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[[Page 40258]]

connection with obtaining such assistance, or with its extension, continuation, renewal, amendment, or modification. The Byrd Amendment applies to the funds that are the subject of this NOFA. Therefore, applicants must file a certification stating that they have not made and will not make any prohibited payments and, if any payments or agreement to make payments of nonappropriated funds for these purposes have been made, a form SF-LLL disclosing such payments must be submitted. The certification and the SF-LLL are included as Attachment D of this NOFA.

The Lobbying Disclosure Act of 1995 (Pub. L. 104-65; approved December 19, 1995), which repealed section 112 of the HUD Reform Act, requires all persons and entities who lobby covered executive or legislative branch officials to register with the Secretary of the Senate and the Clerk of the House of Representatives and file reports concerning their lobbying activities.

#### IX. Environmental Requirements

Activities assisted under this program are subject to HUD environmental review to the extent required under 24 CFR part 50. An award under the Healthy Homes Initiative does not constitute approval of specific sites where activities may be carried out. Following award execution, HUD will perform environmental reviews for activities to be carried out on properties proposed by your organization. You may not rehabilitate, convert, repair or construct a property, or commit or expend program funds or non-HUD funds for these program activities for any eligible property, until you receive written notification from the appropriate HUD official that HUD has completed its environmental review and the property has been approved. The results of environmental reviews may require that proposed activities be modified or proposed sites rejected.

#### X. Authority

The authority for this program is the Departments of Veterans Affairs and Housing and Urban Development, and Independent Agencies Appropriations Act, 1999, Pub. L. 105-276 (approved October 21, 1998), 112 Stat. 2461, 2482.

Dated: July 16, 1999.  
David Jacobs,  
Director of the Office of Lead Hazard Control.

#### Appendix A

The following briefly describes the housing-associated health and injury hazards HUD considers key targets for intervention:

Allergens and asthma: Experts estimate that 14 million Americans have asthma, with an associated annual cost of \$14 billion. Asthma is now recognized as the leading cause of school and work absence, emergency room visits and hospitalization. For sensitized children, exposure to antigens from dust mites, certain pets, and cockroaches has been associated with more severe asthma. There is a preponderance of evidence showing a dose-response relationship between exposure and prevalence of asthma and allergies; some evidence also indicates that exposure to antigens early in life may predispose or hasten the onset of allergies and asthma. Dust mites have been identified as the largest trigger for asthma and allergies. Cockroach allergens appear to be excessive in 30-50% of inner-city housing and affect 5-15% of the population, whereas dust mite appears to be the dominant allergen in other environments. Interventions known to have beneficial effects include installation of impervious mattress and pillow covers, which can reduce allergen exposure by 90%. Other dust mite control measures include dehumidification, laundering bedding, and removal of carpets and other dust sinks. Cleaning carpets with tannic acid solution has also been demonstrated to greatly reduce dust mites. Asthma prevention program costs have been estimated at about \$500 per unit, which includes about \$150 for educational interventions.

Asbestos: Asbestos is a mineral fiber that has been used commonly in a variety of building construction materials and household products for insulation and as a fire-retardant. The Environmental Protection Agency (EPA) and the Consumer Product Safety Commission (CPSC) have banned most asbestos products. Manufacturers have also voluntarily limited uses of asbestos. Today, asbestos is most commonly found in older homes: in pipe and furnace insulation materials, asbestos shingles, millboard, textured paints and other coating materials, and floor tiles. Elevated concentrations of airborne asbestos can occur when asbestos-containing materials (ACM) are disturbed by cutting, sanding or other remodeling activities. Improper attempts to remove these materials can release asbestos fibers into the air in homes, increasing asbestos levels and endangering people living in those homes. The most dangerous asbestos fibers are too small to be visible. After they are inhaled, they can remain and accumulate in the lungs. Asbestos can cause lung cancer, mesothelioma (a cancer of the chest and abdominal linings), and asbestosis (irreversible lung scarring that can be fatal). Most people with asbestos-related diseases were exposed to elevated concentrations on the job; some developed disease from exposure to clothing and equipment brought home from job sites. As with radon, dose-response extrapolations suggest that lower level exposures, as may occur when asbestos-containing building materials deteriorate or are disturbed, may also cause cancer.

