Weatherization *Plus* Health

Program Materials and Protocols
to Integrate Health Concerns in to WX Projects

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Overview of Weatherization Plus Health

Health & Housing Connection - A Need Defined

The link between health and the indoor environment is well established. Research clearly shows that lead paint and dust inside homes is the primary way in which young children are lead poisoned. Similarly, a growing body of evidence documents that indoor environmental conditions can trigger asthma in children and adults. Radon, carbon monoxide and other toxic substances are also well known housing based health threats.

While weatherization has focused on reducing energy bills and improving the comfort of the recipients, many homes have remained in need of a more comprehensive approach -- an approach that reduces lead hazards, asthma triggers, carbon monoxide hazards and other health threats with same determination as energy savings.

Mission of Weatherization Assistance Program (WAP)

To reduce energy costs for low-income families, particularly the elderly, people with disabilities, and children, while ensuring their health and safety.

The Weatherization Assistance Program (WAP), funded and administered by U.S. Department of Energy, was established around the principles that a house is a dynamic structure made up of a system of interconnected components. The performance of each component affects the operation of many others. To successfully address energy, comfort, and health and safety needs of a dwelling, the whole house must be evaluated from top to bottom, including the building envelope, mechanical systems, baseloads, indoor air quality, and occupant health, as well as the interaction of these components. This constitutes a whole-house approach to energy efficiency.

While many people still perceive WAP as primarily an energy efficiency program, service providers understand that the impact of the work delivered through this program has a significant societal benefit in improving indoor air quality, thus potentially reducing health care needs for many low-income families.

Today, housing practitioners increasingly recognize that Healthy Homes principles can help improve the indoor environment and concurrently create more durable, comfortable and energy efficient housing. In most cases weatherization crews are positioned to readily incorporate new strategies and have the skills to accomplish these goals.

The current crisis in health care is creating a need for cost effective answers. Weatherization programs offer a unique opportunity to combine weatherization activities with practical health protections can help improve client health while lessening the burden of incurred health related costs on both the client and the health care system. A study done by the Seattle Health Department during a HUD funded Healthy Homes Program documented that improving housing conditions to reduce asthma triggers (moisture, dust, and pests) resulted in a decrease in emergency room visits. At a minimum, the weatherization of a home should not inadvertently create or exacerbate health and environmental threats and when possible work to improve the indoor environment.
Weatherization Plus Health - A Response

There is an opportunity to respond to this need. Weatherization Plus Health has grown out of a collaborative vision from a broad group of professionals from the public and private sectors closely involved with health & housing issues and the accomplishments of the Opportunity Council’s Weatherization Program. These individuals believed that the capacity inherent in the many weatherization programs (which treat over 100,000 low income housing units year each) is a tremendous resource that can and should be leveraged to address building conditions that are affecting health conditions for these same families. As one team member put it “for nearly all of these families, weatherization crews are the first and usually the last publicly funded service provider they see.”

The national Healthy Homes Program, funded and administered by HUD, targets improves health by improving environmental conditions in homes through a range of interventions. A grant given to the Opportunity Council, a Community Action Agency in Washington State, focused on reducing building related asthma triggers conditions in the home via weatherization. It was designed to augment what weatherization already offered, and systematically improve indoor environmental conditions for households with family members suffering from asthma. The Opportunity Council has integrated Healthy Homes principles into current Weatherization activities to create a sustainable Weatherization Plus Health Program. This work help demonstrate the benefits of combining interventions to improve health with weatherization activities.

Weatherization Plus Health utilizes the already existing structure of local weatherization programs to implement an enhanced service. This begins with quality delivery of typical weatherization service, adds the broader mission of improving health conditions and ends with higher quality overall service delivered.

What is Weatherization Plus Health?

To understand how Weatherization Plus Health works, it is helpful to first understand the basic skill set that weatherization crews already possess. Typically the concept of seeing the house as a system is the basis of all decisions. Specifically it means understanding:

- how forces and pressures in the home can move contaminants and create discomfort,
- what is the comfortable and healthy range for humidity and temperature, and
- how heating and cooling systems should function to support client health and the long term durability of the system/home.

Add to this construct a greater understanding of indoor air and environmental hazards, how building conditions can create or repair such hazards and we have a package that can create healthy conditions in homes by harnessing the experience and knowledge of weatherization programs. Figure 1 illustrates how Weatherization Plus Health easily integrates with the infrastructure of existing weatherization programs.

Weatherization Plus Health adds two levels of services to the core weatherization services currently provided weatherization agencies. These two levels of service are:

- Do No Harm
- Improve Indoor Environment

See Figure 2 for a description of how these additional service levels enhance basic weatherization work.

Offering two levels of services for Weatherization Plus Health gives local weatherization agencies the flexibility to tailor the level of service provide to a household in response to the property’s needs and the financial resources available.
Weatherization Plus Health is created by adding to National Weatherization Programs existing infrastructure.
Figure 2: Weatherization Plus Health– Three Levels

**Basic Weatherization**

In Basic Weatherization the assumption is that certain diagnostics including combustion safety, a weatherization audit system, and energy saving measures are already being delivered proficiently. It is from here that weatherization providers can build to the next level of services, Do No Harm.

