Children's Environmental Project

Project Report

August 2008

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ACKNOWLEDGEMENTS

The **Children's Environmental Project** was launched by the Family Housing Fund and the Supportive Housing Provider Group, a network of 17 supportive housing organizations in the Twin Cities that provide housing and services to homeless families with children. The pilot project was made possible with funding support from the Blue Cross Blue Shield of Minnesota Foundation's initiative, "Growing Up Healthy: Kids and Communities".

The **Children's Environmental Project** is part of the Fund's broader **Visible Child Initiative** (formerly known as the Healthy Families network), a partnership with the Supportive Housing Provider Group that promotes the mental and chemical health of families and the physical, emotional, and academic well-being of homeless children from birth to adolescence.

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Supportive Housing Provider Group Pilot Agencies: Emma's Place
Wayside House, Inc.
YWCA of St. Paul

August 2008

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EXECUTIVE SUMMARY

The goal of this project is to create safe physical environments in supportive housing settings for very young children and all family members. To carry out this goal, the Supportive Housing Provider Group (the Provider Group) with support from the Family Housing Fund (the Fund) and technical assistance from Hart-Shegos and Associates (H-SA) and the Family Supportive Housing Center LLC (the Center) initiated and implemented a process for inspecting supportive housing units and common areas and for interviewing staff and residents to assess the safety and environmental quality for all those living and working in the housing settings. The findings of these interviews and inspections are used to assist supportive housing providers and residents in improving safety and reducing the use of harmful household and personal care products. Next steps will be to create training and educational materials that will help staff and residents improve environmental health and safety for children and families in supportive housing communities. It is the hope that follow-up evaluations will demonstrate the following projected outcomes:

- reduced use of harmful chemicals in household and personal care products
- reduced use of pesticides (rodenticides, insecticides, fungicides, and herbicides)
- reduced exposure to triggers for asthma
- reduced risk of injury.

To achieve these outcomes, we have worked with three member agencies of the Provider Group (Emma's Place, Wayside House, and the YWCA of St. Paul). These organizations have served as pilot agencies for the project. H-SA and the agencies have conducted interviews with residents and staff and implemented a physical inspection of supportive housing residential units, common areas in the housing complexes, and exterior spaces. The surveys have evaluated the living environments within these supportive housing communities. Of 90 possible households, 33 residents volunteered to participate in the study. Interviews and inspections have focused on issues such as:

- cleaning and laundry products – manner of use and potentially harmful ingredients
- personal care products – manner of use and potentially harmful ingredients
- pest control practices
- electrical and physical hazards in units and common areas
- child-proofing safety measures
- potentially harmful materials in the home (i.e., plastics in children's toys and baby bottles; chemicals in furniture and bedding)
- indoor air quality, including mold and volatile organic chemicals (VOCs)
- lead in soil and radon.

Cleaning and Laundry Products

Some cleaning and laundry products and the manner in which they are used have the potential to be detrimental to health. To determine the types of these products that residents and staff use and the way in which they are used, all household cleaning and laundry products that were observed were recorded by brand name. These included such products as all-purpose cleaners, specialty cleaners, window sprays, kitchen and bathroom products, air fresheners, products containing bleach, laundry detergents, and fabric softeners. In the 33 households, a total of 350 cleaning and laundry products were recorded, of which there were 158 different brands. For those products which had the highest frequency of use, the specific ingredients, where available, were determined. In the course of interviews, cleaning practices and use of various products were also determined.

Findings of note

All residents and staff have exposure to some hazardous household chemicals, some to a greater extent than others. These chemicals can be triggers for asthma, skin irritants, immune system toxicants, carcinogens, and linked to developmental and reproductive issues. Studies have shown that people, especially children, who have experienced severe poverty, violence, and/or trauma (all of which are associated with homelessness) have immune systems that are already under significant stress and are more vulnerable to the harmful effects of these toxicants.

A significant finding was the use of chlorine bleach. A total of 23 of the 33 households and the staff of the three agencies used some type of bleach product. There was a total of 50 bleach products, representing 20 different brands. Many sources recommend the use of bleach as a disinfectant and to remove certain asthma triggers such as mold, but bleach is a known respiratory irritant and has been shown to be a trigger for asthma. Of the 33 households surveyed, 20 households had at least one member with a physician-diagnosed case of asthma. Of those 20 households, 15 households currently used bleach in some form. Three households stated that they have used bleach in the past, but no longer do so.

Another significant finding was the popular use of products with obvious fragrance or products with ‘fragrance’ listed as an ingredient. Most cleaning and laundry products had some type of fragrance. Residents used products until they could ‘smell’ them. The smell of a product was associated with cleanliness.

Fragrances consist mostly of chemicals called volatile organic compounds. Ingredients in fragrances can be skin irritants, triggers for asthma and allergies, and hormone disruptors. (Hormone disruptors are substances that act like hormones in the endocrine system and alter or block the function of natural hormones. Studies have linked hormone disruptors to adverse biological effects such as abnormal fetal and reproductive organ development and certain cancers such as breast cancer.) Common ingredients in some fragrances are a group of chemicals called phthalates, which are suspected hormone disruptors.

Product usage is significant. How a product is used and the quantity that is used determines the exposure to potentially harmful chemicals. Most residents do not follow label instructions for cleaning products, but they usually measure laundry detergents. Often these cleaning products are used in rooms without adequate ventilation. Many residents stated that they did household chores in a similar way as their mothers or grandmothers did and used similar products.

Personal Care Products

Some personal care products and the manner in which they are used have the potential to be detrimental to health. To determine the types of personal care products used, all products that were observed were recorded by brand name. These included such products as shampoos and conditioners, soaps and body washes, cleansers, moisturizers, hair care products, deodorants, dental care products, and fragrances. (Only some make up and nail products were recorded because of the large number and variety of product found.) In the 33 households, a total of 347 personal care products were recorded, of which there were 237 different brands. For those products which had the highest frequency of use, the specific ingredients were determined.

To determine the types of children's care products that residents and staff-on-site use, all children's products that were observed were recorded by brand name. These included such products as shampoos and conditioners, soaps and body washes, lotions and oils, and other baby products. In the 33 households, a total of 80 children's care products were recorded, of which there were 53 different brands. For those products which had the highest frequency of use, the specific ingredients were determined.

The ingredients in personal care products vary in the type and severity of health hazards that they pose. Some can cause immediate, or acute, conditions such as respiratory or skin irritations, while others have the potential to cause long-term, or chronic, effects such as cancer and neurological and developmental conditions. Chemicals can be inhaled, can penetrate the skin, or can be ingested from lips and hands. A single exposure is unlikely to do any harm, but a lifetime of exposure or exposure for young children can add up.

Currently, the US government does not require health studies or safety tests for ingredients in personal care products before a product is sold. Any testing that the cosmetic industry carries out is conducted by the manufacturing companies or the Cosmetic Ingredients Review, the industry's self-policing safety panel. According to the Environmental Working Group (EWG), a non-profit organization providing useful resources and research to consumers (www.ewg.org), nearly 90% of the chemicals in personal care products have not been adequately tested for safety. The EWG has compiled a database of chemicals found in personal care products along with the associated risks of the chemicals (www.cosmeticsdatabase.com).

Findings of note

All residents have exposure to products that may have potential harmful effects, some to a greater extent than others. These products contain chemicals that can be triggers for asthma, skin irritants, immune system toxicants, carcinogens, and linked to developmental and reproductive issues.

Most adult and children's personal care products listed fragrance as an ingredient. As with the fragrances found in household cleaning and laundry products, the term 'fragrance' can be a catch-all category and can contain hidden ingredients that may pose chronic long-term health risks. For many products, fragrances are synthetic mixtures of various chemicals. These chemicals are considered to be trade secrets and do not have to be individually listed on product labels; only the term "fragrance" is listed. (See pages 2-3 under Cleaning and Laundry Products for health risks.)

Anti-bacterial soaps and similar products were very popular. Studies have linked triclosan, the active ingredient in most of these products, to a variety of health and environmental concerns, including skin irritation, susceptibility to allergies, disruption of the thyroid system, resistance of bacteria to antibiotics, dioxin contamination, and destruction of fragile ecosystems.

In the Environmental Working Group's "Safety Guide to Children's Personal Care Products" (www.cosmeticsdatabase.com/special/parentsguide) the organization recommends that seven specific ingredients be always avoided, and another set of eleven specific ingredients to be avoided if at all possible. Of the eight most popular children's products used by residents, one product had an ingredient in the group "to be always avoided" and all the products had at least one ingredient in the group "to be avoided if possible".

Children's Physical Safety

Statistics from hospital emergency departments show that accidents in the home are a major cause of severe injury and death among children. Accidents can be prevented by intentionally making living spaces safe for children.

Most residents and all staff were aware of the need to make physical environments safe for children – both in residents' apartments and in child care rooms and common areas in the buildings.

Findings of note

Attempts at childproofing residents' apartments, child care rooms, and common areas were inconsistent. Residents are concerned about the safety of their children, but their knowledge of childproofing techniques and what constitute hazardous situations is inconsistent. The organizations and residents either receive or purchase secondhand items such as toys, car seats, strollers, and other children's products. Donated items are sorted, but not checked for safety recalls.

Plastics

Use of plastics for eating, cooking, and food storage can carry health risks, as well as certain plastics used in some children's products (i.e., baby bottles, sippy cups, toys, bibs, etc.) and home items (i.e., some shower curtains). Fetuses and young children are at greatest risk. Of the various types of plastic, those that are labeled 1, 2, 4, and 5 are considered to be the better choices for food and beverages, but it is advised not to heat food in these types of plastic. Plastics labeled 3, 6, and 7 are considered to be types to avoid. Type '3', or vinyl, contains the plasticizer DEHA (di-2-ethylhexyladipate), which has been linked to negative effects on various organs of the body. Type '6', polystyrene, can leach the chemical styrene which is toxic to the brain and nervous system. Most type '7's, or polycarbonate, can leach the chemical bisphenol A, which mimics the action of the hormone estrogen, disrupting normal reproductive and developmental functions.

Findings of note

Residents were not aware of the potential hazards to their children of using certain types of plastic. Most residents use some type of plastic plates, bowls, cups, sippy cups, and/or baby bottles. Most baby bottles and sippy cups that were observed were made of polycarbonate (type '7').

Food is stored and heated in plastic. Food containers were mainly type '5'. Several different types of plastic wrap are used to cover food (types '3' and '4'). Children have toys made of a variety of types of plastic. Some children sleep on plastic-covered mattresses (most likely vinyl, type '3').

Use of Pesticides

Property management of the organizations and the contracted pest control companies appear to use some of the principles of integrated pest management (IPM), a method of preventing and controlling pests in a way that is the least hazardous to the residents and the environment. Few residents purchased and used pesticides on their own. Further review of practices and additional education for staff and residents are required. IPM, to be effective, depends on everyone to take active roles.

Indoor Air Quality

All the residential units had externally-vented exhaust fans in the kitchens and bathrooms. There were a few units that had some mold around bathtubs. Due to the fact that all of these properties have recently undergone extensive renovations, mold was not seen as an issue.

In many units, indoor air quality was poor due to lack of ventilation, unclean conditions, use of incense and air fresheners, and/or tobacco smoke. None of the residents owned or used a HEPA vacuum cleaner.

Lead and Radon

There is a need to be concerned about elevated lead levels in the environment, particularly in soils in urban areas. Soil samples were taken from areas of bare soil around the edges of playgrounds and tested for lead. Sampling protocol was followed as described in Methodology. The soil lead test results ranged from 2 to 148 ppm. Some of these levels are more than the upper level established by the state (100 ppm), but less than the upper level established by the EPA (400 ppm). For levels of lead above the state's limit, yet within the EPA's limit, it is advisable to take remedial action. Further consultation is in process. Even though some of the test results were within the state's limits, taking remedial action could reduce risks.

Radon is a naturally occurring gas that gets into buildings from the surrounding soil. Radiation emanating from radon can cause various types of cancer, particularly lung cancer. Radon is found globally, but is more pronounced in certain types of bedrock, particularly the rock forming much of the soil in the Upper Midwest. For each housing site that was surveyed, sub-ground level common and living areas and basements were tested for the presence of radon. Sampling protocol was followed as described in Methodology. Radon levels ranged from 0.7 to13.0 pCi/L. The EPA and the state recommend further action be taken for levels above 4.0 pCi/L. For those sites that had high levels, further testing and consultation is in process, with the expectation of mitigation.

Recommendations

Consumer products

Residents and staff need to become more aware of the potential hazards of certain everyday products. By becoming more informed consumers, they can create healthy environments by making healthy choices in the products that they purchase and in the way in which those products are used. Some specific recommendations include:

- Limit or eliminate the use of bleach in household cleaning.
- Reduce the use of scented products.
- Use fewer products.
- Seek out alternative or do-it-yourself products.
- Make sure that there is adequate ventilation when using certain products.
- Avoid products with certain ingredients as listed in consumer safety lists.

Children's physical safety

Residents and staff need to become more aware of steps that can be taken to prevent injuries to children in apartments and common areas. Some specific recommendations include:

- Incorporate additional information on current child safety techniques into parenting and life skills classes.
- Conduct building-wide audits for conditions hazardous to children and other environmental risks.
- Establish policies concerning child safety practices and recall checks.
- Investigate options for child safety devices and help to make them more readily available to residents.

Use of plastic

Residents and staff need to become more aware of the hazards of certain types of plastic and know about alternative options. Some specific recommendations include:

- Choose baby bottles and sippy cups made of glass or polyethylene (1, 2, 4) or polypropylene (5). Many baby bottles are not labeled as to the type of plastic. Use ones that are 'clouded' or 'opaque' instead of hard, shiny clear or tinted plastic ones.
- Store food in glass or ceramic containers.
- Use wax paper instead of cling wrap to cover food in the microwave. Do not reheat food in Styrofoam take-out containers.
- Use non-polycarbonate water bottles. Five-gallon water bottles and sport water bottles (i.e., Nalgene) are made of polycarbonate (7).

Pest control

Residents and staff need to become more aware of the hazards of pesticides and the principles of IPM. Some specific recommendations include:

- Consider an educational program for residents as to the nature of pesticides and their associated health risks and how the residents can be an integral part of responsibly controlling pests.
- Encourage residents to take precautions before and after any pesticide application by covering or removing items that could become contaminated and washing down surfaces and household items after applications.
- Continue to encourage residents and staff to follow IPM principles – for example, keeping food in closed containers, not leaving dirty dishes laying around, sweeping up crumbs, and mopping up spills; repairing water leaks; blocking or plugging up pest entry points; and using pesticides sparingly or not at all.

Indoor air quality

Residents and staff need to become more aware of means to increase the quality of indoor air. Some specific recommendations include:

- Eliminate all mold in units and common areas.
- Adequately ventilate all living areas.
- Limit or eliminate use of air fresheners, candles, and incense.
- Do not smoke in units.

Lead and radon

Residents and staff need to be aware of the hazards of allowing children to play in areas of soil lead contamination and of the means to correct hazardous areas. Specific recommendations include:

- Have bare soil in the area of playgrounds or other areas around buildings where children might play tested periodically.
- To mitigate areas of high lead content, remove soil, pave surface, and/or lay sod or thick mulch in areas of bare soil.

Residents and staff need to be aware of the hazards and incidence of radon. Specific recommendations include:

- Test basements and sub-ground living areas for radon. Because levels of radon vary throughout the year, repeat tests. Some factors that influence radon levels include time of year, test location, weather patterns, and room temperature.
- Mitigate levels of radon in those buildings which had high levels.

Next Steps

Next steps will be to share findings of this project within the Supportive Housing Provider Group and the larger community, to create training and educational materials that will help staff and residents improve environmental health and safety conditions for children and families in supportive housing communities, and to tap into community resources. It is the hope that follow-up evaluations will demonstrate safer and healthier living environments.

INTENT OF PROJECT

The goal of this project is to create safe physical environments in supportive housing settings for very young children and all family members. To carry out this goal, the Supportive Housing Provider Group (the Provider Group) with support from the Family Housing Fund (the Fund) and technical assistance from Hart-Shegos and Associates (H-SA) and the Family Supportive Housing Center LLC (the Center) initiated and implemented a process for inspecting supportive housing units and common areas and for interviewing staff and residents to assess the safety and environmental quality for all those living and working in the housing settings. The findings of these interviews and inspections are used to assist supportive housing providers and residents in improving safety conditions and reducing the use of harmful household and personal care products. Next steps will be to create training and educational materials that will help staff and residents improve environmental health and safety conditions for children and families in supportive housing communities and to tap into community resources. It is the hope that follow-up evaluations will demonstrate safer and healthier living environments.

