



PROGRAMMATIC STAFF

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# WAP Health & Safety

## **By attending this session, participants will gain an understanding of:**

- DOE rules and guidance as they apply to addressing health & safety issues during weatherization
- How to implement WPN 11-6 in their programs

WAP is primarily an energy efficiency program.

Health & Safety measures must meet criteria:

- (1) Elimination of hazards is necessary before, or as a result of, the installation of weatherization materials; and
- (2) H&S spending is limited (expressed as a percent of average dwelling unit costs), and the limit is reasonable in light of the primary energy conservation purpose of the Weatherization Assistance Program.

# Overview of WPN 11-6

## WAP HEALTH & SAFETY

- Drafted in 2011 to put all relevant H&S guidance in one place.
- Describes most common issues encountered during weatherization, what is allowed, what is required, and what is prohibited in terms of dealing with these issues.
- Outlines how grantees must address H&S in their grantee plan, and where more guidance may be needed at the local level.

# Implementing 11-6 in the Plan

## WAP HEALTH & SAFETY

- Budget
- Identify measures
- Set per unit spending limits
- Deferral policy
- Occupant health concerns
- Identify hazards and approaches
- Training/testing
- And more...

### Grantee Health and Safety Plan - Template

(Fill in the white boxes below the category headings.)

<b>Budgeting (Check one):</b> The grantee is encouraged to budget health and safety costs as a separate category and, thereby, excludes such costs from the average per-unit cost calculation. This separate category also allows these costs to be included from energy efficiency costs in program evaluations. The grantee is reminded that, if health and safety costs are budgeted and reported under the program operations category rather than the health and safety category, the related health and safety costs must be included in the calculation of the average cost per house and cost justified through the audit.
Separate Health & Safety <input checked="" type="checkbox"/>
Contained in Program <input type="checkbox"/>
<b>Incidental Repairs (List repairs, if any, that will be removed as health and safety measures and implemented as incidental repairs.):</b> If the grantee chooses to identify any health and safety measures as incidental repairs, they must be implemented as such under the grantee's weatherization program in all cases – meaning, they can never be applied to the health and safety budget category. In order to be considered incidental repairs, the measures must fit the following definition and be cost justified along with the associated efficiency measures. Incidental Repairs means those repairs necessary for the effective performance or preservation of weatherization materials. Such repairs include, but are not limited to, fixing or repairing windows and doors which could not otherwise be caulked or weather-stripped and providing protective materials, such as paint, used to seal materials installed under the program.
<b>Health and Safety Expenditure Limits (Provide a per-unit average percentage and justification relative to the amount. Low percentages should include a statement of what other funding is being used to support health and safety costs, while larger percentages will require greater justification and relevant historical support.):</b> The grantee must set health and safety expenditure limits for this <del>category</del> , providing justification by explaining the basis for setting these limits and providing related historical experience. It is possible that these limits may vary depending upon conditions found in different geographical areas. These limits must be expressed as a percentage of the average cost per dwelling unit. For example, if the average cost per dwelling is \$5000, then an expenditure of \$500 per dwelling would equal 10 percent expenditure for health and safety. 10 percent is not a limit on H&S expenditures but exceeding this amount will require ample justification. These funds are to be expended by <del>weatherization</del> direct weatherization activities. While required as a percentage of the average unit cost, if budgeted separately, the health and safety costs are not calculated into the per-house limitation.
Per Unit Average Percent: %
<b>Deferral Policy (Provide a detailed narrative of the grantee's overall deferral policy):</b> Deferral may be necessary if health and safety issues cannot be adequately addressed according to WFN 11-6 guidance. The decision to defer work is a difficult but necessary in some cases. This does not mean that assistance will never be available, but that work must be postponed until the problem can be resolved under alternative means of help are found. In the judgment of the auditors, any conditions that exist, which may endanger the health and safety of the workers or occupants, should be deferred until the conditions are corrected. Deferral may also be necessary where occupants are unresponsive, abusive, or threatening. The grantee should be specific in their approach and provide the process for clients to be notified in writing of the deferral and what corrective actions are necessary for weatherization to continue. The grantee should also provide a process for the client to appeal to a higher level in the organization.
<b>Procedure for Identifying Occupant Health Concerns:</b> Procedures must be developed and explained on how information is collected from clients to reveal known or suspected occupant health concerns as part of the initial application for weatherization, additional screening of occupants again during the audit, and what steps will be taken to ensure that weatherization work will not increase the health concerns.

The Health & Safety Plan Instructions and Template (Template), included, walks you through the development of an updated H&S plan that covers all relevant issues. This graphic will be used as an icon with the appropriate page number in the Template where each issue is addressed.

**H&S can be a separate budget category or included in regular program operations.**

This icon indicates the topic is addressed on page 3 of the template.



As regular program operations	As separate H&S budget category
<ul style="list-style-type: none"><li>• Included in cost per unit calculations</li><li>• Must be cost-justified by energy audit</li></ul>	<ul style="list-style-type: none"><li>• H&amp;S measures can be isolated from energy efficiency costs during program evaluations</li><li>• Must not be cost-justified</li><li>• Not included in per unit calculations</li></ul>

**Set average expenditure limits as percentage of average cost per dwelling.**

## To calculate average H&S expenditure limits you must set an average cost per dwelling unit



### Determining program operations

Determine your average cost per dwelling unit (not to exceed \$6,500).  
Determine the planned number of homes to weatherize (represented as 10,000 in the example).

$$\$6,500 \times 10,000 = \$6,500,000$$

### Determining H&S expenditures

Determine the amount needed for health and safety in the average home (\$650 in the example) as a percent of the average cost per dwelling unit (\$6,500).

$$\$650 / \$6,500 = \%10$$

**Program Operation x H&S Percent = Total H&S Budget**

$$\$6,500,000 \times 0.10 = \$650,000$$

**Or**

**Average H&S Expenditure Limit x Planned # of Homes = Total H&S Budget**

$$\$650 \times 10,000 = \$650,000$$

## **H&S Plans must include justification for H&S expenditure limit.**



- DOE does not impose a spending cap on H&S.
- Even if the request is 0, justification is required.
- Provide past H&S budget request and actual spent.
- Include a cost breakdown of what would normally be done for H&S in the average home.
- Show any changes from previous years.