**Do No Harm**

Do No Harm adds to Basic Weatherization the elements of Lead Safety Compliance, Visual Survey of Indoor Health Hazards, and an Educational Component for staff and clients. There is more time involved in eligibility, assessment, education and delivery of changes to the homes of the clients. These elements fill in the gaps previously experienced during typical weatherization work, and it is hoped that this will become the new “Base Level” for Weatherization Protocols.

**Improve Indoor Environment**

Improve Indoor Environment builds on Do No Harm, adding steps to more actively fix hazards. Lead Compliance advances to Lead Hazard Reduction & Dust Clearance, Indoor Air Quality Assessment advances to a Comprehensive IAQ treatment to improve ventilation strategies through added fresh air intake and whole house systems. The Education Component offers added one on one meetings to help inform and support changes in behavior and maintenance and to establish health network connections.
**How Was Weatherization Plus Health Developed?**

Between 1999 and 2003, the Opportunity Council (OC) has developed and incorporated a Healthy Homes component to its weatherization and home rehabilitation programs. The OC leveraged a combination of funding to develop the health component that is now called Weatherization Plus Health. Multiple funding sources were essential because none of these funding sources alone contributed sufficient funds specifically targeted toward client health issues over a long enough time frame to develop Weatherization Plus Health. This program was funded by dedicated resources from the Environmental Protection Agency’s (EPA’s) Environmental Justice Program and Housing and Urban Development (HUD) Healthy Homes funds. It also drew upon existing weatherization funds from the Department of Energy’s Weatherization Assistance Program (DOE WAP), Health and Human Services (HHS) as well as local utility funds and was indirectly supported by the State of Washington Department of Community, Trade, and Economic Development (DCTED).

**Supporting Training** The Opportunity Council has relied heavily on DOE training and technical assistance funds to develop staff’s technical ability in the areas of ventilation, combustion safety testing and pressure diagnostics - all important components of the WAP’s Weatherization Plus initiative implemented in 1998. The Opportunity Council’s perspective has been to embrace Weatherization Plus Health and continue to develop service congruent with the programs mission.

**Building Upon the DOE Mission** The Opportunity Council has taken advantage of DOE and DCTED support and the funding they provide to gradually integrate a program component that addresses one of the core objectives of the DOE WAP -- ensuring health and safety for program participants. Moving from a more traditional weatherization service model to a model that incorporates a health component is an incremental process that takes the support of the state office and local agency administration. The Weatherization Plus Health services are intended to give a standardized method of looking at the indoor living environment for all households receiving services and an enhanced level for those households who have someone present with respiratory illness such as asthma. One of the goals of breaking down the protocols into phases and steps is to provide agencies with stepping stones to move forward. The implementation of any step, phase or level will hopefully lead to the next and improve the quality of service provided to all participating households.

**Making It Work – Implementing Weatherization Plus Health**

Implementation of Weatherization Plus Health protocols starts at the local level. Not all agencies have the capacity to begin implementation of this component based program. Likely early adopters of this program are expected to be agencies that have proven expertise and systems in place to deliver the basic elements of weatherization. Agencies that have the ability to manage and deliver basic services as required by their state or DOE are prime candidates for the incremental adoption of the 2 Levels of “Do no harm” and then “Improve Environmental Conditions”.

Early adopters of Weatherization Plus Health at both the state and local level will require support from funding entities in how program expenses are categorized and reported. Health and safety is already a basic tenet of weatherization and the intent of Weatherization Plus Health is to consider additional aspects of the indoor environment and its affects on the clients served by programs. The next section of this document "Integrating Weatherization Plus Health Your Program” serves as the basis for communicating the goals and objectives of Weatherization Plus Health to local agencies.

**Level 1 - Do No Harm**

Most of the work assessed and delivered in Weatherization Plus Health Level I are allowable program expenses under DOE WAP. In fact most of Level I is required by either DOE or policy at the state level. Most weatherization auditors already address a majority of these items informally. Weatherization Plus Health Level I will bring consistency and documentation to the local program, helping to reduce risk for the agency making sure we “do no harm” in the delivery of our services.
**Adding Assessment & Compliance Tools**  Adopting Level 1 means revising or supplementing current auditing and assessment tools to integrate key questions and visual surveying steps laid out in the Environmental Hazard Assessment, Ventilation Worksheet, Lead Compliance Checklist culminating in a new Indoor Environmental Survey Report that documents key issues to follow during any WX work.

**Adding a Health Education Component**  Another major component of Weatherization Plus Health Level I is the informal education component which ensures that the agency or program has a consistent message related to the health and safety of the indoor environment and particularly indoor air quality. The educational component can be implemented with minimal up front cost (using these model program materials) and requires minimal time in program delivery.