To achieve these outcomes, we have worked with three Provider Group member agencies (Emma's Place, Wayside House, and the YWCA of St. Paul) that have served as pilot agencies. H-SA and the pilot agencies have conducted interviews with residents and staff and implemented a physical inspection of supportive housing residential units, common areas in the housing complexes, and exterior spaces. The survey has evaluated living environments within these supportive housing communities. Inspections have focused on items such as pest control practices; use of hazardous cleaning materials and other maintenance products; electrical and physical hazards in units; potentially hazardous materials in the home, such as plastics in children's toys or chemicals in furniture and bedding; and child-proofing safety measures.

Residents have been encouraged to be co-researchers with our team. By including residents in the discovery process, we hoped that the survey would not appear to be intrusive or judgmental. Residents were told that any specific information that was collected would not be shared with staff. Information would only be disseminated in aggregate reports. We wanted to engage the residents as consumers.

Upon completion of the surveys, we have assessed the risks to which the children in the pilot agencies are exposed. The providers will begin to work with us and community resource partners to identify key issues from the data, confirm the health impact and ranking of the key issues, make recommendations on how issues could be addressed, and develop plans to improve environmental quality on-site. The plans will focus on hazards that can be addressed by changing

property management and household products and practices rather than through major reconstruction of supportive housing properties.

The Fund, H-SA, the Center, and the providers will develop educational materials and training to help supportive housing management staff and residents reduce toxins and hazards in the home and common areas. The Fund will disseminate the inspection process and resulting educational materials beyond the pilot group. The findings from this project will be shared with supportive housing providers and the larger community. Also, the findings will be integrated into the Fund's Asset Manager™ initiative, through which educational materials are to be distributed widely among supportive and affordable housing providers in the Twin Cities and nationally.

It is the hope that follow up evaluations will demonstrate a reduced exposure to hazardous chemicals and pesticides, reduced exposure to asthma triggers, and reduced risk of injury. Through a better understanding of environmental risks and ways to reduce those risks, it is hoped that residents and staff of the supportive housing agencies would make changes to their ways of living in their environments and management practices and encourage the development of healthy children and healthy environments.

METHODOLOGY

Selection of Pilot Agencies

Three Provider Group member agencies were chosen to function as pilot agencies for the project. These agencies are Emma's Place, Wayside House, and the YWCA of St. Paul. The agencies and their respective supportive housing complexes are located in Minneapolis, St. Paul, St. Louis Park, and Maplewood, representing both east and west metro urban sites and east and west suburban sites. The representative buildings are of various size, style, age, extensiveness and type of renovation, and type of building materials. The locations of the housing complexes are significant and represent a diverse range of outdoor air quality and pollutants, availability of a variety of shopping outlets, and availability of means of transportation. Residents of these housing complexes form a diverse group with various cultural and educational backgrounds.

Emma's Place, administered by Emma Norton Services, offers permanent, affordable housing and supportive services for homeless, low-income families. Located at 2163 Van Dyke in Maplewood, Emma's Place has thirteen town homes (six 3BR and seven 4BR) for single parents with three or more children. The site has a separate building which houses community space, children's space, kitchen, bathrooms, and offices. The grounds offer a playground and open exterior space. The development was built in 2003.

Wayside House offers two residential sites and supportive services for women in recovery from chemical dependency and their children.

- Incarnation House is a supportive housing program offering up to one year of 24-hour supervised housing and programs for mothers in recovery and their children. Women must be 18 years or older, pregnant, or parenting one or more children who are no older than age eight. Located at 2120 Clinton Avenue in Minneapolis, Incarnation House has a total of nineteen sleeping rooms, a congregate dining room and kitchen, shared bathrooms, a child care room, community rooms, offices, and laundry facilities. There is an enclosed yard area with playground equipment. The two and a half story masonry building was built in 1923 and renovations were completed in 2004.

- Jersey Avenue Apartments offer a safe, affordable housing option for single women, who have a serious commitment to sobriety, and their minor children. Two three-story apartment buildings, located at 1341 and 1349 Jersey Avenue in St. Louis Park, have a total of 20 units (eighteen 2BR and two 3BR). There are offices, a child care room, a community meeting room, a bathroom, and laundry facilities in the lower level of the 1341 building. The buildings were built in 1968 and the renovations were completed in 2004.

The **YWCA of St. Paul** offers three residential sites and supportive services for homeless women with children striving to move from homelessness and dependency to self-sufficiency and independent living.

- Lexington Apartments, located at 95 North Lexington in St. Paul, has a total of 18 dwelling units (six 2BR and twelve 1BR). The masonry three-story building was built in the 1930's and renovation was completed in 2004. There are several community spaces, a child enrichment center, a kitchen, bathrooms, and offices on the lower level.

- Grotto Apartments, located at 138 and 142 Grotto Street in St. Paul, comprise two four-plex buildings with a total of eight 3BR units. The masonry buildings were built in the 1920's and renovation was completed in 2006. There are community meeting and play spaces, an office, and laundry facilities in the basements.

- Oxford Apartments, located at 245, 251, and 261 Oxford Street in St. Paul, comprise three four-plex buildings with a total of twelve 2BR units. The masonry buildings were built in the 1920's and renovation was completed in 2005. There are a meeting and play space, a bathroom, an office, and laundry facilities in the basement of the 261 building.

Selection of Resident Volunteers

Residents of each of the supportive housing agencies were recruited to be co-investigators in the research process. Information/recruitment sessions were held at each organization. These sessions took on different forms depending on the organization and timing of the meetings. At most of the sites we were able to present our project at a regularly scheduled resident meeting; for others, residents were invited to attend an advertised meeting. The sessions were informal with refreshments being served. We gave a brief description of the nature of the environmental survey and the reasons that we had for doing it. We encouraged the residents to ask questions and to join the 'Green Team' as co-investigators. As an incentive for participation, we offered the opportunity of receiving a $50 gift card upon completion of the survey.

We conducted a total of five information/recruitment sessions at Incarnation House, Jersey Avenue Apartments, Lexington Apartments, Grotto Apartments, and Emma's Place. From these sessions, we recruited 36 volunteers (8 from Incarnation House, 7 from Jersey Avenue, 6 from Lexington, 3 from Grotto, 6 from Oxford, and 6 from Emma's Place). Of those 36 volunteers, 33 completed the survey. The pilot agencies had the following number of volunteers who completed the survey: Emma's Place (6 residents who represent 46% of the residents), YWCA of St. Paul (14 residents who represent 37% of the residents), and Wayside House (13 residents who represent 33% of the residents).

Interview and Inspection Process

H-SA developed tools to conduct research regarding the status of living environments within site-based supportive housing communities. These tools – interview and physical inspection protocols – were beta tested and finalized.

Residential units in the supportive housing communities were surveyed by applying a blended approach using interviews with residents combined with physical inspections of their apartments that were focused on specific products and issues. During the interviews, questions were used to guide the resident to convey information in an informal conversation. Following the interview, each resident aided the researcher in conducting the inspection of his/her apartment.

At the beginning of each interview/inspection, each resident was asked to read and sign a consent and waiver form. Upon completion of the survey, each resident was given a $50 gift card for participation.

The intent of the resident interviews was to gather information on:

- housekeeping and laundry practices
- product usage and storage
- approach to pest control
- cooking and eating practices
- cleaning of and type of floor coverings, furniture, and bedding
- approach to childproofing unit
- use of secondhand or recycled children's products
- types of children's products, with emphasis on plastic products
- general health of the residents.

The intent of the unit inspections was to gather specific information on:

- actual products used
    - household, including cleaning and laundry
    - personal care
    - office/arts and crafts
    - pesticides
- storage of products
- use and storage of flammable products
- sources of lead
- evidence of pests
- entry points, hiding places, and supply of needs for pests
- types of floor coverings, furniture, and bedding
- types and use of plastics for cooking, storage, eating, drinking, and toys
- indoor air quality
    - ventilation
    - evidence of mold/mildew
    - evidence of volatile organic compounds (VOCs)
    - environmental tobacco smoke

- childproofing/use of safety features and safe products
- electrical/physical hazards
- hazards resulting from recalled or unsafe products
- use of detectors.

Common areas and exterior spaces in supportive housing communities were surveyed by applying a blended approach using interviews with staff and property management combined with physical inspections that were focused on specific products and issues. The organization signed a consent and waiver.

The intent of the staff interviews was to gather information on:

- maintenance practices
- product usage and storage
- approach to pest control
- approach to childproofing accessible areas
- use of secondhand or recycled children's products
- storage and disposal of hazardous wastes
- storage and disposal of garbage and recyclable items
- radon and carbon monoxide testing
- landscape management practices
- outdoor property maintenance practices
- maintenance practices of playgrounds.

The inspections of the common areas of each housing complex addressed the same categories as the residential units, with the addition of gathering specific information on:

- specifics of pest control
- landscape management
    - design
    - maintenance
    - pesticide/herbicide use
    - surfaces
- exterior physical hazards
- playgrounds
- garbage/recycling
- testing of soil in proximity to playgrounds for lead
- testing of sub-grade common and/or residential space for radon.

Testing

Soil tests for lead were performed using protocols prescribed by the University of Minnesota Soil Testing Laboratory. Soil samples were taken from those play areas which had exposed soil adjacent to playground equipment and surfaces. At each location, several sub-samples of soil were taken from areas of concern. Soil was sampled to the depth to which a child might be exposed, usually one-half to

one inch depth. Samples were submitted to the university laboratory for analysis of lead content.

Radon tests were performed using short-term radon test kits purchased from Air Chek Inc.; the purchase price included lab analysis. Test sampling kits were placed in selected sub-grade community areas and residential units according to recommended manufacturer protocols. The kits were left in place for six days. In order to assess quality control, two kits were placed in each space that was being tested. The short-term tests for indoor radon gas levels were made under closed building conditions. At the end of the test period, the kits were collected and mailed via priority mail to the designated laboratory for analysis. For those tests that were reported at higher than normal radon levels, a second test was performed in order to verify the findings.

Analysis

Residential and agency household and personal care products data were tabulated showing the frequency of specific product usage. For those products which had the highest frequency of use, research was conducted to attempt to determine specific ingredients. Information was obtained from various sources, including product labels, manufacturer's websites, material safety data sheets, government websites (for example: NIH, EPA, CDC, and FDA), consumer-oriented websites (for example: The Green Guide, Environmental Working Group, and Consumer Union), and other literature.

Resident and agency practices and/or procedures were tabulated and observations were noted.

Children's safety data were tabulated and particularly hazardous practices and/or the lack of safe practices were noted. Used or recycled children's products were checked against the Consumer Product Safety Commission's or manufacturer's recall lists.

Soil lead data were tabulated and analyzed against information from such sources as the University Of Minnesota Extension Service, Minnesota Department of Health, the Environmental Protection Agency, and the National Center for Healthy Housing.

Radon gas data was tabulated and analyzed against information from such sources as the Minnesota Department of Health and the Environmental Protection Agency.

FINDINGS

Resident Interviews and Unit Inspections

Thirty-three residents of the three pilot agencies were interviewed and their units inspected. The interviews/inspections followed the protocols described in Methodology. Information was gathered in each of the following categories:

- housekeeping and laundry practices/ products used
- product usage and storage
- approach to pest control
- cooking and eating practices
- floor coverings, furniture, and bedding
- approach to childproofing unit
- use of secondhand or recycled children's products
- type of child products
- personal care products
- indoor air quality
- general health of the residents.

All household and personal care products that were observed were recorded by brand name.

Household and laundry practices/products

Residents clean their units to varying degrees and frequency. Some units were spotless while others were in desperate need of cleaning and organization. Most residents stated that they clean their apartments by doing dishes, picking up, sweeping and mopping floors, dusting, washing down surfaces (countertops, walls, appliances, etc.), and cleaning bathroom fixtures. Most residents use liquid bleach (Clorox or other brands) or other bleach-containing products (Clorox Clean-Up, Clorox Clean-Up Wipes, Clorox Toilet Bowl Cleaner, Soft Scrub with Bleach, etc.) in some manner. Besides using liquid bleach for doing white laundry loads, a common use of liquid bleach is to put it into water for mopping floors and into spray bottles for wiping down surfaces. Many residents used bleach extensively in this manner. It was important for most residents to use products and/or methods that would disinfect or be anti-bacterial. There was interest among some residents to learn about alternative products and methods.

Most residents mentioned that 'smell' was important. They used products until they could smell them (i.e., Pine-Sol). It was mentioned that bleach smells 'clean'. They liked and used products that had fragrances, particularly in laundry products. Air fresheners are very popular (i.e., Airwick and Febreze).

Instructions for household cleaning products are usually not read or followed; most residents stated that they estimate or 'eyeball' amounts used. The exception was laundry detergents; most residents measure out proper quantities. Cleaning and laundry products are mostly kept in unlocked under-the-sink cabinets or on upper level shelving.

Residents' approach to pest control

Insects and rodents are occasionally seen by residents. Ant and rodent influx is seasonal. Some residents have used ant and roach sprays (i.e., Raid) and bait traps. Some residents use Off and Cutters for personal protection from mosquitoes. A few residents stated that they oppose the use of pesticides.

Entry points and food/water supplies for pests are generally minimal. Some of the units were in need of cleaning, particularly in the kitchens where there were dirty dishes, open food containers, and crumbs on counters and the floors.

The property management for one organization inspects units monthly and has handed out bait traps.

Cooking and eating practices

None of the residents use the types of glazed pottery or glassware for eating or drinking that have the possibility of leaching heavy metals, such as lead or cadmium, or other chemicals when used for food consumption.

Most residents use some type of plastic eating and/or cooking utensils (plates, bowls, cups, sippy cups, baby bottles). Many of the residents stated that they use plasticware in microwaves. Some use plastic wrap (i.e., Saran Wrap or Glad Cling Wrap). Several residents expressed concern when they learned that there are hazards to using certain types of plastic and wanted to learn more, particularly what type of plastic could be harmful to children.

The plastic that residents used was composed of a variety of materials, as indicated by the number label (number in recycling logo); some plastic was not labeled. Residents were not aware of the potential hazards to their children of using certain types of plastic (those labeled 3, 6, and 7). Use of plastics for eating, cooking, and food storage can carry health risks, as well as certain plastics used in some children's products (i.e., baby bottles, sippy cups, toys, bibs, etc.) and home items (i.e., some shower curtains). Fetuses and young children are at greatest risk.

Of the various types of plastic, those that are labeled 1, 2, 4, and 5 are considered to be the better choices for food and beverages. Plastics labeled 3, 6, and 7 are considered to be types to avoid.

- Plastic labeled 3 (polyvinyl chloride) contains the plasticizer DEHA (di-2-ethylhexyladipate) which has been linked to negative effects on various organs of the body. Plasticizers are used to 'soften' plastic and make it more malleable. DEHA can leach into oily foods on contact and when heated. Vinyl plastics are found in a variety of products including cling wrap, some plastic squeeze bottles, cooking oil bottles, some toys, teething rings, and some shower curtains.

- Plastic labeled 6 (styrene) can leach from Styrofoam products, some plastic glasses, disposable cups, and take-out containers made from polystyrene plastic. Styrene is toxic to the brain and the nervous system.

- Plastic labeled 7 (polycarbonate and others) contains a chemical called bisphenol A (BPA), which mimics the action of the human hormone estrogen, thereby disrupting normal function. BPA can leach from polycarbonate plastic, which is used in most baby bottles, 5-gallon water bottles, sport water bottles (i.e., Nalgene), metal food can liners (i.e., in some pre-mixed baby formula cans), clear plastic sippy cups, and some clear plastic cutlery. Some plastic labeled 7 is bio-based (corn) plastic and is safer and more environmentally friendly.

Floor coverings, furniture, and bedding

The type of flooring varies with the organization. Some units are carpeted, while others have the flooring composed of linoleum or hardwoods. Most residents have area rugs, which they occasionally sweep or wash if they are small. One housing site has vacuum cleaners for the carpeting. Only a few of the residents own vacuum cleaners, of which none had a HEPA filter.

Most of the furniture, such as sofas, are over-stuffed and upholstered. Most of the residents sleep on regular mattresses, but a few adults and some children sleep on vinyl air mattresses. Some households use mattress pads and/or cloth mattress covers. Many of the children sleep on mattresses that are covered with vinyl plastic covers. Most of the bedding was infrequently washed.

