the ~2010 national evaluation
- Plan reviewed and discussed with DOE in April 2020
- Plan revised by Three3 in May 2020
- Next step: Contractor will be selected to implement the plan via a competitive process by December 2020

Vermiculite Study – A Congressionally Mandated Study

- WAP has little to no data on the asbestos levels in homes with vermiculite insulation and how these levels are impacted by
 - Diagnostic measurements (blower doors)
 - Installation of weatherization measures
- Congress is requiring DOE to perform a study that quantifies WAP effects on homes that contain vermiculite to support the development and implementation of strategies on how to treat such homes

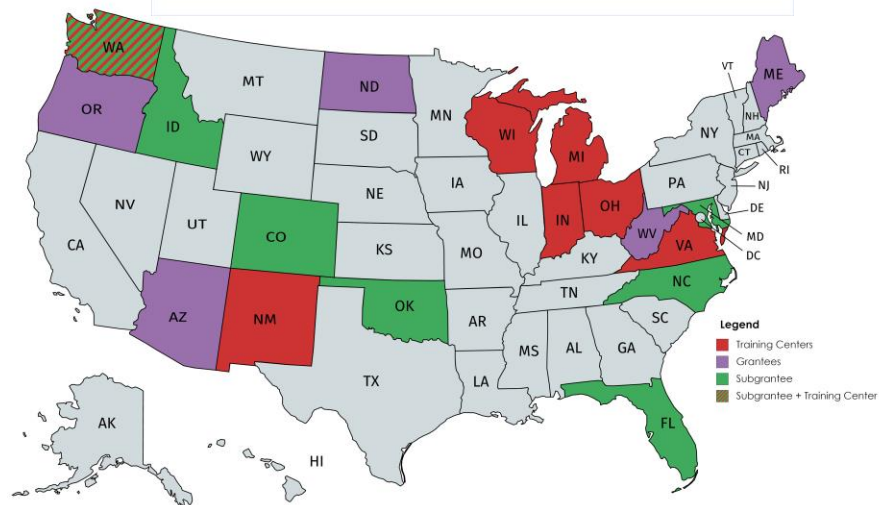


Vermiculite Study – Study Concept

- Measure indoor asbestos levels before and after blower door measurements are performed and weatherization measures are installed in homes with existing vermiculite insulation
- Monitor worker exposure levels while these activities are performed
- Weatherization activities to be monitored
 - Pressurized blower door measurements
 - Blow insulation over the existing vermiculite
 - Weatherize the remaining portions of the house that do not contain vermiculite insulation
 - Unique approaches when vermiculite is present
- Experimental plan has been developed
- Discussions are underway with specific states regarding implementation

Manufactured Housing Innovation Workshop

- Solicit input on how to improve the weatherization of manufactured homes
- Virtual workshop held on three days between July 14-21, 2020
- 30 participants representing Grantees, Subgrantees, training centers, utilities, and research organizations/consultants
- 19 Grantee, Subgrantee, and training center participants represented 18 states
- Draft report documenting participant input and recommendations will be provided to DOE in September 2020



Non-Energy Benefits Study

- Provide background information to DOE addressing the inclusion of non-energy benefits in the selection of weatherization measures under WAP
- Study being performed by Slipstream and ORNL
- Status
 - Literature review and development of an annotated bibliography completed
 - Issues associated with the use of non-energy benefits within WAP identified
 - Initial draft of report written
- Draft report will be provided to DOE in September 2020

HUD NOFA

- [HUD FY2020 Healthy Homes and Weatherization Cooperation Demonstration](#)
 - FR-6400-N-62
 - Due Date of November 9, 2020
- Demonstrate effective strategies for coordination between HUD Lead Hazard Control/Healthy Homes and WAP in up to 5 communities
 - Demonstrate models of cooperation, including client recruiting, data sharing, and reporting
 - Demonstrate models for financing of coordinated interventions
 - Obtain cost efficiencies, reduce WAP deferrals, and improved house and occupant benefits
- ORNL may evaluate the demonstration

Discussion

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Visit our website:
<https://weatherization.ornl.gov>