**Funding Level 1**  In most states HHS Low Income Home Energy Assistance Program (LIHEAP) funds are available for weatherization. In some cases 15% of the total LIHEAP funds are available and in some instances as much as 25% if the state has applied for a waiver. In either case these funds are generally more flexible and can be used to provide weatherization related repairs. These funds are a great source to combine with DOE funds to deliver Level I services.

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**Level 2 - Improve Indoor Environments**

Improving environmental conditions is typically outside the current WX budget. Programs will need to secure supplemental flexible funding.

**Adding Assessment Tools and Undertaking Repairs**  The program calls for several more extensive assessment and repair activities:

- Assessing and delivering more complicated ventilation strategies
- Repairing indoor hazards with a health link (i.e. moisture/mold, asbestos, lead hazards from lead-based paint and dust, radon, pests, dust mite habitats)
- Providing additional resources to maintain a healthy home (i.e., HEPA vacuums to remove dust, walk off mats, pillow and mattress covers to minimize dust mites)
- Providing technical training
- Additional time to start and coordinate a more complex project than standard WX

**Adding a More Extensive Educational Component**  Additional time is need to deliver a more formalized education component that involves one on one discussions with residents to help them establish a workable and long term plan to maintain a healthy home. Often this entails creating a partnership where residents begin to “own” their part in reducing environmental health threats through changes in behavior and maintenance practices.

**Estimating Costs**  It is important to recognize that not all clients will require Level II services. Experience with the WX Plus Health pilot project shows that roughly less than 15% of the homes will require this additional level of service.

**Funding Level 2**  A range of funding source may help underwrite the added activities to Improve Environmental Conditions and include but are not limited to:

- **Utility Funding**
  The utility may not be willing to pay for repair or health and safety measures but the energy conservation funds you receive will make your other funding stretch further.

- **State Matching Funds or General Fund**
  Some states have matching funds for utility contributions to energy conservation and/or general fund monies that are part of the weatherization funding. These funds are generally more flexible and maybe used to support Weatherization Plus Health activities.

- **Federal/State Housing Rehabilitation Funding**
Housing funds are an excellent source of resources, particularly for Level 2: Improve Environmental Conditions. Programs may apply for funds or partner with another agency that already receives funds to deliver housing rehabilitation services.

These funds could include:

- HUD HOME Investment Partnership
- HUD Community Development Block Grant
- USDA Housing Preservation Grant
- State Housing Trust Fund
- Federal Lead Hazard Control Funds
  HUD provides significant funding to state and local governments to undertake lead hazard evaluation and control activities. These funds could be used to support the lead hazard reduction activities outlined in Level 2. Partner with local government housing or health agencies to apply for such funding or seek out existing lead grantees to help direct funds toward units pursuing WX Plus Health.

Program Development Funding
Areas that include underserved minority populations may be eligible to apply for an EPA environmental Justice Grant. The Agency funds education and capacity building projects which can be instrumental in building program capacity.

Federal Healthy Homes Funds
HUD provides funding to non-profit and government agencies to conduct technical studies and demonstration projects.
### Healthy Home Principles

The indoor environment should be...

- dry
- clean
- well ventilated
- combustion byproduct free

It should have no...

- pests
- toxic chemicals
- lead hazards
Integrating Weatherization Plus Health into Your Program

Overview of Program for Agencies

The link between health and the indoor environment is well established. The reduction of asthma triggers is recommended by the medical community as a strategy to reduce instances of asthma symptoms among children & adults. While weatherization has focused on reducing energy bills and improving the comfort of the recipients, many homes have remained in need of a more comprehensive approach, an approach that reduces asthma triggers in the indoor environment and its effect on occupant health with same determination as energy savings. There are 7 key principles that are the underpinnings of creating and sustaining healthy housing that is also durable and comfortable (See Figure ??). In most cases, adhering to these principles also results in improved energy savings. The elements of this approach are highlighted below. In most cases weatherization crews are already working in the setting where these changes can be made easily and have the skills to accomplish these goals. At a minimum, the weatherization of a home should do no harm and ideally improve the indoor environment.

Benefits to your Agency

The benefits to a weatherization agency understanding and adopting effective methods to evaluate, document and improve indoor environmental conditions in homes receiving weatherization fall in to two main categories:

1. **Risk management** An agency will train all personnel to recognize conditions or circumstances that negatively effect the indoor environment. Training will enable staff to prevent problems, refer units to additional services as needed, and repair/address hazards in a safe manner. In addition, the agency will develop systems and protocols to help mitigate risk by ensuring that the staff are well informed and have specific protocols to follow that help minimize risk by ensuring that weatherization does not create an indoor environmental problem or make an existing indoor environmental problem worse.

2. **Capacity building and improved client service** – An agency implementing Weatherization Plus Health protocols will develop highly trained weatherization staff and expand the scope of their service. In some instances this will mean additional training for staff delivering weatherization. The result will be a weatherization process that produces a better end product for the client.