Intact asbestos-containing materials are not a hazard; they should be monitored for damage or deterioration and isolated if possible. Repair of damaged or deteriorating ACM usually involves either sealing (encapsulation) or covering (enclosure) it. Repair is usually cheaper than removal, but it may make later removal of asbestos more difficult and costly. Repairs should be done only by a professional trained and certified to handle asbestos safely and can cost from a few hundred to a few thousand dollars; removal can be more expensive.

Combustion products of heating and cooking appliances: Burning of oil, natural gas, kerosene, and wood for heating or cooking purposes can release a variety of combustion products of health concern. Depending upon the fuel, these may include carbon monoxide (a chemical asphyxiant), oxides of nitrogen (respiratory irritants), polycyclic aromatic hydrocarbons (e.g., the carcinogen benzo[a]pyrene), and airborne particulate matter (respiratory irritants). Carbon monoxide, an odorless gas, can be fatal. Nitrogen

dioxide can damage the respiratory tract, and sulfur dioxide can irritate the eyes, nose and respiratory tract. Smoke and other particulates irritate the eyes, nose and throat, and can cause lung cancer.

Improper venting and poor maintenance of heating systems and cooking appliances can dramatically increase exposure to combustion products. Experts recommend having combustion heating systems inspected by a trained professional every year to identify blocked openings to flues and chimneys; cracked or disconnected flue pipe; dirty filters; rust or cracks in the heat exchanger; soot or creosote build-up; and exhaust or gas odors. Installing a carbon monoxide detector is also recommended; however, such a detector will not detect other combustion by-products.

Insect and Rodent pests: The observed association between exposure to cockroach antigen and asthma severity has already been noted above. In addition, cockroaches may act as vehicles to contaminate and environmental surfaces with certain pathogenic organisms. Rodents can transmit a number of communicable diseases to humans, either through bites, arthropod vectors, or exposure to aerosolized excreta. In addition, humans can become sensitized to proteins in rodent, urine, dander and saliva. Such sensitization may contribute to asthma severity among children. Insect and rodent infestation is frequently associated with substandard housing that makes it difficult to eliminate. Treatment of rodent and insect infestations often includes the use of toxic pesticides which may present hazards to occupants (see below). Integrated pest management (IPM) for rodents and cockroaches, which reduces the use of pesticides, is estimated to cost approximately \$150 per unit. IPM control measures include sealing holes and cracks, removing food sources and use of traps.

Lead: Exposure to lead, especially from deteriorating lead-based paint, remains one of the most important and best-studied of the household environmental hazards to children. Although blood lead levels have fallen nationally, a large reservoir of lead remains in housing. The most recent national survey, conducted from 1991-94, showed that nearly one million U.S. preschoolers still have elevated blood lead levels. Overall, the prevalence rate among all children under six

[[Page 40259]]

years of age is 4.4%. Among low-income children living in older housing where lead-based paint is most prevalent, the rate climbs to 16%; and for African-American children living in such housing, it reaches 21%.

HUD estimates that 64 million dwellings have some lead-based paint, and that 20 million have lead-based paint hazards. Of those, about 3.6 million have young children and of those, about 500,000 units have inadequate cash flow to respond to lead-based paint hazards. Costs can range anywhere from \$500 to \$15,000 per unit. Corrective measures include paint stabilization, enclosure and removal of certain building components coated with lead paint, and cleanup and ``clearance testing'', which ensures the unit is safe for young children.

Mold and moisture: An analysis of several pulmonary disease studies estimates that 25% of airways disease, and 60% of interstitial lung disease may be associated with moisture in the home or work environment. Moisture is a precursor to the growth of mold and other biological agents, which is also associated with respiratory symptoms. An investigation of a cluster of pulmonary hemosiderosis (PH) cases in infants showed PH was associated with a history of recent water damage to homes and with levels of the mold *Stachybotrys atra* (SA) in air and in cultured surface samples. Associations between exposure to SA and ``sick building'' symptoms

in adults have also been observed. Other related toxigenic fungi have been found in association with SA-associated illness and could play a role. For sensitive individuals, exposure to a wide variety of common molds may also aggravate asthma. Addressing mold problems in housing requires coordination among the medical, public health, microbiological, housing, and building science communities.