**DOE will determine if costs are reasonable based on each grantee's justification.**



# H&S Costs Sample Table

WAP HEALTH & SAFETY

Allowed Measure	Average Cost	Frequency	Total
Measure A	\$100	40%	\$40
Measure B	\$500	10%	\$50
Measure C	\$1000	20%	\$200
Measure D	\$200	90%	\$180
Measure E	\$50	100%	\$50
<b>Total:</b>	<b>\$1850</b>		<b>\$520</b>



## WPN 11-6 - HEALTH AND SAFETY GUIDANCE

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“There are some instances where, depending on circumstances, the measure can be considered either a health and safety measure OR an energy conservation measure (e.g., furnaces). In those instances where the measure has a cost-effective savings-to-investment ratio (SIR) of one (1) or greater, the measure should be treated as a weatherization efficiency measure.”

## WPN 11-6 - HEALTH AND SAFETY GUIDANCE

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“Grantees should carefully consider the approach to be taken when they draft their health and safety procedures. While ease of accounting is an important consideration, grantees should keep in mind that activities assigned to the health and safety budget category do not have to be cost-justified by the energy audit. The same items assigned to incidental repair, weatherization material, or installation cost categories must be cost-justified.”

## Necessary for the effective performance or preservation of weatherization materials.

### Examples:

- Lighting fixture replacement
- Wiring upgrades
- Flooring repair for water heater installation
- Included in SIR of the unit
- Expenditures often capped by the grantee



This light fixture can be replaced as an incidental repair if energy-efficient lighting is being installed.

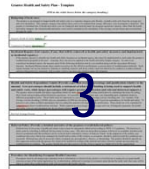
## **Eligible measures that meet the incidental repair definition (must be defined in grantee plan):**

- Correcting moisture creating conditions
- Repairing moisture damage where necessary to perform weatherization
- Roofing repair
- Electrical repair



## **Ineligible measures that do not meet the incidental repair definition:**

- Lead Safe Work and testing
- Asbestos testing, encapsulation, or mitigation
- Removing pollutants
- Radon Testing



- Process for client notification – in writing
- Inform client of corrective action needed
- Provide process for appeal to higher level

## **Possible reasons for deferral:**

- Extensive mold with no alternate funds to remediate
- Illegal activities
- Uncooperative clients

**Deferral is not denial. May weatherize later.**

## Documentation forms must include:

- The client's name and address
- Date of the audit/assessment
- Date the client was informed of a potential health and safety issue
- Clear description of the problem
- Statement indicating conditions under which weatherization could continue
- Responsibility of all parties involved
- The client(s) signature(s) indicating that they understand and have been informed of their rights and options.



# Identify Measures & Hazards



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WAP HEALTH & SAFETY



## Identify hazards to be remedied.

- How will they be remedied? Referral? Deferral?
- List your approaches to testing, training and client education.
- Include all issues required by WPN 11-6 and any additional H&S issues grantee wishes to address



## **All of the H&S-related issues described in 11-6 fall into 10 broad categories:**

- Replacements
- Asbestos
- Codes & Structure
- OSHA for WAP
- Lead-based Paint
- Mold & Moisture
- Radon
- Combustion Appliance Safety and Heating Systems
- Occupant Wellness

## Replacements covers the following:

- Air conditioning and heating systems
- Appliances and water heaters
- Refrigerant
- Window and door replacements, window guards



A cracked heat exchanger, as shown here, is reason for heating system replacement.

# Air Conditioning and Heating Systems



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## WAP HEALTH & SAFETY

### Allowed

- “Red tagged”, inoperable, or nonexistent heating system replacement, repair, or installation is allowed where climate conditions warrant, unless prevented by other guidance.
- “Red tagged”, inoperable, or nonexistent air conditioning system replacement, repair, or installation is allowed in homes of at-risk occupants where climate conditions warrant.

### Required

- Replacements should first be attempted as an ECM.
- Provide client education on maintenance and use of new system.
- Provide client education on proper disposal of bulk fuel tanks when not removed during weatherization.
- Definition of at-risk occupants (for air conditioning replacement) and climate condition justification must be in the grantee’s health and safety plan.

### Restricted

- Air conditioning and heating systems cannot be replaced where climate conditions do not present a health and safety threat.
- Air conditioning systems cannot be replaced with H&S funds if occupants do not meet grantee definition of “at-risk”.

# AC and Heating System Replacements in the Plan

**To ensure uniform implementation,  
the H&S Plan must include:**



Heating Systems	Cooling Systems
	Definition of “at risk occupants”
Explain protocols for repair and replacement, include justification for allowing repair/replacement as H&S measure within scope of grant	
Climate justification – include degree days and recorded preventable deaths	

An attempt must be made to cost-justify the measure prior to using H&S funds.

# Appliances and Water Heaters



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## WAP HEALTH & SAFETY

### Allowed

- Replacement of water heaters is allowed on a case-by-case basis as defined in the grantee's health and safety plan.
- Repair and cleaning of water heaters and other appliances is allowed if necessary in order to perform weatherization measures.

### Required

- Replacements should first be attempted as an ECM.
- Determine whether appliances/water heaters are performing safely.
- Combustion safety testing is required wherever combustion appliances are present.
- Provide client education on proper use, maintenance and disposal of appliances.

### Restricted

- Replacement and installation of appliances other than water heaters, such as stoves or washing machines, are not allowable health and safety costs.

# Appliance and Water Heater Replacements

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Renewable Energy

WAP HEALTH & SAFETY



When replacing hot water heaters or heating/cooling systems for H&S reasons, or any appliances as energy conservation measures, removal and proper disposal of the old appliances is required. Appliances may not be left behind for the client to deal with.