How to Implement

The key to successfully implementing the Weatherization Plus Health protocols into your weatherization program is developing a common understanding of the benefits for the agency and its clients. This understanding coupled with open and clear communication of roles and responsibilities leads to buy in and commitment. Identify those that will be involved every step of the process. Provide training in all areas necessary: intake/eligibility, Auditor/assessor, crews/contractor, inspector/quality assurance. Begin with big picture (7 principles of healthy housing), include background ie prevalence of Asthma in children, effects of indoor environment etc.
Weatherization Plus Health

- Basic Weatherization
- Do No Harm
- Improve Indoor Environment

Components have been color coded to create an easy to follow and transferable plan.
## Program

### Basic WX
- Diagnostics
  - Resident Health Survey
  - Diagnostic Test Report
- Energy Savings
  - Energy Use Evaluation
  - Family Energy Action Plan Plan
- Indoor Air Quality Assessment
  - Environmental Hazard Survey
  - Ventilation Worksheet
  - Indoor Environmental Summary
- Lead Hazard
  - Repair Lead Hazards &
- WX Audit
  - Weatherization Worksheet
- Lead Compliance
  - Lead Safety Checklist
- Basic Educational Component
  - Informal Educational Curriculum
  - General materials
  - HART Flyer
- Comprehensive IAQ
  - Depressurization
  - Multi-Aire
  - Humidity Gauge
  - Integrated Ventilation Strategies
- Dust Control and Non Toxic Cleaning
  - Walk off mats
  - Cleaning Methods
  - Non-Toxic Cleaners

### Do No Harm

### Improve Indoor Environment

### Component

### Tools

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Weatherization Plus Health

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1/11/2004 10:42 AM
Phases

1. Eligibility
2. Assessment
3. Work Plan Development
4. Perform Work Plan
5. Final Inspection
6. Follow Up Education
Eligibility

In Basic Weatherization Programs, eligibility has historically followed financial guidelines and need. This process is usually undertaken with staff during an interview appointment with the client, and gathers all pertinent financial information. The process usually takes about a half hour. Weatherization Plus Health capitalizes on this meeting by gathering information about the clients health in order to determine what level of service they should receive. In addition to standard WX procedures, the following questions are asked during the eligibility interview.

Step 1: Complete Health Questions

☐ Yes  ☐ No  a. Are there any household members with asthma?

☐ Yes  ☐ No  i. If “yes” does the person have a confirmed diagnosis of asthma by a doctor or nurse?

☐ Yes  ☐ No  b. Are there any household members with respiratory problems?

☐ Yes  ☐ No  c. Are there any household members with frequent flu like symptoms (running nose, itchy eyes)?

☐ Yes  ☐ No  d. Does anyone in your home have health problems that you feel may be attributed to the indoor environment? If yes explain.

Step 2: Determine Appropriate Assessment Level

If the client answers “yes” to one or more of the following questions prior to home assessment the auditor will assume the weatherization project will receive Improve Indoor Environment of Weatherization Plus Health. If they answer "no" to all they will be in Do No Harm. The client will not be aware of what level of Weatherization they will receive.

Step 3: Provide Educational Materials and Discuss Issues with Occupant

Review the informal educational curriculum with the client about how poor indoor air quality can effect their health. Use IEQ & You, (Indoor Environmental Quality) as the resource material. The auditor, weatherization crew and inspector will follow up on the core principles you introduce.

After review of IEQ & You, provide the client with the following brochures and check the box they have received them.

☐ EPA Clear Your Home of Asthma Triggers;
☐ American Academy of Pediatrics Your Child and the Environment
☐ EPA Protect your family from Lead in your home

Selected Program (circle one)  Do No Harm  Improve Indoor Environment
Eligibility Determination Health Questions Chart

Does anyone in your family have asthma?  

Are there any household members with respiratory problems?  

Are there any household members with frequent flu-like symptoms?  

Does you or your family have any health problems from the indoor environment?  

NO  

Do No Harm  

YES  

Improve Indoor Environment  

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Program Phase 2

Assessment

Introduction

Assessment involves meeting the client at their home, gathering all pertinent data about the home to perform weatherization services. WX Plus Health adds more tools for assessment and gathers more data about the home to create a plan that can improve the indoor environment. The tools have been set up in a modular fashion, so agencies can use what they need while building on their existing strengths. Informal Education is also happening during the interaction with client at this time.

There are 2 Assessment levels available in WX Plus Health model:

- **Do No Harm**, offers a basic approach and incorporates limited changes to a current WX program. This level is a great next step, if IAQ protocols are not currently in place.
- **Improve Health Conditions** offers a more detailed audit, more intensive solutions, and a more formal and tailored educational component.

The Assessment phase uses Strategies and Tools.