Approach to child safety

Of the residents who have young children, most were conscious of the need to make their households safe. They attempted to accomplish this by putting hazardous products and items up and out of reach and making sure that medications had child-proof caps. Some residents used electrical outlet covers, but most of those were not consistent. Some had child-resistant latches for cabinets, but others complained that they wanted to put on latches, but management would not allow them to do so. Other residents used ties on cabinets or doors. Some residents were aware of the dangers of hanging cords (blinds, electrical cords, etc.). Many residents were not aware of current safety

protocols stipulating that young children should not sleep with blankets, stuffed animals, or crib bumpers. Some mothers did not make any effort to safeguard their homes for their young children. Several mothers commented that they just tell their children to stay out of stuff or ‘danger’.

Most residents use some secondhand or recycled products, including strollers, high chairs, walkers, and car seats. Only one resident stated that she checked manufacturer recall lists for the products that she had purchased or had been given.

All residents with young children use some type of plastic for eating and/or drinking (plates, bowls, cups, sippy cups, baby bottles). Many of the children had plastic toys, some with painted details; some had vinyl teething rings and other types of ‘chewing’ toys. Several residents were aware of recalls of some children’s toys due to excessive lead in paint; all of the residents were unaware of potential hazards of some types of plastic used in children’s products.

Residents are concerned about the safety of their children, but their knowledge of childproofing techniques and what constitutes hazardous situations are inconsistent.

Personal care products

A wide variety of personal care products for both adults and children were found in the households. These products included shampoos/conditioners and other hair products, soaps and body washes, moisturizers and other skin products, various types of makeup, deodorants, dental care products, fragrances, and products specifically formulated or marketed for children. In the 33 households, there were 347 personal care products (237 different brands) and 80 children’s products (53 different brands). Most makeup and nail polishes were not counted. Most residents had their favorites and used a relatively few products, but all residents had many more products that were partially-used up, but very seldom used or not at all. Personal care products were stored in bathroom cabinets, on low bathroom shelves, and in bedrooms. Many residents stated that they liked to shop at the ‘dollar’ stores, such as Family Dollar and Dollar Tree. For children, products manufactured by Johnson & Johnson were the favorites as well as store brands from Wal-Mart and Target.

Indoor air quality

These inspections were made when windows could be opened for better ventilation. It was noted that kitchen and bathroom fans vented to the outside. Except for some mildew in some bathtubs, there was no evidence of mold/mildew or apparent volatile organic compounds (VOCs). There were a few pieces of inexpensive furniture made of particleboard. In many of the units there

was evidence of smoking. Some residents stated that they tried to smoke outside. Air fresheners were very popular.

General health of residents

Seventy-four children range in age from 2 months to 16 years old. There was at least one case of physician-diagnosed asthma in each of 20 of the 33 households that were interviewed/inspected. There are several very severe cases of asthma. Almost all of the children and adults take medication for their asthma. There are 4 cases of eczema (one severe) and a number of individuals who have allergies. There were 5 cases of other chronic illnesses.

Table 1 –Resident Interviews/Inspections

Interviews/inspections of 33 residents/units out of possible 90 units	
Household and laundry practices/ products used	Residents clean their units to varying degrees and frequency (from everyday to twice a month, or 'when needed'). Most residents clean their units by doing dishes, sweeping and mopping floors, dusting, washing down surfaces (countertops, walls, etc.), and cleaning bathroom fixtures. Frequency of doing laundry varies (from weekly to monthly). Twenty-three residents use bleach or a bleach-containing product (a total of 49 products in the 33 households). Bleach is put into water for mopping floors and into spray bottles. Favorite products are: Pine-Sol, Clorox, Clorox Clean-Up, Mr. Clean, Fantastik, Comet, Dawn, Palmolive, Tide, Febreze. Many residents mentioned that 'smell' is important (bleach has a 'clean' smell, fragrances of laundry products). A few residents stated that they don't use bleach because of health concerns or preference. A total of 350 household products (158 different brands) were found. Residents like to shop at the 'dollar' stores.
Product usage and storage	Labels are usually not read or followed for cleaning products; comments included, "I pour until I can smell it" and "until it looks right". Most residents measured to some degree laundry products; others stated "don't go by the line, just fill to the top" or "I eyeball it". Most cleaning and laundry products are stored under kitchen or bathroom sinks. Some are stored on upper shelves or in closets. Personal care products are stored in bathrooms or bedrooms. Art supplies are kept in children's rooms or closets.
Approach to pest control	Residents have seen some ants, flies, spiders, and mice. No evident pest entry points (except for a few holes in screens) or consistent food/water supply. Some units need cleaning. Some residents have used sprays (Raid) or bait traps, but most residents let management take care of pests.
Cooking and eating practices	Most residents use some type of plastic containers or film. Many residents heat up food in plastic containers in microwaves. No one uses ceramics or pottery for eating or drinking Most residents use plastic bottles, plastic cups, sippy cups, and bowls for children.
Floor coverings, furniture, and bedding	Floors are carpeted, linoleum, or hardwood. Many residents have area rugs or throw rugs. One agency supplied a vacuum cleaner. Only a few residents had vacuum cleaners for area rugs. Most used regular mattresses, but a few used air mattresses. Some regular mattresses are covered in plastic.
Approach to childproofing unit	Some residents use outlet covers, keep cleaning products on upper shelves, use childproof latches on cabinets (or ties) and gates. Several residents just tell children not to touch stuff. Some have older children.
Use of secondhand or recycled children's products	Most residents have purchased or been given secondhand items, but most have purchased new items such as car seats, walkers, and strollers.
Type of child products	Children use plastic bottles, sippy cups, pacifiers, teething rings, vinyl toys.
Personal care products	Shampoos/conditioners (63 products, 39 brands), soaps/body washes (102 products, 62 brands), moisturizers (46 products, 39 brands), children's products (80 products, 53 brands). Favorite brands – Suave, Pantene, Dial, Softsoap, Target, Wal-Mart (Equate), Colgate, Johnson & Johnson. Residents like to shop at the 'dollar' stores.
Indoor air quality	Kitchen fans vent to outside. No evidence of mold/mildew or VOCs. Evidence of smoking in many units.
General health of the residents	There was at least one case of diagnosed asthma in each of 20 of the 33 households (7 adults and 23 children); several cases were severe. There were 4 cases of eczema

Residents' Household and Personal Care Products

All household and personal care products that were observed were recorded by brand name. The following products were found in the 33 households interviewed/inspected (out of possible 90 households):

- All-purpose cleaners, specialty cleaners, window sprays, kitchen and bathroom products, air fresheners, bleach, laundry detergents, and fabric softeners. A total of 340 products were recorded, of which there were 158 different brands.

- Shampoos and conditioners, soaps and body washes, cleansers, moisturizers, hair care products, deodorants, dental care, and fragrances. (Only some make up and nail products were recorded). A total of 347 personal care products were recorded, of which there were 237 different brands.

- Shampoos and conditioners, soaps and body washes, lotions and oils, and other baby products. A total of 80 children's products were recorded, of which there were 53 different brands.

The following tables (Table 2, 3, and 4) represent the most popular products.

Also depicted in the following tables is the correlation between the households with physician-diagnosed cases of asthma, cases of eczema, and other chronic illnesses and products used.

Table 2 – Top Household Products Used in 33 Households in the Pilot Organizations

		Freq	33 Households																																
Illness	Households with doctor-diagnosed asthma	20	x	x	x	x		x			x	x	x	x	x	x			x			x	x					x	x		x		x	x	x
	Households with eczema	4	x		x									x																				x		
	Other chronic sicknesses	5		x		x		x							x		x																			
Household Products	Pine-Sol		x			x	x				x							x	x	x	x			x				x		x	x				
	Tide	11		x		x	x		x	x		x	x			x	x		x								x								
	Clorox	10	x			x																x	x	x		x					x	x	x		x
	Windex	10	x			x				x			x	x		x						x							x					x	x
	Clorox Clean-Up	9	x			x								x					x						x		x	x		x	x				
	Comet	7				x		x			x	x	x								x	x														
	The Works toilet bowl cleaner	7			x													x	x	x		x				x	x								
	Febreze	7	x	x		x							x	x											x							x			
	Pine Glo	6												x			x		x	x	x	x													
	Tide with bleach alternative	6				x					x							x	x		x					x									
	Arm & Hammer for sensitive skin	5				x						x					x	x									x								
	Bounce sheets	5					x								x			x						x	x										
	Clorox toilet bowl cleaner w. bleach	4								x				x	x			x																	
	Soft Scrub with bleach	4	x			x								x														x							
	Ajax	4	x				x								x																		x			
	Easy Off Heavy Duty	4	x		x																x		x												
	Orange Clean - tough acting degreaser	4																		x				x										x		x
	Oxyclean	4										x												x				x						x		
	Gain	4	x	x																x									x							

Table 3 – Top Personal Care Products in 33 Households of the 3 Pilot Organizations

		Freq	33 Households																																		
Illness	Households with doctor-diagnosed asthma	20	x	x	x	x		x			x	x	x	x	x	x			x			x	x					x	x		x		x	x	x
	Households with eczema	4	x		x									x																				x		
	Other chronic sicknesses	5		x		x		x							x		x																				
Personal Care Products	Dial bar soap	7		x						x							x			x	x											x					
	Secret	6										x		x			x															x	x				
	Colgate toothpaste	6			x																		x		x	x	x								x	
	Suave shampoo	5			x					x						x																			x		x
	Caress bar soap	5		x						x															x		x									x	
	Off	5	x		x	x												x												x							
	Clairol Herbal Essences shampoo	4	x							x					x													x									
	Dove conditioner	4	x				x	x																x													
	Pantene shampoo	4		x														x																	x	x	
	Dove bar soap	4	x				x														x														x		
	Dove bodywash	4	x	x																							x				x						
	Olay body wash	4			x					x																	x								x		
	White Rain conditioner	3					x																					x			x						
	Irish Spring bar soap	3																												x	x		x			
	SoftSoap	3														x										x						x				
	Suave body wash	3	x								x																				x						
	White Rain bodywash	3						x																x								x					
	Zest bar soap	3											x								x				x												
	St Ives	3													x										x					x							
	Garnier Fructis style	3					x								x		x																				
	Luster's pink sheen spray	3						x													x	x															
	Suave hair spray	3														x												x	x							
	Secret Platinum	3					x										x									x										
	Suave	3												x							x															x	

Table 4 – Top Children's Products Used in 33 Households in the Pilot Organizations

		Freq	33 Households																																		
Illness	Households with doctor-diagnosed asthma	20	x	x	x	x		x			x	x	x	x	x	x			x			x	x					x	x		x		x	x	x
	Households with eczema	4	x		x									x																				x		
	Other chronic sicknesses	5		x		x		x							x		x																				
Children's Products	Johnson's baby lotion	7																x			x						x	x			x		x	x	
	Johnson's baby powder	6					x							x			x	x									x		x						
	Johnson's baby wash	5														x		x								x			x					x	
	Johnson's head-to-toe for baby	3																	x			x												x		
	Johnson's baby oil	3					x											x																x		
	Target nighttime lotion	3		x													x												x							
	Equate baby bath	2		x																					x											
	Huggies hair and body wash	2			x													x																		
	Johnson's bedtime bath	2				x																									x					
	Pampers Kandoo kids shampoo	2													x							x														
	Johnson's bedtime lotion	2																						x								x				

Household cleaning and laundry products

All household cleaning and laundry products that were observed to be used by residents were recorded by brand name. For those products which had the highest frequency of use, specific ingredients, where available, are listed in the following table (Table 5).

Manufacturers of household cleaning products are not required to disclose ingredients on product labels because of government trade secret laws. Some information concerning ingredients can be derived from MSDS's (manufacturer safety data sheets). A MSDS generally focuses on the hazards of working with a product in an occupational setting and is not intended for use by the general consumer. Ingredients are listed in a MSDS only if in their pure bulk form they meet the OSHA (Occupational Safety and Health Administration) definition of hazardous.

Table 5 – Popular Household Cleaning and Laundry Products

Product	Known Ingredients	Concerns
Clorox Laundry Bleach	Sodium hypochlorite, sodium hydroxide	• Trigger for asthma • Skin, eye, and lung irritant
Clorox Clean-Up with Bleach	Sodium hypochlorite, sodium hydroxide	• Trigger for asthma • Skin, eye, and lung irritant
Comet Disinfectant Cleanser	Unspecified surfactants, sodium dichloro-s-triazinetrione dehydrate, quartz, sodium carbonate, calcium carbonate, unspecified bleach, quality control agents, dyes, fragrance.	• Trigger for asthma • Possible hormone disruption, developmental and reproductive issues
Dawn Antibacterial Dishwashing Liquid	Unspecified surfactants, ethanol, triclosan, dyes, fragrance	• Trigger for asthma • Possible hormone disruption, developmental and reproductive issues • Skin irritation, allergies • Bacterial resistance to antibiotics
Downey Fabric Softener	Ethanol, unspecified fabric softening agents (waterproofing agents), dyes, fragrance	• Trigger for asthma
Fantastik	Unspecified surfactants, propylene glycol butyl ether, chelating agents	• Trigger for asthma • Skin, eye, and lung irritants • Possible hormone disruption, developmental and reproductive issues
Febreze	Unspecified deodorizers, fragrances, ethanol	• Trigger for asthma
Lysol Brand All-Purpose Cleaner	Alkyl(C 12-16)dimethylbenzylammonium chloride, unspecified surfactants, fragrance	• Trigger for asthma • Possible hormone disruption, developmental and reproductive issues
Mr. Clean	Unspecified surfactants, ethoxylated alcohols (nonionic surfactants), dyes, fragrance	• Trigger for asthma • Skin, eye, and lung irritants • Pose concerns for reproductive health
Pine-Sol	Pine oil, isopropanol (an alcohol), and unspecified surfactants	• Combination with atmospheric ozone (from urban pollution) or ozone formed during the use of some electronic air purifiers forming toxic chemicals. • Trigger for asthma
SoftScrub with Bleach	Aluminum distearate, sodium hydroxide, calcium carbonate, sodium hypochlorite	• Trigger for asthma and allergies • Skin irritants
Tide	Unspecified enzymes, unspecified surfactants, ethanol, monoethanolamine (MEA), sodium tetraborate, dyes, fragrance	• Trigger for asthma and allergies • Skin irritants • Immune system toxicants
Windex	Ethylene glycol ethers, unspecified surfactants, fragrance, ammonia, alcohol	• Trigger for asthma • Skin, eye, and lung irritants • Pose concerns for reproductive health

Ingredients of concern for household products are the following:

Sodium hypochlorite is a trigger for asthma and a skin, eye, and lung irritant. This chemical is found in a variety of cleaning products including those with bleach and some disinfectants, drain openers, and mildew removers.

Sodium hydroxide is a trigger for asthma and a skin, eye, and lung irritant. This chemical is often in the same products as sodium hypochlorite.

Pine, lemon, and orange oils are used as solvents or for their distinctive scents. They are compounds called terpenes, which are not toxic in themselves, but can combine with atmospheric ozone (from urban pollution) or ozone formed during the use of some electronic air purifiers to form toxic chemicals. Limonene is a common terpene used to give lemon scents. It can be a trigger for asthma.

Surfactants are chemicals that help other ingredients penetrate dirt and grime. Some surfactants are hormone-disrupting or hormone-mimicking compounds. Often surfactants are listed as unspecified (actual chemical composition withheld). One group of surfactants, alkyl phenol ethoxylates (APEs) are found in laundry detergents, stain removers, and all-purpose cleaners. They have been linked to developmental and reproductive issues and are common contaminants in rivers etc. and have been found in household dust.

Triclosan is a broad-spectrum antimicrobial agent or disinfectant used in many types of products, including such products as liquid soaps, cosmetics, toothpastes, deodorants, shaving creams, kitchenware such as antibacterial cutting boards, some children's toys, and Teva® sandals. It's the most common active ingredient in antibacterial liquid hand soaps. Studies have linked triclosan to a variety of health and environmental concerns, including skin irritation, susceptibility to allergies, disruption of the thyroid system, resistance of antibiotics to bacteria, dioxin contamination, and destruction of fragile ecosystems.

Glycol ethers (ethylene and propylene) are commonly used solvents found in glass cleaners and all-purpose spray cleaners. They are skin, eye, and lung irritants, triggers for asthma, and pose concerns for reproductive health.