When working with or replacing refrigerators or air conditioners, refrigerants must be handled according to these guidelines:

<b>Allowed</b>	<ul style="list-style-type: none"><li>• Refrigerators may be replaced as an energy conservation measure (ECM). Cooling systems may be tuned or replaced as an ECM or replaced as a H&amp;S measure.</li></ul>
<b>Required</b>	<ul style="list-style-type: none"><li>• Reclaim refrigerant per Clean Air Act 1990, section 608, as amended by 40 CFR82, 5/14/93.</li><li>• Refrigerants must be handled by technicians certified under EPA section 608.</li><li>• Appliance disposal includes refrigerant reclamation.</li><li>• Educate clients not to disturb refrigerant.</li></ul>
<b>Restricted</b>	<ul style="list-style-type: none"><li>• Non-certified technicians may not attach or disconnect hoses or gauges to measure pressure within the appliances, top-off or remove refrigerant from appliances, or otherwise damage the integrity of the appliance.</li></ul>



# Handling Refrigerant

## WAP HEALTH & SAFETY

Non-certified technicians may not attach or disconnect hoses or gauges to measure pressure within the appliances, top-off or remove refrigerant from appliances, or otherwise damage the integrity of the appliance.



If gauges like these are in use, an EPA-certified technician must be doing the work.



# Window & Door Replacement; Window Guards



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## WAP HEALTH & SAFETY

### Allowed

- Replacement, repair, or installation of doors, windows, or window guards may be allowed as an incidental repair or an ECM if replacement is cost-justified by a DOE-approved energy audit.
- In cases where code compliance is triggered by weatherization activity, health and safety funds can be used to meet the requirements of the jurisdiction having authority.



### Required

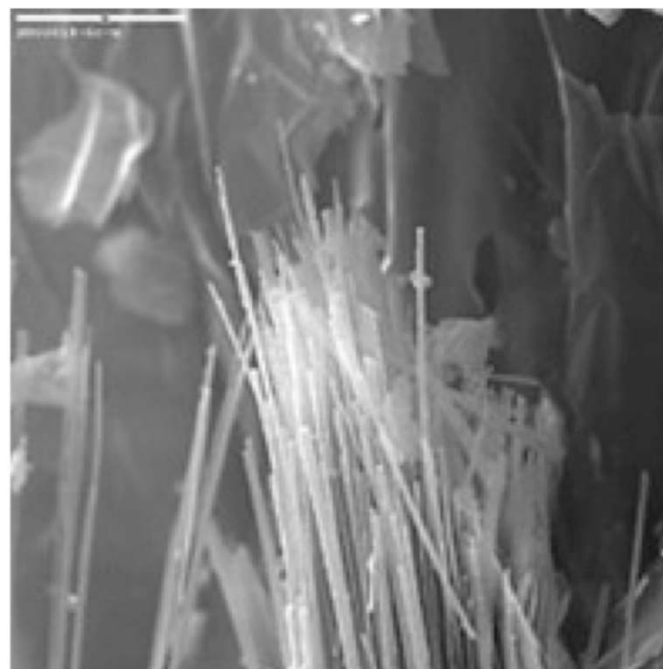
- If disturbing lead paint, follow Lead Safe Work (LSW) practices and provide information on lead risks to the client.
- If complying with local code requirements, the specific code must be noted in the client file with reference to the related weatherization measure(s) that triggered the code activity.

### Restricted

- Replacement, repair, or installation of doors, windows, or window guards is *not* an allowable health and safety cost.

## Asbestos covers the following:

- Asbestos – in siding, walls, ceilings, etc.
- Asbestos – in vermiculite
- Asbestos – on pipes, furnaces, and other small covered surfaces



This scanning electron micrograph of asbestos shows the tiny, glass-like fibers that make asbestos so dangerous. These miniscule fibers become lodged in the lungs and can cause mesothelioma or other cancers.

Photo source: U.S. Geological Survey and U.S. Environmental Protection Agency, Region 8, Denver, Colorado

# Asbestos in siding, walls, ceilings, etc.

## WAP HEALTH & SAFETY

### Allowed

- Removal of siding is allowed when necessary to perform energy conservation measures.
- Recommended, where possible, to insulate through home interior.



### Required

- Inspect exterior wall surface and subsurface for asbestos siding prior to drilling or cutting.
- All precautions must be taken not to damage siding.
- Inform the client that asbestos siding is suspected present and what precautions will be taken.

### Restricted

- Asbestos siding must never be cut or drilled.
- Labor and material costs for activities that would have been conducted anyway, without consideration for asbestos, are not covered by health and safety funds.

# Asbestos in vermiculite

## WAP HEALTH & SAFETY

### Allowed

- Encapsulation by a certified asbestos control professional is allowed.
- Where blower door tests are performed, it is a best practice to perform pressurization instead of depressurization.
- Asbestos Hazard Emergency Response Act of 1986 (AHERA) certified prescriptive sampling is allowed by a certified tester.



### Required

- Assess whether vermiculite is present.
- When vermiculite is present, unless testing determines otherwise, take precautionary measures as if it contains asbestos, such as not using blower door tests and using personal air monitoring in attics.
- Instruct clients not to disturb suspected asbestos-containing material.
- Provide asbestos safety information to the client.
- Formally notify client if test results are positive for asbestos and acquire client's signature.

### Restricted

- Removal is not allowed.

# Asbestos on pipes, furnaces, etc

## WAP HEALTH & SAFETY

### Allowed

- Encapsulation is allowed by a certified asbestos control professional.
- Removal may be allowed by a certified asbestos control professional on a case by case basis as defined in the grantee's health and safety plan.
- Testing is allowed by a certified asbestos control professional.



### Required

- Assume asbestos is present in covering materials.
- If conducting encapsulation, it must be completed prior to blower door testing.
- Instruct clients not to disturb suspected asbestos containing material.
- Provide asbestos safety information to the client.

### Restricted

- Labor and material costs for activities that would have been conducted anyway, without consideration for asbestos, are not covered by health and safety funds.