The cost of mold/moisture-related intervention work (e.g., integrated pest management, clean & tune furnace, remove debris ,vent clothes dryer, cover dirt floor with impermeable vapor barrier) is a few hundred dollars, unless major modification of the ventilation system is needed. In Cleveland, mold interventions, including repairs to ventilation systems and basement flooring, in the most heavily-contaminated homes range from \$500--\$5,000, with some costs also being dedicated to lead hazard control simultaneously through its lead+asthma program.

**Pesticide residues:** According to the EPA, 75 percent of U.S. households used at least one pesticide product indoors during the past year. Products used most often are insecticides and disinfectants. Another study suggests 80 percent of most people's exposure to pesticides occurs indoors and that measurable levels of up to a dozen pesticides have been found in the air inside homes. The amount of pesticides found in homes appears to be greater than can be explained by recent pesticide use in those households; other possible sources include contaminated soil or dust that migrates in from outside, stored pesticide containers, and household surfaces that collect and then release the pesticides. Pesticides used in and around the home include products to control insects (insecticides), termites (termiticides), rodents (rodenticides), molds and fungi (fungicides), and microbes (disinfectants). In 1990, the American Association of Poison Control Centers reported that some 79,000 children were involved in common household pesticide poisonings or exposures. In households with children under five years old, almost one-half stored at least one pesticide product within reach of children. Exposure to chlorpyrifos (CP), a commonly used organophosphate insecticide, in the prenatal and early postnatal period may impair neurodevelopment. While CP is a biodegradable pesticide, substantial persistence of CP in house dust has been demonstrated. Exposure to high levels of cyclodiene pesticides, commonly associated with misapplication, has produced various symptoms, including headaches, dizziness, muscle twitching, weakness, tingling sensations, and nausea. In addition, EPA is concerned that cyclodienes might cause long-term damage to the liver and the central nervous system, as well as an increased risk of cancer.

There are available data on hazard evaluation methods and remediation effectiveness regarding pesticide residues in the home environment.

**Radon progeny:** The National Academy of Sciences estimates that approximately 15,000 cases of lung cancer per year are related to radon exposure. Epidemiologic studies of miners exposed to high levels of radon in inhaled air have defined the dose response relation for radon-induced lung cancer at high exposure levels. Extrapolation of these data has been used to estimate the excess risk of lung cancer attributable to exposure to radon gas at the lower levels found in homes. These estimates indicate that radon gas is an important cause of lung cancer deaths in the U.S. Excessive exposures are typically related to home ventilation, structural integrity and location.

Radon measurement and remediation methods are well-developed, and the Environmental Protection Agency (EPA) recommends that every home be measured for radon. EPA estimates that materials and labor costs for radon reduction in an existing home are \$800-\$2500. Including radon resistant techniques in new home construction costs \$350-\$500, and can save up to \$65 annually in energy costs,

according to the EPA.

Take home hazards from work/hobbies and work at home: When the clothing, hair, skin, or shoes of workers become contaminated with hazardous materials in the workplace, such contaminants may inadvertently be carried to the home environment and/or an automobile. Such ``take-home'' exposures have been demonstrated, for example, in homes of lead-exposed workers. In addition, certain hobbies or workplaces located in the home may provide an especially great risk of household contamination.

Control methods include storing and laundering work clothes separately, and showering and changing before leaving work, or immediately after arriving home. Once a home becomes contaminated, cleaning floors and contact surfaces and replacing furnishings may be necessary to reduce exposures.

Unintentional injuries/fire: Unintentional injury is now the leading cause of death and disability among children younger than 15 years of age. In 1997, nearly 7 million persons in the United States were disabled for at least 1 full day by unintentional injuries received at home. During the same year, 28,400 deaths were attributable to unintentional home injuries, of which 1800 occurred among children 0-4 years of age. Among young children, three types of events accounted for more than 3/4 of deaths: fires/ burns, drownings, and mechanical suffocation. Falls and poisoning are the next most common.

Home visitation protocols have been shown to be effective in reducing exposure to such hazards. The ``add-on'' cost of injury prevention measures, when combined with other housing interventions are estimated at about \$100 per unit. This includes the cost of some injury prevention devices, such as smoke alarms, electrical socket covers, etc.

#### Appendix B

#### References

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