Ammonium quaternary compounds are disinfectants found in some disinfectant sprays and toilet cleaners and are known triggers for asthma.

Ammonia is a skin, eye, and lung irritant and is known as a trigger for asthma. This chemical is found in window cleaners, and as a stand alone cleaner. Ammonia should never be mixed with chlorinated products (for example, products with bleach) because a highly toxic chemical is formed.

Monoethanolamine (MEA) and diethanolamine (DEA) are two of a group of similar compounds that are found in such products as laundry detergents, all-purpose cleaners, and floor cleaners. Studies have shown that there are many concerns with the group of compounds, including being triggers for asthma and allergies, skin irritants, immune system toxicants. MEA and DEA are emulsifiers, or surfactants.

Enzymes are proteins that catalyze chemical reactions. They are often used in household products such as laundry detergents to aid in breaking down protein or oil stains on clothing. Enzymes can be triggers for allergies and asthma.

Sodium tetraborate, also known as borax, is used in some laundry detergents and cosmetics. Borax solutions have a mild toxicity and in larger quantities could cause fetal developmental harm or reproductive concerns. Many consider borax to be safe to use in alternative, non-toxic cleaning products, but others choose to limit its use with young children.

Dyes vary in chemical composition and relative toxicities. Some are banned for certain uses and are also banned in the European Union, but considered safe in the US. Some dyes are considered carcinogenic (cancer-causing) and cause developmental or reproductive issues. Dyes are found in many household products.

Fragrance gives scent to a product. Fragrances consist mostly of chemicals called volatile organic compounds. There are no regulations for listing on a label or in packaging the specific ingredients in a fragrance; it is simply listed as ‘fragrance’ or ‘perfume’. Exposure occurs through inhalation or skin contact. Ingredients in fragrances can be skin irritants, triggers for asthma and allergies, and hormone disruptors. (Hormone disruptors are substances that act like hormones in the endocrine system and alter or block the function of natural hormones. Studies have linked hormone disruptors to adverse biological effects such as abnormal fetal and reproductive organ development and certain cancers such as breast cancer.) A group of chemicals called phthalates are carriers for fragrance in glass cleaners, deodorizers, laundry detergents, and fabric softeners. Phthalates are suspected hormone disruptors.

Use of products containing bleach

The following table (Table 6) depicts the number of households using bleach products and associates bleach use with cases of physician-diagnosed asthma.

Table 6 – Use of Bleach in 33 Households of the 3 Pilot Organizations

		Freq	33 Households																																		
Illness	Households with doctor-diagnosed asthma	20	x	x	x	x		x			x	x	x	x	x	x			x			x	x					x	x		x		x	x	x
	Households with eczema	4	x		x									x																				x		
	Other chronic sicknesses	5		x		x		x							x		x																				
Products with Bleach	Ajax with bleach	2			x																	x															
	All purpose cleaner with bleach (WalMart)	2			x																												x				
	Clorox	10	x			x																x	x	x		x					x	x	x		x		
	Clorox April fresh	1												x																							
	Clorox Clean-Up	9	x			x								x					x					x		x	x		x	x							
	Clorox Clean-Up wipes	2																									x						x				
	Clorox disinfecting spray	2							x								x																				
	Clorox splashless	1															x																				
	Clorox toilet bowl cleaner w. bleach	4							x				x	x			x																				
	Comet with bleach	1																x																			
	Force ultra bleach	1																						x													
	Generic bleach	3	x	x																							x										
	Generic bleach with lavender	0																																			
	Hi-Clorox bleach	1																		x																
	Lysol power bleach	1																																			x
	Majestic bleach	1				x																															
	Soft Scrub with bleach	4	x			x								x													x									
	Target bleach	1														x																					
	Ultra bleach	3			x			x																	x												
	WalMart bleach cleaner	1						x																													

Personal care products

All personal care products that were observed to be used by residents were recorded by brand name. Manufacturers of personal care products are required by law to list the ingredients on a product's label, with exceptions of such ingredients as fragrance and favors. For these ingredients the term 'fragrance' or 'favor' is all that is required to be listed, not what chemicals or substances make up the fragrances or flavors.

Currently, the US government does not require health studies or safety tests for ingredients in personal care products before a product is sold. Any testing that the cosmetic industry carries out is conducted by the manufacturing companies or the Cosmetic Ingredients Review, the industry's self-policing safety panel. According to the Environmental Working Group (EWG), a non-profit organization providing useful resources and research to consumers (www.ewg.org), nearly 90% of the chemicals in personal care products have not been adequately tested for safety. The EWG has compiled a database of chemicals found in personal care products along with the associated risks of the chemicals.

Examples of popular personal care products used by residents are listed in the following table (Table 7). Information used in this report concerning chemicals and concerns associated with personal care products was taken from the EWG's Skin Deep, their cosmetic safety database (www.cosmeticsdatabase.com) and National Geographic's The Green Guide (www.thegreenguide.com) – "The Dirty Dozen Chemicals in Cosmetics". In the following table, the information in the 'Concerns' column is gathered from the EWG's database and the data is often from limited animal studies, but raises awareness of potential hazards. Continuing research on low level exposure of certain chemicals is being conducted.

Table 7 – Popular Personal Care Products

Product	Ingredients	Ingredients considered to be moderate and high risk by the EWG	Concerns
Colgate Total plus Whitening Toothpaste	Sodium fluoride, triclosan, water, hydrated silica, glycerin, sorbitol, PVM/MA copolymer, sodium lauryl sulfate, cellulose gum, flavor, sodium hydroxide, propylene glycol, carrageena, sodium saccharin, titanium dioxide.	High • Sodium fluoride • Triclosan Moderate • Propylene glycol • Sodium hydroxide	High • Cancer • Developmental/reproductive toxicity • Endocrine disruption • Neurotoxicity • Skin, eye, and/or lung irritation • Possible contamination with chloroform and/or dioxin • Persistence and bioaccumulation Moderate • Allergies • Skin, eye, and/or lung irritation • Neurotoxicity
Irish Spring Deodorant Bar Soap	Fragrance, glycerin, stearic acid, BHT, pentasodium pentetate, FD&C green #3, D&C green #8, sodium chloride, water, sodium tallowate, titanium dioxide, coconut fatty acids, sodium cocoate, sodium palm kernelate, and palm kernel acid.	High • Fragrance Moderate • FD&C green #3 • D&C green #8	High • Asthma trigger, allergies • Neurotoxiciy Moderate • Cancer
Secret Platinum Anti-perspirant Deodorant	Aluminum zirconium trichlorohydrex gly 19% (anhydrous), stearyl alcohol, petrolatum, PPG-14, butyl ether, hydrogenated castor oil, cyclodextrin, fragrance, talc, mineral oil, behenyl alcohol.	High • Fragrance Moderate • Aluminum zirconium • trichlorohydrex	High • Asthma trigger, allergies • Neurotoxiciy Moderate • Developmental/reproductive toxicity • Neurotoxicity
Pantene Pro-V Conditioner	Water, cyclopentasiloxane, stearamidopropyl dimethylamine, cetyl alcohol, quaternium-18, panthenol panthenyl ethyl ether, lysine hcl, methyl tyrosinate hcl, histidine, stearyl alcohol, dimethicone, PEG-2m, polysorbate-60, cetearyl alcohol, benzyl alcohol, oleyl alcohol, glyceryl stearate, hydroxyethylcellulose, fragrance, citric acid, EDTA, methylchloroisothiazolinone, methylisothiazolinone	High • Fragrance Moderate • Benzyl alcohol • Methylchloroisothiazolinone • Methylisothiazolinone • Citric acid • Glyceryl stearate	High • Asthma trigger, allergies • Neurotoxiciy Moderate • Asthma trigger, allergies • Neurotoxicity • Skin, eye, and/or lung irritation

Product	Ingredients	Ingredients considered to be moderate and high risk by the EWG	Concerns
Pantene Shampoo	Water, ammonium laureth sulfate, ammonium lauryl sulfate, glycol distearate, dimethicone, cetyl alcohol, sodium chloride, cocamide MEA, fragrance, polyquaternium-10, sodium citrate, hydrogenated polydecene, sodium benzoate, disodium EDTA, PEG-7m, trimethylolpropane tricaprylate/tricaprate, citric acid, panthenol, panthenyl ethyl ether, ammonium xylenesulfonate, methylchloroisothiazolinone, methylisothiazolinone	High • Fragrance Moderate • Methylchloroisothiazolinone • Methylisothiazolinone • Citric acid • Disodium EDTA	High • Asthma trigger, allergies • Neurotoxiciy Moderate • Asthma trigger, allergies • Neurotoxicity • Skin, eye, and/or lung irritation
Purell Hand Sanitizer	Ethyl alcohol 62%, water, stearyl alcohol, cyclomethicone, c12-15 alkyl benzoate, cetyl lactate, cocamidopropyl pg-dimonium chloride phosphate, glycerin, peg-4, propylene glycol, tocopheryl acetate, aminomethyl propanol, carbomer, styrene/acrylates copolymer, fragrance (parfum), diazolidinyl urea, iodopropynyl butylcarbamate, methylparaben, propylparaben.	High • Fragrance Moderate • PEG-4 • Propyl and methyl parabens • Iodopropynyl butylcarbamate • Propylene glycol • Diazolodinyl urea • Ethyl alcohol (ethanol) • Cetyl lactate • Tocopheryl acetate • Styrene acrylates copolymer • Aminomethyl propanol	High • Asthma trigger, allergies • Neurotoxiciy Moderate • Asthma trigger, allergies • Neurotoxicity • Skin, eye, and/or lung irritation • Organ system (non-reproductive) toxicity • Possible contamination with formaldehyde and hydroquinone • Developmental/reproductive toxitiy • Endocrine disruption
Softsoap Antibacterial Liquid Soap	Triclosan, water, sodium laureth sulfate, ammonium lauryl sulfate, decyl glucoside, cocamidopropyl betaine, glycerin, sodium chloride, PEG-18 glyceryl oleate/ cocoate, fragrance, cocamide MEA, DMDM hydantoin, tetrasodium EDTA, D&C yellow #5, D&C red #33	High • Fragrance • Triclosan • DMDM hydantoin Moderate • Cocamidopropyl betaine	High • Asthma trigger, allergies • Neurotoxiciy • Endocrine disruption • Possible contamination with formaldehyde • Persistence and bioaccumulation Moderate • Possible contamination with nitrosmines
Dial Antibacterial Deodorant Bar Soap	Triclocarban, sodium tallowate, sodium cocoate, palm kernelate sodium palmitate, water, PEG-6 methyl ether, palm acid or tallow acid, fragrance, glycerin, sorbitol, sodium chloride, pentasodium pentetate, tetrasodium etidronate, BHT, FD&C yellow 5, D&C yellow 8, FD&C red 4	High • Fragrance Moderate • BHT • FD&C red 4 • D&C yellow 8	High • Asthma trigger, allergies • Neurotoxiciy Moderate • Asthma trigger, allergies • Neurotoxicity • Skin, eye, and/or lung irritation • Organ system (non-reproductive) toxicity • Endocrine disruption

Product	Ingredients	Ingredients considered to be moderate and high risk by the EWG	Concerns
Clairol Herbal Essences Shampoo	Water, sodium laureth sulfate, sodium lauryl sulfate, cocamidopropyl betaine, citric acid, sodium chloride, sodium citrate, rosemarinus officinalis leaf extract (rosemary), jasminum officinale extract (jasmine), citrus aurantium dulcis flower extract (orange), fragrance, cocoamide MEA, sodium benzoate, tetrasodium EDTA, methychloroisothiazolone, methylisothiazolinone, disodium EDTA-copper, sodium xylene sulfonate, yellow 5, orange 4, ext violet 2	High • Fragrance Moderate • Methylchloroisothiazolinone • Methylisothiazolinone • Citric acid • Cocamidopropyl betaine • D&C violet #2	High • Asthma trigger, allergies Neurotoxiciy Moderate • Asthma trigger, allergies • Neurotoxicity • Cancer
Suave Shampoo	Water, ammonium lauryl sulfate, ammonium laureth sulfate, cocamide MEA, panthenol, passion flower extract, lavender extract, peppermint extract, rose extract, ammonium chloride, hydroxypropyl methylcellulose, tetrasodium EDTA, DMDM hydantoin, benzonphenone-4, citric acid, propylene glycol, methychloroisothiazolinone, fragrance (parfum), methyisothiazolinone, ammonium xylenesulfonate, D&C violet no. 2	High • Fragrance • DMDM hydantoin Moderate • Methylchloroisothiazolinone • Methylisothiazolinone • Citric acid • D&C violet #2 • Propylene glycol • Benzonphenone-4 • Aluminum chloride	High • Asthma trigger, allergies • Neurotoxiciy • Skin, eye, and/or lung irritation • Possible contamination with formaldehyde Moderate • Cancer • Asthma trigger, allergies • Neurotoxicity • Skin, eye, and/or lung irritation
Garnier Fructis Style Brilliant Shine Gel	Water, glycerin, propylene glycol, PVP, PEG-14, dimethicone, PEG-40 hydrogenated castor oil, VP/VA copolymer, methacrylate copolymer, phenoxyethanol, polyquaternium-4, triethanolamine (TEA), fragrance, polyethylene glycol, sodium methylparaben, DMDM hydantoin, polyquaternium-11, linalool, limonene, amyl cinnamal, PEG-192, apricot kernel glycerides, PEG-70, mango glycerides, citral, citrus limonum/lemon extract	High • Fragrance • DMDM hydantoin • Triethanolamine (TEA) • Sodium methylparaben Moderate • Polyethylene glycol • Limonene • Linalool • Phenoxyethanol • Citral • Propylene glycol • Amylcinnamal • PEG-40 hydrogenated castor oil	High • Asthma trigger, allergies • Neurotoxiciy • Skin, eye, and/or lung irritation • Biochemical or cellular changes • Cancer • Possible contamination with nitrosamines and formaldehyde • Non-reproductive organ system toxicity Moderate • Developmental/reproductive toxicity • Cancer • Asthma trigger, allergies • Skin, eye, and/or lung irritation • Possible contamination with ethylene oxide and 1,4-dioxane

Product	Ingredients	Ingredients considered to be moderate and high risk by the EWG	Concerns
St. Ives GentleApricot Scrub	Water, glyceryl stearate, glycerin, cetearyl alcohol, cetyl alcohol, zea mays (corn) kernel meal, cocamidopropyl betaine, glycol stearate, glyceryl stearate, PEG-100 stearate, jojoba esters, sodium laureth sulfate, caprylic/capric triglyceride, juglans regia (walnut) shell powder, prunus armeniaca (apricot) fruit extract, chamomilla recutita (matricaria) flower extract, helianthus annuus (sunflower) extract, primula veris extract, sambucus nigra flower extract, acetylated lanolin alcohol, ascorbic acid, carbomer, ceteareth-20, cetyl acetate, dimethicone, disodium EDTA, niacinamide, PEG-12 dimethicone, petrolatum,polysorbate-60, propylene glycol, sodium chloride, sorbitol, stearamidopropyl dimethylamine, stearic acid, tocopheryl acetate, triethanolamine, urea, phenoxyethanol, methylparaben, ethylparaben, propylparaben, fragrance, titanium dioxide, red #30, yellow #5, iron oxides, iron oxides.	High • Fragrance • Triethanolamine (TEA) Moderate • Polyethylene glycol • Phenoxyethanol • Citral • Propylene glycol • Amylcinnamal • PEG-100 stearate • Methyl-,ethyl-, propylparaben • D&C red #30 • FD&C yellow #5 • Tocopheryl acetate • Urea • Glyceryl stearate • Disodium EDTA	High • Asthma trigger, allergies • Neurotoxiciy • Cancer • Possible contamination with nitrosamines • Non-reproductive organ system toxicity Moderate • Developmental/reproductive toxicity • Cancer • Asthma trigger, allergies • Skin, eye, and/or lung irritation • Possible contamination with ethylene oxide, 1,4-dioxane, hydroquinone, nitrosamines, glyceryl diesters • Biochemical or cellular changes • Persistence and bioaccumulation • Neurotoxicity • Non-reproductive organ toxicity • Developmental/reproductive toxicity • Endocrine disruption

Some ingredients of concern for personal care products are listed below, including “The Dirty Dozen Chemicals in Cosmetics”, a list of chemicals that are best avoided, compiled by The Green Guide (thegreenguide.com).