**Strategies include:**

- **Diagnostics**
- **Weatherization Audit**
- **Energy Savings**
- **Lead Compliance**
- **Advanced Indoor Air Quality**
- **Basic Educational Component**
- **Lead Hazard Reduction & Clearance**
- **Enhanced Ventilation**
- **Extended Education Component**
- **Pressurized Blower Door Testing**
- **Dust Control & Non Toxic Cleaning**

**Tools Include:**

- Diagnostic Test Report
- Ventilation Worksheet
- Combustion Safety Worksheet
- Combustion Safety Test Report
- Weatherization Worksheet
- Lead Safe Weatherization
- Energy Use Evaluation
- Family Energy & Indoor Air Quality Action Plan
- Lead Safety Checklist
- Environmental Hazard Assessment
- Indoor Environmental Summary
- Informal Education Curriculum
- HART Flyer
- How you House Works Flyer
- Lead Safe Work Practices
- Depressurization
- Multi-Aire
- Attic Pressurization
- Humidity Gauge
- Education
- HART Workbook
- How Your House Works Workbook
- Extended Education/Follow up
- Access to Health Network
- Walk off mats
- Cleaning Methods
- Non-Toxic Cleaning

**Strategies and Tools** are described in detail in their own sections.
Introduction

In general, a work plan is developed around information gathered during the Assessment phase, the expertise the WX crews, and financial limits per unit. The focus historically has mainly been energy savings, comfort, some lead and IAQ issues for the client. WX Plus Health prioritizes improving health of the clients, by adding a "Health Focus" element during the Work Plan Development Phase.
Perform Work Plan

Introduction

The work plan is carried out to specifications created in the Develop Work Plan phase. Do No Harm and Improve Indoor Environment ask the WX technicians to be sensitive to client health concerns in the home, utilize containment and other methods, to isolate clients from potential health risks and exacerbations. It is expected that if contractors performing the work are savvy to those methods the end product will be healthier and more durable in addition to being energy efficient. Informal Education should be happening within the interaction of the crews and the client.
Final Inspection

Introduction

Inspection of the completed work is necessary and should be done promptly after completion. This could also be considered the commissioning stage, and every effort should be made to educate tech crews on how well they did and what could use improvement if necessary. If lead hazard reduction work is completed a lead clearance test is required in houses units built before 1960. If warranted another round of follow up inspection could be scheduled several months out to fully assess improvements. This is also a time to go over any questions the client may have and recommend adjustments as necessary and to deliver another layer of Informal Education.
Follow Up Education

Introduction

During Improve Health Conditions a more detailed education package is delivered that promotes a partnership with the client. It includes workbooks and in house training, where possible, to change resident house related behavior that can lead to improved health outcomes. The strategy uses workbooks as tools to spur conversations with clients about what they can do to improve their indoor environment (e.g., reducing clutter where dust can accumulate, quick attention to leaks and moisture issues to prevent mold, use bath fans regularly to exhaust humidity). This piece augments the mechanical fixes provided by the WX Crews.
Basic Weatherization

Diagnostics
- Diagnostic Test Report
- Combustion Safety Test Report
- Combustion Safety Worksheet

Weatherization Audit
- Weatherization Worksheet
- Lead Safe Weatherization – Lead Safe Written Compliance

Energy Savings
- Energy Use Evaluation
- Family Energy Action Plan
Level 1 Do No Harm

**Program Components**

**Diagnostics**
- Diagnostic Test Report
- Combustion Safety Test Report
- Combustion Safety Worksheet

**Weatherization Audit**
- Weatherization Worksheet (part of most existing programs)
- Lead Safe Weatherization - Lead Safe Written Compliance (part of most existing programs)

**Energy Savings**
- Energy Use Evaluation
- Family Energy & Indoor Air Quality Action Plan

**Lead Compliance**
- Lead Safety Checklist

**Indoor Air Quality Assessment**
- Environmental Hazard Assessment
- Ventilation Worksheet
- Indoor Environmental Summary

**Basic Educational Component**
- Informal Educational Curriculum
- General materials - Pediatric Asthma, EPA Asthma brochures
- HART Flyer - How you House Works Flyer

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Level 2 Improve Indoor Environment

Program Components

Diagnostics
Diagnostic Test Report
Combustion Safety Worksheet
Combustion Safety Test Report

Weatherization Audit
Weatherization Worksheet
Lead Safe Weatherization – Work Compliance

Energy Savings
Energy Use Evaluation
Family Energy & Indoor Air Quality Action Plan

Lead Safety Compliance
Lead Safety Checklist

Indoor Air Quality Assessment
Environmental Hazard Assessment (change to Environmental Hazard Survey)
Ventilation Worksheet
Indoor Environmental Summary

Basic Educational Component
Informal Educational Curriculum
General materials
HART Flyer
How you House
Works Flyer

Lead Hazard Reduction & Clearance
Hazard Reduction & Clearance Checklist

Comprehensive IAQ
Depressurization
Multi-Aire
Attic Pressurization
Humidity Gauge Log

Extended Education Component
Humidity Gauge
Education
HART Workbook
How Your House Works Workbook
Extended Education/Follow up
Access to Health
Networks

Dust Control & Non Toxic Cleaning

Pressurized Blower Door Testing

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Strategies

- Diagnostics
- Weatherization Audit
- Energy Savings

- Lead Safety Compliance
- Advanced Indoor Air Quality
- Basic Education Component

- Lead Hazard Reduction & Clearance
- Comprehensive IAQ
- Extended Education Component
- Dust Control Strategies & Non-Toxic Cleaning
- Pressurized Blower Door Testing
**Introduction** Use during Assessment, Work Plan Development, and Perform Work Plan

Diagnostics is considered the assessment of a building’s heating and ventilation systems.