# Asbestos in Weatherization

## WAP HEALTH & SAFETY

WAP staff often encounter asbestos siding or in pipe or furnace coverings, in vermiculite mined from areas known to contain asbestos, or even in some textured paints and interior finishes.



Photo source: U.S. Dept. of Energy

When asbestos siding is present, as on the home shown above, it may be removed and replaced, but it must not be cut, sanded, or drilled.

Much of the vermiculite mined in the U.S. before 1990 came from a mine contaminated with asbestos. When vermiculite insulation is discovered, as shown in the attic below, precautions must be taken, and it may not be removed.



Photo source: U.S. Environmental Protection Agency



Photo courtesy of Hub Testing Laboratory, Inc.

Some heating pipes and heating appliances are wrapped with asbestos insulation. Encapsulation and/or removal is allowed by certified professionals on a case-by-case basis.



## **Codes & Structures covers the following:**

- Building structure and roofing
- Code compliance
- Fire hazards
- Electrical, other than Knob-and-tube wiring
- Knob-and-tube wiring



# Building Structure & Roofing

## WAP HEALTH & SAFETY

### Allowed

- Building structure and roofing repairs may be corrected with health and safety funds as they relate to code compliance (see code compliance) and mold and moisture (see mold and moisture).



### Required

- Visual inspection.
- Ensure that areas requiring access for performance of weatherization assessment, work, and inspection have safe access.
- Notify client of structurally compromised areas.

### Restricted

- Building rehabilitation is beyond the scope of the Weatherization Assistance Program.
- Health and safety funds should not be used when the repair is a component of an ECM. In that case, the repair should be cost-justified as an incidental repair.



# Code Compliance

## WAP HEALTH & SAFETY

### Allowed

- Health and safety funds may be used to correct code compliance issues, but only where they are triggered by performing weatherization.



### Required

- State and local (or jurisdiction having authority) codes must be followed while installing weatherization measures.
- Condemned properties and properties where “red tagged” health and safety conditions exist that cannot be corrected under this guidance must be deferred.
- Inform client of observed code compliance issues.

### Restricted

- Correction of preexisting code compliance issues is not an allowable cost, other than where required due to weatherization measures being installed.
- Health and safety funds should not be used when the repair is a component of an ECM, such as fixing a light fixture in order to install a CFL bulb. In this case, the repair should be cost-justified as an incidental repair.

# Fire Hazards

## WAP HEALTH & SAFETY

### Allowed

- Health and safety funds may be used to correct fire hazards when necessary in order to safely perform weatherization.



### Required

- Check for fire hazards in the home during the audit and while performing weatherization.
- Inform client of observed fire hazards.

### Restricted

# Electrical, other than Knob-and-Tube Wiring

## WAP HEALTH & SAFETY

### Allowed

- Minor electrical repairs are allowed where health or safety of the occupant is at risk and when necessary to perform specific weatherization measures.
- Voltage drop and voltage detection testing are allowed.



### Required

- Visual inspection.
- Provide client information on overloading circuits and electrical safety/risks.

### Restricted

- Health and safety funds should not be used when the repair is a component of an ECM. In that case, the repair should be cost-justified as an incidental repair.

# Knob-and-Tube Wiring

## WAP HEALTH & SAFETY

### Allowed

- Minor upgrades and repairs necessary for weatherization measures, and where the health or safety of the occupant is at risk, are allowed.
- Voltage drop and voltage detection testing are allowed.



### Required

- Must provide sufficient over-current protection prior to insulating over knob-and-tube wiring.
- Inspect for presence and condition of knob-and-tube wiring.
- Check for alterations that may create an electrical hazard.
- Visual inspection.
- Provide client information on overloading circuits and electrical safety/risks.

### Restricted

- Replacing knob-and-tube wiring when the jurisdiction having authority allows related weatherization measures to continue is not allowed.

# Knob-and-Tube Wiring

## WAP HEALTH & SAFETY



Photo courtesy of Bill Van der Meer

This K&T circuit was dammed prior to insulating to prevent a fire hazard.

- H&S funds may be used to replace circuit, if required for insulation.
- Likely costs less than labor for this treatment.
- Will provide better insulation value for attic.

## **OSHA for WAP covers the following:**

- OSHA and Crew Safety
- Spray Polyurethane Foam (SPF)

# OSHA and Crew Safety

## WAP HEALTH & SAFETY

### Allowed

- Staff may receive additional OSHA training, as desired.

### Required

- Workers must follow OSHA standards and Material Safety Data Sheets (MSDS) and take precautions to ensure the health and safety of themselves and other workers.
- MSDS must be posted wherever workers may be exposed to hazardous materials.
- Grantees must perform assessments to determine if crews are using safe work practices.
- OSHA 10 hour training is required for all workers.
- OSHA 30 hour training is required for all crew leaders.

### Restricted

- Grantees and subgrantees may not “opt out” of OSHA training requirements.



## The H&S Plan must explain:

- Implementation of OSHA and MSDS requirements related to crew and worker safety
- How 10 and 30-hour training requirements will be met
- How crews' safe work practices will be monitored



## Topics covered in OSHA 10:

Mandatory - 4 hrs	Electives – 2 hrs
<b>Introduction to OSHA – 1 hr</b> <ul style="list-style-type: none"> <li>• OSH Act</li> <li>• Inspections, Citations, Penalties</li> <li>• General Safety and Health Provisions</li> <li>• Competent Person</li> <li>• Value of Safety and health</li> </ul>	Choose at least 2 of the elective topics: <ul style="list-style-type: none"> <li>• Materials Handling, Storage, Use and Disposal</li> <li>• Tools – Hand and Power</li> <li>• Scaffolds</li> <li>• Cranes, Derricks, Hoists, Elevators &amp; Conveyors</li> <li>• Excavations</li> <li>• Stairways and Ladders</li> </ul>
<b>OSHA Focus Four Hazards – 2 hrs</b> <ul style="list-style-type: none"> <li>• Fall Protection</li> <li>• Electrical</li> <li>• Struck by</li> <li>• Caught in/between</li> </ul>	<b>Optional – 4 hrs</b>
<b>Personal Protective and Lifesaving Equipment – 30 minutes</b>	For the remaining four class hours: Teach any other construction industry hazards or policies and/or expand on the mandatory or elective topics.
<b>Health Hazards in Construction – 30 minutes</b>	

# Spray Polyurethane Foam

## WAP HEALTH & SAFETY

### Allowed

- Spray polyurethane foam is allowed for use as long as appropriate precautions are taken.