Fragrance gives scent to a product. Fragrances consist mostly of chemicals called volatile organic compounds. There are no regulations for listing on a label or in packaging the specific ingredients in a fragrance; it is simply listed as ‘fragrance’ or ‘perfume’. Exposure occurs through inhalation or skin contact. Ingredients in fragrances can be skin irritants, triggers for asthma and allergies, and hormone disruptors. Common ingredients in some fragrances are a group of chemicals called phthalates, which are suspected hormone disruptors. Phthalates are used as plasticizers to soften plastics and enhance absorption and lasting scent. They are found in nail polishes, moisturizers, and lotions.

PEG and ceteareth compounds are chemicals used as thickening agents. They can contain impurities such as 1,4-dioxane and ethylene oxide, which are possible and known carcinogens (cancer-causing compounds), respectively.

Dyes give color to a product or mask other colors. They vary in chemical composition and relative toxicities. Some are banned for certain uses and are also banned in the European Union, but considered safe in the US. Some dyes are considered carcinogenic (cancer-causing) and cause developmental or reproductive issues.

Parabens are chemicals used as preservatives. They have been linked to causing reproductive or hormone-disrupting effects and pose cancer concerns. They can also be skin irritants.

Benzyl and isopropyl alcohols are chemicals that have a variety of uses. They can be used in fragrances, as preservatives, or as solvents. These alcohols are skin allergens and irritants. They are considered to have neurological and immune system toxicity and might also have developmental and reproductive issues.

Surfactants are chemicals that help other ingredients penetrate oils. Some surfactants are hormone-disrupting or hormone-mimicking compounds.

Triclosan is a broad-spectrum antimicrobial agent or disinfectant used in many types of products, including such products as liquid soaps, cosmetics, toothpastes, deodorants, shaving creams, kitchenware such as antibacterial cutting boards, some children’s toys, and Teva® sandals. It’s the most common active ingredient in antibacterial liquid hand soaps. Studies have linked triclosan to a variety of health and environmental concerns, including skin irritation, susceptibility to allergies, disruption of the thyroid system, resistance of antibiotics to bacteria, dioxin contamination, and destruction of fragile ecosystems.

Methylisothiazolinone and methylchloroisothiazolinone are preservatives used in shampoos and body care products. Some evidence have linked these compounds with concerns about their neurological and immune system toxicity.

Monoethanolamine (MEA) and diethanolamine (DEA) are two of a group of similar compounds that are found in such products as shampoos, conditioners, moisturizers, and body washes. Studies have shown that there are many concerns with the group of compounds, including being triggers for asthma and allergies, skin irritants, immune system toxicants. MEA and DEA are emulsifiers, or surfactants.

DMDM hydantoin is used as a preservative in hair products and cosmetics to prevent spoilage. It poses concerns of being a skin irritant and have immune system toxicity issues resulting in allergic reactions.

Cocamidopropylbetaine, is a surfactant that can cause skin irritations and allergic reactions.

The Dirty Dozen

- Antibacterials
- Coal tar
- Diethanolamine (DEA)
- 1,4-Dioxane
- Formaldehyde
- Fragrance
- Lead and mercury
- Nanoparticles
- Parabens
- Petroleum distillates
- p-Phenylenediamine
- Hydroquinone

Children's personal care products

Children's personal care products manufactured by Johnson & Johnson were the most frequently used products. The following table (Table 8) illustrates the products and ingredients of concern in each of the products. The data on chemicals of concern was compiled by the Environmental Working Group (www.ewg.org), a non-profit organization providing useful resources and research to consumers.

Table 8 – Ingredients to Avoid in Children's Care Products (from EWG)

	Ingredients to always avoid							Ingredients to avoid when possible										
	triclosan	Dibutyl phthalate and toluene	2-bromo-2-nitropropane-1,3-diol	DMDM hydantoin	oxybenzone	Boric acid and sodium borate	BHA	fragrance	PEG and ceteareth compounds	Iodopropynyl butylcarbamate	dyes	parabens	Benzyl and/or isopropyl alcohols	Triethanolamine (TEA)	Sodium monofluorophosphate	methylchloroisothiazolinone	methylisothiazolinone	Sodium fluoride
Johnson's baby powder								X										
Johnson's baby wash								X	X		X	X						
Pampers Kandoo kids shampoo				X				X		X	X	X	X					
Johnson's baby lotion								X			X	X	X					
Huggies hair and body wash								X	X									
Johnson's bedtime lotion								X				X	X					
Johnson's bedtime moisture wash								X	X									
Johnson's head to toe baby wash								X	X									

Site/Staff Interviews and Inspections

Common areas and exterior spaces were surveyed by applying a blended approach using an interview with staff and property management combined with physical inspections at the various sites that were focused on specific products and issues.

The intent of the interview and inspections was to gather information on:

- maintenance practices
- product usage and storage
- method of pest control
- approach to child safety
- garbage, recycling, and disposal of hazardous wastes
- landscape management practices
- outdoor property maintenance practices
- exterior physical hazards
- maintenance practices and safety of playgrounds
- detectors and radon testing.

The inspections of the common areas of each housing complex addressed the same categories as the residential units. All cleaning and personal care products that were observed were recorded by brand name.

Maintenance practices and products

For most of the housing sites, property management is responsible for cleaning and general maintenance of the sites. At Incarnation House management and residents are responsible for general cleaning. At Jersey Avenue, cleaning and general maintenance is contracted out to two different firms. For all sites there is a regular schedule for cleaning the common areas and offices. Cleaning staff use both commercial and household cleaning products. Product instructions are followed and care is taken when using caustic products. Products are stored in unlocked kitchen and bathroom cabinets, unlocked closets, and locked janitorial closets.

Methods of pest control

Property managements of all the sites have contracts with pest control companies (Adams Pest Control, Orkin Pest Control, or Mr. Bugs) for monthly or quarterly scheduled service. The services include checking for infestations, setting bait traps, spraying perimeters of buildings, and spraying in units as needed. The contracts state that the services are rendered at specific times. Most residents are notified of spraying in advance. Pest control materials that are used include rodent bait boxes along the exterior edges of buildings, glue boards, insect bait traps, sprays, and bags of mouse poison. At some sites management

inspects units monthly; at others, inspection is made less often. Staff attempt to plug access holes and to encourage residents to keep clean units and to cover food. Residents are not educated as to the nature of pesticides or to necessary actions that should be taken before and after pesticide use, such as covering or removing items that could become contaminated, or washing down surfaces and household items after pesticide applications.

When needed, property management practices pest control in addition to the contracted service. Sprays and bait traps are used.

Two of the sites contract out lawn maintenance. The services periodically apply fertilizer and herbicides. They flag after applications, but in only a few places that might not be visible to all residents. The services do not notify in advance of applications.

Approach to child safety

Childproofing accessible areas is not consistent. Some safety outlet plugs and cabinet latches (some broken) are used. In some areas of buildings where young children could be present, there are dangling cords (blinds and electrical cords), cabinets that are not locked or have child-restraint latches, and bookcases that could be pulled over. There are rooms that are used for infants where the cribs have cutout designs in the endboards and have bumper pads, pillows, and blankets in the cribs. (These are conditions that safe practices advise against.) At one site there is a large stuffed animal in the child care room that children climb on which poses concern for lack of cleanliness and potential asthma triggers.

The organizations receive donations such as toys, car seats, strollers, and children's products. Secondhand items are sorted but not checked for safety recalls.

Garbage, recycling, and hazardous waste

Large trash containers, some in enclosed areas, are located at each property site. Most areas are relatively clean and free of debris. Some of the lids are left open, which is convenient, but can attract pests. Some of the sites have either exterior and/or interior recycling bins (paper and plastic/glass/metal) available for residents. Most residents do not recycle. They are not educated on recycling (the importance of recycling, what can be recycled, how to recycle). All sites express a desire to encourage residents to recycle.

Of the sites surveyed, there is inconsistency in approaches to recycling and policies related to disposal of either management's or residents' hazardous waste (i.e., extra paint, used or old cleaning supplies or pesticides, art supplies, printer cartridges). Any hazardous products that are used by property

management are stored in basement areas, work rooms, etc. In most cases these areas are locked.

Landscape management practices

The quality of the landscaping at the surveyed sites is varied. For most of the sites the landscape design is minimal with the use of hardy shrub and perennial species (spiraea, arborvitae, burning bush, spruce, juniper, hosta) and lawns.

Two of the sites contract out lawn maintenance. The services periodically apply fertilizer and herbicides. They flag after applications, but in only a few places that might not be visible to all residents. The services do not notify in advance of applications.

For the other sites, property management maintains the landscapes. Herbicides are not used on lawns. Occasionally weed killer is used around the perimeter of buildings and sidewalks. There is no advance warning for residents or signage used after application.

At one of the sites, the soil grade could be improved; at other sites, lawn is worn away and needs replacement or mulch.

Outdoor property maintenance practices

For most of the housing sites, the property managements are responsible for outdoor maintenance and repairs. Buildings are in basically good repair with some minor work needed. At one site, there are some broken top bricks in the ramp, broken slats in back fence and in back stair enclosure; some areas appear trashy. At one site the play equipment is in need of repair and the landscape grading around the playground is unsafe.

Use of detectors and testing for lead and radon

Smoke detectors are placed in appropriate locations throughout the sites' buildings. Only some of the sites have carbon monoxide detectors.

In that most of the housing sites have had extensive renovation, the buildings were tested for lead as part of the renovation process, but not the soils. Emma's Place is relatively new construction, having been built in 2003, and lead should not be an issue in the buildings. Soil samples were taken from areas of bare soil around the edges of playgrounds (except for Emma's Place because there was no bare soil) and tested for lead. See following sections for results of these tests.

The sub-ground levels of the buildings have never been tested for radon. Radon collection devices were placed in appropriate locations in all six buildings and tested for presence of radon. See following sections for results of these tests.

Staff's Household and Personal Care Products

All household and personal care products that were observed at the three organizations were recorded by brand name. We found a total of 86 different brands of cleaning products, 5 brands of personal care products in the form of hand soaps, and 3 different brands of children's products in the form of baby wipes, powder, and oil.

Favorite products for cleaning were EcoLab and other commercial products, Pine-Sol, Lysol products, Windex, Clorox bleach, Dawn dishwashing liquid, antibacterial soaps, and hand sanitizers. Many of the products that the staff use are similar to those that the residents use.

Lead and Radon Testing

Lead. Background concentrations of lead occur naturally in soil with a range of 7 to 20 ppm. At high concentrations lead has the potential to be toxic to humans. There is a need to be concerned about elevated lead levels in the environment, particularly in soils in urban areas. Lead contamination may occur in soils where lead-based paint has peeled or been stripped from old buildings, from automobile emissions near congested streets or highways, or from industrial sources. Even though paint and gasoline no longer contain lead, once lead is deposited, it can persist for a long time. Exposure to soil lead comes from direct ingestion of contaminated soil or dust. Because young children tend to put their hands or toys in their mouths or because they sit and play near to the ground, they are at risk of ingesting lead from the soil.

As stated in a bulletin from the University of Minnesota Extension Service, the Minnesota State Legislature has established a bare soil standard of 100 ppm, which is based on measured risks of eating soil by young children. This level is currently lower than the level established by the EPA (400 ppm) or of most other states.

At the housing sites that had playgrounds, soil samples were taken from areas of bare soil around the edges of the playgrounds (with the exception of one site that did not have any bare soil) and tested for lead. Sampling protocol was followed as described in Methodology. Levels of lead in the soil ranged from 2 to 148 ppm. These levels are less than the level established by the EPA, but a lead level of 148 ppm is higher than the upper limit recommended by the state.

Radon. Radon is a naturally occurring gas that gets into buildings from the surrounding soil and is odorless, colorless, and radioactive. It is a natural breakdown of uranium and radium in soil and rock. Radon is found globally, but is more pronounced in certain types of bedrock, particularly the rock forming

much of the soil in the Upper Midwest. Radon is most likely to collect in sub-grade areas (basements and other lower areas) due to closer proximity to soil. The ionizing radiation emanating from radon can harm cells that make up human tissues and organs. The result of this damage can cause various types of cancer, particularly lung cancer. Radon is the second leading cause of lung cancer in the US after smoking.

EPA protocol describes two types of radon measurement tests: short term tests conducted from 48 hours up to 90 days, and long term tests that last from 90 to 365 days. The testing that was done as part of this project was an initial screening short term test lasting 6 days. Tests were done under closed-house conditions, with minimal ventilation. Factors that influence radon levels are: time of year, test location, weather patterns, disturbances of test collection devices, room temperature, and timeliness of analysis. EPA and Minnesota Department of Health vary somewhat on protocols for testing and re-testing. The following range of values indicate increasing levels of risk: 0 to 0.5 pCi/L, 0.6 to 1.9 pCi/L, 2.0 to 3.9 pCi/L, 4.0 to 10.0 pCi/L, and 10.1 to 100 pCi/L.

For averages of measurements that are in the range of 0 to 0.5 pCi/L, there is negligible risk. For averages ranging from 0.6 to 1.9 pCi/L, the EPA states that there is little short-term risk for radon levels in range. Because radon levels vary daily, it might be desired to retest at a future date. For averages of measurements that are in the range of 2.0 to 4.0 pCi/L, the EPA suggests conducting long term tests to verify values. Mitigation is warranted for radon levels above 4.0 pCi/L.

For each housing site that was surveyed, sub-ground level common and living areas and basements were tested for the presence of radon. Sampling protocol was followed as described in Methodology. Radon levels ranged from 0.7 to13.0 pCi/L. For those sites that had high levels, further testing and consultation is in process, with the expectation of mitigation.

Consumer Products

Household cleaning and laundry products

All household cleaning and laundry products that were observed being used by residents and staff were recorded by brand name. In the 33 households, a total of 350 cleaning and laundry products were recorded, of which there were 158 different brands. For those products which had the highest frequency of use, the specific ingredients, where available, were determined. In the course of interviews, cleaning practices and use of various products were also determined.

The ingredients in household products vary in the type and severity of health hazards that they pose. Some cause immediate, or acute, hazards such as respiratory or skin irritations, while others have long-term, or chronic, effects such as cancer and neurological and developmental issues. When used indoors in small spaces, commonly used household cleaning products and air fresheners emit toxic pollutants, which are sometimes at significant levels and could lead to health problems.

All residents and staff have exposure to some hazardous household chemicals, some to a greater extent than others. A significant finding was the use of chlorine bleach. A total of 23 of the 33 households and the staff of the three agencies used some type of bleach product. There was a total of 50 bleach products, representing 20 different brands.

Bleach (chlorine bleach) is a staple of the home care arsenal. It is a relatively weak solution of sodium hypochlorite in water. In the environment it breaks down quickly into salt (sodium chloride), oxygen, water, and chlorine. The EPA considers bleach to be a simple and effective product when properly used, that is, in well-ventilated space, with protective gloves, and in appropriate quantities. An issue with bleach is its intentional or accidental misuse or exposure. Often bleach is used with poor ventilation or used in close quarters such as in a bathroom. Bleach combined with ammonia and other types of cleaning agents gives off toxic gases. Another issue with bleach is that it can react with organic matter and release hazardous chemicals such as dioxins, furans, and trihalomethanes – compounds that pose concerns such as being carcinogens and hormone disruptors, and causing birth defects.

Many sources recommend the use of bleach as a disinfectant and to remove certain asthma triggers such as mold, but bleach can be a respiratory irritant and has been shown to be a trigger for asthma. Of the 33 households surveyed, 20 households had at least one member (23 children and 7 adults) with a physician-diagnosed case of asthma. Of those 20 households, 15 households currently

used bleach in some form. Three households stated that they have used bleach in the past, but no longer do so.

Asthma is a chronic condition in which there is inflammation and constriction of the airways resulting in difficulty breathing. Elements in a person's environment can trigger asthma attacks. These triggers can be dust mites, mold, tobacco smoke, volatile organic compounds (for example, from paint and adhesives), and chemicals found in cleaning and laundry products and air fresheners. Products associated with asthma are bleach, disinfectants, carpet cleaners, floor strippers and waxes, oven cleaners, and glass cleaners. Chemicals associated with asthma are oxidizers, ammonia, gluteraldehyde, phenols, limonene, ethanol, formaldehyde, ethylene glycol monobutyl ether, ethanolamine, and sulfonates. Many of these chemicals are found in household cleaning products.

Another significant finding was the popular use of products with obvious fragrance or products with 'fragrance' listed as an ingredient. Most cleaning and laundry products had some type of fragrance. Residents used products until they could 'smell' them. The smell was associated with cleanliness. Air fresheners such as Air Wick, Glade, and Febreze products are popular among residents.