In-field demonstration for any weatherization program include:

- Blower door test
- A ventilation assessment
- Installation of exhaust devices
- Understanding and ability to test mechanical heating/ventilation devices
- Ability to gather building heating & ventilation data
- Understand combustion safety
- Conduct Worst Case testing

**3 Onsite Forms** Title pages shown below

**Diagnostics Test Report**

**Combustion Safety Test Report**

**Combustion Safety Worksheet**

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Weatherization Audit

Introduction Use during Assessment, Work Plan Development, and Perform Work Plan

Understanding the building as a system and assessing a building's structure, insulation levels, safety, electrical integrity, air leakage, basement/crawlspace, durability, comfort and lead hazard potential are covered under Weatherization Audit. Lead Safe Weatherization protocols set forth by DOE.

In field demonstration for any weatherization program include:

- Health & Safety
- Comfort /Infiltration
- Durability
- Walls, Attic Crawlspace, Roof
- Overall Building As a System

2 Onsite Forms Title pages shown below

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**Weatherization Worksheet**

1. **Housing Unit Ownership Information**
   1. Address
   2. Owner/lessee
   3. Years in residence

2. **Health & Safety**
   1. Safety issues to be addressed
   2. Smoke detection
   3. Insulation
   4. Other

3. **Comfort /Infiltration**
   1. drafts and air leaks
   2. Insulation levels
   3. Air sealing
   4. Other

4. **Durability**
   1. Foundation
   2. Structural issues
   3. Repair history
   4. Other

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**Lead Safe Work Written Compliance**

This portion to be filled out by Assessor

- **Name of Assessor**
- **Date**

Which of the following types of evaluations was performed on this home? (Circle one)
- [ ] Risk Assessment
- [ ] Surface Evaluation
- [ ] Pre-Evaluation—Presumptive Lead

Note: If the house was built before 1978 but testing of paint has not taken place, then the presence of lead must be presumed for all surfaces that will be disturbed and lead safe work practices used.

If a report was written, then there is a copy in the client file? Y or N

This portion to be filled out by Lead Technician

- **Name of Lead Technician**
- **Date**

Enter the following information for each task that will require lead safe work practices

<table>
<thead>
<tr>
<th>Task</th>
<th>Hazard Control</th>
<th>Lead in Paint</th>
<th>PPE</th>
<th>Other Protective Clothing</th>
</tr>
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<tbody>
<tr>
<td>1</td>
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<td>10</td>
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</tbody>
</table>

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2 Onsite Forms Title pages shown below
Introduction

The cornerstone of any Weatherization Program, increases in energy savings, are achieved through air sealing of building and ductwork, increased levels of insulation, improved R-Value in windows, replacement of high energy using appliances and lighting, more efficient heating systems and educating clients about their energy use patterns and guiding them to better choices.

In field energy assessment and client education for:

- Energy Bills
- Heating System
- Appliances
- Energy Use Patterns / Choices

2 Onsite Forms  Title pages shown below

---

### Energy Use Evaluation

1. **Client:**
   
2. **Date:**
   
3. **Household use:**
   
4. **Family member attending:**

**Bill Summary:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly Energy Cost</td>
<td></td>
</tr>
<tr>
<td>Cost to heat home</td>
<td></td>
</tr>
<tr>
<td>Heating Degree Days</td>
<td></td>
</tr>
<tr>
<td>Building R Value</td>
<td></td>
</tr>
</tbody>
</table>

**Heating System:**

1. **Primary:**
   
2. **Secondary:**

**Thermostat type:**

1. **Manual**

**Thermostat setting:**

1. **Actual temp:**

**Night time setting:**

1. **When away:**

**Water Heaters:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Task-wrapped?</td>
</tr>
<tr>
<td>Melted water</td>
<td>Pipes-wrapped?</td>
</tr>
</tbody>
</table>

**Existing shower flow rate:**

1. **Economizer:**

**Fan switch:**

1. **Any leaking issues?**

**Refrigerator:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condenser</td>
<td>Temp in frig</td>
</tr>
<tr>
<td>Compressor</td>
<td>Temp in return</td>
</tr>
</tbody>
</table>

**Heat from compressor allowed to escape?**

1. **Yes**

**Condition of Gasket**

1. **Close**

**Estimated cost (per month):**

1. **Replace Y/N**

**Washing Machine:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Size of cu.ft</td>
</tr>
<tr>
<td>Location</td>
<td>Measured KWh/ hr</td>
</tr>
</tbody>
</table>