### Required

- Use EPA recommendations when working within, or when SPF fumes become evident within, the conditioned space.
- When working outside the building envelope, isolate the area where foam will be applied, take precautions so that fumes will not transfer inside conditioned space, and exhaust fumes outside the home.
- Use sensory inspection inside the home for fumes during foam application.
- Provide notification to the client of plans to use two-part foam and the precautions that may be necessary.

### Restricted

# Spray Polyurethane Foam

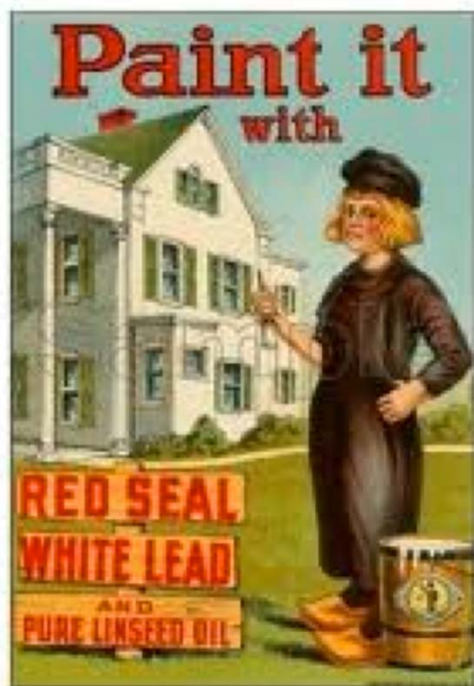
## WAP HEALTH & SAFETY

For large applications of spray polyurethane foam, a positive pressure respirator for installers is recommended.



## Lead-based Paint covers the following:

- Lead-based Paint



According to 1930's advertisements, 8 out of every 10 painters used this brand lead-based paint, but there were plenty of lead paint brands to choose from. Lead paint was valued for its "stretch-ability", it could be thinned and thinned, and still provide great coverage.

# Lead-based Paint

## WAP HEALTH & SAFETY

### Allowed

- Testing is allowed.
- Health and safety funds can be used to cover those costs directly associated with conducting Lead Safe Weatherization (LSW), thus reducing the production costs associated with measures requiring it.

### Required

- Follow guidelines established in EPA's Lead; Renovation, Repair and Painting Program (RRP) and DOE WAP's LSW.
- Deferral is required when weatherization work could create health and safety hazards due to the extent and condition of lead-based paint in the house.
- An EPA Certified Renovator must verify job site set up and clean up.
- Grantee Monitors/Inspectors must be Certified Renovators and receive LSW training.

### Restricted

- Labor and material costs that would have been conducted anyway, without consideration for LSW, may not be charged to health and safety funds.



## The section on lead-based paint in the

### H&S Plan must:

- Describe planned implementation of RRP and LSW
- Describe how compliance will be verified
- Show clear understanding of differences between RRP and LSW, and how all protocols will be met



# LSW in Action

## WAP HEALTH & SAFETY

- When performing an interior blow for dense-pack sidewall insulation on a home containing lead paint, containment and proper cleanup is required.
- For exterior jobs, the ground must be covered with 6 mil poly for 10' around the area, and a containment perimeter 10' outside of that established.



## Mold & Moisture covers the following:

- Mold and Moisture
- Drainage – gutters, down spouts, extensions, flashing, sump pumps, landscape, etc.

Mold, shown here in a bathroom, may not be removed, but the conditions causing it can be addressed. In this case, adding a bathroom exhaust fan on a timer should improve the situation.





# Mold & Moisture

## WAP HEALTH & SAFETY

### Allowed

- Correction of moisture and mold creating conditions is allowed when necessary in order to weatherize the home and to ensure the long term stability and durability of the measures.
- Diagnostics such as moisture meters are recommended pre-weatherization and at final inspection.



### Required

- Where severe mold and moisture issues cannot be addressed, deferral is required.
- Visual assessment is required.
- Provide client notification and disclaimer on mold and moisture awareness.
- Staff trained on national mold and moisture curriculum or equivalent.

### Restricted

- Mold remediation is not allowed.
- Repairs are limited to areas with water damage that can be corrected by weatherization workers.
- Mold testing is not an allowable cost.

# Severe Mold

WAP HEALTH & SAFETY



Photo courtesy of Rainbow International Restoration and Cleaning.

Where severe mold and moisture issues cannot be addressed, deferral is required.

# Drainage

## WAP HEALTH & SAFETY

### Allowed

- Drainage repairs are allowed with health and safety funds only as they relate to code compliance (see code compliance and mold and moisture (see mold and moisture)).
- A repair is allowed as incidental repair when it is a component of an efficiency measure, as with a French drain when installing an air conditioning system, but must be cost-justified with the ECM(s).



### Required

- Inform client of importance of cleaning and maintaining drainage systems and proper landscape design.