Fragrances consist mostly of chemicals called volatile organic compounds. There are no regulations for listing on a label or in packaging the specific ingredients in a fragrance; it is simply listed as 'fragrance' or 'perfume'. Exposure occurs through inhalation or skin contact. Ingredients in fragrances can be skin irritants, triggers for asthma and allergies, and hormone disruptors. Common ingredients in some fragrances are a group of chemicals called phthalates, which are suspected hormone disruptors.

Product usage is significant. How a product is used and the quantity that is used determines the exposure to potentially harmful chemicals. For example, some residents use bleach for everything. In addition to using it in laundry, they put it in bucket water for washing floors, use it in spray bottles for washing down walls, and wipe down kitchen and bathroom surfaces with it. As one woman commented, "I clean until the whole house smells like bleach." Most residents do not follow product instructions and do not use the stated quantity. The exception is that most residents do measure out laundry detergent. Also, to safely use certain household products the area being cleaned requires proper ventilation.

Adult and children's personal care products

All personal care products that were observed being used by residents and staff were recorded by brand name. In the 33 households, a total of 347 personal care products were recorded, of which there were 237 different brands. These included such products as shampoos and conditioners, soaps and body washes, cleansers, moisturizers, hair care products, deodorants, dental care products, and fragrances. (Only some make up and nail products were recorded because

of the large number and variety of product found.) For those products which had the highest frequency of use, the specific ingredients were determined.

All children's personal care products that were observed being used by residents and staff were recorded by brand name. In the 33 households, a total of 80 children's care products were recorded, of which there were 53 different brands. For those products which had the highest frequency of use, the specific ingredients were determined.

Many of the same ingredients are found in both adult and children's personal care products. The ingredients vary in the type and severity of health hazards that they pose. Some cause immediate, or acute, hazards such as respiratory or skin irritations, while others have long-term, or chronic, effects such as cancer and neurological and developmental issues. Many of the chemicals in these products have not been adequately tested for toxicity.

In its official literature, the Food and Drug Administration states that a cosmetic manufacturer may use almost any raw material as a cosmetic ingredient and market the product without approval from the FDA. The government does not police the safety of personal care products, but relies on the chemical/cosmetic industry's safety panel to self-police. An Environmental Working Group analysis found that in the past 30 years, the industry's self-policing safety panel has reviewed the safety of only 11 percent of the 10,500 ingredients used in personal care products. The government does not require health studies or pre-market testing for these products before they are sold.

Of the many chemicals that are in personal care products, a single exposure to any of them is unlikely to cause harm, but daily exposure over a lifetime or repeated exposure for young children may add up. Continued research needs to be carried out by the cosmetic industry, governmental and academic agencies, and consumer groups to determine exposure levels and health risks.

Recommendations for consumer products

By becoming more informed consumers through education and experience, residents and staff can create more healthy environments by making more healthy choices in the products that they purchase and in the way in which those products are used. As residents and staff become aware of potential hazards in certain products and practices, they are encouraged to modify their practices, experiment with alternative products and ways of doing things, and use fewer products.

Awareness of the potential hazards of everyday products will inform residents and staff and hopefully convince them to begin to find new products and ways to use them. Many have made assumptions that if a product – whether it is laundry detergent, shampoo, sunscreen, or baby lotion – is for sale, therefore it is safe to

use and has been adequately tested and/or regulated by the US government. Advertising has convinced consumers that they need various products, that they are good, and that the products will make their life better, easier, cleaner, more germ-free, etc. Change will take time, encouragement, and continuing education.

The following are more specific recommendations on issues highlighted in this survey:

Bleach

- Limit or eliminate the use of bleach in household cleaning. There are other products that are just as effective in cleaning and/or disinfecting.
- If bleach is used for cleaning, use adequate ventilation, particularly in bathrooms or other closed-in spaces.

Fragrances in household products

- Reduce the use of scented products.
- Choose 'fragrance-free' products. While a 'fragrance-free' label does not necessarily mean fragrance chemicals are added, the product will have little, if any, noticeable scent.
- Avoid air fresheners – sprays, candles, aerosols, etc. – that only mask odors with more pleasant scents. Ventilate well and use natural deodorizers such as baking soda and essential oils.
- If using a product such as Pine-Sol, use with adequate ventilation.
- Know that some naturally-derived products, such as some essential oils and herbs, can irritate the skin and lungs, cause allergies, and trigger asthma.

Household cleaning and laundry products

- Use fewer products.
- Seek out alternative products and do-it-yourself products.
- Test effectiveness of alternative products.

Use of products

- For cleaning and laundry products, read labels and follow product instructions. 'More' is not always 'better'.
- When necessary, use appropriate safety measures, such as rubber gloves or safety goggles.
- Make sure that there is adequate ventilation.
- Don't 'stock pile' products that are not used. Most households had products that were not being used for a variety of reasons. Find someone that can use the products or get rid of them in a responsible way. Some products would be considered hazardous waste.

- Always store products in a safe way. If young children are present in the household, make sure that cleaning and laundry products are in locked/tethered cabinets/closets or on high shelves.

Adult personal care products

- Reduce the use of scented products.
- Search out phthalate-free personal care products and cosmetics.
- Reduce the total number of products used.
- Don't 'stock pile' products that are not used. Most households had products that were not being used for a variety of reasons. Find someone that can use the products or get rid of them in a responsible way. Some products would be considered hazardous waste.
- If possible, avoid the following ingredients listed in The Green Guide's "The Dirty Dozen", 12 ingredients to avoid in personal care products. Be aware that some products labeled 'natural' or 'botanical' have been known to include some of these.

    - Antibacterials
    - Coal tar colors: FD&C blue #1, green #3, yellow #5 & #6; D & C red #33
    - Diethanolamine, triethanolamine (DEA, TEA)
    - Quaternium 15 (formaldehyde)
    - Glycol ethers
    - Mercury and lead
    - Methyl, propyl, butyl, and ethyl parabens
    - Petroleum distillates
    - p-Phenylenediamine
    - Fragrance (contains phthlates)
    - Sodium lauryl sulfate (SLS)
    - Toluene

- If possible, avoid the following ingredients which are listed in The Green Guide's "The Dirty Dozen Chemicals in Cosmetics". Some of chemicals in the "dirty dozen" are listed above.

    - 1,4-Dioxane, appears as a contaminant in products containing sodium laureth sulfate and ingredients that include the terms PEG, xynol, ceteareth, oleth.
    - Nanoparticles
    - Hydroquinone.

Children's personal care products

- Follow recommendations for adult personal care products.

- If possible, avoid the following ingredients as listed by the Environmental Working Group.

  Ingredients to always avoid:
  - Triclosan
  - Dibutyl phthalate and toluene
  - 2-bromo-2-nitropropane-1,3-diol
  - DMDM hydantoin
  - Oxybenzone
  - Boric acid and sodium borate
  - BHA

  Ingredients to avoid when possible:
  - Fragrance
  - PEG and ceteareth compounds
  - Iodopropynyl butylcarbamate
  - Dyes
  - Parabens
  - Benzyl and/or isopropyl alcohols
  - Triethanolamine (TEA)
  - Sodium monofluoridephosphate
  - Methylchloroisothiazolinone
  - Methylisothiazolinone
  - Sodium fluoride.

Children's Safety Concerns

Childproofing

Most residents and all staff were conscious of the need to make physical environments safe for children – both in residents' apartments and in child care rooms and common areas in the buildings. Attempts at childproofing these areas were inconsistent. Residents are concerned about the safety of their children, but their knowledge of childproofing techniques and what constitutes hazardous situations is inconsistent.

Of the residents who have young children, most attempted to make safe environments by putting hazardous products and items up and out of reach. There was inconsistent use of electrical outlet covers and cabinet latches (or other means to secure cabinet doors). Only some residents were aware of the dangers of hanging cords (blinds, electrical cords, etc.). Many residents were not aware of current safety protocols stipulating that young children should not sleep with blankets, stuffed animals, or crib bumpers. A few of the residents made no effort to consciously safeguard their homes for their young children.

In accessible areas of the buildings where children could be present, safety precautions were inconsistent. Electrical outlet covers were not consistently used; some blind and electrical cords, cribs, crib accessories, and bookcases could pose safety risks.

The organizations and residents either receive or purchase secondhand items such as toys, car seats, strollers, and other children's products. Donated items are sorted through, but not checked for safety recalls.

Use of plastics

Most residents use some type of plastic plates, bowls, cups, spill-proof cups (sippy cups), and/or baby bottles. Residents were not aware of the potential hazards to their children of using certain types of plastic (those labeled 3, 6, and 7). (Many plastic items are labeled with a number inside the triangular recycling logo.) Use of plastics for eating, cooking, and food storage can carry health risks, as well as certain plastics used in some children's products (i.e., baby bottles, toys, bibs, etc.), home items (i.e., some shower curtains), food can liners (i.e., baby formula), and some dental sealants. Fetuses and young children are at greatest risk.

Of the various types of plastic, those that are polyethylene (1, 2, 4) and polypropylene (5) are considered to be the better choices for food and beverages. Polyvinylchloride (3), polystyrene (6), and polycarbonate (7) are considered to be types to avoid.

Recommendations for children's safety concerns

Childproofing

Residents and staff need to become more aware of steps that can be taken to prevent injuries in the apartments and common areas of the housing sites.

- As an organization, incorporate additional information on current child safety techniques into parenting and life skills classes.
- Conduct building-wide audits for hazardous child safety issues and environmental risks.
- Establish policies concerning child safety practices and recall checks.
- Correct deficiencies.
- Investigate options in child safety devices such as alternatives to electrical outlet plugs that make use easier and more consistent.
- Help to make child safety devices more readily available to residents.

Use of plastic

Residents and staff need to become more aware of the hazards of certain types of plastic and know about alternative options. By becoming more informed consumers through education and experience, parents can make better choices in products used by their young children and themselves.

- Choose baby bottles and sippy cups made of glass or polyethylene (1, 2, 4) or polypropylene (5).
- Many baby bottles are not labeled as to the type of plastic. Use ones that are 'clouded' or 'opaque' instead of hard, shiny clear or tinted plastic ones.
- Discard polycarbonate bottles (7; hard, shiny clear or tinted ones), especially those that are worn or scratched.
- Discard plastic bottles that cannot be identified.
- Store food in glass or ceramic containers.
- Use glass or ceramic containers in the microwave.
- Use wax paper instead of cling wrap to cover food in the microwave.
- Limit the use of plastic wrap.
- Do not use pre-mixed baby formula from cans. Buy powdered formula.
- Avoid dental sealants for baby teeth. Teach children good dental habits.
- Avoid buying water in bottles, unless it's labeled 1 or 2.
- Use non-polycarbonate water bottles. Five-gallon water bottles and sport water bottles (i.e., Nalgene) are made of polycarbonate (7).

Indoor Air Quality

All the residential units had externally-vented exhaust fans in the kitchens and bathrooms. There were a few units that had some mold around bathtubs. Due to the fact that all of these properties have recently undergone extensive renovations, mold was not seen as an issue.

In many units, indoor air quality was poor due to lack of ventilation, unclean conditions, use of incense and air fresheners, and/or tobacco smoke. None of the residents owned or used a HEPA vacuum cleaner.

Recommendations for indoor air quality

Residents and staff need to become more aware of the importance of good ventilation and the health impact of good indoor air quality.

- Encourage the use of kitchen and bathroom fans for ventilation.
- Eliminate all mold in units and common areas.
- Adequately ventilate all living areas.
- Limit or eliminate use of air fresheners, candles, and incense.
- Do not smoke in units.

- Make available to residents a vacuum cleaner with a HEPA filter.

Methods of Pest Control

The property managements of the three pilot agencies have contracts with commercial pest control companies for scheduled service. The contracts state that the services are rendered at specific times. Residents are notified of spraying in advance if it to be done in their units. Among the housing sites, there is inconsistent notification of spraying on the exterior or interior of the buildings. Pest control materials that are used include rodent bait boxes along the exterior edges of buildings, glue boards, insect bait traps, sprays, and bags of mice poison. Management inspects the units regularly. Staff encourage residents to keep clean units and to cover food.

The property managements and the contracted pest control companies appear to use some of the principles of integrated pest management (IPM), a method of preventing and controlling pests in a way that is the least hazardous to the residents and the environment.

Recommendations for methods of pest control

Residents and staff need to become more aware of the hazards of pesticides and the principles of IPM.

- Consider an educational program for residents as to the nature of pesticides and their associated health risks and how the residents can be an integral part of responsibly controlling pests.
- Encourage residents to take precautions before and after any pesticide application by covering or removing items that could become contaminated and washing down surfaces and household items after applications.
- Continue to encourage residents and staff to follow IPM principles – for example, keeping food in closed containers, not leaving dirty dishes laying around, sweeping up crumbs, and mopping up spills; repairing water leaks; blocking or plugging up pest entry points; and using pesticides sparingly or not at all.

Garbage, Recycling, and Hazardous Wastes

Large trash containers, some in enclosed areas, are located at each property site. Most areas are relatively clean and free of debris. Some of the lids are left open, which is convenient, but can attract pests. Some of the sites have either exterior and/or interior recycling bins (paper and plastic/glass/metal) available for residents. Most residents do not recycle. All sites express a desire to encourage residents to recycle.

Of the sites surveyed, there is inconsistency in approaches to recycling and policies related to disposal of either management's or residents' hazardous waste (i.e., extra paint, used or old cleaning supplies or pesticides, art supplies, printer cartridges). Any hazardous products that are used by property management are stored in basement areas, work rooms, etc. In most cases these areas are locked.

Recommendations for garbage, recycling, and hazardous wastes

- Encourage residents and staff to keep the area around the containers free of debris in order to limit pest activity.
- Consider incorporating an education program for residents on recycling (the importance of recycling, what can be recycled, how to recycle) and an incentive plan.
- Place recycling containers in convenient areas in all the buildings.
- Establish and carry out a policy on responsibly disposing of household hazardous wastes.
- Educate residents on the hazards of certain products and their proper disposal.

Landscape Maintenance and Management

Landscape maintenance is varied among the three organizations. Two of the sites contract out lawn maintenance; the other four sites are maintained by their respective property managements. The contracted services periodically apply fertilizer and herbicides. They flag after applications, but in only a few places that might not be visible to all residents. The services do not notify in advance of applications. At the other sites, there is minimal herbicide use.

Recommendations for landscape maintenance and management

- Consider incorporating more hardy shrubs and perennials into the landscape designs and correcting grade issues, if necessary.
- Consider starting community gardens (vegetables and flowers) with residents, getting children involved, and allowing residents to help with maintenance.
- Educate residents and staff on the health risks associated with herbicides.
- When herbicides are applied, give advance warning and signage.
- Work with maintenance services to use the most environmentally responsible methods available.

Outdoor Maintenance

For most of the housing sites, the property managements are responsible for outdoor maintenance and repairs. Buildings are in basically good repair with some minor work needed.

Recommendations for outdoor maintenance

- Continue proper maintenance to avoid moisture issues in lower levels and physical hazards that could result in injuries and to enhance curb appeal.
- Continue proper maintenance of equipment for safe play by children; repair equipment where needed.

Lead Testing

There is a need to be concerned about elevated lead levels in the environment, particularly in soils in urban areas. Exposure to soil lead comes from direct ingestion of contaminated soil or dust. Because young children tend to put their hands or toys in their mouths or because they sit and play near to the ground, they are at risk of ingesting lead from the soil.

At the housing sites that had playgrounds, soil samples were taken from areas of bare soil around the edges of the playgrounds (with the exception of one site that did not have any bare soil) and tested for lead. Levels of lead in the soil ranged from 2 to 148 ppm. These levels are less than the level established by the EPA, but a lead level of 148 ppm is higher than the upper limit recommended by the state.

Recommendations for lead testing

- Have bare soil in the area of playgrounds or other areas around buildings where children might play tested periodically.
- To mitigate areas of high lead content, lay sod or thick mulch in areas of bare soil.

Radon Testing

Radon is a naturally occurring gas that gets into buildings from the surrounding soil. Radiation emanating from radon can cause various types of cancer, particularly lung cancer. Radon is found globally, but is more pronounced in certain types of bedrock, particularly the rock forming much of the soil in the Upper Midwest. Radon is most likely to collect in sub-grade areas (basements and other lower areas) due to closer proximity to soil.