**Estimated cost (per month):**

1. **Replace Y/N**

**Dishwasher:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Size of cu.ft</td>
</tr>
<tr>
<td>Location</td>
<td>Measured KWh/ hr</td>
</tr>
</tbody>
</table>

**Estimated cost (per month):**

1. **Replace Y/N**

**Sprinkler System:**

1. **Yes**

**Estimated cost (per month):**

1. **Replace Y/N**

**Other Energy Saver:**

1. **Yes**

**Estimated cost (per month):**

1. **Replace Y/N**

**Total Estimated Cost:**

1. **$**

---

### Family Energy Action Plan

1. **Opportunity Council**
   
2. **Date:**
   
3. **Air quality Action Plan**
   
4. **Three steps to improve your indoor air quality:**
   
5. 1. 

6. 2. 

7. 3. 

**Three steps to reduce your energy bills:**

8. 1. 

9. 2. 

10. 3. 

---

**Opportunity Council:**

1. 

2. 

---

**Conclusion:**

We refer comments to Erin Hamernyik, erinhamernyik@earthlink.net
1/11/2004 10:42 AM
Introduction

The goal of this compliance checklist is to document that lead safe work practices were followed for all work that touches painted surfaces in homes built before 1978 (when lead-based paint was banned from residential use). The key distinction between this checklist and the existing DOE policy is that it requires lead safe work practices even when the work is below the de minimus level established by HUD and DOE since even small jobs can create big problems if the paint has a high lead content and the activity creates substantial dust and chips (e.g., power sawing).

1. Onsite Form, Level 1 & 2

Title page shown below

---

Lead Safe Work Practices Checklist

- Address: _____________________________  Occupant Name: _____________________________
- Date and Time: _____________________________  Assessor Name: _____________________________

**Level 1: “Do No Harm” (This applies to all work of any size.)**

1. Seal off the Indoor Work Area
   - Keep children and pregnant women out of the room.
   - Remove as much furniture as you can from the room.
   - Cover remaining furniture with heavy plastic sheets and tape it down.
   - Cover the work area floor with heavy plastic sheet or tyvek to the floor or walls. Place plastic at least 3 feet from the work spot.
   - Be careful not to track dust out of the area.
   - Do not eat, drink, or smoke while working.

2. Protect the Outside Work Area
   - Keep children and pregnant women away from the work area.
   - Remove toys, garden supplies, and other resident items from the work area.
   - Place heavy duty plastic sheeting or landscaping fabric below and 22 feet out from work area. Hold down edges with heavy staples. Tape or staple edges to appropriate surfaces. You may use methyl chloride to prevent paint adhesion. You may use methyl chloride to prevent paint adhesion.
   - Close windows and doors within 22 feet of work spot.

3. Avoid Dust, Chips or Particles that May Contain Lead
   - Work wet. Water helps keep lead dust from the air. Mist paint before you scrape or sand. Use wet sanding sponges.
   - Don’t sand or power wash. This can make clouds of lead dust.
   - Provide gloves or T-shirts that the work crew wear and follow with a shower.
   - Do not spray off or brush off lead dust.
   - Do not use paint strippers with methyl chloride.

4. Keep the Area Clean of Dust, Paint Chips and Debris
   - Fold up plastic sheeting, fold dirty side in (dirty side to dirty side) to contain dust and paint chips. Seal plastic with heavy duty tape.
   - Use a vacuum with a HEPA filter to clean up dust and debris. Vacuum carpet slowly.
   - Scrub floors with soap and water. Rinse well with clean water. Change water for each room.
   - Put outside work, pick up all chips or debris that was not caught by the plastic sheet, landscape fabric, or zip lock bags.
   - Never burn trash with lead in it.
Indoor Air Quality Assessment

Introduction

Use during Assessment, Work Plan Development, and Perform Work Plan

Provide the framework for IAQ work to be done. This assessment is a visual survey for environmental health threats and includes a more extensive evaluation of ventilation.

Elements:
- What environmental and health threats may exist in the house?
- How will the Work Plan address these potential threats and Indoor Air Issues?

2 Onsite Forms, 1 Work Plan Development Form

Environmental Health Survey Matrix

Ventilation Worksheet

Opportunity Council

Environmental Hazard Matrix

Ventilation Worksheet

Indoor Environmental Summary

Weatherization Plus Health

Please refer comments to Erin Hamernyk, erinhamernyk@earthlink.net

1/11/2004 10:42 AM
Basic Education Component

Introduction

The heart of the Education Component is the Informal Education Series. Weatherization Staff are trained in the basics of Indoor Environmental Principles, they then convey this information in every setting that they interact with the client.