### Restricted

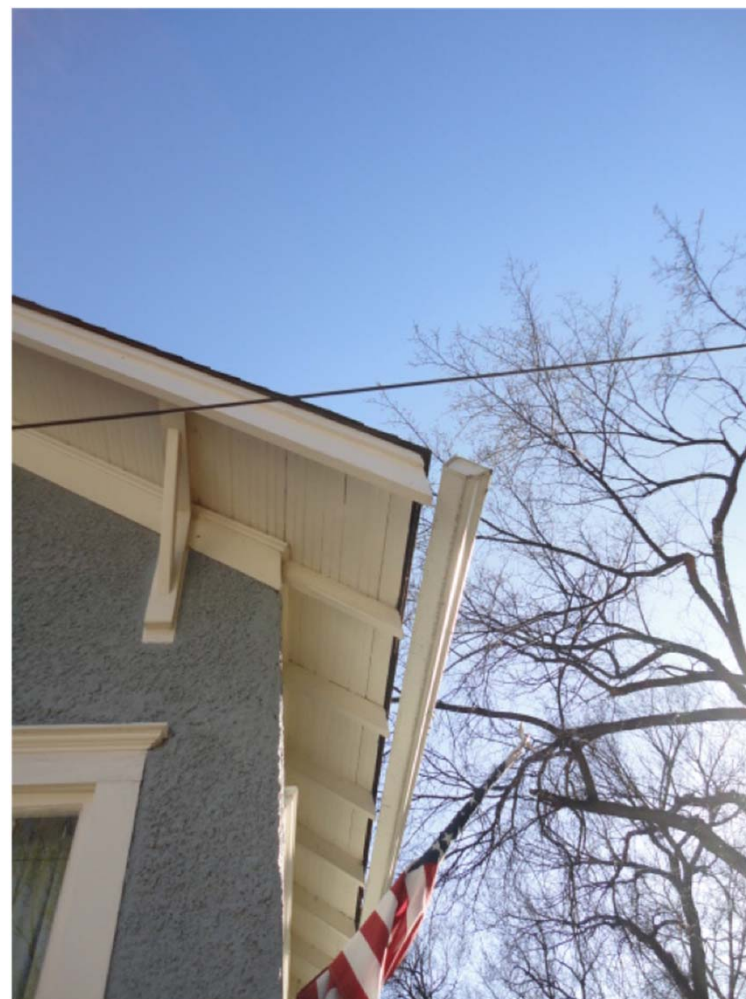
- Major drainage issues are beyond the scope of the Weatherization Assistance Program.

# Gutters and Downspouts

## WAP HEALTH & SAFETY

This loose gutter is causing water buildup near the house, which is causing a moisture problem in the basement as the water leaks through the foundation.

This gutter may be reattached and downspouts installed as necessary to relieve the moisture problem and thus maintain the integrity of the home.



## The H&S Plan must include:

- Protocols used to identify mold and moisture related issues in client homes
- How these issues are discovered during initial audit/inspection
- Client notification policy
- Expected staff training related to alleviating causes of mold and moisture in the home



## Radon covers the following:

- Radon



Both of these homes may have elevated radon levels. Radon presence is not related to income or house size. Radon is an odorless gas released through the soils in certain parts of the country. If radon is present, air sealing the home without addressing the radon can make the problem worse.

# Radon

## WAP HEALTH & SAFETY

### Allowed

- Testing is allowed in locations with high radon potential.



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### Required

- Whenever site conditions permit, exposed dirt must be covered with a vapor barrier, except for mobile homes.
- In homes where radon may be present, precautions must be taken to reduce the likelihood of making radon issues worse.
- Provide client with EPA consumer's guide to radon.

### Restricted

- Radon remediation is not allowed, except for in cases where weatherization work is known to have worsened radon levels **AND** when those levels are above the EPA action level of 4 pCi/L.

# Radon Map

U.S. DEPARTMENT OF  
**ENERGY**

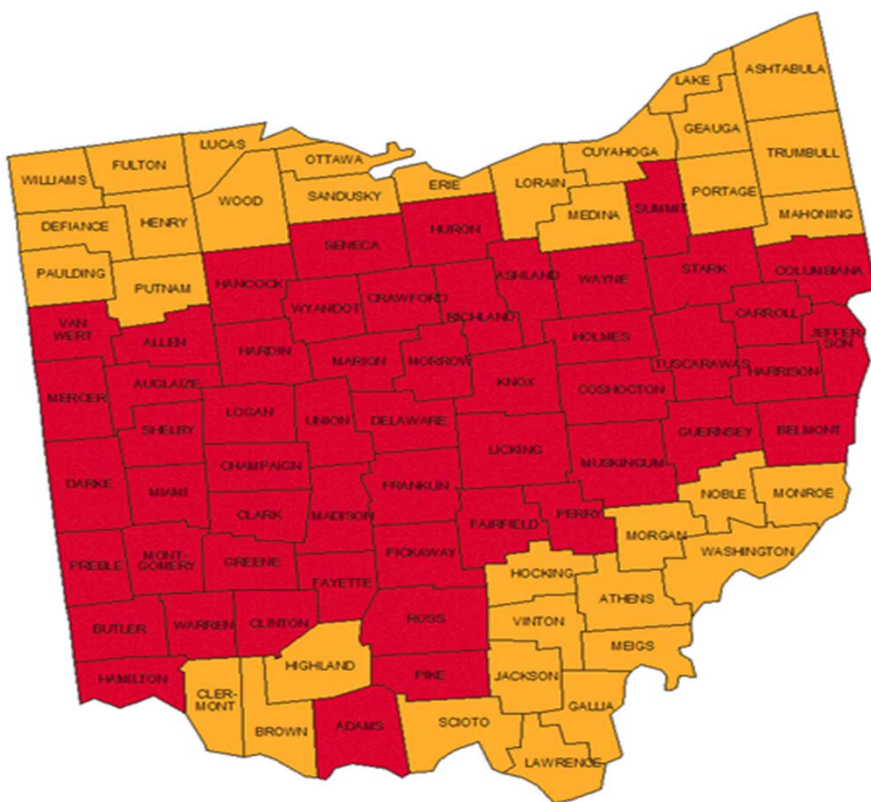
Energy Efficiency &  
Renewable Energy

WAP HEALTH & SAFETY

Radon maps for each state are available at:

[www.epa.gov/radon/whereyoulive.html](http://www.epa.gov/radon/whereyoulive.html)

What do the colors mean?