For each housing site that was surveyed, sub-ground level common and living areas and basements were tested for the presence of radon. Radon levels ranged from 0.7 to13.0 pCi/L. Two sites at radon levels above 4.0 pCi/L, which is the level that the EPA recommends further action be taken. For those sites that had high levels, further testing and consultation is in process, with the expectation of migration.

Recommendations for radon testing

- Because levels of radon vary throughout the year, consider re-testing at a future date. Factors that influence radon levels are: time of year, test location, weather patterns, disturbances of test collection devices, room temperature, and timeliness of analysis

NEXT STEPS

The findings of this project will be used to assist supportive housing providers and residents in improving safety conditions and reducing the use of harmful household and personal care products. It is the hope that follow-up evaluations will demonstrate the following projected outcomes:

- reduced use of harmful chemicals in household and personal care products
- reduced use of pesticides
- reduced exposure to triggers for asthma
- reduced risk of injury.

Next steps will be:

- to meet with residents and staff to share the findings from this research
- to engage residents as co-investigators in researching alternative products and methods and in determining their effectiveness
- to encourage residents and staff to make healthy choices
- to create training and educational materials that will help staff and residents improve environmental health and safety conditions for children and families in supportive housing communities.

APPENDICES

- Source Materials
- Community Resources and Partners
- Resident Interview Questionnaire
- Resident Inspection Tool
- Staff Interview Questionnaire
- Agency Inspection Tool

SOURCE MATERIALS

Books

Editors of E/The Environmental Magazine. Green Living: The E Magazine Handbook for Living Lightly on the Earth. New York: Plume (Penguin Group), 2005.

Gavigan, Christopher. Healthy Child, Healthy World: Creating a Cleaner, Greener, Safer Home. New York: Dutton, 2008.

Schapiro, Mark. Exposed: The Toxic Chemistry of Everyday Products. White River Junction, Vermont: Chelsea Green Publishing, 2007.

Schettler M.D., Ted; Solomon M.D., Gina; Valenti, Maria; and Huddle, Annette. Generations at Risk: Reproductive Health and the Environment. Cambridge, Massachusetts: The MIT Press, 2000.

Websites

Consumer products

Children's Environmental Coalition/Healthehouse/Chemicals/Bleach. http://www.checnet.org/healthehouse/chemicals/chemicals-detail.asp?Main_ID=327

The Clorox Comany/Material Safety Data Sheet. http://www.pgbrands.com/Portals/0/images/msds/Clorox_MSDS_0505_eng.pdf

Environmental Protection Agency/Chemical Summary for Chlorine. http://www.epa.gov/opptintr/chemfact/s_chlori.txt

Environmental Working Group/Home. http://www.ewg.org

Minnesota Department of Health/ Environmental Health. http://www.health.state.mn.us/people.html#communities

National Geographic/The Green Guide. http://www.thegreenguide.com/

National Geographic/The Green Guide/Product Report/Household Cleaning Supplies: The Problems. http://www.thegreenguide.com/reports/product.mhtml?id=15

National Geographic/The Green Guide/The Chlorine Conundrum. Carmela M. Federico. http://www.thegreenguide.com/doc/95/bleach

National Geographic/The Green Guide/The Dirty Dozen Chemicals in Cosmetics. Catherine Zandonella M.P.H. http://www.thegreenguide.com/doc/122/dirtydozen

Skin Deep, Cosmetic Safety Database. http://www.cosmeticsdatabase.com/

Skin Deep, Cosmetic Safety Database/Safety Guide to Children's Personal Care Products.
http://www.cosmeticsdatabase.com/special/parentsguide/index.php?nothanks=1

Women Voice's for the Earth. "Household Hazards: Potential Hazards of Home Cleaning Products". Alexandra Gorman. 2007.
http://www.womenandenvironment.org/campaignsandprograms/SafeCleaning/HazardsReport.pdf

Children's Safety Concerns

American Academy of Family Physicians/ Child Safety: Keeping Your Home Safe for Your Baby. http://familydoctor.org/online/famdocen/home/healthy/safety/kids-family/027.html

Institute for Agriculture and Trade Policy/ Food and Health Program. "Smart Plastics Guide: Healthier Food Uses of Plastics".
http://www.agobservatory.org/library.cfm?refid=77083

National Safety Council/ Fact Sheet Library/ Healthy Living.
http://www.nsc.org/resources/Factsheets/

National Geographic/The Green Guide/Baby Bottles.
http://www.thegreenguide.com/products/Kids_&_Babies/Baby_Bottleshttp://www.thegreenguide.com/

Pediatrics, Vol. 121 No. 2 February 2008. Sheela Sathyanarayana, MD, MPH, Catherine J. Karr, MD, PhD, Paula Lozano, MD, MPH, Elizabeth Brown, PhD, Antonia M. Calafat, PhD, Fan Liu, MS, and Shanna H. Swan, PhD. "Baby care Products: Possible Sources of Infant Phthalate Exposure".

U.S. Consumer Product Safety Commission/ Publications.
http://www.cpsc.gov/cpscpub/pubs/pub_idx.html

The Work Group for Safe Markets. "Baby's Toxic Bottle: Bisphenol A Leaching from Popular Baby Bottles".
http://www.chej.org/documents/BabysToxicBottleFinal.pdf

Indoor Air Quality

Environmental Protection Agency/ Indoor Air Quality. http://www.epa.gov/iaq/

Minnesota Department of Health/ Environmental Health/ Air Quality. http://www.health.state.mn.us/divs/eh/air/index.htm

National Safety Council/ Fact Sheet Library/ In the Environment. http://www.nsc.org/resources/Factsheets/

University of Minnesota Extension/ Living: Environmental Quality, Home. http://www.extension.umn.edu/topics.html?topic=6&subtopic=26

Pest Control

Environmental Protection Agency. Pesticides: Topical and Chemical Fact Sheets/ Integrated Pest Management (IPM) Principles. http://www.epa.gov/pesticides/factsheets/ipm.htm

Minnesota Department of Agriculture/ Integrated Pest Management http://www.mda.state.mn.us/searchtemplates/search.aspx?terms=integrated+pest+management&Submit=Search

Minnesota Department of Health/ Pesticides. http://www.health.state.mn.us/divs/eh/pesticide/index.html

University of Minnesota Extension Services/ Community and School IPM. http://www.extension.umn.edu/pesticides/IPM/ipmhome.htm

Lead and Radon

Environmental Protection Agency/Radon Home. http://www.epa.gov/radon/

Environmental Protection Agency/Radon/A Citizen's Guide to Radon: The Guide to Protecting Yourself and Your Family from Radon. http://www.epa.gov/radon/pubs/citguide.html

Environmental Protection Agency/Lead in Paint, Dust, and Soil. Residential Lead Hazard Standards TSCA Section 403. http://www.epa.gov/lead/pubs/leadhaz.htm

Minnesota Department of Health/ Environmental Health. http://www.health.state.mn.us/people.html#communities

APPENDICES

- Community Resources and Partners
- Resident Interview Questionnaire
- Resident Inspection Tool
- Staff Interview Questionnaire
- Agency Inspection Tool

Community Resources / Partners	Source for Project Discovery	Source for Advice and Guidance	Source for Diagnostics and Evaluation	Source for Training / Education / Remediation
YWCA of St. Paul	X			
Residents of YWCA of St Paul	X	X		
Emma Norton	X			
Residents of Emma's Place (Emma Norton)	X	X		
Wayside House	X			
Residents of Incarnation House (Wayside)	X	X		
Residents of Jersey Avenue (Wayside)	X			
Minnesota Department of Health – Indoor Air Quality		X	X	X
Minnesota Department of Agriculture – Pest Management		X	X	X
Minnesota Pollution Control Agency			X	X
University of Minnesota Extension Services – Department of Soil, Water, and Climate			X	X
University of Minnesota Extension Services – Department of Design, Housing, and Apparel		X		X
Minnesota Green Communities; Janne Flisrand		X		X
Healthy Legacy		X	X	X
Institute for Agriculture and Trade Policy		X	X	X
Green Guardian			X	X
Minnesota Indoor Air Association		X	X	X
National Resources				
Environmental Working Group			X	X
Environmental Protection Agency			X	X
National Institute for Occupational Safety and Health			X	X
Consumer Product Safety Commission			X	X
National Safety Council			X	X
National Geographic – The Green Guide			X	X
National Institutes of Health – Household Products Database			X	X
Science and Environmental Network			X	X

Resident Inspection Tool				
Inspection categories	**Location**		**Item**	**Brand name - Notes**
Hazardous household chemicals/ products				
	Bathroom	☐	Air sanitizer	
		☐	Bath and shower cleaner	
		☐	Bowl cleaner	
		☐	Cleanser	
		☐	Disinfectant	
		☐	Disinfectant cleaner	
		☐	Lime/rust/scale remover	
		☐	Mildew remover	
		☐	Soap scum remover	
		☐	Drain opener	
		☐	Tile and grout cleaner	
		☐	Other	
		☐	Other	
		☐	Other	
	Kitchen/ general cleaning	☐	Dishwashing liquid	
		☐	Dishwasher detergent	
		☐	Ammonia cleaner	
		☐	Glass cleaner	
		☐	Oven cleaner	
		☐	Disinfectant cleaner	
		☐	Floor cleaner/wax	
		☐	Furniture polish	
		☐	Other cleaning products	
		☐	Cleaners that look like beverages	
		☐	Drain opener	
		☐	Plant fertilizer	
		☐	Other	
		☐	Other	
		☐	Other	
	Living room/ bedrooms	☐	Air freshener	
		☐	Scented candles	

Resident Inspection Tool				
Inspection categories	**Location**		**Item**	**Brand name - Notes**
		☐	Candles	
		☐	Other	
		☐	Other	
		☐	Other	
		☐	Other	
		☐	Other	
	Laundry	☐	Detergent	
		☐	Fabric softener	
		☐	Spot remover/ pre-treat	
		☐	Bleach	
		☐	Non-chlorine bleach	
		☐	Other	
		☐	Other	
		☐	Other	
	Other areas	☐	Other	
		☐	Other	
		☐	Other	
	Personal care/ medical	☐	Medications	
		☐	Disinfectants	
		☐	Antibiotic creams	
		☐	Shampoo and conditioners	
		☐	Hair tints/ dyes	
		☐	Hair products	
		☐	Antiperspirants	
		☐	Soaps	
		☐	Make up	

Resident Inspection Tool				
Inspection categories	**Location**		**Item**	**Brand name - Notes**
		☐	Nail polish and remover	
		☐	Fragrances	
		☐	Other	
		☐	Other	
		☐	Other	
	Arts and crafts	☐	Paints/ stains/ varnish	
		☐	Spray paint	
		☐	Markers	
		☐	Crayons	
		☐	Glues/ glue sticks	
		☐	Adhesives	
		☐	Glitter/ sequins/ beads	
		☐	Ink	
		☐	Other	
		☐	Other	
		☐	Other	
	Home office	☐	Printer cartridges	
		☐	Adhesives	
		☐	Correction fluid	
		☐	Other	
		☐	Other	
		☐	Other	
	Pesticides	☐	Rodent/ roach traps	
		☐	Insect sprays	
		☐	Indoor/ outdoor plant sprays	
		☐	Fly strips	
		☐	Insect repellants - household	
		☐	Insect repellants - personal	
		☐	Other	
	Sources of lead	☐	Old painted finishes/ chips/ dust	
		☐	Glazed pottery - in use/ chips/ cracks/ use with acidic substances	

Resident Inspection Tool				
Inspection categories	**Location**		**Item**	**Brand name - Notes**
		☐	Lead crystal used for drinking/ storage of acidic substances	
		☐	Arts and crafts projects	
		☐	Other	
		☐	Other	
Storage of household chemicals/ products				
	Bathroom	☐	Unlocked cabinet/ closet - reachable by child	
		☐	On floor/ countertop or reachable by child	
		☐	Medications in non-child proof containers	
		☐	Other	
	Kitchen	☐	Unlocked cabinet/ closet - reachable by child	
		☐	On floor/ countertop or reachable by child	
		☐	Medications in non-child proof containers	
		☐	Other	
	Living room/ bedrooms	☐	Unlocked cabinet/ closet - reachable by child	
		☐	On floor/ countertop or reachable by child	
		☐	Medications in non-child proof containers	
		☐	Other	
	Other areas	☐	Other	
		☐	Other	
		☐	Other	
Storage/use of flammable products				
	Kitchen	☐	Grease containers	
		☐	Matches	
		☐	Candles	
		☐	Storage of items near sources of flame/ heat	
		☐	Other	

Resident Inspection Tool				
Inspection categories	**Location**		**Item**	**Brand name - Notes**
		☐	Other	
	Living room/ bedrooms	☐	Candles	
		☐	Matches	
		☐	Other	
		☐	Other	
	Other areas	☐	Other	
		☐	Other	
		☐	Other	
Evidence of pests				
	Bathroom	☐	Droppings	
		☐	Damage	
		☐	Actual pests	
		☐	Type	
		☐	Type	
		☐	Other	
	Kitchen	☐	Droppings	
		☐	Damage	
		☐	Actual pests	
		☐	Type	
		☐	Type	
		☐	Other	
	Living room/ bedrooms	☐	Droppings	
		☐	Damage	
		☐	Actual pests	
		☐	Type	
		☐	Type	
		☐	Other	
	Laundry	☐	Droppings	
		☐	Damage	
		☐	Actual pests	
		☐	Type	
		☐	Type	
		☐	Other	
	Furnace/ hot water heater	☐	Droppings	

Resident Inspection Tool				
Inspection categories	**Location**		**Item**	**Brand name - Notes**
		☐	Damage	
		☐	Actual pests	
		☐	Type	
		☐	Type	
		☐	Other	
	Other areas	☐	Droppings	
		☐	Damage	
		☐	Actual pests	
		☐	Type	
		☐	Type	
		☐	Other	
Entry points, hiding places, and supply of needs for pests				
	Bathroom	☐	Cracks, gaps, holes at baseboards, walls, etc	
		☐	Holes, gaps in screens/ windows	
		☐	Openings around water pipes	
		☐	Openings around around heat and air vents	
		☐	Unscreened vents	
		☐	Water leaks	
		☐	Uncovered food and garbage	
		☐	Unsanitary conditions	
		☐	Warm, dark places	
		☐	Other	
	Kitchen	☐	Cracks, gaps, holes at baseboards, walls, etc	
		☐	Holes, gaps in screens/ windows	
		☐	Openings around water pipes	
		☐	Openings around around heat and air vents	
		☐	Unscreened vents	
		☐	Water leaks	

Resident Inspection Tool				
Inspection categories	**Location**		**Item**	**Brand name - Notes**
		☐	Uncovered food and garbage	
		☐	Unsanitary conditions	
		☐	Warm, dark places	
		☐	Other	
	Living room/ bedrooms	☐	Cracks, gaps, holes at baseboards, walls, etc	
		☐	Holes, gaps in screens/ windows	
		☐	Openings around water pipes	
		☐	Openings around around heat and air vents	
		☐	Unscreened vents	
		☐	Water leaks	
		☐	Uncovered food and garbage	
		☐	Unsanitary conditions	
		☐	Warm, dark places	
		☐	Other	
	Laundry	☐	Cracks, gaps, holes at baseboards, walls, etc	
		☐	Holes, gaps in screens/ windows	
		☐	Openings around water pipes	
		☐	Openings around around heat and air vents	
		☐	Unscreened vents	
		☐	Water leaks	
		☐	Uncovered food and garbage	
		☐	Unsanitary conditions	
		☐	Warm, dark places	
		☐	Other	
	Furnace/ hot water heater	☐	Cracks, gaps, holes at baseboards, walls, etc	
		☐	Holes, gaps in screens/ windows	
		☐	Openings around water pipes	

Resident Inspection Tool				
Inspection categories	**Location**		**Item**	**Brand name - Notes**
		☐	Openings around around heat and air vents	
		☐	Unscreened vents	
		☐	Water leaks	
		☐	Uncovered food and garbage	
		☐	Unsanitary conditions	
		☐	Warm, dark places	
		☐	Other	
	Other areas	☐	Cracks, gaps, holes at baseboards, walls, etc	
		☐	Holes, gaps in screens/ windows	
		☐	Openings around water pipes	
		☐	Openings around around heat and air vents	
		☐	Unscreened vents	
		☐	Water leaks	
		☐	Uncovered food and garbage	
		☐	Unsanitary conditions	
		☐	Warm, dark places	
		☐	Other	
Type of floor coverings, furniture, bedding				
	Floor coverings	☐	Carpeting	
		☐	Large area rugs	
		☐	Small, washable rugs	
		☐	Vinyl	
		☐	Linoleum	
		☐	Wood	
		☐	Ceramic tile, slate, marble	
		☐	Other	
		☐	HEPA vacuum	
	Furniture	☐	Upholstered	
		☐	Slipcovers	
		☐	Wood	