2 Flyers, 1 Educational Document

Title pages shown below:

- How your House works!
- Home Asthma Reduction Training Workbook

Flyers:
- How your House Works 1 page flyer
- Home Asthma Reduction 1 Page Flyer

Strategies

Use during Eligibility Process and Perform Work Plan

Flyers:
- 2 Flyers, 1 Educational Document

Title pages shown below:

- How your House works!
- Home Asthma Reduction Training Workbook

Flyers:
- How your House Works 1 page flyer
- Home Asthma Reduction 1 Page Flyer

Informal Education Series

Dry
- Prevents mold growth = reduces chance of pests = low humidity

Clean
- Eliminates allergens triggers = reduces chance of pests =

Well ventilated
- Helps keep home dry = reduces strength of contaminants

Combustion Product Free
- These products are poisonous and should not be treated

Pest Free
- Authority = creates a healthy home = reduces strength of contaminants

Toxic Chemical Free
- Pesticides = create a healthy home = reduces strength of contaminants

Lead Hazard Free
- Lead paint = possible hazards = presents a health hazard
Introduction

Use during Assessment, Work Plan Development, and Perform Work Plan

In Level 2, where the goal is to actively improve environmental and health conditions, the recommended lead response is to repair the key source of housing-based lead hazards (peeling, flaking, chipping lead-based paint). In homes built before 1978, repair the paint and underlying source of the paint failure following lead safe work practices. In homes built before 1960 where the likelihood of higher lead content in the paint and more surfaces painted with lead-base paint is high, the protocols also require "clearance" to ensure that all paint is left intact and that dust lead levels are below the federal clearance thresholds. This added step provides and all important safety net following paint repair in older homes and is required when federal lead or rehabilitation funds are being used.

1 Onsite Form for Level 2

Title page shown below
Introduction  Use during Assessment, Work Plan Development, and Perform Work Plan

Enhanced Ventilation utilizes techniques such as depressurization and pressurization to gain control of the air in the house. More advanced mechanical ventilation systems are considered at this level, including the Multi-Aire fresh air intake system. Also, humidity gauges are left with the client to not only monitor changes but to be used as a point of reference and education.

- Depressurization
- Pressurization
- Fresh air component
- Humidity awareness

Onsite Forms

Relative Humidity Gauge Log

This log is designed for you to record your Relative Humidity levels in the home. Remember that ideally the level should be kept between 40-50%.

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Room</th>
<th>Humidity Reading %</th>
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<tbody>
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</table>
Extended Education Component

**Introduction**  **Use during Assessment, Work Plan Development, and Perform Work Plan**

During Improve Health Conditions a more detailed education package is delivered. It includes the full workbook set of How Your House Works & The Home Asthma Reduction Training Workbook and in house training where possible. The relationship with the client may be ongoing, if allowed and encourages healthful changes in house related behavior. The idea here is to engage the client at the level they are at and educate by a variety of examples how to create an improved indoor environment. This will hopefully augment the mechanical fixes provided by the WX Crews.

**2 Workbooks**  Title pages shown below

---

1. **How your house works!**
   - An EZ guide & workbook to Home Health principles
   - Copyright © Erin Hamernyk
   - How your House Works 1 page flyer

2. **Home Asthma Reduction Training Workbook.**
   - Helping you to reduce asthma for the ones you love!
   - Home Asthma Reduction 1 Page Flyer

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Weatherization Plus Health
Please refer comments to Erin Hamernyk, erinhamernyk@earthlink.net
1/11/2004 10:42 AM
Dust Control & Non Toxic Cleaning

Introduction

Use during Work Plan Development, and Perform Work Plan

Based around Healthy Homes protocols, controlling dust and airborne contaminants is paramount to reducing respiratory irritation. Cleaning with non-toxic low dust methods is something all clients can use.

- Damp wiping
- HEPA Vacuum
- Dust Control Strategies
- Walk Off Mats
- Dust mite covers on mattresses and pillows
- Non – Toxic Cleaners and methods
- Healthy Cleaning Kit
Pressurized Blower Door Testing

Introduction

Use during Assessment, Work Plan Development, and Perform Work Plan

In general, Blower Door Tests are done by depressurizing the house. However, if health concerns are present there is a risk of pulling toxic or unwanted materials from house cavities into the living space. To remedy this Pressurized Blower Door testing is recommended.

2 Onsite Forms  Title pages shown below
Appendix of Forms

Onsite Forms

Diagnostic Test Report
Ventilation Worksheet
Combustion Safety Worksheet
Combustion Safety Test Report
Weatherization Worksheet
Lead Safe Work Written Compliance Worksheet
Energy Use Evaluation
Family Energy & Indoor Air Quality Action Plan
Lead Safe Work Practices Checklist (Level 1 & 2)
Environmental Hazard Assessment
Indoor Environmental Summary
Summary of Work Completed

Education Tools

Informal Educational Curriculum
General materials – EPA, American Pediatrics
Flyers from Workbooks
HART Workbook
Extended Education/Follow up
Access to Health Net

Please refer comments to Erin Hamernyk, erinhamernyk@earthlink.net