- Zone 1** counties have a predicted average indoor radon screening level greater than 4 pCi/L (picocuries per liter) (**red zones**) **Highest Potential**
- Zone 2** counties have a predicted average indoor radon screening level between 2 and 4 pCi/L (**orange zones**) **Moderate Potential**
- Zone 3** counties have a predicted average indoor radon screening level less than 2 pCi/L (**yellow zones**) **Low Potential**



## ASHRAE 62.2 for WAP covers the following:

- Ventilation



Installing an oven hood vented to the exterior, like the one shown here, can be covered under health & safety.

# Ventilation

## WAP HEALTH & SAFETY

### Allowed

- When doing the ASHRAE 62.2 calculations, an infiltration credit based on the anticipated final blower door reading may be applied, reducing the total amount of fan CFM needed for the home.

### Required

- 2010 (or most current) ASHRAE 62.2 is required to be met to the fullest extent possible when performing weatherization activity.
- Existing fans and blower systems must be updated if not adequate.
- To ensure compliance, ASHRAE 62.2 evaluation, fan flow metering, and follow-up testing are required.
- Provide client with information on function, use, and maintenance of ventilation system and components.
- Include disclaimer that ASHRAE 62.2 does not account for high polluting sources or guarantee indoor air quality.
- ASHRAE 62.2 training for weatherization staff.

### Restricted

- Installation and repair of ventilation that is a component of an ECM is not allowed as a health and safety cost.



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## ASHRAE 62.2 in the H&S Plan:

- Detailed explanation – How will you implement in program year 2012
  - Determine and provide training needs
  - Review audit and work processes for 62.2 incorporation
  - Cost evaluation to justify any increase in requested H&S funds for program year 2012

## **Combustion Appliance Safety and Heating Systems covers the following:**

- Combustion Gases
- Solid Fuel Heating – wood stoves, etc.
- Stand Alone Electric Space Heaters
- Unvented Combustion Space Heaters
- Vented Combustion Space Heaters
- Smoke/Carbon Monoxide Alarms & Fire Extinguishers

# Combustion Gases

## WAP HEALTH & SAFETY

### Allowed

- Correction of venting is allowed when testing indicates a problem, although this should be done as an incidental repair when it is a component of an ECM.

### Required

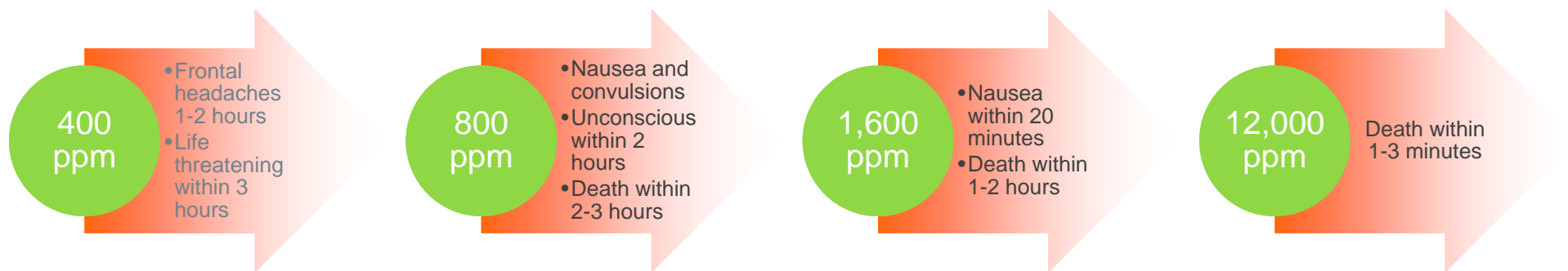
- Proper venting to the outside for combustion appliances, including gas dryers, is required.
- Combustion safety testing is required when combustion appliances are present.
- Inspect venting of combustion appliances and confirm adequate clearances to combustibles.
- Test natural draft appliances for draft and spillage under worst case conditions before and after air sealing. Inspect cooking burners for operability and flame quality.
- Provide client with combustion safety and hazards information, including the importance of using exhaust ventilation when cooking and the importance of keeping burners clean to limit CO production.

### Restricted

- Replacement of cook stoves is not allowed, repair is allowed.

# CO is a combustion gas.

## CO Poisoning



- Symptoms include headache, fatigue, dizziness, drowsiness, or nausea.
- During prolonged or high exposures, symptoms may include vomiting, confusion, and collapse, loss of consciousness, and muscle weakness.

# Combustion Gases in the Plan

The grantee must provide an explanation of procedures to be followed when problems are discovered during testing of combustion gases.



## **Suggest including:**

- Description of test procedures, to ensure consistent meaning of results
- Action levels for draft, CO, and stack temp. for commonly-encountered appliances
- Action required



Combustion Analyzer  
Bacharach, [www.bacharach-inc.com/fyrite-tech.htm](http://www.bacharach-inc.com/fyrite-tech.htm)

# Solid Fuel Heating

## WAP HEALTH & SAFETY

### Allowed

- Maintenance, repair, and replacement of primary indoor heating units is allowed where occupant health and safety is a concern.
- Maintenance and repair of secondary heating units is allowed.



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### Required

- Inspection of chimney and flue, and worst-case combustion appliance zone depressurization testing.

### Restricted

- Replacement of secondary heating units is not allowed.



# Stand Alone Electric Space Heaters

## WAP HEALTH & SAFETY

### Allowed

- Removal is recommended.



### Required

- Check circuitry to ensure adequate power supply for existing space heaters.
- Inform client of hazards and collect a signed waiver if removal is not allowed.

### Restricted

- Repair, replacement, or installation is not allowed.

# Unvented Combustion Space Heaters

## WAP HEALTH & SAFETY

### Allowed

- If used as primary heat source, replacement with an approved heating system is allowed.
- Testing for air-free carbon monoxide (CO) is allowed.
- Repair of secondary units that conform to ANSI Z21.11.2 is allowed.



### Required

- Units that do not meet ANSI Z21.11.2 must be removed prior to weatherization, but may remain until a replacement heating system is in place.
- Check units for ANSI Z21.11.2 label.
- Inform client of dangers of unvented space heaters - CO, moisture, and NO2. CO can be dangerous even if CO alarm does not sound.