Resident Inspection Tool				
Inspection categories	**Location**		**Item**	**Brand name - Notes**
		☐	Vinyl	
		☐	Plastic	
		☐	Other	
	Bedding	☐	Foam	
		☐	Upholstered	
		☐	Down	
		☐	Down alternative	
		☐	Washable bed covers	
		☐	Covered mattresses - cloth	
		☐	Covered mattresses - vinyl/plastic	
		☐	Covered mattresses - rubber/latex	
		☐	Other	
Types and use of plastics for cooking/ storage/ eating/ drinking/ toys				
	Cooking/ storage	☐	Cookware/ microwave	
		☐	Utensils	
		☐	Food storage	
		☐	Plastic wraps	
		☐	Water bottles	
		☐	Other	
		☐	Other	
		☐	Other	
	Children's use	☐	Baby bottles	
		☐	Juice containers	
		☐	Sippy cups	
		☐	Bottle nipples	
		☐	Teething toys	
		☐	Toys/ books	
		☐	Other	
		☐	Other	
Evidence of mold/ mildew				
	Bathroom	☐	Tubs/ showers/ sinks	
		☐	Shower curtain	

Resident Inspection Tool				
Inspection categories	**Location**		**Item**	**Brand name - Notes**
		☐	Under cabinets	
		☐	Walls/ floors	
		☐	Wall coverings	
		☐	Excessive humidity	
		☐	Other	
	Kitchen	☐	Sinks	
		☐	Under cabinets	
		☐	Walls/ floors	
		☐	Wall coverings	
		☐	Spoiled food	
		☐	Excessive humidity	
		☐	Other	
	Living room/ bedrooms	☐	Walls/ floors	
		☐	Wall coverings	
		☐	Excessive humidity	
		☐	Other	
	Laundry/ furnace/ hot water heater	☐	Walls/ floors	
		☐	Excessive humidity	
		☐	Other	
	Air conditioners/ humidifiers	☐	Filters	
		☐	Drainage	
		☐	Other	
Evidence/ odor of volatile organic compounds (VOCs)				
	Use in cleaning, disinfecting, cosmetics, degrasing, and hobby products	☐	Paints/ varnishes/ waxes	
		☐	Other	
		☐	Other	
		☐	Other	
	Building products	☐	Adhesives	
		☐	Composite materials	
		☐	Finishes	
		☐	Other	

Resident Inspection Tool				
Inspection categories	**Location**		**Item**	**Brand name - Notes**
		☐	Other	
	Benzene (particularly hazardous)-	☐	Paint supplies	
		☐	Tobacco smoke	
		☐	Automobile emissions	
		☐	Other	
	Methylene chloride (particularly hazardous)-	☐	Paint strippers	
		☐	Adhesive removers	
		☐	Aerosol spray paint	
		☐	Other	
		☐	Dry cleaning	
		☐	Other	
Environmental tobacco smoke				
		☐	Evidence of smoking	
		☐	Odor of smoking	
		☐	Odor	
Childproofing/ use of safety features and safe products				
	Bathroom	☐	Child-proof locks/ latches on cabinets/ closets	
		☐	Electrical outlet covers	
		☐	Ground fault receptacle	
		☐	Door knob lock disengaged or modified	
		☐	Non skid surface in tub	
		☐	Diaper pail lock	
		☐	Toilet lid lock	
		☐	Other	
	Kitchen	☐	Child-proof locks/ latches on cabinets/ closets	
		☐	Electrical outlet covers	
		☐	Ground fault receptacle	
		☐	Stove safety/ knobs, pot handles	

Resident Inspection Tool				
Inspection categories	**Location**		**Item**	**Brand name - Notes**
		☐	Alternate warming of bottles instead of microwaving	
	Living room/ bedrooms	☐		
		☐	Child-proof locks/ latches on cabinets/ closets	
		☐	Electrical outlet covers	
		☐	Other	
		☐	Other	
		☐	Other	
	Unsafe products	☐	Bath seats and rings	
		☐	Wooden toy chests with lids that don't stay open	
		☐	Safe bedding etc. - quilts, bumper pads, stuffed toys in crib	
		☐	Sleep positioners	
		☐	Cleaning products that look like beverages	
		☐	Other	
		☐	Other	
		☐	Other	
	Miscellaneous	☐	Accessible poison control number	
Electrical/ physical hazards				
	Bathroom	☐	Small appliances	
		☐	Absent ground fault receptacles	
		☐	Drapery or blind cords	
		☐	Other	
		☐	Other	
	Kitchen	☐	Small appliances with cords	
		☐	Pot handles	
		☐	Step stools	
		☐	Trash cans	
		☐	Other	
		☐	Other	

Resident Inspection Tool				
Inspection categories	**Location**		**Item**	**Brand name - Notes**
	Living room/ bedrooms	☐	Cords across walkways	
		☐	Cords that could pull down heavy objects	
		☐	Drapery or blind cords	
		☐	Rips in carpeting	
		☐	Small area rugs without skid backing	
		☐	Bookcases unsecured	
		☐	Stairs unsecured by gates	
		☐	Other	
		☐	Other	
		☐	Other	
Use of detectors				
	Kitchen	☐	Smoke detector	
		☐	CO detector	
	Bathroom	☐	Smoke detector	
		☐	CO detector	
	Living room/ bedrooms	☐	Smoke detector	
		☐	CO detector	
	Hallways	☐	Smoke detector	
		☐	CO detector	
Hazards resulting from recalled products/ unsafe products				
	Baby/child products	☐	Cribs	
		☐	Car seats	
		☐	Play pens	
		☐	Gates	
		☐	Walkers	
		☐	Toys	
		☐	Drawstring outerwear	
		☐	Other	
		☐	Other	
		☐	Other	
		☐	Other	

Agency Inspection Tool - Common Areas				
Inspection categories	**Location/ Issues**		**Item**	**Notes**
Common spaces of a housing complex will address the same inspection categories as the residential units, as well as the following categories:				
Pest control				
	Management	☐	Self	
		☐	Contract	
		☐	Both	
		☐	Other	
	Method of control - pesticide	☐	Chemical - liquid	
		☐	Chemical - spray	
		☐	Chemical - granular	
		☐	Traps -chemical	
		☐	Traps - sticky	
		☐	Other	
		☐	Other	
	Method of control - IPM	☐	Chemical - granular	
		☐	Chemical - liquid	
		☐	Chemical - spray	
		☐	Traps - chemical	
		☐	Traps - sticky	
		☐	Other	
		☐	Other	
	Policies	☐	Notification of residents	
		☐	Frequency of applications	
		☐	Applications as needed	
		☐	Applications scheduled	
		☐	Locations of applications	
		☐	Other	
		☐	Other	
		☐	Other	
Hazardous wastes				
	Types	☐	Paints etc	
		☐	Florescent bulbs	
		☐	Batteries	
		☐	Appliances	
		☐	TVs	
		☐	Computers	

Agency Inspection Tool - Common Areas				
Inspection categories	**Location/ Issues**		**Item**	**Notes**
		☐	Chemicals	
		☐	Other	
		☐	Other	
		☐	Other	
		☐	Other	
	Policies	☐	Method of disposal - agency	
		☐	Method of disposal - residents	
		☐	Storage	
		☐	Other	
		☐	Other	
Garbage/ recycling				
	Type	☐	Garbarge	
		☐	Other	
	Recycling	☐	Newspaper	
		☐	Loose paper	
		☐	Cardboard	
		☐	Metal	
		☐	Glass	
		☐	Plastic	
		☐	Other	
	Policies	☐	Scheduled removal	
		☐	Storage/ containers	
		☐	Self removal	
		☐	Other	
Radon				
	Testing/ monitoring	☐	Subgrade spaces	
		☐	Other	

Agency Inspection Tools - Exterior Spaces				
Inspection categories	**Issues**		**Item**	**Notes**
Landscape managment - pesticides/ herbicides				
	Management	☐	Self	
		☐	Contract	
		☐	Both	
		☐	Other	
	Contract	☐	Description of method	
		☐	Restrictions to method	
		☐	Notification of residents	
		☐	Other	
		☐	Other	
		☐	Other	
	Self	☐	Description of method	
		☐	Restrictions to method	
		☐	Applicator(s)	
		☐	Other	
		☐	Other	
	Method of control - pesticide	☐	Chemical - liquid	
		☐	Chemical - spray	
		☐	Chemical - granular	
		☐	Other	
		☐	Other	
	Method of control - IPM	☐	Chemical - granular	
		☐	Chemical - liquid	
		☐	Chemical - spray	
		☐	Other	
		☐	Other	
	Policies	☐	Notification of residents	
		☐	Frequency of applications	
		☐	Applications as needed	
		☐	Applications scheduled	
		☐	Locations of applications	
		☐	Other	
		☐	Other	
		☐	Other	

Agency Inspection Tools - Exterior Spaces				
Inspection categories	**Issues**		**Item**	**Notes**
Landscape management - design				
	Plant material	☐	Trees	
		☐	Shrubs	
		☐	Grasses	
		☐	Lawns	
		☐	Perennials	
		☐	Annuals	
		☐	Vines	
		☐	Other	
		☐	Other	
		☐	Other	
	Characteristics of plant material	☐	Native species	
		☐	Hardy	
		☐	Drought tolerant	
		☐	Traffic tolerant	
		☐	High water needs	
		☐	Dense barriers	
		☐	Thorns, etc	
		☐	Edible	
		☐	Inedible	
		☐	Poisonous	
		☐	Other	
		☐	Other	
	Maintenance	☐	Watering	
		☐	Mulch	
		☐	Mowing/weeding	
		☐	Seasonal	
		☐	Other	
		☐	Other	
	Surfaces	☐	Cement	
		☐	Asphalt	
		☐	Mulch	
		☐	Gravel	
		☐	Sand	
		☐	Rubber	

Agency Inspection Tools - Exterior Spaces				
Inspection categories	**Issues**		**Item**	**Notes**
		☐	Other	
		☐	Other	
Physical hazards				
	Walks/ stairs/ curbs/ drive-ways/ parking lots	☐	Uneven	
		☐	Cracked	
		☐	Rough	
		☐	Broken	
		☐	Unaccessible to disabled	
		☐	Broken or lack of handrails	
		☐	Signage	
		☐	Other	
		☐	Other	
		☐	Other	
		☐	Other	
	Fencing/ gates	☐	Broken	
		☐	Non-functional	
		☐	Sharp edges	
		☐	Missing parts	
		☐	Rusty	
		☐	Other	
		☐	Other	
		☐	Other	
Playgrounds				
	Surfaces	☐	Mulch	
		☐	Sand	
		☐	Rubber	
		☐	Asphalt	
		☐	Cement	
		☐	Other	
		☐	Other	
	Equipment	☐	Broken/ damaged	
		☐	Inappropriate for age of children	
		☐	Unaccessible to disabled	
		☐	Non-durable materials	

Agency Inspection Tools - Exterior Spaces				
Inspection categories	**Issues**		**Item**	**Notes**
		☐	Hazardous materials	
		☐	Other	
		☐	Other	
		☐	Other	
	Barriers/ fencing/ gates	☐	Broken/ damaged/ missing parts	
		☐	Rough surfaces	
		☐	Rusty	
		☐	Railroad ties	
		☐	Other	
		☐	Other	
	Hazardous products/ contamination	☐	Railroad ties	
		☐	Lead in soil	
		☐	Other	
		☐	Other	
Garbage/ recycling				
	Garbage	☐	Storage/ containers	
		☐	Removal	
	Recycling	☐	Storage/ containers	
		☐	Removal	

Staff Interview Questionnaire	
Survey #	
Date	
Organization	
Site	
Contact	
Unit #	
Phone	
Maintenance practices	
Who is responsible for cleaning and general maintenance of the property?	
What types of cleaning products are used?	
Are there any cleaning products that are your favorites or that you think “really work”?	
What is the schedule for cleaning the common areas in the building?	
Does carpeting and upholstered furniture get shampooed? How often?	
How often does carpeting get vacuumed? What type of vacuum cleaner is used?	
Product usage and storage	
How do you use (various types) of products? How much do you use? Do you read the labels and follow directions?	
Where are (various types) of products stored?	
Approach to pest control	
Do you ever see bugs, mice, flies, or other pests in the building?	
What is your approach to pest control?	
Do you have a contract with a pest control company or do you take care of pest control internally?	
If a contract, how often do they come out and what type of products do they use?	
If you use pesticides, what kind do you use? Do you have any favorites?	

How do you use pesticides? How much do you use? Do you read the labels and follow directions?	
Where do you keep pesticides?	
Approach to childproofing accessible areas	
What actions have you taken to keep children safe in the common areas?	
Use of secondhand or recycled children's products	
Do you have any secondhand children's products?	
Have you checked to see if any of the products have been recalled?	
Storage and disposal of hazardous wastes	
Do you have an agency policy on storage and disposal of hazardous wastes? For the residents? For the agency?	
Storage and disposal of garbage and recyclable items	
Do you encourage recycling? For the residents? For the agency?	
Radon and carbon monoxide testing	
Have areas of the building been tested for radon? Are there carbon monoxide detectors in appropriate areas?	
Landscape management practices	
What is your approach to landscape maintenance and management?	
If contract, describe the contract terms for pesticide use?	
Are residents and staff notified of pesticide use? By whom?	
If self, describe the contract terms for pesticide use?	
Are residents and staff notified of pesticide use? By whom?	
What is the frequency of pesticide use?	
What is the landscape maintenance schedule?	

Outdoor property maintenance practices	
Who is responsible for outdoor maintenance and repairs?	
Maintenance practices of playgrounds.	
Who is responsible for maintenance and repair of playgrounds?	

Resident Interview Questionnaire	
Survey #	
Date	
Organization	
Site	
Resident's Name	
Unit #	
Phone	
Household and laundry practices	
How do you clean your apartment?	
How do you clean the kitchen and bathroom?	
Did anyone teach you to clean? Do you clean your apartment in the same way as the home was cleaned where you grew up?	
Are there any cleaning products that are your favorites or that you think "really work"?	
How do you use cleaning products? How much do you use? Do you read the labels and follow directions?	
How often do you clean?	
How often do you wash clothes? Do you have a washer/dryer in the apartment or do you go to a laundry room in the building or to a laudermat?	
Are there any laundry products that are your favorites or that you think "really work"?	
How do you use laundry products? How much do you use? Do you read the labels and follow directions?	
Product usage and storage	
How do you use (various types) of products? How much do you use? Do you read the labels and follow directions?	
Where do you store your cleaning products, laundry products, etc.?	
Where do you keep your personal products – hair products, makeup, nail products, medications, etc.?	
Where do you keep art supplies, office supplies, etc.?	

Approach to pest control	
Do you ever see bugs, mice, flies, or other pests in the apartment?	
If you see pests, do you do anything about them or does the building management take care of the problem?	
If you use pesticides, what kind do you use? Do you have any favorites?	
How do you use pesticides? How much do you use? Do you read the labels and follow directions?	
Where do you keep pesticides?	
Cooking and eating practices	
Do you use any plastic containers or plastic film for cooking in the microwave?	
What kind of dishes and glasses do you use?	
Do you have any ceramics or pottery that you use for eating or drinking?	
Floor coverings, furniture, and bedding	
How do you clean your carpets or rugs? What kind of vacuum cleaner do you have?	
Do you ever shampoo the carpets or upholstered furniture?	
What types of mattresses are on the beds?	
Do you have mattress covers on the beds? What are they made of – plastic or fabric?	
Approach to childproofing unit	
Have you done anything special to keep your children out of things or to keep them from getting hurt?	
Use of secondhand or recycled children's products	
Have you bought any baby things or toys from a store such as Goodwill or has the management or other source given you things to use for your children?	
Type of child products	
Do you have a child that uses baby bottles, pacifiers, or sippy cups?	
What types of things does your baby or toddler play with?	

General health of the residents	
How many children are living here and what are their ages?	
At times, do you or your children have difficulty breathing, coughing, headaches, etc.?	
Has a doctor told you that either you or a child has asthma?	
Do you or your child often feel sick?	
When your children are sick or having breathing problems, do they stay home from school or child care? How many days out of the school year do they miss?	