### Restricted

- Installation is not allowed.
- Replacement of secondary heat sources is not allowed.

# Unvented Space Heater

## WAP HEALTH & SAFETY

This unvented space heater does not conform to ANSI Z21.11.2. This must be removed before weatherization can occur on the house.

If this were the primary heat source, it could be left in place until another heat source was installed, then weatherization would proceed.



# Vented Combustion Space Heaters

WAP HEALTH & SAFETY

**Allowed**



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**Required**

- Should be treated as furnaces (see heating systems).

**Restricted**

# Smoke/Carbon Monoxide Alarms and Fire Extinguishers



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## WAP HEALTH & SAFETY

### Allowed

- Installation of smoke/CO alarms is allowed where detectors are not present or are inoperable.
- Inoperable smoke/CO alarms can be replaced if required as condition of local code compliance (see code compliance).
- Providing fire extinguishers is allowed only when solid fuel is present.

### Required

- Provide client with verbal and written information on use of smoke/CO alarms and fire extinguishers when installed.

### Restricted

- Replacement of operable smoke/CO detectors is not an allowable cost, except where required by local code compliance.
- Installing fire extinguishers is not allowed, unless solid fuel appliances are present.

# Smoke and CO Alarms in the Plan



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## Detailed implementation plan

- Installation parameters:
  - If non-functioning or nonexistent, is replacement required by grantee?
- Installation procedures:
  - Specifications dictated by grantee?
  - Installation guidelines to ensure units serve purpose.

## **Occupant Wellness covers the following:**

- Occupant Preexisting or Potential Health Conditions
- Biologicals and Unsanitary Conditions – odors, mustiness, bacteria, viruses, raw sewage, rotting wood, etc.
- Pests
- Formaldehyde, Volatile Organic Compounds (VOC), and other Air Pollutants
- Injury Prevention

# Occupant Preexisting or Potential Health Condition



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## WAP HEALTH & SAFETY

### Allowed

- Temporary relocation of at-risk occupants may be allowed on a case-by-case basis.

### Required

- When a person's health may be at risk and/or the work activities could constitute a health or safety hazard, the occupant at risk will be required to take appropriate action based on severity of risk.
- Failure or the inability to take appropriate actions must result in deferral.
- Grantees must require occupant to reveal known or suspected health concerns as part of initial application for weatherization.
- Occupants must also be screened for known or suspected health concerns during the initial home audit.
- Provide client information of any known risks to their condition.
- Provide client with worker contact information so client can inform of any issues.

### Restricted

Weatherization may not proceed if the occupant cannot or will not take appropriate actions based on the severity of the risk.



# Occupant Health Concerns in the Plan



## In the Plan:

- Policy to determine existing health conditions of occupants
- Documentation for notifying clients of potential health concerns. Concerns might include:
  - Mold discovered in bedroom
  - Unsafe electrical wiring not covered by WAP H&S

# Biological and Unsanitary Conditions

## WAP HEALTH & SAFETY

### Allowed

- Remediation of conditions that may lead to or promote biological concerns and unsanitary conditions is allowed when necessary to perform weatherization or if those conditions were a result of weatherization. (also see mold and moisture)
- Deferral may be necessary in cases where a known agent is present in the home that may create a serious risk to occupants or weatherization workers.



### Required

- Inform client of observed conditions.
- Provide information on how to maintain a sanitary home and steps to correct deferral conditions.
- Sensory inspection.

### Restricted

- Addressing bacteria and viruses is not an allowable cost.
- Cleaning or repairing conditions other than those that may lead to or promote biological concerns and/or are not necessary to perform weatherization is not allowed.

# Pests

## WAP HEALTH & SAFETY

### Allowed

- Pest removal is allowed only where infestation would prevent weatherization.
- Screening of windows and points of access to prevent intrusion is allowed.



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### Required

- Infestation of pests may be cause for deferral where they cannot be reasonably removed or the infestation poses a health and safety concern for workers.
- Assessment of presence and degree of infestation and risk to worker.
- Inform client of observed condition and associated risks.

### Restricted

- Removing pests that would not otherwise prevent the workers ability to weatherize the home or protect weatherization measures.

# Pest Removal

WAP HEALTH & SAFETY



The good, the  
bad, the  
adorable...?  
Some minor  
pests that were  
safely removed  
to conduct  
heating system  
testing and  
repair.

*Photos courtesy of T. Boothby*

# Formaldehyde, VOCs, & Other Air Pollutants

## WAP HEALTH & SAFETY

### Allowed

- Removal of pollutants is allowed where necessary to perform weatherization.



### Required

- Removal of pollutants is required if they pose a risk to workers.
- If pollutants pose a risk to workers and removal cannot be performed or is not allowed by the client, the unit must be deferred.
- Sensory inspection.
- Inform client of observed condition and associated risks. Provide client written materials on safety and proper disposal of household pollutants.

### Restricted

Removal of pollutants that is not necessary to perform weatherization (e.g. cleaning old paint cans and oil out of the garage) is not allowed.

# Injury Prevention

## WAP HEALTH & SAFETY

### Allowed

- Minor repairs and installation may be conducted only when necessary to effectively weatherize the home.



### Required

- Workers must take all reasonable precautions against performing work on homes that will subject workers or occupants to health and safety risks. In other words, work safe.
- Observe if dangers are present that would prevent weatherization.
- Inform client of observed hazards and associated risks.

### Restricted

- Minor repairs and installation of items such as stairs, porches, safety lighting, hand rails, etc. are not allowed unless their absence would prevent the effective weatherization of the home.



- WPN 11-6 provides guidance on what is allowable, what is required, and what is restricted for most health and safety concerns encountered through weatherization.
- The grantee health and safety plan will provide further guidance.
- The grantee's plan may choose not to allow something that is allowed by WPN 11-6, but it must adhere to required actions and restrictions.
- If a measure is identified as incidental repair in the H&S plan, that definition must be consistently applied throughout the program.